



SILICON PLANAR EPITAXIAL TRANSISTORS

N-P-N transistors in plastic TO-92 envelopes, primarily intended for low-noise input stages in tape recorders, hi-fi amplifiers and other audio-frequency equipment.

QUICK REFERENCE DATA

			BC549	BC550
Collector-emitter voltage ($V_{BE} = 0$)	V_{CES}	max	30	50 V
Collector-emitter voltage (open base)	V_{CEO}	max	30	45 V
Collector current (peak value)	I_{CM}	max	200	200 mA
Total power dissipation up to $T_{amb} = 25^\circ\text{C}$	P_{tot}	max	500	500 mW
Junction temperature	T_j	max	150	150 $^\circ\text{C}$
D.C. current gain				
$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$	h_{FE}	$>$	200	200
		$<$	800	800
Transition frequency				
$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	f_T	typ	300	300 MHz
Noise figure at $R_S = 2\text{ k}\Omega$				
$I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$				
$f = 30\text{ Hz to } 15\text{ kHz}$	F	typ	1,4	1,4 dB
		$<$	4	3 dB
$f = 1\text{ kHz}; B = 200\text{ Hz}$	F	typ	1,2	1 dB
$f = 10\text{ Hz to } 50\text{ Hz}$ (equivalent noise voltage)	V_n	$<$	—	0,135 μV

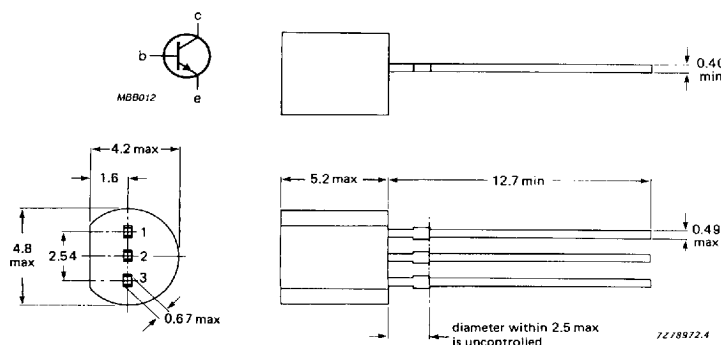
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92.

Pinning

- 1 = emitter
2 = base
3 = collector



Capability approved to CECC NECC-C-002

BC549
BC550**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			BC549	BC550
Collector-base voltage (open emitter)	V_{CBO}	max.	30	50 V
Collector-emitter voltage ($V_{BE} = 0$)	V_{CES}	max.	30	50 V
Collector-emitter voltage (open base)	V_{CEO}	max.	30	45 V
Emitter-base voltage (open collector)	V_{EBO}	max.	5	5 V
Collector current (d.c.)	I_C	max.		100 mA
Collector current (peak value)	I_{CM}	max.		200 mA
Emitter current (peak value)	$-I_{EM}$	max.		200 mA
Base current (peak value)	I_{BM}	max.		200 mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.		500 mW
Storage temperature	T_{stg}		-65 to + 150 $^{\circ}\text{C}$	
Junction temperature	T_j	max.		150 $^{\circ}\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	0,25 K/mW
From junction to case	$R_{th\ j-c}$	=	0,15 K/mW

CHARACTERISTICS $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

Collector cut-off current

 $I_E = 0; V_{CB} = 30\text{ V}$ $I_{CBO} < 15\text{ nA}$ $I_E = 0; V_{CB} = 30\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ $I_{CBO} < 5\text{ }\mu\text{A}$

Base emitter voltage*

 $I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$ V_{BE} typ. 660 mV
580 to 700 mV $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$ $V_{BE} < 770\text{ mV}$

Saturation voltages **

 $I_C = 10\text{ mA}; I_B = 0,5\text{ mA}$ V_{CEsat} typ. 90 mV
< 250 mV V_{BEsat} typ. 700 mV $I_C = 100\text{ mA}; I_B = 5\text{ mA}$ V_{CEsat} typ. 200 mV
< 600 mV V_{BEsat} typ. 900 mV* V_{BE} decreases by about 2 mV/K with increasing temperature.** V_{BEsat} decreases by about 1,7 mV/K with increasing temperature.

