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TECHNICAL SUPPORT/DESIGN-IN

WIMA PROCESS CONTROL SYSTEM

SHIP-TO-STOCK DELIVERIES

Film Capacitors for Electronic Equipment

Edition 2019

Content

Nominal Capacitance

The nominal capacitance of a capacitor is usually given in pF, nF or µF.

Operating/Rated Voltage

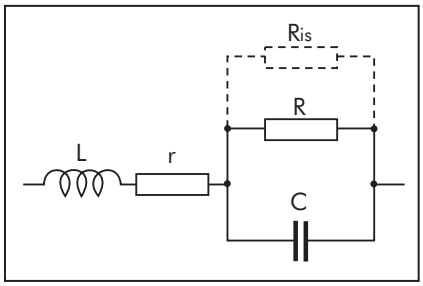
Each capacitor is designed for a specified rated voltage in continuous operation.
This is usually only valid for ambient temperatures of T ⩽ + 85° C. In the case of higher temperatures a derating factor must be applied to the rated voltage from 85° C.

Insulation Resistance/Time Constant

The insulation resistance is normally expressed in megohms (MΩ) and is measured at a specified voltage after 1 minute.
The time constant defines the time in seconds, in which the voltage across the capacitor self-discharges to 37% of the fully charged state and it is expressed as $\tau = R_{is} \times C$.
The insulation resistance or time constant value denotes the quality of the dielectric insulation.

Dissipation Factor

The dissipation factor tan δ is the quotient of the resistive and reactive parts of the impedance.
The dielectric losses are illustrated by R in the equivalent circuit diagram.
The insulation resistance R_{is} is in parallel with R, and affects the tan δ only at very low frequencies.
The dissipation factor is also affected by the resistance of both electrodes and of the termination – electrode interface. This is represented by the series resistance r.
L represents the remaining self-inductance.



Capacitance Tolerance

The tolerance is the permissible actual capacitance relative to the nominal capacitance and it is defined in per cent. The tolerance is to be measured at + 20° C and the permissible tolerance is only valid at the time of shipment.
The capacitance may change after long storage or long usage.
The tolerance, with the exception of ± 20%, is usually marked on the capacitor body in clear digits.

Temperature Coefficient of Capacitance

The temperature coefficient α expresses the change in capacitance with temperature, relative to the capacitance at the reference temperature of + 20° C; it is usually expressed in ppm per °C.

$$C_T = C_{20} \times [1 + \alpha \times (T - 20° C)]$$

C_{20} = capacitance at +20° C
C_T = capacitance at T
α = may be positive or negative.

Pulse Stressing

The ratings on pulse rise time are based on tests in accordance with DIN-IEC 60384 part 1.
The test voltage corresponds to the rated voltage and the test comprises 10 000 pulses with a repetition frequency of 1 Hz.
The catalogue ratings are in accordance with the CECC specifications which specify that the test pulse rise time shall be 10 times the catalogue rating.
It should also be noted that the pulse rise time (F) i.e. V/µsec also provides the maximum current capability, as it can be determined from the following formula.

$$I = F \times C \times 1.6$$

C in µF / I in amps.
The information on the pulse rise time refers to pulses equal to the rated voltage so that, at lower operating voltages, the permissible pulse rise times may be increased.

Warning Notice/Technical Support

AC voltage load at the mains
Anticipating possible interfering pulses, DC voltage capacitors must not be operated at the mains (power line), irrespective of the rated AC voltage. For this purpose, use approved interference suppression capacitors only.

Thermal load in the application
If a plastic film capacitor is overstressed due to inappropriate usage under AC voltage conditions, the temperature inside the component may rise to an impermissibly high level. Thus, the dielectric film may subsequently be damaged leading to a short circuit or formation of smoke and even fire in the capacitor.
This may also happen if the capacitor is overheated by an external heat source.

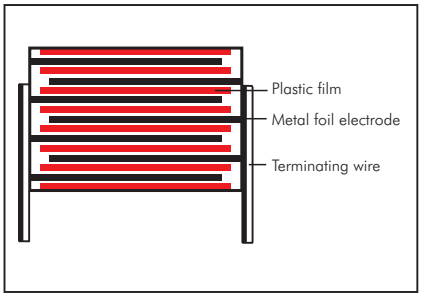
Shock and/or vibration load for larger case sizes
For increased shock and vibration applications involving larger case sizes (i.e., PCM 22.5 mm pin spacing or greater), it is recommended to fix capacitors in an appropriate way; or special pin and plate terminations may be required respectively to minimize lead separation from the capacitor element or the solder joint.

Processing
When processing plastic film capacitors it is mandatory to observe the application recommendations with regard to soldering and/or cleaning and drying processes.

General remarks
All catalogue data, range surveys and application data correspond to the actual state of the art and were elaborated as thoroughly and precisely as possible. They are to be understood as general information, and the right for amendments and construction changes is reserved. Special customized designs which deviate from our catalogue data, irrespective of whether being based on factory standards, specifications or related data, do not release the user from his duty of care with regard to incoming goods inspection and production monitoring. In case of the components being purchased through second or third suppliers we urgently ask to compare the technical details with the data given by the manufacturer. In cases of doubt we recommend use is made of our technical support, since we do not take any responsibility for damages caused by inappropriate use or processing of our capacitors.

Construction Principles of WIMA Capacitors

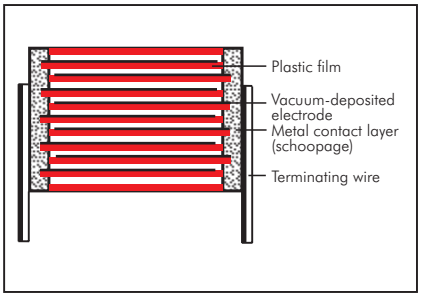
Film and Foil Construction



WIMA Types:

FKP 02 | FKS 2 | FKP 2
FKS 3 | FKP 3

Metallized Construction



WIMA Types:

SMD-PET | SMD-PEN | SMD-PPS
MKS 4 | MKP 4C | MKP 4
MP 3-Y2 | DC-LINK MKP 3 | DC-LINK MKP 4
DC-LINK HC | DC-LINK HY

Advantages of Film/Foil Construction:
- High pulse and current rating
- High insulation resistance
- Close tolerances up to ± 1%

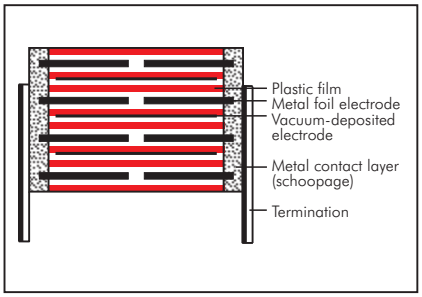
Disadvantages: short circuit at end of life

Advantages of Metallized Construction:
- High capacitances in small box sizes
- Excellent self-healing ability
- Very good price/performance ratio

Disadvantage: low pulse resistance

MKS 02 | MKS 2 | MKP 2
MKP-X2 | MP 3-X3 | MP 3-X1
DC-LINK MKP 4S | DC-LINK MKP 5 | DC-LINK MKP 6

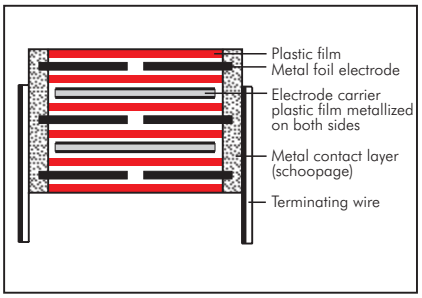
Film and Foil Construction with Internal Series Connection and Self-Healing, Metallized Plastic Film



WIMA Types:

Snubber FKP

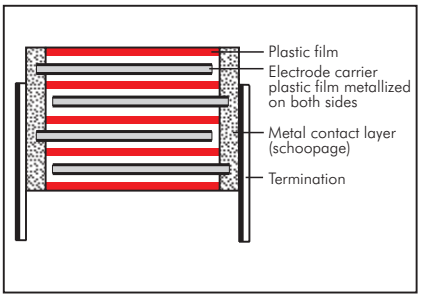
Film and Foil Construction with Internal Series Connection and Self-Healing Plastic Film Metallized on Both Sides



WIMA Types:

FKP 1

Pulse Duty Construction with Self-Healing Plastic Film Metallized on Both Sides

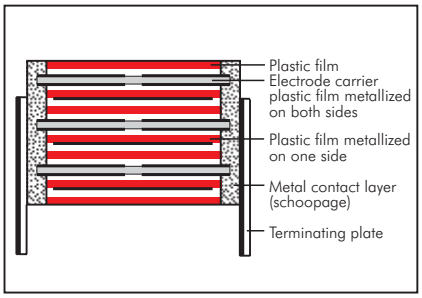


WIMA Types:

MKP 10* | GTO MKP*

*up to 250 VAC *up to 250 VAC

Pulse Duty Construction with Internal Series Connection and Self-Healing Plastic Film Metallized on Both Sides

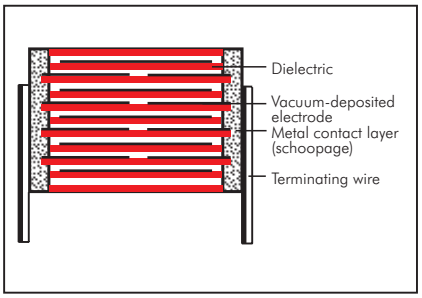


WIMA Types:

MKP 10* | Snubber MKP | GTO MKP*

*400 to 700 VAC *from 400 VAC

Metallized Construction with Internal Series Connection



WIMA Types:

MKS 4* | MKP 4* | MKP 4F

*400 VAC *400 VAC

MKP-X1 R | MKP-Y2 | MP 3R-Y2

Typical Characteristics and Graphs of the Polyester (PET) Film

Polyester Film and Foil Types

FKS 2 | FKS 3

Metallized Polyester Types

SMD-PET | MKS 02 | MKS 2 | MKS 4

Typical Applications

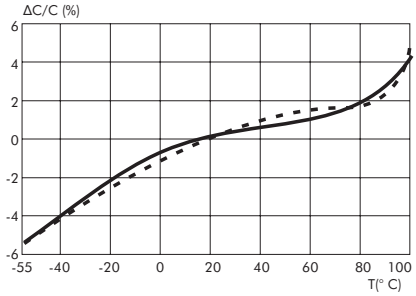
For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

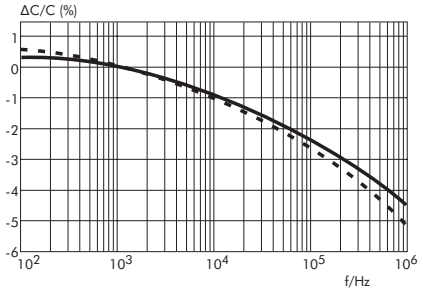
Film Properties

Dielectric constant
at 1 kHz and +23° C:
3.3 positive as temperature rise
Specific volume resistance
in Ω cm at +23° C:
10^{18}
Dielectric strength (DC voltage)
in V/µm at +23° C:
580
Preferred temperature range
in ° C:
-55 to +100
Dielectric absorption
in % at + 23° C:
0.20 to 0.25

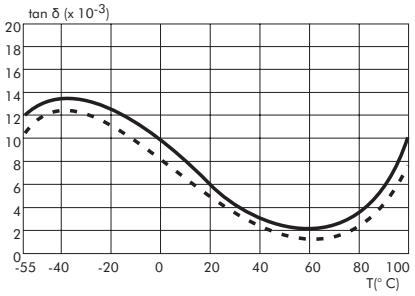
Typical Graphs



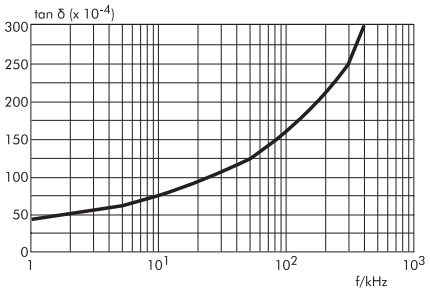
Capacitance change versus temperature (f=1 kHz) (general guide)



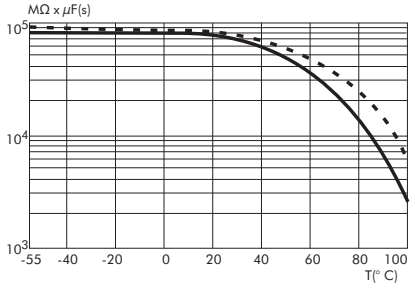
Capacitance change versus frequency (general guide)



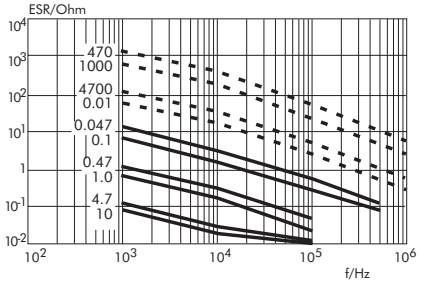
Dissipation factor change versus temperature (f=1 kHz) (general guide)



Dissipation factor change versus frequency. Example: MKS 4, 0.1 µF/400 VDC (general guide)



Insulation resistance change versus temperature (general guide)



ESR change versus frequency (general guide)

The broken lines show the film and foil types.

The full lines characterize the metallized versions.

Typical Characteristics and Graphs of the Polypropylene (PP) Film

Polypropylene Film and Foil Types

FKP 02 | FKP 2 | FKP 3 | FKP 1 | Snubber FKP

Metallized Polypropylene Types

MKP 2 | MKP 4C | MKP 4 | MKP 10 | MKP-X2 | MKP-X1 R
MKP-Y2 | MKP 4F | Snubber MKP | GTO MKP | DC-LINK MKP 3 | DC-LINK MKP 4
DC-LINK MKP 4S | DC-LINK MKP 5 | DC-LINK MKP 6 | DC-LINK HC | DC-LINK HY

Typical Applications

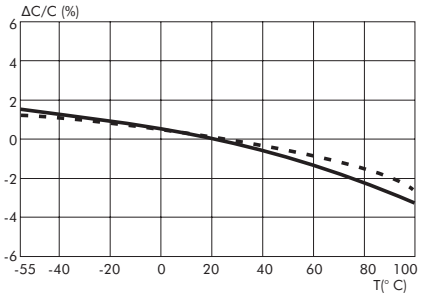
For high frequency and high pulse applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**
- **High frequency coupling and decoupling**
- **TV and monitor sets**
- **Lighting**
- **Power electronics**

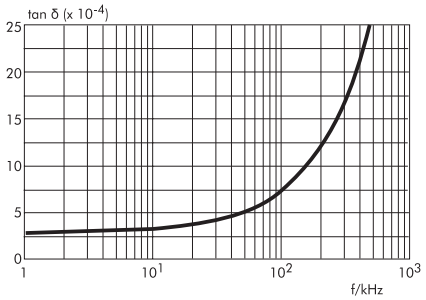
Film Properties

Dielectric constant
at 1 kHz and +23° C:
2.2 negative as temperature rise
Specific volume resistance
in Ω cm at +23° C:
6×10^{18}
Dielectric strength (DC voltage)
in V/µm at +23° C:
650
Preferred temperature range
in ° C:
-55 to +100
Dielectric absorption
in % at + 23° C:
0.05 to 0.10

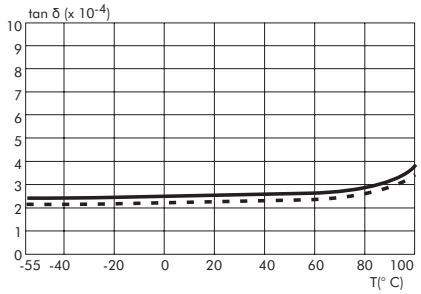
Typical Graphs



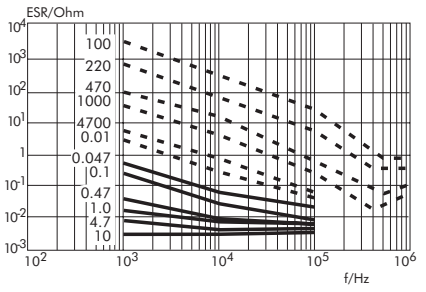
Capacitance change versus temperature (f=1 kHz) (general guide)



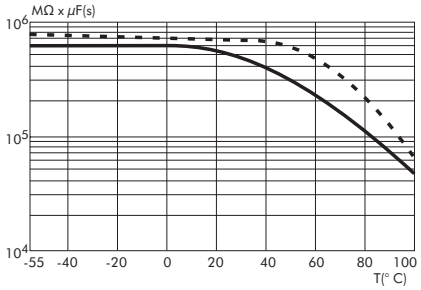
Dissipation factor change versus frequency. Example: MKP 10, 0.01 µF/400 VDC (general guide)



Dissipation factor change versus temperature (f=1 kHz) (general guide)



ESR change versus frequency (general guide)



Insulation resistance change versus temperature (general guide)

The broken lines show the film and foil types.

The full lines characterize the metallized versions.

Typical Characteristics and Graphs of the Polyethylene-Naphthalate (PEN) Film

Metallized Polyethylene-Naphthalate Type

SMD-PEN

Typical Applications

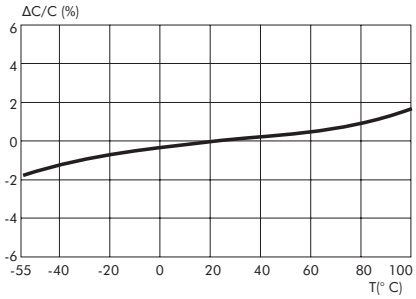
For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

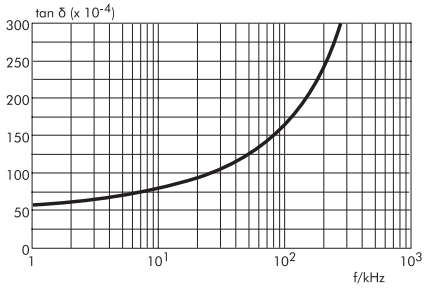
Film Properties

Dielectric constant
at 1 kHz and +23° C:
3.0 positive as temperature rise
Specific volume resistance
in Ω cm at +23° C:
10^{18}
Dielectric strength (DC voltage)
in V/µm at +23° C:
580
Preferred temperature range
in ° C:
-55 to +125
Dielectric absorption
in % at + 23° C:
1.0

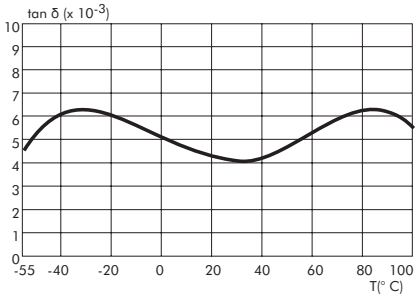
Typical Graphs



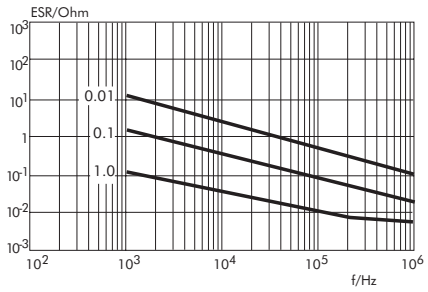
Capacitance change versus temperature (f=1 kHz) (general guide)



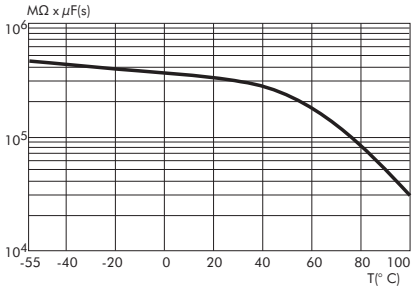
Dissipation factor change versus frequency. Example: SMD-PEN, 0.1 µF/250 VDC (general guide)



Dissipation factor change versus temperature (f=1 kHz) (general guide)



ESR change versus frequency (general guide)



Insulation resistance change versus temperature (general guide)

Typical Characteristics and Graphs of the Polyphenylene-Sulphide (PPS) Film

Metallized Polyphenylene-Sulphide Type

SMD-PPS

Typical Applications

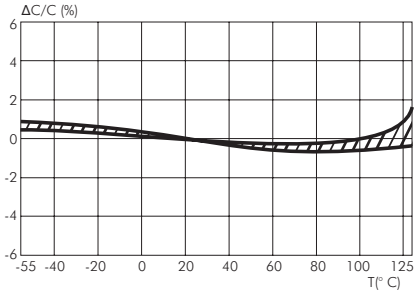
For general applications in high frequency and high temperature circuits e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**
- **Filtering**
- **Oscillating circuits**
- **TV and monitor sets**
- **Lighting**
- **Automotive electronics**

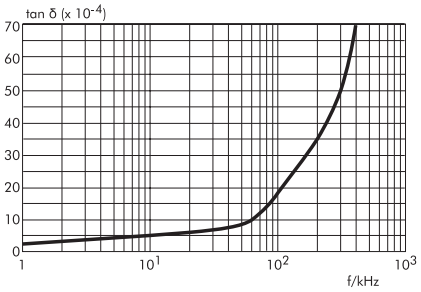
Film Properties

Dielectric constant
at 1 kHz and +23° C:
3.0 very constant versus temperature
Specific volume resistance
in Ω cm at +23° C:
5×10^{17}
Dielectric strength (DC voltage)
in V/µm at +23° C:
470
Preferred temperature range
in ° C:
-55 to +140
Dielectric absorption
in % at + 23° C:
0.05 to 0.10

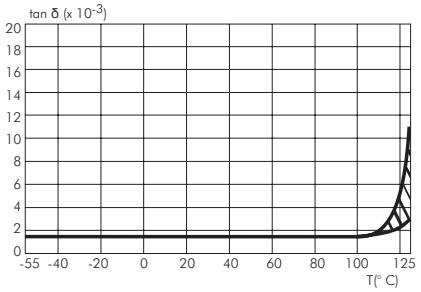
Typical Graphs



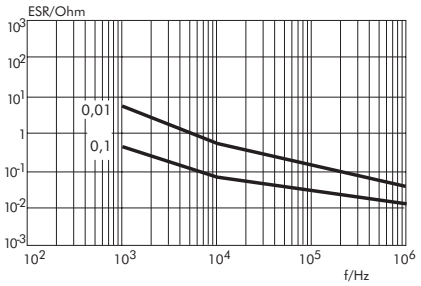
Capacitance change versus temperature (f=1 kHz) (general guide)



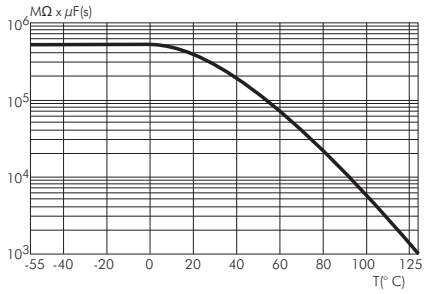
Dissipation factor change versus frequency. Example: SMD-PPS, 0.1 µF/63 VDC (general guide)



Dissipation factor change versus temperature (f=1 kHz) (general guide)



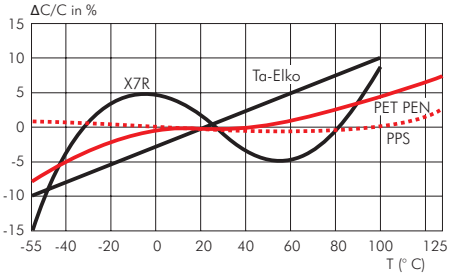
ESR change versus frequency (general guide)



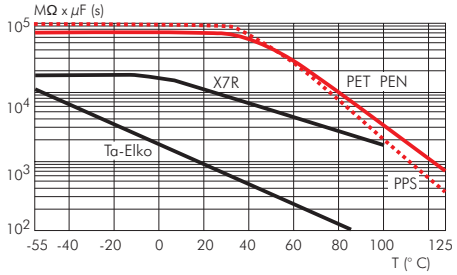
Insulation resistance change versus temperature (general guide)

Characteristics of Metallized Film Capacitors in Comparison with Other Dielectrics

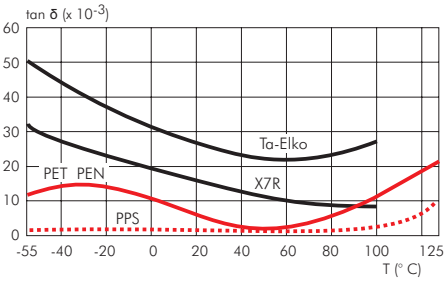
	PET	PP	PEN	PPS	NPO	X7R	Tantalum
Dielectric constant 1 kHz/23° C	3.3 positve as temperature rise	2.2 negative as temperature rise	3.0 positve as temperature rise	3.0 very constant versus temperature	12 ... 40	700...2000	26
Operating temp. (° C)	-55...+100	-55...+100	-55...+125	-55...+140	-55...+125	-55...+125	-55...+125
Dielectric absorption (%)	0.2 ... 0.25	0.05 ... 0.10	1.0	0.05	0.6	2.5	n. a.
ΔC/C versus temperature (%)	±5	±2.5	±5	±1.5	±0.3	±15	±10
ΔC/C versus voltage (%)	negligible	negligible	negligible	negligible	negligible	-20	negligible
ΔC aging rate (%/h decreasing)	negligible	negligible	negligible	negligible	negligible	2	n. a.
Dissipation factor (%) 1 kHz 10 kHz 100 kHz	 0.8 1.5 3.0	 0.05 0.08 0.25	 0.8 1.5 3.0	 0.2 0.25 0.5	 0.10 0.10 0.10	 2.5	 8
ESR	low	very low	low	very low	low	moderate	high
Ris (MΩ x µF) 25° C 85° C	 10 000 1 000	 100 000 10 000	 10 000 1 000	 10 000 1 000	 10 000 1 000	 1 000 500	 100 10
Capacitance range from pF to µF	1 000 ... 680	27 ... 400	10 000 ... 1.0	10 000 ... 2.2	1... 0.1	100 ... 2.2	100 000 ... 1 000
Capacitance tolerance (±%)	5/10/20	1/2.5/5/10/20	5/10/20	2.5/5/10/20	5/10	10/20	10/20
Self-healing	yes	yes	yes	yes	no	no	no
Typical failure mode at end of life	open	open	open	open	short	short	short
Reliability	high	high	high	high	high	moderate	low
Piezoelectric effect	no	no	no	no	no	yes	yes
Resistance to thermal and mechanical shock	high	high	high	high	moderate to low	moderate to low	high
Polarity	no	no	no	no	no	no	yes



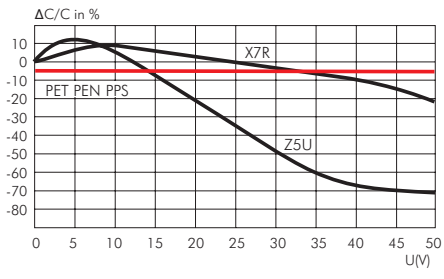
Capacitance change versus temperature (f=1 kHz) (general guide))



Insulation resistance change versus temperature (general guide)



Dissipation factor change versus temperature (f=1 kHz) (general guide)



Capacitance change versus voltage (general guide)

Reliability

The failure rate in fit (10^{-9}/h) for plastic film capacitors is shown in the formula:

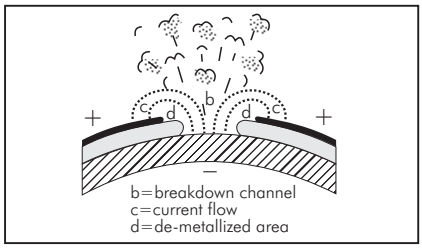
$$\lambda = \lambda_0 \times \pi_T \times \pi_V$$

λ_0 = expected value
π_T = temperature factor
π_V = voltage factor

The expected value has been determined for each component on the basis of life tests. If such a test is carried out at e.g. T=85° C, this corresponds to an operating time of approx. 150 000 - 200 000 h in an equipment with ⩽ 40° C ambient temperature. Nowadays the best values are achieved by our metallized Polyester film capacitors with an expected value of 2 fit and a failure rate of λ=10 fit.

Self-Healing

The self-healing process in metallized plastic film capacitors is started by an electric breakdown, which takes about 10^{-8} sec. Temperatures of approximately 6000 K occur and evaporate the metallization around the failure spot. Insulated areas are formed and the capacitor continues to function properly.



Inductance and Self-Resonance

Depending on the construction, an alternating current in the capacitor winding creates a more or less distinctive magnetic field which can be measured as inductance L. Nowadays, modern plastic film capacitors are contacted over the whole end surface of the winding element. In this way the self-inductance of the winding element is short-circuited and is reduced to the PCM (0.8 nH/mm) and the remaining length of the terminating wires (in case of SMD capacitors the distance between the soldering plates).
L and C form a series oscillating circuit; at a frequency of

Old type with high self-inductance
The tape length of the winding element determines the value of the self-inductance

Modern WIMA type with low self-inductance
WIMA MKS 02/PCM 2.5 mm
Self-inductance L < 8 nH

WIMA SMD/Size Code 1812
Self-inductance L < 6 nH

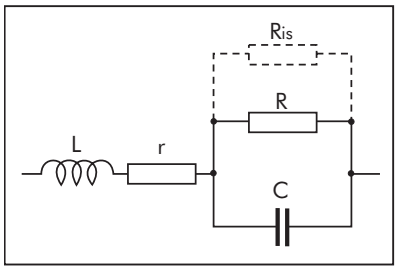
Average value for practical applications: inductance related to length= 0.8 nH/mm
Example: length of the terminating wires = 2 x 3 mm + PCM.

$$f_0 = \frac{1}{2\pi \times \sqrt{L \times C}}$$

the capacitor is in self-resonance and has the lowest impedance, which only consists of r (ESR).

Dissipation Factor and ESR

The dissipation factor tan δ is the quotient of the active and reactive components of the impedance. The losses occur mainly in the dielectric and are represented by R in the equivalent circuit diagram. Parallel to R is the insulation resistance Ris, which, in fact, only affects tan δ at very low frequencies. Further dissipation is caused by the finite conductivity of the electrodes and the transfer resistance between the electrodes and the terminating wires. This is represented in the equivalent circuit diagram by the series resistance r.
L represents the remaining self-inductance.



The dissipation factor is, for example, of importance for AC capacitors, which are subjected to strong currents: too high a tan δ can lead to excessive heating brought about by the incoming active power and thus to a shorter life time of the capacitor.

Values of ESR are not directly stated in the data sheets of plastic film capacitors. The ESR for an individual capacitance value C can be calculated by the formula:

$$ESR = \tan\delta \times (2 \times \pi \times f \times C)^{-1}$$

tan δ: see data sheet of the respective WIMA type
f: frequency of the AC voltage share in the application.
ESR values for certain capacitances see characteristics of film dielectrics page 5.

Box Encapsulation

All WIMA series are produced with the proven box technology, showing the following advantages in comparison with non-encapsulated or dipped versions

- Safe protection of the capacitor element against mechanical stresses during processing and operation
- No danger of internal cracks, delamination or tearing away of the contacts due to construction elasticity
- Excellent self-healing properties of metallized capacitors due to pressure free layers in the winding element
- Solvent-resistant and flame-retardant plastic case in accordance with UL 94 V-0
- Clearly defined dimensions allows for close placement and exact setting of parts on PC-boards. Even larger parts are easily robotically insertable.

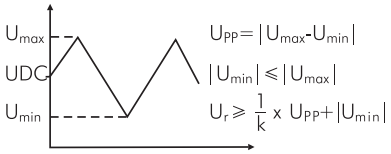
Stress Computation for WIMA Capacitors

The maximum permissible AC voltage that can be applied to capacitors in **sinusoidal** waveform applications, can be determined from the graphs in this catalogue.

However, where **pulse conditions** exist, the following procedure is to be observed to ensure that the correct capacitor rating is selected for a particular duty:

1. **Rated Voltage (U_r):** The rated voltage of a capacitor against a zero potential reference point shall take into consideration that the dielectric strength of the capacitor film diminishes with rising frequency. The calculation of the required rated voltage of a capacitor must therefore allow for the correction factor k; where k = dielectric strength of the film at the frequency f in % is shown in graph 1.

   The calculation of the required dielectric strength is shown in the following example (U_{min}, U_{max} have the same polarity).



   Furthermore the rms voltage derived from the peak to peak voltage shall not be greater than the nominal AC voltage rating of the capacitor to avoid the ionization inception level:
   $U_{rms} \leq$ UAC rated.

2. **Maximum current:** The voltage gradient or rise time of the pulse is taken as the reference point when calculating the maximum current rating of the end contacts. The maximum permissible current load on the end contacts is calculated by means of the voltage rise of the pulses (pulse rise time F).
   $I_{max} = F \times C \times 1.6$
   The data of the rated pulse rise time F_r for pulses equal to the rated voltage figure in the technical data of the different types.
   With low voltage rise in operation (U_{PP}) the permissible current load is calculated as follows:

$$F_{max} = \frac{U_r}{U_{PP}} \times F_r$$

   for example
   $U_r = 63$ V, $U_{PP} = 12$ V, $F_r = 50$ V/µsec.

$$\text{hence } F_{max} = \frac{63}{12} \times 50 = 262.5 \text{ V/µsec.}$$

   When using maximum current ratings, self-heating must be taken into account at higher frequencies, and must not exceed 10 K.

3. **Dissipation (heat losses):** The heat dissipated by a capacitor when stressed by non-sinusoidal voltages or when under pulse conditions can be approximately determined from the following formula:

   $P_d = U_{rms}^2 \times \omega C \times \tan \delta$ where
   P_d = dissipation in Watts (see table 1 for the max. W per K).
   U_{rms} = root mean square value of the AC voltage share.
   $\omega = 2\pi \times f$, where f is the repetition frequency of the pulse waveform (C = capacitance in Farad)
   $\tan \delta$ = dissipation factor corresponding to the frequency of the steepest part of the pulse.

$$\text{pulse frequency} = \frac{1}{\text{pulse width}}$$

   The temperature rise is as follows:
   Temperature rise in K = $\frac{\text{calculated dissipation}}{\text{specific dissipation}}$ (see table 1)

   In applications where reliability is critical, it is recommended to measure the surface temperature of the capacitor and to take into account that the temperature within the capacitor will be approximately 5 K above the case temperature.

4. **Determining the permissible AC voltage and AC current at given frequencies:**
   To determine the permissible AC voltage (sinusoidal) for applications in a higher frequency spectrum, graphs showing AC voltage derating with frequency are available for the respective WIMA series. The diagrams refer to a permissible self-heating of:
   $\Delta \vartheta \leq 10$ K

   For the WIMA MKP 10 / 0.01 µF / 630 VDC / 400 VAC, for example, this shows – when f = 50 kHz – a permissible AC voltage of
   $U_{rms} = 280$ V (graph 2)
   The AC voltage given in the diagrams can also be used to determine the maximum effective current.

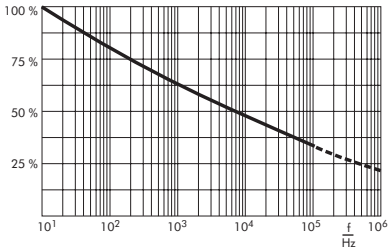
$$Xc = \frac{1}{\omega \times C} = \frac{1}{2\pi \times 50 \text{ kHz} \times 0.01 \text{ µF}}$$

$$Xc = 318 \ \Omega$$

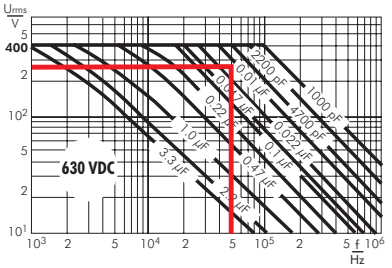
$$Ic = \frac{Uc}{Xc} = \frac{280 \text{ V}}{318 \ \Omega}$$

$$Ic = 0.88 \text{ A}$$

   The calculated maximum value of the effective current
   $I_P = Ic \times \sqrt{2} = 0.88 \text{ A} \times \sqrt{2}$
   $I_P = 1.24$ A
   must not exceed the maximum current rating specified in the maximum pulse rise time calculation (cf. Fmax on left). In this case, the operating AC voltage is to be reduced accordingly.



Graph 1: Dielectric strength of Polypropylene film as a factor of frequency (general guide).



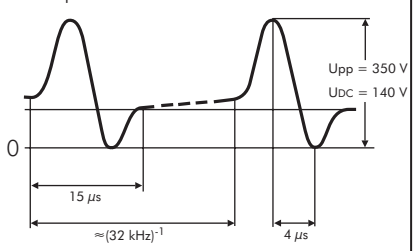
Graph 2: Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).

Printed circuit module PCM (in mm)	Specific dissipation in Watts per K above the ambient temperature
2.5	0.0025
5	0.004
7.5	0.006
10	0.0075
15	0.012
22.5	0.015
27.5	0.025
37.5	0.03

Table 1: The data is for ordinary assembly and ventilation conditions avoiding radiant heat within the chassis of the equipment

The Selection of Capacitors for Pulse Applications

Example



Capacitor: WIMA FKP 1/0.1 µF

Determination of nominal voltage

Calculation is based on an operating temperature < +60° C unless other data is given by the user.
$U_r \geqslant 350$ V
U_{rms} 85 V (referring to AC voltage share)
Selected nominal voltage:
400 VDC/250 VAC pin spacing 27.5 mm

Permissible voltage gradient

The voltage rise time is:

$$\frac{350\ V}{4\ \mu sec.} \cong 87.5\ V/\mu sec$$

Value from table "pulse rise time WIMA FKP 1", page 72: 7000 V/µsec.

The calculated voltage gradient is lower than the permissible value shown in the catalogue for this capacitor.

Dissipation

Given: $U_{rms} = 85$ V
$f = 32$ kHz
$C = 0.1$ µF

The frequency determined from the steepest part of the pulse is:
Pulse width = 15 µsec. = 1 cycle

Hence pulse frequency =

$$\frac{1}{15 \times 10^{-6}} \cong 66\ kHz$$

The tan δ of WIMA FKP 1 at 66 kHz $\cong 10 \times 10^{-4}$ (graph 4).

$P_d = 85^2 \times 2\ \pi \times 32 \times 10^3 \times 0.1 \times 10^{-6} \times 10 \times 10^{-4} \cong 0.145$ Watts

The selected capacitor has a pin spacing of 27.5 mm (table 1, page 11 specific dissipation = 0.025 Watts/K) and the temperature rise due to self-heating is:

$$\text{Temperature rise} = \frac{0.145\ Watts}{0.025\ Watts/K} \cong +6\ K$$

The temperature rise plus the max. ambient temperature ⩽ max. permissible operating temperature (taking into account the voltage derating factor as detailed in the Technical Data). If the permissible temperature is exceeded, please select a capacitor with a higher voltage rating.

Optionally a recommendation can be offered by our engineers upon receipt of voltage and current oscillogrammes.

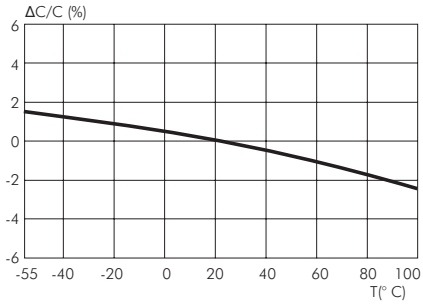
Questionnaire available on demand.

WIMA FKP 1 Pulse Capacitors for Very High Current Ratings

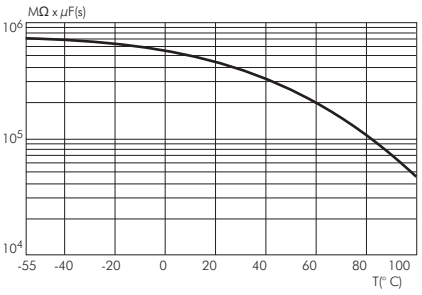
The WIMA FKP1 series was developed for extremely high pulse loads. It has an internal series connection, the metal foil electrodes being combined with a floating electrode metallized on both sides. The metal foil electrodes are safely contacted on both sides of the end surfaces and allow for high current and pulse loading capabilities. At the same time the capacitor is fully self-healing due to the floating electrode metallized on both sides.

As regards pulse loading capability, WIMA FKP 1 represent the high-end of capacitor technology.

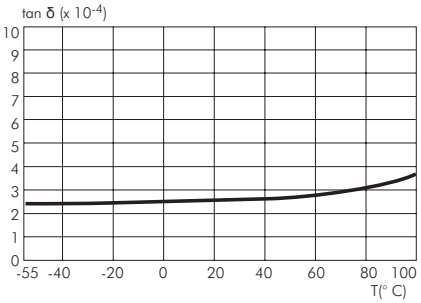
More information see page 72.



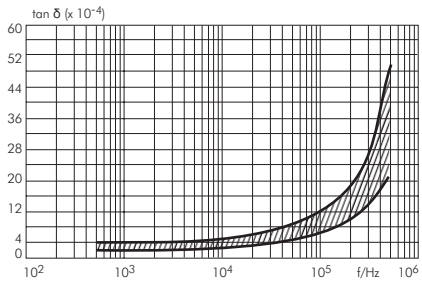
Capacitance change versus temperature (f=1 kHz) (general guide).



Insulation resistance change versus temperature (general guide).



Dissipation factor change versus temperature (f=1 kHz) (general guide).



Dissipation factor change versus frequency (general guide).

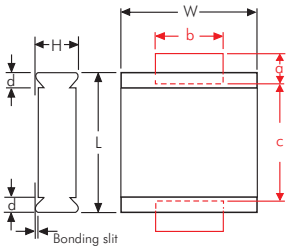
01.19

Recommendation for Processing and Application of SMD Capacitors

Layout Form

The components can generally be positioned on the carrier material as desired. In order to prevent soldering shadows or ensure regular temperature distribution, extreme concentration of the components should be avoided. In practice, it has proven best to keep a minimum distance of the soldering surfaces between two WIMA SMDs of twice the height of the components.

Solder Pad Recommendation



Size code	L ± 0.3	W ± 0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5
4030	10.2	7.6	0.5	2.5	6	9
5040	12.7	10.2	0.7	2.5	6	11.5
6054	15.3	13.7	0.7	2.5	6	14

The solder pad size recommendations given for each individual series are to be understood as minimum dimensions which can at any time be adjusted to the layout form.

Processing

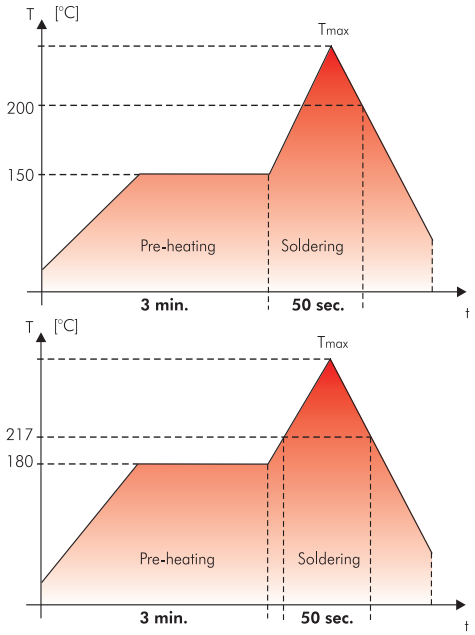
The processing of SMD components

– assembling
– soldering
– electrical final inspection/calibrating

must be regarded as a complete process. The soldering of the printed circuit board, for example, can constitute considerable stress on all the electronic components. The manufacturer's instructions on the processing of the components are mandatory.

Soldering Process

Re-flow soldering



SMD-PET	
Size code	Tmax.
1812	220° C
2220	230° C
2824	230° C
4030	230° C
5040	240° C
6054	250° C

SMD-PEN	
Size code	Tmax.
1812	220° C
2220	230° C
2824	230° C

SMD-PPS	
Size code	Tmax.
1812	250° C
2220	250° C
2824	250° C
4030	250° C
5040	250° C
6054	250° C

Temperature/time graph for the permissible processing temperature of the WIMA SMD film capacitor for typical convection soldering processes.

Due to versatile procedures exact processing parameters for re-flow soldering processes cannot be specified. The graph depicted is to be understood as a recommendation to help establishing a suitable soldering profile fulfilling the requirements in practice at the user. During processing a max. temperature of T=210° C inside the component should not be exceeded. Due to the differing heat absorption the length of the soldering process should be kept as short as possible for smaller size codes.

SMD Handsoldering

WIMA SMD capacitors with plastic film dielectric are generally suitable for hand-soldering, e. g. for lab purposes, with a soldering iron where, however, similar to automated soldering processes, a certain duration and temperature should not be exceeded. These parameters are dependent on the physical size of the components and the relevant heat absorption involved.

The below data are to be regarded as guideline values and should serve to avoid damage to the dielectric caused by excessive heat during the soldering process. The soldering quality depends on the tool used and on the skill and experience of the person with the soldering iron in hand.

Size code	Temperature °C / °F	Time duration
1812	250 / 482	2 sec plate 1 / 5 sec off / 2 sec plate 2
2220	250 / 482	3 sec plate 1 / 5 sec off / 3 sec plate 2
2824	260 / 500	3 sec plate 1 / 5 sec off / 3 sec plate 2
4030	260 / 500	5 sec plate 1 / 5 sec off / 5 sec plate 2
5040	260 / 500	5 sec plate 1 / 5 sec off / 5 sec plate 2
6054	260 / 500	5 sec plate 1 / 5 sec off / 5 sec plate 2

Recommendation for Processing and Application of SMD Capacitors (Continuation)

Solder Paste

To achieve reliable soldering results one of the following solder alloys have from case to case proven being workable:

Lead free solder paste
Sn - Bi
Sn - Zn (Bi)
Sn - Ag - Cu (suitable for SMD-PET 5040/6054, SMD-PEN and SMD-PPS)

Solder paste with lead
Sn - Pb - Ag (Sn60-Pb40-A, Sn63-Pb37-A)

Washing

WIMA SMD components with plastic encapsulation - like all other components of similar construction irrespective of the make - cannot be regarded as hermetically sealed. Due to today's common washing substances, e. g. on aqueous basis instead of the formerly used halogenated hydrocarbons, with enhanced washing efficiency it became obvious that assembled SMD capacitors may show an impermissibly high deviation of the electrical parameters after a corresponding washing process. Hence it is recommended to refrain from applying industrial washing processes for WIMA SMD capacitors in order to avoid possible damages.

Initial Operation/Calibration

Due to the stress which the components are subjected to during processing, reversible parameter changes occur in almost all electronic components. The capacitance recovery accuracy to be expected with careful processing is within a scope of

$|\Delta C/C| \leqslant 5\ \%$.

For the initial operation of the device a minimum storage time of

$t \geqslant 24$ hours

is to be taken into account. With calibrated devices or when the application is largely dependent on capacitance it is advisable to prolong the storage time to

$t \geqslant 10$ days

In this way ageing effects of the capacitor structure can be anticipated. Parameter changes due to processing are not to be expected after this period of time

Humidity Protection Bags

Taped WIMA SMD capacitors are shipped in humidity protection bags according to JEDEC standard (ESD/EMI-shield/water-vapour proof).
Under controlled conditions the components can be stored two years and more in the originally sealed bag. Opened packing units should immediately be used up for processing. If storage is necessary the opened packing units should be stored air-tight in the original plastic bag.

Reliability

Taking account of the manufacturer's guidelines and compatible processing, the WIMA SMD stand out for the same high quality and reliability as the analogous through-hole WIMA series. The technology of metallized film capacitors used e.g. in WIMA SMD-PET achieves the best values for all fields of application. The expected value is about:

$\lambda_0 \leqslant 2$ fit

Furthermore the production of all WIMA components is subject to the regulations laid down by ISO 9001:2015 as well as the guidelines for component specifications set out by IEC quality assessment system (IECQ) for electronic components.

Electrical Characteristics and Fields of Application

Basically the WIMA SMD series have the same electrical characteristics as the analogous through-hole WIMA capacitors. Compared to ceramic or tantalum dielectrics WIMA SMD capacitors have a number of other outstanding qualities:

- **favourable pulse rise time**
- **low ESR**
- **low dielectric absorption**
- **available in high voltage series**
- **large capacitance spectrum**
- **stand up to high mechanical stress**
- **good long-term stability**

As regards technical performance as well as quality and reliability, the WIMA SMD series offer the possibility to cover nearly all applications of conventionally through-hole film capacitors with SMD components. Furthermore, the WIMA SMD series can now be used for all the demanding capacitor applications for which, in the past, the use of through-hole components was mandatory:

- **measuring techniques**
- **oscillator circuits**
- **differentiating and integrating circuits**
- **A/D or D/A transformers**
- **sample and hold circuits**
- **automotive electronics**

With the WIMA SMD programme available today, the major part of all plastic film capacitors can be replaced by WIMA SMD components. The field of application ranges from standard coupling capacitors to use in switch-mode power supplies as filter or charging capacitors with high voltage and capacitance values, as well as in telecommunications e.g. the well-known telephone capacitor 1µF/250VDC.

Recommendation for Processing and Application of Through-Hole Capacitors

Soldering Process

Internal temperature of the capacitor must be kept as follows:

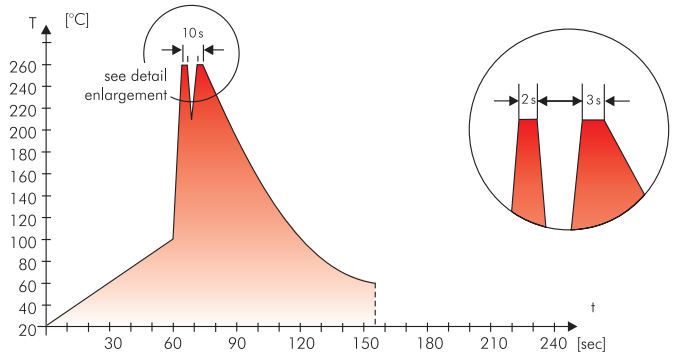
Polyester:	preheating:	$T_{max.} \leqslant 125°$ C
	soldering:	$T_{max.} \leqslant 135°$ C
Polypropylene:	preheating:	$T_{max.} \leqslant 100°$ C
	soldering:	$T_{max.} \leqslant 110°$ C

Single wave soldering
Soldering bath temperature: T < 260° C
Dwell time: t < 5 sec

Double wave soldering
Soldering bath temperature: T < 260° C
Dwell time: Σt < 5 sec

Due to different soldering processes and heat requirements the graphs are to be regarded as a recommendation only.

Wave soldering



Typical temperature/time graph for double wave soldering

WIMA Quality and Environmental Philosophy

ISO 9001:2015 Certification

ISO 9001:2015 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2015 of our factories by the infaz (Institut für Auditierung und Zertifizierung) certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

WIMA WPCS

The WIMA Process Control System (WPCS) is a quality surveillance and optimization system developed by WIMA. WPCS is a major part of the quality-oriented WIMA production. Points of application during production process:

- **incoming material inspection**
- **metallization**
- **film inspection**
- **schoopage**
- **pre-healing**
- **pin attachment**
- **cast resin preparation/ encapsulation**
- **100% final inspection**
- **Testing as per customer requirements**

WIMA Environmental Policy

All WIMA capacitors, irrespective of whether through-hole devices or SMD, are made of environmentally friendly materials. Neither during manufacture nor in the product itself any toxic substances are used, e.g.

- **Lead**
- **PCB**
- **CFC**
- **Hydrocarbon chloride**
- **Chromium 6+**
- **PBB/PBDE**
- **Arsenic**
- **Cadmium**
- **Mercury**
- **etc.**

We merely use pure, recyclable materials for packing our components, such as:

- **carton**
- **cardboard**
- **adhesive tape made of paper**
- **polystyrene**

We almost completely refrain from using packing materials such as:

- **adhesive tapes made of plastic**
- **metal clips**

RoHS Compliance

According to the RoHS Directive 2011/65/EU certain hazardous substances like e.g. lead, cadmium, mercury must not be used any longer in electronic equipment as of July 1st, 2006. For the sake of the environment WIMA has refraind from using such substances since years already.

Tape for lead-free WIMA capacitors

DIN EN ISO 14001:2004

WIMA's environmental management has been established in accordance with the guidelines of DIN EN ISO 14001:2004 to optimize the production processes with regard to energy and resources.

WIMA SMD Capacitors in Accordance with RoHS 2011/65/EU

WIMA SMD-PET

WIMA SMD-PEN

WIMA SMD-PPS

WIMA SMD capacitors in size codes 1812, 2220, 2824, 4030, 5040 and 6054, capacitance values from 0.01 µF through 6.8 µF and voltage ranges of 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC and 1000 VDC cover nearly the entire application range of conventional through-hole plastic film capacitors.

The WIMA SMD-PET is designed for general DC-applications e.g. coupling and decoupling, blocking, by-passing or timing and corresponds to the RoHS 2011/65/EU guidelines (Restriction of Hazardous Substances) of the EU.

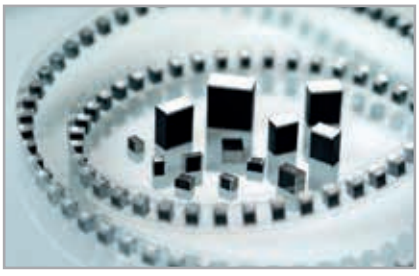
The WIMA SMD-PEN is applicable for operating temperatures up to +125° C and thus suitable for lead-free solder processes in accordance with RoHS.

The WIMA SMD-PPS has an operating temperature range up to +140° C and stands out for its stable capacitance and frequency behaviour versus temperature. Capacitors of this range are environmentally compatible with the RoHS 2011/65/EU guidelines.

All WIMA SMD series are produced with the proven box technology, showing the following advantages in comparison with non-encapsulated or moulded SMD capacitor versions:

- Safe protection of the capacitor element against mechanical and thermal stresses during processing and operation. When using more temperature resistant dielectrics like PEN or PPS an even larger safety margin than with non- encapsulated parts is obtained.
- No danger of internal cracks or tearing away of the contacts due to construction elasticity.
- No danger of delamination due to solder plates covering the capacitor's entire end surfaces.
- Solvent-resistant, flame-retardant plastic case in accordance with UL 94 V-0.

These features and the wide capacitance range enable WIMA SMDs to substitute other capacitor technologies and become standard components in electronic developments.



WIMA SMD-PET

**Metallized Polyester (PET) SMD Film Capacitors with Box Encapsulation.
Capacitances from 0.01 µF to 6.8 µF. Rated Voltages from 63 VDC to 1000 VDC.
Size Codes from 1812 to 6054.**

Special Features

- **Size codes 1812, 2220, 2824, 4030, 5040 and 6054 with PET and encapsulated**
- **Operating temperature up to 100° C**
- **Self-healing**
- **According to RoHS 2011/65/EU**

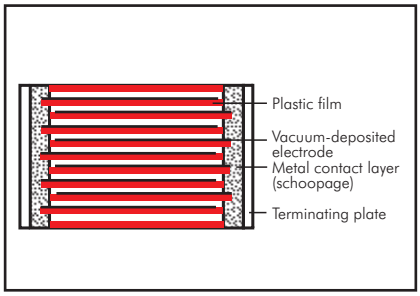
Typical Applications

For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case, UL 94 V-0
Terminations:
Tinned plates.
Marking:
Box colour: Black.

Electrical Data

Capacitance range:
0.01 µF to 6.8 µF
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +100° C (+125° C available subject to special enquiry)
Climatic test category:
55/100/21 according to IEC for size codes 1812 to 2824
55/100/56 according to IEC for size codes 4030 to 6054
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 6.8 µF
63 VDC 100 VDC	50 V 100 V	⩾ 3.75 x 10^3 MΩ	⩾ 1250 sec (MΩ x µF)
⩾ 250 VDC	100 V	⩾ 1 x 10^4 MΩ	⩾ 3000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}	⩽ 10 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}	–
100 kHz	⩽ 30 x 10^{-3}	–	–

Maximum pulse rise time: for pulses equal to the rated voltage

Capacitance µF	Pulse rise time V/µsec max. operation/test					
	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC
0.01 ... 0.022	30/300	35/350	40/400	35/350	40/400	50/500
0.033 ... 0.068	20/200	20/200	40/400	21/210	25/250	32/320
0.1 ... 0.22	10/100	10/100	12/120	14/140	17/170	–
0.33 ... 0.68	8/80	6/60	9/90	10/100	–	–
1.0 ... 2.2	3.5/35	4/40	7/70	–	–	–
3.3 ... 6.8	3/30	3/30	–	–	–	–

Test voltage: 1.6 U_r, 2 sec.
Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Dip Solder Test/Processing

Resistance to soldering heat:
Test Tb in accordance with DIN IEC 60068-2-58/DIN EN 60384-19.
Soldering bath temperature max. 260° C.
Soldering duration max. 5 sec.
Change in capacitance ΔC/C < 5%.
Soldering process:
Re-flow soldering (see temperature/time graphs page 131).

Packing

Available taped and reeled in blister pack.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

WIMA SMD-PET

Continuation

General Data

Capacitance	63 VDC/40 VAC*			100 VDC/63 VAC*			250 VDC/160 VAC*		
	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number
0.01 µF	1812	3.0	SMDTC02100KA00_____	1812	3.0	SMDTD02100KA00_____	2220	3.5	SMDTF02100QA00_____
	2220	3.5	SMDTC02100QA00_____	2220	3.5	SMDTD02100QA00_____	2824	3.0	SMDTF02100TA00_____
	2824	3.0	SMDTC02100TA00_____	2824	3.0	SMDTD02100TA00_____			
0.015 „	1812	3.0	SMDTC02150KA00_____	1812	3.0	SMDTD02150KA00_____	2220	3.5	SMDTF02150QA00_____
	2220	3.5	SMDTC02150QA00_____	2220	3.5	SMDTD02150QA00_____	2824	3.0	SMDTF02150TA00_____
	2824	3.0	SMDTC02150TA00_____	2824	3.0	SMDTD02150TA00_____			
0.022 „	1812	3.0	SMDTC02220KA00_____	1812	3.0	SMDTD02220KA00_____	2220	3.5	SMDTF02220QA00_____
	2220	3.5	SMDTC02220QA00_____	2220	3.5	SMDTD02220QA00_____	2824	3.0	SMDTF02220TA00_____
	2824	3.0	SMDTC02220TA00_____	2824	3.0	SMDTD02220TA00_____			
0.033 „	1812	3.0	SMDTC02330KA00_____	1812	3.0	SMDTD02330KA00_____	2220	3.5	SMDTF02330QA00_____
	2220	3.5	SMDTC02330QA00_____	2220	3.5	SMDTD02330QA00_____	2824	3.0	SMDTF02330TA00_____
	2824	3.0	SMDTC02330TA00_____	2824	3.0	SMDTD02330TA00_____	4030	5.0	SMDTF02330VA00_____
0.047 „	1812	3.0	SMDTC02470KA00_____	1812	3.0	SMDTD02470KA00_____	2220	3.5	SMDTF02470QA00_____
	2220	3.5	SMDTC02470QA00_____	2220	3.5	SMDTD02470QA00_____	2824	3.0	SMDTF02470TA00_____
	2824	3.0	SMDTC02470TA00_____	2824	3.0	SMDTD02470TA00_____	4030	5.0	SMDTF02470VA00_____
0.068 „	1812	3.0	SMDTC02680KA00_____	1812	3.0	SMDTD02680KA00_____	2220	4.5*	SMDTF02680QB00_____
	2220	3.5	SMDTC02680QA00_____	2220	3.5	SMDTD02680QA00_____	2824	3.0	SMDTF02680TA00_____
	2824	3.0	SMDTC02680TA00_____	2824	3.0	SMDTD02680TA00_____	4030	5.0	SMDTF02680VA00_____
0.1 µF	1812	4.0*	SMDTC03100KB00_____	1812	4.0*	SMDTD03100KB00_____	2220	4.5*	SMDTF03100QB00_____
	2220	3.5	SMDTC03100QA00_____	2220	3.5	SMDTD03100QA00_____	2824	5.0	SMDTF03100TB00_____
	2824	3.0	SMDTC03100TA00_____	2824	3.0	SMDTD03100TA00_____	4030	5.0	SMDTF03100VA00_____
0.15 „	1812	4.0*	SMDTC03150KB00_____	1812	4.0	SMDTD03150KB00_____	2824	5.0	SMDTF03150TB00_____
	2220	3.5	SMDTC03150QA00_____	2220	3.5	SMDTD03150QA00_____	4030	5.0	SMDTF03150VA00_____
	2824	3.0	SMDTC03150TA00_____	2824	3.0	SMDTD03150TA00_____			
0.22 „	1812	4.0*	SMDTC03220KB00_____	1812	4.0	SMDTD03220KB00_____	2824	5.0	SMDTF03220TB00_____
	2220	3.5	SMDTC03220QA00_____	2220	3.5	SMDTD03220QA00_____	4030	5.0	SMDTF03220VA00_____
	2824	3.0	SMDTC03220TA00_____	2824	3.0	SMDTD03220TA00_____			
0.33 „	1812	4.0	SMDTC03330KB00_____	2220	4.5	SMDTD03330QB00_____	2824	5.0	SMDTF03330TB00_____
	2220	4.5*	SMDTC03330QB00_____	2824	5.0	SMDTD03330TB00_____	4030	5.0	SMDTF03330VA00_____
	2824	5.0*	SMDTC03330TB00_____	4030	5.0	SMDTD03330VA00_____	5040	6.0	SMDTF03330XA00_____
0.47 „	1812	4.0	SMDTC03470KB00_____	2220	4.5	SMDTD03470QB00_____	4030	5.0	SMDTF03470VA00_____
	2220	4.5*	SMDTC03470QB00_____	2824	5.0	SMDTD03470TB00_____	5040	6.0	SMDTF03470XA00_____
	2824	5.0*	SMDTC03470TB00_____	4030	5.0	SMDTD03470VA00_____			
0.68 „	2220	4.5	SMDTC03680QB00_____	2824	5.0	SMDTD03680TB00_____	5040	6.0	SMDTF03680XA00_____
	2824	5.0*	SMDTC03680TB00_____	4030	5.0	SMDTD03680VA00_____			
	4030	5.0	SMDTC03680VA00_____	5040	6.0	SMDTD03680XA00_____			
1.0 µF	2220	4.5	SMDTC04100QB00_____	2824	5.0	SMDTD04100TB00_____	6054	7.0	SMDTF04100YA00_____
	2824	5.0*	SMDTC04100TB00_____	4030	5.0	SMDTD04100VA00_____			
	4030	5.0	SMDTC04100VA00_____	5040	6.0	SMDTD04100XA00_____			
1.5 „	2824	5.0	SMDTC04150TB00_____	4030	5.0	SMDTD04150VA00_____			
	4030	5.0	SMDTC04150VA00_____	5040	6.0	SMDTD04150XA00_____			
2.2 „	2824	5.0	SMDTC04220TB00_____	5040	6.0	SMDTD04220XA00_____			
	4030	5.0	SMDTC04220VA00_____						
3.3 „	4030	5.0	SMDTC04330VA00_____	5040	6.0	SMDTD04330XA00_____			
4.7 „	5040	6.0	SMDTC04470XA00_____	6054	7.0	SMDTD04470YA00_____			
6.8 „	6054	7.0	SMDTC04680YA00_____						

* Version according to catalogue 2013 still available

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

Taped version see page 148.

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

01.19

Continuation page 19

Continuation

General Data

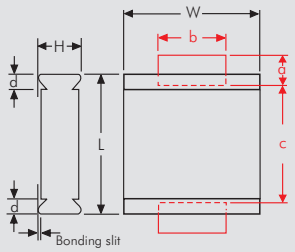
Capacitance	400 VDC/200 VAC* Size code	H ± 0.3	Part number	630 VDC/300 VAC* Size code	H ± 0.3	Part number	1000 VDC/400 VAC* Size code	H ± 0.3	Part number
0.01 µF	2824 4030	3.0 5.0	SMDTG02100TA00_ _ _ _ SMDTG02100VA00_ _ _ _	4030	5.0	SMDTJ02100VA00_ _ _ _			
0.015 „	2824 4030	3.0 5.0	SMDTG02150TA00_ _ _ _ SMDTG02150VA00_ _ _ _	4030	5.0	SMDTJ02150VA00_ _ _ _	5040	6.0	SMDTO12150XA00_ _ _ _
0.022 „	2824 4030	5.0* 5.0	SMDTG02220TB00_ _ _ _ SMDTG02220VA00_ _ _ _	5040	6.0	SMDTJ02220XA00_ _ _ _	5040	6.0	SMDTO12220XA00_ _ _ _
0.033 „	2824 4030	5.0 5.0	SMDTG02330TB00_ _ _ _ SMDTG02330VA00_ _ _ _	5040	6.0	SMDTJ02330XA00_ _ _ _	5040	6.0	SMDTO12330XA00_ _ _ _
0.047 „	2824 4030	5.0 5.0	SMDTG02470TB00_ _ _ _ SMDTG02470VA00_ _ _ _	5040	6.0	SMDTJ02470XA00_ _ _ _	6054	7.0	SMDTO12470YA00_ _ _ _
0.068 „	4030 5040	5.0 6.0	SMDTG02680VA00_ _ _ _ SMDTG02680XA00_ _ _ _	5040	6.0	SMDTJ02680XA00_ _ _ _			
0.1 µF	4030 5040	5.0 6.0	SMDTG03100VA00_ _ _ _ SMDTG03100XA00_ _ _ _	6054	7.0	SMDTJ03100YA00_ _ _ _			
0.15 „	4030 5040	5.0 6.0	SMDTG03150VA00_ _ _ _ SMDTG03150XA00_ _ _ _	6054	7.0	SMDTJ03150YA00_ _ _ _			
0.22 „	5040	6.0	SMDTG03220XA00_ _ _ _	6054	7.0	SMDTJ03220YA00_ _ _ _			
0.33 „	5040	6.0	SMDTG03330XA00_ _ _ _						
0.47 „	6054	7.0	SMDTG03470YA00_ _ _ _						

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

* Version according to catalogue 2013 still available

Dims. in mm.

Solder pad recommendation



Size code	L ±0.3	W ±0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5
4030	10.2	7.6	0.5	2.5	6	9
5040	12.7	10.2	0.7	2.5	6	11.5
6054	15.3	13.7	0.7	2.5	6	14

Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: none = 00

Taped version see page 148.

WIMA SMD-PEN

Metallized Polyethylene-Naphthalate (PEN) SMD Film Capacitors with Box Encapsulation. Capacitances from 0.01 µF to 1.0 µF. Rated Voltages from 63 VDC to 400 VDC. Size Codes from 1812 to 2824.

Special Features

- **Size codes 1812, 2220 and 2824, with PEN and encapsulated**
- **Operating temperature up to 125° C**
- **Self-healing**
- **Suitable for lead-free soldering**
- **According to RoHS 2011/65/EU**

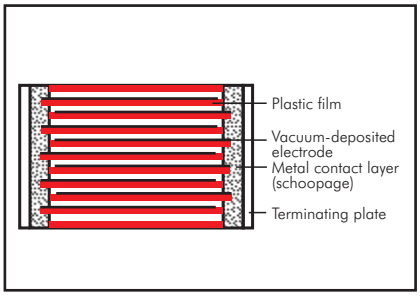
Typical Applications

For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-Naphthalate (PEN) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case, UL 94 V-0
Terminations:
Tinned plates.
Marking:
Colour: Black.

Electrical Data

Capacitance range:
0.01 µF to 1.0 µF
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC
Capacitance tolerances:
±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +125° C
Climatic test category:
55/125/21 according to IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 1.0 µF
63 VDC 100 VDC	50 V 100 V	⩾ 3.75 x 10^3 MΩ	⩾ 1250 sec (MΩ x µF)
⩾ 250 VDC	100 V	⩾ 1 x 10^4 MΩ	⩾ 3000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}
100 kHz	⩽ 30 x 10^{-3}	–

Maximum pulse rise time: for pulses equal to the rated voltage

Capacitance µF	Pulse rise time V/µsec max. operation/test			
	63 VDC	100 VDC	250 VDC	400 VDC
0.01 ... 0.022	30/300	35/350	40/400	35/350
0.033 ... 0.068	20/200	20/200	40/400	21/210
0.1 ... 0.22	10/100	10/100	12/120	–
0.33 ... 0.68	8/80	6/60	–	–
1.0	3,5/35	4/40	–	–

Dip Solder Test/Processing

Resistance to soldering heat:
Test Tb in accordance with DIN IEC 60068-2-58/DIN EN 60384-23.
Soldering bath temperature max. 260° C.
Soldering duration max. 5 sec.
Change in capacitance ΔC/C < 5%.
Soldering process:
Re-flow soldering (see temperature/time graphs page 13).