Collector capacitance at $f = 1$ MHz

$$I_E = I_C = 0; V_{CB} = 10 \text{ V}$$

C_C typ. 2,5 pF

Emitter capacitance at $f = 1$ MHz

$$I_C = I_E = 0; V_{EB} = 0,5 \text{ V}$$

C_e typ. 9 pF

Transition frequency at $f = 35$ MHz

$$I_C = 10 \text{ mA}; V_{CE} = 5 \text{ V}$$

f_T typ. 300 MHz

Small signal current gain at $f = 1$ kHz

$$I_C = 2 \text{ mA}; V_{CE} = 5 \text{ V}$$

h_{fe} 125 — 900

Noise figure at $R_S = 2 \text{ k}\Omega$

$$I_C = 200 \mu\text{A}; V_{CE} = 5 \text{ V}$$

$$f = 30 \text{ Hz to } 15 \text{ kHz}$$

		BC549	BC550
F	typ.	1,4	1,4 dB
	<	4	3 dB
F	typ.	1,2	1 dB
	<	4	4 dB

$$f = 1 \text{ kHz}; B = 200 \text{ Hz}$$

Equivalent noise voltage at $R_S = 2 \text{ k}\Omega$

$$I_C = 200 \mu\text{A}; V_{CE} = 5 \text{ V}$$

$$f = 10 \text{ Hz to } 50 \text{ Hz}; T_{amb} = 25 \text{ }^\circ\text{C}$$

V_n max. — 0,135 μV

D.C. current gain

$$I_C = 10 \mu\text{A}; V_{CE} = 5 \text{ V}$$

		BC549B BC550B	BC549C BC550C
h_{FE}	typ.	150	270
	>	200	420
h_{FE}	typ.	290	520
	<	450	800

$$I_C = 2 \text{ mA}; V_{CE} = 5 \text{ V}$$

h_{FE} typ. 290 520
< 450 800

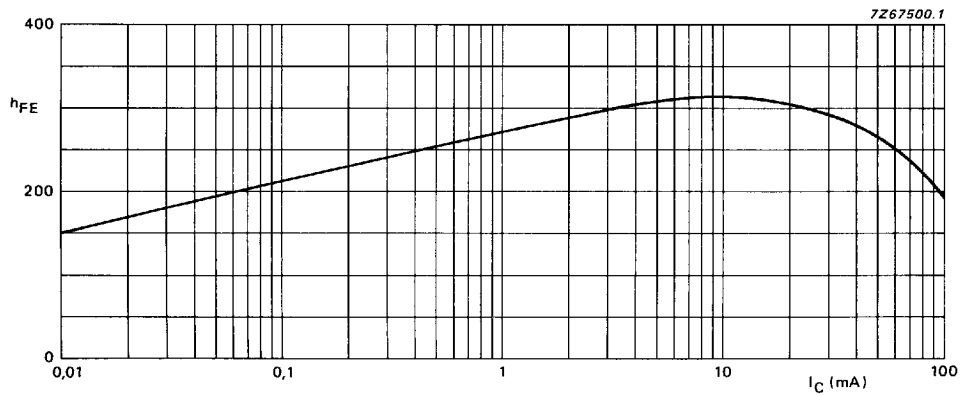


Fig. 2 BC549B and BC550B; $V_{CE} = 5$ V; $T_j = 25$ °C; typical values.