Packing

Available taped and reeled in blister pack.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*			100 VDC/63 VAC*		
	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number
0.01 µF	1812	3.0	SMDNC02100KA00_ _ _ _	1812	3.0	SMDND02100KA00_ _ _ _
	2220	3.5	SMDNC02100QA00_ _ _ _	2220	3.5	SMDND02100QA00_ _ _ _
	2824	3.0	SMDNC02100TA00_ _ _ _	2824	3.0	SMDND02100TA00_ _ _ _
0.015 „	1812	3.0	SMDNC02150KA00_ _ _ _	1812	3.0	SMDND02150KA00_ _ _ _
	2220	3.5	SMDNC02150QA00_ _ _ _	2220	3.5	SMDND02150QA00_ _ _ _
	2824	3.0	SMDNC02150TA00_ _ _ _	2824	3.0	SMDND02150TA00_ _ _ _
0.022 „	1812	3.0	SMDNC02220KA00_ _ _ _	1812	3.0	SMDND02220KA00_ _ _ _
	2220	3.5	SMDNC02220QA00_ _ _ _	2220	3.5	SMDND02220QA00_ _ _ _
	2824	3.0	SMDNC02220TA00_ _ _ _	2824	3.0	SMDND02220TA00_ _ _ _
0.033 „	1812	3.0	SMDNC02330KA00_ _ _ _	1812	3.0	SMDND02330KA00_ _ _ _
	2220	3.5	SMDNC02330QA00_ _ _ _	2220	3.5	SMDND02330QA00_ _ _ _
	2824	3.0	SMDNC02330TA00_ _ _ _	2824	3.0	SMDND02330TA00_ _ _ _
0.047 „	1812	3.0	SMDNC02470KA00_ _ _ _	1812	3.0	SMDND02470KA00_ _ _ _
	2220	3.5	SMDNC02470QA00_ _ _ _	2220	3.5	SMDND02470QA00_ _ _ _
	2824	3.0	SMDNC02470TA00_ _ _ _	2824	3.0	SMDND02470TA00_ _ _ _
0.068 „	1812	3.0	SMDNC02680KA00_ _ _ _	1812	3.0	SMDND02680KA00_ _ _ _
	2220	3.5	SMDNC02680QA00_ _ _ _	2220	3.5	SMDND02680QA00_ _ _ _
	2824	3.0	SMDNC02680TA00_ _ _ _	2824	3.0	SMDND02680TA00_ _ _ _
0.1 µF	1812	4.0	SMDNC03100KB00_ _ _ _	1812	4.0	SMDND03100KB00_ _ _ _
	2220	3.5	SMDNC03100QA00_ _ _ _	2220	3.5	SMDND03100QA00_ _ _ _
	2824	3.0	SMDNC03100TA00_ _ _ _	2824	3.0	SMDND03100TA00_ _ _ _
0.15 „	1812	4.0	SMDNC03150KB00_ _ _ _	1812	4.0	SMDND03150KB00_ _ _ _
	2220	3.5	SMDNC03150QA00_ _ _ _	2220	3.5	SMDND03150QA00_ _ _ _
	2824	3.0	SMDNC03150TA00_ _ _ _	2824	3.0	SMDND03150TA00_ _ _ _
0.22 „	2220	3.5	SMDNC03220QA00_ _ _ _	2220	3.5	SMDND03220QA00_ _ _ _
	2824	3.0	SMDNC03220TA00_ _ _ _	2824	3.0	SMDND03220TA00_ _ _ _
0.33 „	2220	4.5	SMDNC03330QB00_ _ _ _	2220	4.5	SMDND03330QB00_ _ _ _
	2824	5.0	SMDNC03330TB00_ _ _ _	2824	5.0	SMDND03330TB00_ _ _ _
0.47 „	2220	4.5	SMDNC03470QB00_ _ _ _	2220	4.5	SMDND03470QB00_ _ _ _
	2824	5.0	SMDNC03470TB00_ _ _ _	2824	5.0	SMDND03470TB00_ _ _ _
0.68 „	2824	5.0	SMDNC03680TB00_ _ _ _	2824	5.0	SMDND03680TB00_ _ _ _
1.0 µF	2824	5.0	SMDNC04100TB00_ _ _ _	2824	5.0	SMDND04100TB00_ _ _ _

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims in mm.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

Taped version see page 148.

Continuation page 22

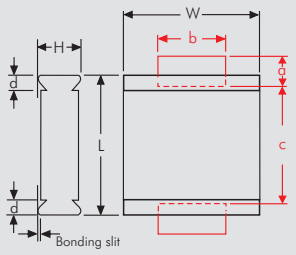
Continuation

General Data

Capacitance	250 VDC/160 VAC*			400 VDC/200 VAC*		
	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number
0.01 µF	2220 2824	3.5 3.0	SMDNF02100QA00_ _ _ _ SMDNF02100TA00_ _ _ _	2824	3.0	SMDNG02100TA00_ _ _ _
0.015 „	2220 2824	3.5 3.0	SMDNF02150QA00_ _ _ _ SMDNF02150TA00_ _ _ _	2824	3.0	SMDNG02150TA00_ _ _ _
0.022 „	2220 2824	3.5 3.0	SMDNF02220QA00_ _ _ _ SMDNF02220TA00_ _ _ _	2824	5.0	SMDNG02220TB00_ _ _ _
0.033 „	2220 2824	3.5 3.0	SMDNF02330QA00_ _ _ _ SMDNF02330TA00_ _ _ _	2824	5.0	SMDNG02330TB00_ _ _ _
0.047 „	2220 2824	3.5 3.0	SMDNF02470QA00_ _ _ _ SMDNF02470TA00_ _ _ _	2824	5.0	SMDNG02470TB00_ _ _ _
0.068 „	2220 2824	4.5 3.0	SMDNF02680QB00_ _ _ _ SMDNF02680TA00_ _ _ _			
0.1 µF	2220 2824	4.5 5.0	SMDNF03100QB00_ _ _ _ SMDNF03100TB00_ _ _ _			
0.15 „	2824	5.0	SMDNF03150TB00_ _ _ _			

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims in mm.



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

Taped version see page 148.

Size code	L ±0.3	W ±0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5

WIMA SMD-PPS

Metallized Polyphenylene-Sulphide (PPS) SMD Film Capacitors with Box Encapsulation. Capacitances from 0.01 µF to 2.2 µF. Rated Voltages from 63 VDC to 1000 VDC. Size Codes from 1812 to 6054.

Special Features

- **Size codes 1812, 2220, 2824, 4030,5040 and 6054 with PPS and encapsulated**
- **Operating temperature up to 140° C**
- **Self-healing**
- **Suitable for lead-free soldering**
- **Low dissipation factor**
- **Low dielectric absorption**
- **Very constant capacitance value versus temperature**
- **According to RoHS 2011/65/EU**

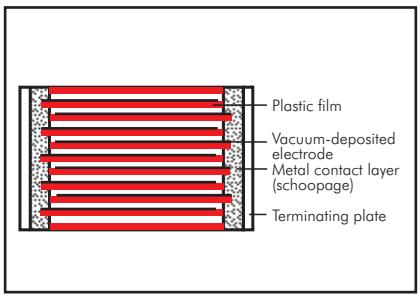
Typical Applications

For general applications in high temperature circuits e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**
- **Filtering**
- **Oscillating circuits**

Construction

Dielectric:
Polyphenylene-sulphide (PPS) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case, UL 94 V-0
Terminations:
Tinned plates.
Marking:
Box colour: Black.

Electrical Data

Capacitance range: 0.01 µF to 2.2 µF
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +140° C
Climatic test category:
55/140/56 in accordance with IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 2.2 µF
63 VDC 100 VDC	50 V 100 V	⩾ 1 x 10^4 MΩ	⩾ 3000 sec (MΩ x µF)
⩾ 250 VDC	100 V	⩾ 3 x 10^4 MΩ	⩾ 6000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 15 x 10^{-4}	⩽ 20 x 10^{-4}	⩽ 20 x 10^{-4}
10 kHz	⩽ 25 x 10^{-4}	⩽ 25 x 10^{-4}	–
100 kHz	⩽ 50 x 10^{-4}	–	–

Maximum pulse rise time: for pulses equal to the rated voltage

Capacitance µF	Pulse rise time V/µsec max. operation/test					
	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC
0.01 ... 0.022	25/250	25/250	30/300	35/350	40/400	45/450
0.033 ... 0.068	15/150	15/150	20/200	25/250	28/280	32/320
0.1 ... 0.22	10/100	10/100	12/120	15/150	–	–
0.33 ... 0.68	5/50	5/50	6/60	8/80	–	–
1.0 ... 2.2	3/30	3/30	–	–	–	–

Dip Solder Test/Processing

Resistance to soldering heat:
Test Tb in accordance with DIN IEC 60068-2-58/DIN EN 60384-20.
Soldering bath temperature max. 260° C.
Soldering duration max. 5 sec.
Change in capacitance ΔC/C < 5%.
Soldering process:
Re-flow soldering (see temperature/time graphs page 13).

Packing

Available taped and reeled in blister pack.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*			100 VDC/63 VAC*			250 VDC/160 VAC*		
	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number
0.01 µF	1812	3.0	SMDIC02100KA00____	1812	3.0	SMDID02100KA00____	2220	3.5	SMDIF02100QA00____
	2220	3.5	SMDIC02100QA00____	2220	3.5	SMDID02100QA00____			
0.015 „	1812	3.0	SMDIC02150KA00____	1812	3.0	SMDID02150KA00____	2220	3.5	SMDIF02150QA00____
	2220	3.5	SMDIC02150QA00____	2220	3.5	SMDID02150QA00____			
0.022 „	1812	3.0	SMDIC02220KA00____	1812	3.0	SMDID02220KA00____	2220	3.5	SMDIF02220QA00____
	2220	3.5	SMDIC02220QA00____	2220	3.5	SMDID02220QA00____	2824	3.0	SMDIF02220TA00____
0.033 „	1812	3.0	SMDIC02330KA00____	1812	3.0	SMDID02330KA00____	2824	3.0	SMDIF02330TA00____
	2220	3.5	SMDIC02330QA00____	2220	3.5	SMDID02330QA00____	4030	5.0	SMDIF02330VA00____
	2824	3.0	SMDIC02330TA00____	2824	3.0	SMDID02330TA00____			
0.047 „	1812	3.0	SMDIC02470KA00____	1812	3.0	SMDID02470KA00____	2824	5.0	SMDIF02470TB00____
	2220	3.5	SMDIC02470QA00____	2220	3.5	SMDID02470QA00____	4030	5.0	SMDIF02470VA00____
	2824	3.0	SMDIC02470TA00____	2824	3.0	SMDID02470TA00____			
0.068 „	1812	3.0	SMDIC02680KA00____	2220	3.5	SMDID02680QA00____	2824	5.0	SMDIF02680TB00____
	2220	3.5	SMDIC02680QA00____	2824	3.0	SMDID02680TA00____	4030	5.0	SMDIF02680VA00____
	2824	3.0	SMDIC02680TA00____						
0.1 µF	1812	3.0	SMDIC03100KA00____	2220	3.5	SMDID03100QA00____	2824	5.0	SMDIF03100TB00____
	2220	3.5	SMDIC03100QA00____	2824	3.0	SMDID03100TA00____	4030	5.0	SMDIF03100VA00____
	2824	3.0	SMDIC03100TA00____				5040	6.0	SMDIF03100XA00____
0.15 „	1812	4.0	SMDIC03150KB00____	2824	3.0	SMDID03150TA00____	4030	5.0	SMDIF03150VA00____
	2220	3.5	SMDIC03150QA00____				5040	6.0	SMDIF03150XA00____
	2824	3.0	SMDIC03150TA00____				6054	7.0	SMDIF03150YA00____
0.22 „	2220	4.5	SMDIC03220QB00____	2220	4.5	SMDID03220QB00____	4030	5.0	SMDIF03220VA00____
	2824	5.0	SMDIC03220TB00____	2824	5.0	SMDID03220TB00____	5040	6.0	SMDIF03220XA00____
							6054	7.0	SMDIF03220YA00____
0.33 „	2220	4.5	SMDIC03330QB00____	2824	5.0	SMDID03330TB00____	5040	6.0	SMDIF03330XA00____
	2824	5.0	SMDIC03330TB00____	4030	5.0	SMDID03330VA00____	6054	7.0	SMDIF03330YA00____
	4030	5.0	SMDIC03330VA00____						
0.47 „	2220	4.5	SMDIC03470QB00____	2824	5.0	SMDID03470TB00____	6054	7.0	SMDIF03470YA00____
	2824	5.0	SMDIC03470TB00____	4030	5.0	SMDID03470VA00____			
	4030	5.0	SMDIC03470VA00____						
0.68 „	2824	5.0	SMDIC03680TB00____	4030	5.0	SMDID03680VA00____			
	4030	5.0	SMDIC03680VA00____						
1.0 µF	2824	5.0	SMDIC04100TB00____	5040	6.0	SMDID04100XA00____			
	4030	5.0	SMDIC04100VA00____						
	5040	6.0	SMDIC04100XA00____						
1.5 „	4030	5.0	SMDIC04150VA00____	6054	7.0	SMDID04150YA00____			
	5040	6.0	SMDIC04150XA00____						
2.2 „	6054	7.0	SMDIC04220YA00____	6054	7.0	SMDID04220YA00____			

Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: none = 00

Taped version see page 148.

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Continuation page 25

Continuation

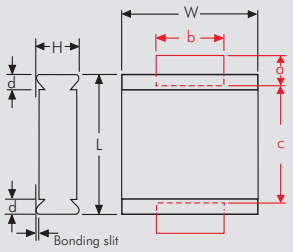
General Data

Capacitance	400 VDC/200 VAC* Size code	H ± 0.3	Part number	630 VDC/300 VAC* Size code	H ± 0.3	Part number	1000 VDC/400 VAC* Size code	H ± 0.3	Part number
0.01 µF				5040	6.0	SMDIJ02100XA00_ _ _ _	5040	6.0	SMDIO12100XA00_ _ _ _
0.015 „				5040	6.0	SMDIJ02150XA00_ _ _ _	5040	6.0	SMDIO12150XA00_ _ _ _
0.022 „	4030 5040	5.0 6.0	SMDIG02220VA00_ _ _ _ SMDIG02220XA00_ _ _ _	5040	6.0	SMDIJ02220XA00_ _ _ _	6054	7.0	SMDIO12220YA00_ _ _ _
0.033 „	4030 5040	5.0 6.0	SMDIG02330VA00_ _ _ _ SMDIG02330XA00_ _ _ _	5040	6.0	SMDIJ02330XA00_ _ _ _	6054	7.0	SMDIO12330YA00_ _ _ _
0.047 „	4030 5040	5.0 6.0	SMDIG02470VA00_ _ _ _ SMDIG02470XA00_ _ _ _	5040	6.0	SMDIJ02470XA00_ _ _ _			
0.068 „	4030 5040	5.0 6.0	SMDIG02680VA00_ _ _ _ SMDIG02680XA00_ _ _ _	6054	7.0	SMDIJ02680YA00_ _ _ _			
0.1 µF	4030 5040 6054	5.0 6.0 7.0	SMDIG03100VA00_ _ _ _ SMDIG03100XA00_ _ _ _ SMDIG03100YA00_ _ _ _						
0.15 „	5040 6054	6.0 7.0	SMDIG03150XA00_ _ _ _ SMDIG03150YA00_ _ _ _						
0.22 „	6054	7.0	SMDIG03220YA00_ _ _ _						
0.33 „	6054	7.0	SMDIG03330YA00_ _ _ _						

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Solder pad recommendation



Size code	L ±0.3	W ±0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5
4030	10.2	7.6	0.5	2.5	6	9
5040	12.7	10.2	0.7	2.5	6	11.5
6054	15.3	13.7	0.7	2.5	6	14

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

Taped version see page 148.

WIMA Miniature Capacitors in PCM 2.5 mm

The WIMA series with PCM 2.5 mm are contacted at the end surfaces and have very low self-inductance due to the small pin spacing of the capacitor and its fully contacted electrodes. Furthermore, the pulse and current loading capacities basically increase, the smaller the PCM can be designed, because – provided that the thickness of the film is the same – a longer band length is needed to achieve a particular capacitance value.

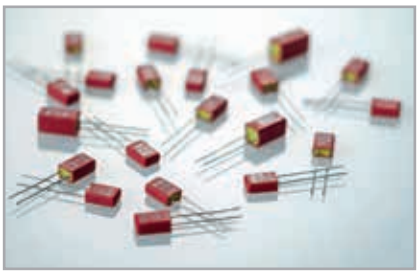
WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmetally compatible with the RoHS 2011/65/EU guidelines of the European Union.

WIMA subminiature capacitors in PCM 2.5 mm are outstandingly suitable as reservoir and decoupling capacitors for high-speed digital circuits and for HF decoupling in the field of high frequencies. Due to their excellent electrical properties they can replace ceramic capacitors in applications where quality and reliability are required. Due to their reduced dimensions they open up new possibilities for use in applications with limited space requirements and high package density.

WIMA FKP 02
WIMA MKS 02

WIMA plastic film capacitors in PCM 2.5 mm are available in metallized, self-healing version WIMA MKS 02 or in pulse duty film and foil versions WIMA FKP 02. As a dielectric, Polyester or Polypropylene film is used. The capacitance range includes values of 100 pF through 1.0 µF and voltage ratings of 50 VDC, 63 VDC, 100 VDC, 250 VDC and 400 VDC.

The realization of the smallest plastic film capacitors in the world has been made possible by the use of ultra-thin plastic film in thicknesses of 0.8 µm and below. The film processing with highly sensitive machines requires a high degree of experience and technical know-how.



WIMA FKP 02

Polypropylene (PP) Film/Foil Capacitors for Pulse Applications in PCM 2.5 mm. Capacitances from 100 pF to 0.01 µF. Rated Voltages from 63 VDC to 400 VDC.

Special Features

- **Pulse duty construction**
- **PCM 2.5 mm**
- **Close tolerances up to ±2.5%**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**

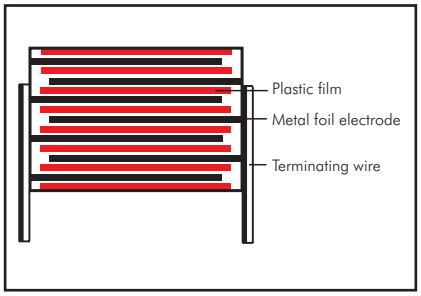
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
100 pF to 0.01 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC
Capacitance tolerances:
±20%, ±10%, ±5%, ±2.5%
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-13
Climatic test category:
55/100/21 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 3 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec for pulses equal to the rated voltage

Dielectric absorption:
0.05%
Temperature coefficient:
–200 x 10^{-6}/° C (typical)
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.01 µF
1 kHz	⩽ 5 x 10^{-4}
10 kHz	⩽ 6 x 10^{-4}
100 kHz	⩽ 8 x 10^{-4}

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

WIMA FKP 02

Continuation

General Data

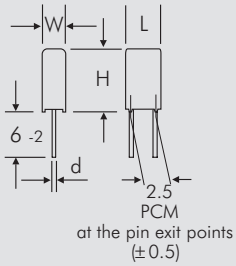
Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	2.5	7	4.6	**2.5**	FKP0C001000B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D001000B00_ _ _ _
150 „	2.5	7	4.6	**2.5**	FKP0C001500B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D001500B00_ _ _ _
220 „	2.5	7	4.6	**2.5**	FKP0C002200B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D002200B00_ _ _ _
330 „	2.5	7	4.6	**2.5**	FKP0C003300B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D003300B00_ _ _ _
470 „	2.5	7	4.6	**2.5**	FKP0C004700B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D004700B00_ _ _ _
680 „	2.5	7	4.6	**2.5**	FKP0C006800B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D006800B00_ _ _ _
1000 pF	2.5	7	4.6	**2.5**	FKP0C011000B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D011000B00_ _ _ _
1500 „	2.5	7	4.6	**2.5**	FKP0C011500B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0D011500B00_ _ _ _
2200 „	3	7.5	4.6	**2.5**	FKP0C012200C00_ _ _ _	3	7.5	4.6	**2.5**	FKP0D012200C00_ _ _ _
3300 „	3.8	8.5	4.6	**2.5**	FKP0C013300D00_ _ _ _	3.8	8.5	4.6	**2.5**	FKP0D013300D00_ _ _ _
4700 „	4.6	9	4.6	**2.5**	FKP0C014700E00_ _ _ _	4.6	9	4.6	**2.5**	FKP0D014700E00_ _ _ _
6800 „	4.6	9	4.6	**2.5**	FKP0C016800E00_ _ _ _	4.6	9	4.6	**2.5**	FKP0D016800E00_ _ _ _
0.01 µF	5.5	10	4.6	**2.5**	FKP0C021000F00_ _ _ _	5.5	10	4.6	**2.5**	FKP0D021000F00_ _ _ _

Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	2.5	7	4.6	**2.5**	FKP0F001000B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0G001000B00_ _ _ _
150 „	2.5	7	4.6	**2.5**	FKP0F001500B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0G001500B00_ _ _ _
220 „	2.5	7	4.6	**2.5**	FKP0F002200B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0G002200B00_ _ _ _
330 „	2.5	7	4.6	**2.5**	FKP0F003300B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0G003300B00_ _ _ _
470 „	2.5	7	4.6	**2.5**	FKP0F004700B00_ _ _ _	2.5	7	4.6	**2.5**	FKP0G004700B00_ _ _ _
680 „	2.5	7	4.6	**2.5**	FKP0F006800B00_ _ _ _	3	7.5	4.6	**2.5**	FKP0G006800C00_ _ _ _
1000 pF	2.5	7	4.6	**2.5**	FKP0F011000B00_ _ _ _	3.8	8.5	4.6	**2.5**	FKP0G011000D00_ _ _ _
1500 „	3	7.5	4.6	**2.5**	FKP0F011500C00_ _ _ _	4.6	9	4.6	**2.5**	FKP0G011500E00_ _ _ _
2200 „	3.8	8.5	4.6	**2.5**	FKP0F012200D00_ _ _ _	4.6	9	4.6	**2.5**	FKP0G012200E00_ _ _ _
3300 „	4.6	9	4.6	**2.5**	FKP0F013300E00_ _ _ _	5.5	10	4.6	**2.5**	FKP0G013300F00_ _ _ _
4700 „	5.5	10	4.6	**2.5**	FKP0F014700F00_ _ _ _					

* AC voltage: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

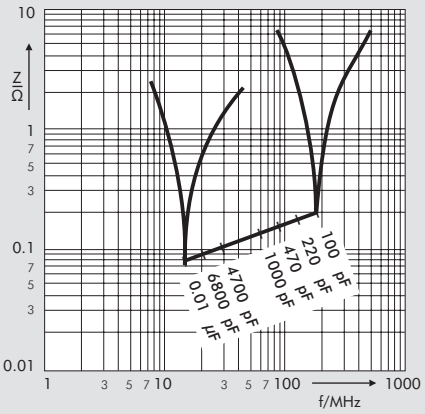
Dims. in mm.



d = 0.4 ⌀

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
	2.5 % = H
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.



Impedance change with frequency (general guide).

The values of the WIMA FKS 02 and WIMA FKM 02 ranges according to the main catalogue 2009 are still available on request.

WIMA MKS 02

Metallized Polyester (PET) Capacitors in PCM 2.5 mm. Capacitances from 3300 pF to 1.0 µF. Rated Voltages from 63 VDC to 400 VDC.

Special Features

- **High volume/capacitance ratio and reduced base**
- **PCM 2.5 mm**
- **Self-healing**
- **According to RoHS 2011/65/EU**

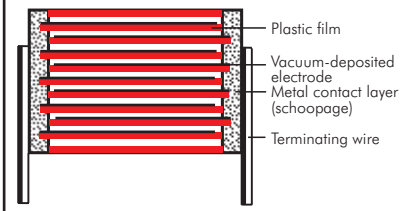
Typical Applications

For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Silver.

Electrical Data

Capacitance range:
3300 pF to 1.0 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC
Capacitance tolerances:
±20%, ± 10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-2
Climatic test category:
55/100/21 in accordance with IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 1.0 µF)
63 VDC	50 V	⩾ 3.75 x 10^3 MΩ	⩾ 1250 sec (MΩ x µF)
⩾ 100 VDC	100 V	⩾ 1 x 10^4 MΩ	–

Measuring time: 1 min.
Test voltage: 1.6 U_r, 2 sec.
Maximum pulse rise time:

Capacitance pF/µF	Pulse rise time V/µsec max. operation/test
3300 ... 6800	100 / 1000
0.01 ... 0.022	50 / 500
0.033 ... 0.068	30 / 300
0.1 ... 0.33	20 / 200
0.47 ... 1.0	15 / 150

for pulses equal to the rated voltage

Dissipation factors at + 20° C: tan δ

at f	C⩽0.1 µF	0.1 µF < C ⩽ 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}
100 kHz	⩽ 30 x 10^{-3}	–

Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	2.5	7	4.6	**2.5**	MKS0C021000B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0D021000B00_ _ _ _
0.015 „	2.5	7	4.6	**2.5**	MKS0C021500B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0D021500B00_ _ _ _
0.022 „	2.5	7	4.6	**2.5**	MKS0C022200B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0D022200B00_ _ _ _
0.033 „	2.5	7	4.6	**2.5**	MKS0C023300B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0D023300B00_ _ _ _
0.047 „	2.5	7	4.6	**2.5**	MKS0C024700B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0D024700B00_ _ _ _
0.068 „	2.5	7	4.6	**2.5**	MKS0C026800B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0D026800B00_ _ _ _
0.1 µF	3	7.5	4.6	**2.5**	MKS0C031000C00_ _ _ _	3	7.5	4.6	**2.5**	MKS0D031000C00_ _ _ _
0.15 „	3	7.5	4.6	**2.5**	MKS0C031500C00_ _ _ _	3.8	8.5	4.6	**2.5**	MKS0D031500D00_ _ _ _
0.22 „	3	7.5	4.6	**2.5**	MKS0C032200C00_ _ _ _	4.6	9	4.6	**2.5**	MKS0D032200E00_ _ _ _
0.33 „	3.8	8.5	4.6	**2.5**	MKS0C033300D00_ _ _ _	5.5	10	4.6	**2.5**	MKS0D033300F00_ _ _ _
0.47 „	4.6	9	4.6	**2.5**	MKS0C034700E00_ _ _ _					
0.68 „	5.5	10	4.6	**2.5**	MKS0C036800F00_ _ _ _					
1.0 µF	5.5	10	4.6	**2.5**	MKS0C041000F00_ _ _ _					

Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
3300 pF	2.5	7	4.6	**2.5**	MKS0F013300B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0G013300B00_ _ _ _
4700 „	2.5	7	4.6	**2.5**	MKS0F014700B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0G014700B00_ _ _ _
6800 „	2.5	7	4.6	**2.5**	MKS0F016800B00_ _ _ _	2.5	7	4.6	**2.5**	MKS0G016800B00_ _ _ _
0.01 µF	2.5	7	4.6	**2.5**	MKS0F021000B00_ _ _ _	3	7.5	4.6	**2.5**	MKS0G021000C00_ _ _ _
0.015 „	2.5	7	4.6	**2.5**	MKS0F021500B00_ _ _ _	3.8	8.5	4.6	**2.5**	MKS0G021500D00_ _ _ _
0.022 „	2.5	7	4.6	**2.5**	MKS0F022200B00_ _ _ _	4.6	9	4.6	**2.5**	MKS0G022200E00_ _ _ _
0.033 „	3	7.5	4.6	**2.5**	MKS0F023300C00_ _ _ _	5.5	10	4.6	**2.5**	MKS0G023300F00_ _ _ _
0.047 „	3.8	8.5	4.6	**2.5**	MKS0F024700D00_ _ _ _	5.5	10	4.6	**2.5**	MKS0G024700F00_ _ _ _
0.068 „	4.6	9	4.6	**2.5**	MKS0F026800E00_ _ _ _					
0.1 µF	5.5	10	4.6	**2.5**	MKS0F031000F00_ _ _ _					

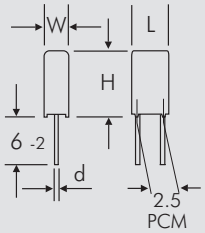
* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New range and value

** PCM = Printed circuit module = pin spacing

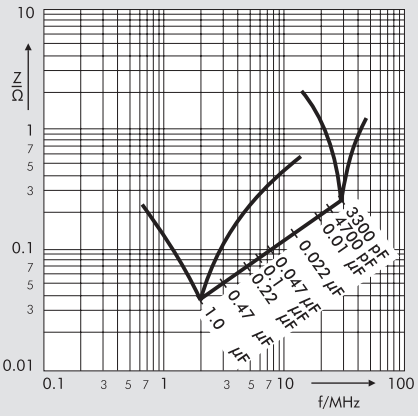
Dims. in mm.

d = 0.4 ⌀



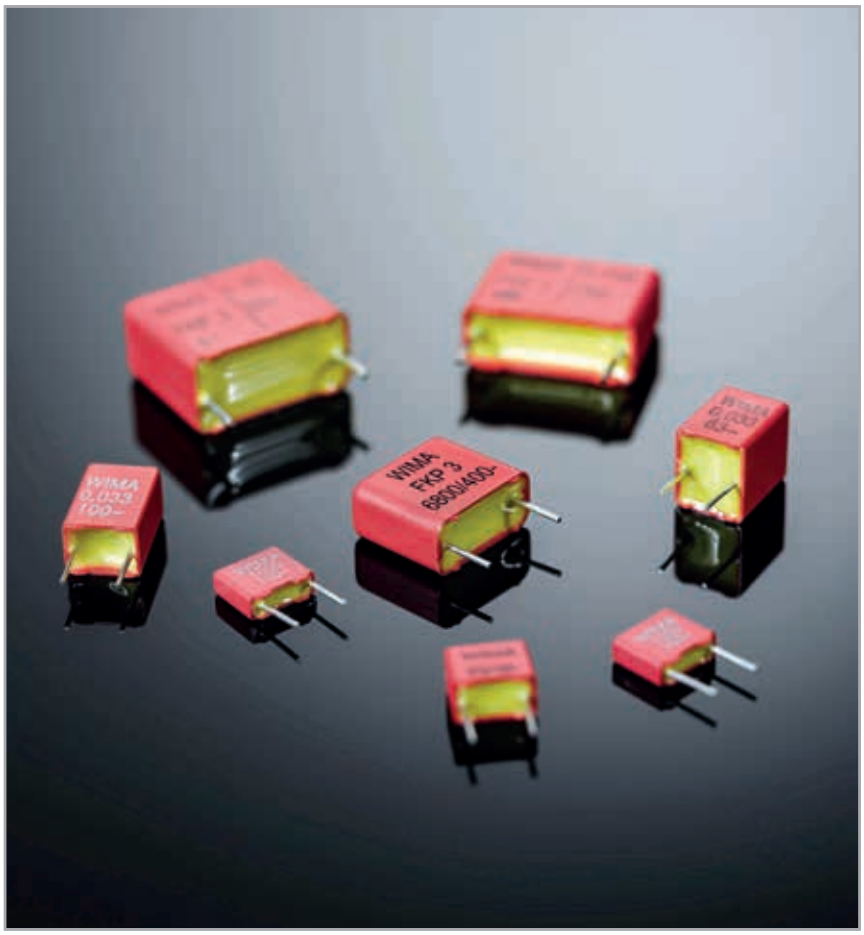
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.



Impedance change with frequency (general guide).

WIMA Capacitors in PCM 5 - 15 mm with Pulse Duty Film/Foil Construction



ined from the specific breakdown strength of the material.

WIMA film/foil capacitors in PCM 5 mm, 7.5 mm, 10 mm and 15 mm are available in two dielectric versions.

Capacitors with a Polyester dielectric (PET) are suitable for general applications such as coupling, decoupling and by-passing.

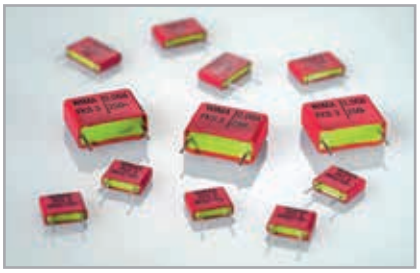
Polypropylene capacitors (PP) are used in the high frequency field. This includes resonant circuits, power supplies, deflection circuits, oscillator circuits and audio equipment.

WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2011/65/EU regulations of the European Union.

WIMA FKS 2
WIMA FKP 2
WIMA FKS 3
WIMA FKP 3

In the case of film and foil types, the electrode is not applied as for the metallized capacitors, but is wound with the dielectric as a metal foil. Due to their lower series resistance, the components produced this way have excellent pulse and current carrying capability, as well as a very high insulation resistance.

The film/foil construction is mainly used for capacitors with smaller capacitance value. The advantage of this construction principle is the easy contactability of the metal foil electrodes and the good pulse strength. To avoid breakdowns caused by weak spots in the dielectric, the insulating film chosen is always thicker than theoretically required by the values which are determ-



WIMA FKS 2

Polyester (PET) Film/Foil Capacitors for Pulse Applications in PCM 5 mm. Capacitances from 1000 pF to 0.047 µF. Rated Voltages from 63 VDC to 630 VDC.

Special Features

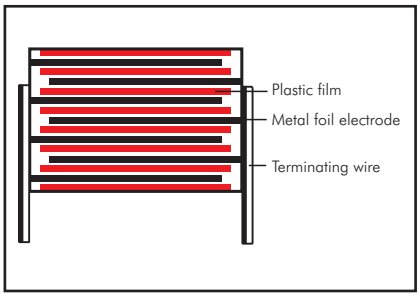
- **Pulse duty construction**
- **According to RoHS 2011/65/EU**

Typical Applications

For general DC-applications e.g.
- **Coupling**
- **Decoupling**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Silver.

Electrical Data

Capacitance range:
1000 pF to 0.047 µF
(E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC
Capacitance tolerances:
± 20%, ±10%, ±5%
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-11
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 1 \times 10^5$ MΩ
Measuring voltage: 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec for pulses equal to the rated voltage

Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.047 µF
1 kHz	⩽ 7×10^{-3}
10 kHz	⩽ 15×10^{-3}
100 kHz	⩽ 20×10^{-3}

Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	2.5	6.5	7.2	**5**	FKS2C011001A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2D011001A00_ _ _ _
1500 „	2.5	6.5	7.2	**5**	FKS2C011501A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2D011501A00_ _ _ _
2200 „	2.5	6.5	7.2	**5**	FKS2C012201A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2D012201A00_ _ _ _
3300 „	2.5	6.5	7.2	**5**	FKS2C013301A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2D013301A00_ _ _ _
4700 „	2.5	6.5	7.2	**5**	FKS2C014701A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2D014701A00_ _ _ _
6800 „	2.5	6.5	7.2	**5**	FKS2C016801A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2D016801A00_ _ _ _
0.01 µF	3	7.5	7.2	**5**	FKS2C021001B00_ _ _ _	3	7.5	7.2	**5**	FKS2D021001B00_ _ _ _
0.015 „	3.5	8.5	7.2	**5**	FKS2C021501C00_ _ _ _	3.5	8.5	7.2	**5**	FKS2D021501C00_ _ _ _
0.022 „	4.5	9.5	7.2	**5**	FKS2C022201E00_ _ _ _	4.5	9.5	7.2	**5**	FKS2D022201E00_ _ _ _
0.033 „	5.5	11.5	7.2	**5**	FKS2C023301H00_ _ _ _	5.5	11.5	7.2	**5**	FKS2D023301H00_ _ _ _
0.047 „	7.2	13	7.2	**5**	FKS2C024701K00_ _ _ _	7.2	13	7.2	**5**	FKS2D024701K00_ _ _ _

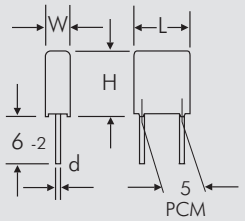
Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	2.5	6.5	7.2	**5**	FKS2F011001A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2G011001A00_ _ _ _
1500 „	2.5	6.5	7.2	**5**	FKS2F011501A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2G011501A00_ _ _ _
2200 „	2.5	6.5	7.2	**5**	FKS2F012201A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2G012201A00_ _ _ _
3300 „	2.5	6.5	7.2	**5**	FKS2F013301A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2G013301A00_ _ _ _
4700 „	2.5	6.5	7.2	**5**	FKS2F014701A00_ _ _ _	2.5	6.5	7.2	**5**	FKS2G014701A00_ _ _ _
6800 „	2.5	6.5	7.2	**5**	FKS2F016801A00_ _ _ _	3	7.5	7.2	**5**	FKS2G016801B00_ _ _ _
0.01 µF	3	7.5	7.2	**5**	FKS2F021001B00_ _ _ _	3.5	8.5	7.2	**5**	FKS2G021001C00_ _ _ _
0.015 „	3.5	8.5	7.2	**5**	FKS2F021501C00_ _ _ _	4.5	9.5	7.2	**5**	FKS2G021501E00_ _ _ _
0.022 „	4.5	9.5	7.2	**5**	FKS2F022201E00_ _ _ _	5.5	11.5	7.2	**5**	FKS2G022201H00_ _ _ _
0.033 „	5.5	11.5	7.2	**5**	FKS2F023301H00_ _ _ _	7.2	13	7.2	**5**	FKS2G023301K00_ _ _ _
0.047 „	7.2	13	7.2	**5**	FKS2F024701K00_ _ _ _					

Capacitance	630 VDC/250 VAC*				
	W	H	L	PCM**	Part number
1000 pF	3	7.5	7.2	**5**	FKS2J011001B00_ _ _ _
1500 „	3	7.5	7.2	**5**	FKS2J011501B00_ _ _ _
2200 „	3	7.5	7.2	**5**	FKS2J012201B00_ _ _ _
3300 „	3	7.5	7.2	**5**	FKS2J013301B00_ _ _ _
4700 „	3.5	8.5	7.2	**5**	FKS2J014701C00_ _ _ _
6800 „	4.5	9.5	7.2	**5**	FKS2J016801E00_ _ _ _
0.01 µF	4.5	9.5	7.2	**5**	FKS2J021001E00_ _ _ _
0.015 „	5.5	11.5	7.2	**5**	FKS2J021501H00_ _ _ _
0.022 „	7.2	13	7.2	**5**	FKS2J022201K00_ _ _ _

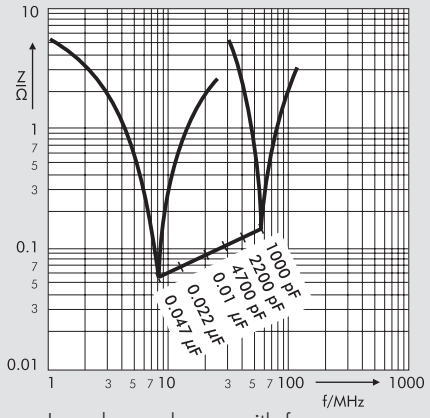
* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.5 ⌀



Impedance change with frequency (general guide).

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

WIMA FKP 2

Polypropylene (PP) Film/Foil Capacitors for Pulse Applications in PCM 5 mm. Capacitances from 33 pF to 0.033 µF. Rated Voltages from 63 VDC to 1000 VDC.

Special Features

- **Pulse duty construction**
- **Close tolerances up to ±2.5 % (±1 % on request)**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**

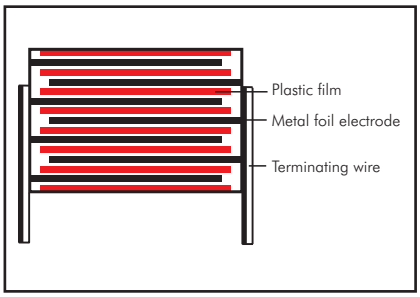
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
33 pF to 0.033 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 800 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%, ±2.5% (±2%, ±1.5% or ±1% available as precision capacitors subject to special enquiry)
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-13
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 3 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 1000 pF	1000 pF < C ⩽ 4700 pF	C > 4700 pF
1 kHz	⩽ 5×10^{-4}	⩽ 5×10^{-4}	⩽ 5×10^{-4}
10 kHz	⩽ 6×10^{-4}	⩽ 6×10^{-4}	⩽ 6×10^{-4}
100 kHz	⩽ 8×10^{-4}	⩽ 8×10^{-4}	–
1 MHz	⩽ 10×10^{-4}	–	–

Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec for pulses equal to the rated voltage
Dielectric absorption:
0.05%
Temperature coefficient:
-200×10^{-6}/° C (typical)
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	4.5	6	7.2	**5**	FKP2C001001D00_____	4.5	6	7.2	**5**	FKP2D001001D00_____
150 „	4.5	6	7.2	**5**	FKP2C001501D00_____	4.5	6	7.2	**5**	FKP2D001501D00_____
220 „	4.5	6	7.2	**5**	FKP2C002201D00_____	4.5	6	7.2	**5**	FKP2D002201D00_____
330 „	4.5	6	7.2	**5**	FKP2C003301D00_____	4.5	6	7.2	**5**	FKP2D003301D00_____
470 „	4.5	6	7.2	**5**	FKP2C004701D00_____	4.5	6	7.2	**5**	FKP2D004701D00_____
680 „	4.5	6	7.2	**5**	FKP2C006801D00_____	4.5	6	7.2	**5**	FKP2D006801D00_____
1000 pF	4.5	6	7.2	**5**	FKP2C011001D00_____	4.5	6	7.2	**5**	FKP2D011001D00_____
1500 „	4.5	6	7.2	**5**	FKP2C011501D00_____	4.5	6	7.2	**5**	FKP2D011501D00_____
2200 „	4.5	6	7.2	**5**	FKP2C012201D00_____	4.5	6	7.2	**5**	FKP2D012201D00_____
3300 „	4.5	6	7.2	**5**	FKP2C013301D00_____	5.5	7	7.2	**5**	FKP2D013301G00_____
4700 „	4.5	6	7.2	**5**	FKP2C014701D00_____	5.5	7	7.2	**5**	FKP2D014701G00_____
6800 „	4.5	6	7.2	**5**	FKP2C016801D00_____	5.5	7	7.2	**5**	FKP2D016801G00_____
0.01 µF	5.5	7	7.2	**5**	FKP2C021001G00_____	6.5	8	7.2	**5**	FKP2D021001I00_____
0.015 „	6.5	8	7.2	**5**	FKP2C021501I00_____	7.2	8.5	7.2	**5**	FKP2D021501J00_____
0.022 „	7.2	8.5	7.2	**5**	FKP2C022201J00_____	8.5	10	7.2	**5**	FKP2D022201L00_____
0.033 „	8.5	10	7.2	**5**	FKP2C023301L00_____					

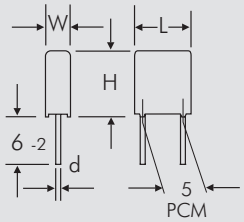
Capacitance	250 VDC/160 VAC*					400 VDC/220 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	4.5	6	7.2	**5**	FKP2F001001D00_____	4.5	6	7.2	**5**	FKP2G001001D00_____
150 „	4.5	6	7.2	**5**	FKP2F001501D00_____	4.5	6	7.2	**5**	FKP2G001501D00_____
220 „	4.5	6	7.2	**5**	FKP2F002201D00_____	4.5	6	7.2	**5**	FKP2G002201D00_____
330 „	4.5	6	7.2	**5**	FKP2F003301D00_____	4.5	6	7.2	**5**	FKP2G003301D00_____
470 „	4.5	6	7.2	**5**	FKP2F004701D00_____	4.5	6	7.2	**5**	FKP2G004701D00_____
680 „	4.5	6	7.2	**5**	FKP2F006801D00_____	4.5	6	7.2	**5**	FKP2G006801D00_____
1000 pF	4.5	6	7.2	**5**	FKP2F011001D00_____	4.5	6	7.2	**5**	FKP2G011001D00_____
1500 „	4.5	6	7.2	**5**	FKP2F011501D00_____	4.5	6	7.2	**5**	FKP2G011501D00_____
2200 „	4.5	6	7.2	**5**	FKP2F012201D00_____	4.5	6	7.2	**5**	FKP2G012201D00_____
3300 „	5.5	7	7.2	**5**	FKP2F013301G00_____	5.5	7	7.2	**5**	FKP2G013301G00_____
4700 „	6.5	8	7.2	**5**	FKP2F014701I00_____	6.5	8	7.2	**5**	FKP2G014701I00_____
6800 „	6.5	8	7.2	**5**	FKP2F016801I00_____	7.2	8.5	7.2	**5**	FKP2G016801J00_____
0.01 µF	7.2	8.5	7.2	**5**	FKP2F021001J00_____	8.5	10	7.2	**5**	FKP2G021001L00_____
0.015 „	8.5	10	7.2	**5**	FKP2F021501L00_____					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

E12 values and individual values available from 27 pF up on request.

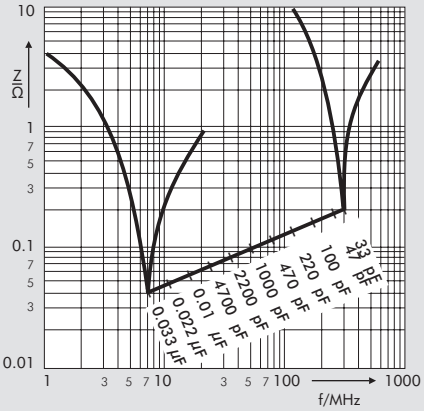
Dims. in mm.



d = 0.5 ⌀

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
	2.5 % = H
	2 % = G
	1.5 % = F
	1 % = E
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.



Impedance change with frequency (general guide).

Continuation page 36

Continuation

General Data

Capacitance	630 VDC/250 VAC*					800 VDC/250 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	4.5	6	7.2	**5**	FKP2J001001D00_ _ _ _	4.5	6	7.2	**5**	FKP2L001001D00_ _ _ _
150 „	4.5	6	7.2	**5**	FKP2J001501D00_ _ _ _	4.5	6	7.2	**5**	FKP2L001501D00_ _ _ _
220 „	4.5	6	7.2	**5**	FKP2J002201D00_ _ _ _	4.5	6	7.2	**5**	FKP2L002201D00_ _ _ _
330 „	4.5	6	7.2	**5**	FKP2J003301D00_ _ _ _	4.5	6	7.2	**5**	FKP2L003301D00_ _ _ _
470 „	4.5	6	7.2	**5**	FKP2J004701D00_ _ _ _	5.5	7	7.2	**5**	FKP2L004701G00_ _ _ _
680 „	4.5	6	7.2	**5**	FKP2J006801D00_ _ _ _	5.5	7	7.2	**5**	FKP2L006801G00_ _ _ _
1000 pF	4.5	6	7.2	**5**	FKP2J011001D00_ _ _ _	5.5	7	7.2	**5**	FKP2L011001G00_ _ _ _
1500 „	4.5	6	7.2	**5**	FKP2J011501D00_ _ _ _	5.5	7	7.2	**5**	FKP2L011501G00_ _ _ _
2200 „	5.5	7	7.2	**5**	FKP2J012201G00_ _ _ _	6.5	8	7.2	**5**	FKP2L012201I00_ _ _ _
3300 „	6.5	8	7.2	**5**	FKP2J013301I00_ _ _ _	7.2	8.5	7.2	**5**	FKP2L013301J00_ _ _ _
4700 „	6.5	8	7.2	**5**	FKP2J014701I00_ _ _ _	8.5	10	7.2	**5**	FKP2L014701L00_ _ _ _
6800 „	7.2	8.5	7.2	**5**	FKP2J016801J00_ _ _ _					
0.01 µF	8.5	10	7.2	**5**	FKP2J021001L00_ _ _ _					

Capacitance	1000 VDC/250 VAC*				
	W	H	L	PCM**	Part number
33 pF	4.5	6	7.2	**5**	FKP2O100331D00_ _ _ _
47 „	4.5	6	7.2	**5**	FKP2O100471D00_ _ _ _
68 „	4.5	6	7.2	**5**	FKP2O100681D00_ _ _ _
100 pF	4.5	6	7.2	**5**	FKP2O101001D00_ _ _ _
150 „	4.5	6	7.2	**5**	FKP2O101501D00_ _ _ _
220 „	4.5	6	7.2	**5**	FKP2O102201D00_ _ _ _
330 „	4.5	6	7.2	**5**	FKP2O103301D00_ _ _ _
470 „	5.5	7	7.2	**5**	FKP2O104701G00_ _ _ _
680 „	5.5	7	7.2	**5**	FKP2O106801G00_ _ _ _
1000 pF	6.5	8	7.2	**5**	FKP2O111001I00_ _ _ _
1500 „	7.2	8.5	7.2	**5**	FKP2O111501J00_ _ _ _
2200 „	8.5	10	7.2	**5**	FKP2O112201L00_ _ _ _

E12 values and individual values available from 27 pF up on request.

Dims. in mm.

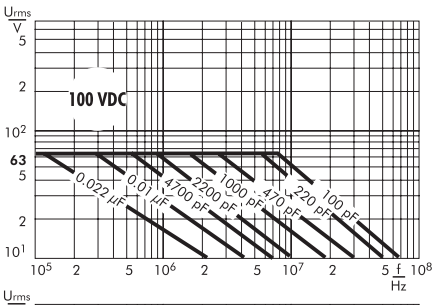
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
	2.5 % = H
	2 % = G
	1.5 % = F
	1 % = E
Packing:	bulk = S
Pin length:	6-2 = SD

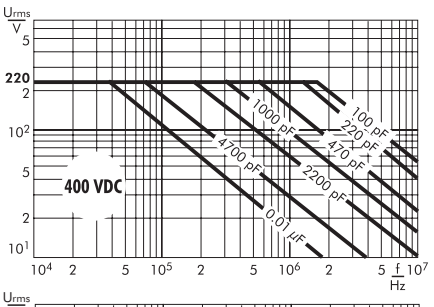
Taped version see page 149.

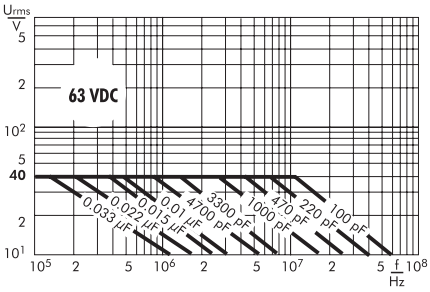
* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

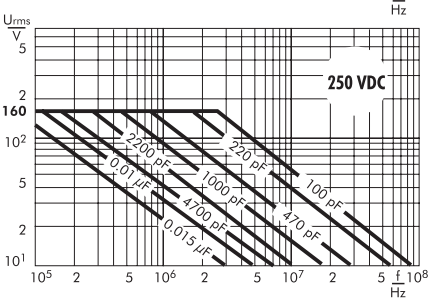
** PCM = Printed circuit module = pin spacing.

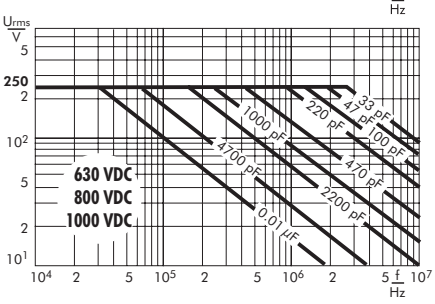
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).











WIMA FKS 3

Polyester (PET) Film/Foil Capacitors for Pulse Applications in PCM 7.5 mm to 15 mm. Capacitances from 1000 pF to 0.22 µF. Rated Voltages from 100 VDC to 630 VDC.

Special Features

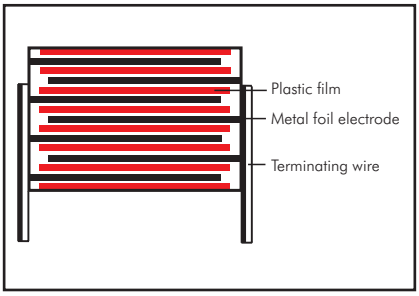
- **Pulse duty construction**
- **According to RoHS 2011/65/EU**

Typical Applications

For general DC-applications e.g.
- **Coupling**
- **Decoupling**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 0.22 µF (E12-values on request)
Rated voltages:
100 VDC, 250 VDC, 400 VDC, 630 VDC
Capacitance tolerances:
± 20%, ±10%, ±5%,
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-11
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 1 \times 10^5$ MΩ
Measuring voltage: 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec for pulses equal to the rated voltage

Dissipation factors at +20° C: tan δ

at f	C⩽0,22 µF
1 kHz	$\leqslant 7 \times 10^{-3}$
10 kHz	$\leqslant 15 \times 10^{-3}$
100 kHz	$\leqslant 20 \times 10^{-3}$

Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

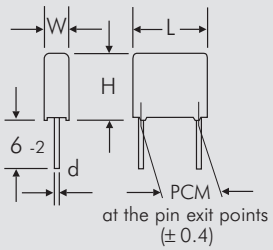
Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	3	8.5	10	**7.5**	FKS3D011002B00_ _ _ _	3	8.5	10	**7.5**	FKS3F011002B00_ _ _ _
1500 „	3	8.5	10	**7.5**	FKS3D011502B00_ _ _ _	3	8.5	10	**7.5**	FKS3F011502B00_ _ _ _
2200 „	3	8.5	10	**7.5**	FKS3D012202B00_ _ _ _	3	8.5	10	**7.5**	FKS3F012202B00_ _ _ _
3300 „	3	8.5	10	**7.5**	FKS3D013302B00_ _ _ _	3	8.5	10	**7.5**	FKS3F013302B00_ _ _ _
4700 „	3	8.5	10	**7.5**	FKS3D014702B00_ _ _ _	3	8.5	10	**7.5**	FKS3F014702B00_ _ _ _
						3	9	13	10	FKS3F014703A00_ _ _ _
6800 „	3	8.5	10	**7.5**	FKS3D016802B00_ _ _ _	3	8.5	10	**7.5**	FKS3F016802B00_ _ _ _
						3	9	13	10	FKS3F016803A00_ _ _ _
0.01 µF	3	8.5	10	**7.5**	FKS3D021002B00_ _ _ _	3	9	13	10	FKS3F021003A00_ _ _ _
	3	9	13	10	FKS3D021003A00_ _ _ _					
0.015 „	3	8.5	10	**7.5**	FKS3D021502B00_ _ _ _	4	9.5	13	10	FKS3F021503D00_ _ _ _
	3	9	13	10	FKS3D021503A00_ _ _ _					
0.022 „	3	8.5	10	**7.5**	FKS3D022202B00_ _ _ _	5	11	13	10	FKS3F022203F00_ _ _ _
	3	9	13	10	FKS3D022203A00_ _ _ _					
0.033 „	4	9.5	13	10	FKS3D023303D00_ _ _ _	6	12	13	10	FKS3F023303G00_ _ _ _
0.047 „	4	9.5	13	10	FKS3D024703D00_ _ _ _	6	12.5	18	15	FKS3F024704C00_ _ _ _
0.068 „	5	11	13	10	FKS3D026803F00_ _ _ _	7	14	18	15	FKS3F026804D00_ _ _ _
0.1 µF	6	12	13	10	FKS3D031003G00_ _ _ _	8	15	18	15	FKS3F031004F00_ _ _ _
0.15 „	7	14	18	15	FKS3D031504D00_ _ _ _	9	16	18	15	FKS3F031504J00_ _ _ _
0.22 „	8	15	18	15	FKS3D032204F00_ _ _ _					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.

The values of the WIMA FKM 3 range according to the main catalogue 2009 are still available on request.



d = 0.5 ø if W = 3
d = 0.6 ø if W ⩾ 4
} PCM 7.5 and 10
d = 0.8 ø if PCM = 15

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 149.	

Continuation page 39

Continuation

General Data

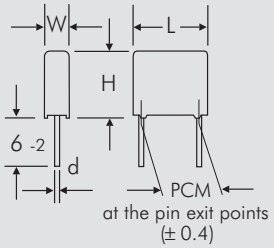
Capacitance	400 VDC/250 VAC*					630 VDC/300 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	3	9	13	10	FKS3G011003A00_ _ _ _	3	9	13	10	FKS3J011003A00_ _ _ _
1500 „	3	9	13	10	FKS3G011503A00_ _ _ _	3	9	13	10	FKS3J011503A00_ _ _ _
2200 „	3	9	13	10	FKS3G012203A00_ _ _ _	3	9	13	10	FKS3J012203A00_ _ _ _
3300 „	3	9	13	10	FKS3G013303A00_ _ _ _	4	9.5	13	10	FKS3J013303D00_ _ _ _
4700 „	3	9	13	10	FKS3G014703A00_ _ _ _	4	9.5	13	10	FKS3J014703D00_ _ _ _
6800 „	3	9	13	10	FKS3G016803A00_ _ _ _	5	11	13	10	FKS3J016803F00_ _ _ _
0.01 µF	4	9.5	13	10	FKS3G021003D00_ _ _ _	6	12	13	10	FKS3J021003G00_ _ _ _
0.015 „	5	11	13	10	FKS3G021503F00_ _ _ _	6	12.5	18	15	FKS3J021504C00_ _ _ _
0.022 „	6	12	13	10	FKS3G022203G00_ _ _ _	7	14	18	15	FKS3J022204D00_ _ _ _
0.033 „	6	12.5	18	15	FKS3G023304C00_ _ _ _	8	15	18	15	FKS3J023304F00_ _ _ _
0.047 „	7	14	18	15	FKS3G024704D00_ _ _ _					
0.068 „	8	15	18	15	FKS3G026804F00_ _ _ _					
0.1 µF	9	16	18	15	FKS3G031004J00_ _ _ _					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.

The values of the WIMA FKM 3 range according to the main catalogue 2009 are still available on request..



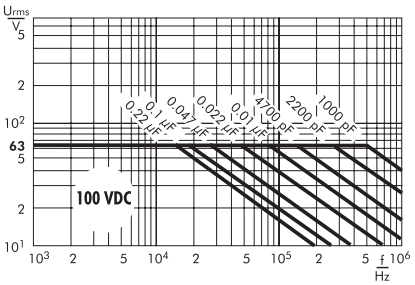
d = 0.5 Ø if W = 3
d = 0.6 Ø if W ⩾ 4
d = 0.8 Ø if PCM = 15
} PCM 7.5 and 10

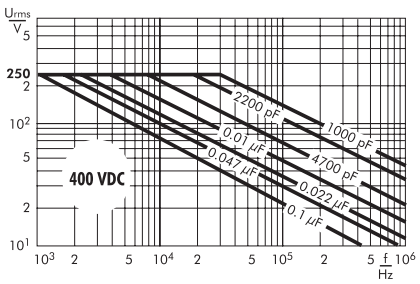
Part number completion:

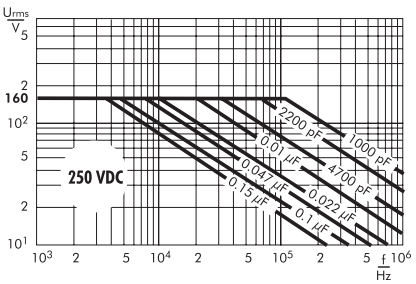
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD

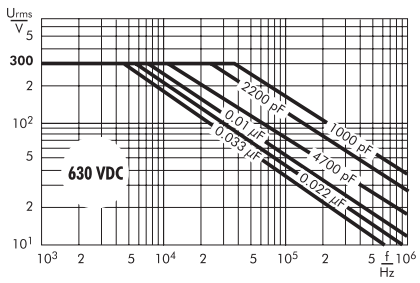
Taped version see page 149.

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).









WIMA FKP 3

Polypropylene (PP) Film and Foil Capacitors for Pulse Applications in PCM 7.5 mm to 15 mm. Capacitances from 100 pF to 0.22 µF. Rated Voltages from 63 VDC to 1000 VDC.

Special Features

- **Pulse duty construction**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**

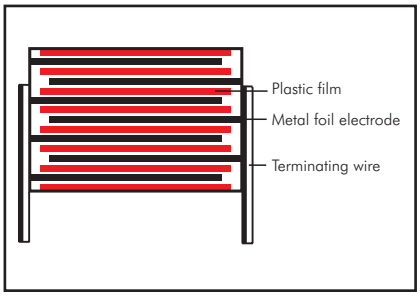
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
100 pF to 0.22 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 850 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-13
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 3 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec for pulses equal to the rated voltage

Dielectric absorption:
0.05 %
Temperature coefficient:
–200 x 10^{-6}/° C (general guide)
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 0.22 µF
1 kHz	$\leqslant 5 \times 10^{-4}$	$\leqslant 5 \times 10^{-4}$
10 kHz	$\leqslant 6 \times 10^{-4}$	$\leqslant 6 \times 10^{-4}$
100 kHz	$\leqslant 8 \times 10^{-4}$	-

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC* W	H	L	PCM**	Part number	100 VDC/63 VAC* W	H	L	PCM**	Part number
100 pF						3	8.5	10	**7.5**	FKP3D001002B00_ _ _ _
150 „						3	8.5	10	**7.5**	FKP3D001502B00_ _ _ _
220 „						3	8.5	10	**7.5**	FKP3D002202B00_ _ _ _
330 „						3	8.5	10	**7.5**	FKP3D003302B00_ _ _ _
470 „						3	8.5	10	**7.5**	FKP3D004702B00_ _ _ _
680 „						3	8.5	10	**7.5**	FKP3D006802B00_ _ _ _
1000 pF						3	8.5	10	**7.5**	FKP3D011002B00_ _ _ _
1500 „						3	8.5	10	**7.5**	FKP3D011502B00_ _ _ _
2200 „						3	8.5	10	**7.5**	FKP3D012202B00_ _ _ _
3300 „						3	8.5	10	**7.5**	FKP3D013302B00_ _ _ _
4700 „						3	8.5	10	**7.5**	FKP3D014702B00_ _ _ _
6800 „						4	9	10	**7.5**	FKP3D016802C00_ _ _ _
0.01 µF						4	9	10	**7.5**	FKP3D021002C00_ _ _ _
0.015 „	4	9	10	**7.5**	FKP3C021502C00_ _ _ _	4	9.5	13	10	FKP3D021503D00_ _ _ _
0.022 „	4	9.5	13	10	FKP3C022203D00_ _ _ _	5	11	13	10	FKP3D022203F00_ _ _ _
0.033 „	4	9.5	13	10	FKP3C023303D00_ _ _ _	6	12	13	10	FKP3D023303G00_ _ _ _
0.047 „	5	11	13	10	FKP3C024703F00_ _ _ _	5	11	18	15	FKP3D024704B00_ _ _ _
0.068 „	6	12	13	10	FKP3C026803G00_ _ _ _	6	12.5	18	15	FKP3D026804C00_ _ _ _
0.1 µF	6	12.5	18	15	FKP3C031004C00_ _ _ _	7	14	18	15	FKP3D031004D00_ _ _ _
0.15 „	8	15	18	15	FKP3C031504F00_ _ _ _	9	16	18	15	FKP3D031504J00_ _ _ _
0.22 „	9	16	18	15	FKP3C032204J00_ _ _ _					

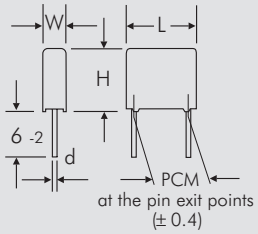
Capacitance	250 VDC/160 VAC* W	H	L	PCM**	Part number	400 VDC/250 VAC* W	H	L	PCM**	Part number
100 pF	3	8.5	10	**7.5**	FKP3F001002B00_ _ _ _	3	8.5	10	**7.5**	FKP3G001002B00_ _ _ _
150 „	3	8.5	10	**7.5**	FKP3F001502B00_ _ _ _	3	8.5	10	**7.5**	FKP3G001502B00_ _ _ _
220 „	3	8.5	10	**7.5**	FKP3F002202B00_ _ _ _	3	8.5	10	**7.5**	FKP3G002202B00_ _ _ _
330 „	3	8.5	10	**7.5**	FKP3F003302B00_ _ _ _	3	8.5	10	**7.5**	FKP3G003302B00_ _ _ _
470 „	3	8.5	10	**7.5**	FKP3F004702B00_ _ _ _	3	8.5	10	**7.5**	FKP3G004702B00_ _ _ _
680 „	3	8.5	10	**7.5**	FKP3F006802B00_ _ _ _	3	8.5	10	**7.5**	FKP3G006802B00_ _ _ _
1000 pF	3	8.5	10	**7.5**	FKP3F011002B00_ _ _ _	3	8.5	10	**7.5**	FKP3G011002B00_ _ _ _
1500 „	3	8.5	10	**7.5**	FKP3F011502B00_ _ _ _	4	9	10	**7.5**	FKP3G011502C00_ _ _ _
2200 „	4	9	10	**7.5**	FKP3F012202C00_ _ _ _	4	9	10	**7.5**	FKP3G012202C00_ _ _ _
						4	9.5	13	10	FKP3G012203D00_ _ _ _
3300 „	3	9	13	10	FKP3F013303A00_ _ _ _	4	9.5	13	10	FKP3G013303D00_ _ _ _
4700 „	4	9.5	13	10	FKP3F014703D00_ _ _ _	5	11	13	10	FKP3G014703F00_ _ _ _
6800 „	5	11	13	10	FKP3F016803F00_ _ _ _	6	12	13	10	FKP3G016803G00_ _ _ _
0.01 µF	5	11	13	10	FKP3F021003F00_ _ _ _	5	11	18	15	FKP3G021004B00_ _ _ _
0.015 „	6	12	13	10	FKP3F021503G00_ _ _ _	6	12.5	18	15	FKP3G021504C00_ _ _ _
	5	11	18	15	FKP3F021504B00_ _ _ _					
0.022 „	6	12.5	18	15	FKP3F022204C00_ _ _ _	7	14	18	15	FKP3G022204D00_ _ _ _
0.033 „	7	14	18	15	FKP3F023304D00_ _ _ _	8	15	18	15	FKP3G023304F00_ _ _ _
0.047 „	8	15	18	15	FKP3F024704F00_ _ _ _	9	16	18	15	FKP3G024704J00_ _ _ _
0.068 „	9	16	18	15	FKP3F026804J00_ _ _ _					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.5 ø if W = 3
d = 0.6 ø if W ⩾ 4
d = 0.8 ø if PCM = 15
} PCM 7.5 and 10



Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD

Taped version see page 149.