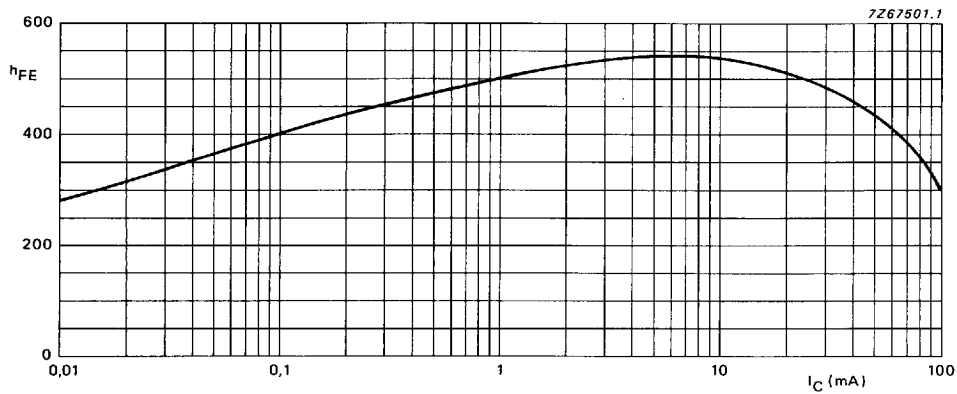


Fig. 3 BC549C and BC550C; $V_{CE} = 5$ V; $T_j = 25$ °C; typical values.

Silicon planar epitaxial transistors

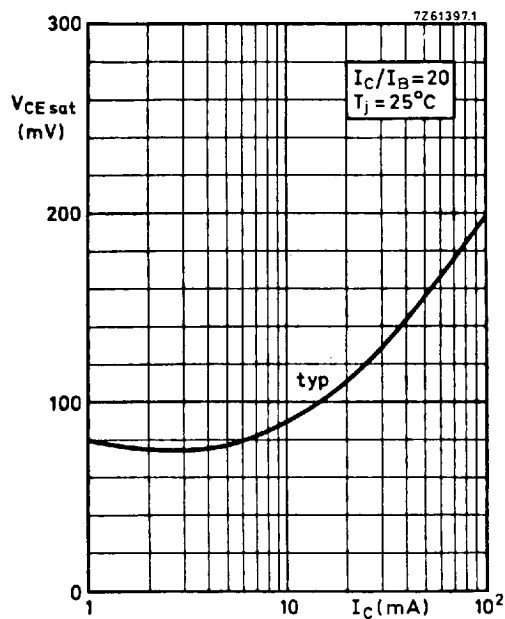
BC549
BC550

Fig. 4.

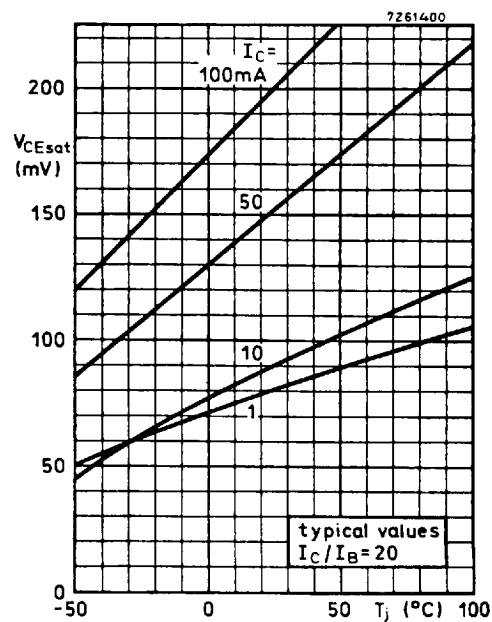
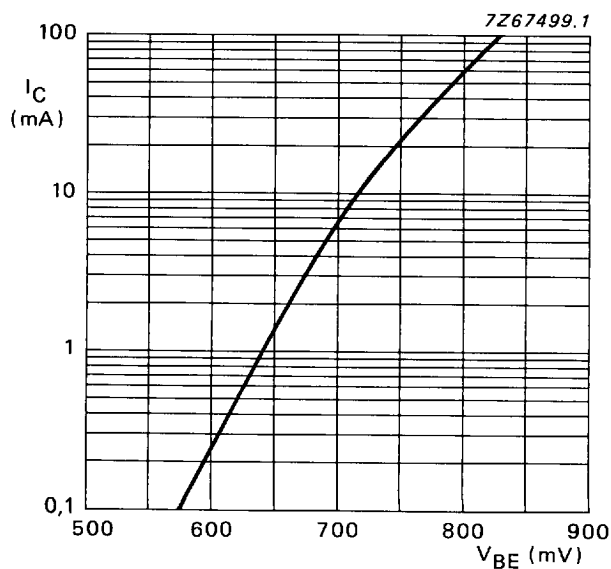


Fig. 5.

Fig. 6 $V_{CE} = 5\text{ V}$; $T_j = 25^\circ\text{C}$; typical values.

BC549

BC550

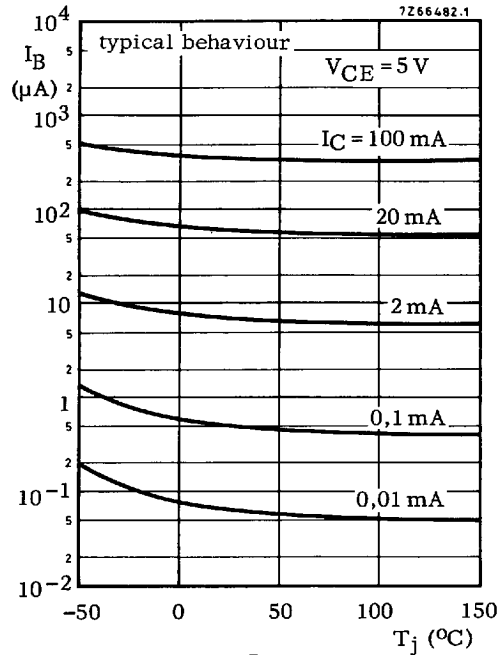


Fig. 7.

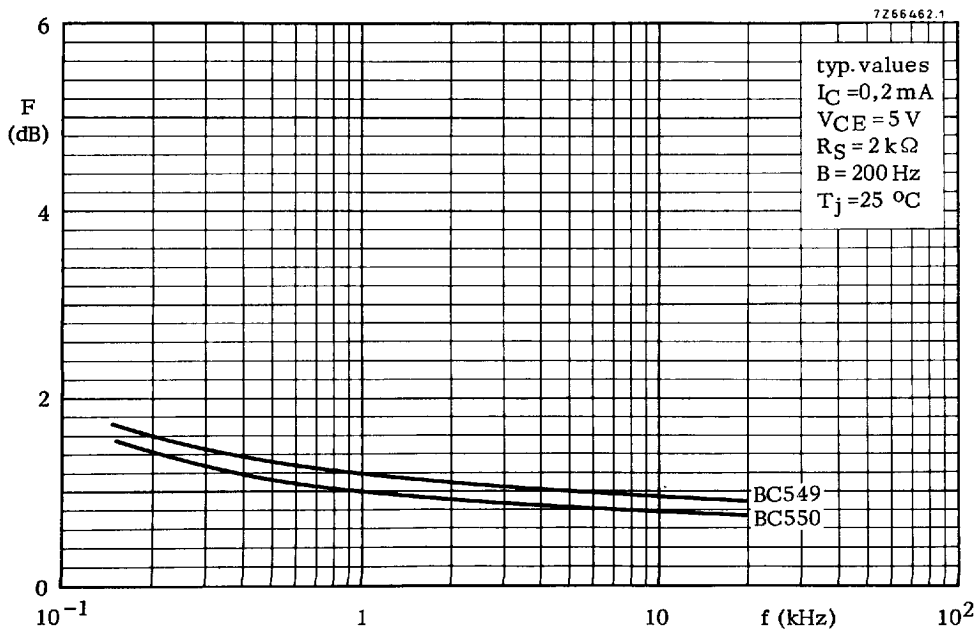


Fig. 8.