Continuation page 42

Continuation

General Data

Capacitance	630 VDC/300 VAC* W	H	L	PCM**	Part number	850 VDC/300 VAC* W	H	L	PCM**	Part number
100 pF	3	8.5	10	**7.5**	FKP3J001002B00_ _ _ _	3	8.5	10	**7.5**	FKP3M001002B00_ _ _ _
150 „	3	8.5	10	**7.5**	FKP3J001502B00_ _ _ _	3	8.5	10	**7.5**	FKP3M001502B00_ _ _ _
220 „	3	8.5	10	**7.5**	FKP3J002202B00_ _ _ _	3	8.5	10	**7.5**	FKP3M002202B00_ _ _ _
330 „	3	8.5	10	**7.5**	FKP3J003302B00_ _ _ _	3	8.5	10	**7.5**	FKP3M003302B00_ _ _ _
470 „	3	8.5	10	**7.5**	FKP3J004702B00_ _ _ _	3	8.5	10	**7.5**	FKP3M004702B00_ _ _ _
680 „	3	8.5	10	**7.5**	FKP3J006802B00_ _ _ _	3	8.5	10	**7.5**	FKP3M006802B00_ _ _ _
1000 pF	4	9	10	**7.5**	FKP3J011002C00_ _ _ _	4	9	10	**7.5**	FKP3M011002C00_ _ _ _
1500 „	4	9.5	13	10	FKP3J011503D00_ _ _ _	4	9.5	13	10	FKP3M011503D00_ _ _ _
2200 „	4	9.5	13	10	FKP3J012203D00_ _ _ _	4	9.5	13	10	FKP3M012203D00_ _ _ _
3300 „	5	11	13	10	FKP3J013303F00_ _ _ _	5	11	13	10	FKP3M013303F00_ _ _ _
4700 „	6	12	13	10	FKP3J014703G00_ _ _ _	6	12	13	10	FKP3M014703G00_ _ _ _
6800 „	5	11	18	15	FKP3J016804B00_ _ _ _	5	11	18	15	FKP3M016804B00_ _ _ _
0.01 µF	6	12.5	18	15	FKP3J021004C00_ _ _ _	6	12.5	18	15	FKP3M021004C00_ _ _ _
0.015 „	8	15	18	15	FKP3J021504F00_ _ _ _	8	15	18	15	FKP3M021504F00_ _ _ _
0.022 „	9	16	18	15	FKP3J022204J00_ _ _ _	9	16	18	15	FKP3M022204J00_ _ _ _
0.033 „	9	16	18	15	FKP3J023304J00_ _ _ _					

Capacitance	1000 VDC300 VAC* W	H	L	PCM**	Part number
100 pF	3	8.5	10	**7.5**	FKP3O101002B00_ _ _ _
150 „	3	8.5	10	**7.5**	FKP3O101502B00_ _ _ _
220 „	3	8.5	10	**7.5**	FKP3O102202B00_ _ _ _
330 „	3	8.5	10	**7.5**	FKP3O103302B00_ _ _ _
470 „	3	8.5	10	**7.5**	FKP3O104702B00_ _ _ _
680 „	3	8.5	10	**7.5**	FKP3O106802B00_ _ _ _
1000 pF	4	9	10	**7.5**	FKP3O111002C00_ _ _ _
1500 „	4	9.5	13	10	FKP3O111503D00_ _ _ _
2200 „	4	9.5	13	10	FKP3O112203D00_ _ _ _
3300 „	5	11	13	10	FKP3O113303F00_ _ _ _
4700 „	6	12	13	10	FKP3O114703G00_ _ _ _
6800 „	5	11	18	15	FKP3O116804B00_ _ _ _
0.01 µF	6	12.5	18	15	FKP3O121004C00_ _ _ _
0.015 „	8	15	18	15	FKP3O121504F00_ _ _ _
0.022 „	9	16	18	15	FKP3O122204J00_ _ _ _

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New range

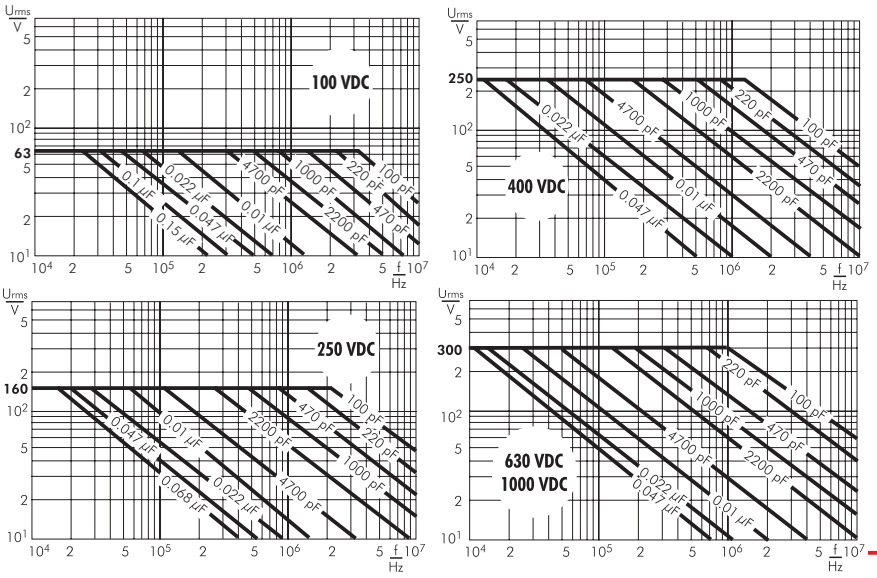
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Permissible AC voltage
in relation to frequency
at 10° C internal temperature rise
(general guide).



WIMA Capacitors with Metallized, Self-Healing Construction PCM 5 to 52.5 mm

WIMA MKS 2
WIMA MKP 2
WIMA MKS 4
WIMA MKP 4C
WIMA MKP 4

In the case of metallized capacitors, thin layers of aluminium (approx. 0.03 µm) are vacuum-deposited on the insulating film as conducting electrodes. In the case of a breakdown, the short circuit current causes the thin metal coating to evaporate around the point of failure and an insulating area is formed. The capacitor remains intact (self-healing). Due to their construction principle metallized capacitors stand out for their very favourable capacitance/ volume ratio.

Metallized WIMA capacitors in PCM 5 mm – 52.5 mm are available in two dielectric versions.

Capacitors with a Polyester dielectric (PET) are suitable for general applications such as coupling, decoupling and by-passing. By making use of ultra thin film and appropriate manufacturing experience, it has been possible to achieve high capacitance values in very small box sizes. The WIMA MKS 2 for example is available with capacitance values up to 10 µF in PCM 5 mm whereas the MKS 4 is offering capacitances up to 680 µF in PCM 52.5 mm.

Polypropylene capacitors (PP) are used in the high frequency field. This includes resonant circuits, power supplies, deflection circuits, oscillator circuits and audio equipment. WIMA metallized Polypropylene capacitors in PCM 5 - 37.5 mm are available with capacitance values up to 10 µF and voltage ratings up to 1000 VDC.

Upon customer request, larger box sizes can be supplied in 4-pin versions. Types with terminating plates can also be manufactured on request. The advantage of this method of construction, besides the improved mechanical stability of the component on the board, is the excellent electrical contact reliability.

WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2011/65/EU regulations of the European Union.

WIMA MKS 2

Metallized Polyester (PET) Capacitors in PCM 5 mm. Capacitances from 0.01 µF to 10 µF. Rated Voltages from 50 VDC to 630 VDC.

Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2011/65/EU**

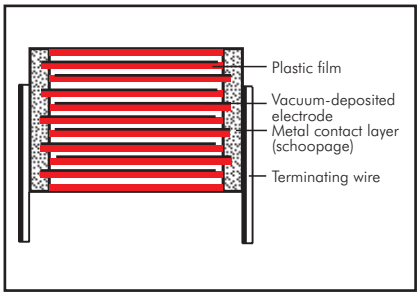
Typical Applications

For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Silver/White.

Electrical Data

Capacitance range:
0.01 µF to 10 µF (E12-values on request)
Rated voltages:
50 VDC, 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
U_r = 50 VDC: –55° C to +100° C
U_r ⩾ 63 VDC: –55° C to +125° C
Climatic test category:
55/100/21 in accordance with IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 10 µF
50 VDC	10 V	⩾5 x 10^3 MΩ	⩾1000 sec (MΩ x µF)
63 VDC	50 V	⩾1 x 10^4 MΩ	⩾1250 sec (MΩ x µF)
⩾100 VDC	100 V	⩾1.5 x 10^4 MΩ	⩾3000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}	⩽ 10 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}	–
100 kHz	⩽ 30 x 10^{-3}	–	–

Maximum pulse rise time: for pulses equal to the rated voltage

Capacitance µF	Pulse rise time V/µsec max. operation/test					
	50 VDC	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC
0.01 ... 0.022	–	35/350	35/350	50/500	80/800	110/1100
0.033 ... 0.068	–	20/200	25/250	50/500	80/800	90/900
0.1 ... 0.47	10/100	15/150	20/200	50/500	80/800	–
0.68 ... 1.0	8/80	12/120	15/150	25/250	–	–
1.5 ... 3.3	8/80	7.5/75	10/100	–	–	–
4.7	5/50	5/50	–	–	–	–
6.8	3/30	3/30	–	–	–	–
10	2.5/25	–	–	–	–	–

Test specifications:
In accordance with IEC 60384-2
Test voltage: 1.6 U_r, 2 sec.
Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours (+125° C permitted for 1000 hours max. distributed over the entire operating life)
Failure rate < 2 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

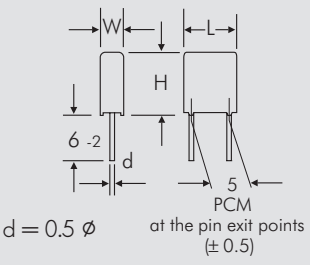
Capacitance	50 VDC/30 VAC* W	H	L	PCM**	Part number	63 VDC/40 VAC* W	H	L	PCM**	Part number
0.01 µF						2.5	6.5	7.2	**5**	MKS2C021001A00_ _ _ _
0.015 „						2.5	6.5	7.2	**5**	MKS2C021501A00_ _ _ _
0.022 „						2.5	6.5	7.2	**5**	MKS2C022201A00_ _ _ _
0.033 „						2.5	6.5	7.2	**5**	MKS2C023301A00_ _ _ _
0.047 „						2.5	6.5	7.2	**5**	MKS2C024701A00_ _ _ _
0.068 „						2.5	6.5	7.2	**5**	MKS2C026801A00_ _ _ _
0.1 µF						2.5	6.5	7.2	**5**	MKS2C031001A00_ _ _ _
0.15 „						2.5	6.5	7.2	**5**	MKS2C031501A00_ _ _ _
0.22 „						3	7.5	7.2	**5**	MKS2C032201B00_ _ _ _
0.33 „	2.5	6.5	7.2	**5**	MKS2B033301A00_ _ _ _	3.5	8.5	7.2	**5**	MKS2C033301C00_ _ _ _
0.47 „	3	7.5	7.2	**5**	MKS2B034701B00_ _ _ _	3.5	8.5	7.2	**5**	MKS2C034701C00_ _ _ _
0.68 „	3.5	8.5	7.2	**5**	MKS2B036801C00_ _ _ _	4.5	9.5	7.2	**5**	MKS2C036801E00_ _ _ _
1.0 µF	3.5	8.5	7.2	**5**	MKS2B041001C00_ _ _ _	5	10	7.2	**5**	MKS2C041001F00_ _ _ _
1.5 „	4.5	9.5	7.2	**5**	MKS2B041501E00_ _ _ _	5.5	11.5	7.2	**5**	MKS2C041501H00_ _ _ _
2.2 „	5	10	7.2	**5**	MKS2B042201F00_ _ _ _	7.2	13	7.2	**5**	MKS2C042201K00_ _ _ _
3.3 „	5.5	11.5	7.2	**5**	MKS2B043301H00_ _ _ _	7.2	13	7.2	**5**	MKS2C043301K00_ _ _ _
4.7 „	7.2	13	7.2	**5**	MKS2B044701K00_ _ _ _	8.5	14	7.2	**5**	MKS2C044701M00_ _ _ _
6.8 „	8.5	14	7.2	**5**	MKS2B046801M00_ _ _ _	11	16	7.2	**5**	MKS2C046801N00_ _ _ _
10 µF	11	16	7.2	**5**	MKS2B051001N00_ _ _ _					

Capacitance	100 VDC/63 VAC* W	H	L	PCM**	Part number	250 VDC/160 VAC* W	H	L	PCM**	Part number
0.01 µF	2.5	6.5	7.2	**5**	MKS2D021001A00_ _ _ _	2.5	6.5	7.2	**5**	MKS2F021001A00_ _ _ _
0.015 „	2.5	6.5	7.2	**5**	MKS2D021501A00_ _ _ _	2.5	6.5	7.2	**5**	MKS2F021501A00_ _ _ _
0.022 „	2.5	6.5	7.2	**5**	MKS2D022201A00_ _ _ _	2.5	6.5	7.2	**5**	MKS2F022201A00_ _ _ _
0.033 „	2.5	6.5	7.2	**5**	MKS2D023301A00_ _ _ _	3.5	8.5	7.2	**5**	MKS2F023301C00_ _ _ _
0.047 „	2.5	6.5	7.2	**5**	MKS2D024701A00_ _ _ _	3.5	8.5	7.2	**5**	MKS2F024701C00_ _ _ _
0.068 „	2.5	6.5	7.2	**5**	MKS2D026801A00_ _ _ _	3.5	8.5	7.2	**5**	MKS2F026801C00_ _ _ _
0.1 µF	2.5	6.5	7.2	**5**	MKS2D031001A00_ _ _ _	4.5	9.5	7.2	**5**	MKS2F031001E00_ _ _ _
0.15 „	3.5	8.5	7.2	**5**	MKS2D031501C00_ _ _ _	5	10	7.2	**5**	MKS2F031501F00_ _ _ _
0.22 „	3.5	8.5	7.2	**5**	MKS2D032201C00_ _ _ _	5.5	11.5	7.2	**5**	MKS2F032201H00_ _ _ _
0.33 „	4.5	9.5	7.2	**5**	MKS2D033301E00_ _ _ _	7.2	13	7.2	**5**	MKS2F033301K00_ _ _ _
0.47 „	4.5	9.5	7.2	**5**	MKS2D034701E00_ _ _ _	8.5	14	7.2	**5**	MKS2F034701M00_ _ _ _
0.68 „	5	10	7.2	**5**	MKS2D036801F00_ _ _ _	11	16	7.2	**5**	MKS2F036801N00_ _ _ _
1.0 µF	7.2	13	7.2	**5**	MKS2D041001K00_ _ _ _					
1.5 „	8.5	14	7.2	**5**	MKS2D041501M00_ _ _ _					
2.2 „	11	16	7.2	**5**	MKS2D042201N00_ _ _ _					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 46

Continuation

General Data

Capacitance	400 VDC/200 VAC* W	H	L	PCM**	Part number	630 VDC/220 VAC* W	H	L	PCM**	Part number
0.01 µF	2.5	6.5	7.2	**5**	MKS2G021001A00_ _ _ _	5.5	11.5	7.2	**5**	MKS2J021001H00_ _ _ _
0.015 „	2.5	6.5	7.2	**5**	MKS2G021501A00_ _ _ _	7.2	13	7.2	**5**	MKS2J021501K00_ _ _ _
0.022 „	3.5	8.5	7.2	**5**	MKS2G022201C00_ _ _ _	7.2	13	7.2	**5**	MKS2J022201K00_ _ _ _
0.033 „	4.5	9.5	7.2	**5**	MKS2G023301E00_ _ _ _	7.2	13	7.2	**5**	MKS2J023301K00_ _ _ _
0.047 „	4.5	9.5	7.2	**5**	MKS2G024701E00_ _ _ _	8.5	14	7.2	**5**	MKS2J024701M00_ _ _ _
0.068 „	5.5	11.5	7.2	**5**	MKS2G026801H00_ _ _ _					
0.1 µF	7.2	13	7.2	**5**	MKS2G031001K00_ _ _ _					
0.15 „	8.5	14	7.2	**5**	MKS2G031501M00_ _ _ _					
0.22 „	11	16	7.2	**5**	MKS2G032201N00_ _ _ _					

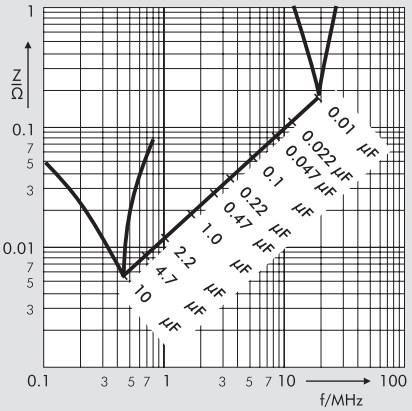
* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.

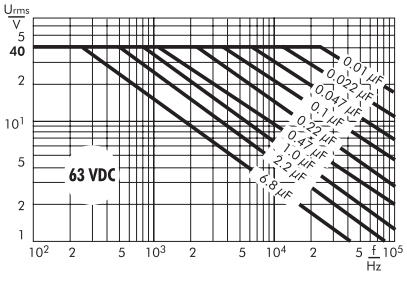
The values of the WIMA MKM 2 range according to the main catalogue 2009 are still available on request.

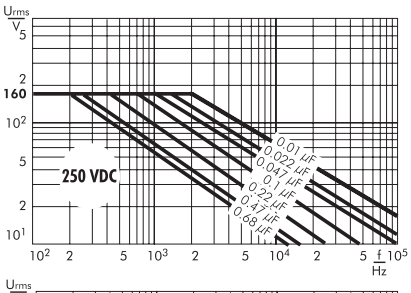
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 149.	

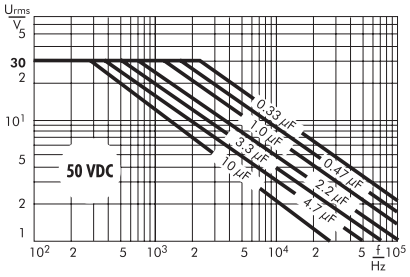


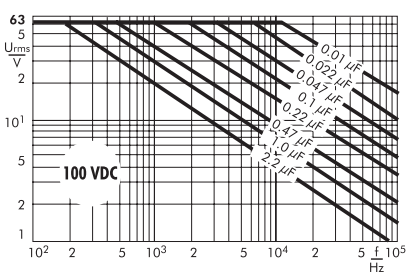
Impedance change with frequency (general guide).

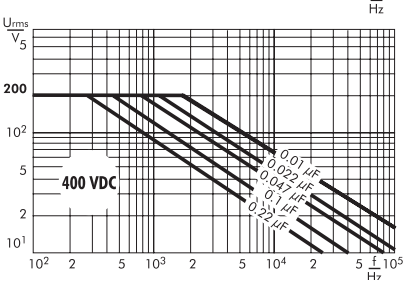
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).











WIMA MKP 2

Metallized Polypropylene (PP) Capacitors in PCM 5 mm. Capacitances from 1000 pF to 1.0 µF. Rated Voltages from 63 VDC to 1000 VDC.

Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **Increased pulse duty from 250 VDC rated voltage**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2011/65/EU**

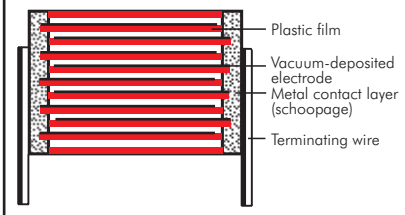
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **Oscillating circuits**
- **High frequency coupling and decoupling**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 1.0 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 800 VDC, 1000 VDC
Capacitance tolerances:
± 20%, ±10%, ±5%
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-16
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 1 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Test voltage:
1.6 U_r, 2 sec.
Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec						
	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	800 VDC	1000 VDC
1000 ... 2200	–	–	–	300	400	450	500
3300 ... 6800	–	–	–	300	400	450	500
0.01 ... 0.022	100	100	250	300	400	450	500
0.033 ... 0.068	100	100	250	300	400	450	–
0.1 ... 0.22	100	100	250	250	–	–	–
0.33 ... 0.68	100	100	250	–	–	–	–
1.0	70	70	–	–	–	–	–

for pulses equal to the rated voltage

Dielectric absorption:
0.05 %
Dissipation factors at +20° C: tan δ

at f	C≤0.1 µF	0.1 µF < C ≤ 1.0 µF
1 kHz	$\leqslant 5 \times 10^{-4}$	$\leqslant 5 \times 10^{-4}$
10 kHz	$\leqslant 8 \times 10^{-4}$	$\leqslant 8 \times 10^{-4}$
100 kHz	$\leqslant 25 \times 10^{-4}$	-

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	7.5	7.2	**5**	MKP2C021001B00_____	3	7.5	7.2	**5**	MKP2D021001B00_____
0.015 „	3	7.5	7.2	**5**	MKP2C021501B00_____	3	7.5	7.2	**5**	MKP2D021501B00_____
0.022 „	3	7.5	7.2	**5**	MKP2C022201B00_____	3	7.5	7.2	**5**	MKP2D022201B00_____
0.033 „	3	7.5	7.2	**5**	MKP2C023301B00_____	3	7.5	7.2	**5**	MKP2D023301B00_____
0.047 „	3.5	8.5	7.2	**5**	MKP2C024701C00_____	3.5	8.5	7.2	**5**	MKP2D024701C00_____
0.068 „	4.5	9.5	7.2	**5**	MKP2C026801E00_____	4.5	9.5	7.2	**5**	MKP2D026801E00_____
0.1 µF	5	10	7.2	**5**	MKP2C031001F00_____	5	10	7.2	**5**	MKP2D031001F00_____
0.15 „	5.5	11.5	7.2	**5**	MKP2C031501H00_____	5.5	11.5	7.2	**5**	MKP2D031501H00_____
0.22 „	7.2	13	7.2	**5**	MKP2C032201K00_____	7.2	13	7.2	**5**	MKP2D032201K00_____
0.33 „	8.5	14	7.2	**5**	MKP2C033301M00_____	8.5	14	7.2	**5**	MKP2D033301M00_____
0.47 „	8.5	14	7.2	**5**	MKP2C034701M00_____	8.5	14	7.2	**5**	MKP2D034701M00_____
0.68 „	8.5	14	7.2	**5**	MKP2C036801M00_____	8.5	14	7.2	**5**	MKP2D036801M00_____
1.0 µF	11	16	7.2	**5**	MKP2C041001N00_____	11	16	7.2	**5**	MKP2D041001N00_____

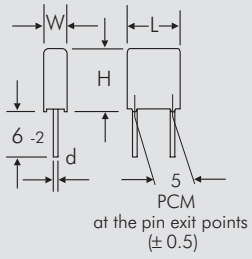
Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF						3	7.5	7.2	**5**	MKP2G011001B00_____
1500 „						3	7.5	7.2	**5**	MKP2G011501B00_____
2200 „						3	7.5	7.2	**5**	MKP2G012201B00_____
3300 „						3	7.5	7.2	**5**	MKP2G013301B00_____
4700 „						3	7.5	7.2	**5**	MKP2G014701B00_____
6800 „						3	7.5	7.2	**5**	MKP2G016801B00_____
0.01 µF	3	7.5	7.2	**5**	MKP2F021001B00_____	3.5	8.5	7.2	**5**	MKP2G021001C00_____
0.015 „	3	7.5	7.2	**5**	MKP2F021501B00_____	3.5	8.5	7.2	**5**	MKP2G021501C00_____
0.022 „	3	7.5	7.2	**5**	MKP2F022201B00_____	4.5	9.5	7.2	**5**	MKP2G022201E00_____
0.033 „	3	7.5	7.2	**5**	MKP2F023301B00_____	5.5	11.5	7.2	**5**	MKP2G023301H00_____
0.047 „	3.5	8.5	7.2	**5**	MKP2F024701C00_____	7.2	13	7.2	**5**	MKP2G024701K00_____
0.068 „	4.5	9.5	7.2	**5**	MKP2F026801E00_____	7.2	13	7.2	**5**	MKP2G026801K00_____
0.1 µF	5	10	7.2	**5**	MKP2F031001F00_____	8.5	14	7.2	**5**	MKP2G031001M00_____
0.15 „	7.2	13	7.2	**5**	MKP2F031501K00_____	11	16	7.2	**5**	MKP2G031501N00_____
0.22 „	7.2	13	7.2	**5**	MKP2F032201K00_____					
0.33 „	8.5	14	7.2	**5**	MKP2F033301M00_____					
0.47 „	11	16	7.2	**5**	MKP2F034701N00_____					

Capacitance	630 VDC/250 VAC*				
	W	H	L	PCM**	Part number
1000 pF	3	7.5	7.2	**5**	MKP2J011001B00_____
1500 „	3	7.5	7.2	**5**	MKP2J011501B00_____
2200 „	3	7.5	7.2	**5**	MKP2J012201B00_____
3300 „	3	7.5	7.2	**5**	MKP2J013301B00_____
4700 „	3	7.5	7.2	**5**	MKP2J014701B00_____
6800 „	3.5	8.5	7.2	**5**	MKP2J016801C00_____
0.01 µF	4.5	9.5	7.2	**5**	MKP2J021001E00_____
0.015 „	5	10	7.2	**5**	MKP2J021501F00_____
0.022 „	5.5	11.5	7.2	**5**	MKP2J022201H00_____
0.033 „	7.2	13	7.2	**5**	MKP2J023301K00_____
0.047 „	8.5	14	7.2	**5**	MKP2J024701M00_____
0.068 „	11	16	7.2	**5**	MKP2J026801N00_____

* AC voltage: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.



d = 0.5 ø

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 49

Continuation

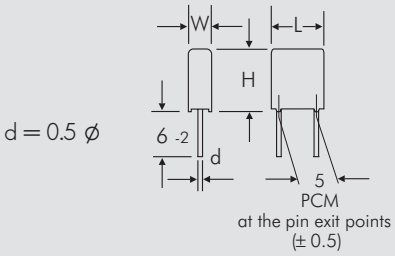
General Data

Capacitance	800 VDC/250 VAC* W	H	L	PCM**	Part number	1000 VDC/250 VAC* W	H	L	PCM**	Part number
1000 pF	3	7.5	7.2	**5**	MKP2L011001B00_ _ _ _	3	7.5	7.2	**5**	MKP2O111001B00_ _ _ _
1500 „	3	7.5	7.2	**5**	MKP2L011501B00_ _ _ _	3	7.5	7.2	**5**	MKP2O111501B00_ _ _ _
2200 „	3	7.5	7.2	**5**	MKP2L012201B00_ _ _ _	3	7.5	7.2	**5**	MKP2O112201B00_ _ _ _
3300 „	3	7.5	7.2	**5**	MKP2L013301B00_ _ _ _	3.5	8.5	7.2	**5**	MKP2O113301C00_ _ _ _
4700 „	3.5	8.5	7.2	**5**	MKP2L014701C00_ _ _ _	4.5	9.5	7.2	**5**	MKP2O114701E00_ _ _ _
6800 „	4.5	9.5	7.2	**5**	MKP2L016801E00_ _ _ _	5	10	7.2	**5**	MKP2O116801F00_ _ _ _
0.01 µF	5	10	7.2	**5**	MKP2L021001F00_ _ _ _	7.2	13	7.2	**5**	MKP2O121001K00_ _ _ _
0.015 „	5.5	11.5	7.2	**5**	MKP2L021501H00_ _ _ _	8.5	14	7.2	**5**	MKP2O121501M00_ _ _ _
0.022 „	7.2	13	7.2	**5**	MKP2L022201K00_ _ _ _	11	16	7.2	**5**	MKP2O122201N00_ _ _ _
0.033 „	8.5	14	7.2	**5**	MKP2L023301M00_ _ _ _					
0.047 „	11	16	7.2	**5**	MKP2L024701N00_ _ _ _					

* AC voltage: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

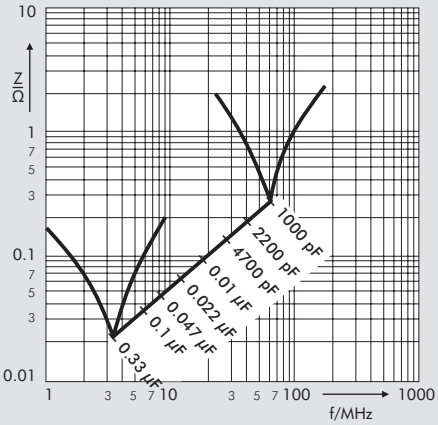
** PCM = printed circuit module = pin spacing.

Dims. in mm.



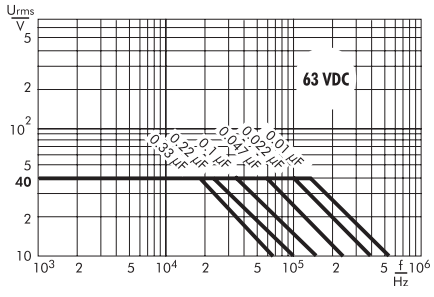
d = 0.5 ⌀

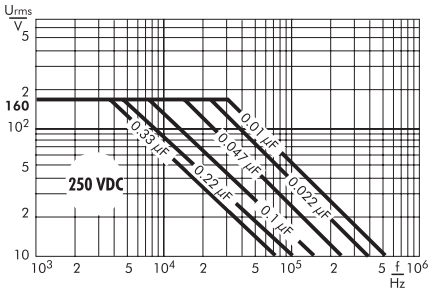
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 149.	

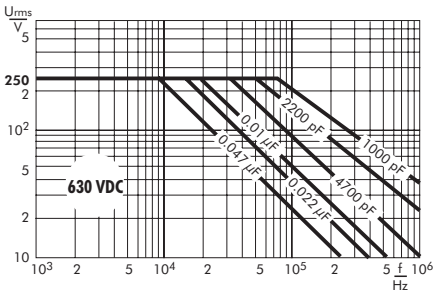


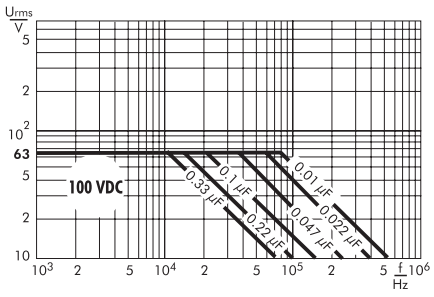
Impedance change with frequency (general guide).

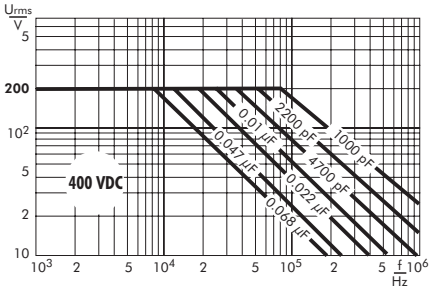
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).

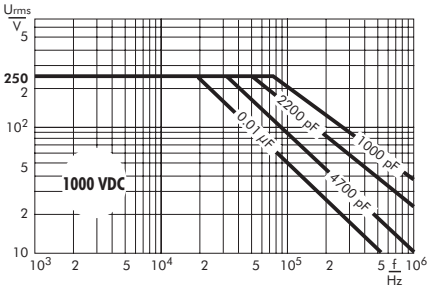












WIMA MKS 4

Metallized Polyester (PET) Capacitors in PCM 7.5 mm to 52.5 mm. Capacitances from 1000 pF to 680 µF. Rated Voltages from 50 VDC to 2000 VDC.

Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **According to RoHS 2011/65/EU**

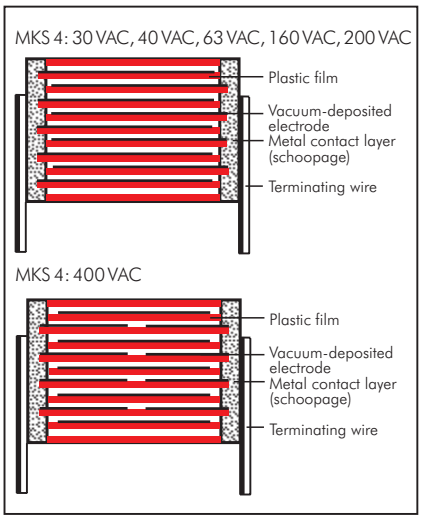
Typical Applications

For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Smoothing**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 680 µF (E12-values on request)
Rated voltages:
50 VDC, 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1500 VDC, 2000 VDC
Capacitance tolerances:
±20%, ±10% ±5%
Operating temperature range:
U_r = 50 VDC: –55° C to +100° C
$U_r \geqslant$ 63 VDC: –55° C to +125° C
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:

Test voltage: 1.6 U_r, 2 sec.
Test specifications:
In accordance with IEC 60384-2
Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours (+125° C permitted for 1000 hours max. distributed over the entire operating life)
Failure rate < 2 fit (0.5 x U_r and 40° C)

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 680 µF
50 VDC	100 V	⩾5 x 10^3 MΩ	⩾1500 sec (MΩ x µF)
63 VDC	100 V	⩾1 x 10^4 MΩ	⩾3000 sec (MΩ x µF)
100 VDC	200 V	⩾1.5 x 10^4 MΩ	⩾5000 sec (MΩ x µF)
⩾250 VDC	1.5 U_r	⩾3 x 10^4 MΩ	⩾10 000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}	⩽ 10 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}	–
100 kHz	⩽ 30 x 10^{-3}	–	–

Maximum pulse rise time: for pulses equal to the rated voltage

Capacitance pF/µF	Pulse rise time V/µsec max. operation/test								
	50VDC	63VDC	100VDC	250VDC	400VDC	630VDC	1000VDC	1500VDC	2000VDC
1000 ... 6800	–	–	–	–	–	–	70/700	90/900	100/1000
0.01 ... 0.022	–	30/300	30/300	35/350	38/380	40/400	50/500	50/500	60/600
0.033 ... 0.068	–	15/150	15/150	20/200	25/250	32/320	26/260	35/350	40/400
0.1 ... 0.22	10/100	10/100	12/120	15/150	15/150	17/170	20/200	35/350	40/400
0.33 ... 0.68	9/90	9/90	9/90	10/100	10/100	13/130	20/200	20/200	38/380
1.0 ... 2.2	6/60	6/60	5/50	6/60	9/90	13/130	14/140	15/150	15/150
3.3 ... 6.8	2.5/25	3/30	3/30	6/60	6/60	9/90	12/120	–	–
10 ... 22	2.5/25	2.5/25	2.5/25	3/30	6/60	6/60	6/60	–	–
33 ... 68	2.5/25	2.5/25	2.5/25	3/30	3/30	–	–	–	–
100 ... 220	2.5/25	2.5/25	2.5/25	0.9/9	–	–	–	–	–
330 ... 680	0.2/2	0.2/2	0.3/3	–	–	–	–	–	–

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 ø: 10 N in direction of pins
d > 0.8 ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	50 VDC/30 VAC*					63 VDC/40 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF						2.5	7	10	**7.5**	MKS4C021002A_____
						4	9	13	10	MKS4C021003C_____
0.015 „						2.5	7	10	**7.5**	MKS4C021502A_____
						4	9	13	10	MKS4C021503C_____
0.022 „						2.5	7	10	**7.5**	MKS4C022202A_____
						4	9	13	10	MKS4C022203C_____
0.033 „						2.5	7	10	**7.5**	MKS4C023302A_____
						4	9	13	10	MKS4C023303C_____
0.047 „						2.5	7	10	**7.5**	MKS4C024702A_____
						4	9	13	10	MKS4C024703C_____
0.068 „						2.5	7	10	**7.5**	MKS4C026802A_____
						4	9	13	10	MKS4C026803C_____
0.1 µF	2.5	7	10	**7.5**	MKS4B031002A_____	2.5	7	10	**7.5**	MKS4C031002A_____
						4	9	13	10	MKS4C031003C_____
0.15 „	2.5	7	10	**7.5**	MKS4B031502A_____	2.5	7	10	**7.5**	MKS4C031502A_____
						4	9	13	10	MKS4C031503C_____
0.22 „	2.5	7	10	**7.5**	MKS4B032202A_____	3	8.5	10	**7.5**	MKS4C032202B_____
						4	9	13	10	MKS4C032203C_____
0.33 „	2.5	7	10	**7.5**	MKS4B033302A_____	4	9	10	**7.5**	MKS4C033302C_____
						4	9	13	10	MKS4C033303C_____
0.47 „	3	8.5	10	**7.5**	MKS4B034702B_____	4	9	10	**7.5**	MKS4C034702C_____
						4	9	13	10	MKS4C034703C_____
0.68 ”	4	9	10	**7.5**	MKS4B036802C_____	5	10.5	10.3	**7.5**	MKS4C036802E_____
						4	9	13	10	MKS4C036803C_____
1.0 µF	4	9	10	**7.5**	MKS4B041002C_____	5	10.5	10.3	**7.5**	MKS4C041002E_____
						4	9	13	10	MKS4C041003C_____
1.5 „	5	10.5	10.3	**7.5**	MKS4B041502E_____	5.7	12.5	10.3	**7.5**	MKS4C041502F_____
						5	11	13	10	MKS4C041503F_____
2.2 „	5.7	12.5	10.3	**7.5**	MKS4B042202F_____	5	11	13	10	MKS4C042203F_____
						6	12.5	18	15	MKS4C042204C_____
3.3 „	5.7	12.5	10.3	**7.5**	MKS4B043302F_____	6	12	13	10	MKS4C043303G_____
						7	14	18	15	MKS4C043304D_____
4.7 „	7.2	12.5	10.3	**7.5**	MKS4B044702G_____	7	14	18	15	MKS4C044704D_____
	6	12	13	10	MKS4B044703G_____	6	15	26.5	22.5	MKS4C044705B_____
6.8 „	7.2	12.5	10.3	**7.5**	MKS4B046802G_____	8	15	18	15	MKS4C046804F_____
	6	12	13	10	MKS4B046803G_____	7	16.5	26.5	22.5	MKS4C046805D_____
10 µF	9	16	18	15	MKS4B051004J_____	8.5	18.5	26.5	22.5	MKS4C051005F_____
						11	21	31.5	27.5	MKS4C051006B_____
15 „	11	21	26.5	22.5	MKS4B051505I_____	11	21	26.5	22.5	MKS4C051505I_____
						11	21	31.5	27.5	MKS4C051506B_____
22 „	11	21	31.5	27.5	MKS4B052206B_____	13	24	31.5	27.5	MKS4C052206D_____
33 „	13	24	31.5	27.5	MKS4B053306D_____	15	26	31.5	27.5	MKS4C053306F_____
47 „	15	26	31.5	27.5	MKS4B054706F_____	17	29	31.5	27.5	MKS4C054706G_____
	13	24	41.5	37.5	MKS4B054707C_____	17	29	41.5	37.5	MKS4C054707E_____
68 „	20	39.5	31.5	27.5	MKS4B056806J_____	20	39.5	31.5	27.5	MKS4C056806J_____
	17	29	41.5	37.5	MKS4B056807E_____	19	32	41.5	37.5	MKS4C056807F_____
100 µF	19	32	41.5	37.5	MKS4B061007F_____	20	39.5	41.5	37.5	MKS4C061007G_____
150 „	20	39.5	41.5	37.5	MKS4B061507G_____	24	45.5	41.5	37.5	MKS4C061507H_____
220 „	24	45.5	41.5	37.5	MKS4B062207H_____	40	55	41.5	37.5	MKS4C062207K_____
330 „	40	55	41.5	37.5	MKS4B063307K_____	45	55	57	52.5	MKS4C063309H_____
470 „	35	50	57	52.5	MKS4B064709F_____	45	55	57	52.5	MKS4C064709H_____
680 „	45	55	57	52.5	MKS4B066809H_____	45	65	57	52.5	MKS4C066809J_____

* AC voltages: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = printed circuit module = pin spacing

Dims. in mm.

Continuation page 52

Continuation

General Data

Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	2.5	7	10	**7.5**	MKS4D021002A_____	3	8.5	10	**7.5**	MKS4F021002B_____
	4	9	13	10	MKS4D021003C_____	4	9	13	10	MKS4F021003C_____
0.015 „	2.5	7	10	**7.5**	MKS4D021502A_____	3	8.5	10	**7.5**	MKS4F021502B_____
	4	9	13	10	MKS4D021503C_____	4	9	13	10	MKS4F021503C_____
0.022 „	2.5	7	10	**7.5**	MKS4D022202A_____	3	8.5	10	**7.5**	MKS4F022202B_____
	4	9	13	10	MKS4D022203C_____	4	9	13	10	MKS4F022203C_____
0.033 „	2.5	7	10	**7.5**	MKS4D023302A_____	3	8.5	10	**7.5**	MKS4F023302B_____
	4	9	13	10	MKS4D023303C_____	4	9	13	10	MKS4F023303C_____
0.047 „	2.5	7	10	**7.5**	MKS4D024702A_____	3	8.5	10	**7.5**	MKS4F024702B_____
	4	9	13	10	MKS4D024703C_____	4	9	13	10	MKS4F024703C_____
0.068 „	2.5	7	10	**7.5**	MKS4D026802A_____	4	9	10	**7.5**	MKS4F026802C_____
	4	9	13	10	MKS4D026803C_____	4	9	13	10	MKS4F026803C_____
0.1 µF	2.5	7	10	**7.5**	MKS4D031002A_____	4	9	10	**7.5**	MKS4F031002C_____
	4	9	13	10	MKS4D031003C_____	4	9	13	10	MKS4F031003C_____
0.15 „	3	8.5	10	**7.5**	MKS4D031502B_____	5	10.5	10.3	**7.5**	MKS4F031502E_____
	4	9	13	10	MKS4D031503C_____	4	9	13	10	MKS4F031503C_____
0.22 „	3	8.5	10	**7.5**	MKS4D032202B_____	5	10.5	10.3	**7.5**	MKS4F032202E_____
	4	9	13	10	MKS4D032203C_____	5	11	13	10	MKS4F032203F_____
0.33 „	4	9	10	**7.5**	MKS4D033302C_____	5.7	12.5	10.3	**7.5**	MKS4F033302F_____
	4	9	13	10	MKS4D033303C_____	5	11	13	10	MKS4F033303F_____
0.47 „	4.5	9.5	10.3	**7.5**	MKS4D034702D_____	6	12	13	10	MKS4F034703G_____
	4	9	13	10	MKS4D034703C_____	6	12.5	18	15	MKS4F034704C_____
0.68 „	5	10.5	10.3	**7.5**	MKS4D036802E_____	7	14	18	15	MKS4F036804D_____
	4	9	13	10	MKS4D036803C_____					
1.0 µF	5.7	12.5	10.3	**7.5**	MKS4D041002F_____	8	15	18	15	MKS4F041004F_____
	5	11	13	10	MKS4D041003F_____	6	15	26.5	22.5	MKS4F041005B_____
1.5 „	6	12	13	10	MKS4D041503G_____	9	16	18	15	MKS4F041504J_____
	7	14	18	15	MKS4D041504D_____	7	16.5	26.5	22.5	MKS4F041505D_____
2.2 „	8	15	18	15	MKS4D042204F_____	10.5	19	26.5	22.5	MKS4F042205G_____
	6	15	26.5	22.5	MKS4D042205B_____	9	19	31.5	27.5	MKS4F042206A_____
3.3 „	9	16	18	15	MKS4D043304J_____	11	21	26.5	22.5	MKS4F043305I_____
	7	16.5	26.5	22.5	MKS4D043305D_____	11	21	31.5	27.5	MKS4F043306B_____
4.7 „	10.5	19	26.5	22.5	MKS4D044705G_____	11	21	31.5	27.5	MKS4F044706B_____
	9	19	31.5	27.5	MKS4D044706A_____					
6.8 „	10.5	19	26.5	22.5	MKS4D046805G_____	13	24	31.5	27.5	MKS4F046806D_____
	11	21	31.5	27.5	MKS4D046806B_____					
10 µF	13	24	31.5	27.5	MKS4D051006D_____	17	29	31.5	27.5	MKS4F051006G_____
15 „	13	24	31.5	27.5	MKS4D051506D_____	17	34.5	31.5	27.5	MKS4F051506I_____
						17	29	41.5	37.5	MKS4F051507E_____
22 „	15	26	31.5	27.5	MKS4D052206F_____	19	32	41.5	37.5	MKS4F052207F_____
33 „	17	29	31.5	27.5	MKS4D053306G_____	24	45.5	41.5	37.5	MKS4F053307H_____
	13	24	41.5	37.5	MKS4D053307C_____					
47 „	17	29	41.5	37.5	MKS4D054707E_____	31	46	41.5	37.5	MKS4F054707I_____
68 „	20	39.5	41.5	37.5	MKS4D056807G_____	40	55	41.5	37.5	MKS4F056807K_____
100 µF	24	45.5	41.5	37.5	MKS4D061007H_____	45	65	57	52.5	MKS4F061009J_____
150 „	31	46	41.5	37.5	MKS4D061507I_____	45	65	57	52.5	MKS4F061509J_____
220 „	40	55	41.5	37.5	MKS4D062207K_____					
330 „	45	55	57	52.5	MKS4D063309H_____					
470 „	45	65	57	52.5	MKS4D064709J_____					

* AC voltages: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = printed circuit module = pin spacing

Dims. in mm.

Part number completion:

Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 53

Continuation

General Data

Capacitance	400 VDC/200 VAC*					630 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	**7.5**	MKS4G021002B_____	3	8.5	10	**7.5***	MKS4J021002B_____
	4	9	13	10	MKS4G021003C_____	4	9	13	10	MKS4J021003C_____
0.015 „	3	8.5	10	**7.5**	MKS4G021502B_____	4	9	10	**7.5***	MKS4J021502C_____
	4	9	13	10	MKS4G021503C_____	4	9	13	10	MKS4J021503C_____
0.022 „	4	9	10	**7.5**	MKS4G022202C_____	4.5	9.5	10.3	**7.5***	MKS4J022202D_____
	4	9	13	10	MKS4G022203C_____	4	9	13	10	MKS4J022203C_____
0.033 „	4	9	10	**7.5**	MKS4G023302C_____	5	10.5	10.3	**7.5***	MKS4J023302E_____
	4	9	13	10	MKS4G023303C_____	5	11	13	10	MKS4J023303F_____
0.047 „	5	10.5	10.3	**7.5**	MKS4G024702E_____	5.7	12.5	10.3	**7.5***	MKS4J024702F_____
	4	9	13	10	MKS4G024703C_____	6	12	13	10	MKS4J024703G_____
0.068 „	5	10.5	10.3	**7.5**	MKS4G026802E_____	6	12	13	10	MKS4J026803G_____
	4	9	13	10	MKS4G026803C_____	5	11	18	15	MKS4J026804B_____
0.1 µF	5	10.5	10.3	**7.5**	MKS4G031002E_____	6	12.5	18	15	MKS4J031004C_____
	5	11	13	10	MKS4G031003F_____	6	15	26.5	22.5	MKS4J031005B_____
0.15 „	5.7	12.5	10.3	**7.5**	MKS4G031502F_____	7	14	18	15	MKS4J031504D_____
	6	12	13	10	MKS4G031503G_____	6	15	26.5	22.5	MKS4J031505B_____
0.22 „	6	12	13	10	MKS4G032203G_____	8	15	18	15	MKS4J032204F_____
	6	12.5	18	15	MKS4G032204C_____	6	15	26.5	22.5	MKS4J032205B_____
0.33 „	8	15	18	15	MKS4G033304F_____	7	16.5	26.5	22.5	MKS4J033305D_____
						9	19	31.5	27.5	MKS4J033306A_____
0.47 „	8	15	18	15	MKS4G034704F_____	10.5	19	26.5	22.5	MKS4J034705G_____
	6	15	26.5	22.5	MKS4G034705B_____	9	19	31.5	27.5	MKS4J034706A_____
0.68 „	7	16.5	26.5	22.5	MKS4G036805D_____	11	21	26.5	22.5	MKS4J036805I_____
						11	21	31.5	27.5	MKS4J036806B_____
1.0 µF	10.5	19	26.5	22.5	MKS4G041005G_____	11	21	31.5	27.5	MKS4J041006B_____
	11	21	31.5	27.5	MKS4G041006B_____					
1.5 „	11	21	26.5	22.5	MKS4G041505I_____	15	26	31.5	27.5	MKS4J041506F_____
	11	21	31.5	27.5	MKS4G041506B_____					
2.2 „	11	21	31.5	27.5	MKS4G042206B_____	17	34.5	31.5	27.5	MKS4J042206I_____
						15	26	41.5	37.5	MKS4J042207D_____
3.3 „	13	24	31.5	27.5	MKS4G043306D_____	20	39.5	31.5	27.5	MKS4J043306J_____
						19	32	41.5	37.5	MKS4J043307F_____
4.7 „	17	29	31.5	27.5	MKS4G044706G_____	20	39.5	41.5	37.5	MKS4J044707G_____
6.8 „	17	34.5	31.5	27.5	MKS4G046806I_____	24	45.5	41.5	37.5	MKS4J046807H_____
	15	26	41.5	37.5	MKS4G046807D_____					
10 µF	19	32	41.5	37.5	MKS4G051007F_____	35	50	41.5	37.5	MKS4J051007J_____
15 „	20	39.5	41.5	37.5	MKS4G051507G_____	40	55	41.5	37.5	MKS4J051507K_____
22 „	31	46	41.5	37.5	MKS4G052207I_____	45	55	57	52.5	MKS4J052209H_____
33 „	35	50	41.5	37.5	MKS4G053307J_____					
47 „	35	50	57	52.5	MKS4G054709F_____					
68 „	45	65	57	52.5	MKS4G056809J_____					

* AC voltages: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = printed circuit module = pin spacing

* Admissible AC voltage 250 VAC max.

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 54

Continuation

General Data

Capacitance	1000 VDC/400 VAC*					1500 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	3	8.5	10	**7.5**	MKS4O111002B_____	4	9	13	10	MKS4S011003C_____
	4	9	13	10	MKS4O111003C_____					
1500 „	3	8.5	10	**7.5**	MKS4O111502B_____	4	9	13	10	MKS4S011503C_____
	4	9	13	10	MKS4O111503C_____					
2200 „	3	8.5	10	**7.5**	MKS4O112202B_____	4	9	13	10	MKS4S012203C_____
	4	9	13	10	MKS4O112203C_____					
3300 „	4	9	10	**7.5**	MKS4O113302C_____	4	9	13	10	MKS4S013303C_____
	4	9	13	10	MKS4O113303C_____					
4700 „	4	9	10	**7.5**	MKS4O114702C_____	4	9	13	10	MKS4S014703C_____
	4	9	13	10	MKS4O114703C_____	5	11	18	15	MKS4S014704B_____
6800 „	4.5	9.5	10.3	**7.5**	MKS4O116802D_____	5	11	13	10	MKS4S016803F_____
	4	9	13	10	MKS4O116803C_____	5	11	18	15	MKS4S016804B_____
0.01 µF	5	10.5	10.3	**7.5**	MKS4O121002E_____	6	12	13	10	MKS4S021003G_____
	5	11	13	10	MKS4O121003F_____	5	11	18	15	MKS4S021004B_____
0.015 „	5.7	12.5	10.3	**7.5**	MKS4O121502F_____	6	12.5	18	15	MKS4S021504C_____
	6	12	13	10	MKS4O121503G_____					
0.022 „	5	11	18	15	MKS4O122204B_____	7	14	18	15	MKS4S022204D_____
						6	15	26.5	22.5	MKS4S022205B_____
0.033 „	6	12.5	18	15	MKS4O123304C_____	8	15	18	15	MKS4S023304F_____
	6	15	26.5	22.5	MKS4O123305B_____	6	15	26.5	22.5	MKS4S023305B_____
0.047 „	7	14	18	15	MKS4O124704D_____	7	16.5	26.5	22.5	MKS4S024705D_____
	6	15	26.5	22.5	MKS4O124705B_____					
0.068 „	8	15	18	15	MKS4O126804F_____	8.5	18.5	26.5	22.5	MKS4S026805F_____
	6	15	26.5	22.5	MKS4O126805B_____					
0.1 µF	9	16	18	15	MKS4O131004J_____	10.5	19	26.5	22.5	MKS4S031005G_____
	7	16.5	26.5	22.5	MKS4O131005D_____	9	19	31.5	27.5	MKS4S031006A_____
0.15 „	8.5	18.5	26.5	22.5	MKS4O131505F_____	11	21	31.5	27.5	MKS4S031506B_____
0.22 „	10.5	19	26.5	22.5	MKS4O132205G_____	13	24	31.5	27.5	MKS4S032206D_____
0.33 „	11	21	26.5	22.5	MKS4O133305I_____	17	34.5	31.5	27.5	MKS4S033306I_____
	11	21	31.5	27.5	MKS4O133306B_____	17	29	41.5	37.5	MKS4S033307E_____
0.47 „	13	24	31.5	27.5	MKS4O134706D_____	20	39.5	31.5	27.5	MKS4S034706J_____
						17	29	41.5	37.5	MKS4S034707E_____
0.68 „	15	26	31.5	27.5	MKS4O136806F_____	20	39.5	41.5	37.5	MKS4S036807G_____
1.0 µF	17	29	31.5	27.5	MKS4O141006G_____	24	45.5	41.5	37.5	MKS4S041007H_____
	17	29	41.5	37.5	MKS4O141007E_____					
1.5 „	19	32	41.5	37.5	MKS4O141507F_____	31	46	41.5	37.5	MKS4S041507I_____
2.2 „	20	39.5	41.5	37.5	MKS4O142207G_____	35	50	41.5	37.5	MKS4S042207J_____
						35	50	57	52.5	MKS4S042209F_____
3.3 „	24	45.5	41.5	37.5	MKS4O143307H_____	45	55	57	52.5	MKS4S043309H_____
4.7 „	35	50	41.5	37.5	MKS4O144707J_____	45	65	57	52.5	MKS4S044709J_____
6.8 „	40	55	41.5	37.5	MKS4O146807K_____					
	35	50	57	52.5	MKS4O146809F_____					
10 µF	45	55	57	52.5	MKS4O151009H_____					

* AC voltages: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 55

Continuation

General Data

Capacitance	2000 VDC/400 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKS4U011003C_____
1500 „	4	9	13	10	MKS4U011503C_____
2200 „	5	11	13	10	MKS4U012203F_____
3300 „	6	12	13	10	MKS4U013303H_____
	5	11	18	15	MKS4U013304B_____
4700 „	5	11	18	15	MKS4U014704B_____
6800 „	6	12.5	18	15	MKS4U016804C_____
0.01 µF	7	14	18	15	MKS4U021004D_____
	6	15	26.5	22.5	MKS4U021005B_____
0.015 „	6	15	26.5	22.5	MKS4U021505B_____
0.022 „	7	16.5	26.5	22.5	MKS4U022205D_____
0.033 „	10.5	19	26.5	22.5	MKS4U023305G_____
0.047 „	11	21	26.5	22.5	MKS4U024705I_____
	11	21	31.5	27.5	MKS4U024706B_____
0.068 „	11	21	31.5	27.5	MKS4U026806B_____
0.1 µF	13	24	31.5	27.5	MKS4U031006D_____
0.15 „	17	29	31.5	27.5	MKS4U031506G_____
	13	24	41.5	37.5	MKS4U031507C_____
0.22 „	17	29	41.5	37.5	MKS4U032207E_____
0.33 „	20	39.5	41.5	37.5	MKS4U033307G_____
0.47 „	24	45.5	41.5	37.5	MKS4U034707H_____
0.68 „	31	46	41.5	37.5	MKS4U036807I_____
1.0 µF	40	55	41.5	37.5	MKS4U041007K_____
	35	50	57	52.5	MKS4U041009F_____
1.5 „	45	55	57	52.5	MKS4U041509H_____
2.2 „	45	65	57	52.5	MKS4U042209J_____

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

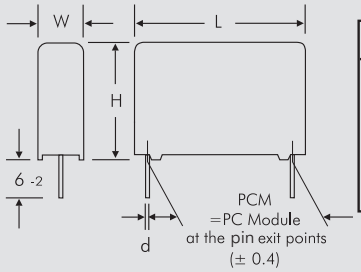
** PCM = Printed circuit module = pin spacing

Dims. in mm.

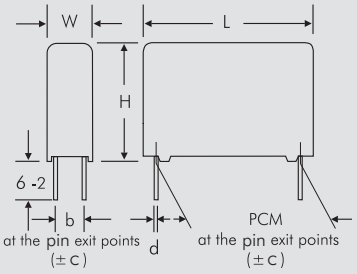
The values of the WIMA MKM 4 ranges according to the main catalogue 2009 are still available on request.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

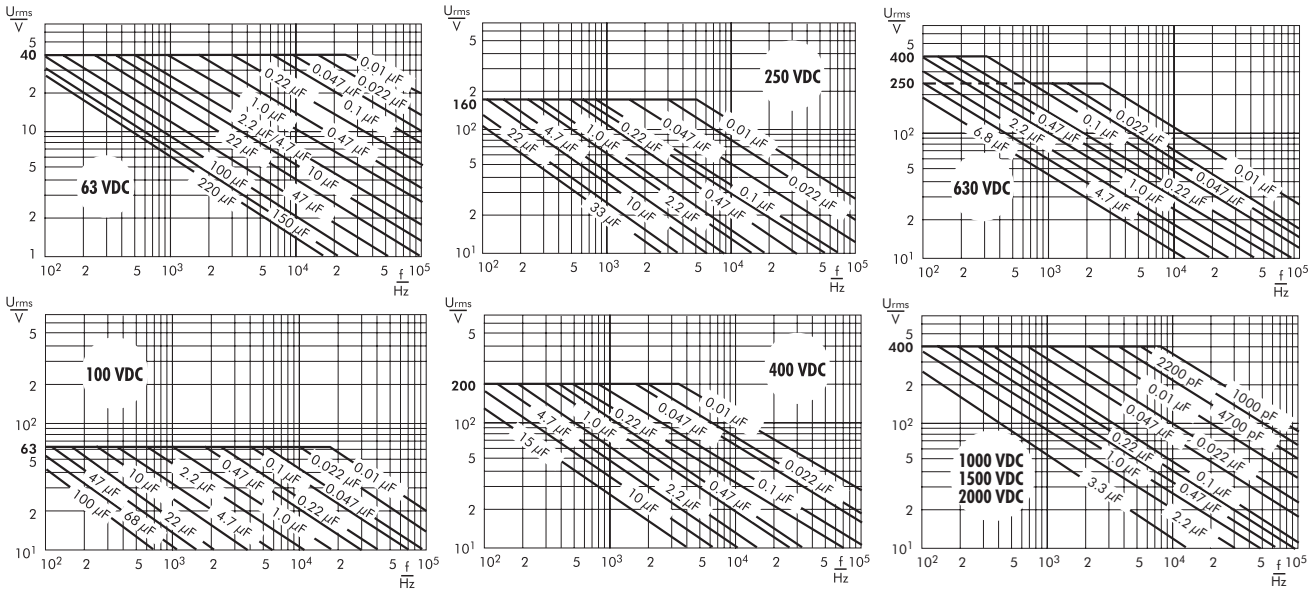


Ø d	PCM	W
0.5	7.5	⩽ 3
0.6	7.5	⩾ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	



W	PCM	b	Ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



WIMA MKP 4C

Compact Type: Metallized Polypropylene (PP)- Capacitors in PCM 10 mm to 22.5 mm. Capacitances from 0.068 µF to 2.2 µF. Rated Voltages from 450 VDC to 630 VDC.

Special Features

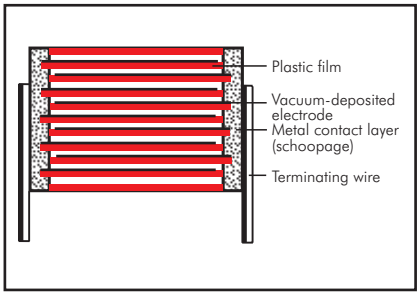
- **Very compact size, high volume/ capacitance ratio**
- **Self-healing**
- **Very high ripple and peak current**
- **High frequency AC operation capability**
- **High voltage capability**
- **According to RoHS 2011/65/EU**

Typical Applications

For high frequency applications e.g.
- **PFC (power factor correction)**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:

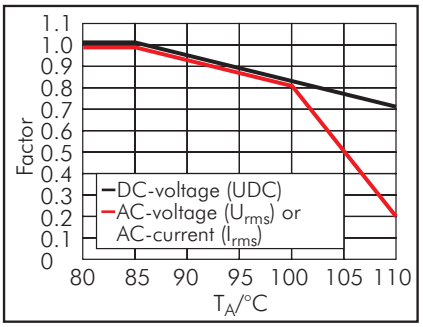


Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
0.068 µF to 2.2 µF (E12-values on request)
Rated voltages:
450 VDC, 520 VDC, 630 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +110° C
Climatic test category:
55/110/56 in accordance with IEC
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test specifications:
In accordance with 60384-16
Test voltage:
1.6 U_r, 2sec
Dielectric absorption:
0.05%
Reliability:
Operational life > 300 000 hours
Failure rate < 24 fit (0.5 x U_r and 40° C)

Derating:
85° C < T_A ⩽ 110° C: UDC; U_{rms}
Compared to nominal voltage, the admissible AC voltage (U_{rms}) **and** DC voltage (UDC) have to be reduced by 1.33% per K according to the graph.
100° C ⩽ T_A: I_{rms}; U_{rms}
The admissible AC voltage (U_{rms}) **or** the admissible AC current (I_{rms}) must be reduced by a derating factor according to the graph:



Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 10 x 10^{-4}	⩽ 10 x 10^{-4}	⩽ 10 x 10^{-4}
10 kHz	⩽ 25 x 10^{-4}	⩽ 25 x 10^{-4}	–
100 kHz	⩽ 150 x 10^{-4}	–	–

Reference frequency 1 kHz in accordance with IEC 60384-1

Maximum pulse rise time:

PCM	max. pulse rise timet V/µsec at T_A < 40° C		
	450 VDC	520 VDC	630 VDC
10	140	200	250
15	120	160	180
22.5	100	110	130

for pulses equal to the rated voltage

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	450 VDC/160 VAC*					520 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.068 µF	4	9	13	10	MKPCH026803C00_ _ _ _	4	9	13	10	MKPCH226803C00_ _ _ _
0.1 µF	4	9	13	10	MKPCH031003C00_ _ _ _	5	11	13	10	MKPCH231003F00_ _ _ _
	5	11	18	15	MKPCH031004B00_ _ _ _					
0.15 „	4	9	13	10	MKPCH031503C00_ _ _ _	5	11	13	10	MKPCH231503F00_ _ _ _
						5	11	18	15	MKPCH231504B00_ _ _ _
0.22 „	5	11	13	10	MKPCH032203F00_ _ _ _	6	12	13	10	MKPCH232203G00_ _ _ _
	5	11	18	15	MKPCH032204B00_ _ _ _	5	11	18	15	MKPCH232204B00_ _ _ _
0.33 „	6	12	13	10	MKPCH033303G00_ _ _ _	6	12.5	18	15	MKPCH233304C00_ _ _ _
	5	11	18	15	MKPCH033304B00_ _ _ _					
0.47 „	8	12	13	10	MKPCH034703I00_ _ _ _	7	14	18	15	MKPCH234704D00_ _ _ _
	5	11	18	15	MKPCH034704B00_ _ _ _	6	15	26.5	22.5	MKPCH234705B00_ _ _ _
0.68 „	6	12.5	18	15	MKPCH036804C00_ _ _ _	9	14	18	15	MKPCH236804H00_ _ _ _
						6	15	26.5	22.5	MKPCH236805B00_ _ _ _
1.0 µF	7	14	18	15	MKPCH041004D00_ _ _ _	9	16	18	15	MKPCH241004J00_ _ _ _
	6	15	26.5	22.5	MKPCH041005B00_ _ _ _	7	16.5	26.5	22.5	MKPCH241005D00_ _ _ _
1.5 „	7	16.5	26.5	22.5	MKPCH041505D00_ _ _ _	10.5	19	26.5	22.5	MKPCH241505G00_ _ _ _
2.2 „	8.5	18.5	26.5	22.5	MKPCH042205F00_ _ _ _	10.5	20.5	26.5	22.5	MKPCH242205H00_ _ _ _

Capacitance	630 VDC/200 VAC*				
	W	H	L	PCM**	Part number
0.068 µF	4	9	13	10	MKPCJ026803C00_ _ _ _
0.1 µF	5	11	13	10	MKPCJ031003F00_ _ _ _
0.15 „	6	12	13	10	MKPCJ031503G00_ _ _ _
	5	11	18	15	MKPCJ031504B00_ _ _ _
0.22 „	8	12	13	10	MKPCJ032203I00_ _ _ _
	6	12.5	18	15	MKPCJ032204C00_ _ _ _
0.33 „	7	14	18	15	MKPCJ033304D00_ _ _ _
	6	15	26.5	22.5	MKPCJ033305B00_ _ _ _
0.47 „	8	15	18	15	MKPCJ034704F00_ _ _ _
	6	15	26.5	22.5	MKPCJ034705B00_ _ _ _
0.68 „	9	16	18	15	MKPCJ036804J00_ _ _ _
	7	16.5	26.5	22.5	MKPCJ036805D00_ _ _ _
1.0 µF	8.5	18.5	26.5	22.5	MKPCJ041005F00_ _ _ _
1.5 „	10.5	19	26.5	22.5	MKPCJ041505G00_ _ _ _
2.2 „	11	21	26.5	22.5	MKPCJ042205I00_ _ _ _

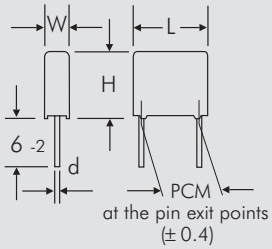
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

* AC voltages: f ⩽ 1 kHz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

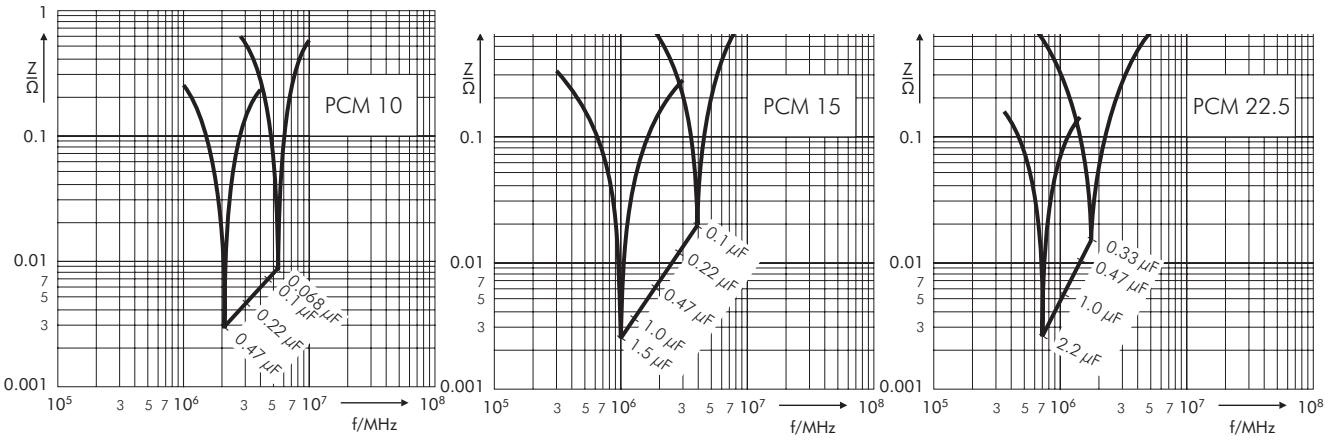


d = 0.6 ø if PCM = 10
d = 0.8 ø if PCM = 15 - 22.5

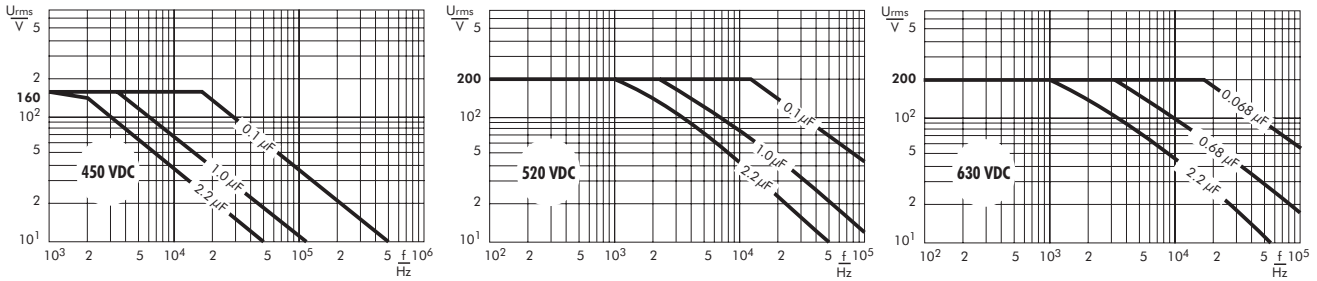
Continuation page 58

Continuation

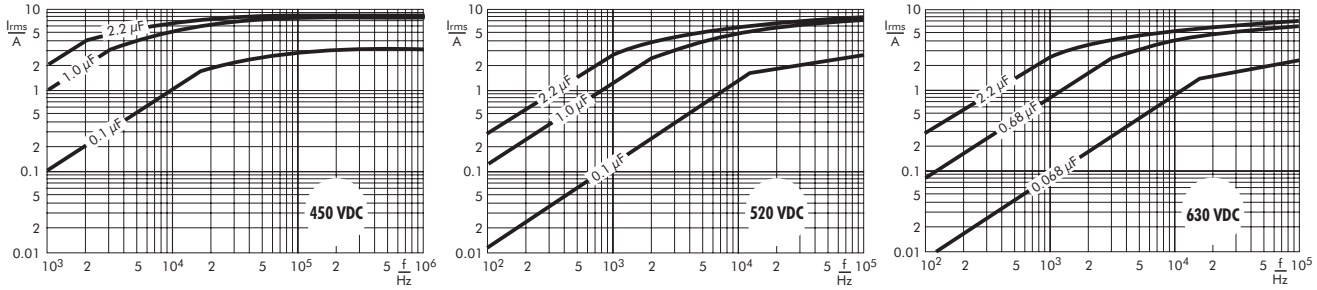
Impedance change with frequency (general guide).



Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



Permissible AC current in relation to frequency at 10° C internal temperature rise (general guide).