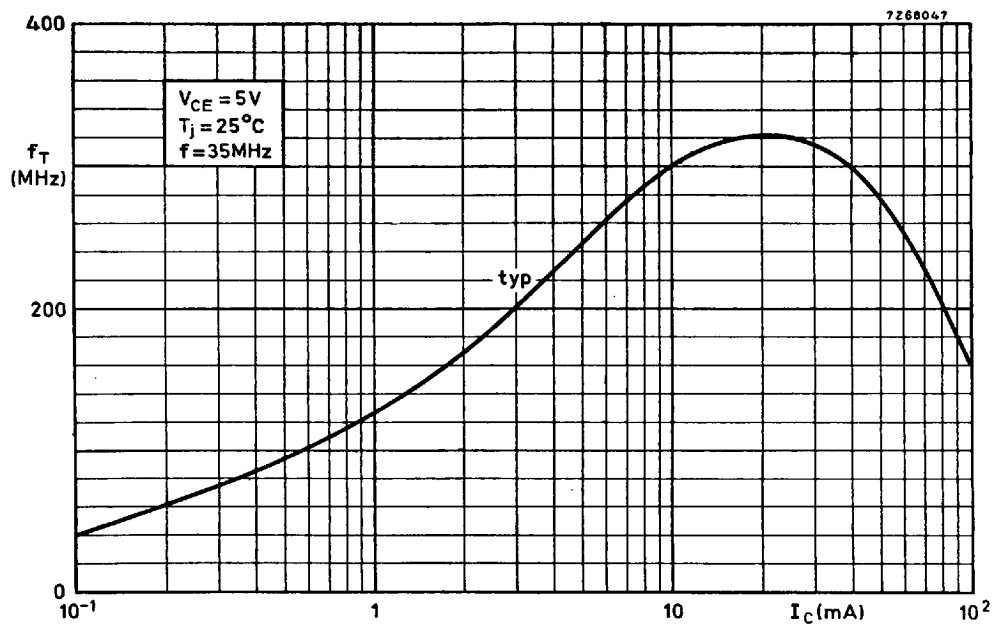


Fig. 9.

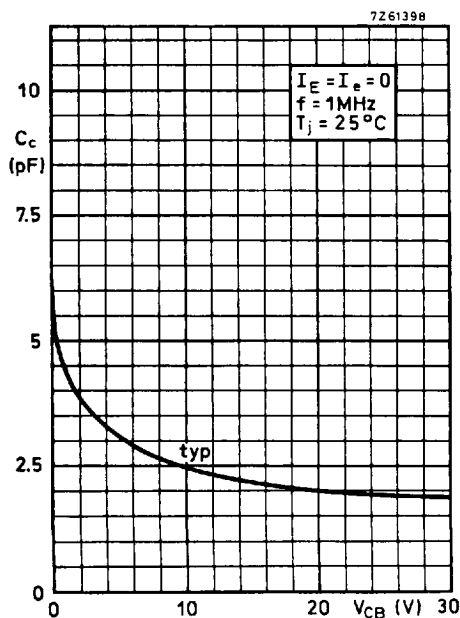


Fig. 10.

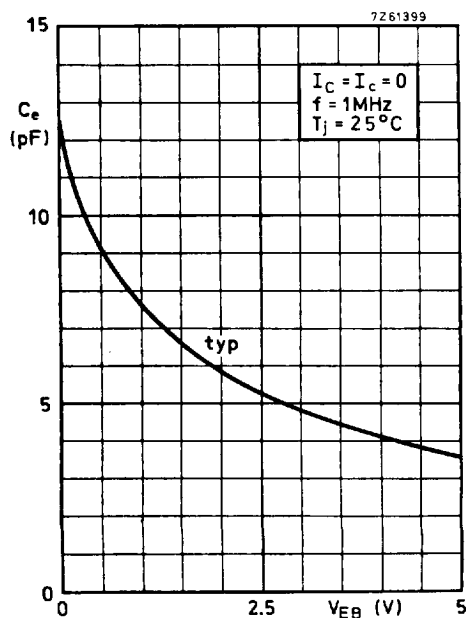


Fig. 11.