WIMA MKP 4

Metallized Polypropylene (PP) Capacitors in PCM 7.5 mm to 37.5 mm. Capacitances from 1000 pF to 10 µF. Rated Voltages from 100 VDC to 2000 VDC.

Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**

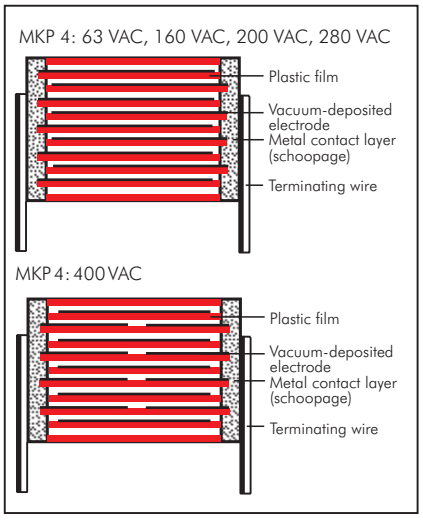
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **Oscillating circuits**
- **High frequency coupling and decoupling**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 10 µF (E12-values on request)
Rated voltages:
100 VDC, 250 VDC, 400 VDC, 630 VDC, 850 VDC, 1000 VDC, 1600 VDC, 2000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +100° C
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Dissipation factors at + 20° C:

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}
10 kHz	⩽ 8 x 10^{-4}	⩽ 8 x 10^{-4}	–
100 kHz	⩽ 25 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec at T_A < 40° CC							
	100 VDC	250 VDC	400 VDC	630 VDC	850 VDC	1000 VDC	1600 VDC	2000 VDC
1000 ... 2200	–	–	–	–	2200	2200	3500	5200
3300 ... 6800	–	–	–	–	1150	1150	2700	3500
0.01 ... 0.022	450	450	450	500	550	550	1800	2700
0.033 ... 0.068	250	250	300	350	400	400	900	1800
0.1 ... 0.22	150	150	200	250	300	300	500	900
0.33 ... 0.68	100	100	150	200	200	200	–	–
1.0 ... 2.2	75	100	100	150	150	150	–	–
3.3 ... 4.7	60	100	100	120	140	140	–	–
6.8 ... 10	40	50	60	85	–	–	–	–

for pulses equal to the rated voltage

Test specifications:
In accordance with IEC 60384-16
Test voltage: 1.6 U_r, 2 sec.
Dielectric absorption:
0.05 %
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C).

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 ø: 10 N in direction of pins
d > 0.8 ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2
in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	**7.5**	MKP4D021002B00_ _ _ _	3	8.5	10	**7.5**	MKP4F021002B00_ _ _ _
0.015 „	3	8.5	10	**7.5**	MKP4D021502B00_ _ _ _	3	8.5	10	**7.5**	MKP4F021502B00_ _ _ _
0.022 „	3	8.5	10	**7.5**	MKP4D022202B00_ _ _ _	3	8.5	10	**7.5**	MKP4F022202B00_ _ _ _
0.033 „	3	8.5	10	**7.5**	MKP4D023302B00_ _ _ _	3	8.5	10	**7.5**	MKP4F023302B00_ _ _ _
	4	9	13	10	MKP4D023303C00_ _ _ _	4	9	13	10	MKP4F023303C00_ _ _ _
0.047 „	4	9	10	**7.5**	MKP4D024702C00_ _ _ _	4	9	10	**7.5**	MKP4F024702C00_ _ _ _
	4	9	13	10	MKP4D024703C00_ _ _ _	4	9	13	10	MKP4F024703C00_ _ _ _
0.068 „	4	9	10	**7.5**	MKP4D026802C00_ _ _ _	4	9	10	**7.5**	MKP4F026802C00_ _ _ _
	4	9	13	10	MKP4D026803C00_ _ _ _	4	9	13	10	MKP4F026803C00_ _ _ _
0.1 µF	4.5	9.5	10.3	**7.5**	MKP4D031002D00_ _ _ _	4.5	9.5	10.3	**7.5**	MKP4F031002D00_ _ _ _
	4	9	13	10	MKP4D031003C00_ _ _ _	4	9	13	10	MKP4F031003C00_ _ _ _
0.15 „	5	10.5	10.3	**7.5**	MKP4D031502E00_ _ _ _	5	10.5	10.3	**7.5**	MKP4F031502E00_ _ _ _
	5	11	13	10	MKP4D031503F00_ _ _ _	5	11	13	10	MKP4F031503F00_ _ _ _
0.22 „	6	12	13	10	MKP4D032203G00_ _ _ _	6	12	13	10	MKP4F032203G00_ _ _ _
	5	11	18	15	MKP4D032204B00_ _ _ _	5	11	18	15	MKP4F032204B00_ _ _ _
0.33 „	6	12.5	18	15	MKP4D033304C00_ _ _ _	6	12.5	18	15	MKP4F033304C00_ _ _ _
0.47 „	7	14	18	15	MKP4D034704D00_ _ _ _	7	14	18	15	MKP4F034704D00_ _ _ _
0.68 „	8	15	18	15	MKP4D036804F00_ _ _ _	8	15	18	15	MKP4F036804F00_ _ _ _
	6	15	26.5	22.5	MKP4D036805B00_ _ _ _	6	15	26.5	22.5	MKP4F036805B00_ _ _ _
1.0 µF	7	16.5	26.5	22.5	MKP4D041005D00_ _ _ _	7	16.5	26.5	22.5	MKP4F041005D00_ _ _ _
1.5 „	10.5	19	26.5	22.5	MKP4D041505G00_ _ _ _	10.5	19	26.5	22.5	MKP4F041505G00_ _ _ _
2.2 „	11	21	26.5	22.5	MKP4D042205I00_ _ _ _	11	21	26.5	22.5	MKP4F042205I00_ _ _ _
	11	21	31.5	27.5	MKP4D042206B00_ _ _ _	11	21	31.5	27.5	MKP4F042206B00_ _ _ _
3.3 „	13	24	31.5	27.5	MKP4D043306D00_ _ _ _	13	24	31.5	27.5	MKP4F043306D00_ _ _ _
4.7 „	13	24	31.5	27.5	MKP4D044706D00_ _ _ _	15	26	31.5	27.5	MKP4F044706F00_ _ _ _
6.8 „	15	26	31.5	27.5	MKP4D046806F00_ _ _ _	17	29	31.5	27.5	MKP4F046806G00_ _ _ _
	13	24	41.5	37.5	MKP4D046807C00_ _ _ _	15	26	41.5	37.5	MKP4F046807D00_ _ _ _
10 µF	17	29	41.5	37.5	MKP4D051007E00_ _ _ _	19	32	41.5	37.5	MKP4F051007F00_ _ _ _

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

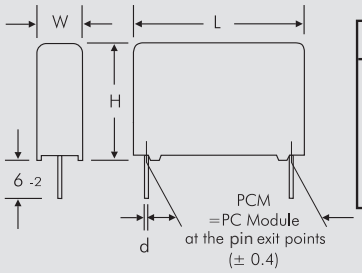
** PCM = Printed circuit module = pin spacing

The high values and large box sizes according to main catalogue 2015 are still available on request.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Dims. in mm.



ø d	PCM	W
0.5	7.5	= 3
0.6	7.5	⩾ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

Continuation page 61

Continuation

General Data

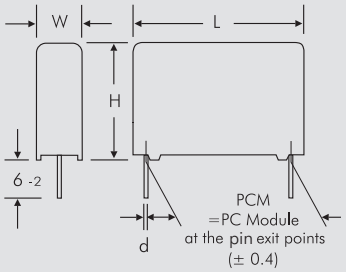
Capacitance	400 VDC/220 VAC*					630 VDC/280 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	**7.5**	MKP4G021002B00____	3	8.5	10	**7.5**	MKP4J021002B00____
						4	9	13	10	MKP4J021003C00____
0.015 „	4	9	10	**7.5**	MKP4G021502C00____	4	9	10	**7.5**	MKP4J021502C00____
	4	9	13	10	MKP4G021503C00____	4	9	13	10	MKP4J021503C00____
0.022 „	4.5	9.5	10.3	**7.5**	MKP4G022202D00____	4.5	9.5	10.3	**7.5**	MKP4J022202D00____
	4	9	13	10	MKP4G022203C00____	4	9	13	10	MKP4J022203C00____
0.033 „	5	10.5	10.3	**7.5**	MKP4G023302E00____	5	10.5	10.3	**7.5**	MKP4J023302E00____
	4	9	13	10	MKP4G023303C00____	4	9	13	10	MKP4J023303C00____
0.047 „	5	10.5	10.3	**7.5**	MKP4G024702E00____	5.7	12.5	10.3	**7.5**	MKP4J024702F00____
	5	11	13	10	MKP4G024703F00____	5	11	13	10	MKP4J024703F00____
0.068 „	5.7	12.5	10.3	**7.5**	MKP4G026802F00____	6	12	13	10	MKP4J026803G00____
	5	11	13	10	MKP4G026803F00____	6	12.5	18	15	MKP4J026804C00____
0.1 µF	6	12	13	10	MKP4G031003G00____	7	14	18	15	MKP4J031004D00____
	5	11	18	15	MKP4G031004B00____					
0.15 „	6	12.5	18	15	MKP4G031504C00____	8	15	18	15	MKP4J031504F00____
						6	15	26.5	22.5	MKP4J031505B00____
0.22 „	7	14	18	15	MKP4G032204D00____	9	16	18	15	MKP4J032204J00____
						7	16.5	26.5	22.5	MKP4J032205D00____
0.33 „	8	15	18	15	MKP4G033304F00____	8.5	18.5	26.5	22.5	MKP4J033305F00____
	6	15	26.5	22.5	MKP4G033305B00____					
0.47 „	7	16.5	26.5	22.5	MKP4G034705D00____	10.5	19	26.5	22.5	MKP4J034705G00____
						11	21	31.5	27.5	MKP4J034706B00____
0.68 „	8.5	18.5	26.5	22.5	MKP4G036805F00____	11	21	31.5	27.5	MKP4J036806B00____
1.0 µF	11	21	26.5	22.5	MKP4G041005I00____	13	24	31.5	27.5	MKP4J041006D00____
	11	21	31.5	27.5	MKP4G041006B00____					
1.5 „	11	21	31.5	27.5	MKP4G041506B00____	15	26	31.5	27.5	MKP4J041506F00____
2.2 „	15	26	31.5	27.5	MKP4G042206F00____	17	29	41.5	37.5	MKP4J042207E00____
3.3 „	17	29	31.5	27.5	MKP4G043306G00____	19	32	41.5	37.5	MKP4J043307F00____
	17	29	41.5	37.5	MKP4G043307E00____					
4.7 „	19	32	41.5	37.5	MKP4G044707F00____	20	39.5	41.5	37.5	MKP4J044707G00____
6.8 „	20	39.5	41.5	37.5	MKP4G046807G00____	24	45.5	41.5	37.5	MKP4J046807H00____
10 µF	24	45.5	41.5	37.5	MKP4G051007H00____	35	50	41.5	37.5	MKP4J051007J00____

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

The high values and large box sizes according to main catalogue 2015 are still available on request.

Dims. in mm.



ø d	PCM	W
0.5	7.5	= 3
0.6	7.5	⩾ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 62

Continuation

General Data

Capacitance	850 VDC/400 VAC*					1000 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP4M011003C00_ _ _ _	4	9	13	10	MKP4O111003C00_ _ _ _
1500 „	4	9	13	10	MKP4M011503C00_ _ _ _	4	9	13	10	MKP4O111503C00_ _ _ _
2200 „	4	9	13	10	MKP4M012203C00_ _ _ _	4	9	13	10	MKP4O112203C00_ _ _ _
3300 „	4	9	13	10	MKP4M013303C00_ _ _ _	4	9	13	10	MKP4O113303C00_ _ _ _
4700 „	4	9	13	10	MKP4M014703C00_ _ _ _	4	9	13	10	MKP4O114703C00_ _ _ _
6800 „	4	9	13	10	MKP4M016803C00_ _ _ _	5	11	13	10	MKP4O116803F00_ _ _ _
0.01 µF	5	11	13	10	MKP4M021003F00_ _ _ _	5	11	13	10	MKP4O121003F00_ _ _ _
0.015 „	5	11	13	10	MKP4M021503F00_ _ _ _	5	11	13	10	MKP4O121503F00_ _ _ _
	5	11	18	15	MKP4M021504B00_ _ _ _	5	11	18	15	MKP4O121504B00_ _ _ _
0.022 „	5	11	18	15	MKP4M022204B00_ _ _ _	5	11	18	15	MKP4O122204B00_ _ _ _
0.033 „	6	12.5	18	15	MKP4M023304C00_ _ _ _	6	12.5	18	15	MKP4O123304C00_ _ _ _
0.047 „	7	14	18	15	MKP4M024704D00_ _ _ _	7	14	18	15	MKP4O124704D00_ _ _ _
0.068 „	8	15	18	15	MKP4M026804F00_ _ _ _	8	15	18	15	MKP4O126804F00_ _ _ _
	6	15	26.5	22.5	MKP4M026805B00_ _ _ _	6	15	26.5	22.5	MKP4O126805B00_ _ _ _
0.1 µF	9	16	18	15	MKP4M031004J00_ _ _ _	9	16	18	15	MKP4O131004J00_ _ _ _
	7	16.5	26.5	22.5	MKP4M031005D00_ _ _ _	7	16.5	26.5	22.5	MKP4O131005D00_ _ _ _
0.15 „	8.5	18.5	26.5	22.5	MKP4M031505F00_ _ _ _	8.5	18.5	26.5	22.5	MKP4O131505F00_ _ _ _
0.22 „	11	21	26.5	22.5	MKP4M032205I00_ _ _ _	11	21	26.5	22.5	MKP4O132205I00_ _ _ _
	11	21	31.5	27.5	MKP4M032206B00_ _ _ _	11	21	31.5	27.5	MKP4O132206B00_ _ _ _
0.33 „	11	21	31.5	27.5	MKP4M033306B00_ _ _ _	11	21	31.5	27.5	MKP4O133306B00_ _ _ _
0.47 „	13	24	31.5	27.5	MKP4M034706D00_ _ _ _	13	24	31.5	27.5	MKP4O134706D00_ _ _ _
0.68 „	17	29	31.5	27.5	MKP4M036806G00_ _ _ _	17	29	31.5	27.5	MKP4O136806G00_ _ _ _
1.0 µF	17	29	41.5	37.5	MKP4M041007E00_ _ _ _	17	29	41.5	37.5	MKP4O141007E00_ _ _ _
1.5 „	20	39.5	41.5	37.5	MKP4M041507G00_ _ _ _	20	39.5	41.5	37.5	MKP4O141507G00_ _ _ _
2.2 „	24	45.5	41.5	37.5	MKP4M042207H00_ _ _ _	24	45.5	41.5	37.5	MKP4O142207H00_ _ _ _
3.3 „	31	46	41.5	37.5	MKP4M043307I00_ _ _ _	31	46	41.5	37.5	MKP4O143307I00_ _ _ _
4.7 „	35	50	41.5	37.5	MKP4M044707J00_ _ _ _	35	50	41.5	37.5	MKP4O144707J00_ _ _ _

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New values and range

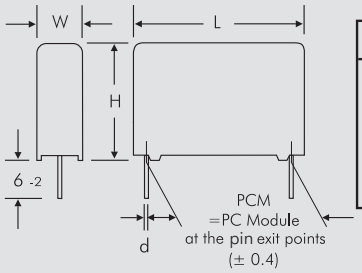
** PCM = Printed circuit module = pin spacing

The high values and large box sizes according to main catalogue 2015 are still available on request.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Dims. in mm.



ø d	PCM	W
0.5	7.5	= 3
0.6	7.5	⩾ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

Continuation page 63

Continuation

General Data

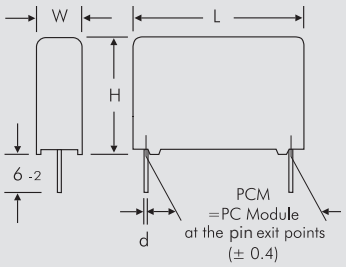
Capacitance	1600 VDC/630 VAC*					2000 VDC/700 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP4T011003C00_ _ _ _	4	9	13	10	MKP4U011003C00_ _ _ _
1500 „	4	9	13	10	MKP4T011503C00_ _ _ _	4	9	13	10	MKP4U011503C00_ _ _ _
2200 „	4	9	13	10	MKP4T012203C00_ _ _ _	4	9	13	10	MKP4U012203C00_ _ _ _
3300 „	4	9	13	10	MKP4T013303C00_ _ _ _	4	9	13	10	MKP4U013303C00_ _ _ _
4700 „	4	9	13	10	MKP4T014703C00_ _ _ _	4	9	13	10	MKP4U014703C00_ _ _ _
6800 „	5	11	13	10	MKP4T016803F00_ _ _ _	5	11	13	10	MKP4U016803F00_ _ _ _
						5	11	18	15	MKP4U016804B00_ _ _ _
0.01 µF	5	11	13	10	MKP4T021003F00_ _ _ _	6	12.5	18	15	MKP4U021004C00_ _ _ _
0.015 „	5	11	18	15	MKP4T021504B00_ _ _ _	7	14	18	15	MKP4U021504D00_ _ _ _
0.022 „	6	12.5	18	15	MKP4T022204C00_ _ _ _	8	15	18	15	MKP4U022204F00_ _ _ _
0.033 „	7	14	18	15	MKP4T023304D00_ _ _ _	9	16	18	15	MKP4U023304J00_ _ _ _
	6	15	26.5	22.5	MKP4T023305B00_ _ _ _	6	15	26.5	22.5	MKP4U023305B00_ _ _ _
0.047 „	9	16	18	15	MKP4T024704J00_ _ _ _	7	16.5	26.5	22.5	MKP4U024705D00_ _ _ _
	6	15	26.5	22.5	MKP4T024705B00_ _ _ _					
0.068 „	7	16.5	26.5	22.5	MKP4T026805D00_ _ _ _	8.5	18.5	26.5	22.5	MKP4U026805F00_ _ _ _
0.1 µF	8.5	18.5	26.5	22.5	MKP4T031005F00_ _ _ _	11	21	26.5	22.5	MKP4U031005I00_ _ _ _

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New ranges

** PCM = Printed circuit module = pin spacing

Dims in mm



ø d	PCM	W
0.5	7.5	= 3
0.6	7,5	⩾ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

Part number completion:

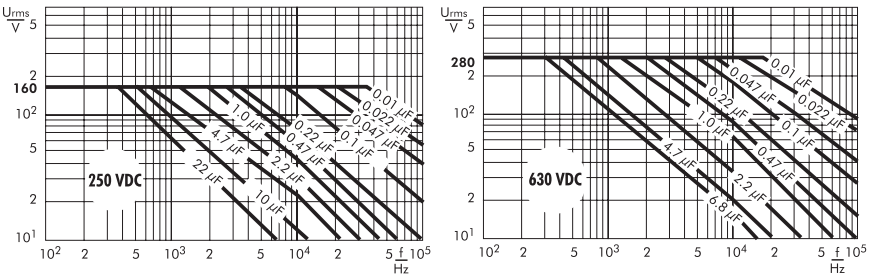
Tolerance: 20 % = M
10 % = K
5 % = J

Packing: bulk = S

Pin length: 6-2 = SD

Taped version see page 149.

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



WIMA Capacitors for Good Contact at High Pulse Ratings

WIMA MKP 10
WIMA FKP 1

An important construction criterion in the manufacture of reliable, self-healing capacitors for pulse applications is the current-carrying capacity of the contacts, i.e. the connection between the terminating wires and the electrodes.

The construction principle of the WIMA MKP 10 series consists of a non-metallized dielectric film and an carrier film metallized on both sides acting as electrode. Due to the metallization on both sides, the electrical conductivity is considerably improved and the contact surface between the electrodes and the schoopage layer is doubled. This results in better contact and allows high current and pulse loading capability. The properties of metallized capacitors such as excellent self-healing and high capacitances remain unchanged.

The WIMA FKP 1 series was developed to withstand extremely high pulse loads. It has an internal series connection, the metal foil electrodes being combined with a floating electrode metallized on both sides. The metal foil electrodes are safely contacted on both sides of the end surfaces. At the same time the capacitor is fully self-healing due to the floating electrode metallized on both sides. As regards pulse loading capability, WIMA FKP 1 represents the high-end of capacitor technology.

WIMA pulse capacitors are suitable for high pulse and high frequency applications in e.g. switch mode power supplies, TV and monitor sets, lighting industry, audio/video equipment, convertes in drives and power electronics or in electronic ballasts. They are available with capacitances from 100 pF through 47 µF and with voltage ratings from 100 VDC through 6000 VDC.

WIMA pulse capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2011/65/EU regulations.

WIMA MKP 10

Polypropylene (PP) Capacitors for Pulse Applications with Double-Sided Metallized Electrodes in PCM 7.5 mm to 52.5 mm. Capacitances from 1000 pF to 47 µF. Rated Voltages from 100 VDC to 3000 VDC.

Special Features

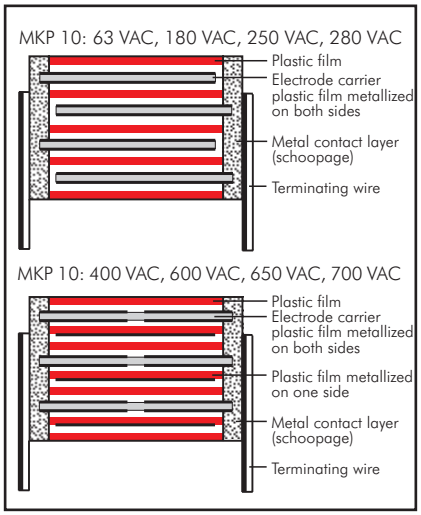
- **Pulse duty construction**
- **Self-healing**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2011/65/EU**

Typical Applications

For pulse applications e.g.
- **Switch mode power supplies**
- **TV and monitor sets**
- **Lighting**
- **Audio/video equipment**

Construction

Dielectric: Polypropylene (PP) film
Capacitor electrodes:
Double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations: Tinned wire.
Marking: Colour: Red.
Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 47 µF (E12-values on request)
Rated voltages: 100 VDC, 250 VDC, 400 VDC, 630 VDC, 850 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC, 2500 VDC, 3000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +100° C
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage: 2 sec.

L	⩽ 2000 VDC	2500 VDC	⩾ 3000 VDC
< 41.5	1.6 U_r	1.4 U_r	1.2 U_r
41.5	1.4 U_r	1.4 U_r	1.2 U_r
57	1.2 U_r	1.2 U_r	1.2 U_r

Climatic test category:
55/100/56 in accordance with IEC
Dielectric absorption: 0.05 %
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size* W x H x L in mm	Specific dissipation in Watts per K above the ambient temperature
35 x 50 x 57	0.132
45 x 55 x 57	0.164
45 x 65 x 57	0.184

* other box sizes see page 11.

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}
10 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	–
100 kHz	⩽ 15 x 10^{-4}	–	–

Maximum pulse rise time for pulses equal to the rated voltage

Capacitance pF/µF	max. pulse rise time V/µsec at T_A < 40° C										
	100 VDC	250 VDC	400 VDC	630 VDC	850 VDC	1000 VDC	1250 VDC	1600 VDC	2000 VDC	2500 VDC	3000 VDC
1000 ... 2200	1250	2300	2300	2300	3500	3500	7000	7000	11500	11500	–
3300 ... 6800	1150	1500	1500	1500	3500	3500	7000	7000	11500	11500	–
0.01 ... 0.022	900	1400	1500	1500	2700	2700	3800	3800	4400	11500	–
0.033 ... 0.068	500	1000	1150	1400	2700	2700	2700	2700	2700	2700	2700
0.1 ... 0.22	250	650	650	1150	1800	1800	1800	1800	1800	1800	1800
0.33 ... 0.68	130	390	500	900	1150	1150	1150	1150	1150	1150	1150
1.0 ... 2.2	90	250	250	500	500	500	650	650	650	650	500
3.3 ... 4.7	65	100	130	190	230	230	330	330	–	–	–
6.8 ... 15	45	65	90	160	–	–	–	–	–		
22 ... 47	30	45	45	–	–	–	–	–	–		

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 ø: 10 N in direction of pins
d > 0.8 ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	100 VDC/63 VAC* W	H	L	PCM**	Part number	250 VDC/180 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	10	**7.5**	MKP1D011002C_____	4	9	10	**7.5**	MKP1F011002C_____
1500 „	4	9	10	**7.5**	MKP1D011502C_____	4	9	10	**7.5**	MKP1F011502C_____
2200 „	4	9	10	**7.5**	MKP1D012202C_____	4	9	10	**7.5**	MKP1F012202C_____
3300 „	4	9	10	**7.5**	MKP1D013302C_____	4	9	10	**7.5**	MKP1F013302C_____
4700 „	4	9	10	**7.5**	MKP1D014702C_____	4	9	10	**7.5**	MKP1F014702C_____
6800 „	4	9	10	**7.5**	MKP1D016802C_____	4	9	10	**7.5**	MKP1F016802C_____
0.01 µF	4	9	10	**7.5**	MKP1D021002C_____	4	9	10	**7.5**	MKP1F021002C_____
						4	9	13	10	MKP1F021003C_____
0.015 „	4	9	10	**7.5**	MKP1D021502C_____	4	9	10	**7.5**	MKP1F021502C_____
						4	9	13	10	MKP1F021503C_____
0.022 „	4	9	10	**7.5**	MKP1D022202C_____	4	9	10	**7.5**	MKP1F022202C_____
						4	9	13	10	MKP1F022203C_____
0.033 „	5	10.5	10.3	**7.5**	MKP1D023302E_____	5	10.5	10.3	**7.5**	MKP1F023302E_____
	4	9	13	10	MKP1D023303C_____	4	9	13	10	MKP1F023303C_____
0.047 „	5	10.5	10.3	**7.5**	MKP1D024702E_____	5	10.5	10.3	**7.5**	MKP1F024702E_____
	4	9	13	10	MKP1D024703C_____	4	9	13	10	MKP1F024703C_____
0.068 „	5	11	13	10	MKP1D026803F_____	5	11	13	10	MKP1F026803F_____
						5	11	18	15	MKP1F026804B_____
0.1 µF	6	12	13	10	MKP1D031003G_____	6	12	13	10	MKP1F031003G_____
						5	11	18	15	MKP1F031004B_____
0.15 „	6	12.5	18	15	MKP1D031504C_____	6	12.5	18	15	MKP1F031504C_____
						6	15	26.5	22.5	MKP1F031505B_____
0.22 „	7	14	18	15	MKP1D032204D_____	7	14	18	15	MKP1F032204D_____
						6	15	26.5	22.5	MKP1F032205B_____
0.33 „	8	15	18	15	MKP1D033304F_____	8	15	18	15	MKP1F033304F_____
						6	15	26.5	22.5	MKP1F033305B_____
0.47 „	9	16	18	15	MKP1D034704J_____	9	16	18	15	MKP1F034704J_____
	7	16.5	26.5	22.5	MKP1D034705D_____	7	16.5	26.5	22.5	MKP1F034705D_____
0.68 „	8.5	18.5	26.5	22.5	MKP1D036805F_____	8.5	18.5	26.5	22.5	MKP1F036805F_____
						9	19	31.5	27.5	MKP1F036806A_____
1.0 µF	10.5	19	26.5	22.5	MKP1D041005G_____	11	21	26.5	22.5	MKP1F041005I_____
						11	21	31.5	27.5	MKP1F041006B_____
1.5 „	11	21	31.5	27.5	MKP1D041506B_____	13	24	31.5	27.5	MKP1F041506D_____
						13	24	41.5	37.5	MKP1F041507C_____
2.2 „	13	24	31.5	27.5	MKP1D042206D_____	15	26	31.5	27.5	MKP1F042206F_____
						13	24	41.5	37.5	MKP1F042207C_____
3.3 „	17	29	31.5	27.5	MKP1D043306G_____	17	34.5	31.5	27.5	MKP1F043306I_____
						17	29	41.5	37.5	MKP1F043307E_____
4.7 „	20	39.5	31.5	27.5	MKP1D044706J_____	20	39.5	31.5	27.5	MKP1F044706J_____
	17	29	41.5	37.5	MKP1D044707E_____	19	32	41.5	37.5	MKP1F044707F_____
6.8 „	19	32	41.5	37.5	MKP1D046807F_____	20	39.5	41.5	37.5	MKP1F046807G_____
10 µF	20	39.5	41.5	37.5	MKP1D051007G_____	24	45.5	41.5	37.5	MKP1F051007H_____
15 „	24	45.5	41.5	37.5	MKP1D051507H_____	35	50	41.5	37.5	MKP1F051507J_____
	31	46	41.5	37.5	MKP1D051507I_____	35	50	57	52.5	MKP1F051509F_____
22 „	35	50	41.5	37.5	MKP1D052207J_____	35	50	57	52.5	MKP1F052209F_____
33 „	40	55	41.5	37.5	MKP1D053307K_____	45	65	57	52.5	MKP1F053309J_____
	35	50	57	52.5	MKP1D053309F_____					
47 „	45	65	57	52.5	MKP1D054709J_____					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 67

Continuation

General Data

Capacitance	400 VDC/250 VAC*					630 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	10	**7.5**	MKP1G011002C_____	4	9	10	**7.5***	MKP1J011002C_____
1500 „	4	9	10	**7.5**	MKP1G011502C_____	4	9	10	**7.5***	MKP1J011502C_____
2200 „	4	9	10	**7.5**	MKP1G012202C_____	4	9	10	**7.5***	MKP1J012202C_____
3300 „	4	9	10	**7.5**	MKP1G013302C_____	4	9	10	**7.5***	MKP1J013302C_____
4700 „	4	9	10	**7.5**	MKP1G014702C_____	4	9	10	**7.5***	MKP1J014702C_____
6800 „	4	9	10	**7.5**	MKP1G016802C_____	4	9	10	**7.5***	MKP1J016802C_____
						4	9	13	10	MKP1J016803C_____
0.01 µF	4	9	10	**7.5**	MKP1G021002C_____	5	10.5	10.3	**7.5***	MKP1J021002E_____
	4	9	13	10	MKP1G021003C_____	4	9	13	10	MKP1J021003C_____
0.015 „	5	10.5	10.3	**7.5**	MKP1G021502E_____	5	11	13	10	MKP1J021503F_____
	4	9	13	10	MKP1G021503C_____	5	11	18	15	MKP1J021504B_____
0.022 „	5	10.5	10.3	**7.5**	MKP1G022202E_____	5	11	13	10	MKP1J022203F_____
	4	9	13	10	MKP1G022203C_____	5	11	18	15	MKP1J022204B_____
0.033 „	5.7	12.5	10.3	**7.5**	MKP1G023302F_____	6	12	13	10	MKP1J023303G_____
	5	11	13	10	MKP1G023303F_____	5	11	18	15	MKP1J023304B_____
0.047 „	6	12	13	10	MKP1G024703G_____	6	12.5	18	15	MKP1J024704C_____
	5	11	18	15	MKP1G024704B_____	6	15	26.5	22.5	MKP1J024705B_____
0.068 „	6	12.5	18	15	MKP1G026804C_____	7	14	18	15	MKP1J026804D_____
	6	15	26.5	22.5	MKP1G026805B_____	6	15	26.5	22.5	MKP1J026805B_____
0.1 µF	7	14	18	15	MKP1G031004D_____	9	16	18	15	MKP1J031004J_____
	6	15	26.5	22.5	MKP1G031005B_____	7	16.5	26.5	22.5	MKP1J031005D_____
0.15 „	8	15	18	15	MKP1G031504F_____	8.5	18.5	26.5	22.5	MKP1J031505F_____
	6	15	26.5	22.5	MKP1G031505B_____	9	19	31.5	27.5	MKP1J031506A_____
0.22 „	9	16	18	15	MKP1G032204J_____	8.5	18.5	26.5	22.5	MKP1J032205F_____
	7	16.5	26.5	22.5	MKP1G032205D_____	9	19	31.5	27.5	MKP1J032206A_____
0.33 „	8.5	18.5	26.5	22.5	MKP1G033305F_____	11	21	26.5	22.5	MKP1J033305I_____
	9	19	31.5	27.5	MKP1G033306A_____	11	21	31.5	27.5	MKP1J033306B_____
0.47 „	10.5	19	26.5	22.5	MKP1G034705G_____	11	21	31.5	27.5	MKP1J034706B_____
	9	19	31.5	27.5	MKP1G034706A_____					
0.68 „	11	21	26.5	22.5	MKP1G036805I_____	15	26	31.5	27.5	MKP1J036806F_____
	11	21	31.5	27.5	MKP1G036806B_____	13	24	41.5	37.5	MKP1J036807C_____
1.0 µF	13	24	31.5	27.5	MKP1G041006D_____	17	29	31.5	27.5	MKP1J041006G_____
	13	24	41.5	37.5	MKP1G041007C_____	15	26	41.5	37.5	MKP1J041007D_____
1.5 „	17	29	31.5	27.5	MKP1G041506G_____	20	39.5	31.5	27.5	MKP1J041506J_____
	13	24	41.5	37.5	MKP1G041507C_____	19	32	41.5	37.5	MKP1J041507F_____
2.2 „	20	39.5	31.5	27.5	MKP1G042206J_____	20	39.5	41.5	37.5	MKP1J042207G_____
	17	29	41.5	37.5	MKP1G042207E_____					
3.3 „	20	39.5	41.5	37.5	MKP1G043307G_____	24	45.5	41.5	37.5	MKP1J043307H_____
4.7 „	20	39.5	41.5	37.5	MKP1G044707G_____	35	50	41.5	37.5	MKP1J044707J_____
6.8 „	24	45.5	41.5	37.5	MKP1G046807H_____	40	55	41.5	37.5	MKP1J046807K_____
						35	50	57	52.5	MKP1J046809F_____
10 µF	35	50	41.5	37.5	MKP1G051007J_____	45	55	57	52.5	MKP1J051009H_____
	35	50	57	52.5	MKP1G051009F_____					
15 „	40	55	41.5	37.5	MKP1G051507K_____					
	35	50	57	52.5	MKP1G051509F_____					
22 „	45	65	57	52.5	MKP1G052209J_____					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

* Admissible AC voltage 280 VAC.

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 68

Continuation

General Data

Capacitance	850 VDC/450 VAC* W	H	L	PCM**	Part number	1000 VDC/600 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	10	**7.5**	MKP1M011002C_____	4	9	10	**7.5**	MKP1O111002C_____
	4	9	13	10	MKP1M011003C_____	4	9	13	10	MKP1O111003C_____
1500 „	4	9	10	**7.5**	MKP1M011502C_____	4	9	10	**7.5**	MKP1O111502C_____
	4	9	13	10	MKP1M011503C_____	4	9	13	10	MKP1O111503C_____
2200 „	4	9	10	**7.5**	MKP1M012202C_____	4	9	10	**7.5**	MKP1O112202C_____
	4	9	13	10	MKP1M012203C_____	4	9	13	10	MKP1O112203C_____
3300 „	4	9	10	**7.5**	MKP1M013302C_____	4	9	10	**7.5**	MKP1O113302C_____
	4	9	13	10	MKP1M013303C_____	4	9	13	10	MKP1O113303C_____
4700 „	4.5	9.5	10.3	**7.5**	MKP1M014702D_____	4.5	9.5	10.3	**7.5**	MKP1O114702D_____
	4	9	13	10	MKP1M014703C_____	4	9	13	10	MKP1O114703C_____
6800 „	5.7	12.5	10.3	**7.5**	MKP1M016802F_____	5.7	12.5	10.3	**7.5**	MKP1O116802F_____
	5	11	13	10	MKP1M016803F_____	5	11	13	10	MKP1O116803F_____
0.01 µF	5	11	13	10	MKP1M021003F_____	5	11	13	10	MKP1O121003F_____
	5	11	18	15	MKP1M021004B_____	5	11	18	15	MKP1O121004B_____
0.015 „	6	12	13	10	MKP1M021503G_____	6	12	13	10	MKP1O121503G_____
	5	11	18	15	MKP1M021504B_____	5	11	18	15	MKP1O121504B_____
0.022 „	6	12.5	18	15	MKP1M022204C_____	6	12.5	18	15	MKP1O122204C_____
	6	15	26.5	22.5	MKP1M022205B_____	6	15	26.5	22.5	MKP1O122205B_____
0.033 „	7	14	18	15	MKP1M023304D_____	7	14	18	15	MKP1O123304D_____
	6	15	26.5	22.5	MKP1M023305B_____	6	15	26.5	22.5	MKP1O123305B_____
0.047 „	8	15	18	15	MKP1M024704F_____	8	15	18	15	MKP1O124704F_____
	6	15	26.5	22.5	MKP1M024705B_____	6	15	26.5	22.5	MKP1O124705B_____
0.068 „	7	16.5	26.5	22.5	MKP1M026805D_____	7	16.5	26.5	22.5	MKP1O126805D_____
0.1 µF	8.5	18.5	26.5	22.5	MKP1M031005F_____	8.5	18.5	26.5	22.5	MKP1O131005F_____
	11	21	31.5	27.5	MKP1M031006B_____	11	21	31.5	27.5	MKP1O131006B_____
0.15 „	11	21	26.5	22.5	MKP1M031505I_____	11	21	26.5	22.5	MKP1O131505I_____
	11	21	31.5	27.5	MKP1M031506B_____	11	21	31.5	27.5	MKP1O131506B_____
0.22 „	11	21	31.5	27.5	MKP1M032206B_____	11	21	31.5	27.5	MKP1O132206B_____
0.33 „	13	24	31.5	27.5	MKP1M033306D_____	13	24	31.5	27.5	MKP1O133306D_____
	15	26	31.5	27.5	MKP1M033306F_____	15	26	31.5	27.5	MKP1O133306F_____
	13	24	41.5	37.5	MKP1M033307C_____	13	24	41.5	37.5	MKP1O133307C_____
0.47 „	17	29	31.5	27.5	MKP1M034706G_____	17	29	31.5	27.5	MKP1O134706G_____
	13	24	41.5	37.5	MKP1M034707C_____	13	24	41.5	37.5	MKP1O134707C_____
0.68 „	20	39.5	31.5	27.5	MKP1M036806J_____	20	39.5	31.5	27.5	MKP1O136806J_____
	17	29	41.5	37.5	MKP1M036807E_____	17	29	41.5	37.5	MKP1O136807E_____
1.0 µF	20	39.5	41.5	37.5	MKP1M041007G_____	20	39.5	41.5	37.5	MKP1O141007G_____
1.5 „	24	45.5	41.5	37.5	MKP1M041507H_____	24	45.5	41.5	37.5	MKP1O141507H_____
2.2 „	31	46	41.5	37.5	MKP1M042207I_____	31	46	41.5	37.5	MKP1O142207I_____
3.3 „	40	55	41.5	37.5	MKP1M043307K_____	40	55	41.5	37.5	MKP1O143307K_____
	35	50	57	52.5	MKP1M043309F_____	35	50	57	52.5	MKP1O143309F_____
4.7 „	45	55	57	52.5	MKP1M044709H_____	45	55	57	52.5	MKP1O144709H_____

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

New range

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 69

Continuation

General Data

Capacitance	1250 VDC/600 VAC*					1600 VDC/650 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP1R011003C_____	4	9	13	10	MKP1T011003C_____
1500 „	4	9	13	10	MKP1R011503C_____	4	9	13	10	MKP1T011503C_____
2200 „	4	9	13	10	MKP1R012203C_____	4	9	13	10	MKP1T012203C_____
3300 „	4	9	13	10	MKP1R013303C_____	4	9	13	10	MKP1T013303C_____
4700 „	5	11	13	10	MKP1R014703F_____	5	11	13	10	MKP1T014703F_____
6800 „	6	12	13	10	MKP1R016803G_____	6	12	13	10	MKP1T016803G_____
	5	11	18	15	MKP1R016804B_____	5	11	18	15	MKP1T016804B_____
0.01 µF	5	11	18	15	MKP1R021004B_____	5	11	18	15	MKP1T021004B_____
0.015 „	6	12.5	18	15	MKP1R021504C_____	6	12.5	18	15	MKP1T021504C_____
	6	15	26.5	22.5	MKP1R021505B_____	6	15	26.5	22.5	MKP1T021505B_____
0.022 „	7	14	18	15	MKP1R022204D_____	7	14	18	15	MKP1T022204D_____
	6	15	26.5	22.5	MKP1R022205B_____	6	15	26.5	22.5	MKP1T022205B_____
0.033 „	8	15	18	15	MKP1R023304F_____	8	15	18	15	MKP1T023304F_____
	6	15	26.5	22.5	MKP1R023305B_____	6	15	26.5	22.5	MKP1T023305B_____
0.047 „	7	16.5	26.5	22.5	MKP1R024705D_____	7	16.5	26.5	22.5	MKP1T024705D_____
	9	19	31.5	27.5	MKP1R024706A_____	9	19	31.5	27.5	MKP1T024706A_____
0.068 „	10.5	19	26.5	22.5	MKP1R026805G_____	10.5	19	26.5	22.5	MKP1T026805G_____
	9	19	31.5	27.5	MKP1R026806A_____	9	19	31.5	27.5	MKP1T026806A_____
0.1 µF	11	21	26.5	22.5	MKP1R031005I_____	11	21	26.5	22.5	MKP1T031005I_____
	11	21	31.5	27.5	MKP1R031006B_____	11	21	31.5	27.5	MKP1T031006B_____
0.15 „	13	24	31.5	27.5	MKP1R031506D_____	13	24	31.5	27.5	MKP1T031506D_____
0.22 „	15	26	31.5	27.5	MKP1R032206F_____	15	26	31.5	27.5	MKP1T032206F_____
	13	24	41.5	37.5	MKP1R032207C_____	13	24	41.5	37.5	MKP1T032207C_____
0.33 „	17	34.5	31.5	27.5	MKP1R033306I_____	17	34.5	31.5	27.5	MKP1T033306I_____
	17	29	41.5	37.5	MKP1R033307E_____	17	29	41.5	37.5	MKP1T033307E_____
0.47 „	20	39.5	31.5	27.5	MKP1R034706J_____	20	39.5	31.5	27.5	MKP1T034706J_____
	19	32	41.5	37.5	MKP1R034707F_____	19	32	41.5	37.5	MKP1T034707F_____
0.68 „	20	39.5	41.5	37.5	MKP1R036807G_____	20	39.5	41.5	37.5	MKP1T036807G_____
1.0 µF	24	45.5	41.5	37.5	MKP1R041007H_____	24	45.5	41.5	37.5	MKP1T041007H_____
1.5 „	31	46	41.5	37.5	MKP1R041507I_____	31	46	41.5	37.5	MKP1T041507I_____
2.2 „	40	55	41.5	37.5	MKP1R042207K_____	40	55	41.5	37.5	MKP1T042207K_____
	35	50	57	52.5	MKP1R042209F_____	35	50	57	52.5	MKP1T042209F_____
3.3 „	45	65	57	52.5	MKP1R043309J_____	45	65	57	52.5	MKP1T043309J_____

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New range

** PCM = Printed circuit module = pin spacing

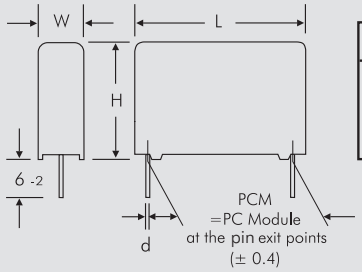
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

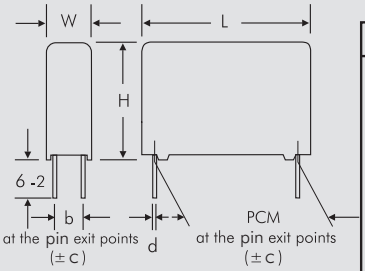
Taped version see page 149.

2-pin version



ø d	PCM
0.6	7.5 -10
0.8	15 - 27.5
1.0	37.5

4-pin version



W	PCM	b	ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 70

Continuation

General Data

Capacitance	2000 VDC/700 VAC*					2500 VDC/700 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP1U011003C_____	5	11	18	15	MKP1V011004B_____
						6	15	26.5	22.5	MKP1V011005B_____
1500 „	4	9	13	10	MKP1U011503C_____	5	11	18	15	MKP1V011504B_____
						6	15	26.5	22.5	MKP1V011505B_____
2200 „	5	11	13	10	MKP1U012203F_____	5	11	18	15	MKP1V012204B_____
	5	11	18	15	MKP1U012204B_____	6	15	26.5	22.5	MKP1V012205B_____
3300 „	5	11	18	15	MKP1U013304B_____	5	11	18	15	MKP1V013304B_____
						6	15	26.5	22.5	MKP1V013305B_____
4700 „	5	11	18	15	MKP1U014704B_____	6	12.5	18	15	MKP1V014704C_____
	6	15	26.5	22.5	MKP1U014705B_____	6	15	26.5	22.5	MKP1V014705B_____
6800 „	6	12.5	18	15	MKP1U016804C_____	7	14	18	15	MKP1V016804D_____
	6	15	26.5	22.5	MKP1U016805B_____	7	16.5	26.5	22.5	MKP1V016805D_____
0.01 µF	7	14	18	15	MKP1U021004D_____	8.5	18.5	26.5	22.5	MKP1V021005F_____
	6	15	26.5	22.5	MKP1U021005B_____					
0.015 „	8	15	18	15	MKP1U021504F_____	10.5	19	26.5	22.5	MKP1V021505G_____
	6	15	26.5	22.5	MKP1U021505B_____					
0.022 „	9	16	18	15	MKP1U022204J_____	11	21	26.5	22.5	MKP1V022205I_____
	7	16.5	26.5	22.5	MKP1U022205D_____					
0.033 „	8.5	18.5	26.5	22.5	MKP1U023305F_____	11	21	26.5	22.5	MKP1V023305I_____
	9	19	31.5	27.5	MKP1U023306A_____	9	19	31.5	27.5	MKP1V023306A_____
0.047 „	10.5	19	26.5	22.5	MKP1U024705G_____	11	21	31.5	27.5	MKP1V024706B_____
	11	21	31.5	27.5	MKP1U024706B_____					
0.068 „	11	21	26.5	22.5	MKP1U026805I_____	13	24	31.5	27.5	MKP1V026806D_____
	11	21	31.5	27.5	MKP1U026806B_____					
0.1 µF	13	24	31.5	27.5	MKP1U031006D_____	15	26	31.5	27.5	MKP1V031006F_____
						13	24	41.5	37.5	MKP1V031007C_____
0.15 „	15	26	31.5	27.5	MKP1U031506F_____	17	34.5	31.5	27.5	MKP1V031506I_____
	13	24	41.5	37.5	MKP1U031507C_____	15	26	41.5	37.5	MKP1V031507D_____
0.22 „	17	34.5	31.5	27.5	MKP1U032206I_____	19	32	41.5	37.5	MKP1V032207F_____
	17	29	41.5	37.5	MKP1U032207E_____					
0.33 „	19	32	41.5	37.5	MKP1U033307F_____	24	45.5	41.5	37.5	MKP1V033307H_____
0.47 „	20	39.5	41.5	37.5	MKP1U034707G_____	31	46	41.5	37.5	MKP1V034707I_____
0.68 „	24	45.5	41.5	37.5	MKP1U036807H_____	35	50	41.5	37.5	MKP1V036807J_____
1.0 µF	35	50	41.5	37.5	MKP1U041007J_____	40	55	41.5	37.5	MKP1V041007K_____
						35	50	57	52.5	MKP1V041009F_____
1.5 „	40	55	41.5	37.5	MKP1U041507K_____	45	55	57	52.5	MKP1V041509H_____
	35	50	57	52.5	MKP1U041509F_____					
2.2 „	45	55	57	52.5	MKP1U042209H_____					

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 71

Continuation

General Data

Capacitance	3000 VDC/700 VAC* W	H	L	PCM**	Part number
0.01 µF	8.5	18.5	26.5	22,5	MKP1W021005F_____
0.015 „	10.5	19	26.5	22,5	MKP1W021505G_____
0.022 „	11	21	26.5	22,5	MKP1W022205I_____
0.033 „	11	21	26.5	22.5	MKP1W023305I_____
	9	19	31.5	27.5	MKP1W023306A_____
0.047 „	11	21	31.5	27.5	MKP1W024706B_____
0.068 „	13	24	31.5	27.5	MKP1W026806D_____
0.1 µF	15	26	31.5	27.5	MKP1W031006F_____
	13	24	41.5	37.5	MKP1W031007C_____
0.15 „	17	34.5	31.5	27.5	MKP1W031506I_____
	15	26	41.5	37.5	MKP1W031507D_____
0.22 „	19	32	41.5	37.5	MKP1W032207F_____
0.33 „	24	45.5	41.5	37.5	MKP1W033307H_____
0.47 „	31	46	41.5	37.5	MKP1W034707I_____
0.68 „	35	50	41.5	37.5	MKP1W036807J_____
1.0 µF	40	55	41.5	37.5	MKP1W041007K_____
	35	50	57	52.5	MKP1W041009F_____
1.5 „	45	55	57	52.5	MKP1W041509H_____

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

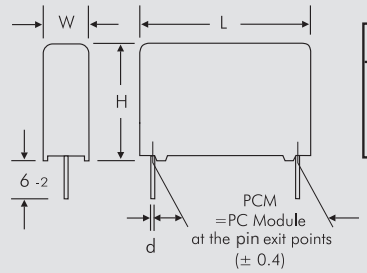
Dims. in mm.

The box sizes according to the main catalogue 2015 are still available on request

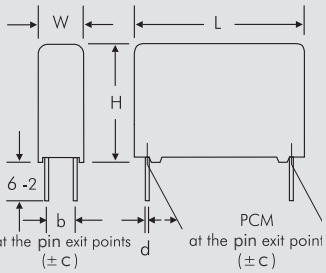
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

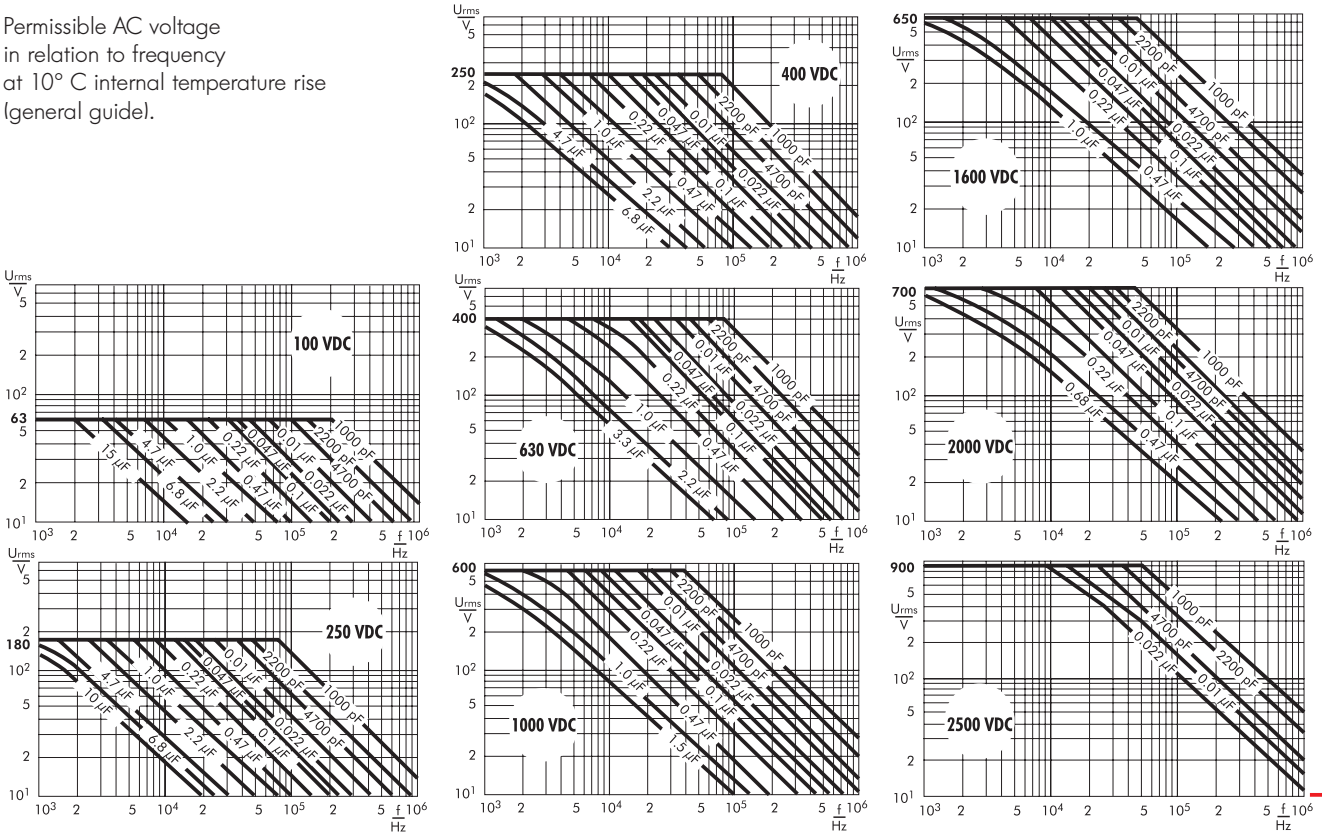


ø d	PCM
0.6	7.5 -10
0.8	15 - 27.5
1.0	37.5



W	PCM	b	ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



WIMA FKP 1

Polypropylene (PP) Capacitors for Pulse Applications with Metal Foil Electrodes and Metallized Internal Series Connection in PCM 15 mm to 52.5 mm. Capacitances from 100 pF to 4.7 µF. Rated Voltages from 400 VDC to 6000 VDC.

Special Features

- **Extremely high pulse duty**
- **Self-healing**
- **Internal series connection**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2011/65/EU**

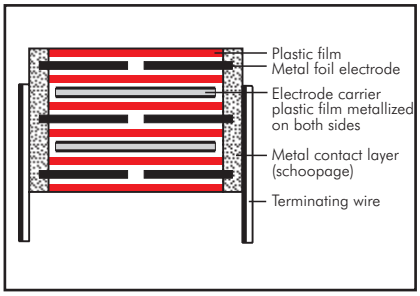
Typical Applications

For high pulse and high frequency applications e.g.

- **Switch mode power supplies**
- **Converters in drives and power electronics**
- **Deflection systems in monitors and TV-sets**
- **Electronic ballasts**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Aluminium foil and double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
100 pF to 4.7 µF (E12-values on request)
Rated voltages:
400 VDC, 630 VDC, 850 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC, 4000 VDC, 6000 VDC
Capacitance tolerances:
±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)
Operating temperature range:
–55° C to +100° C
Climatic test category:
55/100/56 in accordance with IEC
Test voltage: 2 U_r, 2 sec / 6 kV: PCM < 37.5
1.6 U_r, 2 sec, PCM 37.5 1.2 U_r, 2 sec.
Dielectric absorption: 0.05 %
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 5×10^{-4}	⩽ 5×10^{-4}	⩽ 5×10^{-4}
10 kHz	⩽ 6×10^{-4}	⩽ 6×10^{-4}	-
100 kHz	⩽ 10×10^{-4}	-	-

Insulation resistance at +20° C:
C ⩽ 0.1 µF: ⩾ 1 x 10^5 MΩ
C > 0.1 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)

Maximum pulse rise time: for pulses equal to the rated voltage

Capacitance pF/µF	max. pulse rise time V/µsec at T_A < 40° C								
	400 VDC	630 VDC	850 VDC	1000 VDC	1250 VDC	1600 VDC	2000 VDC	4000 VDC	6000 VDC
100 ... 220	–	–	–	–	–	56000	56000	–	–
330 ... 680	–	–	–	–	–	51000	56000	56000	56000
1000 ... 2200	29000	29000	29000	29000	29000	46000	51000	51000	51000
3300 ... 6800	9000	14000	27000	27000	29000	29000	29000	29000	29000
0.01 ... 0.022	9000	11000	11000	11000	11000	11000	13000	13000	13000
0.033 ... 0.068	9000	11000	11000	11000	11000	11000	11000	13000	13000
0.1 ... 0.22	7000	11000	11000	11000	11000	11000	11000	13000	13000
0.33 ... 0.68	6000	10000	11000	11000	11000	11000	11000	–	–
1.0 ... 2.2	5000	6600	8300	8300	9500	11000	–	–	–
3.3 ... 4.7	2500	–	–	–	–	–	–	–	–

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 ø: 10 N in direction of pins
d > 0.8 ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2
in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	400 VDC/250 VAC* W	H	L	PCM**	Part number	630 VDC/400 VAC* W	H	L	PCM**	Part number
1000 pF	5	11	18	15	FKP1G011004B_ _ _ _ _ _	5	11	18	15	FKP1J011004B_ _ _ _ _ _
1500 „	5	11	18	15	FKP1G011504B_ _ _ _ _ _	5	11	18	15	FKP1J011504B_ _ _ _ _ _
2200 „	5	11	18	15	FKP1G012204B_ _ _ _ _ _	5	11	18	15	FKP1J012204B_ _ _ _ _ _
3300 „	5	11	18	15	FKP1G013304B_ _ _ _ _ _	5	11	18	15	FKP1J013304B_ _ _ _ _ _
4700 „	5	11	18	15	FKP1G014704B_ _ _ _ _ _	5	11	18	15	FKP1J014704B_ _ _ _ _ _
6800 „	5	11	18	15	FKP1G016804B_ _ _ _ _ _	6	12.5	18	15	FKP1J016804C_ _ _ _ _ _
0.01 µF	5	11	18	15	FKP1G021004B_ _ _ _ _ _	7	14	18	15	FKP1J021004D_ _ _ _ _ _
						5	14	26.5	22.5	FKP1J021005A_ _ _ _ _ _
0.015 „	6	12.5	18	15	FKP1G021504C_ _ _ _ _ _	8	15	18	15	FKP1J021504F_ _ _ _ _ _
						6	15	26.5	22.5	FKP1J021505B_ _ _ _ _ _
0.022 „	7	14	18	15	FKP1G022204D_ _ _ _ _ _	7	16.5	26.5	22.5	FKP1J022205D_ _ _ _ _ _
	5	14	26.5	22.5	FKP1G022205A_ _ _ _ _ _					
0.033 „	8	15	18	15	FKP1G023304F_ _ _ _ _ _	8.5	18.5	26.5	22.5	FKP1J023305F_ _ _ _ _ _
	6	15	26.5	22.5	FKP1G023305B_ _ _ _ _ _					
0.047 „	7	16.5	26.5	22.5	FKP1G024705D_ _ _ _ _ _	10.5	20.5	26.5	22.5	FKP1J024705H_ _ _ _ _ _
						9	19	31.5	27.5	FKP1J024706A_ _ _ _ _ _
0.068 „	8.5	18.5	26.5	22.5	FKP1G026805F_ _ _ _ _ _	11	21	31.5	27.5	FKP1J026806B_ _ _ _ _ _
						9	19	41.5	37.5	FKP1J026807A_ _ _ _ _ _
0.1 µF	10.5	20.5	26.5	22.5	FKP1G031005H_ _ _ _ _ _	13	24	31.5	27.5	FKP1J031006D_ _ _ _ _ _
	9	19	31.5	27.5	FKP1G031006A_ _ _ _ _ _	11	22	41.5	37.5	FKP1J031007B_ _ _ _ _ _
0.15 „	11	21	31.5	27.5	FKP1G031506B_ _ _ _ _ _	13	24	41.5	37.5	FKP1J031507C_ _ _ _ _ _
0.22 „	13	24	31.5	27.5	FKP1G032206D_ _ _ _ _ _	15	26	41.5	37.5	FKP1J032207D_ _ _ _ _ _
	11	22	41.5	37.5	FKP1G032207B_ _ _ _ _ _					
0.33 „	13	24	41.5	37.5	FKP1G033307C_ _ _ _ _ _	19	32	41.5	37.5	FKP1J033307F_ _ _ _ _ _
0.47 „	17	29	41.5	37.5	FKP1G034707E_ _ _ _ _ _	20	39.5	41.5	37.5	FKP1J034707G_ _ _ _ _ _
0.68 „	19	32	41.5	37.5	FKP1G036807F_ _ _ _ _ _	24	45.5	41.5	37.5	FKP1J036807H_ _ _ _ _ _
1.0 µF	20	39.5	41.5	37.5	FKP1G041007G_ _ _ _ _ _	35	50	41.5	37.5	FKP1J041007J_ _ _ _ _ _
1.5 „	31	46	41.5	37.5	FKP1G041507I_ _ _ _ _ _	40	55	41.5	37.5	FKP1J041507K_ _ _ _ _ _
						35	50	57	52.5	FKP1J041509F_ _ _ _ _ _
2.2 „	35	50	41.5	37.5	FKP1G042207J_ _ _ _ _ _	45	55	57	52.5	FKP1J042209H_ _ _ _ _ _
3.3 „	35	50	57	52.5	FKP1G043309F_ _ _ _ _ _					
4.7 „	45	65	57	52.5	FKP1G044709J_ _ _ _ _ _					

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

The values of the WIMA FKP 4 range according to main catalogue 2015 are still available on request.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completeion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 74

Continuation

General Data

Capacitance	850 VDC/450 VAC* W	H	L	PCM**	Part number	1000 VDC/600 VAC* W	H	L	PCM**	Part number
1000 pF	5	11	18	15	FKP1M011004B_ _ _ _ _ _	5	11	18	15	FKP1O111004B_ _ _ _ _ _
1500 „	5	11	18	15	FKP1M011504B_ _ _ _ _ _	5	11	18	15	FKP1O111504B_ _ _ _ _ _
2200 „	5	11	18	15	FKP1M012204B_ _ _ _ _ _	5	11	18	15	FKP1O112204B_ _ _ _ _ _
3300 „	5	11	18	15	FKP1M013304B_ _ _ _ _ _	5	11	18	15	FKP1O113304B_ _ _ _ _ _
4700 „	6	12.5	18	15	FKP1M014704C_ _ _ _ _ _	6	12.5	18	15	FKP1O114704C_ _ _ _ _ _
6800 „	7	14	18	15	FKP1M016804D_ _ _ _ _ _	7	14	18	15	FKP1O116804D_ _ _ _ _ _
0.01 µF	8	15	18	15	FKP1M021004F_ _ _ _ _ _	8	15	18	15	FKP1O121004F_ _ _ _ _ _
	6	15	26.5	22.5	FKP1M021005B_ _ _ _ _ _	6	15	26.5	22.5	FKP1O121005B_ _ _ _ _ _
0.015 „	6	15	26.5	22.5	FKP1M021505B_ _ _ _ _ _	6	15	26.5	22.5	FKP1O121505B_ _ _ _ _ _
0.022 „	8.5	18.5	26.5	22.5	FKP1M022205F_ _ _ _ _ _	8.5	18.5	26.5	22.5	FKP1O122205F_ _ _ _ _ _
0.033 „	10.5	20.5	26.5	22.5	FKP1M023305H_ _ _ _ _ _	10.5	20.5	26.5	22.5	FKP1O123305H_ _ _ _ _ _
	9	19	31.5	27.5	FKP1M023306A_ _ _ _ _ _	9	19	31.5	27.5	FKP1O123306A_ _ _ _ _ _
0.047 „	11	21	31.5	27.5	FKP1M024706B_ _ _ _ _ _	11	21	31.5	27.5	FKP1O124706B_ _ _ _ _ _
0.068 „	13	24	31.5	27.5	FKP1M026806D_ _ _ _ _ _	13	24	31.5	27.5	FKP1O126806D_ _ _ _ _ _
	11	22	41.5	37.5	FKP1M026807B_ _ _ _ _ _	11	22	41.5	37.5	FKP1O126807B_ _ _ _ _ _
0.1 µF	13	24	41.5	37.5	FKP1M031007C_ _ _ _ _ _	13	24	41.5	37.5	FKP1O131007C_ _ _ _ _ _
0.15 „	15	26	41.5	37.5	FKP1M031507D_ _ _ _ _ _	15	26	41.5	37.5	FKP1O131507D_ _ _ _ _ _
0.22 „	19	32	41.5	37.5	FKP1M032207F_ _ _ _ _ _	19	32	41.5	37.5	FKP1O132207F_ _ _ _ _ _
0.33 „	20	39.5	41.5	37.5	FKP1M033307G_ _ _ _ _ _	20	39.5	41.5	37.5	FKP1O133307G_ _ _ _ _ _
0.47 „	31	46	41.5	37.5	FKP1M034707I_ _ _ _ _ _	31	46	41.5	37.5	FKP1O134707I_ _ _ _ _ _
0.68 „	35	50	41.5	37.5	FKP1M036807J_ _ _ _ _ _	35	50	41.5	37.5	FKP1O136807J_ _ _ _ _ _
1.0 µF	40	55	41.5	37.5	FKP1M041007K_ _ _ _ _ _	40	55	41.5	37.5	FKP1O141007K_ _ _ _ _ _
	35	50	57	52.5	FKP1M041009F_ _ _ _ _ _	35	50	57	52.5	FKP1O141009F_ _ _ _ _ _
1.5 „	45	55	57	52.5	FKP1M041509H_ _ _ _ _ _	45	55	57	52.5	FKP1O141509H_ _ _ _ _ _
2,2 „	45	65	57	52,5	FKP1M042209J_ _ _ _ _ _	45	65	57	52,5	FKP1O142209J_ _ _ _ _ _

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New range

** PCM = Printed circuit module = pin spacing

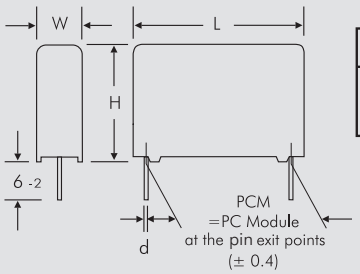
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

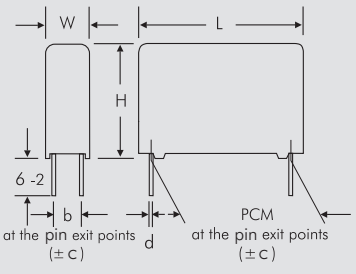
Taped version see page 149.

2-pin version



Ø d	PCM
0.8	15 - 27.5
1.0	37.5

4-pin version



W	PCM	b	Ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 75

Continuation

General Data

Capacitance	1250 VDC/600 VAC* W	H	L	PCM**	Part number	1600 VDC/650 VAC* W	H	L	PCM**	Part number
100 pF						5	11	18	15	FKP1T001004B_ _ _ _ _ _
150 „						5	11	18	15	FKP1T001504B_ _ _ _ _ _
220 „						5	11	18	15	FKP1T002204B_ _ _ _ _ _
330 „						5	11	18	15	FKP1T003304B_ _ _ _ _ _
470 „						5	11	18	15	FKP1T004704B_ _ _ _ _ _
680 „						5	11	18	15	FKP1T006804B_ _ _ _ _ _
1000 pF	5	11	18	15	FKP1R011004B_ _ _ _ _ _	6	12.5	18	15	FKP1T011004C_ _ _ _ _ _
						5	14	26.5	22.5	FKP1T011005A_ _ _ _ _ _
1500 „	5	11	18	15	FKP1R011504B_ _ _ _ _ _	7	14	18	15	FKP1T011504D_ _ _ _ _ _
						5	14	26.5	22.5	FKP1T011505A_ _ _ _ _ _
2200 „	5	11	18	15	FKP1R012204B_ _ _ _ _ _	8	15	18	15	FKP1T012204F_ _ _ _ _ _
						5	14	26.5	22.5	FKP1T012205A_ _ _ _ _ _
3300 „	6	12.5	18	15	FKP1R013304C_ _ _ _ _ _	6	15	26.5	22.5	FKP1T013305B_ _ _ _ _ _
4700 „	7	14	18	15	FKP1R014704D_ _ _ _ _ _	7	16.5	26.5	22.5	FKP1T014705D_ _ _ _ _ _
6800 „	8	15	18	15	FKP1R016804F_ _ _ _ _ _	8.5	18.5	26.5	22.5	FKP1T016805F_ _ _ _ _ _
	5	14	26.5	22.5	FKP1R016805A_ _ _ _ _ _					
0.01 µF	7	16.5	26.5	22.5	FKP1R021005D_ _ _ _ _ _	10.5	20.5	26.5	22.5	FKP1T021005H_ _ _ _ _ _
0.015 „	8.5	18.5	26.5	22.5	FKP1R021505F_ _ _ _ _ _	11	21	31.5	27.5	FKP1T021506B_ _ _ _ _ _
0.022 „	10.5	20.5	26.5	22.5	FKP1R022205H_ _ _ _ _ _	11	21	31.5	27.5	FKP1T022206B_ _ _ _ _ _
0.033 „	11	21	31.5	27.5	FKP1R023306B_ _ _ _ _ _	13	24	31.5	27.5	FKP1T023306D_ _ _ _ _ _
	9	19	41.5	37.5	FKP1R023307A_ _ _ _ _ _	13	24	41.5	37.5	FKP1T023307C_ _ _ _ _ _
0.047 „	13	24	31.5	27.5	FKP1R024706D_ _ _ _ _ _	13	24	41.5	37.5	FKP1T024707C_ _ _ _ _ _
	11	22	41.5	37.5	FKP1R024707B_ _ _ _ _ _					
0.068 „	11	22	41.5	37.5	FKP1R026807B_ _ _ _ _ _	15	26	41.5	37.5	FKP1T026807D_ _ _ _ _ _
0.1 µF	15	26	41.5	37.5	FKP1R031007D_ _ _ _ _ _	17	29	41.5	37.5	FKP1T031007E_ _ _ _ _ _
0.15 „	17	29	41.5	37.5	FKP1R031507E_ _ _ _ _ _	20	39.5	41.5	37.5	FKP1T031507G_ _ _ _ _ _
0.22 „	19	32	41.5	37.5	FKP1R032207F_ _ _ _ _ _	24	45.5	41.5	37.5	FKP1T032207H_ _ _ _ _ _
0.33 „	24	45.5	41.5	37.5	FKP1R033307H_ _ _ _ _ _	31	46	41.5	37.5	FKP1T033307I_ _ _ _ _ _
0.47 „	31	46	41.5	37.5	FKP1R034707I_ _ _ _ _ _	40	55	41.5	37.5	FKP1T034707K_ _ _ _ _ _
0.68 „	40	55	41.5	37.5	FKP1R036807K_ _ _ _ _ _	35	50	57	52.5	FKP1T036809F_ _ _ _ _ _
1.0 µF	35	50	57	52.5	FKP1R041009F_ _ _ _ _ _	45	55	57	52.5	FKP1T041009H_ _ _ _ _ _
1.5 „	45	65	57	52.5	FKP1R041509J_ _ _ _ _ _					

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 76

Continuation

General Data

Capacitance	2000 VDC/700 VAC~* W	H	L	PCM**	Part number	4000 VDC/700 VAC* W	H	L	PCM**	Part number
100 pF	5	11	18	15	FKP1U001004B_ _ _ _ _ _					
150 „	5	11	18	15	FKP1U001504B_ _ _ _ _ _					
220 „	5	11	18	15	FKP1U002204B_ _ _ _ _ _					
330 „	6	12.5	18	15	FKP1U003304C_ _ _ _ _ _					
470 „	6	12.5	18	15	FKP1U004704C_ _ _ _ _ _	5	14	26.5	22.5	FKP1X004705A_ _ _ _ _ _
680 „	6	12.5	18	15	FKP1U006804C_ _ _ _ _ _	5	14	26.5	22.5	FKP1X006805A_ _ _ _ _ _
1000 pF	7	14	18	15	FKP1U011004D_ _ _ _ _ _	5	14	26.5	22.5	FKP1X011005A_ _ _ _ _ _
	5	14	26.5	22.5	FKP1U011005A_ _ _ _ _ _					
1500 „	6	15	26.5	22.5	FKP1U011505B_ _ _ _ _ _	7	16.5	26.5	22.5	FKP1X011505D_ _ _ _ _ _
2200 „	7	16.5	26.5	22.5	FKP1U012205D_ _ _ _ _ _	8.5	18.5	26.5	22.5	FKP1X012205F_ _ _ _ _ _
3300 „	7	16.5	26.5	22.5	FKP1U013305D_ _ _ _ _ _	10.5	20.5	26.5	22.5	FKP1X013305H_ _ _ _ _ _
4700 „	8.5	18.5	26.5	22.5	FKP1U014705F_ _ _ _ _ _	11	21	31.5	27.5	FKP1X014706B_ _ _ _ _ _
6800 „	10.5	20.5	26.5	22.5	FKP1U016805H_ _ _ _ _ _	13	24	31.5	27.5	FKP1X016806D_ _ _ _ _ _
0.01 µF	11	21	31.5	27.5	FKP1U021006B_ _ _ _ _ _	15	26	31.5	27.5	FKP1X021006F_ _ _ _ _ _
0.015 „	13	24	31.5	27.5	FKP1U021506D_ _ _ _ _ _	13	24	41.5	37.5	FKP1X021507C_ _ _ _ _ _
0.022 „	15	26	31.5	27.5	FKP1U022206F_ _ _ _ _ _	17	29	41.5	37.5	FKP1X022207E_ _ _ _ _ _
	13	24	41.5	37.5	FKP1U022207C_ _ _ _ _ _					
0.033 „	13	24	41.5	37.5	FKP1U023307C_ _ _ _ _ _	20	39.5	41.5	37.5	FKP1X023307G_ _ _ _ _ _
0.047 „	17	29	41.5	37.5	FKP1U024707E_ _ _ _ _ _	24	45.5	41.5	37.5	FKP1X024707H_ _ _ _ _ _
0.068 „	19	32	41.5	37.5	FKP1U026807F_ _ _ _ _ _	31	46	41.5	37.5	FKP1X026807I_ _ _ _ _ _
0.1 µF	20	39.5	41.5	37.5	FKP1U031007G_ _ _ _ _ _	35	50	41.5	37.5	FKP1X031007J_ _ _ _ _ _
0.15 „	24	45.5	41.5	37.5	FKP1U031507H_ _ _ _ _ _	40	55	41.5	37.5	FKP1X031507K_ _ _ _ _ _
0.22 „	35	50	41.5	37.5	FKP1U032207J_ _ _ _ _ _	45	55	57	52.5	FKP1X032209H_ _ _ _ _ _
0.33 „	40	55	41.5	37.5	FKP1U033307K_ _ _ _ _ _					
0.47 „	45	55	57	52.5	FKP1U034709H_ _ _ _ _ _					
0.68 „	45	65	57	52.5	FKP1U036809J_ _ _ _ _ _					

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

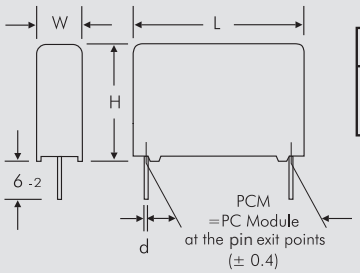
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

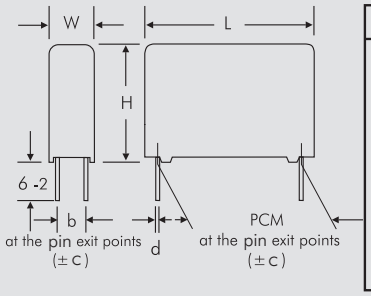
Taped version see page 149.

2-pin version



ø d	PCM
0.8	15 - 27.5
1.0	37.5

4-pin version



W	PCM	b	ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 77

Continuation

General Data

Capacitance	6000 VDC/700 VAC* W	H	L	PCM**	Part number
470 pF	5	14	26.5	22.5	FKP1Y004705A_ _ _ _ _ _
680 „	5	14	26.5	22.5	FKP1Y006805A_ _ _ _ _ _
1000 pF	5	14	26.5	22.5	FKP1Y011005A_ _ _ _ _ _
1500 „	7	16.5	26.5	22.5	FKP1Y011505D_ _ _ _ _ _
2200 „	10.5	20.5	26.5	22.5	FKP1Y012205H_ _ _ _ _ _
3300 „	10.5	20.5	26.5	22.5	FKP1Y013305H_ _ _ _ _ _
4700 „	11	21	31.5	27.5	FKP1Y014706B_ _ _ _ _ _
6800 „	13	24	31.5	27.5	FKP1Y016806D_ _ _ _ _ _
0.01 µF	15	26	31.5	27.5	FKP1Y021006F_ _ _ _ _ _
0.015 „	13	24	41.5	37.5	FKP1Y021507C_ _ _ _ _ _
0.022 „	17	29	41.5	37.5	FKP1Y022207E_ _ _ _ _ _
0.033 „	20	39.5	41.5	37.5	FKP1Y023307G_ _ _ _ _ _
0.047 „	24	45.5	41.5	37.5	FKP1Y024707H_ _ _ _ _ _
0.068 „	31	46	41.5	37.5	FKP1Y026807I_ _ _ _ _ _
0.1 µF	35	50	41.5	37.5	FKP1Y031007J_ _ _ _ _ _
0.15 „	40	55	41.5	37.5	FKP1Y031507K_ _ _ _ _ _
0.22 „	45	55	57	52.5	FKP1Y032209H_ _ _ _ _ _

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

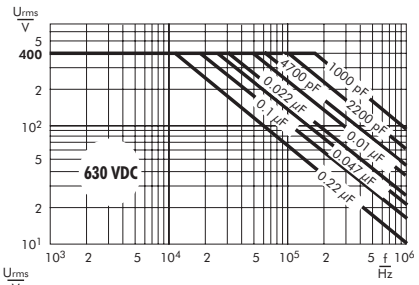
Dims. in mm.

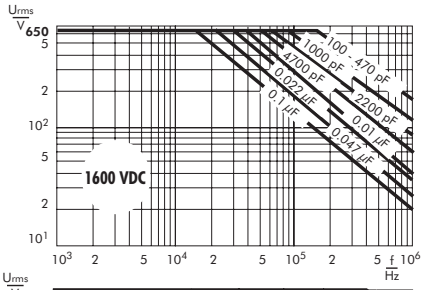
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

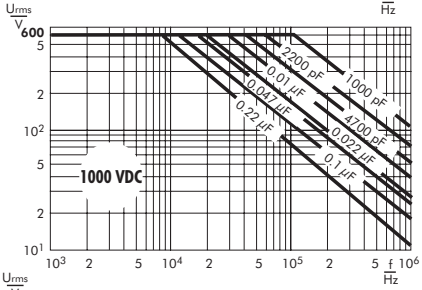
Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

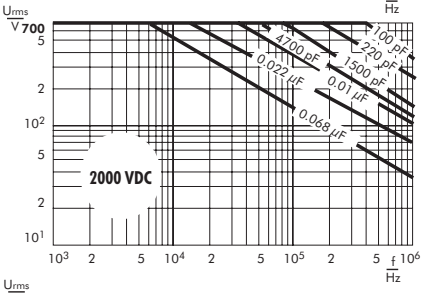
Taped version see page 149.

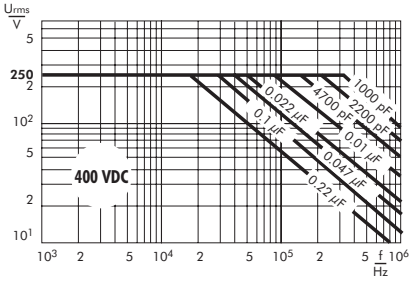
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).

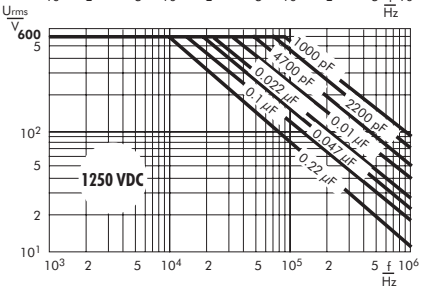


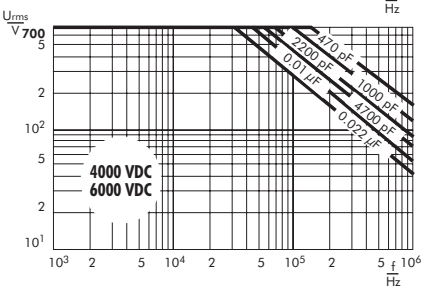












WIMA Radio Interference Suppression Capacitors for Overvoltage Protection

WIMA MKP-X2
WIMA MKP-X1 R
WIMA MKP-Y2

WIMA MP 3-X2
WIMA MP 3-X1
WIMA MP 3-Y2/3R-Y2

Depending on the application, radio interference suppression capacitors remain on the mains for an uninterrupted period of 10, 20 or more years. They need not only satisfy EMC requirements in suppressing outgoing interference from an application but they also have to protect the application from incoming power surges. Hence careful selection of these components is essential.

The special feature of WIMA Polypropylene RFI capacitors are the high capacitance values at smaller case sizes compared to metallized paper capacitors, being available with capacitances from 1000 pF through 10 µF at AC voltages of 300 VAC, 305 VAC and 440 VAC for class X2, X1 and Y2. Based on the dielectric used they are highly cost-effective.

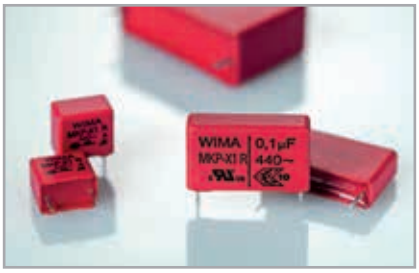
WIMA metallized paper capacitors are neither actively nor passively flammable. The components are resin impregnated under vacuum and encapsulated with self-extinguishing cast resin. Thanks to the good oxidation behaviour of the paper dielectric, they have outstanding self-healing properties even with high energy pulses. The capacitors are specified for temperatures up to 110° C and are available for class X1, X2 and Y2 applications.

Class X capacitors are connected between phase and neutral or phase and phase conductors. Class Y capacitors have an increased degree of electrical and mechanical safety and are connected, for example, between phase conductors and earthed casing, and thus by-pass operating insulation.

WIMA RFI capacitors with metallized paper dielectric are available with capacitances from 1000 pF through 1.0 µF and voltage ratings of 250 VAC, 275 VAC, 300 VAC, 440 VAC and 500 VAC.

The specified rated AC voltage takes into account a rise of the mains voltage of up to 10% above the nominal value, in accordance with IEC 60384-14.

The components are environmentally compatible with the RoHS 2011/65/EU regulations of the European Union.



WIMA MKP-X2

Metallized Polypropylene (PP) RFI-Capacitors Class X2 in PCM 7.5 mm to 37.5 mm. Capacitances from 1000 pF to 10 µF. Rated Voltage 305 VAC.

Special Features

- **Reliable self-healing**
- **High degree of interference suppression due to good attenuation and low ESR**
- **According to RoHS 2011/65/EU**

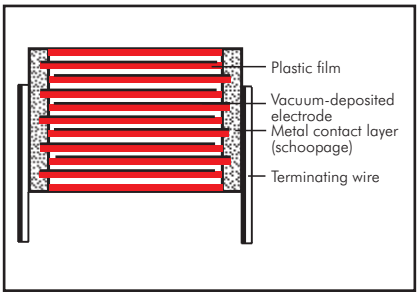
Typical Applications

Class X2 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase and neutral or phase conductors**
- **General requirements, pulse peak voltage ⩽ 2.5 kV**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1000 pF to 10 µF
Rated voltage: 305 VAC
Continuous DC voltage* (general guide): ⩽ 560 V
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Passive flammability class:
B for capacitors with V > 1750 mm³
C for capacitors with V ⩽ 1750 mm³
Test specifications:
In accordance with IEC 60384-14
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 18 x 10^{-4}	⩽ 20 x 10^{-4}	⩽ 20 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 60 x 10^{-4}	–
100 kHz	⩽ 50 x 10^{-4}	–	–

Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1.5 x 10^4 MΩ
C > 0.33 µF: ⩾ 5000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Maximum pulse rise time:
100 V/µsec for pulses equal to a voltage amplitude with $\sqrt{2}$ x 305 VAC = 432 V according to IEC 60384-14
Test voltage:
C ⩽ 1.0 µF: 2260 VDC, 2 sec.
C > 1.0 µF: 1800 VDC, 2 sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40003472
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

Mechanical Tests

Pull test on pins: 10 N in direction of pins according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$

if the DC operating voltage UDC is higher than $\sqrt{2}$ x UAC

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

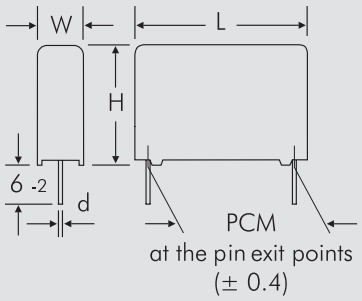
Capacitance	305 VAC*				
	W	H	L	PCM**	Part number
1000 pF	4	9	10	**7.5**	MKX2AW11002C00_ _ _ _
1200 „	4	9	10	**7.5**	MKX2AW11202C00_ _ _ _
1500 „	4	9	10	**7.5**	MKX2AW11502C00_ _ _ _
1800 „	4	9	10	**7.5**	MKX2AW11802C00_ _ _ _
2200 „	4	9	10	**7.5**	MKX2AW12202C00_ _ _ _
2700 „	4	9	10	**7.5**	MKX2AW12702C00_ _ _ _
3300 „	4	9	10	**7.5**	MKX2AW13302C00_ _ _ _
3900 „	4	9	10	**7.5**	MKX2AW13902C00_ _ _ _
4700 „	4	9	10	**7.5**	MKX2AW14702C00_ _ _ _
5600 „	4	9	10	**7.5**	MKX2AW15602C00_ _ _ _
6800 „	4	9	10	**7.5**	MKX2AW16802C00_ _ _ _
8200 „	4	9	10	**7.5**	MKX2AW18202C00_ _ _ _
0.01 µF	4	9	10	**7.5**	MKX2AW21002C00_ _ _ _
	5	11	13	10	MKX2AW21003F00_ _ _ _
0.012 „	4	9	10	**7.5**	MKX2AW21202C00_ _ _ _
	5	11	13	10	MKX2AW21203F00_ _ _ _
0.015 „	4	9	10	**7.5**	MKX2AW21502C00_ _ _ _
	5	11	13	10	MKX2AW21503F00_ _ _ _
0.018 „	4	9	10	**7.5**	MKX2AW21802C00_ _ _ _
	5	11	13	10	MKX2AW21803F00_ _ _ _
0.022 „	4	9	10	**7.5**	MKX2AW22202C00_ _ _ _
	5	11	13	10	MKX2AW22203F00_ _ _ _
0.027 „	5	10.5	10.3	**7.5**	MKX2AW22702E00_ _ _ _
	5	11	13	10	MKX2AW22703F00_ _ _ _
0.033 „	5	10.5	10.3	**7.5**	MKX2AW23302E00_ _ _ _
	5	11	13	10	MKX2AW23303F00_ _ _ _
0.039 „	5.7	12.5	10.3	**7.5**	MKX2AW23902F00_ _ _ _
	5	11	13	10	MKX2AW23903F00_ _ _ _
0.047 „	5.7	12.5	10.3	**7.5**	MKX2AW24702F00_ _ _ _
	6	12.5	13	10	MKX2AW24703H00_ _ _ _
	5	11	18	15	MKX2AW24704B00_ _ _ _
0.056 „	6	12.5	13	10	MKX2AW25603H00_ _ _ _
	5	11	18	15	MKX2AW25604B00_ _ _ _
0.068 „	6	12.5	13	10	MKX2AW26803H00_ _ _ _
	5	11	18	15	MKX2AW26804B00_ _ _ _
0.082 „	6	12.5	13	10	MKX2AW28203H00_ _ _ _
	5	11	18	15	MKX2AW28204B00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.6 ø if PCM < 15
d = 0.8 ø if PCM ≥ 15



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 81

Continuation

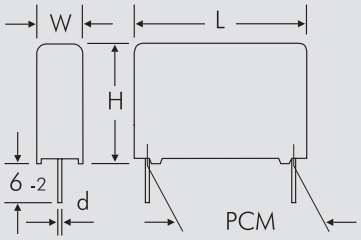
General Data

Capacitance	305 VAC* W	H	L	PCM**	Part number
0.1 µF	8	12	13	10	MKX2AW31003I00_ _ _ _
	5	11	18	15	MKX2AW31004B00_ _ _ _
	6	12.5	18	15	MKX2AW31004C00_ _ _ _
0.12 „	6	12.5	18	15	MKX2AW31204C00_ _ _ _
0.15 „	6	12.5	18	15	MKX2AW31504C00_ _ _ _
	8	15	18	15	MKX2AW31504F00_ _ _ _
	6	15	26.5	22.5	MKX2AW31505B00_ _ _ _
0.18 „	8	15	18	15	MKX2AW31804F00_ _ _ _
	6	15	26.5	22.5	MKX2AW31805B00_ _ _ _
0.22 „	9	14	18	15	MKX2AW32204H00_ _ _ _
	8	15	18	15	MKX2AW32204F00_ _ _ _
	6	15	26.5	22.5	MKX2AW32205B00_ _ _ _
0.27 „	8	15	18	15	MKX2AW32704F00_ _ _ _
	7	16.5	26.5	22.5	MKX2AW32705D00_ _ _ _
0.33 „	11	14	18	15	MKX2AW33304M00_ _ _ _
	9	16	18	15	MKX2AW33304J00_ _ _ _
	7	16.5	26.5	22.5	MKX2AW33305D00_ _ _ _
0.39 „	8.5	18.5	26.5	22.5	MKX2AW33905F00_ _ _ _
0.47 „	8.5	18.5	26.5	22.5	MKX2AW34705F00_ _ _ _
	10.5	19	26.5	22.5	MKX2AW34705G00_ _ _ _
	9	19	31.5	27.5	MKX2AW34706A00_ _ _ _
0.56 „	10.5	19	26.5	22.5	MKX2AW35605G00_ _ _ _
	9	19	31.5	27.5	MKX2AW35606A00_ _ _ _
0.68 „	10.5	19	26.5	22.5	MKX2AW36805G00_ _ _ _
	11	21	26.5	22.5	MKX2AW36805I00_ _ _ _
	9	19	31.5	27.5	MKX2AW36806A00_ _ _ _
0.82 „	11	21	26.5	22.5	MKX2AW38205I00_ _ _ _
	9	19	31.5	27.5	MKX2AW38206A00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.6 ø if PCM = 10
d = 0.8 ø if PCM ⩾ 15

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 82

Continuation

General Data

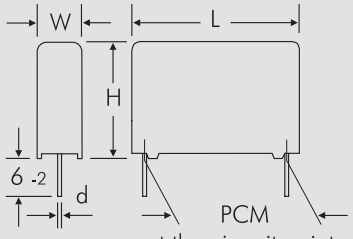
Capacitance	305 VAC* W	H	L	PCM**	Part number
1.0 µF	11	21	26.5	22.5	MKX2AW41005I00_ _ _ _
	11	21	31.5	27.5	MKX2AW41006B00_ _ _ _
	13	24	31.5	27.5	MKX2AW41006D00_ _ _ _
1.2 „	11	21	31.5	27.5	MKX2AW41206B00_ _ _ _
1.5 „	13	24	31.5	27.5	MKX2AW41506D00_ _ _ _
	15	26	31.5	27.5	MKX2AW41506F00_ _ _ _
	13	24	41.5	37.5	MKX2AW41507C00_ _ _ _
1.8 „	13	24	31.5	27.5	MKX2AW41806D00_ _ _ _
	13	24	41.5	37.5	MKX2AW41807C00_ _ _ _
2.2 „	15	26	31.5	27.5	MKX2AW42206F00_ _ _ _
	17	29	31.5	27.5	MKX2AW42206G00_ _ _ _
	13	24	41.5	37.5	MKX2AW42207C00_ _ _ _
	15	26	41.5	37.5	MKX2AW42207D00_ _ _ _
2.7 „	17	29	31.5	27.5	MKX2AW42706G00_ _ _ _
	15	26	41.5	37.5	MKX2AW42707D00_ _ _ _
	17	29	41.5	37.5	MKX2AW42707E00_ _ _ _
3.3 „	17	34.5	31.5	27.5	MKX2AW43306I00_ _ _ _
	20	39.5	31.5	27.5	MKX2AW43306J00_ _ _ _
	15	26	41.5	37.5	MKX2AW43307D00_ _ _ _
	17	29	41.5	37.5	MKX2AW43307E00_ _ _ _
3.9 „	17	34.5	31.5	27.5	MKX2AW43906I00_ _ _ _
	17	29	41.5	37.5	MKX2AW43907E00_ _ _ _
	19	32	41.5	37.5	MKX2AW43907F00_ _ _ _
4.7 „	20	39.5	31.5	27.5	MKX2AW44706J00_ _ _ _
	19	32	41.5	37.5	MKX2AW44707F00_ _ _ _
	20	39.5	41.5	37.5	MKX2AW44707G00_ _ _ _
5.6 „	19	32	41.5	37.5	MKX2AW45607F00_ _ _ _
	20	39.5	41.5	37.5	MKX2AW45607G00_ _ _ _
6.8 „	20	39.5	41.5	37.5	MKX2AW46807G00_ _ _ _
	24	45.5	41.5	37.5	MKX2AW46807H00_ _ _ _
8.2 „	24	45.5	41.5	37.5	MKX2AW48207H00_ _ _ _
	31	46	41.5	37.5	MKX2AW48207I00_ _ _ _
10 µF	24	45.5	41.5	37.5	MKX2AW51007H00_ _ _ _
	31	46	41.5	37.5	MKX2AW51007I00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.8 ø if PCM ⩽ 27.5
d = 1.0 ø if PCM = 37.5



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

WIMA MKP-X1 R

Metallized Polypropylene (PP) RFI-Capacitors Class X1 with Internal Series Connection in PCM 10 mm to 37.5 mm. Capacitances from 1000 pF to 2.2 µF. Rated Voltage 440 VAC.

Special Features

- **Reliable self-healing**
- **Increased corona inception level due to internal series connection**
- **High degree of interference suppression due to good attenuation and low ESR**
- **According to RoHS 2011/65/EU**

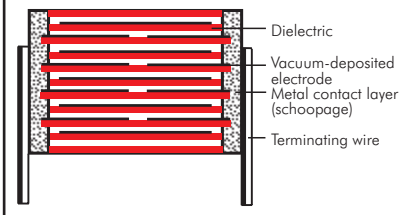
Typical Applications

Class X1 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase and neutral or phase and phase conductors**
- **High peak voltage applications, pulse peak voltage ⩽ 4 kV**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



PCM 10: triple series connection

Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V–0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1000 pF to 2.2 µF
Rated voltage: 440 VAC
Continuous DC voltage* (general guide): ⩽ 1000 V
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Passive flammability class:
B for capacitors with V > 1750 mm³
C for capacitors with V ⩽ 1750 mm³
Test specifications:
In accordance with IEC 60384-14
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 18 x 10^{-4}	⩽ 20 x 10^{-4}	⩽ 30 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 60 x 10^{-4}	–
100 kHz	⩽100 x 10^{-4}	–	–

Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1.5 x10^4 MΩ
C > 0.33 µF: ⩾ 5 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Maximum pulse rise time:
100 V/µsec for pulses equal to a voltage amplitude with $\sqrt{2}$ x 440 VAC = 623 V according to IEC 60384-14
Test voltage:
C ⩽ 1.0 µF: 2260 VDC, 2sec.
C > 1.0 µF: 1900 VDC, 2sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40041297
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

Mechanical Tests

Pull test on pins: 10 N in direction of pins according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$

if the DC operating voltage UDC is higher than $\sqrt{2}$ x UAC

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

WIMA MKP-X1 R

Continuation

General Data

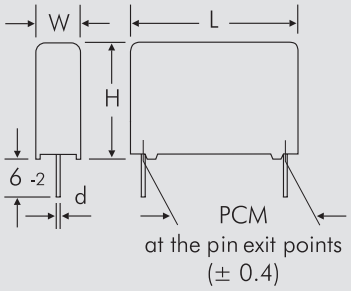
Capacitance	440 VAC*				
	W	H	L	PCM**	Part number
1000 pF	4	9.5	13	10	MKX14W11003D00_ _ _ _
1200 „	4	9.5	13	10	MKX14W11203D00_ _ _ _
1500 „	4	9.5	13	10	MKX14W11503D00_ _ _ _
1800 „	4	9.5	13	10	MKX14W11803D00_ _ _ _
2200 ″	4	9.5	13	10	MKX14W12203D00_ _ _ _
2700 „	4	9.5	13	10	MKX14W12703D00_ _ _ _
3300 ″	4	9.5	13	10	MKX14W13303D00_ _ _ _
3900 „	4	9.5	13	10	MKX14W13903D00_ _ _ _
4700 ″	5	11	13	10	MKX14W14703F00_ _ _ _
5600 „	5	11	13	10	MKX14W15603F00_ _ _ _
6800 „	6	12.5	13	10	MKX14W16803H00_ _ _ _
	5	11	18	15	MKX14W16804B00_ _ _ _
8200 „	6	12.5	13	10	MKX14W18203H00_ _ _ _
	5	11	18	15	MKX14W18204B00_ _ _ _
0.01 µF	8	12	13	10	MKX14W21003I00_ _ _ _
	5	11	18	15	MKX14W21004B00_ _ _ _
0.012 „	5	11	18	15	MKX14W21204B00_ _ _ _
0.015 „	5	11	18	15	MKX14W21504B00_ _ _ _
0.018 „	5	11	18	15	MKX14W21804B00_ _ _ _
0.022 „	6	12.5	18	15	MKX14W22204C00_ _ _ _
0.027 „	6	12.5	18	15	MKX14W22704C00_ _ _ _
0.033 „	8	15	18	15	MKX14W23304F00_ _ _ _
0.039 „	8	15	18	15	MKX14W23904F00_ _ _ _
0.047 „	8	15	18	15	MKX14W24704F00_ _ _ _
0.056 „	8	15	18	15	MKX14W25604F00_ _ _ _
0.068 „	9	16	18	15	MKX14W26804J00_ _ _ _
	6	15	26.5	22.5	MKX14W26805B00_ _ _ _
0.082 „	7	16.5	26.5	22.5	MKX14W28205D00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.6 ø if PCM = 10
d = 0.8 ø if PCM = 15 - 22.5



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 85

Continuation

General Data

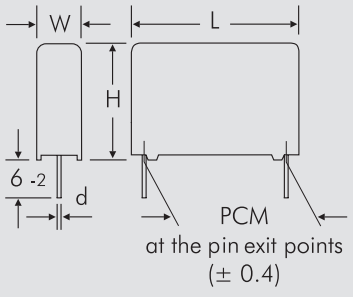
Capacitance	440 VAC* W	H	L	PCM**	Part number
0.1 µF	6	15	26.5	22.5	MKX14W31005B00_ _ _ _
	7	16.5	26.5	22.5	MKX14W31005D00_ _ _ _
0.12 „	7	16.5	26.5	22.5	MKX14W31205D00_ _ _ _
	8.5	18.5	26.5	22.5	MKX14W31205F00_ _ _ _
0.15 „	7	16.5	26.5	22.5	MKX14W31505D00_ _ _ _
	8.5	18.5	26.5	22.5	MKX14W31505F00_ _ _ _
	9	19	31.5	27.5	MKX14W31506A00_ _ _ _
0.18 „	8.5	18.5	26.5	22.5	MKX14W31805F00_ _ _ _
	10.5	19	26.5	22.5	MKX14W31805G00_ _ _ _
	9	19	31.5	27.5	MKX14W31806A00_ _ _ _
0.22 „	8.5	18.5	26.5	22.5	MKX14W32205F00_ _ _ _
	11	21	26.5	22.5	MKX14W32205I00_ _ _ _
	9	19	31.5	27.5	MKX14W32206A00_ _ _ _
0.27 „	10.5	19	26.5	22.5	MKX14W32705G00_ _ _ _
	9	19	31.5	27.5	MKX14W32706A00_ _ _ _
	11	21	31.5	27.5	MKX14W32706B00_ _ _ _
0.33 „	11	21	26.5	22.5	MKX14W33305I00_ _ _ _
	9	19	31.5	27.5	MKX14W33306A00_ _ _ _
	11	21	31.5	27.5	MKX14W33306B00_ _ _ _
	13	24	41.5	37.5	MKX14W33307C00_ _ _ _
0.39 „	11	21	31.5	27.5	MKX14W33906B00_ _ _ _
	13	24	31.5	27.5	MKX14W33906D00_ _ _ _
	13	24	41.5	37.5	MKX14W33907C00_ _ _ _
0.47 „	11	21	31.5	27.5	MKX14W34706B00_ _ _ _
	15	26	31.5	27.5	MKX14W34706F00_ _ _ _
	13	24	41.5	37.5	MKX14W34707C00_ _ _ _
0.56 „	13	24	31.5	27.5	MKX14W35606D00_ _ _ _
	15	26	31.5	27.5	MKX14W35606F00_ _ _ _
	13	24	41.5	37.5	MKX14W35607C00_ _ _ _
	15	26	41.5	37.5	MKX14W35607D00_ _ _ _
0.68 „	15	26	31.5	27.5	MKX14W36806F00_ _ _ _
	17	29	31.5	27.5	MKX14W36806G00_ _ _ _
	13	24	41.5	37.5	MKX14W36807C00_ _ _ _
	15	26	41.5	37.5	MKX14W36807D00_ _ _ _
	17	29	41.5	37.5	MKX14W36807E00_ _ _ _
0.82 „	15	26	31.5	27.5	MKX14W38206F00_ _ _ _
	17	34.5	31.5	27.5	MKX14W38206I00_ _ _ _
	13	24	41.5	37.5	MKX14W38207C00_ _ _ _
	17	29	41.5	37.5	MKX14W38207E00_ _ _ _
	19	32	41.5	37.5	MKX14W38207F00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.8 ø if PCM ⩽ 27.5
d = 1.0 ø if PCM = 37.5



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 86

Continuation

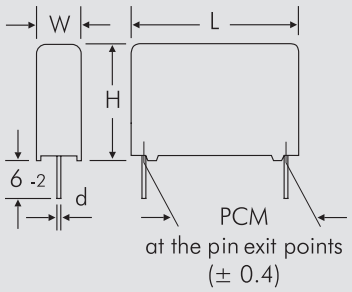
General Data

Capacitance	440 VAC* W	H	L	PCM**	Part number
1.0 µF	17	29	31.5	27.5	MKX14W41006G00_ _ _ _
	20	39.5	31.5	27.5	MKX14W41006J00_ _ _ _
	15	26	41.5	37.5	MKX14W41007D00_ _ _ _
	17	29	41.5	37.5	MKX14W41007E00_ _ _ _
	20	39.5	41.5	37.5	MKX14W41007G00_ _ _ _
1.2 „	17	34.5	31.5	27.5	MKX14W41206I00_ _ _ _
	17	29	41.5	37.5	MKX14W41207E00_ _ _ _
1.5 „	20	39.5	31.5	27.5	MKX14W41506J00_ _ _ _
	19	32	41.5	37.5	MKX14W41507F00_ _ _ _
1.8 „	19	32	41.5	37.5	MKX14W41807F00_ _ _ _
2.2 „	20	39.5	41.5	37.5	MKX14W42207G00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 149.	

d = 0.8 ø if PCM = 27.5
d = 1.0 ø if PCM = 37.5

WIMA MKP-Y2

Metallized Polypropylene (PP) RFI-Capacitors Class Y2 in PCM 10 mm to 37.5 mm. Capacitances from 1000 pF to 1.0 µF. Rated Voltage 300 VAC.

Special Features

- **Reliable self-healing**
- **High degree of interference suppression due to good attenuation and low ESR**
- **According to RoHS 2011/65/EU**

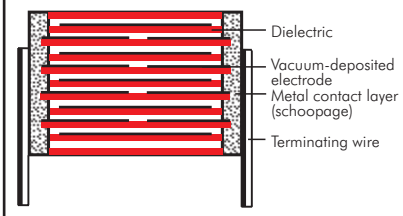
Typical Applications

Class Y2 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase or neutral and earthed casing**
- **By-passing of the basic or supplementary insulation, pulse peak voltage ⩽ 5 kV**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



PCM 10: triple series connection

Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1000 pF to 1.0 µF
Rated voltage: 300 VAC
Continuous DC voltage* (general guide): ⩽ 1000 V
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Passive flammability class:
B for capacitors with V > 1750 mm^3
C for capacitors with V ⩽ 1750 mm^3
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF
1 kHz	⩽ 18 x 10^{-4}	⩽ 20 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 60 x 10^{-4}
100 kHz	⩽100 x 10^{-4}	–

Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1.5 x10^4 MΩ
C > 0.33 µF: ⩾ 5 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test specifications:
In accordance with IEC 60384-14
Maximum pulse rise time:
100 V/µsec for pulses equal to a voltage amplitude with $\sqrt{2}$ x 300 VAC = 425 V according to IEC 60384-14
Test voltage: 2700 VDC, 2 sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40008997
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

Mechanical Tests

Pull test on pins: 10 N in direction of pins according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$

if the DC operating voltage UDC is higher than $\sqrt{2}$ x UAC

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

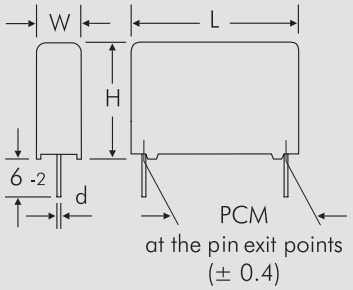
General Data

Capacitance	300 VAC* W	H	L	PCM**	Part number
1000 pF	4	9.5	13	10	MKY22W11003D00_ _ _ _
1200 „	4	9.5	13	10	MKY22W11203D00_ _ _ _
1500 „	4	9.5	13	10	MKY22W11503D00_ _ _ _
1800 „	4	9.5	13	10	MKY22W11803D00_ _ _ _
2200 „	4	9.5	13	10	MKY22W12203D00_ _ _ _
2700 „	4	9.5	13	10	MKY22W12703D00_ _ _ _
3300 „	4	9.5	13	10	MKY22W13303D00_ _ _ _
3900 „	4	9.5	13	10	MKY22W13903D00_ _ _ _
4700 „	5	11	13	10	MKY22W14703F00_ _ _ _
5600 „	5	11	13	10	MKY22W15603F00_ _ _ _
6800 „	6	12.5	13	10	MKY22W16803H00_ _ _ _
	5	11	18	15	MKY22W16804B00_ _ _ _
8200 „	6	12.5	13	10	MKY22W18203H00_ _ _ _
	5	11	18	15	MKY22W18204B00_ _ _ _
0.01 µF	8	12	13	10	MKY22W21003I00_ _ _ _
	5	11	18	15	MKY22W21004B00_ _ _ _
0.012 „	5	11	18	15	MKY22W21204B00_ _ _ _
0.015 „	5	11	18	15	MKY22W21504B00_ _ _ _
0.018 „	5	11	18	15	MKY22W21804B00_ _ _ _
0.022 „	6	12.5	18	15	MKY22W22204C00_ _ _ _
0.027 „	6	12.5	18	15	MKY22W22704C00_ _ _ _
0.033 „	8	15	18	15	MKY22W23304F00_ _ _ _
0.039 „	8	15	18	15	MKY22W23904F00_ _ _ _
0.047 „	8	15	18	15	MKY22W24704F00_ _ _ _
0.056 „	8	15	18	15	MKY22W25604F00_ _ _ _
0.068 „	9	16	18	15	MKY22W26804J00_ _ _ _
	6	15	26.5	22.5	MKY22W26805B00_ _ _ _
0.082 „	7	16.5	26.5	22.5	MKY22W28205D00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.6 ø if PCM = 10
d = 0.8 ø if PCM = 15 - 22.5

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

Continuation page 89

Continuation

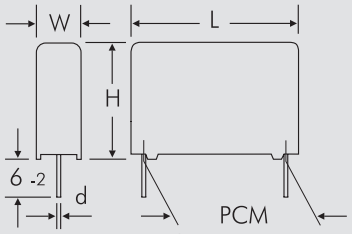
General Data

Capacitance	300 VAC* W	H	L	PCM**	Part number
0.1 µF	7	16.5	26.5	22.5	MKY22W31005D00_ _ _ _
0.12 „	8.5	18.5	26.5	22.5	MKY22W31205F00_ _ _ _
0.15 „	8.5	18.5	26.5	22.5	MKY22W31505F00_ _ _ _
	9	19	31.5	27.5	MKY22W31506A00_ _ _ _
0.18 „	10.5	19	26.5	22.5	MKY22W31805G00_ _ _ _
	9	19	31.5	27.5	MKY22W31806A00_ _ _ _
0.22 „	11	21	26.5	22.5	MKY22W32205I00_ _ _ _
	9	19	31.5	27.5	MKY22W32206A00_ _ _ _
0.27 „	11	21	31.5	27.5	MKY22W32706B00_ _ _ _
0.33 „	11	21	31.5	27.5	MKY22W33306B00_ _ _ _
	13	24	41.5	37.5	MKY22W33307C00_ _ _ _
0.39 „	13	24	31.5	27.5	MKY22W33906D00_ _ _ _
	13	24	41.5	37.5	MKY22W33907C00_ _ _ _
0.47 „	15	26	31.5	27.5	MKY22W34706F00_ _ _ _
	13	24	41.5	37.5	MKY22W34707C00_ _ _ _
0.56 „	15	26	31.5	27.5	MKY22W35606F00_ _ _ _
	13	24	41.5	37.5	MKY22W35607C00_ _ _ _
	15	26	41.5	37.5	MKY22W35607D00_ _ _ _
0.68 „	17	29	31.5	27.5	MKY22W36806G00_ _ _ _
	15	26	41.5	37.5	MKY22W36807D00_ _ _ _
	17	29	41.5	37.5	MKY22W36807E00_ _ _ _
0.82 „	17	34.5	31.5	27.5	MKY22W38206I00_ _ _ _
	17	29	41.5	37.5	MKY22W38207E00_ _ _ _
	19	32	41.5	37.5	MKY22W38207F00_ _ _ _
1.0 µF	20	39.5	31.5	27.5	MKY22W41006J00_ _ _ _
	17	29	41.5	37.5	MKY22W41007E00_ _ _ _
	20	39.5	41.5	37.5	MKY22W41007G00_ _ _ _

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.8 ø if PCM ⩽ 27.5
d = 1.0 ø if PCM = 37.5

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 149.	

WIMA MP 3-X2

Metallized Paper (MP) RFI-Capacitors Class X2 in PCM 10 mm to 27.5 mm. Capacitances from 1000 pF to 1.0 µF. Rated Voltages 250 VAC and 275 VAC.

Special Features

- **Particularly high reliability against active and passive flammability**
- **Excellent self-healing as well as high voltage strength**
- **High degree of interference suppression due to good attenuation and low ESR**
- **For temperatures up to +110° C**
- **According to RoHS 2011/65/EU**

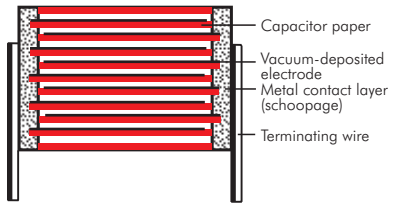
Typical Applications

Class X2 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase and neutral or phase and phase conductors**
- **General requirements, pulse peak voltage ⩽ 2.5 kV**

Construction

Dielectric:
Paper, epoxy resin impregnated
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Self-extinguishing epoxy resin, UL 94 V-0, metal foil
Terminations:
Tinned wire.
Marking:
Marking: Black on Silver.

Electrical Data

Capacitance range:
1000 pF to 1.0 µF (E12-values on request)
Rated voltages: 250 VAC, 275 VAC
Continuous DC voltage* (general guide):
⩽ 630 V
Capacitance tolerances: ±20%
Operating temperature range:
–40° C to +110° C
Climatic test category:
40/110/56/C in accordance with IEC
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 12 x 10^3 MΩ
C > 0.33 µF: ⩾ 4000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Dissipation factors:
tan δ ⩽ 13 x 10^{-3} at 1 kHz and +20° C
Test specifications:
In accordance with IEC 60384-14

Maximum pulse rise time:

Capacitance pF/µF	Pulse rise time V/µsec max. operation
1000 ... 0.068	1500
0.1 ... 0.33	750
0.47	500
0.68 ... 1.0	250

for pulses equal to a voltage amplitude with $\sqrt{2}$ x UAC = 390 V
according to IEC 60384-14
Test voltage: 1300 VDC, 2 sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14	EN 60384-14	89749
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14	c UL us	E 100438

Mounting Recommendation

To minimize or avoid shock and/or vibration stresses to terminating wires and solder connections we recommend to fix voluminous resin-potted MP capacitors as from e.g. PCM 22.5 mm in an appropriate way since for constructional reasons they do not sit tight on the board.

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$

if the DC operating voltage UDC is higher than $\sqrt{2}$ x UAC

Packing

Available taped and reeled up to and including PCM 22.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	250 VAC*					275 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	8.5	13.5	10	MPX20W1100FA00____	4	8.5	13.5	10	MPX21W1100FA00____
1500 „	4	8.5	13.5	10	MPX20W1150FA00____	4	8.5	13.5	10	MPX21W1150FA00____
2200 „	4	8.5	13.5	10	MPX20W1220FA00____	4	8.5	13.5	10	MPX21W1220FA00____
3300 „	4	8.5	13.5	10	MPX20W1330FA00____	4	8.5	13.5	10	MPX21W1330FA00____
4700 „	5	10	13.5	10	MPX20W1470FB00____	5	10	13.5	10	MPX21W1470FB00____
6800 „	5	13	19	15	MPX20W1680FC00____	5	13	19	15	MPX21W1680FC00____
0.01 µF	5	13	19	15	MPX20W2100FC00____	5	13	19	15	MPX21W2100FC00____
0.015 „	5	13	19	15	MPX20W2150FC00____	5	13	19	15	MPX21W2150FC00____
0.022 „	5	13	19	15	MPX20W2220FC00____	5	13	19	15	MPX21W2220FC00____
0.033 „	6	14	19	15	MPX20W2330FD00____	6	14	19	15	MPX21W2330FD00____
0.047 „	7	15	19	15	MPX20W2470FE00____	7	15	19	15	MPX21W2470FE00____
0.068 „	8	17	19	15	MPX20W2680FF00____	8	17	19	15	MPX21W2680FF00____
0.1 µF	10	18	19	15	MPX20W3100FG00____	10	18	19	15	MPX21W3100FG00____
	8	20	28	22.5	MPX20W3100FH00____	8	20	28	22.5	MPX21W3100FH00____
0.15 „	8	20	28	22.5	MPX20W3150FH00____	8	20	28	22.5	MPX21W3150FH00____
0.22 „	10	22	28	22.5	MPX20W3220FI00____	10	22	28	22.5	MPX21W3220FI00____
0.33 „	12	24	28	22.5	MPX20W3330FJ00____	12	24	28	22.5	MPX21W3330FJ00____
0.47 „	13	25	33	27.5	MPX20W3470FK00____	13	25	33	27.5	MPX21W3470FK00____
0.68 „	15	26	33	27.5	MPX20W3680FL00____	15	26	33	27.5	MPX21W3680FL00____
1.0 µF	20	32	33	27.5	MPX20W4100FM00____	20	32	33	27.5	MPX21W4100FM00____

* f = 50/60 Hz

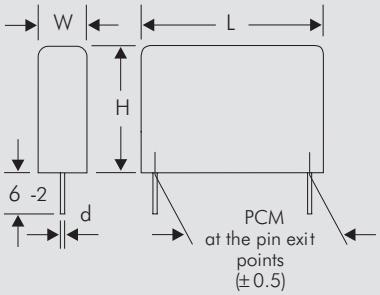
** PCM = Printed circuit module = pin spacing

Upon request with long pins 35-2 mm max.

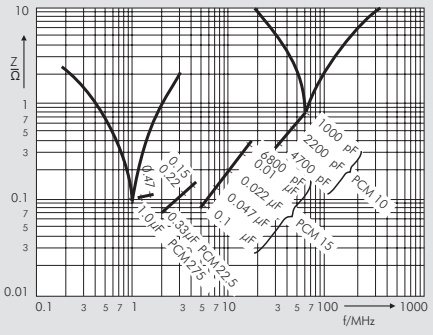
Dims. in mm.

Part number completion:	
Tolerance:	20 % = M
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.



d = 0.6 ø if PCM 10
d = 0.8 ø if PCM ⩾ 15



Impedance change with frequency (general guide)

WIMA MP 3-X1

Metallized Paper (MP) RFI-Capacitors Class X1 in PCM 10 mm to 27.5 mm. Capacitances from 1000 pF to 0.22 µF. Rated Voltages from 300 VAC to 500 VAC.

Special Features

- **Particularly high reliability against active and passive flammability**
- **Excellent self-healing as well as high voltage strength**
- **High degree of interference suppression due to good attenuation and low ESR**
- **For temperatures up to +110° C**
- **According to RoHS 2011/65/EU**

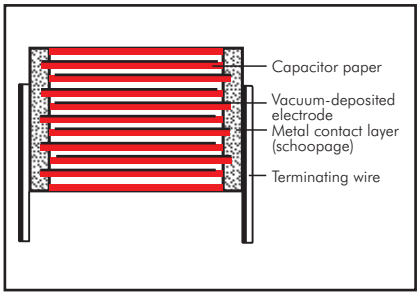
Typical Applications

Class X1 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase and neutral or phase and phase conductors**
- **High peak voltage applications, pulse peak voltage ⩽ 4 kV**

Construction

Dielectric:
Paper, epoxy resin impregnated
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Self-extinguishing epoxy resin, UL 94 V-0, metal foil
Terminations:
Tinned wire.
Marking:
Marking: Black on Silver.

Electrical Data

Capacitance range:
1000 pF to 0.22 µF (E12-values on request)
Rated voltages:
300 VAC, 440 VAC, 500 VAC
Continuous DC voltage* (general guide):
⩽ 730 V for 300 VAC
⩽ 850 V for 440 VAC and 500 VAC
Capacitance tolerances: ±20%
Operating temperature range:
–40° C to +110° C
Climatic test category:
40/110/56/C in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 12 \times 10^3$ MΩ
Measuring voltage:
100 V/1 min. for 300 VAC and 440 VAC
500 V/1 min. for 500 VAC
Dissipation factors:
tan δ ⩽ 13×10^{-3} at 1 kHz and +20° C
Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14	DVE EN 60384-14	101355 (440/500 VAC) 89748 (300 VAC)
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14	c UL us	E 100438 (300 VAC)

Test specifications:
In accordance with IEC 60384-14
Maximum pulse rise time:

Capacitance pF/µF	Pulse rise time V/µsec max. operation
1000 ... 4700	2500
6800 ... 0.022	1750
0.033 ... 0.15	750
0.22	500

for pulses equal to a voltage amplitude
with $\sqrt{2} \times 300$ VAC = 425 V,
with $\sqrt{2} \times 440$ VAC = 623 V,
with $\sqrt{2} \times 500$ VAC = 707 V
according to IEC 60384-14
Test voltage: 2300 VDC, 2 sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)

Mounting Recommendation

To minimize or avoid shock and/or vibration stresses to terminating wires and solder connections we recommend to fix voluminous resin-potted MP capacitors as from e.g. PCM 22.5 mm in an appropriate way since for constructional reasons they do not sit tight on the board.

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$

if the DC operating voltage UDC is higher than $\sqrt{2} \times UAC$

Packing

Available taped and reeled up to and including PCM 22.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

WIMA MP 3-X1

Continuation

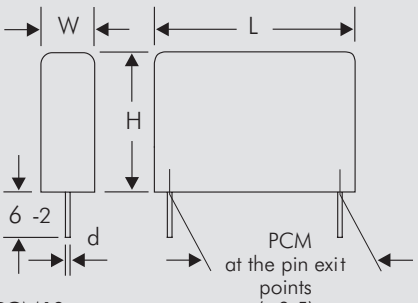
General Data

Capacitance	300 VAC* W	H	L	PCM**	Part number	440 VAC* W	H	L	PCM**	Part number
1000 pF	4	8.5	13.5	10	MPX12W1100FA00____					
1500 „	4	8.5	13.5	10	MPX12W1150FA00____					
2200 „	4	8.5	13.5	10	MPX12W1220FA00____					
3300 „	4	8.5	13.5	10	MPX12W1330FA00____					
4700 „	5	10	13.5	10	MPX12W1470FB00____					
6800 „	5	13	19	15	MPX12W1680FC00____	5	13	19	15	MPX14W1680FC00____
0.01 µF	5	13	19	15	MPX12W2100FC00____	5	13	19	15	MPX14W2100FC00____
0.015 „	6	14	19	15	MPX12W2150FD00____	6	14	19	15	MPX14W2150FD00____
0.022 „	7	15	19	15	MPX12W2220FE00____	7	15	19	15	MPX14W2220FE00____
0.033 „	8	17	19	15	MPX12W2330FF00____	10	18	19	15	MPX14W2330FG00____
0.047 „	10	18	19	15	MPX12W2470FG00____					
0.068 „	8	20	28	22.5	MPX12W2680FH00____					
0.1 µF	10	22	28	22.5	MPX12W3100FI00____					
0.15 „	12	24	28	22.5	MPX12W3150FJ00____					
0.22 „	13	25	33	27.5	MPX12W3220FK00____					

Capacitance	500 VAC* W	H	L	PCM**	Part number
6800 pF	5	13	19	15	MPX15W1680FC00____
0.01 µF	5	13	19	15	MPX15W2100FC00____
0.015 „	6	14	19	15	MPX15W2150FD00____
0.022 „	7	15	19	15	MPX15W2220FE00____
0.033 „	10	18	19	15	MPX15W2330FG00____

** PCM = Printed circuit module = pin spacing

Upon request with long pins 35-2 mm max.



d = 0.6 ø if PCM10
d = 0.8 ø if PCM≥15

* f = 50/60 Hz

Dims in mm.

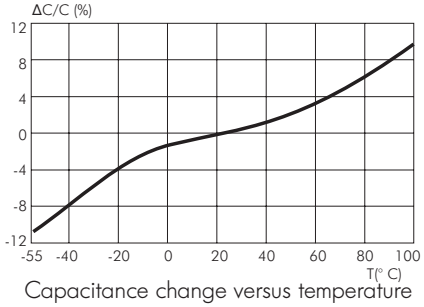
Part number completion:	
Tolerance:	20 % = M
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 149.

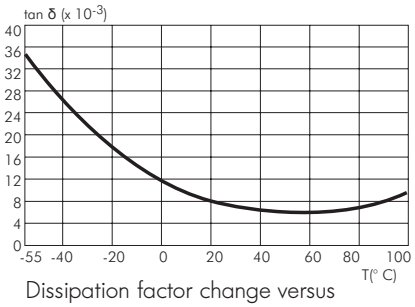
Typical Graphs of the Capacitor Paper Dielectric

valid for:

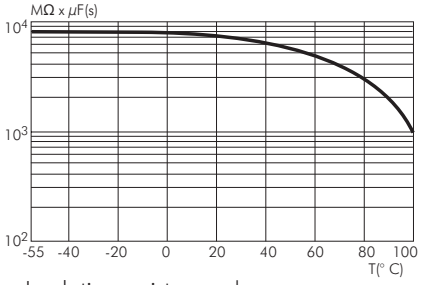
- MP 3-X2
- MP 3-X1
- MP 3-Y2 / 3R-Y2



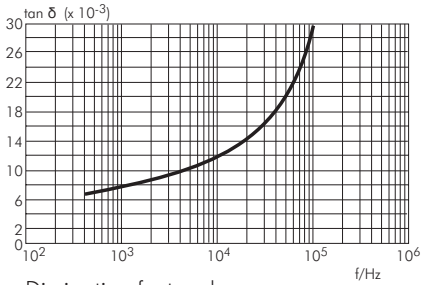
Capacitance change versus temperature (f=1 kHz) (general guide)



Dissipation factor change versus temperature (f= 1 kHz) (general guide)



Insulation resistance change versus temperature (general guide)



Dissipation factor change versus frequency (general guide).

WIMA MP 3-Y2 / 3R-Y2

Metallized Paper (MP) RFI-Capacitors Class Y2 in PCM 10 mm to 27.5 mm. Capacitances from 1000 pF to 0.1 µF. Rated Voltages 250 VAC and 300 VAC.

Special Features

- **Particularly high reliability against active and passive flammability**
- **Excellent self-healing as well as high voltage strength**
- **Twice the safety by internal series connection (300 VAC)**
- **High degree of interference suppression due to good attenuation and low ESR**
- **For temperatures up to +110° C**
- **According to RoHS 2011/65/EU**

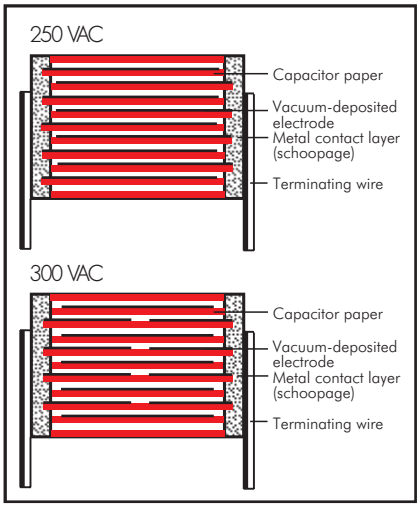
Typical Applications

Class Y2 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase or neutral and earthed casing**
- **By-passing of the basic or supplementary insulation, pulse peak voltage ⩽ 5 kV**

Construction

Dielectric:
Paper, epoxy resin impregnated
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Self-extinguishing epoxy resin, UL 94 V-0.
metal foil
Terminations:
Tinned wire.
Marking:
Marking: Black on Silver.

Electrical Data

Capacitance range:
1000 pF to 0.1 µF (E12-values on request)
Rated voltages:
250 VAC, 300 VAC
Continuous DC voltage* (general guide):
250 VAC: ⩽ 1000 V
300 VAC: ⩽ 1250 V
Capacitance tolerances: ±20%
Operating temperature range:
–40° C to +110° C
Climatic test category:
250 VAC: 40/110/56/C
300 VAC: 40/110/56/B
in accordance with IEC
Insulation resistance at +20° C:
⩾ 12 x 10^3 MΩ
Measuring voltage: 100 V/1 min.
Dissipation factors:
tan δ ⩽ 13 x 10^{-3} at 1 kHz and +20° C
Test specifications:
in accordance with IEC 60384-14
Approvals:

Country	Authority	Specification	Symbol 250 VAC	Symbol 300 VAC	Approval-No. 250 VAC	Approval-No. 300 VAC
Germany	VDE	IEC 60384-14	EN 60384-14	10	87455	40032534
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14	c US	c US	E 100438	E 100438

Maximum pulse rise time 250 VAC:

Capacitance pF/µF	Pulse rise time V/µsec max. operation
1000 ... 4700	2500
6800 ... 0.022	1750

Maximum pulse rise time 300 VAC:

Capacitance pF/µF	Pulse rise time V/µsec max. operation
1000 ... 4700	2500
6800 ... 0.015	1850
0.022 ... 0.1	600

for pulses equal to a voltage amplitude
with $\sqrt{2}$ x 250 VAC = 355 V
with $\sqrt{2}$ x 300 VAC = 425 V
according to IEC 60384-14
Test voltage: 2400 VDC, 2sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins: 10 N in direction of pins according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$

if the DC operating voltage UDC is higher than $\sqrt{2}$ x UAC

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

WIMA MP 3-Y2 / 3R-Y2

Continuation

General Data

Capacitance	250 VAC*					300 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	8.5	13.5	10	MPY20W1100FA00_ _ _ _	5	13	19	15	MPRY2W1100FC00_ _ _ _
1500 „	4	8.5	13.5	10	MPY20W1150FA00_ _ _ _	5	13	19	15	MPRY2W1150FC00_ _ _ _
2200 „	4	8.5	13.5	10	MPY20W1220FA00_ _ _ _	5	13	19	15	MPRY2W1220FC00_ _ _ _
3300 „	4	8.5	13.5	10	MPY20W1330FA00_ _ _ _	5	13	19	15	MPRY2W1330FC00_ _ _ _
4700 „	5	10	13.5	10	MPY20W1470FB00_ _ _ _	6	14	19	15	MPRY2W1470FD00_ _ _ _
6800 „	5	13	19	15	MPY20W1680FC00_ _ _ _	7	15	19	15	MPRY2W1680FE00_ _ _ _
0.01 µF	5	13	19	15	MPY20W2100FC00_ _ _ _	8	17	19	15	MPRY2W2100FF00_ _ _ _
0.015 „	6	14	19	15	MPY20W2150FD00_ _ _ _	10	18	19	15	MPRY2W2150FG00_ _ _ _
0.022 „	7	15	19	15	MPY20W2220FE00_ _ _ _	8	20	28	22.5	MPRY2W2220FH00_ _ _ _
0.033 „						8	20	28	22.5	MPRY2W2330FH00_ _ _ _
0.047 „						10	22	28	22.5	MPRY2W2470FI00_ _ _ _
0.068 „						12	24	28	22.5	MPRY2W2680FJ00_ _ _ _
0.1 µF						13	25	33	27.5	MPRY2W3100FK00_ _ _ _

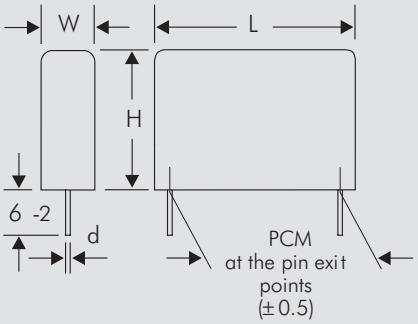
* f = 50/60 Hz

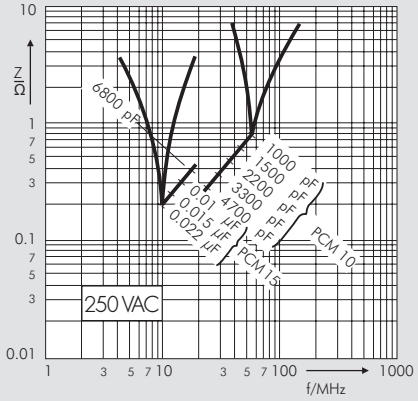
** PCM = Printed circuit module = pin spacing

Upon request with long pins 35-2 mm max.

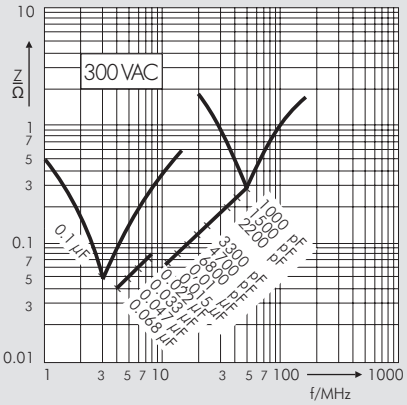
Dims. in mm.

d = 0.6 Ø if PCM 10
d = 0.8 Ø if PCM ⩾15





Impedance change with frequency (general guide)



Impedance change with frequency (general guide)

Part number completion:	
Tolerance:	20 % = M
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 149.	

WIMA MKP 4F

Due to their typical circuit position AC filter capacitors have to exhibit good high-frequency characteristics and at the same time high AC voltage capabilities. They in general fulfil two requirements:

- Low AC impedance to dissipate high-frequency interference signals
- Attenuation of transient voltage pulses caused e.g. by switching.

WIMA filter capacitors are designed on the basis of low-loss Polypropylene film and exhibit high AC current capability at high frequencies as well as low ESL and ESR values.

They are available with capacitances from 0.68 µF up to 75 µF and rated voltages of 250 VAC, 275 VAC, 305 VAC, 350 VAC and 440 VAC for an operational temperature range of -55° C to +105° C. The 440 VAC range has an internal series connection and stands out for an increased corona discharge inception voltage.

Their metallized construction, i.e. a thin aluminium layer serving as electrode being vapour-deposited onto the insulating film, entails very good self-healing properties of WIMA filter capacitors in case of a dielectric breakdown. The short-circuit current causes the thin metal layer to vaporize around the discharge channel and thus forming an insulating "halo". The capacitor remains fully operative.

Further positive features are the dry construction and thus the waiver of additional impregnating agents, the very favourable capacitance/volume ratio and the long life time at high capacitance long-term stability even under demanding operating conditions.

WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2011/65/EU regulations of the European Union.

WIMA MKP 4F

Metallized Polypropylen (PP) Filter Capacitors in PCM 27.5 mm to 52.5 mm. Capacitances from 0.68 µF to 75 µF. Rate Voltages from 230 VAC to 440 VAC.

Special Features

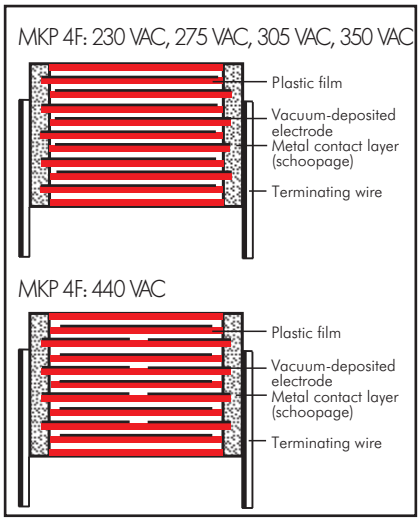
- **High volume/capacitance ratio**
- **High peak current capabilities**
- **Self-healing**
- **Long lifetime**
- **According to RoHS 2011/65/EU**

Typical Applications

For high frequency applications e.g.
- **AC filtering in UPS systems**
- **Harmonic filter**
- **Welding equipment**
- **Renewable energy - grid interface**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
0.68 µF to 75 µF
Rated voltages: 230 VAC, 275 VAC, 305 VAC, 350 VAC, 440 VAC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Insulation resistance at +20° C:
⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage:
1.5 $U_{r\,DC}$, 10sec.
Test specifications:
In accordance with IEC 61071 and 60068
Dissipation factors at +20° C: tan δ

at f	PCM 27.5	PCM 37.5	PCM 52.5
1 kHz	⩽ 5 x 10^{-4}	⩽ 10 x 10^{-4}	⩽ 15 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 45 x 10^{-4}	⩽ 90 x 10^{-4}

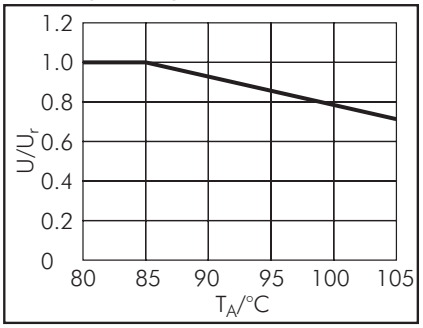
Reference frequency 1 kHz in accordance with IEC 60384-1

Maximum pulse rise time:

PCM	max. pulse rise time V/µsec at T_A < 40° C				
	230 VAC	275 VAC	305 VAC	350 VAC	440 VAC
27.5	45	55	68	100	110
37.5	20	30	35	50	70
52.5	10	13	15	25	40

for pulses equal to the rated voltage ($U_{r\,DC}$)

Voltage derating:
A voltage derating factor must be applied according to the graph:



Reliability:
Operational life > 60 000 hours at U_r
Failure rate < 10 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	230 VAC*/450 VDC I_S A	I_{rms} (10 kHz) at 85° C A	Part number
1.0 µF	9	19	31.5	27.5	2	45	2.5	MKPF3Y41006A_____
1.5 „	11	21	31.5	27.5	2/4	70	3	MKPF3Y41506B_____
2.2 „	11	21	31.5	27.5	2/4	100	3.5	MKPF3Y42206B_____
3.3 „	13	24	31.5	27.5	2/4	150	5	MKPF3Y43306D_____
4.7 „	15	26	31.5	27.5	2/4	210	7.5	MKPF3Y44706F_____
6.8 „	17	29	31.5	27.5	2/4	300	8.5	MKPF3Y46806G_____
10 µF	20	39.5	31.5	27.5	2/4	450	11.5	MKPF3Y51006J_____
	19	32	41.5	37.5	2/4	200	8	MKPF3Y51007F_____
12 „	19	32	41.5	37.5	2/4	240	10	MKPF3Y51207F_____
15 „	20	39.5	41.5	37.5	2/4	300	12	MKPF3Y51507G_____
20 „	24	45.5	41.5	37.5	2/4	400	14	MKPF3Y52007H_____
22 „	24	45.5	41.5	37.5	2/4	440	15	MKPF3Y52207H_____
25 „	31	46	41.5	37.5	2/4	500	17	MKPF3Y52507I_____
30	31	46	41.5	37.5	2/4	600	19	MKPF3Y53007I_____
	25	45	57	52.5	2/4	300	15	MKPF3Y53009D_____
35 „	35	50	41.5	37.5	2/4	700	20.5	MKPF3Y53507J_____
	25	45	57	52.5	2/4	350	15	MKPF3Y53509D_____
40 „	30	45	57	52.5	2/4	400	17.5	MKPF3Y54009E_____
45 „	30	45	57	52.5	2/4	450	18.5	MKPF3Y54509E_____
50 „	35	50	57	52.5	4	500	21	MKPF3Y55009F_____
55 „	35	50	57	52.5	4	550	22	MKPF3Y55509F_____
60 „	45	55	57	52.5	4	600	23	MKPF3Y56009H_____
65 „	45	55	57	52.5	4	650	25.5	MKPF3Y56509H_____
70 „	45	55	57	52.5	4	700	26	MKPF3Y57009H_____
75 „	45	65	57	52.5	4	750	27	MKPF3Y57509J_____

* AC voltages: f ⩽ 100 Hz

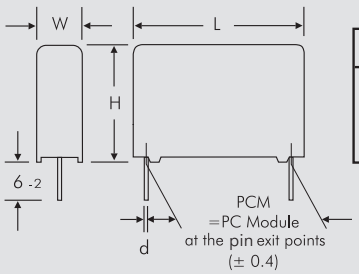
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

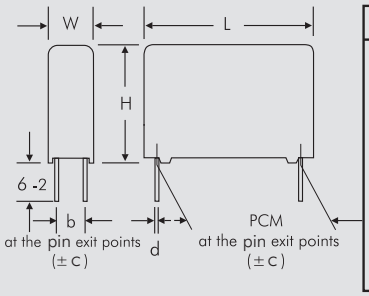
Taped version see page 149.