BC549
BC550

Curves of constant noise figure

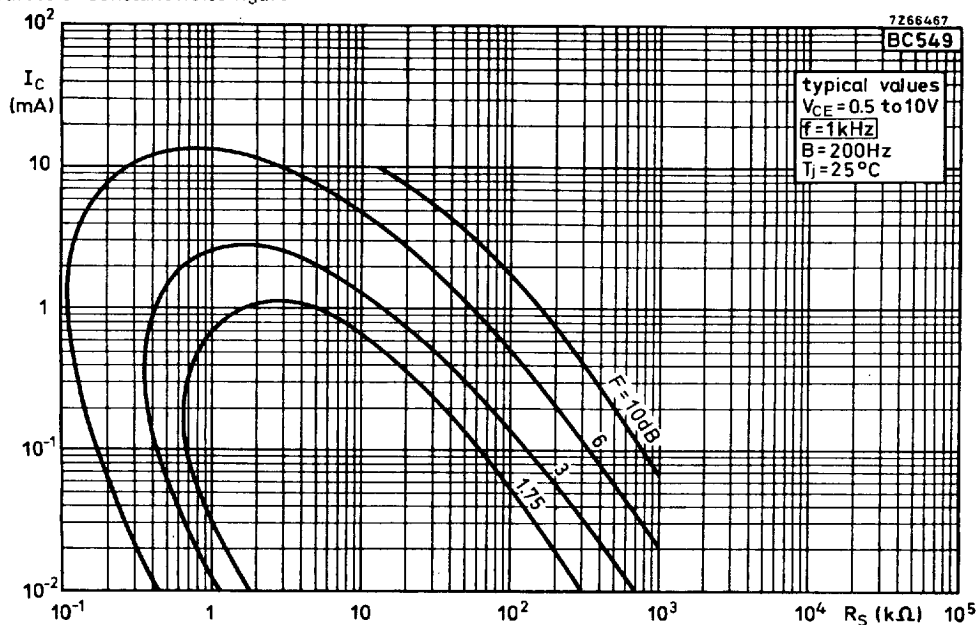


Fig. 12.

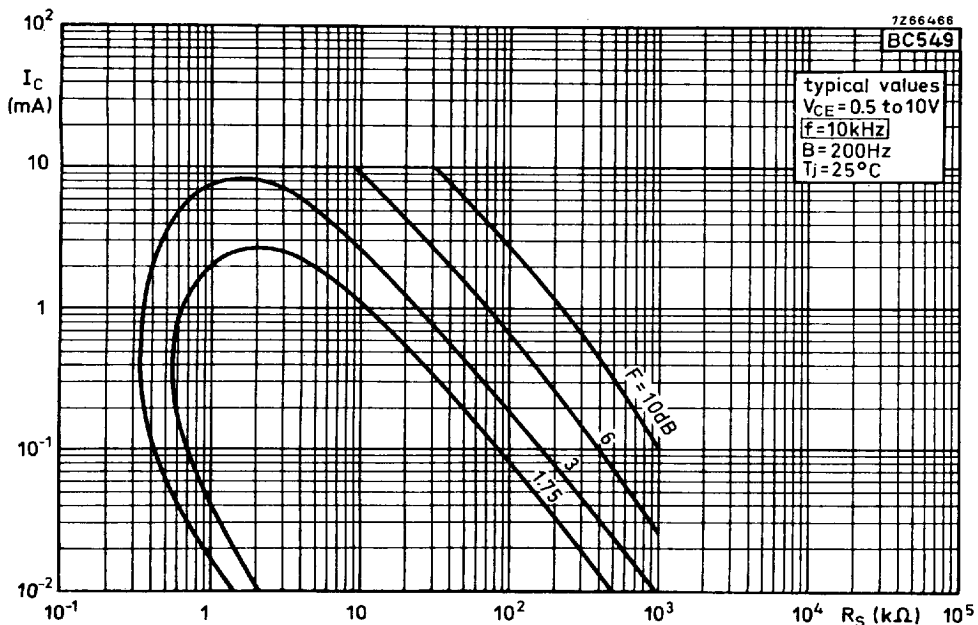


Fig. 13.