2-pin version



ø d	PCM
0.8	27.5
1.0	37.5
1.2	52.5

4-pin version



W	PCM	b	ø d	c
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
25	52.5	20	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 99

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	275 VAC*/600 VDC I_S A	275 VAC*/600 VDC I_{rms} (10 kHz) at 85° C A	Part number
1.0 µF	9	19	31.5	27.5	2	55	2.5	MKPF1W41006A_____
1.5 „	11	21	31.5	27.5	2/4	80	3.5	MKPF1W41506B_____
2.2 „	13	24	31.5	27.5	2/4	120	5	MKPF1W42206D_____
3.3 „	15	26	31.5	27.5	2/4	180	5.5	MKPF1W43306F_____
4.7 „	17	34.5	31.5	27.5	2/4	260	8	MKPF1W44706I_____
6.8 „	20	39.5	31.5	27.5	2/4	370	10	MKPF1W46806J_____
10 µF	20	39.5	41.5	37.5	2/4	300	10	MKPF1W51007G_____
12 „	20	39.5	41.5	37.5	2/4	360	12	MKPF1W51207G_____
15 „	24	45.5	41.5	37.5	2/4	450	14	MKPF1W51507H_____
	25	45	57	52.5	2/4	195	11	MKPF1W51509D_____
20 „	31	46	41.5	37.5	2/4	600	16	MKPF1W52007I_____
	25	45	57	52.5	2/4	260	12	MKPF1W52009D_____
22 „	25	45	57	52.5	2/4	286	14	MKPF1W52209D_____
25 „	30	45	57	52.5	2/4	325	16	MKPF1W52509E_____
30	35	50	57	52.5	4	390	17	MKPF1W53009F_____
35 „	35	50	57	52.5	4	455	20	MKPF1W53509F_____
40 „	45	55	57	52.5	4	520	21	MKPF1W54009H_____
45 „	45	55	57	52.5	4	585	23	MKPF1W54509H_____
50 „	45	65	57	52.5	4	650	24	MKPF1W55009J_____

* AC voltages: f ⩽ 100 Hz

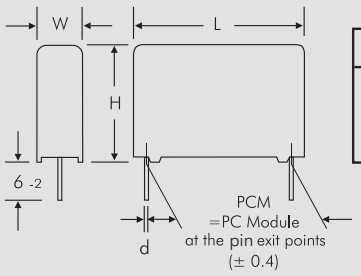
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

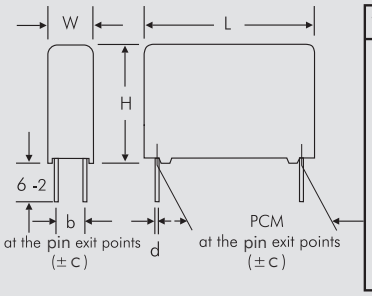
Taped version see page 149.

2-pin version



ø d	PCM
0.8	27.5
1.0	37.5
1.2	52.5

4-pin version



W	PCM	b	ø d	c
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
25	52.5	20	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 100

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	305 VAC*/630 VDC I_S A	I_{rms} (10 kHz) at 85° C A	Part number
0.68 µF	9	19	31.5	27.5	2	50	2	MKPFAW36806A_____
1.0 µF	11	21	31.5	27.5	2/4	68	3	MKPFAW41006B_____
1.5 „	13	24	31.5	27.5	2/4	110	4	MKPFAW41506D_____
2.2 „	15	26	31.5	27.5	2/4	150	5	MKPFAW42206F_____
3.3 „	17	29	31.5	27.5	2/4	220	7	MKPFAW43306G_____
4.7 „	20	39.5	31.5	27.5	2/4	320	9	MKPFAW44706J_____
6.8 „	20	39.5	41.5	37.5	2/4	245	10	MKPFAW46807G_____
10 µF	24	45.5	41.5	37.5	2/4	350	12	MKPFAW51007H_____
	25	45	57	52.5	2/4	150	10	MKPFAW51009D_____
12 „	24	45.5	41.5	37.5	2/4	420	13	MKPFAW51207H_____
15 „	31	46	41.5	37.5	2/4	525	15	MKPFAW51507I_____
	25	45	57	52.5	2/4	225	13	MKPFAW51509D_____
20 „	40	55	41.5	37.5	2/4	700	19	MKPFAW52007K_____
	30	45	57	52.5	2/4	300	14	MKPFAW52009E_____
22 „	35	50	57	52.5	4	330	16	MKPFAW52209F_____
25 „	35	50	57	52.5	4	375	17	MKPFAW52509F_____
30	45	55	57	52.5	4	450	21	MKPFAW53009H_____
35 „	45	65	57	52.5	4	525	22	MKPFAW53509J_____

* AC voltages: f ⩽ 100 Hz

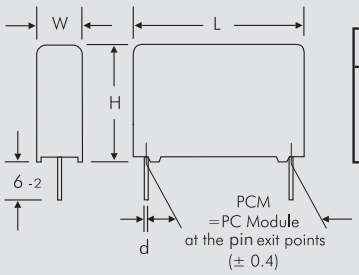
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

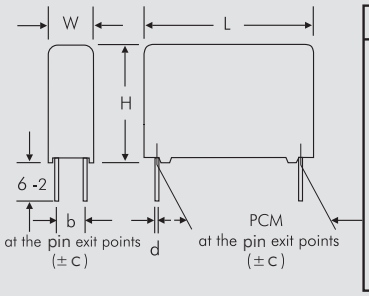
Taped version see page 149.

2-pin version



ø d	PCM
0.8	27.5
1.0	37.5
1.2	52.5

4-pin version



W	PCM	b	ø d	c
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
25	52.5	20	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 101

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz) at 85° C A	Part number
				350 VAC*/700 VDC				
0.68 µF	9	19	31.5	27.5	2	70	1.5	MKPFBW36806A_____
1.0 µF	11	21	31.5	27.5	2/4	100	3	MKPFBW41006B_____
1.5 „	13	24	31.5	27.5	2/4	150	4	MKPFBW41506D_____
2.2 „	15	26	31.5	27.5	2/4	220	5	MKPFBW42206F_____
3.3 „	17	29	31.5	27.5	2/4	330	7	MKPFBW43306G_____
4.7 „	20	39.5	31.5	27.5	2/4	470	11	MKPFBW44706J_____
6.8 „	20	39.5	41.5	37.5	2/4	340	10	MKPFBW46807G_____
10 µF	24	45.5	41.5	37.5	2/4	500	13	MKPFBW51007H_____
	25	45	57	52.5	2/4	250	11	MKPFBW51009D_____
12 „	24	45.5	41.5	37.5	2/4	600	14	MKPFBW51207H_____
15 „	31	46	41.5	37.5	2/4	750	16	MKPFBW51507I_____
	25	45	57	52.5	2/4	375	13	MKPFBW51509D_____
20 „	40	55	41.5	37.5	2/4	1000	18	MKPFBW52007K_____
	30	45	57	52.5	2/4	500	16	MKPFBW52009E_____
22 „	35	50	57	52.5	4	550	18	MKPFBW52209F_____
25 „	35	50	57	52.5	4	625	19	MKPFBW52509F_____
30	45	55	57	52.5	4	750	22	MKPFBW53009H_____
35 „	45	65	57	52.5	4	870	25	MKPFBW53509J_____

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz) at 85° C A	Part number
				440 VAC*/1000 VDC				
0.68 „	13	24	31.5	27.5	2/4	74.8	3	MKPF4W36806D_____
1.0 µF	13	24	31.5	27.5	2/4	110	4	MKPF4W41006D_____
1.5 „	17	29	31.5	27.5	2/4	165	5	MKPF4W41506G_____
2.2 „	20	39.5	31.5	27.5	2/4	240	6	MKPF4W42206J_____
3.3 „	20	39.5	41.5	37.5	2/4	230	7.5	MKPF4W43307G_____
4.7 „	24	45.5	41.5	37.5	2/4	330	8.5	MKPF4W44707H_____
6.8 „	31	46	41.5	37.5	2/4	480	11.5	MKPF4W46807I_____
10 µF	30	45	57	52.5	2/4	400	16	MKPF4W51009E_____
12 „	35	50	57	52.5	4	480	17	MKPF4W51209F_____

* AC voltages: f ⩽ 100 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

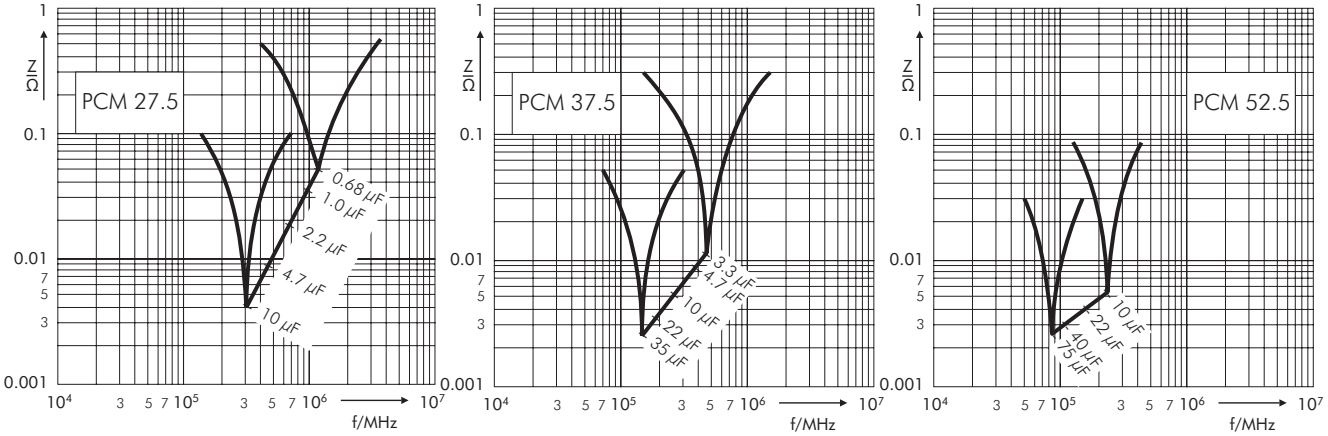
Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

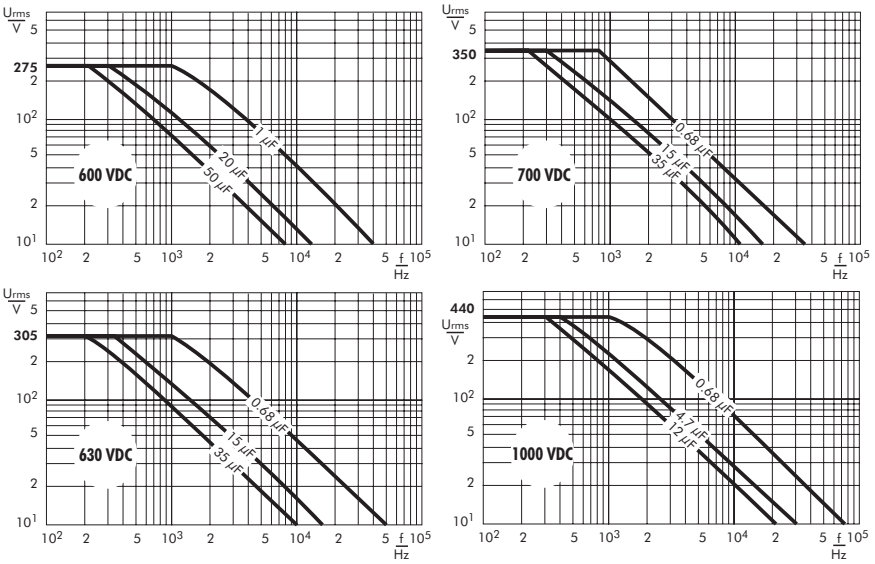
Continuation page 102

Continuation

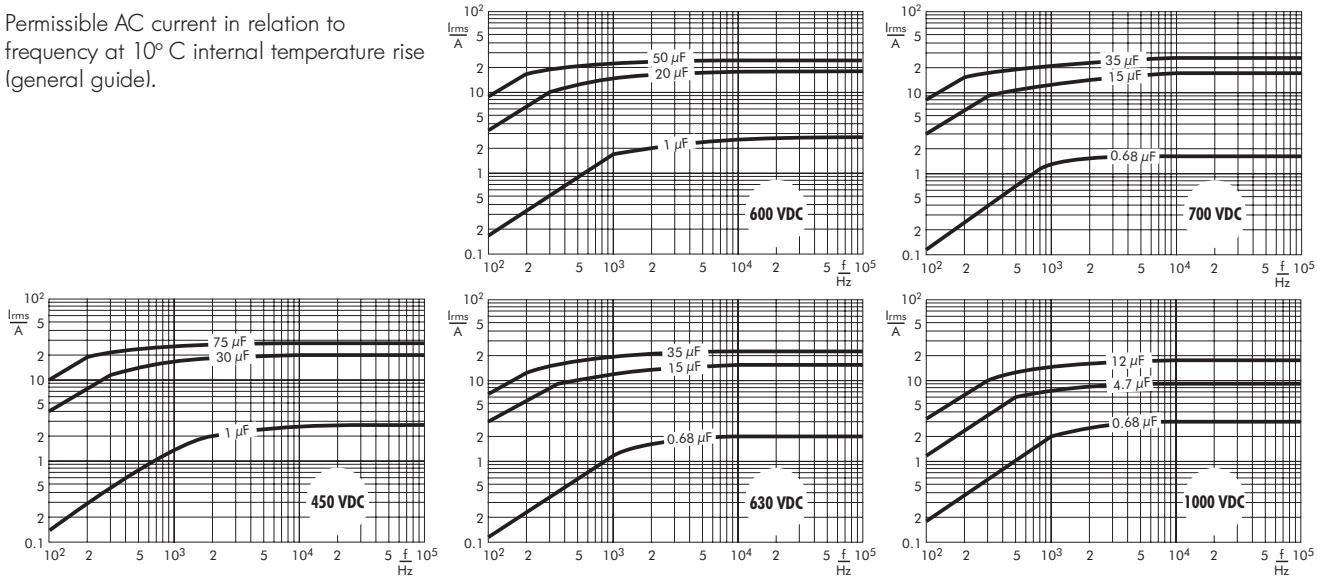
Impedance change with frequency (general guide).



Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



Permissible AC current in relation to frequency at 10° C internal temperature rise (general guide).



WIMA Snubber Capacitors with Plates or Lead Terminations for Best Contacts

- Low inductance construction achieved by end-surface contacts
- High pulse reliability due to double-sided metallization and/or film/foil construction
- High voltage/overvoltage strength by internal series connection with self-healing metallized floating electrode
- Available in various contact configurations
- Solvent-resistant, flame retardant plastic case in accordance with UL 94 V-0
- Production sites ISO 9001:2015 certified

WIMA Snubber capacitors are manufactured under conditions of large volume production, but are also available in small quantities as individually configurable high-rel. components.

WIMA Snubber capacitors are available with capacitances from 0.01 µF through 8.0 µF and with rated voltages from 630 VDC through 4000 VDC.

All components are environmentally compatible with the RoHS 2011/65/EU regulations of the European Union.

WIMA Snubber MKP
WIMA Snubber FKP

Development of the WIMA Snubber MKP and WIMA Snubber FKP capacitor series for high power conversion is based on decades of experience with Polypropylene film pulse capacitors.

WIMA Snubber capacitors are available both as double-sided metallized pulse version – WIMA Snubber MKP – and for extremly high pulse ratings in self-healing film/foil technology – WIMA Snubber FKP. Their electrical performance as well as the manifold number of available connecting options makes the WIMA Snubber technology unique:

- Plates soldered directly to the schoopage for safe contacts at high rms currents

WIMA Snubber MKP

Snubber MKP Capacitors for Pulse Applications with Double-Sided Metallized Electrodes and Internal Series Connection. Capacitances from 0.047 µF to 8.0 µF. Rated Voltages from 700 VDC to 3000 VDC.

Special Features

- **Pulse duty construction**
- **Self-healing**
- **Particularly reliable contact-configurations: 4-pin versions and screwable plate connections**
- **Internal series connection**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2011/65/EU**

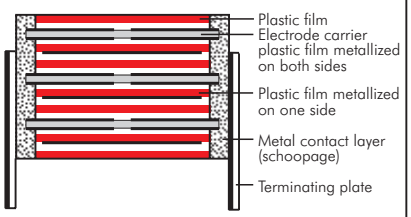
Typical Applications

For high pulse and high frequency applications requiring extremely reliable contacts e.g.

- **IGBT-applications**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire or plates.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 0.047 µF to 8.0 µF
Rated voltages: 700 VDC, 850 VDC, 1000 VDC, 1250 VDC, 1700 VDC, 2000 VDC, 2500 VDC, 3000 VDC
Capacitance tolerances:
±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)
Operating temperature range:
–55° C to +100° C
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage: 2 sec

L	⩽2000 VDC	2500 VDC	⩾3000 VDC
<41.5	1.6 U_r	1.4 U_r	1.2 U_r
41.5	1.4 U_r	1.4 U_r	1.2 U_r
56	1.2 U_r	1.2 U_r	1.2 U_r

Climatic test category:
55/100/56 in accordance with IEC
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size* W x H x L in mm	Specific dissipation in Watts per K above the ambient temperature
19 x 31 x 56	0.068
23 x 34 x 56	0.079
27 x 37.5 x 56	0.092
33 x 48 x 56	0.122
37 x 54 x 56	0.142

* other box sizes see page 11.

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}
10 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	–
100 kHz	⩽ 15 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec at T_A < 40° C							
	700 VDC	850 VDC	1000 VDC	1250 VDC	1700 VDC	2000 VDC	2500 VDC	3000 VDC
0.047 ... 0.22	1150	1150	1800	1800	1800	1800	1800	1800
0.33 ... 0.68	900	900	1150	1150	1150	1150	1150	1150
1.0 ... 2.2	500	500	500	500	650	650	650	650
2.5 ... 6.8	190	190	390	390	500	–	–	–
7.0 ... 8.0	90	90	–	–	–	–	–	–

for pulses equal to the rated voltage

Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the plates the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

Packing

Packing units at the end of the catalogue.

Packing quantities may vary depending on the plate version.

WIMA Snubber MKP

Continuation

General Data

Capac-itance	700 VDC/420 VAC* W	H	L	Part number	850 VDC/450 VAC* W	H	L	Part number	1000 VDC/600 VAC* W	H	L	Part number
0.22 „									11	21	31.5	SNMPO132206B_____
									11	22	41.5	SNMPO132207B_____
0.33 „					15	26	31.5	SNMPM033306F_____	15	26	31.5	SNMPO133306F_____
					13	24	41.5	SNMPM033307C_____	13	24	41.5	SNMPO133307C_____
0.47 „	11	21	31.5	SNMPK034706B_____	17	29	31.5	SNMPM034706G_____	17	29	31.5	SNMPO134706G_____
	11	22	41.5	SNMPK034707B_____	15	26	41.5	SNMPM034707D_____	15	26	41.5	SNMPO134707D_____
0.68 „	15	26	31.5	SNMPK036806F_____	17	29	41.5	SNMPM036807E_____	17	29	41.5	SNMPO136807E_____
	13	24	41.5	SNMPK036807C_____								
1.0 µF	17	29	31.5	SNMPK041006G_____	19	32	41.5	SNMPM041007F_____	20	39.5	41.5	SNMPO141007G_____
	15	26	41.5	SNMPK041007D_____					23	34	56	SNMPO141008E_____
1.5 „	19	32	41.5	SNMPK041507F_____	20	39.5	41.5	SNMPM041507G_____	24	45.5	41.5	SNMPO141507H_____
					23	34	56	SNMPM041508E_____	23	34	56	SNMPO141508E_____
2.0 „	20	39.5	41.5	SNMPK042007G_____	24	45.5	41.5	SNMPM042007H_____	31	46	41.5	SNMPO142007I_____
					23	34	56	SNMPM042008E_____	27	37.5	56	SNMPO142008H_____
2.2 „	20	39.5	41.5	SNMPK042207G_____	24	45.5	41.5	SNMPM042207H_____	31	46	41.5	SNMPO142207I_____
					23	34	56	SNMPM042208E_____	27	37.5	56	SNMPO142208H_____
2.5 „	24	45.5	41.5	SNMPK042507H_____	31	46	41.5	SNMPM042507I_____	35	50	41.5	SNMPO142507J_____
					27	37.5	56	SNMPM042508H_____	33	48	56	SNMPO142508J_____
3.0 „	24	45.5	41.5	SNMPK043007H_____	31	46	41.5	SNMPM043007I_____	40	55	41.5	SNMPO143007K_____
					27	37.5	56	SNMPM043008H_____	33	48	56	SNMPO143008J_____
3.3 „	24	45.5	41.5	SNMPK043307H_____	35	50	41.5	SNMPM043307J_____	40	55	41.5	SNMPO143307K_____
					33	48	56	SNMPM043308J_____	33	48	56	SNMPO143308J_____
4.0 „	31	46	41.5	SNMPK044007I_____	35	50	41.5	SNMPM044007J_____	37	54	56	SNMPO144008L_____
					33	48	56	SNMPM044008J_____				
4.7 „	31	46	41.5	SNMPK044707I_____	33	48	56	SNMPM044708J_____	37	54	56	SNMPO144708L_____
5.0 „	31	46	41.5	SNMPK045007I_____	33	48	56	SNMPM045008J_____	37	54	56	SNMPO145008L_____
6.0 „	35	50	41.5	SNMPK046007J_____	37	54	56	SNMPM046008L_____	37	54	56	SNMPO146008L_____
	33	48	56	SNMPK046008J_____								
7.0 „	40	55	41.5	SNMPK047007K_____	37	54	56	SNMPM047008L_____				
	33	48	56	SNMPK047008J_____								
8.0 „	37	54	56	SNMPK048008L_____								

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 111.

Part number completion:
Version codes see page 113. Tolerance: 20 % = M 10 % = K 5 % = J Packing: bulk = S Pin length: 6-2 = SD none = 00 (for plate versions)

Continuation page 106

WIMA Snubber MKP

Continuation

General Data

Capac-itance	1250 VDC/600 VAC* W	H	L	Part number	1700 VDC/650 VAC* W	H	L	Part number	2000 VDC/700 VAC* W	H	L	Part number
0.068 µF									11	21	31.5	SNMPU026806B_____
									11	22	41.5	SNMPU026807B_____
0.1 µF					11	21	31.5	SNMPTA31006B_____	13	24	31.5	SNMPU031006D_____
					11	22	41.5	SNMPTA31007B_____	11	22	41.5	SNMPU031007B_____
0.15 „					13	24	31.5	SNMPTA31506D_____	15	26	31.5	SNMPU031506F_____
					11	22	41.5	SNMPTA31507B_____	13	24	41.5	SNMPU031507C_____
0.22 „	11	21	31.5	SNMPR032206B_____	15	26	31.5	SNMPTA32206F_____	15	26	41.5	SNMPU032207D_____
	11	22	41.5	SNMPR032207B_____	13	24	41.5	SNMPTA32207C_____				
0.33 „	15	26	31.5	SNMPR033306F_____	17	34.5	31.5	SNMPTA33306I_____	19	32	41.5	SNMPU033307F_____
	13	24	41.5	SNMPR033307C_____	15	26	41.5	SNMPTA33307D_____				
0.47 „	17	29	31.5	SNMPR034706G_____	19	32	41.5	SNMPTA34707F_____	20	39.5	41.5	SNMPU034707G_____
	15	26	41.5	SNMPR034707D_____					23	34	56	SNMPU034708E_____
0.68 „	17	29	41.5	SNMPR036807E_____	20	39.5	41.5	SNMPTA36807G_____	24	45.5	41.5	SNMPU036807H_____
					23	34	56	SNMPTA36808E_____	27	37.5	56	SNMPU036808H_____
1.0 µF	20	39.5	41.5	SNMPR041007G_____	24	45.5	41.5	SNMPTA41007H_____	35	50	41.5	SNMPU041007J_____
	23	34	56	SNMPR041008E_____	27	37.5	56	SNMPTA41008H_____	33	48	56	SNMPU041008J_____
1.5 „	24	45.5	41.5	SNMPR041507H_____	31	46	41.5	SNMPTA41507I_____	40	55	41.5	SNMPU041507K_____
	23	34	56	SNMPR041508E_____	27	37.5	56	SNMPTA41508H_____	33	48	56	SNMPU041508J_____
2.0 „	31	46	41.5	SNMPR042007I_____	40	55	41.5	SNMPTA42007K_____	37	54	56	SNMPU042008L_____
	27	37.5	56	SNMPR042008H_____	33	48	56	SNMPTA42008J_____				
2.2 „	31	46	41.5	SNMPR042207I_____	40	55	41.5	SNMPTA42207K_____	37	54	56	SNMPU042008L_____
	27	37.5	56	SNMPR042208H_____	33	48	56	SNMPTA42208J_____				
2.5 „	35	50	41.5	SNMPR042507J_____	37	54	56	SNMPTA42508L_____				
	33	48	56	SNMPR042508J_____								
3.0 „	40	55	41.5	SNMPR043007K_____	37	54	56	SNMPTA43008L_____				
	33	48	56	SNMPR043008J_____								
3.3 „	40	55	41.5	SNMPR043307K_____								
	33	48	56	SNMPR043308J_____								
4.0 „	37	54	56	SNMPR044008L_____								
4.7 „	37	54	56	SNMPR044708L_____								
5.0 „	37	54	56	SNMPR045008L_____								
6.0 „	37	54	56	SNMPR046008L_____								

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 111.

Part number completion:
Version codes see page 113.
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
none = 00 (for plate versions)

Continuation page 107

Continuation

General Data

Capacitance	2500 VDC/700 VAC*				3000 VDC/700 VAC*			
	W	H	L	Part number	W	H	L	Part number
0.047 µF	11	21	31.5	SNMPV024706B_____	11	21	31.5	SNMPW024706B_____
	11	22	41.5	SNMPV024707B_____	11	22	41.5	SNMPW024707B_____
0.068 „	13	24	31.5	SNMPV026806D_____	13	24	31.5	SNMPW026806D_____
	11	22	41.5	SNMPV026807B_____	11	22	41.5	SNMPW026807B_____
0.1 µF	15	26	31.5	SNMPV031006F_____	15	26	31.5	SNMPW031006F_____
	13	24	41.5	SNMPV031007C_____	13	24	41.5	SNMPW031007C_____
0.15 „	15	26	41.5	SNMPV031507D_____	15	26	41.5	SNMPW031507D_____
0.22 „	19	32	41.5	SNMPV032207F_____	19	32	41.5	SNMPW032207F_____
0.33 „	24	45.5	41.5	SNMPV033307H_____	24	45.5	41.5	SNMPW033307H_____
0.47 „	31	46	41.5	SNMPV034707I_____	31	46	41.5	SNMPW034707I_____
	27	37.5	56	SNMPV034708H_____	27	37.5	56	SNMPW034708H_____
0.68 „	35	50	41.5	SNMPV036807J_____	35	50	41.5	SNMPW036807J_____
	33	48	56	SNMPV036808J_____	33	48	56	SNMPW036808J_____
1.0 µF	40	55	41.5	SNMPV041007K_____	40	55	41.5	SNMPW041007K_____
	33	48	56	SNMPV041008J_____	33	48	56	SNMPW041008J_____
1.5 „	37	54	56	SNMPV041508L_____	37	54	56	SNMPW041508L_____

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

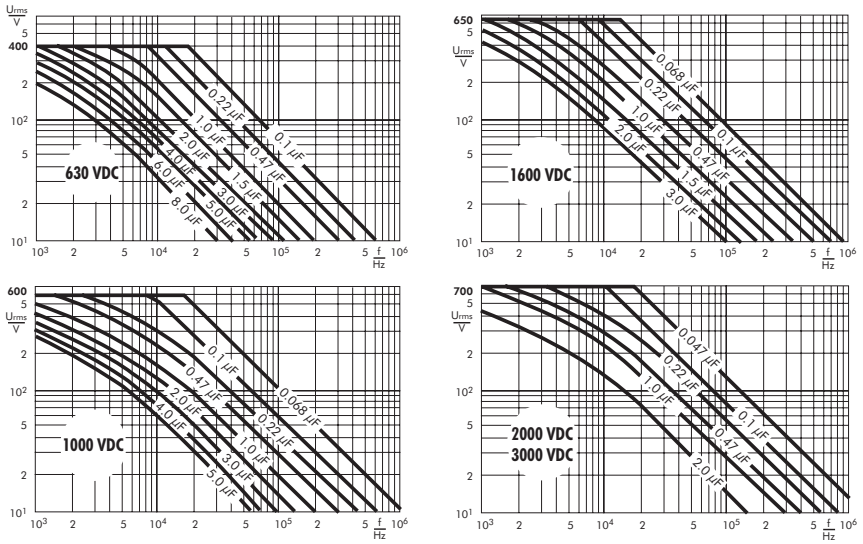
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 111.

Part number completion:

Version codes see page 113.
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
none = 00 (for plate versions)

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



WIMA Snubber FKP

Snubber FKP Capacitors for High Pulse Applications with Metal Foil Electrodes and Metallized Internal Series Connection. Capacitances from 0.01 µF to 3.3 µF. Rated Voltages from 630 VDC to 4000 VDC.

Special Features

- **High pulse duty**
- **Self-healing**
- **Particularly reliable contact-configurations: 4-pin versions and screwable plate connections**
- **Internal series connection**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2011/65/EU**

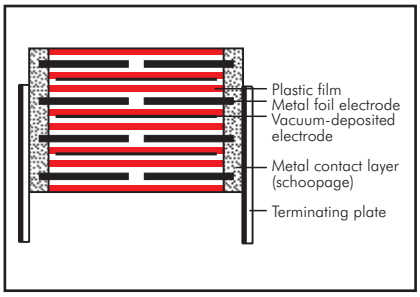
Typical Applications

For high pulse and high frequency applications requiring extremely reliable contacts e.g.

- **IGBT-applications**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Aluminium foil and single-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire or plates.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 0.01 µF to 3.3 µF
Rated voltages: 630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC, 3000 VDC, 4000 VDC
Capacitance tolerances:
±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)
Operating temperature range:
–55° C to +100° C
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage: 2 sec

L	⩽ 2000 VDC	⩾ 3000 VDC
< 41.5	1.6 U_r	1.2 U_r
41.5	1.4 U_r	1.2 U_r
56	1.2 U_r	1.2 U_r

Climatic test category:
55/100/56 in accordance with IEC
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size* W x H x L in mm	Specific dissipation in Watts per K above the ambient temperature
19 x 31 x 56	0.068
23 x 34 x 56	0.079
27 x 37.5 x 56	0.092
33 x 48 x 56	0.122
37 x 54 x 56	0.142

* other box sizes see page 11.

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 5 x 10^{-4}	⩽ 5 x 10^{-4}	⩽ 5 x 10^{-4}
10 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	–
100 kHz	⩽ 10 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec at T_A < 40° C						
	630 VDC	1000 VDC	1250 VDC	1600 VDC	2000 VDC	3000 VDC	4000 VDC
0.01 ... 0.022	–	11000	11000	11000	11000	11000	11000
0.033 ... 0.068	9000	9000	9000	9000	9000	9000	9000
0.1 ... 0.22	9000	9000	9000	9000	9000	9000	9000
0.33 ... 0.68	5000	5000	5000	5000	5000	5000	5000
1.0 ... 3.3	1600	2000	2000	2000	–	–	–

for pulses equal to the rated voltage

Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the plates the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

Packing

Packing units at the end of the catalogue.

Packing quantities may vary depending on the plate version.

Continuation

General Data

Capacitance	630 VDC/400 VAC* W	H	L	Part number	1000 VDC/600 VAC* W	H	L	Part number
0.022 µF					11	22	41.5	SNFPO122207B_____
0.033 „					11	22	41.5	SNFPO123307B_____
0.047 „	11	22	41.5	SNFPJ024707B_____	11	22	41.5	SNFPO124707B_____
0.068 „	11	22	41.5	SNFPJ026807B_____	11	22	41.5	SNFPO126807B_____
0.1 µF	11	22	41.5	SNFPJ031007B_____	11	22	41.5	SNFPO131007B_____
0.15 „	11	22	41.5	SNFPJ031507B_____	15	26	41.5	SNFPO131507D_____
0.22 „	13	24	41.5	SNFPJ032207C_____	17	29	41.5	SNFPO132207E_____
0.33 „	15	26	41.5	SNFPJ033307D_____	19	32	41.5	SNFPO133307F_____
0.47 „	17	29	41.5	SNFPJ034707E_____	20	39.5	41.5	SNFPO134707G_____
0.68 „	19	32	41.5	SNFPJ036807F_____	24	45.5	41.5	SNFPO136807H_____
					23	34	56	SNFPO136808E_____
1.0 µF	20	39.5	41.5	SNFPJ041007G_____	31	46	41.5	SNFPO141007I_____
					27	37.5	56	SNFPO141008H_____
1.5 „	24	45.5	41.5	SNFPJ041507H_____	35	50	41.5	SNFPO141507J_____
					33	48	56	SNFPO141508J_____
2.2 „	31	46	41.5	SNFPJ042207I_____	37	54	56	SNFPO142208L_____
	27	37.5	56	SNFPJ042208H_____				
2.5 „	35	50	41.5	SNFPJ042507J_____				
	33	48	56	SNFPJ042508J_____				
3.0 „	37	54	56	SNFPJ043008L_____				
3.3 „	37	54	56	SNFPJ043308L_____				

Capacitance	1250 VDC/600 VAC* W	H	L	Part number	1600 VDC/650 VAC* W	H	L	Part number
0.01 µF					11	22	41.5	SNFPT021007B_____
0.015 „					11	22	41.5	SNFPT021507B_____
0.022 „	11	22	41.5	SNFPR022207B_____	11	22	41.5	SNFPT022207B_____
0.033 „	11	22	41.5	SNFPR023307B_____	11	22	41.5	SNFPT023307B_____
0.047 „	11	22	41.5	SNFPR024707B_____	11	22	41.5	SNFPT024707B_____
0.068 „	11	22	41.5	SNFPR026807B_____	15	26	41.5	SNFPT026807D_____
0.1 µF	11	22	41.5	SNFPR031007B_____	17	29	41.5	SNFPT031007E_____
0.15 „	15	26	41.5	SNFPR031507D_____	19	32	41.5	SNFPT031507F_____
0.22 „	17	29	41.5	SNFPR032207E_____	20	39.5	41.5	SNFPT032207G_____
0.33 „	19	32	41.5	SNFPR033307F_____	24	45.5	41.5	SNFPT033307H_____
0.47 „	20	39.5	41.5	SNFPR034707G_____	31	46	41.5	SNFPT034707I_____
					27	37.5	56	SNFPT034708H_____
0.68 „	24	45.5	41.5	SNFPR036807H_____	35	50	41.5	SNFPT036807J_____
	23	34	56	SNFPR036808E_____	27	37.5	56	SNFPT036808H_____
1.0 µF	31	46	41.5	SNFPR041007I_____	33	48	56	SNFPT041008J_____
	27	37.5	56	SNFPR041008H_____				
1.5 „	33	48	56	SNFPR041508J_____				

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 111.

Part number completion:

Version codes see page 113.
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
none = 00 (for plate versions)

Continuation page 110

WIMA Snubber FKP

Continuation

General Data

Capac-itance	2000 VDC/700 VAC* W	H	L	Part number	3000 VDC/700 VAC* W	H	L	Part number	4000 VDC/700 VAC* W	H	L	Part number
0.01 µF	11	22	41.5	SNFPU021007B_____	11	22	41.5	SNFPW021007B_____	11	22	41.5	SNFPX021007B_____
0.015 „	11	22	41.5	SNFPU021507B_____	11	22	41.5	SNFPW021507B_____	11	22	41.5	SNFPX021507B_____
0.022 „	11	22	41.5	SNFPU022207B_____	11	22	41.5	SNFPW022207B_____	13	24	41.5	SNFPX022207C_____
0.033 „	13	24	41.5	SNFPU023307C_____	13	24	41.5	SNFPW023307C_____	15	26	41.5	SNFPX023307D_____
0.047 „	15	26	41.5	SNFPU024707D_____	15	26	41.5	SNFPW024707D_____	17	29	41.5	SNFPX024707E_____
0.068 „	17	29	41.5	SNFPU026807E_____	17	29	41.5	SNFPW026807E_____	19	32	41.5	SNFPX026807F_____
0.1 µF	17	29	41.5	SNFPU031007E_____	19	32	41.5	SNFPW031007F_____	20	39.5	41.5	SNFPX031007G_____
0.15 „	20	39.5	41.5	SNFPU031507G_____	20	39.5	41.5	SNFPW031507G_____	24	45.5	41.5	SNFPX031507H_____
0.22 „	24	45.5	41.5	SNFPU032207H_____	24	45.5	41.5	SNFPW032207H_____	31	46	41.5	SNFPX032207I_____
									27	37.5	56	SNFPX032208H_____
0.33 „	31	46	41.5	SNFPU033307I_____	31	46	41.5	SNFPW033307I_____	33	48	56	SNFPX033308J_____
	27	37.5	56	SNFPU033308H_____	27	37.5	56	SNFPW033308H_____				
0.47 „	31	46	41.5	SNFPU034707I_____	33	48	56	SNFPW034708J_____				
	27	37.5	56	SNFPU034708H_____								
0.68 „	33	48	56	SNFPU036808J_____								

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

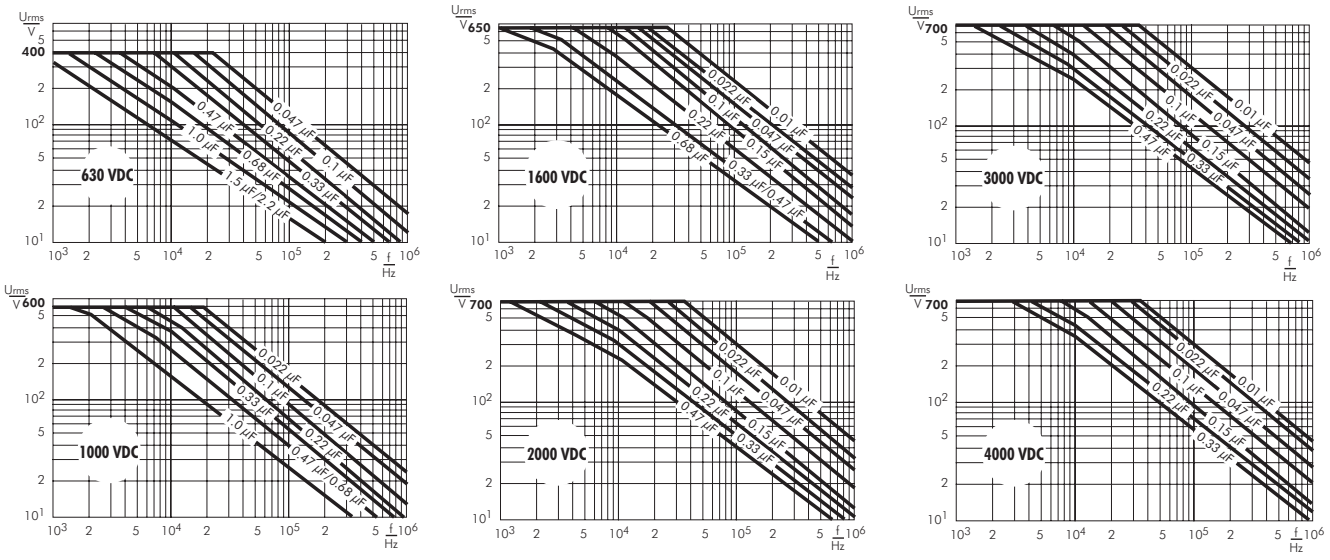
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

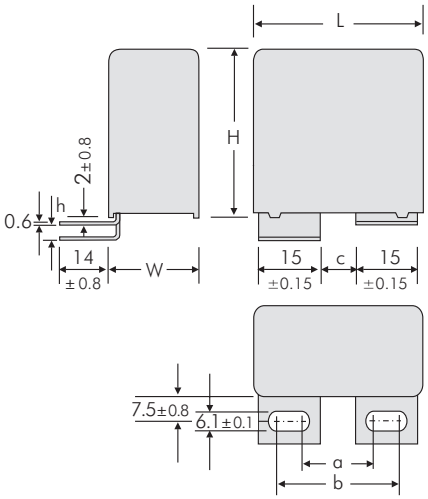
Versions and dimensional drawings see page 111.

Part number completion:
Version codes see page 113.
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
none = 00 (for plate versions)

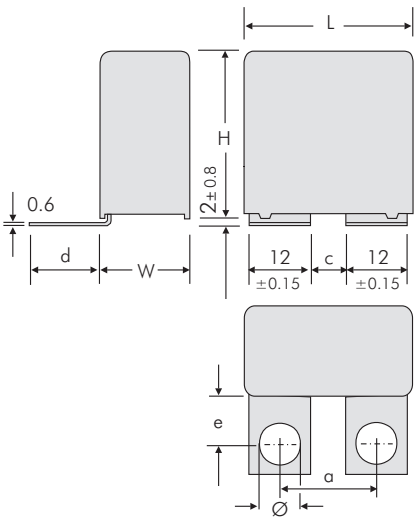
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



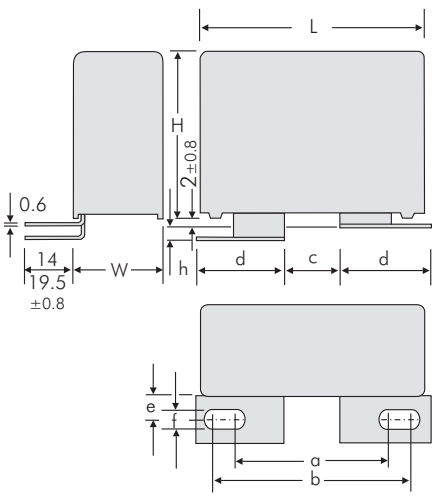
Versions of WIMA Snubber- and DC-LINK MKP 4- Capacitors



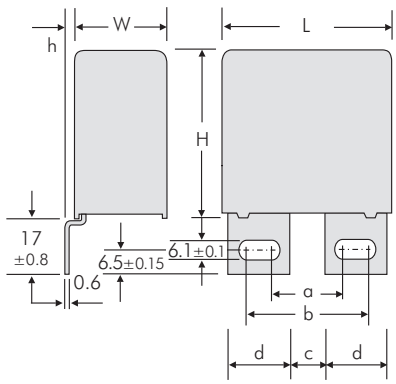
Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A1	41.5	17.5	28	7.5	0
A1.5	41.5	17.5	28	7.5	3.5
A1	56	20	30	10	0
A1.1.1	56	28	38	18	0
A1.4.1	56	28	38	18	3.5



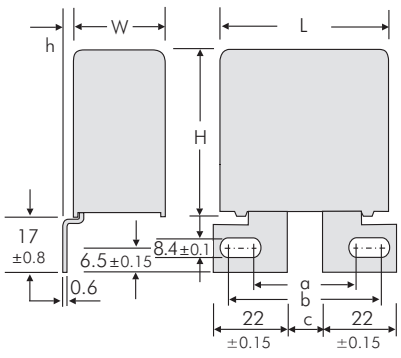
Version	L	a ±0.5	c ±0.5	d ±0.8	e ±0.8	Ø ±0.1
A1.6	41.5	18	6	21.5	16	7
A1.6.1	41.5	22	10	18.5	13	7
A1.6.2	41.5	23	10	18.5	13	8
A1.6	56	29	17	21.5	16	7



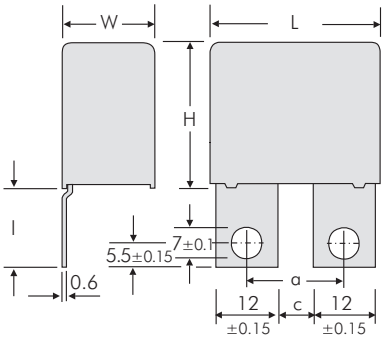
Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	e ±0.8	f ±0.1	h ±0.8
A2	41.5	36	46.5	14.5	22	7.5	8.4	0
A2.4.1	41.5	33.5	39.5	7.5	22	13	8.4	0
A2.6.1	41.5	31.5	41.5	14	22	13	6.1	3.5
A2.6.2	41.5	31.5	41.5	14	22	13	6.1	0
A2.8	41.5	36	46.5	14.5	22	7.5	8.4	3.5
A2.1	56	39.5	45.5	13.5	22	7.5	8.4	0
A2.1.2	56	36	45.5	14.5	21.5	7.5	8.4	0



Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	h ±0.8
A3	41.5	17.5	27.5	7.5	15	0
A3.5	41.5	17.5	27.5	7.5	15	3
A3.12	41.5	17.5	30	7.5	16.5	0
A3	56	20	30	10	15	0
A3.1	56	28	38	18	15	0
A3.5	56	20	30	10	15	3
A3.10	56	28	38	18	15	3

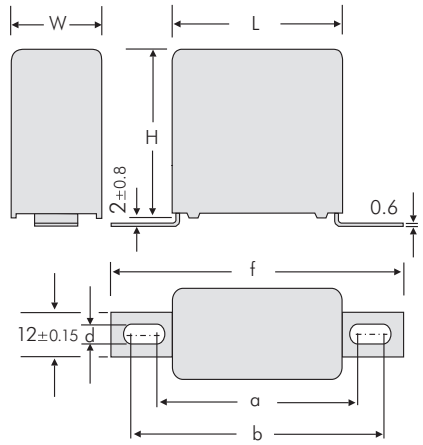


Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A3.9	41.5	36	46.5	14.5	0
A3.11	41.5	36	46.5	14.5	3
A3.2	56	36	46.5	14.5	0
A3.3	56	36	46.5	14.5	3

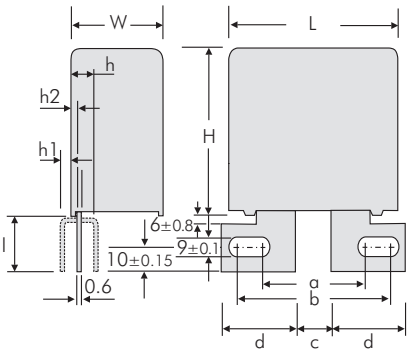


Version	L	a ±0.5	c ±0.5	l ±0.8
A3.8	41.5 W ⩾ 17	18	6	23
A3.8.1	41.5 W ⩾ 17	22	10	17.5
A3.8.2	41.5 W ⩾ 17	22	10	23

Versions of WIMA Snubber- and DC-LINK MKP 4- Capacitors

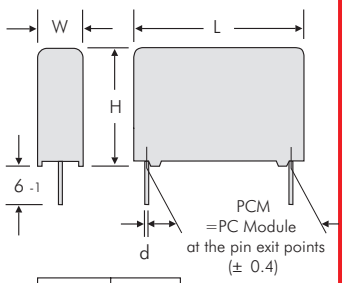


Version	L	a ±0.8	b ±0.8	f ±0.8	d ±0.1
A4.9	31.5 W ⩾ 15	44	47	57	4.5
A4.10	31.5 W ⩾ 15	43	59	69	6.1
A4.2	41.5 W ⩾ 15	54	57	67	4.5
A4	41.5 W ⩾ 15	53	69	79	6.1
A4.7	56	65	68	78	4.5
A4	56	64	80	90	6.1



Version	W	a ±0.5	b ±0.5	c ±0.5	d ±0.15	h ±0.8	h1 ±0.8	h2 ±0.8	l ±0.8
A6	⩾23	41.5	45.5	15.5	24.15	7	-	-	26
A6.3	⩾19	35	39	18	19	-	5	3	25
A6.4	⩾23	42.8	44.8	21	21,5	-	-	6.4	26

2-pin version

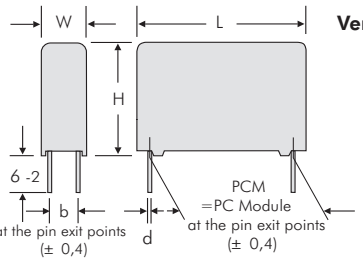


PCM	d
28.5*	0.8
38.5*	1.2
49.5*	1.2

*apply only to Snubber

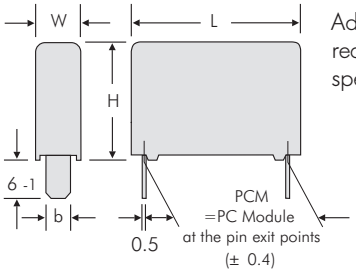
Dims. in mm

4-pin version



W	H	L	PCM	b	d
11	21	31.5	27.5	5	0.8
13	24	31.5	27.5	7.5	0.8
15	26	31.5	27.5	7.5	0.8
17	29	31.5	27.5	10	0.8
19	30	31.5	27.5	10	0.8
17	34.5	31.5	27.5	10	0.8
20	39.5	31.5	27.5	12.5	0.8
22	43.5	31.5	27.5	12.5	0.8
11	22	41.5	37.5	5	1
13	24	41.5	37.5	7.5	1
15	26	41.5	37.5	7.5	1
17	29	41.5	37.5	10	1
19	32	41.5	37.5	10	1
20	39.5	41.5	37.5	12.5	1
24	45.5	41.5	37.5	12.5	1
31	46	41.5	37.5	20	1
35	50	41.5	37.5	20	1
40	55	41.5	37.5	20	1
19	31	56	48.5	12.5	1
23	34	56	48.5	15	1
27	37.5	56	48.5	15	1
33	48	56	48.5	20	1
37	54	56	48.5	20	1

Version B



L	PCM	b ±0.15
31.5	28.5	8
41.5	38.5	8
56	49.5	8

Additional special versions can be realized. Please contact us with your specific needs.

Versions of WIMA Snubber- and DC-LINK MKP 4- Capacitors

Version code		D2	D4	B8	1A	1B	1G	1H	1I	1J	1S	2A	2B	2Q	2F	2J	2K	2M	3A	3C	3D	3E	3G	3K	3L	3M	3N	3O	3P	3Q	4A	4C	4J	4L	4M	6A	6B	6C
W x H x L	Size code	2-pin	4-pin	B8	A1	A1.1.1	A1.4.1	A1.5	A1.6	A1.6.1	A1.6.2	A2	A2.1	A2.1.2	A2.4.1	A2.6.1	A2.6.2	A2.8	A3	A3.1	A3.2	A3.3	A3.5	A3.8	A3.8.1	A3.8.2	A3.9	A3.10	A3.11	A3.12	A4	A4.2	A4.7	A4.9	A4.10	A6	A6.3	A6.4
11 x 21 x 31.5	**6B**	■	■	■																																		
13 x 24 x 31.5	**6D**	■	■	■																																		
15 x 26 x 31.5	**6F**	■	■	■																													■	■			
17 x 29 x 31.5	**6G**	■	■	■																													■	■			
17 x 34.5 x 31.5	**6I**	■	■	■																													■	■			
11 x 22 x 41.5	**7B**	■	■	■	■			■	■	■	■								■				■							■								
13 x 24 x 41.5	**7C**	■	■	■	■			■	■	■	■								■				■	■	■	■				■								
15 x 26 x 41.5	**7D**	■	■	■	■			■	■	■	■								■				■	■	■	■		■	■	■	■	■						
17 x 29 x 41.5	**7E**	■	■	■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
19 x 32 x 41.5	**7F**	■	■	■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
20 x 39.5 x 41.5	**7G**	■	■	■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
24 x 45.5 x 41.5	**7H**	■	■	■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
31 x 46 x 41.5	**7I**	■	■	■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
35 x 50 x 41.5	**7J**	■	■		■			■	■	■	■	■				■	■	■	■				■	■	■	■	■			■								
40 x 55 x 41.5	**7K**	■	■		■			■	■	■	■	■				■	■	■	■				■	■	■	■	■			■								
19 x 31 x 56	**8D**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■				■	
23 x 34 x 56	**8E**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■
27 x 37.5 x 56	**8H**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■
33 x 48 x 56	**8J**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■
37 x 54 x 56	**8L**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■

Possible connecting respective plate versions - depending on box size.

■ 4-pin versions on request.

WIMA GTO Capacitors with Screw Connection for High Current Carrying Capability

- High rms current carrying capability
- Very low dissipation factor
- Negative capacitance change versus temperature
- Excellent self-healing properties
- Outstanding mechanical stability
- High shock and vibration resistance
- Solvent-resistant, flame-retardant plastic case in accordance with UL 94 V-0
- Almost unlimited life expectancy

Fields of applications are designs where high current and voltage carrying capabilities are required, e.g. converter equipment in power generation or in traction technology for train drives, hoists, crane drives etc.

WIMA GTO MKP capacitors are available with capacitances from 1.0 µF through 100 µF and with nominal voltages from 400 VDC through 2000 VDC. For mounting purposes M6 and M8 threaded terminations are possible. Customer-specific requirements can be realized on demand.

All components are environmentally compatible with the RoHS 2011/65/EU regulations of the European Union.

WIMA GTO MKP

WIMA GTO MKP capacitors are especially designed to attenuate voltage spikes on GTO (Gate-Turn-Off) Thyristors and IGBT (Insulated Gate Bipolar Transistor). They are manufactured in dry-type technology with double-sided metallized electrodes and encapsulated in a cylindrical plastic case sealed with self-extinguishing polyurethane resin.

Their construction principle combined with the Polypropylene dielectric used creates outstanding features, e.g.:

- Very low self-inductance
- High pulse reliability

WIMA GTO MKP

GTO MKP Capacitors for Pulse Applications with Internal Series Connection. Capacitances from 1.0 µF to 100 µF. Rated Voltages from 400 VDC to 2000 VDC.

Special Features

- **Pulse duty construction**
- **Self-healing**
- **Cylindrical capacitor body with axial screw and thread connections size M6 or M8**
- **Internal series connection from 400 VAC**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2011/65/EU**

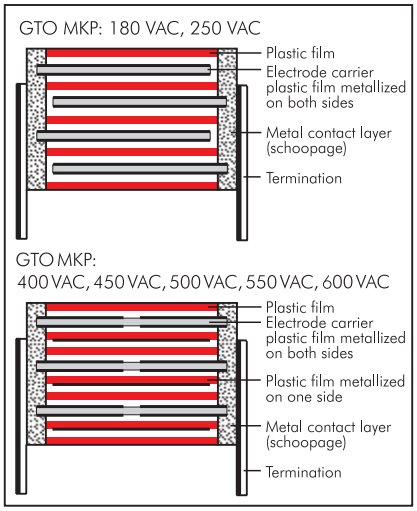
Typical Applications

For high pulse and high frequency applications requiring extremely reliable contacts e.g.

- **Damping of voltage spikes on GTO-Thyristors**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with PU seal, UL 94 V-0
Terminations:
Axial screw connection M6 or M8.
Marking:
Colour: Red. Marking: Black on Silver.

Electrical Data

Capacitance range:
1.0 µF to 100 µF
Rated voltages:
400 VDC, 600 VDC, 850 VDC, 1000 VDC, 1200 VDC, 1500 VDC, 2000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +85° C
Climatic test category:
55/085/56 in accordance with IEC
Insulation resistance at +20° C:
⩾ 10 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage:
1.2 U_r, 2 sec.
Dielectric absorption:
0.05 %
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 20 µF	20 µF < C ⩽ 50 µF	C > 50 µF
1 kHz	⩽ 3 x 10^{-4}	⩽ 5 x 10^{-4}	⩽ 8 x 10^{-4}

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +65° C for DC voltages and from +60° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size D x L in mm	Specific dissipation in Watts per K above the ambient temperature
60 x 49	0.186
70 x 49	0.231
80 x 49	0.280
90 x 49	0.333
90 x 58	0.364
90 x 97	0.501

Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the capacitor the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

Packing

Transportation-safe packing in cardboard boxes.
Packing units

D	pcs. per packing unit
60	12
70	8
80	6
90	6

Continuation

General Data

Capacitance	400 VDC/180 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number	600 VDC/250 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number
3.5 µF					60 x 49	200	770	GTOMI04350GA00_ _ _ _
4 „					60 x 49	200	890	GTOMI04400GA00_ _ _ _
4.5 „					60 x 49	200	990	GTOMI04450GA00_ _ _ _
5 „					60 x 49	180	1090	GTOMI04500GA00_ _ _ _
6 „					60 x 49	180	1310	GTOMI04600GA00_ _ _ _
8 „					60 x 49	80	610	GTOMI04800GA00_ _ _ _
10 µF					60 x 49	80	780	GTOMI05100GA00_ _ _ _
15 „	60 x 49	50	790	GTOMG05150GA00_ _ _ _	60 x 49	80	1150	GTOMI05150GA00_ _ _ _
20 „	60 x 49	50	1050	GTOMG05200GA00_ _ _ _	70 x 49	80	1540	GTOMI05200GB00_ _ _ _
25 „	60 x 49	50	1330	GTOMG05250GA00_ _ _ _	70 x 49	80	1940	GTOMI05250GB00_ _ _ _
30 „	60 x 49	50	1610	GTOMG05300GA00_ _ _ _	80 x 49	80	2340	GTOMI05300GC00_ _ _ _
40 „	70 x 49	50	2090	GTOMG05400GB00_ _ _ _	90 x 49	80	3080	GTOMI05400GD00_ _ _ _
50 „	80 x 49	50	2680	GTOMG05500GC00_ _ _ _	90 x 58	60	3050	GTOMI05500GE00_ _ _ _
60 „	80 x 49	50	3240	GTOMG05600GC00_ _ _ _	90 x 97	35	2140	GTOMI05600GF00_ _ _ _
70 „	90 x 49	50	3630	GTOMG05700GD00_ _ _ _	90 x 97	35	2520	GTOMI05700GF00_ _ _ _
80 „	90 x 49	50	4100	GTOMG05800GD00_ _ _ _	90 x 97	35	2810	GTOMI05800GF00_ _ _ _
90 „	90 x 58	40	3800	GTOMG05900GE00_ _ _ _	90 x 97	35	3200	GTOMI05900GF00_ _ _ _
100 µF	90 x 58	40	4300	GTOMG06100GE00_ _ _ _	90 x 97	35	3550	GTOMI06100GF00_ _ _ _

Capacitance	850 VDC/400 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number	1000 VDC/450 VAC* D x L mm	du/dt V/µsec	I_{max} A	Part number
3 µF	60 x 49	200	770	GTOMM04300GA00_ _ _ _	60 x 49	260	790	GTOMO14300GA00_ _ _ _
3.5 „	60 x 49	200	770	GTOMM04350GA00_ _ _ _	60 x 49	260	910	GTOMO14350GA00_ _ _ _
4 „	60 x 49	200	890	GTOMM04400GA00_ _ _ _	60 x 49	260	1050	GTOMO14400GA00_ _ _ _
4.5 „	60 x 49	200	990	GTOMM04450GA00_ _ _ _	60 x 49	260	1170	GTOMO14450GA00_ _ _ _
5 „	60 x 49	200	1090	GTOMM04500GA00_ _ _ _	60 x 49	260	1310	GTOMO14500GA00_ _ _ _
6 „	60 x 49	200	1310	GTOMM04600GA00_ _ _ _	60 x 49	260	1550	GTOMO14600GA00_ _ _ _
8 „	60 x 49	200	1740	GTOMM04800GA00_ _ _ _	70 x 49	260	2080	GTOMO14800GB00_ _ _ _
10 µF	70 x 49	200	2190	GTOMM05100GB00_ _ _ _	70 x 49	260	2600	GTOMO15100GB00_ _ _ _
15 „	70 x 49	200	3230	GTOMM05150GB00_ _ _ _	90 x 49	260	3920	GTOMO15150GD00_ _ _ _
20 „	80 x 49	200	4310	GTOMM05200GC00_ _ _ _	90 x 58	200	4300	GTOMO15200GE00_ _ _ _
25 „	90 x 49	200	5390	GTOMM05250GD00_ _ _ _	90 x 97	120	3050	GTOMO15250GF00_ _ _ _
30 „	90 x 58	160	4800	GTOMM05300GE00_ _ _ _	90 x 97	120	3580	GTOMO15300GF00_ _ _ _
40 „	90 x 97	100	3780	GTOMM05400GF00_ _ _ _	90 x 97	120	4770	GTOMO15400GF00_ _ _ _
50 „	90 x 97	100	4790	GTOMM05500GF00_ _ _ _				
60 „	90 x 97	100	5800	GTOMM05600GF00_ _ _ _				

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

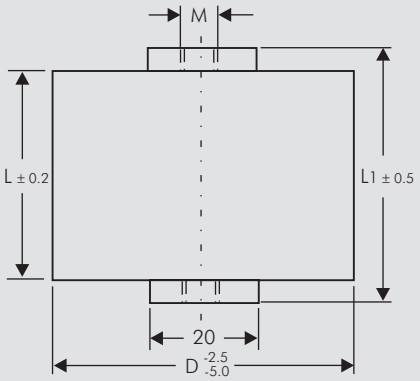
Continuation page 117

Continuation

General Data

Capacitance	1200 VDC/500 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number	1500 VDC/550 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number
1 µF					60 x 49	400	420	GTOMS04100GA00_ _ _ _
1.5 „					60 x 49	400	590	GTOMS04150GA00_ _ _ _
2 „					60 x 49	400	820	GTOMS04200GA00_ _ _ _
2.5 „	60 x 49	300	770	GTOMQ04250GA00_ _ _ _	60 x 49	400	1010	GTOMS04250GA00_ _ _ _
3 „	60 x 49	300	950	GTOMQ04300GA00_ _ _ _	60 x 49	400	1220	GTOMS04300GA00_ _ _ _
3.5 „	60 x 49	300	1070	GTOMQ04350GA00_ _ _ _	60 x 49	400	1400	GTOMS04350GA00_ _ _ _
4 „	60 x 49	300	1230	GTOMQ04400GA00_ _ _ _	70 x 49	400	1630	GTOMS04400GB00_ _ _ _
4.5 „	60 x 49	300	1380	GTOMQ04450GA00_ _ _ _	70 x 49	400	1800	GTOMS04450GB00_ _ _ _
5 „	60 x 49	300	1570	GTOMQ04500GA00_ _ _ _	70 x 49	400	2010	GTOMS04500GB00_ _ _ _
6 „	70 x 49	300	1840	GTOMQ04600GB00_ _ _ _	80 x 49	400	2390	GTOMS04600GC00_ _ _ _
8 „	70 x 49	300	2470	GTOMQ04800GB00_ _ _ _	90 x 49	400	3210	GTOMS04800GD00_ _ _ _
10 µF	80 x 49	300	3080	GTOMQ05100GC00_ _ _ _	90 x 58	320	3210	GTOMS05100GE00_ _ _ _
15 „	90 x 58	230	3550	GTOMQ05150GE00_ _ _ _	90 x 97	180	2690	GTOMS05150GF00_ _ _ _
20 „	90 x 97	130	2690	GTOMQ05200GF00_ _ _ _	90 x 97	180	3600	GTOMS05200GF00_ _ _ _
25 „	90 x 97	130	3370	GTOMQ05250GF00_ _ _ _				
30 „	90 x 97	130	4110	GTOMQ05300GF00_ _ _ _				

Capacitance	2000 VDC/600 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number
1 µF	60 x 49	500	500	GTOMU04100GA00_ _ _ _
1.5 „	60 x 49	500	750	GTOMU04150GA00_ _ _ _
2 „	70 x 49	500	1000	GTOMU04200GB00_ _ _ _
2.5 „	70 x 49	500	1250	GTOMU04250GB00_ _ _ _
3 „	80 x 49	500	1500	GTOMU04300GC00_ _ _ _
3.5 „	80 x 49	500	1750	GTOMU04350GC00_ _ _ _
4 „	90 x 49	500	2000	GTOMU04400GD00_ _ _ _
4.5 „	90 x 49	500	2250	GTOMU04450GD00_ _ _ _
5 „	90 x 58	500	2500	GTOMU04500GE00_ _ _ _
6 „	90 x 58	450	2700	GTOMU04600GE00_ _ _ _
8 „	90 x 97	400	3200	GTOMU04800GF00_ _ _ _
10 µF	90 x 97	300	3000	GTOMU05100GF00_ _ _ _



D	L	L1	M
60	49	55	M6
70	49	55	M6
80	49	55	M8
90	49	55	M8
90	58	64	M8
90	97	103	M8

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

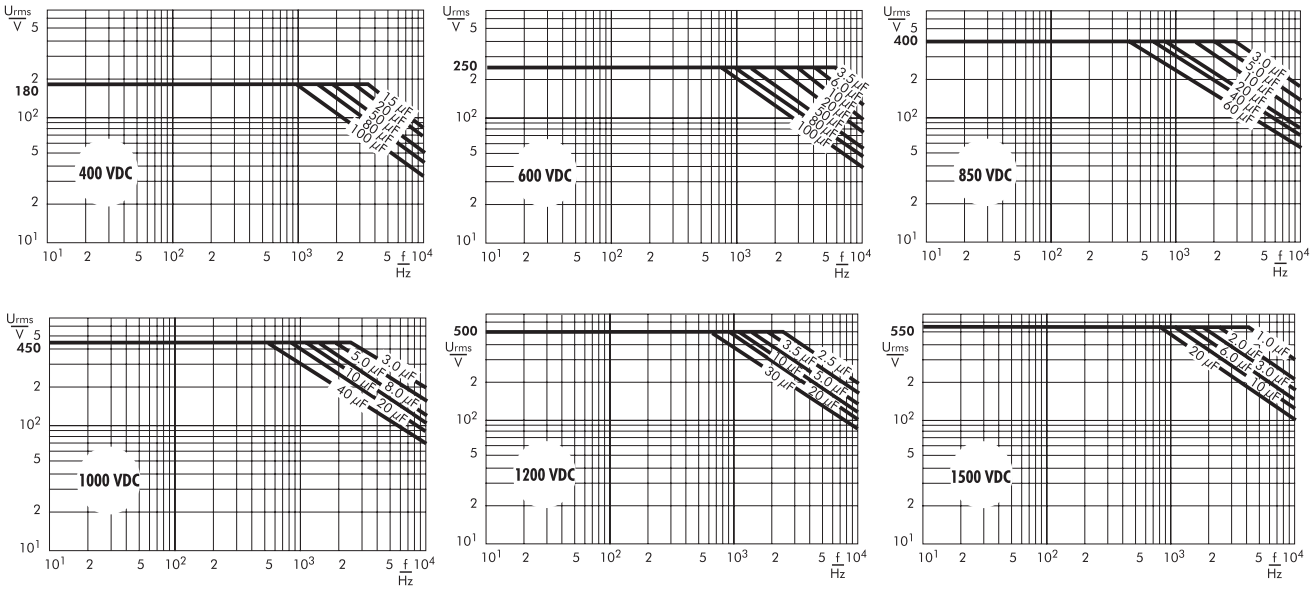
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

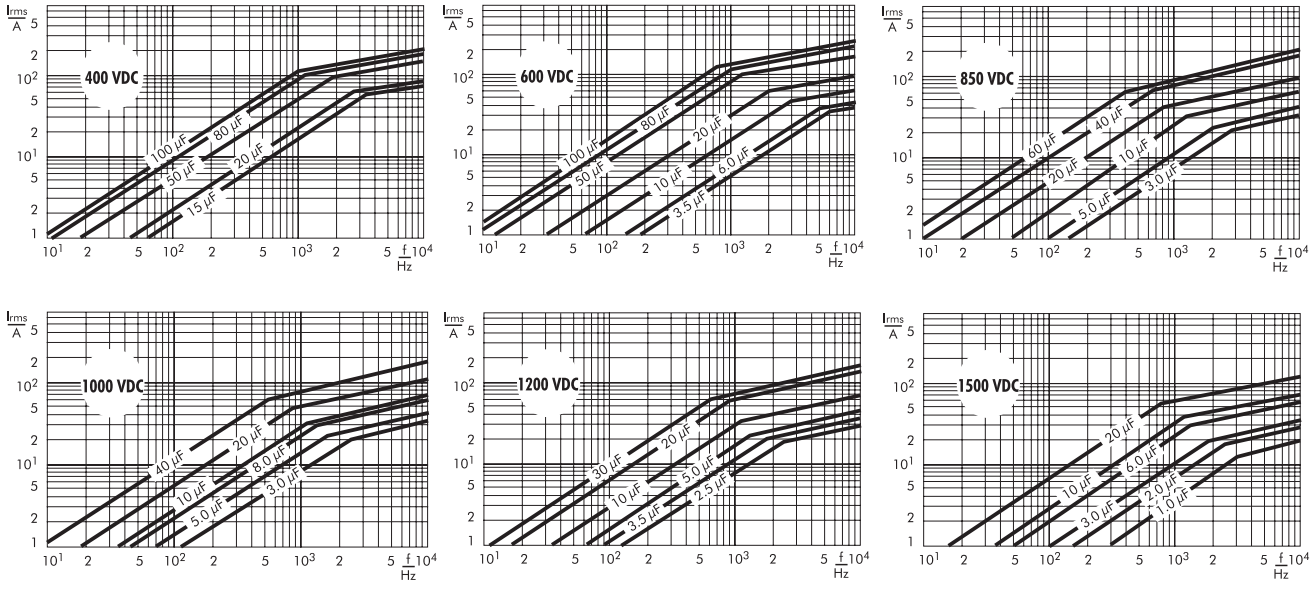
Continuation page 118

Continuation

Permissible AC voltage in relation to frequency
at 20° C internal temperature rise (general guide).



Permissible AC current in relation to frequency
at 20° C internal temperature rise (general guide).



WIMA Intermediate Circuit Capacitors for Applications in High Power Converter Technology

WIMA DC-LINK MKP 3
WIMA DC-LINK MKP 4
WIMA DC-LINK MKP 4S
WIMA DC-LINK MKP 5
WIMA DC-LINK MKP 6
WIMA DC-LINK HC
WIMA DC-LINK HY

WIMA DC-LINK capacitors are especially designed for applications in high power converter technology where they are more and more substituting electrolytic capacitors due to increasing electrical requirements. Manufactured with a low loss Polypropylene dielectric they show a higher current carrying capability as well as lower dissipation/self-heating at high frequencies compared to electrolytic capacitors. Further outstanding features are, e.g.:

- Very high capacitance/volume ratio
- High voltage rating per component
- Very low dissipation factor (ESR)
- Very high insulation resistance
- Excellent self-healing properties
- Long life expectancy
- Non-polar construction
- Particularly reliable contact configuration
- High shock and vibration resistance
- Outstanding mechanical stability

WIMA DC-LINK MKP 3 capacitors in cylindrical case with screw fixing are available with capacitances from 35 µF through 200 µF and with voltage ranges from 700 VDC through 1500 VDC. They can be provided with male or female terminations.

WIMA DC-LINK MKP 4 capacitors with rectangular case are available with capacitance values from 1 µF through 400 µF and with rated voltages from 400 VDC through 1300 VDC. For mounting purposes 2-pin and 4-pin versions are possible. The WIMA DC-LINK MKP 4S series has been designed for stringent requirements.

WIMA DC-LINK MKP 5 capacitors in cylindrical plastic case are available with capacitances from 16 µF through 260 µF and with rated voltages from 500 VDC through 1300 VDC. They are provided with tinned wire terminations for PCB mounting.

WIMA DC-LINK MKP 6 capacitors have a cylindrical aluminium case. They are available with capacitances from 75 µF through 4920 µF and with rated voltages from 600 VDC through 1500 VDC. For bus bar mounting they are designed with male or female terminations and screw bolt.

Customized solutions e.g. can be realized with WIMA DC-LINK HC and WIMA DC-LINK HY with variable connecting configurations.

All components are environmentally compatible with the RoHS 2011/65/EU regulations of the European Union.

WIMA DC-LINK MKP 3

Metallized Polypropylene (PP) - Capacitors for DC-Link Applications. Capacitances from 35 µF to 200 µF. Rated Voltages from 700 VDC to 1500 VDC.

Special Features

- **Very high volume/capacitance ratio**
- **Self-healing properties**
- **With cylindrical plastic case and screw fixing**
- **Dry construction without electrolyte or oil**
- **No internal fuse required**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**
- **Customer-specific capacitances or voltages on request**

Electrical Data

Capacitance range: 35 µF to 200 µF
Rated voltages: 700 VDC, 900 VDC, 1100 VDC, 1300 VDC, 1500 VDC
Capacitance tolerances: ±20%, ±10%, (±5% available subject to special enquiry)
Operating temperature range: –40° C to +85° C
Insulation resistance at +20° C: ⩾ 5000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.

Dielectric loss factor
tan δ_0: 2 x 10^{-4}
Test voltage: 1.5 U_r, 2sec
Dielectric absorption: 0.05 %
Reliability:
Operational life > 100 000 hours
Failure rate < 50 fit (hot spot ⩽ 70° C)

Typical Applications

DC capacitors with high capacitances for applications in power electronics also at non-sinusoidal voltages and currents e.g. in

- **Wind power systems**
- **Inverters**

Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors.

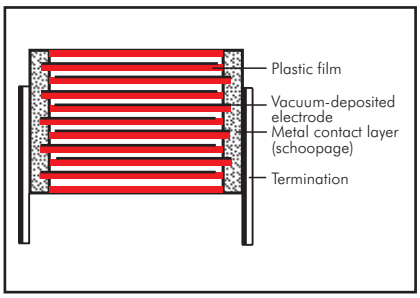
Packing

Transport-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.

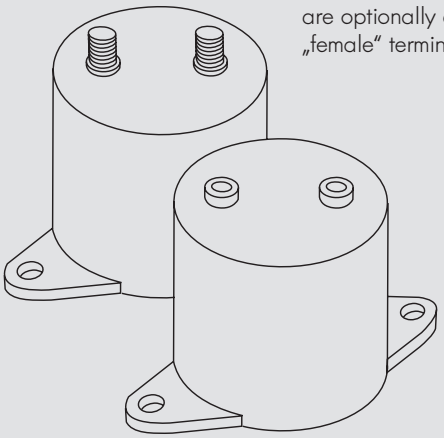
Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with PU-sealing and screw fixing, UL 94 V-0
Terminations:
Screw connection (male or female).
Marking:
Colour: Black. Marking: Gold.

The capacitors are non-polarized and are optionally available with „male“ and „female“ terminations.



Continuation

General Data

U_R	C_N	D x L mm	I_{rms} (1 kHz)* A	ESR (1 kHz)* mΩ	R_{th} K/W	L_e nH	Approx. weight g	Part number
700 VDC	150 µF	84.5 x 51	100	0.9	7.0	< 32	430	DCP3K06150G100_ _ _ _
	200 „	84.5 x 64	100	1.0	8.5	< 40	510	DCP3K06200G200_ _ _ _
900 VDC	100 µF	84.5 x 51	90	1.0	7.2	< 30	430	DCP3N06100G100_ _ _ _
	140 „	84.5 x 64	100	1.3	8.5	< 40	510	DCP3N06140G200_ _ _ _
1100 VDC	70 µF	84.5 x 51	100	1.1	7.0	< 32	430	DCP3P05700G100_ _ _ _
	90 „	84.5 x 64	100	1.2	8.5	< 40	510	DCP3P05900G200_ _ _ _
1300 VDC	50 µF	84.5 x 51	60	1.7	7.0	< 35	430	DCP3R25500G100_ _ _ _
	70 „	84.5 x 64	50	2.1	8.5	< 40	510	DCP3R25700G200_ _ _ _
1500 VDC	35 µF	84.5 x 51	60	1.7	7.0	< 35	430	DCP3S05350G100_ _ _ _
	50 „	84.5 x 64	70	1.9	8.5	< 40	510	DCP3S05500G200_ _ _ _

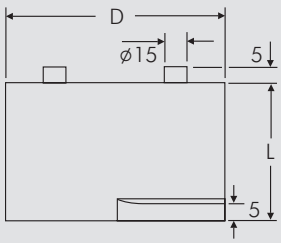
Contacts can handle: peak currents $\hat{I}$ up to 5 kA
surge currents I_S up to 20 kA

Customer-specific capacitances or voltages on request

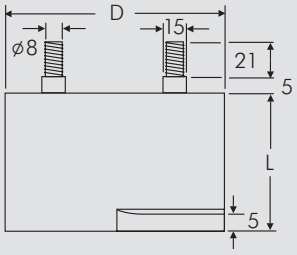
* General guide

Dims. in mm.

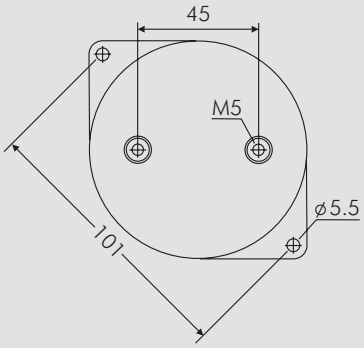
female

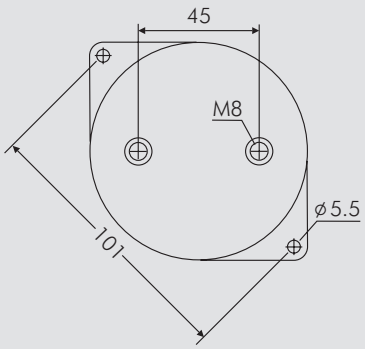


male



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F





D	L
84.5	51
84.5	64

WIMA DC-LINK MKP 4

Metallized Polypropylene (PP) - Capacitors for DC-Link Applications. Capacitances from 1.0 µF to 400 µF. Rated Voltages from 400 VDC to 1300 VDC.

Special Features

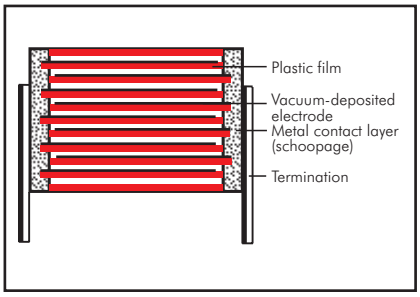
- **Capacitances up to 400 µF**
- **High volume/capacitance ratio**
- **Excellent self-healing properties**
- **Very low dissipation factor**
- **High reliability**
- **2-pin and 4-pin contact configuration (plate versions on request)**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2011/65/EU**

Typical Applications

As intermediate circuit capacitor e.g. in high power converter technology, power supplies, solar inverters etc.

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire (plate versions on request).
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1 µF to 400 µF (intermediate values on request)
Rated voltages: 400 VDC, 500 VDC, 600 VDC, 800 VDC, 900 VDC, 1100 VDC, 1300 VDC
Capacitance tolerances: ±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C (hot spot including self-heating)
Climatic test category: 55/085/56 in accordance with IEC
Dissipation factors at +20° C:

PCM	1 kHz	10 kHz
27.5	$\leqslant 15 \times 10^{-4}$	$\leqslant 160 \times 10^{-4}$
37.5	$\leqslant 30 \times 10^{-4}$	$\leqslant 210 \times 10^{-4}$
52.5	$\leqslant 50 \times 10^{-4}$	$\leqslant 260 \times 10^{-4}$

Voltage and current derating:
A derating factor of 1.35% per K must be applied from +85° C for DC voltages and from +70° C for AC currents (I_{rms}). Additionally a derating factor of 4.5% per K must be applied from +85° C for AC currents (I_{rms})
Reliability: Operational life > 100 000 hours (U_r and 70° C)
Failure rate λ_0 (0.5 x U_r and 40° C)

$\Pi = \lvert C_N\ [\mu F] \times U_r\ [V] \rvert$	λ_0
$\Pi \leqslant 10\,000$	< 2 fit
$10\,000 < \Pi \leqslant 25\,000$	< 5 fit
$25\,000 < \Pi \leqslant 50\,000$	< 10 fit
$50\,000 < \Pi \leqslant 100\,000$	< 20 fit
$\Pi > 100\,000$	< 30 fit

Insulation resistance at +20° C:
⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage:
1.2 U_r, 2sec
Dielectric absorption: 0.05 %
Specific dissipation:

Box size W x H x L in mm	Specific dissipation in Watts per K above the ambient temperature
9 x 19 x 31.5	0.021
11 x 21 x 31.5	0.025
13 x 24 x 31.5	0.030
15 x 26 x 31.5	0.034
17 x 29 x 31.5	0.039
27 x 15 x 41.5	0.043
17 x 34.5 x 31.5	0.044
20 x 39.5 x 31.5	0.053
19 x 32 x 41.5	0.054
20 x 39.5 x 41.5	0.065
24 x 45.5 x 41.5	0.080
31 x 46 x 41.5	0.092
35 x 50 x 41.5	0.106
40 x 55 x 41.5	0.123
35 x 50 x 57	0.132
45 x 55 x 57	0.164
45 x 65 x 57	0.184

Packing

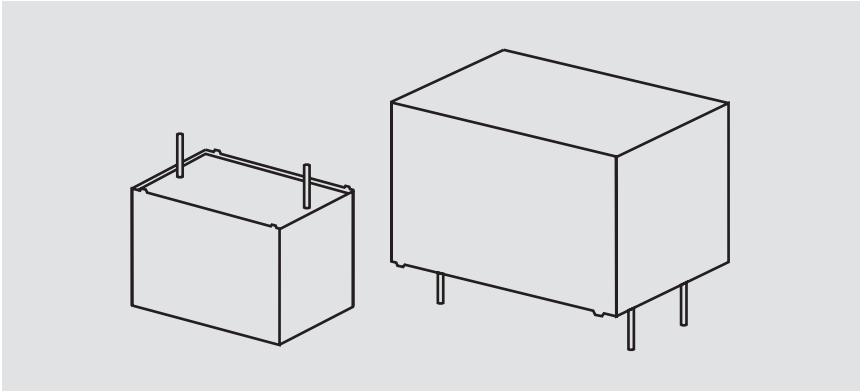
Packing units at the end of the catalogue

For further details and graphs please refer to Technical Information.

Maximum pulse rise time:

PCM	max. pulse rise time V/µsec at T_A < 40° C						
	400 VDC	500 VDC	600 VDC	800 VDC	900 VDC	1100 VDC	1300 VDC
27.5	11	15	27	29	35	43	50
37.5	8	10	19	21	22	29	35
52.5	5	7	13	15	18	21	25

for pulses equal to the rated voltage



Continuation

General Data

Capacitance	400 VDC (70° C) / 300 VDC (85° C) W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
1 µF	9	19	31.5	27.5	2	11	1	238.7	DCP4G041006A_____
2 „	9	19	31.5	27.5	2	22	1.5	119.4	DCP4G042006A_____
3 „	9	19	31.5	27.5	2	33	1.5	79.6	DCP4G043006A_____
4 „	9	19	31.5	27.5	2	44	2	59.7	DCP4G044006A_____
5 „	9	19	31.5	27.5	2	55	2	47.7	DCP4G045006A_____
7 „	9	19	31.5	27.5	2	77	2.5	34.1	DCP4G047006A_____
10 µF	11	21	31.5	27.5	2/4	110	3.5	23.9	DCP4G051006B_____
15 „	13	24	31.5	27.5	2/4	165	4.5	15.9	DCP4G051506D_____
20 „	15	26	31.5	27.5	2/4	220	5.5	11.9	DCP4G052006F_____
25 „	17	29	31.5	27.5	2/4	275	6.5	9.5	DCP4G052506G_____
30 „	17	34.5	31.5	27.5	2/4	330	7	8	DCP4G053006I_____
40 „	20	39.5	31.5	27.5	2/4	440	9.5	6	DCP4G054006J_____
50 „	20	39.5	41.5	37.5	2/4	400	11	5.4	DCP4G055007G_____
60 „	20	39.5	41.5	37.5	2/4	480	11.5	4.8	DCP4G056007G_____
70 „	24	45.5	41.5	37.5	2/4	560	15	3.6	DCP4G057007H_____
80 „	24	45.5	41.5	37.5	2/4	640	17	2.7	DCP4G058007H_____
90 „	24	45.5	41.5	37.5	2/4	720	17.5	2.6	DCP4G059007H_____
100 µF	31	46	41.5	37.5	2/4	800	19	2.5	DCP4G061007I_____
120 „	31	46	41.5	37.5	2/4	960	20	2.3	DCP4G061207I_____
140 „	35	50	41.5	37.5	2/4	1120	22.5	2.1	DCP4G061407J_____
150 „	35	50	41.5	37.5	2/4	1200	23	2	DCP4G061507J_____
160 „	40	55	41.5	37.5	2/4	1280	28	1.6	DCP4G061607K_____
180 „	40	55	41.5	37.5	2/4	1440	29.5	1.4	DCP4G061807K_____
190 „	40	55	41.5	37.5	2/4	1520	31.5	1.2	DCP4G061907K_____
200 „	40	55	41.5	37.5	2/4	1600	32.5	1.2	DCP4G062007K_____
220 „	35	50	57	52.5	4	1100	27	1.8	DCP4G062209F_____
250 „	45	55	57	52.5	4	1250	32	1.6	DCP4G062509H_____
270 „	45	55	57	52.5	4	1350	33.5	1.5	DCP4G062709H_____
300 „	45	55	57	52.5	4	1500	35	1.3	DCP4G063009H_____
330 „	45	65	57	52.5	4	1650	37	1.2	DCP4G063309J_____
350 „	45	65	57	52.5	4	1750	40	1.1	DCP4G063509J_____
370 „	45	65	57	52.5	4	1850	41.5	1.1	DCP4G063709J_____
400 „	45	65	57	52.5	4	2000	43	1	DCP4G064009J_____

* General guide

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

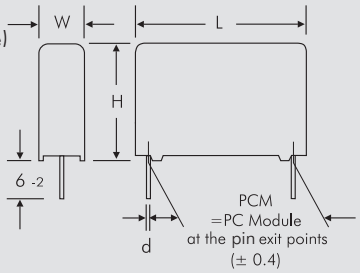
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

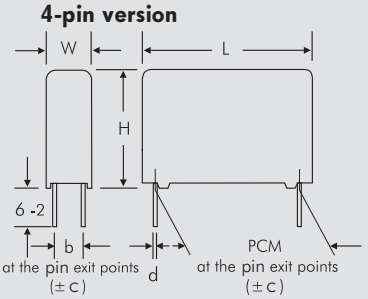
Taped version see page 149.

2-pin version



PCM	d
27.5	0.8
37.5	1

4-pin version



W	PCM	b	d	c
11	27.5	5	0.8	0.4
13	27.5	7.5	0.8	0.4
15	27.5	7.5	0.8	0.4
17	27.5	10	0.8	0.4
20	27.5	12.5	0.8	0.4
20	37.5	12.5	1	0.4
24	37.5	12.5	1	0.4
31	37.5	20	1	0.4
35	37.5	20	1	0.4
40	37.5	20	1	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 124

Continuation

General Data

Capacitance	500 VDC (70° C) / 400 VDC (85° C) W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
1 µF	9	19	31.5	27.5	2	15	1	238.7	DCP4H141006A_____
2 „	9	19	31.5	27.5	2	30	1.5	119.4	DCP4H142006A_____
3 „	9	19	31.5	27.5	2	45	1.5	79.6	DCP4H143006A_____
5 „	9	19	31.5	27.5	2	75	2.5	47.7	DCP4H145006A_____
7 „	11	21	31.5	27.5	2/4	105	3	34.1	DCP4H147006B_____
8 „	13	24	31.5	27.5	2/4	120	3	29.8	DCP4H148006D_____
10 µF	13	24	31.5	27.5	2/4	150	4	23.9	DCP4H151006D_____
12 „	15	26	31.5	27.5	2/4	180	4	19.9	DCP4H151206F_____
15 „	17	29	31.5	27.5	2/4	225	5	15.9	DCP4H151506G_____
20 „	17	34.5	31.5	27.5	2/4	300	6	11.9	DCP4H152006I_____
22 „	20	39.5	31.5	27.5	2/4	330	7	10.9	DCP4H152206J_____
25 „	20	39.5	31.5	27.5	2/4	375	7.5	9.5	DCP4H152506J_____
30 „	20	39.5	41.5	37.5	2/4	300	9	7.9	DCP4H153007G_____
35 „	20	39.5	41.5	37.5	2/4	350	8.5	9.1	DCP4H153507G_____
40 „	20	39.5	41.5	37.5	2/4	400	10	5.7	DCP4H154007G_____
	24	45.5	41.5	37.5	2/4	400	10	8	DCP4H154007H_____
45 „	24	45.5	41.5	37.5	2/4	450	12.5	5	DCP4H154507H_____
50 „	24	45.5	41.5	37.5	2/4	500	13	4.8	DCP4H155007H_____
55 „	24	45.5	41.5	37.5	2/4	550	14	4	DCP4H155507H_____
60 „	31	46	41.5	37.5	2/4	600	14	4.7	DCP4H156007I_____
65 „	31	46	41.5	37.5	2/4	650	16.5	3.3	DCP4H156507I_____
70 „	31	46	41.5	37.5	2/4	700	18	2.9	DCP4H157007I_____
75 „	31	46	41.5	37.5	2/4	750	17	3.2	DCP4H157507I_____
80 „	31	46	41.5	37.5	2/4	800	18	2.8	DCP4H158007I_____
85 „	35	50	41.5	37.5	2/4	850	10.5	3.2	DCP4H158507J_____
90 „	35	50	41.5	37.5	2/4	900	21	2.4	DCP4H159007J_____
95 „	35	50	41.5	37.5	2/4	950	21.5	2.2	DCP4H159507J_____
100 µF	35	50	41.5	37.5	2/4	1000	24	1.9	DCP4H161007J_____
	35	50	57	52.5	4	700	18	4	DCP4H161009F_____
110 „	40	55	41.5	37.5	2/4	1100	19	2.9	DCP4H161107K_____
	35	50	57	52.5	4	770	19	3.6	DCP4H161109F_____
120 „	40	55	41.5	37.5	2/4	1200	22.5	2.7	DCP4H161207K_____
	35	50	57	52.5	4	840	20	3.3	DCP4H161209F_____
130 „	40	55	41.5	37.5	2/4	1300	23	2.4	DCP4H161307K_____
	35	50	57	52.5	4	910	21	3.1	DCP4H161309F_____
140 „	35	50	57	52.5	4	980	21.5	2.8	DCP4H161409F_____
150 „	35	50	57	52.5	4	1050	22.5	2.7	DCP4H161509F_____
160 „	45	55	57	52.5	4	1120	25.5	2.5	DCP4H161609H_____
170 „	45	55	57	52.5	4	1190	26.5	2.3	DCP4H161709H_____
180 „	45	55	57	52.5	4	1260	27	2.2	DCP4H161809H_____
190 „	45	55	57	52.5	4	1330	28	2.1	DCP4H161909H_____
200 „	45	55	57	52.5	4	1400	28.5	2	DCP4H162009H_____
210 „	45	55	57	52.5	4	1470	29.5	1.9	DCP4H162109H_____
220 „	45	65	57	52.5	4	1540	32	1.8	DCP4H162209J_____
240 „	45	65	57	52.5	4	1680	33.5	1.7	DCP4H162409J_____

* General guide

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Continuation page 125

Continuation

General Data

Capacitance	600 VDC (70° C) / 450 VDC (85° C) W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz)* A	ESR (10 kHz)* mΩ	Part number
2 µF	9	19	31.5	27.5	2	54	2	56	DCP4I042006A_____
5 „	13	24	31.5	27.5	2/4	135	3.5	22	DCP4I045006D_____
7 „	15	26	31.5	27.5	2/4	189	4.5	16	DCP4I047006F_____
10 µF	17	29	31.5	27.5	2/4	270	6	11	DCP4I051006G_____
	27	15	41.5	37.5	2/4	190	6.5	10	DCP4I051007M_____
15 „	17	34.5	31.5	27.5	2/4	405	7.5	7.4	DCP4I051506I_____
20 „	20	39.5	31.5	27.5	2/4	540	9	6.2	DCP4I052006J_____
	20	39.5	41.5	37.5	2/4	380	10	6.2	DCP4I052007G_____
25 „	20	39.5	41.5	37.5	2/4	475	11.5	5	DCP4I052507G_____
30 „	24	45.5	41.5	37.5	2/4	570	14	4.1	DCP4I053007H_____
35 „	24	45.5	41.5	37.5	2/4	665	14.5	3.8	DCP4I053507H_____
40 „	31	46	41.5	37.5	2/4	760	16.5	3.3	DCP4I054007I_____
45 „	31	46	41.5	37.5	2/4	855	17	3.2	DCP4I054507I_____
50 „	35	50	41.5	37.5	2/4	950	19	2.9	DCP4I055007J_____
55 „	35	50	41.5	37.5	2/4	1045	17	3.8	DCP4I055507J_____
60 „	35	50	41.5	37.5	2/4	1140	17.5	3.4	DCP4I056007J_____
65 „	40	55	41.5	37.5	2/4	1235	19.5	3.3	DCP4I056507K_____
	35	50	57	52.5	4	845	20	3.3	DCP4I056509F_____
70 „	40	55	41.5	37.5	2/4	1330	20	3.1	DCP4I057007K_____
	35	50	57	52.5	4	910	20.5	3.1	DCP4I057009F_____
75 „	40	55	41.5	37.5	2/4	1425	20.5	3	DCP4I057507K_____
	35	50	57	52.5	4	975	21	3	DCP4I057509F_____
80 „	40	55	41.5	37.5	2/4	1520	22	2.6	DCP4I058007K_____
	35	50	57	52.5	4	1040	22	2.6	DCP4I058009F_____
85 „	35	50	57	52.5	4	1105	22.5	2.1	DCP4I058509F_____
90 „	35	50	57	52.5	4	1170	23.5	1.9	DCP4I059009F_____
95 „	45	55	57	52.5	4	1235	24	2.8	DCP4I059509H_____
100 µF	45	55	57	52.5	4	1300	25	2.6	DCP4I061009H_____
110 „	45	55	57	52.5	4	1430	26.5	2.3	DCP4I061109H_____
115 „	45	65	57	52.5	4	1495	27.5	2.5	DCP4I061159J_____
120 „	45	65	57	52.5	4	1560	28	2.3	DCP4I061209J_____
130 „	45	65	57	52.5	4	1690	29.5	2.1	DCP4I061309J_____
140 „	45	65	57	52.5	4	1820	31	1.9	DCP4I061409J_____
150 „	45	65	57	52.5	4	1950	33	1.7	DCP4I061509J_____

* General guide

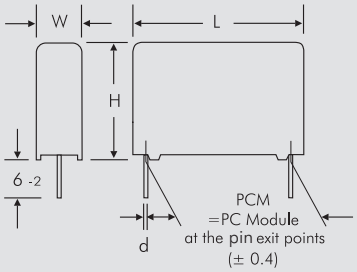
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

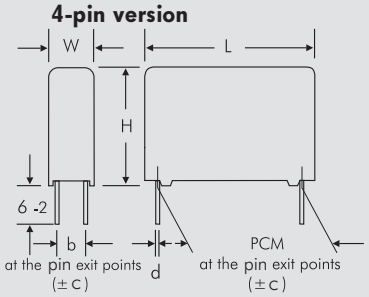
Taped version see page 149.

2-pin version



PCM	d
27.5	0.8
37.5	1

4-pin version



W	PCM	b	d	c
11	27.5	5	0.8	0.4
13	27.5	7.5	0.8	0.4
15	27.5	7.5	0.8	0.4
17	27.5	10	0.8	0.4
20	27.5	12.5	0.8	0.4
19	37.5	10	1	0.4
20	37.5	12.5	1	0.4
24	37.5	12.5	1	0.4
27	37.5	20	1	0.4
31	37.5	20	1	0.4
35	37.5	20	1	0.4
40	37.5	20	1	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 126

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz)* A	ESR (10 kHz)* mΩ	Part number
						800 VDC (70° C) / 700 VDC (85° C)			
2 µF	9	19	31.5	27.5	2	58	2	52	DCP4L042006A_____
5 „	13	24	31.5	27.5	2/4	145	4	21	DCP4L045006D_____
7 „	17	29	31.5	27.5	2/4	203	5	15	DCP4L047006G_____
10 µF	17	34.5	31.5	27.5	2/4	290	6.5	10	DCP4L051006I_____
15 „	20	39.5	31.5	27.5	2/4	435	9	6.9	DCP4L051506J_____
	20	39.5	41.5	37.5	2/4	315	9.5	6.9	DCP4L051507G_____
20 „	20	39.5	41.5	37.5	2/4	420	10	6.2	DCP4L052007G_____
25 „	24	45.5	41.5	37.5	2/4	525	12.5	5	DCP4L052507H_____
30 „	24	45.5	41.5	37.5	2/4	630	14	4.1	DCP4L053007H_____
35 „	31	46	41.5	37.5	2/4	735	15.5	3.8	DCP4L053507I_____
40 „	31	46	41.5	37.5	2/4	840	16.5	3.3	DCP4L054007I_____
45 „	35	50	41.5	37.5	2/4	945	17.5	3.4	DCP4L054507J_____
50 „	35	50	41.5	37.5	2/4	1050	19	3	DCP4L055007J_____
55 „	40	55	41.5	37.5	2/4	1155	19.5	3.2	DCP4L055507K_____
	35	50	57	52.5	4	825	20.4	3.2	DCP4L055509F_____
60 „	40	55	41.5	37.5	2/4	1260	20.5	2.9	DCP4L056007K_____
	35	50	57	52.5	4	900	21.5	2.9	DCP4L056009F_____
65 „	35	50	57	52.5	4	975	22.5	2.2	DCP4L056509F_____
70 „	45	55	57	52.5	4	1050	23.5	3	DCP4L057009H_____
75 „	45	55	57	52.5	4	1125	24	2.9	DCP4L057509H_____
80 „	45	55	57	52.5	4	1200	24.5	3	DCP4L058009H_____
85 „	45	65	57	52.5	4	1275	25	2.6	DCP4L058509J_____
90 „	45	65	57	52.5	4	1350	25.5	2.5	DCP4L059009J_____
95 „	45	65	57	52.5	4	1425	26	2.4	DCP4L059509J_____
100 µF	45	65	57	52.5	4	1500	26.5	2.3	DCP4L061009J_____
110 „	45	65	57	52.5	4	1650	27.5	2.2	DCP4L061109J_____
115 „	45	65	57	52.5	4	1725	28	2.1	DCP4L061159J_____

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz)* A	ESR (10 kHz)* mΩ	Part number
						900 VDC (70° C) / 760 VDC (85° C)			
2 µF	11	21	31.5	27.5	2/4	70	2.5	44	DCP4N042006B_____
5 „	17	29	31.5	27.5	2/4	175	4.5	18	DCP4N045006G_____
7 „	17	34.5	31.5	27.5	2/4	245	6	13	DCP4N047006I_____
10 µF	20	39.5	31.5	27.5	2/4	350	8	8.8	DCP4N051006J_____
	20	39.5	41.5	37.5	2/4	220	8.5	8.8	DCP4N051007G_____
15 „	20	39.5	41.5	37.5	2/4	330	10.5	5.8	DCP4N051507G_____
20 „	24	45.5	41.5	37.5	2/4	440	13	4.8	DCP4N052007H_____
25 „	31	46	41.5	37.5	2/4	550	15.5	3.8	DCP4N052507I_____
30 „	31	46	41.5	37.5	2/4	660	15.5	3.7	DCP4N053007I_____
35 „	35	50	41.5	37.5	2/4	770	18	3.2	DCP4N053507J_____
40 „	40	55	41.5	37.5	2/4	880	19.5	3.2	DCP4N054007K_____
	35	50	57	52.5	4	720	20.5	3.2	DCP4N054009F_____
45 „	35	50	57	52.5	4	810	21	2.8	DCP4N054509F_____
50 „	35	50	57	52.5	4	900	22	3.3	DCP4N055009F_____
55 „	35	50	57	52.5	4	990	22.5	3.2	DCP4N055509F_____
	45	55	57	52.5	4	990	22.5	3.2	DCP4N055509H_____
60 „	45	55	57	52.5	4	1080	23	3	DCP4N056009H_____
65 „	45	55	57	52.5	4	1170	24	2.9	DCP4N056509H_____
70 „	45	65	57	52.5	4	1260	24.5	3.3	DCP4N057009J_____
75 „	45	65	57	52.5	4	1350	25	2.9	DCP4N057509J_____
80 „	45	65	57	52.5	4	1440	25.5	2.8	DCP4N058009J_____

* General guide

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Continuation page 127

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz)* A	ESR (10 kHz)* mΩ	Part number
						1100 VDC (70° C) / 920 VDC (85° C)			
2 µF	13	24	31.5	27.5	2/4	86	3	36	DCP4P042006D_____
3 „	15	26	31.5	27.5	2/4	129	4	23	DCP4P043006F_____
5 „	17	34.5	31.5	27.5	2/4	215	5.5	14	DCP4P045006I_____
7 „	20	39.5	31.5	27.5	2/4	301	7.5	10	DCP4P047006J_____
	19	32	41.5	37.5	2/4	203	7.5	10	DCP4P047007F_____
10 µF	20	39.5	41.5	37.5	2/4	290	9.5	7.2	DCP4P051007G_____
15 „	31	46	41.5	37.5	2/4	435	13	5.4	DCP4P051507I_____
20 „	31	46	41.5	37.5	2/4	580	14	5.2	DCP4P052007I_____
	35	50	41.5	37.5	2/4	580	15	4.7	DCP4P052007J_____
25 „	40	55	41.5	37.5	2/4	725	16.5	4.6	DCP4P052507K_____
30 „	35	50	57	52.5	4	630	17.5	4.4	DCP4P053009F_____
35 „	35	50	57	52.5	4	735	18	4	DCP4P053509F_____
40 „	45	55	57	52.5	4	840	19	4.5	DCP4P054009H_____
45 „	45	55	57	52.5	4	945	20	4.1	DCP4P054509H_____
50 „	45	65	57	52.5	4	1050	21	4.1	DCP4P055009J_____
55 „	45	65	57	52.5	4	1150	22	3.8	DCP4P055509J_____
60 „	45	65	57	52.5	4	1260	23	3.5	DCP4P056009J_____

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz)* A	ESR (10 kHz)* mΩ	Part number
						1300 VDC (70° C) / 1100 VDC (85° C)			
2 µF	15	26	31.5	27.5	2/4	100	3	36	DCP4R242006F_____
5 „	20	39.5	31.5	27.5	2/4	250	6	14	DCP4R245006J_____
	20	39.5	41.5	37.5	2/4	175	7	14	DCP4R245007G_____
7 „	20	39.5	41.5	37.5	2/4	245	8	10	DCP4R247007G_____
10 µF	24	45.5	41.5	37.5	2/4	350	10.5	7,2	DCP4R251007H_____
15 „	31	46	41.5	37.5	2/4	525	14	4.8	DCP4R251507I_____
20 „	40	55	41.5	37.5	2/4	700	17.5	4	DCP4R252007K_____
	35	50	57	52.5	4	500	18	4	DCP4R252009F_____
25 „	35	50	57	52.5	4	625	19	3.6	DCP4R252509F_____
30 „	45	55	57	52.5	4	750	20	4	DCP4R253009H_____
35 „	45	65	57	52.5	4	875	21	4.1	DCP4R253509J_____
40 „	45	65	57	52.5	4	1000	22	3.7	DCP4R254009J_____

* General guide

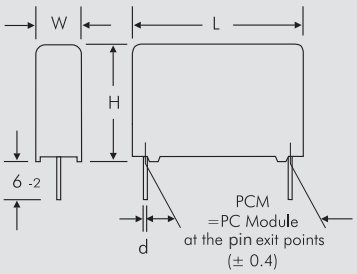
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

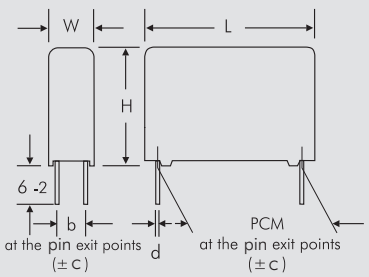
Taped version see page 149.

2-pin version



PCM	d
27.5	0.8
37.5	1

4-pin version



W	PCM	b	d	c
11	27.5	5	0.8	0.4
13	27.5	7.5	0.8	0.4
15	27.5	7.5	0.8	0.4
17	27.5	10	0.8	0.4
20	27.5	12.5	0.8	0.4
19	37.5	10	1	0.4
20	37.5	12.5	1	0.4
24	37.5	12.5	1	0.4
31	37.5	20	1	0.4
35	37.5	20	1	0.4
40	37.5	20	1	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

WIMA DC-LINK MKP 4S

Metallized Polypropylene (PP) - DC-Link Capacitors for STRINGENT REQUIREMENTS. Capacitances from 0.47 µF to 80 µF. Rated Voltages from 450 VDC to 1050 VDC.

Special Features

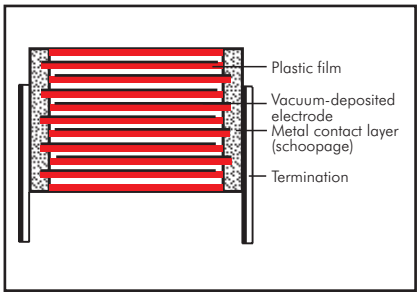
- **Capacitances up to 80 µF**
- **High volume/capacitance ratio**
- **Excellent self-healing properties**
- **For stringent requirements**
- **Very low dissipation factor**
- **High reliability**
- **2-pin and 4-pin contact configuration (plate versions on request)**
- **According to RoHS 2011/65/EU**

Typical Applications

As intermediate circuit capacitor e.g. in high power converter technology, power supplies, solar inverters etc.

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire (plate versions on request).
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 0.47 µF to 80 µF (intermediate values on request)
Rated voltages: 450 VDC, 630 VDC, 800 VDC, 900 VDC, 1050 VDC
Capacitance tolerances: ±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C (hot spot including self-heating)
Climatic test category: 55/085/56 in accordance with IEC
Dissipation factors at +20° C:

PCM	1 kHz
27.5	⩽ 12 x 10^{-4}
37.5	⩽ 25 x 10^{-4}
52.5	⩽ 45 x 10^{-4}

Voltage and current derating:
A derating factor of 1.35% per K must be applied from +85° C for DC voltages and from +70° C for AC currents (I_{rms}). Additionally a derating factor of 4.5% per K must be applied from +85° C for AC currents (I_{rms})
Reliability: Operational life > 100 000 hours (U_r and 70° C)
Failure rate λ_0 (0.5 x U_r and 40° C)

$\Pi = \lvert C_N$ [µF] x U_r [V]$\rvert$	λ_0
Π ⩽ 10 000	< 2 fit
10 000 < Π ⩽ 25 000	< 5 fit
25 000 < Π ⩽ 50 000	< 10 fit
50 000 < Π ⩽ 100 000	< 20 fit
Π > 100 000	< 30 fit

Insulation resistance at +20° C:
⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage:
1.6 U_r, 2sec
Dielectric absorption: 0.05 %
Specific dissipation:

Box size W x H x L in mm	Specific dissipation in Watts per K above the ambient temperature
11 x 21 x 31.5	0.025
13 x 24 x 31.5	0.030
15 x 26 x 31.5	0.034
17 x 29 x 31.5	0.039
17 x 34.5 x 31.5	0.044
20 x 39.5 x 31.5	0.053
15 x 26 x 41.5	0.042
17 x 29 x 41.5	0.048
19 x 32 x 41.5	0.054
20 x 39.5 x 41.5	0.065
24 x 45.5 x 41.5	0.080
31 x 46 x 41.5	0.092
35 x 50 x 41.5	0.106
40 x 55 x 41.5	0.123
35 x 50 x 57	0.132
45 x 55 x 57	0.164
45 x 65 x 57	0.184

Packing

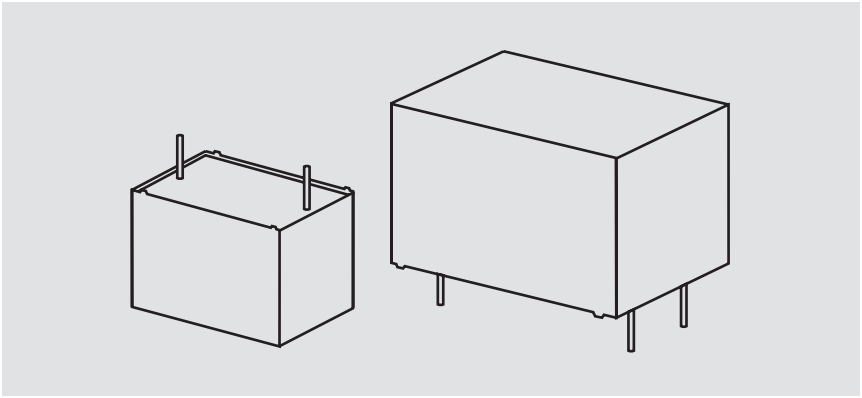
Packing units at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Maximum pulse rise time:

PCM	max. pulse rise time V/µsec at T_A < 40° C				
	450 VDC	630 VDC	800 VDC	900 VDC	1050 VDC
27.5	48	59	71	81	93
37.5	32	41	51	60	69
52.5	27	32	37	43	48

for pulses equal to the rated voltage



Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	450 VDC (70° C) / 300 VDC (85° C) I_S A	I_{rms} (10 kHz)* A 10 K	I_{rms} (10 kHz)* A 20 K	ESR (10 kHz)* mΩ	Part number
2.2 µF	11	21	31.5	27.5	2/4	106	4.3	6.1	13.7	DCPSH042206B_____
3.3 „	13	24	31.5	27.5	2/4	158	5.3	7.5	10.6	DCPSH043306D_____
4.7 „	15	26	31.5	27.5	2/4	226	6.2	8.8	8.8	DCPSH044706F_____
6.8 „	17	29	31.5	27.5	2/4	326	7.4	10.5	7.1	DCPSH046806G_____
10 µF	19	32	41.5	37.5	2/4	320	9.6	13.6	5.9	DCPSH051007F_____
15 „	20	39.5	41.5	37.5	2/4	480	11.8	16.7	4.7	DCPSH051507G_____
20 „	24	45.5	41.5	37.5	2/4	640	13.9	19.7	4.1	DCPSH052007H_____
25 „	31	46	41.5	37.5	2/4	800	15.5	21.9	3.8	DCPSH052507I_____
30 „	31	46	41.5	37.5	2/4	960	16.3	23.0	3.5	DCPSH053007I_____
35 „	35	50	41.5	37.5	2/4	1120	18.3	25.8	3.2	DCPSH053507J_____
40	40	55	41.5	37.5	2/4	1280	20.3	28.7	3.0	DCPSH054007K_____
	35	50	57	52.5	4	1080	21.0	29.7	3.0	DCPSH054009F_____
45 „	35	50	57	52.5	4	1215	21.7	30.7	2.8	DCPSH054509F_____
50 „	35	50	57	52.5	4	1350	22.4	31.7	2.6	DCPSH055009F_____
55 „	45	55	57	52.5	4	1485	25.4	35.9	2.5	DCPSH055509H_____
60 „	45	55	57	52.5	4	1620	26.0	36.8	2.4	DCPSH056009H_____
65 „	45	55	57	52.5	4	1755	26.3	37.2	2.4	DCPSH056509H_____
70 „	45	65	57	52.5	4	1890	28.2	39.8	2.3	DCPSH057009J_____
75 „	45	65	57	52.5	4	2025	28.6	40.4	2.3	DCPSH057509J_____
80 „	45	65	57	52.5	4	2160	29.0	41.0	2.2	DCPSH058009J_____

Capacitance	W	H	L	PCM**	Pin	630 VDC (70° C) / 450 VDC (85° C) I_S A	I_{rms} (10 kHz)* A 10 K	I_{rms} (10 kHz)* A 20 K	ESR (10 kHz)* mΩ	Part number
1.5 µF	11	21	31.5	27.5	2/4	89	3.8	5.4	17.0	DCPSJ041506B_____
2.2 „	13	24	31.5	27.5	2/4	130	4.7	6.6	13.7	DCPSJ042206D_____
3.3 „	15	26	31.5	27.5	2/4	195	5.7	8.0	10.6	DCPSJ043306F_____
4.7 „	17	34.5	31.5	27.5	2/4	277	7.1	10.0	8.8	DCPSJ044706I_____
6.8 „	17	29	41.5	37.5	2/4	279	8.2	11.6	7.1	DCPSJ046807E_____
10 µF	20	39.5	41.5	37.5	2/4	410	10.5	14.8	5.9	DCPSJ051007G_____
15 „	31	46	41.5	37.5	2/4	615	14.0	19.8	4.7	DCPSJ051507I_____
20 „	35	50	41.5	37.5	2/4	820	16.0	22.6	4.1	DCPSJ052007J_____
25 „	40	55	41.5	37.5	2/4	1025	18.0	25.5	3.8	DCPSJ052507K_____
30 „	35	50	57	52.5	4	960	19.6	27.7	3.5	DCPSJ053009F_____
35 „	35	50	57	52.5	4	1120	20.4	28.8	3.1	DCPSJ053509F_____
40 „	45	55	57	52.5	4	1280	23.4	33.1	3.0	DCPSJ054009H_____
45 „	45	55	57	52.5	4	1440	25.5	36.1	2.8	DCPSJ054509H_____
50 „	45	65	57	52.5	4	1600	26.4	37.3	2.6	DCPSJ055009J_____
55 „	45	65	57	52.5	4	1760	26.9	38.0	2.5	DCPSJ055509J_____
60 „	45	65	57	52.5	4	1920	27.5	38.8	2.4	DCPSJ056009J_____

* General guide.

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 130

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	800 VDC (70° C) / 630 VDC (85° C) I_S A	I_{rms} (10 kHz)* A 10 K	I_{rms} (10 kHz)* A 20 K	ESR (10 kHz)* mΩ	Part number
1.0 µF	11	21	31.5	27.5	2/4	71	3.3	4.6	23.1	DCPSL041006B_____
1.5 „	13	24	31.5	27.5	2/4	107	4.2	5.9	17.0	DCPSL041506D_____
2.2 „	15	26	31.5	27.5	2/4	156	5.0	7.0	13.7	DCPSL042206F_____
3.3 „	17	29	31.5	27.5	2/4	234	6.1	8.5	10.6	DCPSL043306G_____
4.7 „	19	32	41.5	37.5	2/4	240	7.8	11.0	8.8	DCPSL044707F_____
6.8 „	20	39.5	41.5	37.5	2/4	347	9.5	13.5	7.1	DCPSL046807G_____
10 µF	24	45.5	41.5	37.5	2/4	510	11.7	16.4	5.9	DCPSL051007H_____
15 „	31	46	41.5	37.5	2/4	765	14.0	19.8	4.7	DCPSL051507I_____
20 „	40	55	41.5	37.5	2/4	1020	17.2	24.3	4.1	DCPSL052007K_____
	35	50	57	52.5	4	740	17.9	25.2	4.1	DCPSL052009F_____
25 „	35	50	57	52.5	4	925	18.6	26.2	3.8	DCPSL052509F_____
30 „	45	55	57	52.5	4	1110	21.8	30.8	3.5	DCPSL053009H_____
35 „	45	65	57	52.5	4	1295	24.0	33.9	3.2	DCPSL053509J_____
40 „	45	65	57	52.5	4	1480	24.8	35.0	3.0	DCPSL054009J_____

Capacitance	W	H	L	PCM**	Pin	900 VDC (70° C) / 750 VDC (85° C) I_S A	I_{rms} (10 kHz)* A 10 K	I_{rms} (10 kHz)* A 20 K	ESR (10 kHz)* mΩ	Part number
0.68 µF	11	21	31.5	27.5	2/4	55	2.8	3.9	32.8	DCPSN036806B_____
1.0 µF	13	24	31.5	27.5	2/4	81	3.6	5.1	23.1	DCPSN041006D_____
1.5 „	15	26	31.5	27.5	2/4	122	4.5	6.3	17.0	DCPSN041506F_____
2.2 „	17	29	31.5	27.5	2/4	178	5.3	7.5	13.7	DCPSN042206G_____
3.3 „	17	29	41.5	37.5	2/4	198	6.7	9.5	10.6	DCPSN043307E_____
4.7 „	20	39.5	41.5	37.5	2/4	282	8.6	12.1	8.8	DCPSN044707G_____
6.8 „	24	45.5	41.5	37.5	2/4	408	10.6	15.0	7.1	DCPSN046807H_____
10 µF	31	46	41.5	37.5	2/4	600	12.5	17.7	5.9	DCPSN051007I_____
15 „	40	55	41.5	37.5	2/4	900	16.2	22.9	4.7	DCPSN051507K_____
20 „	35	50	57	52.5	4	860	17.9	25.3	4.1	DCPSN052009F_____
25 „	45	55	57	52.5	4	1075	20.7	29.3	3.8	DCPSN052509H_____

* General guide

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

Continuation page 131

Continuation

General Data

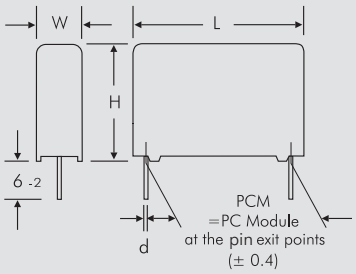
Capacitance	W	H	L	PCM**	Pin	1050 VDC (70° C) / 875 VDC (85° C) I_S A	I_{rms} (10 kHz)* A 10 K	I_{rms} (10 kHz)* A 20 K	ESR (10 kHz)* mΩ	Part number
0.47 µF	11	21	31.5	27.5	2/4	44	2.4	3.4	44.0	DCPSO334706B_____
0.68 „	11	21	31.5	27.5	2/4	63	2.8	3.9	32.8	DCPSO336806B_____
1.0 µF	13	24	31.5	27.5	2/4	93	3.6	5.1	23.1	DCPSO341006D_____
1.5 „	17	29	31.5	27.5	2/4	140	4.8	6.8	17.0	DCPSO341506G_____
	15	26	41.5	37.5	2/4	104	5.0	7.0	17.0	DCPSO341507D_____
2.2 „	17	34.5	31.5	27.5	2/4	205	5.7	8.0	13.7	DCPSO342206I_____
	17	29	41.5	37.5	2/4	152	5.9	8.4	13.7	DCPSO342207E_____
3.3 „	20	39.5	31.5	27.5	2/4	307	7.1	10.0	10.6	DCPSO343306J_____
	19	32	41.5	37.5	2/4	228	7.1	10.1	10.6	DCPSO343307F_____
4.7 „	20	39.5	41.5	37.5	2/4	324	8.6	12.1	8.8	DCPSO344707G_____
6.8 „	31	46	41.5	37.5	2/4	469	11.4	16.0	7.1	DCPSO346807I_____
10 µF	35	50	41.5	37.5	2/4	690	13.4	19.0	5.9	DCPSO351007J_____
15 „	35	50	57	52.5	4	720	16.8	23.8	4.7	DCPSO351509F_____
20 „	45	55	57	52.5	4	960	19.9	28.2	4.1	DCPSO352009H_____

* General guide

** PCM = Printed circuit module = pin spacing

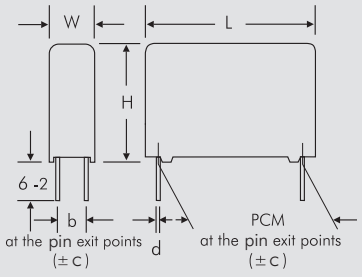
Dims. in mm.

2-pin version



PCM	d
27.5	0.8
37.5	1

4-pin version



W	PCM	b	d	c
11	27.5	5	0.8	0.4
13	27.5	7.5	0.8	0.4
15	27.5	7.5	0.8	0.4
17	27.5	10	0.8	0.4
20	27.5	12.5	0.8	0.4
17	37.5	10	1	0.4
19	37.5	10	1	0.4
20	37.5	12.5	1	0.4
24	37.5	12.5	1	0.4
31	37.5	20	1	0.4
35	37.5	20	1	0.4
40	37.5	20	1	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 149.

WIMA DC-LINK MKP 5

Metallized Polypropylene (PP) - Capacitors in Cylindrical Case for DC-Link Applications. Capacitances from 16 µF to 260 µF. Rated Voltages from 500 VDC to 1300 VDC.

Special Features

- **Very high volume/capacitance ratio**
- **Self-healing properties**
- **With cylindrical plastic case for PCB mounting**
- **Dry construction without electrolyte or oil**
- **No internal fuse required**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**
- **Customer-specific capacitances or voltages on request**

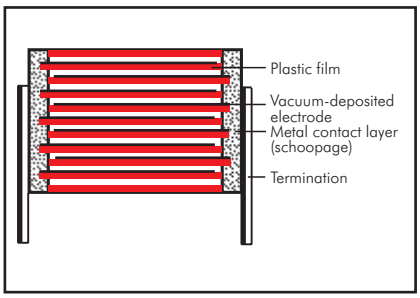
Typical Applications

DC capacitors with high capacitances for applications in power electronics also at non-sinusoidal voltages and currents e.g. in

- **Wind power systems**
- **Inverters**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with PU-sealing, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Grey. Marking: Black on silver label.

Electrical Data

Capacitance range: 16 µF to 260 µF
Rated voltages: 500 VDC, 700 VDC, 900 VDC,1100 VDC, 1300 VDC
Capacitance tolerances: ±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–40° C to +85° C
Insulation resistance at +20° C:
⩾ 5 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.

Dielectric loss factor tan δ_0:
2×10^{-4}
Test voltage: 1.5 U_r, 2sec
Dielectric absorption:
0.05 %
Reliability:
Operational life > 100 000 hours
Failure rate < 50 fit (hot spot ⩽ 70° C)

Mounting Recommendation

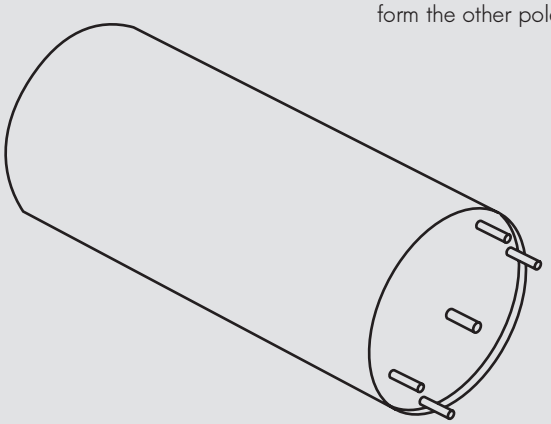
Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors.

Packing

Transportation-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.

The capacitors are non-polarized. The centre termination is designed as one pole whereas the four outer terminations form the other pole.



Continuation

General Data

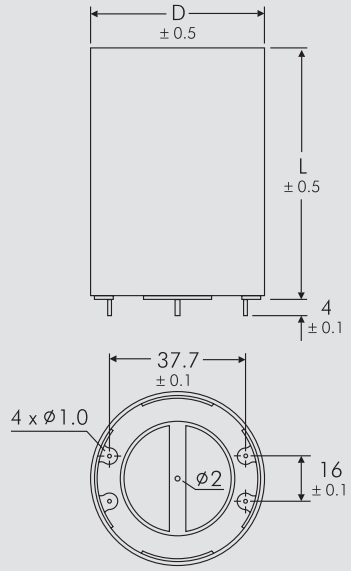
U_R	C_N	D x L mm	I_{rms} (1 kHz)* A	ESR (1 kHz)* mΩ	R_{th} K/W	L_e nH	Approx. weight g	Part number
500 VDC	85 µF	50 x 57	35	2.0	11.0	< 45	120	DCP5H15850D000_ _ _ _
	195 „	50 x 95	32	3.4	7.5	< 65	190	DCP5H16195D100_ _ _ _
	260 „	50 x 120	30	5.2	6.0	< 85	220	DCP5H16260D200_ _ _ _
700 VDC	59 µF	50 x 57	30	1.9	11.0	< 45	120	DCP5K05590D000_ _ _ _
	143 „	50 x 95	32	3.5	7.5	< 65	190	DCP5K06143D100_ _ _ _
	190 „	50 x 120	25	4.7	6.0	< 85	220	DCP5K06190D200_ _ _ _
900 VDC	53 µF	50 x 57	35	2.3	11.0	< 45	120	DCP5N05530D000_ _ _ _
	114 „	50 x 95	32	4.2	7.5	< 65	190	DCP5N06114D100_ _ _ _
	158 „	50 x 120	30	6.0	6.0	< 85	220	DCP5N06158D200_ _ _ _
1100 VDC	30 µF	50 x 57	20	2.8	11.0	< 45	120	DCP5P05300D000_ _ _ _
	72 „	50 x 95	25	4.5	7.5	< 65	190	DCP5P05720D100_ _ _ _
	100 „	50 x 120	25	6.1	6.0	< 85	220	DCP5P06100D200_ _ _ _
1300 VDC	16 µF	50 x 57	20	3.0	11.0	< 45	120	DCP5R25160D000_ _ _ _
	40 „	50 x 95	25	5.7	7.5	< 65	190	DCP5R25400D100_ _ _ _
	55 „	50 x 120	25	7.7	6.0	< 85	220	DCP5R25550D200_ _ _ _

Contacts can handle: peak currents $\hat{I}$ up to 1.1 kA
surge currents I_S up to 3.5 kA

Customer-specific capacitances or voltages on request

* General guide

Dims. in mm.



D	L
50	57
50	95
50	120

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

WIMA DC-LINK MKP 6

Metallized Polypropylene (PP) - Capacitors in Cylindrical Case. MKP 6 with High Volume/Capacitance Ratio, MKP 6 HP with Higher Current Carrying Capability. Capacitances from 75 µF to 4920 µF. Rated Voltages from 600 VDC to 1500 VDC.

Special Features

- **Very high volume/capacitance ratio**
- **Self-healing properties**
- **With cylindrical aluminium case for bus bar mounting**
- **Dry construction without electrolyte or oil**
- **No internal fuse required**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**
- **Customer-specific capacitances or voltages on request**

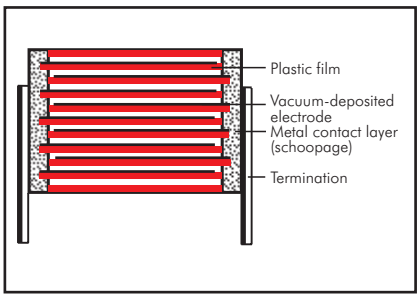
Typical Applications

DC capacitors with high capacitances for applications in power electronics also at non-sinusoidal voltages and currents e.g. in

- **Wind power systems**
- **Inverters**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Aluminium case with PU-sealing, UL 94 V-0
Terminations:
Screw connection (male or female), screw bolt M12 x 16.
Marking:
Colour: Metallic. Marking: Black on silver label.

Electrical Data

Capacitance range: 75 µF to 4920 µF
Rated voltages: 600 VDC, 700 VDC, 900 VDC,1100 VDC, 1300 VDC, 1500 VDC
Capacitance tolerances: ±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–40° C to +85° C
Insulation resistance at +20° C:
⩾ 5 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.

Dielectric loss factor tan δ_0: 2 x 10^{-4}
Test voltage between terminals
at +25° C: 1.5 $U_{r\,DC}$, 10sec
Test voltage between terminals and case
at +25° C and 50 Hz: 3 kV_{AC} , 1 min.
Dielectric absorption:
0.05 %
Reliability:
Operational life > 100 000 hours
Failure rate < 50 fit (hot spot ⩽ 70° C)

Mounting Recommendation

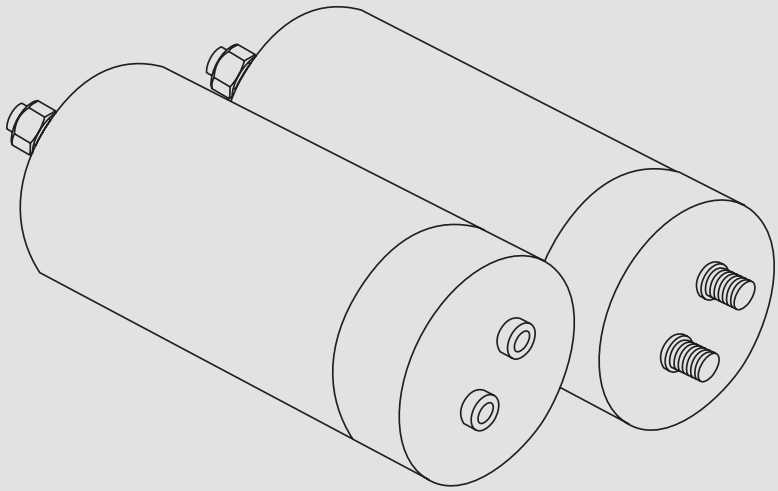
Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors.

Packing

Transportation-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.

The capacitors are non-polarized and are optionally available with „male“ and „female“ terminations. The earth bolt is electrically inactive and serves for fixing and/or earthing of the metal case.



Continuation

General Data

U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
600 VDC	450 VDC	320 µF	85 x 60	25	2.1	< 40	380	DCP6I06320EB00_ _ _ _
		460 „	85 x 76	25	2.1	< 40	480	DCP6I06460EC00_ _ _ _
		520 „	85 x 85	30	2.0	< 40	540	DCP6I06520ED00_ _ _ _
		620 „	85 x 95	30	1.9	< 40	600	DCP6I06620EE00_ _ _ _
		760 „	85 x 110	30	1.7	< 40	690	DCP6I06760EF00_ _ _ _
		780 „	85 x 120	30	1.7	< 40	700	DCP6I06780E000_ _ _ _
		950 „	85 x 132	35	1.8	< 40	850	DCP6I06950E100_ _ _ _
		1030 „	85 x 140	35	1.8	< 40	880	DCP6I07103EG00_ _ _ _
		1220 „	116 x 95	40	1.7	< 40	1200	DCP6I07122EN00_ _ _ _
		1500 „	116 x 110	40	1.7	< 40	1390	DCP6I07150EO00_ _ _ _
		1640 „	116 x 120	40	1.6	< 40	1510	DCP6I07164EP00_ _ _ _
		1890 „	116 x 132	40	1.6	< 40	1660	DCP6I07189EQ00_ _ _ _
		2030 „	116 x 140	40	1.6	< 40	1760	DCP6I07203ER00_ _ _ _
700 VDC	600 VDC	230 µF	85 x 60	25	1.9	< 40	380	DCP6K06230EB00_ _ _ _
		330 „	85 x 76	25	1.9	< 40	480	DCP6K06330EC00_ _ _ _
		380 „	85 x 85	30	1.7	< 40	540	DCP6K06380ED00_ _ _ _
		450 „	85 x 95	30	1.7	< 40	600	DCP6K06450EE00_ _ _ _
		550 „	85 x 110	30	1.8	< 40	690	DCP6K06550EF00_ _ _ _
		585 „	85 x 120	30	1.8	< 40	700	DCP6K06585E000_ _ _ _
		690 „	85 x 132	35	1.8	< 40	850	DCP6K06690E100_ _ _ _
		740 „	85 x 140	35	1.8	< 40	880	DCP6K06740EG00_ _ _ _
		890 „	116 x 95	40	1.7	< 40	1200	DCP6K06890EN00_ _ _ _
		1090 „	116 x 110	40	1.7	< 40	1390	DCP6K07109EO00_ _ _ _
		1190 „	116 x 120	40	1.8	< 40	1510	DCP6K07119EP00_ _ _ _
		1370 „	116 x 132	40	1.8	< 40	1660	DCP6K07137EQ00_ _ _ _
		1470 „	116 x 140	40	1.8	< 40	1760	DCP6K07147ER00_ _ _ _
900 VDC	760 VDC	190 µF	85 x 60	30	1.9	< 40	380	DCP6N06190EB00_ _ _ _
		270 „	85 x 76	30	1.9	< 40	480	DCP6N06270EC00_ _ _ _
		315 „	85 x 85	30	1.8	< 40	540	DCP6N06315ED00_ _ _ _
		360 „	85 x 95	30	1.7	< 40	600	DCP6N06360EE00_ _ _ _
		450 „	85 x 110	30	1.7	< 40	690	DCP6N06450EF00_ _ _ _
		480 „	85 x 120	35	1.8	< 40	700	DCP6N06480E000_ _ _ _
		550 „	85 x 132	35	1.8	< 40	850	DCP6N06550E100_ _ _ _
		620 „	85 x 140	35	1.8	< 40	880	DCP6N06620EG00_ _ _ _
		730 „	116 x 95	40	1.7	< 40	1200	DCP6N06730EN00_ _ _ _
		900 „	116 x 110	40	1.7	< 40	1390	DCP6N06900EO00_ _ _ _
		980 „	116 x 120	40	1.8	< 40	1510	DCP6N06980EP00_ _ _ _
		1130 „	116 x 132	40	1.8	< 40	1660	DCP6N07113EQ00_ _ _ _
		1200 „	116 x 140	40	1.8	< 40	1760	DCP6N07120ER00_ _ _ _
1100 VDC	920 VDC	120 µF	85 x 60	30	2.0	< 40	380	DCP6P06120EB00_ _ _ _
		170 „	85 x 76	30	2.0	< 40	480	DCP6P06170EC00_ _ _ _
		200 „	85 x 85	30	1.9	< 40	540	DCP6P06200ED00_ _ _ _
		230 „	85 x 95	30	1.9	< 40	600	DCP6P06230EE00_ _ _ _
		290 „	85 x 110	30	1.8	< 40	690	DCP6P06290EF00_ _ _ _
		325 „	85 x 120	40	1.8	< 40	700	DCP6P06325E000_ _ _ _
		360 „	85 x 132	40	1.8	< 40	850	DCP6P06360E100_ _ _ _
		390 „	85 x 140	40	2.0	< 40	880	DCP6P06390EG00_ _ _ _
		470 „	116 x 95	40	1.8	< 40	1200	DCP6P06470EN00_ _ _ _
		580 „	116 x 110	40	1.8	< 40	1390	DCP6P06580EO00_ _ _ _
		630 „	116 x 120	40	1.7	< 40	1510	DCP6P06630EP00_ _ _ _
		720 „	116 x 132	40	1.7	< 40	1660	DCP6P06720EQ00_ _ _ _
		780 „	116 x 140	40	1.6	< 40	1760	DCP6P06780ER00_ _ _ _

Contacts can handle: peak currents Î up to 5 kA
surge currents I_S up to 20 kA

Customer-specific capacitances or voltages on request

* General guide

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

Continuation page 136

Continuation

General Data

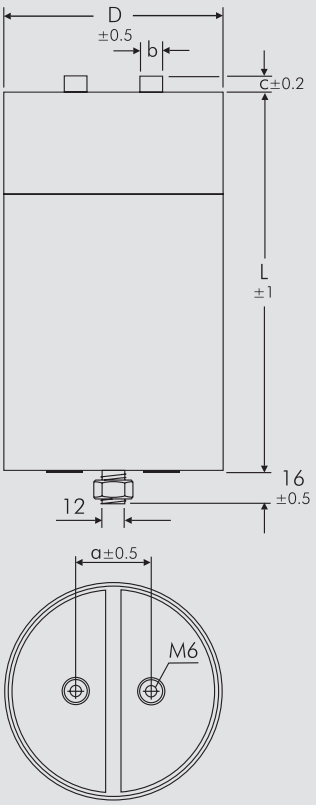
U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
1300 VDC	1100 VDC	85 µF	85 x 60	30	2.1	< 40	380	DCP6R25850EB00_ _ _ _
		120 „	85 x 76	30	2.1	< 40	480	DCP6R26120EC00_ _ _ _
		135 „	85 x 85	30	1.9	< 40	540	DCP6R26135ED00_ _ _ _
		160 „	85 x 95	30	1.9	< 40	600	DCP6R26160EE00_ _ _ _
		200 „	85 x 110	30	1.8	< 40	690	DCP6R26200EF00_ _ _ _
		215 „	85 x 120	30	1.8	< 40	700	DCP6R26215E000_ _ _ _
		250 „	85 x 132	40	2.2	< 40	850	DCP6R26250E100_ _ _ _
		270 „	85 x 140	40	2.2	< 40	880	DCP6R26270EG00_ _ _ _
		320 „	116 x 95	40	1.8	< 40	1200	DCP6R26320EN00_ _ _ _
		390 „	116 x 110	40	1.8	< 40	1390	DCP6R26390EO00_ _ _ _
		430 „	116 x 120	40	1.7	< 40	1510	DCP6R26430EP00_ _ _ _
		490 „	116 x 132	40	1.7	< 40	1660	DCP6R26490EQ00_ _ _ _
		530 „	116 x 140	40	1.6	< 40	1760	DCP6R26530ER00_ _ _ _
1500 VDC	1250 VDC	75 µF	85 x 60	25	2.5	< 40	380	DCP6S05750EB00_ _ _ _
		110 „	85 x 76	25	2.5	< 40	480	DCP6S06110EC00_ _ _ _
		120 „	85 x 85	25	2.3	< 40	540	DCP6S06120ED00_ _ _ _
		145 „	85 x 95	30	2.3	< 40	600	DCP6S06145EE00_ _ _ _
		180 „	85 x 110	30	2.3	< 40	690	DCP6S06180EF00_ _ _ _
		195 „	85 x 120	40	2.4	< 40	700	DCP6S06195E000_ _ _ _
		225 „	85 x 132	40	2.4	< 40	850	DCP6S06225E100_ _ _ _
		240 „	85 x 140	40	2.5	< 40	880	DCP6S06240EG00_ _ _ _
		290 „	116 x 95	40	1.8	< 40	1200	DCP6S06290EN00_ _ _ _
		355 „	116 x 110	40	1.8	< 40	1390	DCP6S06355EO00_ _ _ _
		390 „	116 x 120	40	1.7	< 40	1510	DCP6S06390EP00_ _ _ _
		445 „	116 x 132	40	1.7	< 40	1660	DCP6S06445EQ00_ _ _ _
		480 „	116 x 140	40	1.7	< 40	1760	DCP6S06480ER00_ _ _ _

Contacts can handle: peak currents Î up to 5 kA
surge currents I_S up to 20 kA

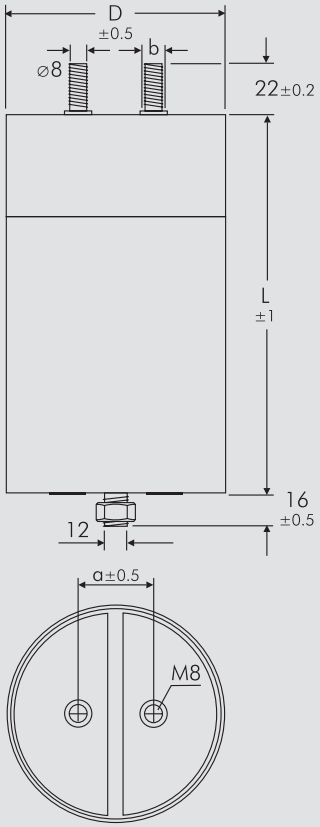
Customer-specific capacitances or voltages on request

* General guide

female



male



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

D	L	a	b	c
85	60	32	12	6
85	76	32	12	6
85	85	32	12	6
85	95	32	12	6
85	110	32	12	6
85	120	32	12	6
85	132	32	12	6
85	140	32	12	6
116	95	50	14	5
116	110	50	14	5
116	120	50	14	5
116	132	50	14	5
116	140	50	14	5

Dims. in mm.