Curves of constant noise figure

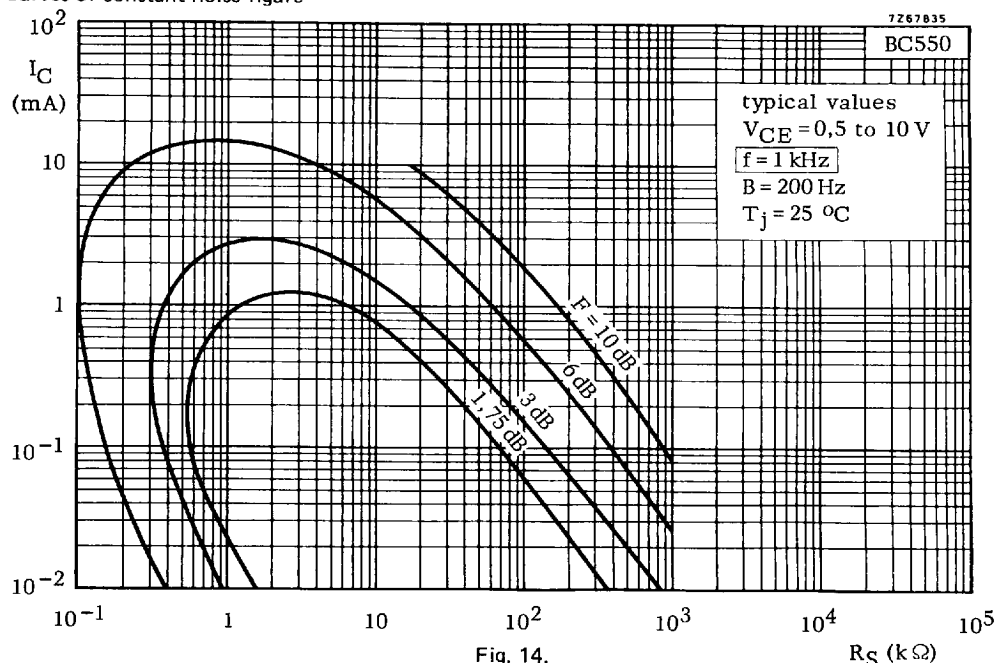


Fig. 14.

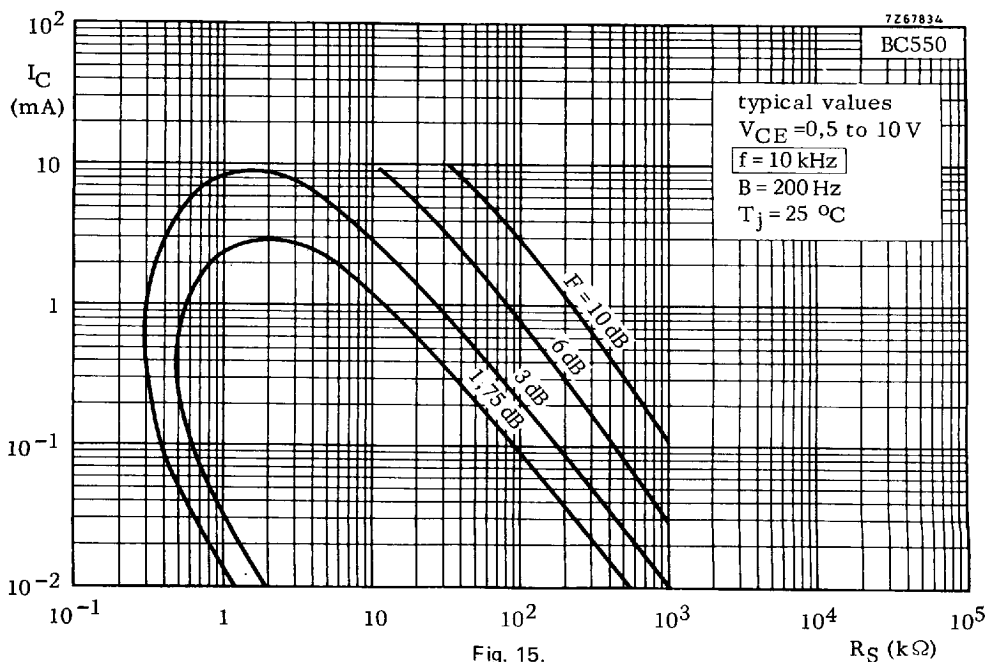


Fig. 15.