Continuation page 137

WIMA DC-LINK MKP 6 HP

Continuation: Versions with increased dimensioning for higher current carrying capability

General Data

U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
600 VDC	450 VDC	640 µF	85 x 110	50	1.3	< 40	690	DCHPI06640EF00_ _ _ _
		920 „	85 x 140	50	1.3	< 40	880	DCHPI06920EG00_ _ _ _
		1040 „	85 x 155	60	1.3	< 40	980	DCHPI07104EH00_ _ _ _
		1240 „	85 x 185	60	1.3	< 60	1165	DCHPI07124EI00_ _ _ _
		1520 „	85 x 210	60	1.2	< 60	1400	DCHPI07152E200_ _ _ _
		1660 „	85 x 235	60	1.2	< 60	1480	DCHPI07166EJ00_ _ _ _
		1900 „	85 x 252	60	1.2	< 60	1590	DCHPI07190EK00_ _ _ _
		2060 „	85 x 260	60	1.2	< 60	1640	DCHPI07206EL00_ _ _ _
		2490 „	85 x 345	70	1.0	< 70	2190	DCHPI07249EM00_ _ _ _
		1260 „	116 x 110	80	1.2	< 40	1385	DCHPI07126EO00_ _ _ _
		1820 „	116 x 140	80	1.2	< 40	1765	DCHPI07182ER00_ _ _ _
		2060 „	116 x 158	80	1.1	< 40	1990	DCHPI07206ES00_ _ _ _
		2440 „	116 x 185	80	1.1	< 60	2330	DCHPI07244ET00_ _ _ _
		3000 „	116 x 215	80	1.0	< 60	2710	DCHPI07300EU00_ _ _ _
		3280 „	116 x 230	90	1.0	< 60	2900	DCHPI07328E700_ _ _ _
		3780 „	116 x 255	90	1.0	< 60	3210	DCHPI07378EV00_ _ _ _
		4060 „	116 x 295	90	1.0	< 70	3720	DCHPI07406EW00_ _ _ _
		4920 „	116 x 342	100	0.7	< 70	4350	DCHPI07492EX00_ _ _ _
700 VDC	600 VDC	460 µF	85 x 110	50	1.3	< 40	690	DCHPK06460EF00_ _ _ _
		660 „	85 x 140	50	1.3	< 40	880	DCHPK06660EG00_ _ _ _
		760 „	85 x 155	60	1.2	< 40	980	DCHPK06760EH00_ _ _ _
		900 „	85 x 185	60	1.2	< 60	1165	DCHPK06900EI00_ _ _ _
		1100 „	85 x 210	60	1.2	< 60	1400	DCHPK07110E200_ _ _ _
		1200 „	85 x 235	60	1.2	< 60	1480	DCHPK07120EJ00_ _ _ _
		1380 „	85 x 252	70	1.1	< 60	1590	DCHPK07138EK00_ _ _ _
		1480 „	85 x 260	70	1.1	< 60	1640	DCHPK07148EL00_ _ _ _
		1800 „	85 x 345	80	1.0	< 70	2190	DCHPK07180EM00_ _ _ _
		920 „	116 x 110	80	1.3	< 40	1385	DCHPK06920EO00_ _ _ _
		1320 „	116 x 140	80	1.3	< 40	1765	DCHPK07132ER00_ _ _ _
		1500 „	116 x 158	80	1.3	< 40	1990	DCHPK07150ES00_ _ _ _
		1780 „	116 x 185	80	1.2	< 60	2330	DCHPK07178ET00_ _ _ _
		2180 „	116 x 215	90	1.2	< 60	2710	DCHPK07218EU00_ _ _ _
		2380 „	116 x 230	90	1.0	< 60	2900	DCHPK07238E700_ _ _ _
		2740 „	116 x 255	90	1.0	< 60	3210	DCHPK07274EV00_ _ _ _
		2940 „	116 x 295	90	1.0	< 70	3720	DCHPK07294EW00_ _ _ _
		3570 „	116 x 342	110	0.7	< 70	4350	DCHPK07357EX00_ _ _ _
900 VDC	760 VDC	380 µF	85 x 110	50	1.4	< 40	690	DCHPN06380EF00_ _ _ _
		540 „	85 x 140	50	1.4	< 40	880	DCHPN06540EG00_ _ _ _
		630 „	85 x 155	60	1.3	< 40	980	DCHPN06630EH00_ _ _ _
		720 „	85 x 185	60	1.3	< 60	1165	DCHPN06720EI00_ _ _ _
		900 „	85 x 210	60	1.1	< 60	1400	DCHPN06900E200_ _ _ _
		1000 „	85 x 235	70	1.0	< 60	1480	DCHPN07100EJ00_ _ _ _
		1140 „	85 x 252	70	0.9	< 60	1590	DCHPN07114EK00_ _ _ _
		1240 „	85 x 260	70	0.9	< 60	1640	DCHPN07124EL00_ _ _ _
		1500 „	85 x 345	80	0.7	< 70	2190	DCHPN07150EM00_ _ _ _

Contacts can handle: peak currents Î up to 10 kA
surge currents I_S up to 40 kA

Customer-specific capacitances or voltages on request

* General guide

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

Continuation page 138

Continuation

General Data

U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
900 VDC	760 VDC	760 µF	116 x 110	80	1.3	< 40	1385	DCHPN06760EO00_ _ _ _
		1100 „	116 x 140	80	1.3	< 40	1765	DCHPN07110ER00_ _ _ _
		1240 „	116 x 158	80	1,3	< 40	1990	DCHPN07124ES00_ _ _ _
		1460 „	116 x 185	80	1.2	< 60	2330	DCHPN07146ET00_ _ _ _
		1800 „	116 x 215	90	1.2	< 60	2710	DCHPN07180EU00_ _ _ _
		1960 „	116 x 230	90	1.0	< 60	2900	DCHPN07196E700_ _ _ _
		2260 „	116 x 255	90	1.0	< 60	3210	DCHPN07226EV00_ _ _ _
		2400 „	116 x 295	90	1.0	< 70	3720	DCHPN07240EW00_ _ _ _
		2940 „	116 x 342	110	0.7	< 70	4350	DCHPN07294EX00_ _ _ _
1100 VDC	920 VDC	240 µF	85 x 110	50	1.3	< 40	690	DCHPP06240EF00_ _ _ _
		340 „	85 x 140	50	1.2	< 40	880	DCHPP06340EG00_ _ _ _
		400 „	85 x 155	50	1.2	< 40	980	DCHPP06400EH00_ _ _ _
		460 „	85 x 185	50	1.2	< 60	1165	DCHPP06460EI00_ _ _ _
		580 „	85 x 210	60	1.2	< 60	1400	DCHPP06580E200_ _ _ _
		640 „	85 x 235	60	1.1	< 60	1480	DCHPP06640EJ00_ _ _ _
		720 „	85 x 252	60	1.1	< 60	1590	DCHPP06720EK00_ _ _ _
		780 „	85 x 260	60	1.2	< 60	1640	DCHPP06780EL00_ _ _ _
		960 „	85 x 345	80	1.0	< 70	2190	DCHPP06960EM00_ _ _ _
		480 „	116 x 110	80	1.4	< 40	1385	DCHPP06480EO00_ _ _ _
		700 „	116 x 140	80	1.3	< 40	1765	DCHPP06700ER00_ _ _ _
		780 „	116 x 158	80	1.3	< 40	1990	DCHPP06780ES00_ _ _ _
		940 „	116 x 185	80	1.3	< 60	2330	DCHPP06940ET00_ _ _ _
		1160 „	116 x 215	90	1.2	< 60	2710	DCHPP07116EU00_ _ _ _
		1260 „	116 x 230	90	1.2	< 60	2900	DCHPP07126E700_ _ _ _
		1440 „	116 x 255	90	1.1	< 60	3210	DCHPP07144EV00_ _ _ _
		1560 „	116 x 295	90	1.0	< 70	3720	DCHPP07156EW00_ _ _ _
		1890 „	116 x 342	110	0.8	< 70	4350	DCHPP07189EX00_ _ _ _
1300 VDC	1100 VDC	170 µF	85 x 110	50	1.3	< 40	690	DCHPR26170EF00_ _ _ _
		240 „	85 x 140	50	1.3	< 40	880	DCHPR26240EG00_ _ _ _
		270 „	85 x 155	50	1.2	< 40	980	DCHPR26270EH00_ _ _ _
		320 „	85 x 185	60	1.2	< 60	1165	DCHPR26320EI00_ _ _ _
		400 „	85 x 210	60	1.2	< 60	1400	DCHPR26400E200_ _ _ _
		440 „	85 x 235	60	1.1	< 60	1480	DCHPR26440EJ00_ _ _ _
		500 „	85 x 252	60	1.1	< 60	1590	DCHPR26500EK00_ _ _ _
		540 „	85 x 260	60	1.2	< 60	1640	DCHPR26540EL00_ _ _ _
		660 „	85 x 345	80	1.0	< 70	2190	DCHPR26660EM00_ _ _ _
		330 „	116 x 110	80	1.4	< 40	1385	DCHPR26330EO00_ _ _ _
		480 „	116 x 140	80	1.4	< 40	1765	DCHPR26480ER00_ _ _ _
		540 „	116 x 158	80	1.3	< 40	1990	DCHPR26540ES00_ _ _ _
		640 „	116 x 185	80	1.3	< 60	2330	DCHPR26640ET00_ _ _ _
		780 „	116 x 215	90	1.2	< 60	2710	DCHPR26780EU00_ _ _ _
		860 „	116 x 230	90	1.2	< 60	2900	DCHPR26860E700_ _ _ _
		980 „	116 x 255	90	1.1	< 60	3210	DCHPR26980EV00_ _ _ _
		1060 „	116 x 295	90	1.1	< 70	3720	DCHPR27106EW00_ _ _ _
		1290 „	116 x 342	110	0.8	< 70	4350	DCHPR27129EX00_ _ _ _

Contacts can handle: peak currents $\hat{I}$ up to 10 kA
surge currents I_S up to 40 kA

Customer-specific capacitances or voltages on request

* General guide

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

Continuation page 139

Continuation

General Data

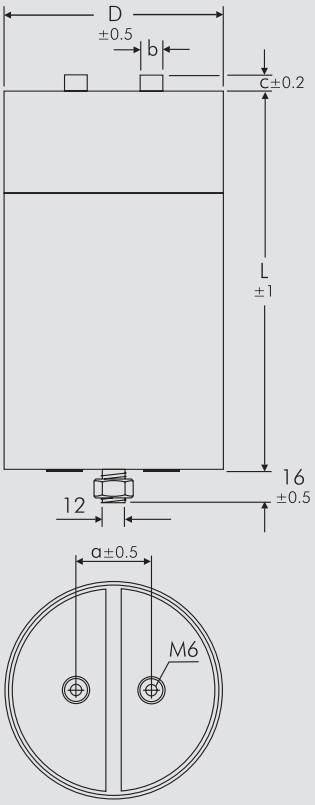
U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
1500 VDC	1250 VDC	150 µF	85 x 110	50	1.3	< 40	690	DCHPS06150EF00_ _ _ _
		220 „	85 x 140	50	1.3	< 40	880	DCHPS06220EG00_ _ _ _
		240 „	85 x 155	50	1.2	< 40	980	DCHPS06240EH00_ _ _ _
		290 „	85 x 185	60	1.2	< 60	1165	DCHPS06290EI00_ _ _ _
		360 „	85 x 210	60	1.2	< 60	1400	DCHPS06360E200_ _ _ _
		390 „	85 x 235	60	1.1	< 60	1480	DCHPS06390EJ00_ _ _ _
		450 „	85 x 252	60	1.1	< 60	1590	DCHPS06450EK00_ _ _ _
		480 „	85 x 260	60	1.1	< 60	1640	DCHPS06480EL00_ _ _ _
		585 „	85 x 345	80	1.0	< 70	2190	DCHPS06585EM00_ _ _ _
		300 „	116 x 110	80	1.5	< 40	1385	DCHPS06300EO00_ _ _ _
		430 „	116 x 140	80	1.4	< 40	1765	DCHPS06430ER00_ _ _ _
		490 „	116 x 158	80	1.4	< 40	1990	DCHPS06490ES00_ _ _ _
		580 „	116 x 185	80	1.4	< 60	2330	DCHPS06580ET00_ _ _ _
		710 „	116 x 215	90	1.3	< 60	2710	DCHPS06710EU00_ _ _ _
		780 „	116 x 230	90	1.2	< 60	2900	DCHPS06780E700_ _ _ _
		890 „	116 x 255	90	1.2	< 60	3210	DCHPS06890EV00_ _ _ _
		960 „	116 x 295	90	1.1	< 70	3720	DCHPS06960EW00_ _ _ _
		1170 „	116 x 342	110	0.8	< 70	4350	DCHPS07117EX00_ _ _ _

Contacts can handle: peak currents $\hat{I}$ up to 10 kA
surge currents I_S up to 40 kA

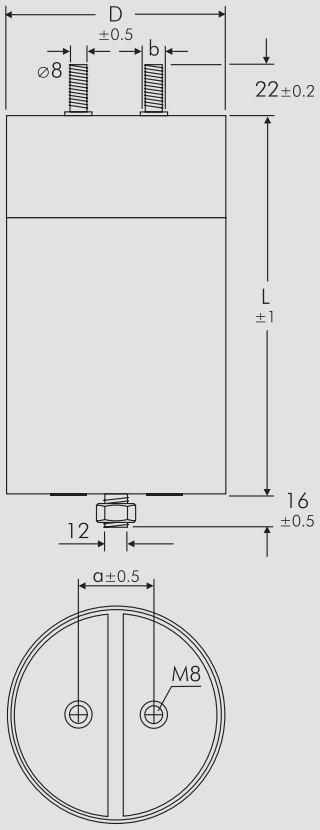
Customer-specific capacitances or voltages on request

* General guide

female



male



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

D	L	a	b	c
85	110	32	12	6
85	140	32	12	6
85	155	32	12	6
85	185	32	12	6
85	210	32	12	6
85	235	32	12	6
85	252	32	12	6
85	260	32	12	6
85	345	32	12	6
116	110	50	14	5
116	140	50	14	5
116	158	50	14	5
116	185	50	14	5
116	215	50	14	5
116	230	50	14	5
116	255	50	14	5
116	295	50	14	5
116	342	50	14	5

Dims. in mm.

WIMA DC-LINK HC

Metallized Polypropylene (PP) - Capacitors for DC-Link Applications. Capacitances from 140 µF to 8250 µF. Rated Voltages from 450 VDC to 1500 VDC.

Special Features

- **Very high volume/capacitance ratio**
- **Self-healing, internal safety disconnector**
- **Safe contact configurations by screwable plates**
- **Dry construction without electrolyte or oil**
- **Very low disipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**
- **Customer-specific tabs, capacitances or voltages on request**
- **105° C version on request**

Typical Applications

As intermediate circuit capacitor e. g. in high power converter technology

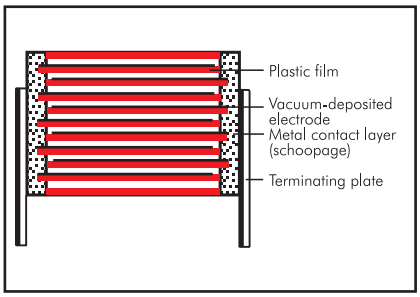
Electrical Data

Capacitance range: 140 µF to 8250 µF
Rated voltages:
450 VDC, 900 VDC, 1500 VDC
Capacitance tolerance: ±10%
Operating temperature:
–55° C to +85° C (+105° C on request)
Insulation resistance at +20° C:
⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Self-inductance: ⩽ 50 nH depending on tab configuration
ESR at +20° C: See General Data.

Test voltage: 1.5 U_r, 10 sec
Dielectric absorption: 0.05 %
Voltage derating:
A derating factor of 1.35% per K must be applied from +70° C for AC currents (I_{rms})
Reliability:
Operational life > 100 000 hours at 70° C hot spot
Failure rate < 50 fit (hot spot ⩽ 70° C)
Specific dissipation:
See General Data.
Standards: in accordance with IEC 61071

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent resistant, flame-retardant plastic case with PU seal
Terminations:
Tinned plates, customized plate configurations are possible.
Marking:
Colour: Black. Marking: Gold.

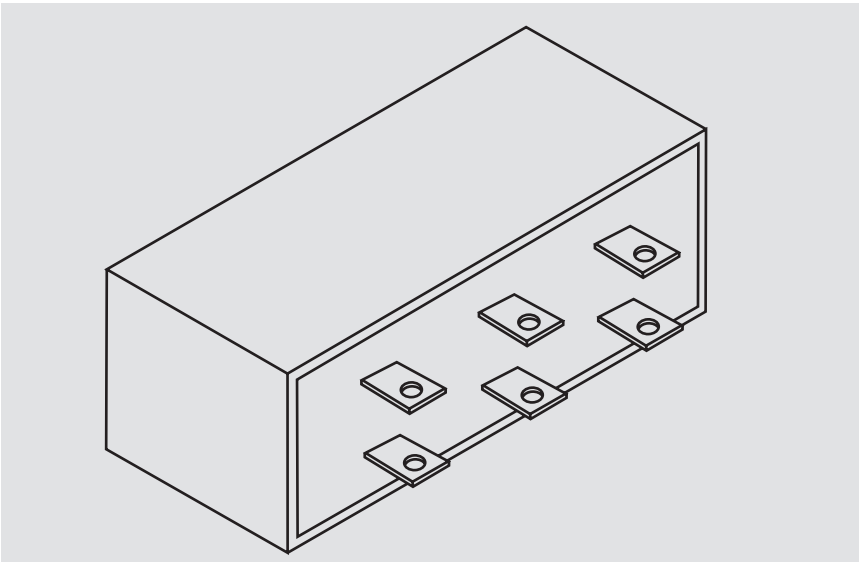
Mounting Recommendation

Excessive mechanical strain, e. g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the capacitor the screw torque is to be limited to max. 5 Nm.

Packing

Transportation-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.



Continuation

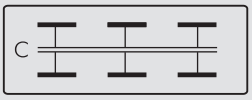
General Data

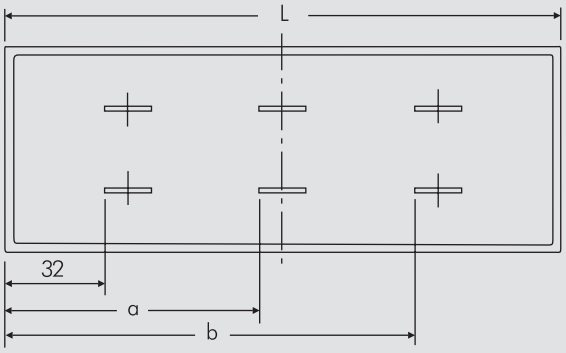
U_R	C_N	E_N W_S	Size (mm) W	H	L	I_{rms} (max.)* A	$\hat{I}$* kA	I_S* kA	ESR (1 kHz)* mΩ	R_{th}* K/W	Approx. weight g	Part number
450 VDC	1440 µF	146	84	66	179	100	4.6	18.6	0.3	2.8	1220	DCHCH07144JB00KS00
	2400 „	243	84	66	291	170	7.7	30.9	0.2	1.8	1985	DCHCH07240JH00KS00
	3000 „	304	107	91	179	120	6.7	26.7	0.3	2.0	2145	DCHCH07300JC00KS00
	4950 „	501	130	114	179	140	8.7	34.9	0.3	1.5	3265	DCHCH07495JE00KS00
	5000 „	506	107	91	291	190	11.1	44.5	0.2	1.3	3485	DCHCH07500JI00KS00
	8250 „	835	130	114	291	210	14.5	58.1	0.2	1.1	5305	DCHCH07825JJ00KS00
900 VDC	450 µF	182	84	66	179	90	2.2	8.8	0.5	2.8	1220	DCHCN06450JB00KS00
	750 „	304	84	66	291	140	3.7	14.6	0.3	1.8	1985	DCHCN06750JH00KS00
	940 „	381	107	91	179	100	2.9	11.6	0.5	2.0	2145	DCHCN06940JC00KS00
	1500 „	608	130	114	179	110	3.5	14.1	0.5	1.5	3265	DCHCN07150JE00KS00
	1560 „	632	107	91	291	160	4.8	19.3	0.3	1.3	3485	DCHCN07156JI00KS00
	2600 „	1053	130	114	291	180	6.1	24.4	0.3	1.1	5305	DCHCN07260JJ00KS00
1500 VDC	140 µF	158	84	66	179	60	1.2	4.9	0.9	2.8	1220	DCHCS06140JB00KS00
	230 „	259	84	66	291	100	2.0	8.1	0.6	1.8	1985	DCHCS06230JH00KS00
	280 „	315	107	91	179	80	1.5	6.1	0.8	2.0	2145	DCHCS06280JC00KS00
	460 „	518	130	114	179	90	1.8	7.3	0.8	1.5	3265	DCHCS06460JE00KS00
	470 „	529	107	91	291	130	2.5	10.2	0.5	1.3	3485	DCHCS06470JI00KS00
	790 „	889	130	114	291	150	3.1	12.5	0.4	1.1	5305	DCHCS06790JJ00KS00

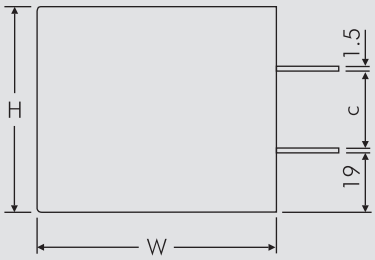
* General guide

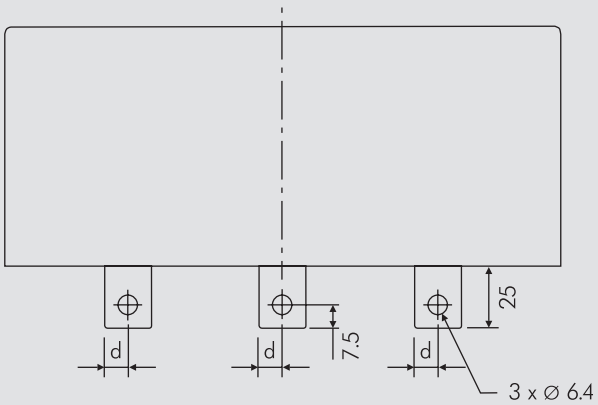
Customer-specific tabs, capacitances or voltages on request

External wiring:









W	H	L	a	b	c	d
84	66	179	82	132	25	7.5
107	91	179	82	132	50	7.5
130	114	179	82	132	73	7.5
84	66	291	135.5	239	25	10
107	91	291	135.5	239	50	10
130	114	291	135.5	239	73	10

Dims. in mm. Case tolerances: general tolerances in accordance with ISO 2768-1 C (approximate)

WIMA DC-LINK HY

Metallized Polypropylene (PP) - Capacitors for Hybrid Drives. Capacitance 500 µF. Rated Voltage 450 VDC.

Special Features

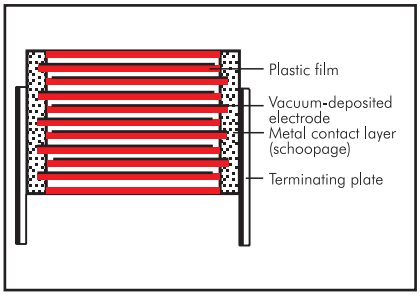
- **Very high volume/capacitance ratio**
- **Self-healing, internal safety disconnector**
- **Safe contact configuration by screwable plates**
- **Dry construction without electrolyte or oil**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**
- **Customer-specific capacitances or voltages on request**

Typical Applications

As intermediate circuit capacitor e.g. in hybrid drives

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with PU seal, UL 94 V-0
Terminations:
Tinned plates
Marking:
Colour: Black. Marking: Gold.

Electrical Data

Capacitance range:
500 µF
Rated voltage:
450 VDC
Capacitance tolerances:
±20%, ±10%, (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +85° C (hot spot ⩽+110° C in combination with a heatsink)
Insulation resistance at +20° C:
⩾ 10 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.

Dielectric loss factor tan δ_0: 2 x 10^{-4}
Test voltage: 1.3 U_r, 2sec
Dielectric absorption: 0.05 %
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltage.
Reliability:
Operational life > 100 000 hours at 40° C
Failue rate < 36 fit (0.75 x U_r and 40° C)

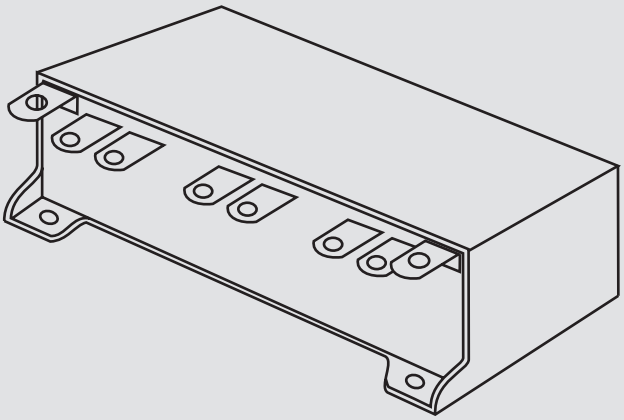
Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the capacitor the screw torque is to be limited to max. 5 Nm.

Packing

Transport-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.



Continuation

General Data

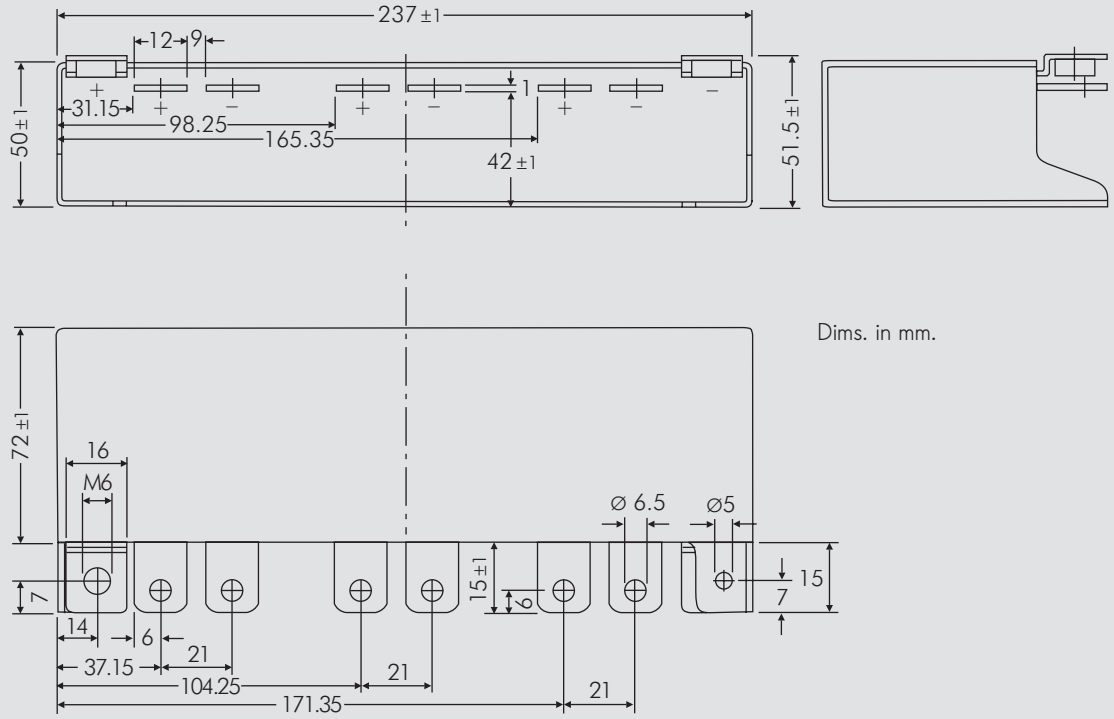
Capacitance	U_R	I_{max} A	I_{rms}* A	L_e nH	ESR* mΩ	Approx. weight g	Part number
500 µF	450 VDC	5000	120**	< 15	0.8**	1400	DCHYH06500JG00_ _ _ _

* f = 1kHz

Customized solutions can be realized on request

** General guide

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00



Dims. in mm.

WIMA PowerBlock

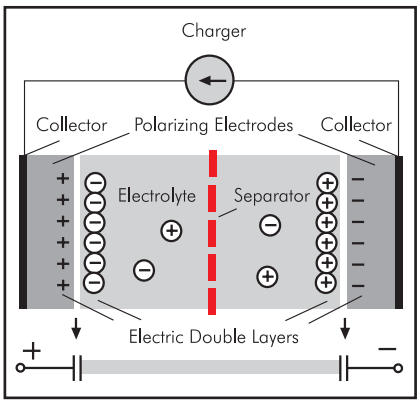
Double-Layer Capacitor (SuperCap) Modules with Very High Capacitances

Special Features

- **Modules with very high capacitance values from 62 F to 500 F and rated voltages from 16 VDC to 125 VDC**
- **Discharge current up to 1900 A**
- **Maintenance-free**
- **Series connected**
- **Actively balanced**
- **According to RoHS 2011/65/EU**

Construction

Encapsulation: Metal case IP65
Terminal tread size: M8 / M10
Marking: Colour: Black. Marking: Gold
Internal construction:



The WIMA PowerBlock range has a modular design. The configurations displayed are representative examples which at any time can be adapted in terms of capacitance, voltage or dimensions. Customized solutions can be realized on request.

Technical Options on Request

- **Temperature monitoring**
- **Overvoltage signal**
- **Voltage monitoring**
- **Industrial connector/CAN-connector**
- **Application-adapted cooling**
- **Application-specific protection classes**

General Data

U_R	C_N	Dimensions W	H	L	Part number
16 V	105 F	157	69	250	MCPBA0B105MC00QV00
	500 F	157	156	250	MCPBA0B500MC00QV00
62.5 V	125 F	283	156	439	MCPBB4B125MC00QV00
125 V	62 F	409	156	575	MCPBDAA620MC00QV00

Application:

WIMA PowerBlock modules stores energy and releases it within short time in e.g.:

- Motor start in construction, agriculture and earth moving machines, trucks, busses, vessels, generators
- Railway technology e.g. locomotives, electric tramway, metro etc.
- Hybrid and heavy transportation in e.g. construction, agricultural and forest machines, city busses, forklifts, cranes etc.
- Automated guided vehicules (AGV) in production facilities, in-plant logistic systems etc.
- Uninterruptible power supply (UPS) in hospitals, telecommunication systems, oil and gas extraction etc.
- Wind power systems e.g. in pitch control.

Advantages:

- Fast supply of several 100 - 1000 A in direct current operation
- Operating temperature range from -40° C to +65° C
- Maintenance-free operation with up to 1 million charge/discharge cycles
- Life expectancy >10 years
- Low weight against batteries or secondary batteries
- Environmentally friendly materials
- No risk of damage do to complete discharge of the component
- Very fast recharge of the PowerBlock.

Conclusion:

The use of PowerBlocks as energy storage increases efficiency and life time of the applications, saves weight and cost for maintenance, and is environmentally friendly.

Continuation

Technical Data

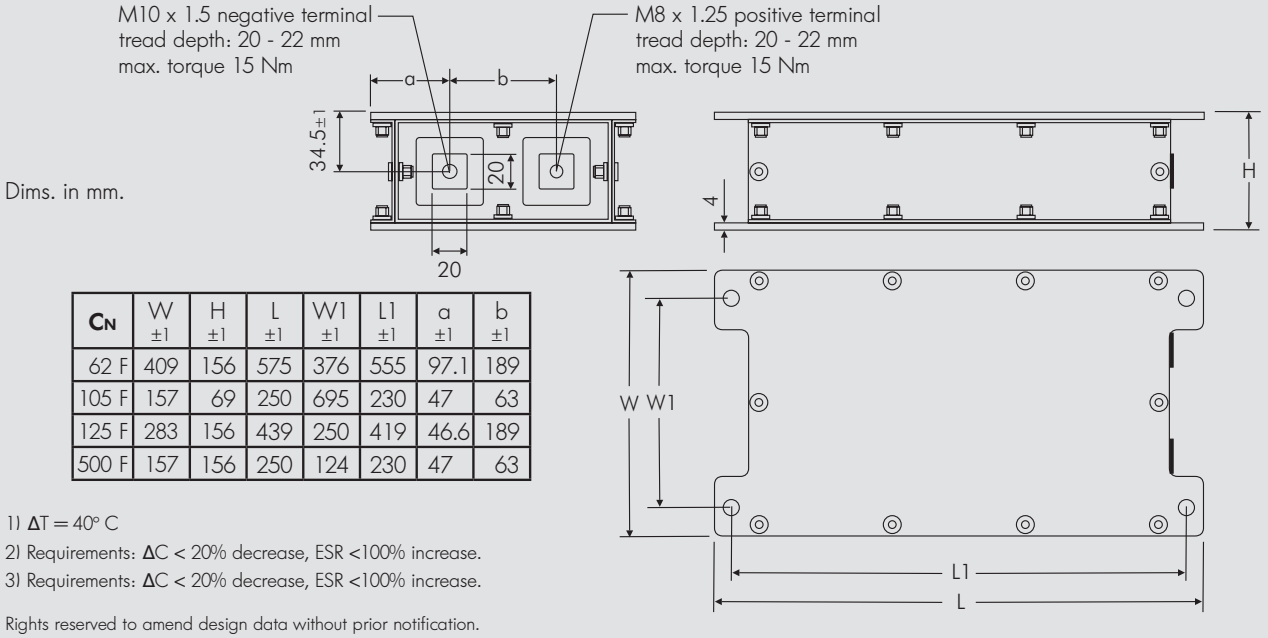
Rated capacitance:	C_N [F]	105	500	125	62
Capacitance tolerance:	[%]	0%/+20%			
Rated voltage:	U_R [V]	16		62.5	125
Max. continuous current[1]:	I_C [A, rms]	54	130	130	130
Current, peak (1 sec):	I_P [A]	up to 680	up to 1900	up to 1900	up to 1900
Max. ESR, initial:	R_{DC} [mΩ]	5.2	2.1	8.3	16.4
Max. stored energy: ±20%	$E_{max.}$ [Wh]	3.7	17.8	67.8	134.5
Operating temperature:	T_{op} [°C]	–40° C … +65° C			
Storage temperature:	T_{st} [°C]	–40° C … +70° C			
Weight:	m [kg]	2.3	4.4	16	31.9
Volume:	V [l]	2.7	6.1	19.4	36.7

Additional Data

Case:	–	AlMg3
Lug terminals:	–	M8 / M10

Comparative Data

Lifetime:					
in hours [2]	[h]	90 000, rated voltage, 25° C			
in cycles [3]	cycles	>1 million, rated voltage, 25° C			
Energy density:					
gravimetric	E_d [Wh/kg]	1.62	4.03	4.24	4.21
volumetric	E_V [Wh/l]	1.38	2.9	3.5	3.67



Dims. in mm.

C_N	W ±1	H ±1	L ±1	W1 ±1	L1 ±1	a ±1	b ±1
62 F	409	156	575	376	555	97.1	189
105 F	157	69	250	695	230	47	63
125 F	283	156	439	250	419	46.6	189
500 F	157	156	250	124	230	47	63

1) ΔT = 40° C
2) Requirements: ΔC < 20% decrease, ESR <100% increase.
3) Requirements: ΔC < 20% decrease, ESR <100% increase.

Fields of Application for WIMA PowerBlock Modules

Motor Start

WIMA PowerBlock Modules replace, protect or support converntional batteries to reliably crank big diesel engines in e.g.:

- **Trucks**
- **Construction, agricultural and earth moving machines**
- **Busses and trains**
- **Vessels**
- **Generators**
- **etc.**

During start-up of a big diesel engine the energy requirement is quite high. By using WIMA PowerBlock modules the battery layout can be designed smaller and thus lower in weight which leads to a significant reduction of fuel cost and emission of harmful substances.

Railway Technology

WIMA PowerBlock modules store braking energy and immediately release it for engine starting, acceleration or peak-load levelling in e.g.:

- **Locomotives**
- **Electric tramway**
- **etc.**

The use of PowerBlock modules as energy storage increases efficiency and life time of transportation systems, saves weight and cost for maintenance, and is environmentally friendly.

Hybrid/Heavy Transportation

WIMA PowerBlock modules in hybrid drives support diesel engines with fast and frequent dynamic loads in e.g.:

- **City busses**
- **Construction machines, agricultural machines and forestry equipment**
- **Forklifts, cranes**
- **etc.**

The use of WIMA PowerBlock modules as energy storage leads to significant saving in terms of fuel consumption and considerably reduces exhaust and noise emission.

Automated Guided Vehicles (AGV)

WIMA PowerBlock modules serve as rechargeable or exchangeable energy storage in independent, automated guided vehicles (AGV) in e.g.:

- **Warehouse and distribution environments**
- **Production facilities**
- **In-plant logistic systems**
- **etc.**

The use of PowerBlock modules as energy storage saves weight, reduces cost for maintenance and increases efficiency and life time of the transportation system.

Uninterruptible Power Supply (UPS)

Cascaded WIMA PowerBlock modules are used as emergency power supply in e.g.:

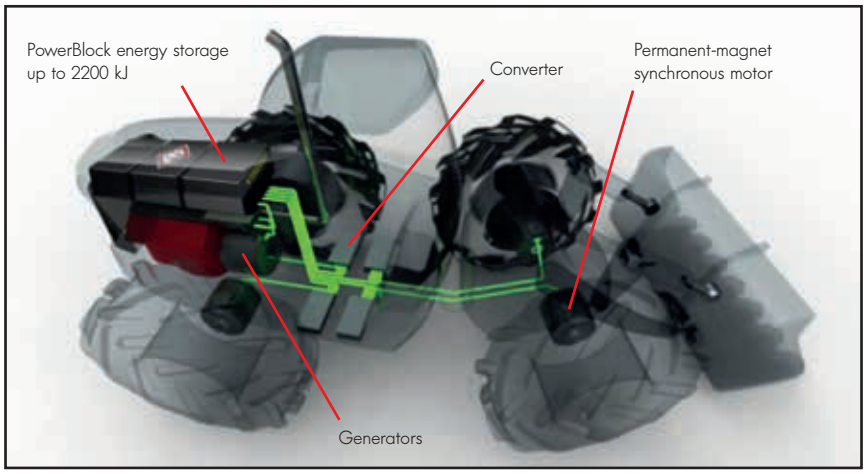
- **Hospitals**
- **Telecommunication systems**
- **Oil production plants**
- **Gas extraction**
- **etc.**

By reliably bridging short-term power outages cost-intensive system crashes can be avoided.

WIMA Competence

WIMA has many years of experience in construction of customized energy storage modules based on double layer capacitors. Design and construction of individual solutions is coordinated with the user. Customer's advantages are:

- High expertise due to many years of manufacturing and field experience
- Individual design related to
  - environment
  - space requirements
  - fixing
  - connecting options
- Flexible capacitance or voltage due to serial or parallel cascading of single cells with 350 F to 3,000 F
- Laser-based, reliable welding of the single cells
- Robust, vibration resistant construction according to IP-25 - IP-69 K on demand
- Various technical options, e.g.:
  - temperature monitoring
  - overvoltage signal
  - voltage monitoring
  - industrial connector/CAN-connector
  - application-adapted cooling
  - custom-specific protection class
- Pulse current, endurance and voltage tests accord. to IEC 62576 or DIN EN 62391-1
- Prototype and small series production
- Ready for connection supply.



VISEDO electrified wheel-loader using WIMA PowerBlock energy storage modules.

01.19

WIMA Part Number System

A WIMA part number consists of 18 digits and is composed as follows:

Field 1 - 4: Type description
Field 5 - 6: Rated voltage
Field 7 - 10: Capacitance
Field 11 - 12: Size and PCM
Field 13 - 14: Version code (e.g. Snubber versions)
Field 15: Capacitance tolerance
Field 16: Packing
Field 17 - 18: Pin length (untaped)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	**K**	**S**	**2**	**C**	**0**	**2**	**1**	**0**	**0**	**1**	**A**	**0**	**0**	**M**	**S**	**S**	**D**
MKS 2				63 VDC		0.01 µF				2.5 x 6.5 x 7.2		-		20%	bulk	6 -2	

Type description:

SMD-PET	= SMDT
SMD-PEN	= SMDN
SMD-PPS	= SMDI
FKP 02	= FKP0
MKS 02	= MKS0
FKS 2	= FKS2
FKP 2	= FKP2
FKS 3	= FKS3
FKP 3	= FKP 3
MKS 2	= MKS2
MKP 2	= MKP2
MKS 4	= MKS4
MKP 4C	= MKPC
MKP 4	= MKP4
MKP 10	= MKP1
FKP 1	= FKP1
MKP-X2	= MKX2
MKP-X1 R	= MKX1
MKP-Y2	= MKY2
MP 3-X2	= MPX2
MP 3-X1	= MPX1
MP 3-Y2	= MPY2
MP 3R-Y2	= MPRY
MKP 4F	= MKPF
Snubber MKP	= SNMP
Snubber FKP	= SNFP
GTO MKP	= GTOM
DC-LINK MKP 3	= DCP3
DC-LINK MKP 4	= DCP4
DC-LINK MKP 4S	= DCPS
DC-LINK MKP 5	= DCP5
DC-LINK MKP 6	= DCP6
DC-LINK HC	= DCHC
DC-LINK HY	= DCHY

Rated voltage:

50 VDC	= B0
63 VDC	= C0
100 VDC	= D0
250 VDC	= F0
400 VDC	= G0
450 VDC	= H0
520 VDC	= H2
600 VDC	= I0
630 VDC	= J0
700 VDC	= K0
800 VDC	= L0
850 VDC	= M0
900 VDC	= N0
1000 VDC	= O1
1100 VDC	= P0
1200 VDC	= Q0
1250 VDC	= R0
1500 VDC	= S0
1600 VDC	= T0
2000 VDC	= U0
2500 VDC	= V0
3000 VDC	= W0
4000 VDC	= X0
6000 VDC	= Y0
250 VAC	= 0W
275 VAC	= 1W
300 VAC	= 2W
305 VAC	= AW
350 VAC	= BW
440 VAC	= 4W
500 VAC	= 5W
...	

Capacitance:

22 pF	= 0022
47 pF	= 0047
100 pF	= 0100
150 pF	= 0150
220 pF	= 0220
330 pF	= 0330
470 pF	= 0470
680 pF	= 0680
1000 pF	= 1100
1500 pF	= 1150
2200 pF	= 1220
3300 pF	= 1330
4700 pF	= 1470
6800 pF	= 1680
0.01 µF	= 2100
0.022 µF	= 2220
0.047 µF	= 2470
0.1 µF	= 3100
0.22 µF	= 3220
0.47 µF	= 3470
1 µF	= 4100
2.2 µF	= 4220
4.7 µF	= 4470
10 µF	= 5100
22 µF	= 5220
47 µF	= 5470
100 µF	= 6100
220 µF	= 6220
1000 µF	= 7100
1500 µF	= 7150
...	

Size:

4.8 x 3.3 x 3 Size 1812	= KA
4.8 x 3.3 x 4 Size 1812	= KB
5.7 x 5.1 x 3.5 Size 2220	= QA
5.7 x 5.1 x 4.5 Size 2220	= QB
7.2 x 6.1 x 3 Size 2824	= TA
7.2 x 6.1 x 5 Size 2824	= TB
10.2 x 7.6 x 5 Size 4030	= VA
12.7 x 10.2 x 6 Size 5040	= XA
15.3 x 13.7 x 7 Size 6054	= YA
2.5 x 7 x 4.6 PCM 2.5	= 0B
3 x 7.5 x 4.6 PCM 2.5	= 0C
2.5 x 6.5 x 7.2 PCM 5	= 1A
3 x 7.5 x 7.2 PCM 5	= 1B
2.5 x 7 x 10 PCM 7.5	= 2A
3 x 8.5 x 10 PCM 7.5	= 2B
3 x 9 x 13 PCM 10	= 3A
4 x 9 x 13 PCM 10	= 3C
5 x 11 x 18 PCM 15	= 4B
6 x 12.5 x 18 PCM 15	= 4C
5 x 14 x 26.5 PCM 22.5	= 5A
6 x 15 x 26.5 PCM 22.5	= 5B
9 x 19 x 31.5 PCM 27.5	= 6A
11 x 21 x 31.5 PCM 27.5	= 6B
9 x 19 x 41.5 PCM 37.5	= 7A
11 x 22 x 41.5 PCM 37.5	= 7B
19 x 31 x 56 PCM 48.5	= 8D
25 x 45 x 57 PCM 52.5	= 9D
...	

Version code:

Standard	= 00
Version A1	= 1A
Version A1.1.1	= 1B
Version A2	= 2A
...	

Tolerance:

±20%	= M
±10%	= K
±5%	= J
±2.5%	= H
±1%	= E
...	

Packing:

AMMO H16.5 340 x 340	= A
AMMO H16.5 490 x 370	= B
AMMO H18.5 340 x 340	= C
AMMO H18.5 490 x 370	= D
REEL H16.5 360	= F
REEL H16.5 500	= H
REEL H18.5 360	= I
REEL H18.5 500	= J
ROLL H16.5	= N
ROLL H18.5	= O
BLISTER W12 180	= P
BLISTER W12 330	= Q
BLISTER W16 330	= R
BLISTER W24 330	= T
Bulk/TPS Standard	= S
...	

Pin length (untaped)

3.5 ±0.5	= C9
6 -2	= SD
16 ±1	= P1
...	

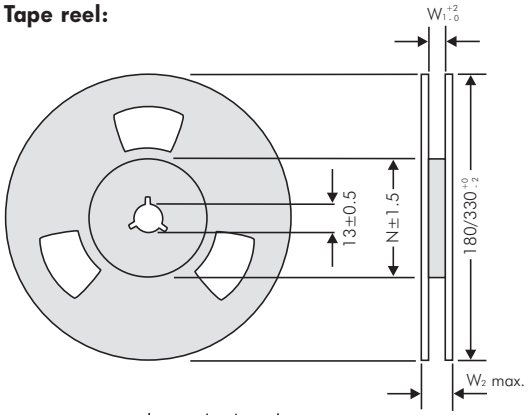
Pin length (taped)

none	= 00

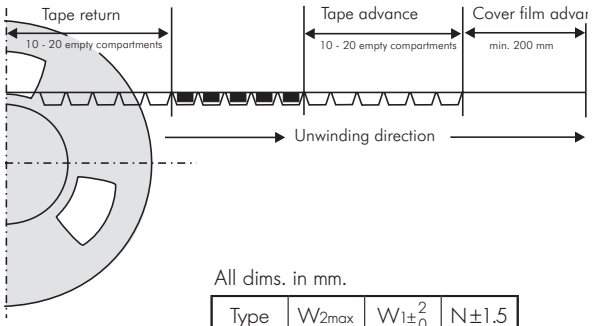
The data on this page is not complete and serves only to explain the part number system. Part number information is listed on the pages of the respective WIMA range.

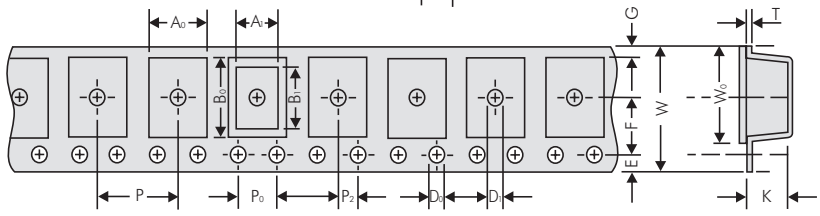
Blister Tape Packaging and Packing Units of the WIMA SMD Capacitors

Tape reel:



Tape advance and return:





All dims. in mm.

Type	W2max	W1±$^{2}_{0}$	N±1.5
1812	19	12.4	62
2220	19	12.4	62
2824	19	12.4	62
4030	22.4	16.4	60
5040	30.4	24.4	90
6054	30.4	24.4	90

Size Code 1812		A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Box size	Code																
4.8x3.3x3	**KA**	3.55	3.3	5.1	4.8	ø1.5	ø1.5	8	4	2	1.75	5.5	2.2	12	9.5	3.4	0.3
4.8x3.3x4	**KB**	3.55	3.3	5.1	4.8	ø1.5	ø1.5	8	4	2	1.75	5.5	2.2	12	9.5	4.4	0.3

Packing units

taped Reel 180 mm ø	taped Reel 330 mm ø	bulk Standard
700	2500	3000
500	2000	3000

Size Code 2220		A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Box size	Code																
5.7x5.1x3.5	**QA**	6.3	5.7	5.6	5.1	ø1.5	ø1.5	8	4	2	1.75	5.5	1.95	12	9.5	3.7	0.3
5.7x5.1x4.5	**QB**	6.3	5.7	5.6	5.1	ø1.5	ø1.5	8	4	2	1.75	5.5	1.95	12	9.5	4.7	0.3

taped Reel 180 mm ø	taped Reel 330 mm ø	bulk Standard
500	1800	3000
400	1500	3000

Size Code 2824		A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Box size	Code																
7.2x6.1x3	**TA**	6.6	6.1	7.7	7.2	ø1.5	ø1.5	12	4	2	1.75	5.5	0.9	12	9.5	3.4	0.3
7.2x6.1x5	**TB**	6.6	6.1	7.7	7.2	ø1.5	ø1.5	12	4	2	1.75	5.5	0.9	12	9.5	5.4	0.4

taped Reel 330 mm ø	bulk Standard
1500	2000
750	2000

	Code	A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Size Code 4030	**VA**	10.7	10.2	8.1	9.1	ø1.5	ø1.5	16	4	2	1.75	7.5	1.9	16	13.3	5.5	0.3
Size Code 5040	**XA**	13.5	12.7	11	11.5	ø1.5	ø1.5	16	4	2	1.75	11.5	4.7	24	21.3	6.5	0.3
Size Code 6054	**YA**	17.0	16.5	15.6	15.0	ø1.5	ø1.5	20	4	2	1.75	11.5	2.95	24	21.3	7.5	0.3

taped Reel 330 mm ø	bulk Standard
775	2000
600	1000
450	500

* cumulative after 10 steps ± 0.2 mm max.
Samples and pre-production needs on request or 1 Reel minimum.

Part number codes for SMD packing

W (Blister)	ø in mm	Code
12	180	**P**
12	330	**Q**
16	330	**R**
24	330	**T**

Bulk Standard	**S**

01.19

Typical Dimensions for Taping Configuration

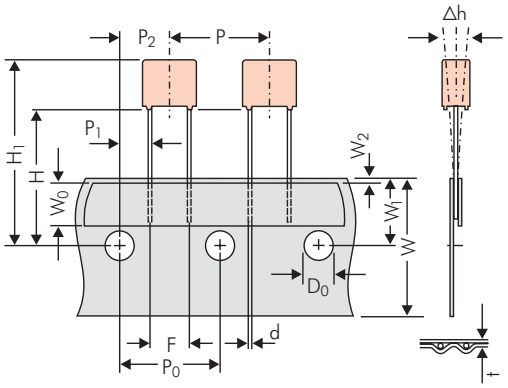


Diagram 1:
PCM 2.5/5/7.5mm

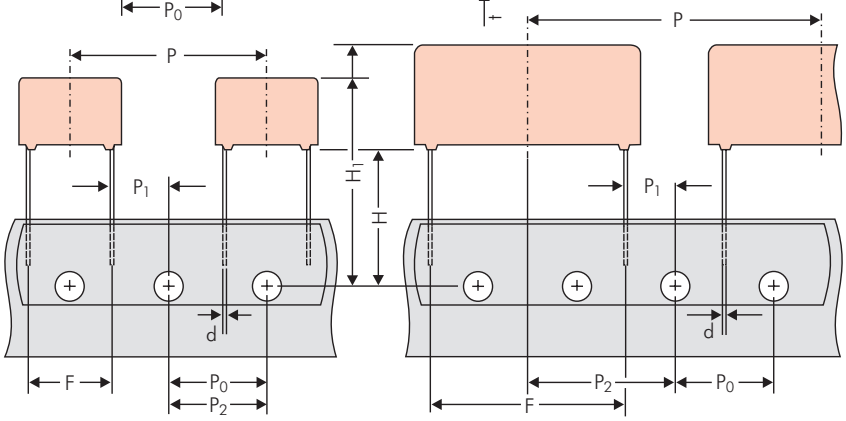


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5*mm
*PCM 27.5 taping possible with two feed holes between components

Designation	Symbol	Dimensions for Radial Taping						
		PCM 2.5 taping	**PCM 5 taping**	**PCM 7.5 taping**	**PCM 10 taping***	**PCM 15 taping***	**PCM 22.5 taping**	**PCM 27.5 taping**
Carrier tape width	W	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5
Hold-down tape width	W_0	6.0 for hot-sealing adhesive tape	6.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape
Hole position	W_1	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5
Hold-down tape position	W_2	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.
Feed hole diameter	D_0	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2
Pitch of component	P	12.7 ±1.0	12.7 ±1.0	12.7 ±1.0	25.4 ±1.0	25.4 ±1.0	38.1 ±1.5	*38.1 ±1.5 or 50.8 ±1.5
Feed hole pitch	P_0	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch
Feed hole centre to pin	P_1	5.1 ±0.5	3.85 ±0.7	2.6 ±0.7	7.7 ±0.7	5.2 ±0.7	7.8 ±0.7	5.3 ±0.7
Hole centre to component centre	P_2	6.35 ±1.3	6.35 ±1.3	6.35 ±1.3	12.7 ±1.3	12.7 ±1.3	19.05 ±1.3	19.05 ±1.3
Feed hole centre to bottom edge of the component	H	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5
Feed hole centre to top edge of the component	H_1	$H+H_{component} < H_1$ 32.25 max.	$H+H_{component} < H_1$ 32.25 max.	$H+H_{component} < H_1$ 24.5 to 31.5	$H+H_{component} < H_1$ 25.0 to 31.5	$H+H_{component} < H_1$ 26.0 to 37.0	$H+H_{component} < H_1$ 30.0 to 43.0	$H+H_{component} < H_1$ 35.0 to 45.0
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 +0.8 −0.2	7.5 ±0.8	10.0 ±0.8	15 ±0.8	22.5 ±0.8	27.5 ±0.8
Pin diameter	d	0.4 ±0.05	0.5 ±0.05	•0.5 ±0.05 or 0.6 +0.06 −0.05	•0.5 ±0.05 or 0.6 +0.06 −0.05	0.8 +0.08 −0.05	0.8 +0.08 −0.05	0.8 +0.08 −0.05
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.
Total tape thickness	t	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2
Package (see also page 150)		ROLL/AMMO		AMMO				
		REEL ø 360 max. ø 30 ±1 B 52 ±2 / 58 ±2 } depending on comp. dimensions		REEL ø 360 max. ø 30 ±1 B 52 ±2 / 58 ±2 / 66 ±2 or REEL ø 500 max. ø 25 ±1 B 54 ±2 / 60 ±2 / 68 ±2 } depending on PCM and component dimensions				
Unit		see details page 151.						

Dims in mm.

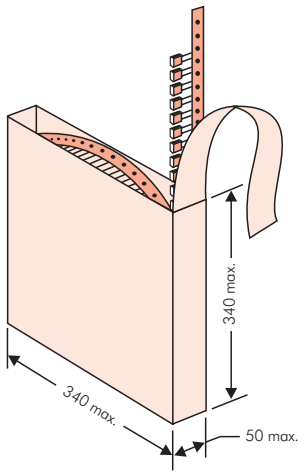
• Diameter of pins see General Data.

Please clarify customer-specific deviations with the manufacturer.

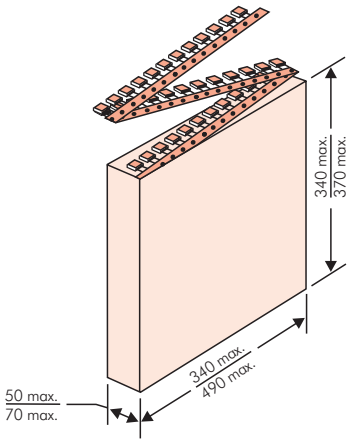
* PCM 10 and PCM 15 can be crimped to PCM 7.5.
Position of components according to PCM 7.5 (sketch 1). P_0 = 12.7 or 15.0 is possible

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

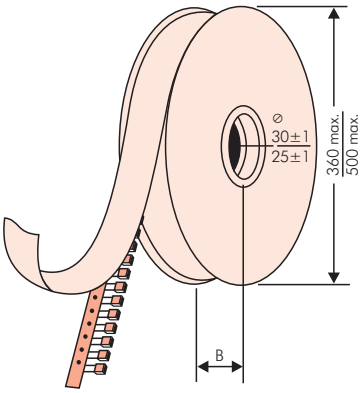
ROLL Packaging



AMMO Packaging



REEL Packaging



BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumerical Bar Code

Scanner decoding of

- WIMA supplier number
- Customer's P/O number
- Customer's part number
- WIMA confirmation number
- WIMA part number
- Lot number
- Date code
- Quantity

In addition part description of

– article
– capacitance value
– rated voltage
– dimensions
– capacitance tolerance
– packing

as well as gross weight and customer's name are indicated in plain text.

BARCODE „Code 39"

Packing Quantities for Capacitors with Radial Pins in PCM 2.5 mm to 22.5 mm

PCM	Size				bulk	pcs. per packing unit									
						ROLL		REEL				AMMO			
								ø 360		ø 500		340 × 340		490 × 370	
						H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5
	W	H	L	Codes	S	N	O	F	I	H	J	A	C	B	D
2.5 mm	2.5	7	4.6	**0B**	5000	2200		2500		–		2800		–	
	3	7.5	4.6	**0C**	5000	2000		2300		–		2300		–	
	3.8	8.5	4.6	**0D**	5000	1500		1800		–		1800		–	
	4.6	9	4.6	**0E**	5000	1200		1500		–		1500		–	
	5.5	10	4.6	**0F**	5000	900		1200		–		1200		–	
5 mm	2.5	6.5	7.2	**1A**	5000	2200		2500		–		2800		–	
	3	7.5	7.2	**1B**	5000	2000		2300		–		2300		–	
	3.5	8.5	7.2	**1C**	5000	1600		2000		–		2000		–	
	4.5	6	7.2	**1D**	6000	1300		1500		–		1500		–	
	4.5	9.5	7.2	**1E**	4000	1300		1500		–		1500		–	
	5	10	7.2	**1F**	3500	1100		1400		–		1400		–	
	5.5	7	7.2	**1G**	4000	1000		1200		–		1200		–	
	5.5	11.5	7.2	**1H**	2500	1000		1200		–		1200		–	
	6.5	8	7.2	**1I**	2500	800		1000		–		1000		–	
	7.2	8.5	7.2	**1J**	2500	700		1000		–		1000		–	
	7.2	13	7.2	**1K**	2000	700		950		–		1000		–	
	8.5	10	7.2	**1L**	2000	600		800		–		800		–	
	8.5	14	7.2	**1M**	1500	600		800		–		800		–	
	11	16	7.2	**1N**	1000	500		600		–		640		–	
7.5 mm	2.5	7	10	**2A**	5000	–		2500		4400		2500		–	
	3	8.5	10	**2B**	5000	–		2200		4300		2300		4150	
	4	9	10	**2C**	4000	–		1700		3200		1700		3100	
	4.5	9.5	10.3	**2D**	3500	–		1500		2900		1400		2700	
	5	10.5	10.3	**2E**	3000	–		1300		2500		1300		–	
	5.7	12.5	10.3	**2F**	2000	–		1000		2200		1100		–	
	7.2	12.5	10.3	**2G**	1500	–		900		1800		1000		–	
10 mm	3	9	13	**3A**	3000	–		1100		2200		–		1900	
	4	8.5	13.5	**FA**	3000	–		900		1600		–		1450	
	4	9	13	**3C**	3000	–		900		1600		–		1450	
	4	9.5	13	**3D**	3000	–		900		1600		–		1400	
	5	10	13.5	**FB**	2000	–		700		1300		–		1200	
	5	11	13	**3F**	3000	–		700		1300		–		1200	
	6	12	13	**3G**	2400	–		550		1100		–		1000	
	6	12.5	13	**3H**	2400	–		550		1100		–		1000	
	8	12	13	**3I**	2000	–		400		800		–		740	
15 mm	5	11	18	**4B**	2400	–		600		1200		–		1150	
	5	13	19	**FC**	1000	–		600		1200		–		1200	
	6	12.5	18	**4C**	2000	–		500		1000		–		1000	
	6	14	19	**FD**	1000	–		500		1000		–		1000	
	7	14	18	**4D**	1600	–		450		900		–		850	
	7	15	19	**FE**	1000	–		450		900		–		850	
	8	15	18	**4F**	1200	–		400		800		–		740	
	8	17	19	**FF**	500	–		400		800		–		740	
	9	14	18	**4H**	1200	–		350		700		–		650	
	9	16	18	**4J**	900	–		350		700		–		650	
	10	18	19	**FG**	500	–		300		650		–		590	
	11	14	18	**4M**	1000	–		300		600		–		540	
22.5 mm	5	14	26.5	**5A**	1200	–		–		800		–		770	
	6	15	26.5	**5B**	1000	–		–		700		–		640	
	7	16.5	26.5	**5D**	760	–		–		600		–		550	
	8	20	28	**FH**	500	–		–		500		–		480	
	8.5	18.5	26.5	**5F**	500	–		–		480		–		450	
	10	22	28	**FI**	570*	–		–		420		–		380	
	10.5	19	26.5	**5G**	594*	–		–		400		–		360	
	10.5	20.5	26.5	**5H**	594*	–		–		400		–		360	
	11	21	26.5	**5I**	561*	–		–		380		–		350	
	12	24	28	**FJ**	480*	–		–		350		–		310	

* TPS (Tray-Packing-System). Plate versions may have different packing units. Samples and pre-production needs on request.

Moulded versions.

Packing Quantities for Capacitors with Radial Pins in PCM 27.5 mm to 52.5 mm

PCM	Size				bulk	pcs. per packing unit									
						ROLL		REEL				AMMO			
								ø 360		ø 500		340 × 340		490 × 370	
						H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5
	W	H	L	Codes	S	N	O	F	I	H	J	A	C	B	D
27.5 mm	9	19	31.5	**6A**	567*	–		–		460/340*		–		420	
	11	21	31.5	**6B**	459*	–		–		380/280*		–		350	
	13	24	31.5	**6D**	378*	–		–		300		–		290	
	13	25	33	**FK**	405*	–		–		–		–		–	
	15	26	31.5	**6F**	324*	–		–		270		–		250	
	15	26	33	**FL**	324*	–		–		–		–		–	
	17	29	31.5	**6G**	198*	–		–		–		–		–	
	17	34.5	31.5	**6I**	198*	–		–		–		–		–	
	20	32	33	**FM**	162*	–		–		–		–		–	
	20	39.5	31.5	**6J**	162*	–		–		–		–		–	
37.5 mm	9	19	41.5	**7A**	441*	–		–		–		–		–	
	11	22	41.5	**7B**	357*	–		–		–		–		–	
	13	24	41.5	**7C**	294*	–		–		–		–		–	
	15	26	41.5	**7D**	252*	–		–		–		–		–	
	17	29	41.5	**7E**	154*	–		–		–		–		–	
	19	32	41.5	**7F**	140*	–		–		–		–		–	
	20	39.5	41.5	**7G**	126*	–		–		–		–		–	
	24	45.5	41.5	**7H**	112*	–		–		–		–		–	
	31	46	41.5	**7I**	84*	–		–		–		–		–	
	35	50	41.5	**7J**	35*	–		–		–		–		–	
	40	55	41.5	**7K**	28*	–		–		–		–		–	
48.5 mm	19	31	56	**8D**	120*	–		–		–		–		–	
	23	34	56	**8E**	80*	–		–		–		–		–	
	27	37.5	56	**8H**	84*	–		–		–		–		–	
	33	48	56	**8J**	25*	–		–		–		–		–	
	37	54	56	**8L**	25*	–		–		–		–		–	
52.5 mm	25	45	57	**9D**	70*	–		–		–		–		–	
	30	45	57	**9E**	60*										
	35	50	57	**9F**	25*										
	45	55	57	**9H**	20*	–		–		–		–		–	
	45	65	57	**9J**	20*	–		–		–		–		–	

* for 2-inch transport pitches.

* TPS (Tray-Packing-System). Plate versions may have different packing units. Samples and pre-production needs on request.

Moulded versions.

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