AMP48

MAX **180W** MOS POWER AMP LME49830+2SK1058/J162

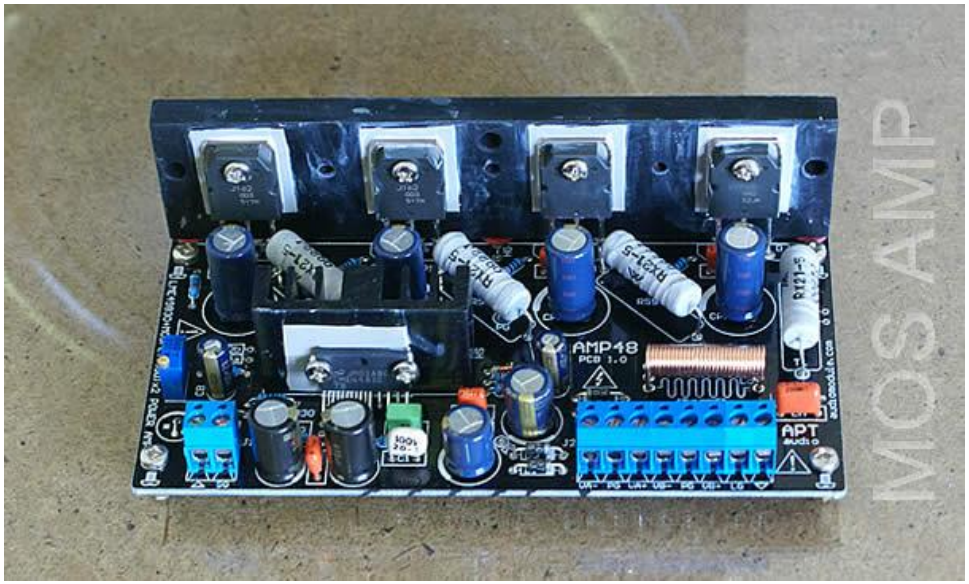
APT audio

V1.0

Function

AMP47 - Standard Version

1. MSOFET Power Amplifiers Module
2. VAS Core: NSC **LME49830** Driver chip
3. Output Stage: **2SK1058/J162** Two Pairs
4. AC Feedback /DC Feedback
5. Single-pole / **Two-pole** compensation
6. Dual Power Interface design VAS (Voltage amplification stage) / OS (Output stage)
7. Easy installation and commissioning of the out stages metal plate
8. High reliability heat sink for LME49830
9. Improved PCB Design and Optimization of parameters



Reference Photos

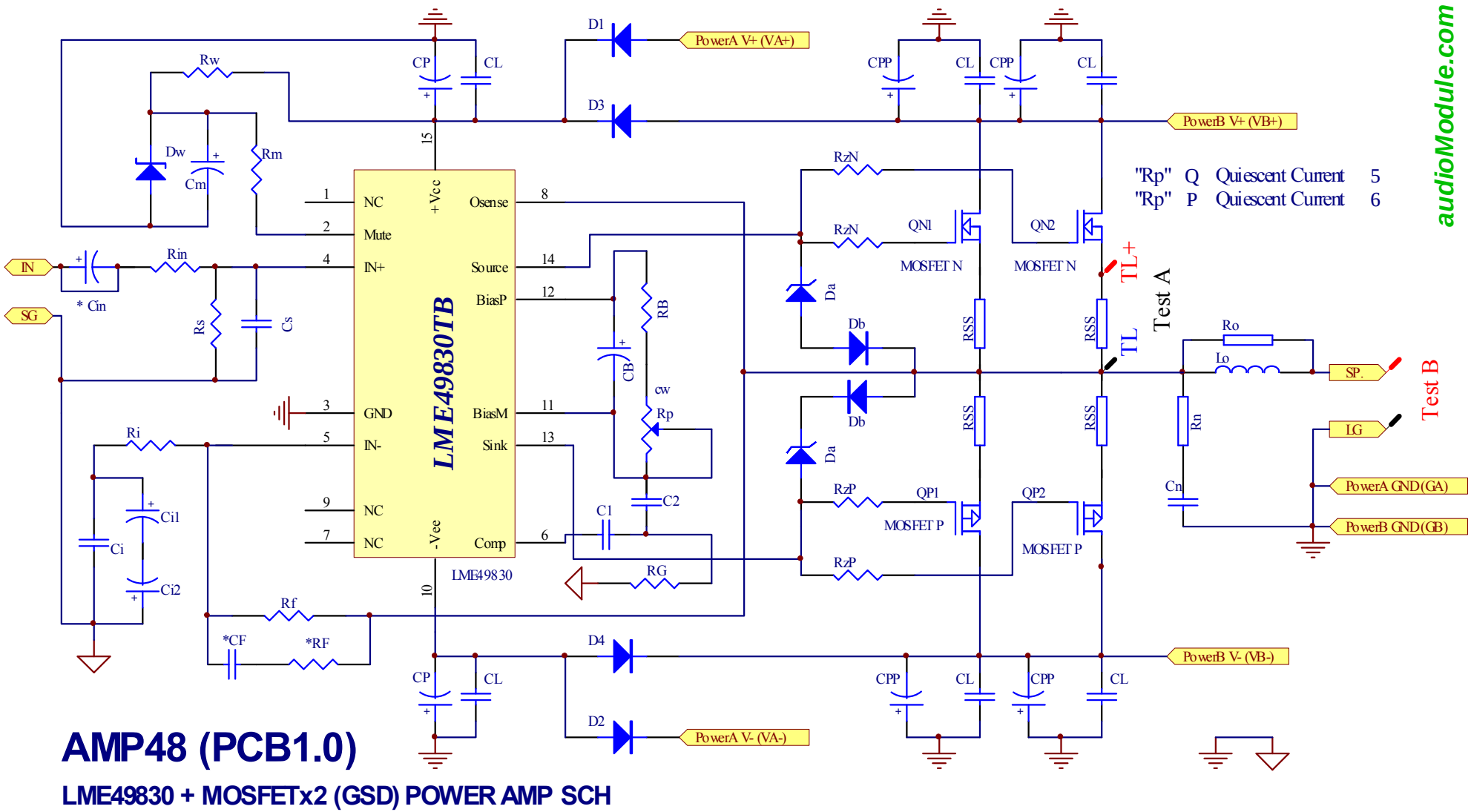
2mm PCB Thickness / Black

- VAS Operating Voltage: DC 43 ~ 53V
- OS Operating Voltage: DC 33 ~ 43V
- Output Power: 55 ~ 100W @ 8Ω
- Load Impedance: 4/8Ω
- Frequency response: 0Hz ~ 100KHz
- Voltage Gain: 32dB

• Matsushita FC series Electrolytic Capacitor
• WIMA Capacitor / Philips CBB
• Compensation capacitor Mica
• 1% Metal Film Resistors

W(width) x D(depth) x H(height) : 146x79x46 mm
Net Weight: 275g

Schematic

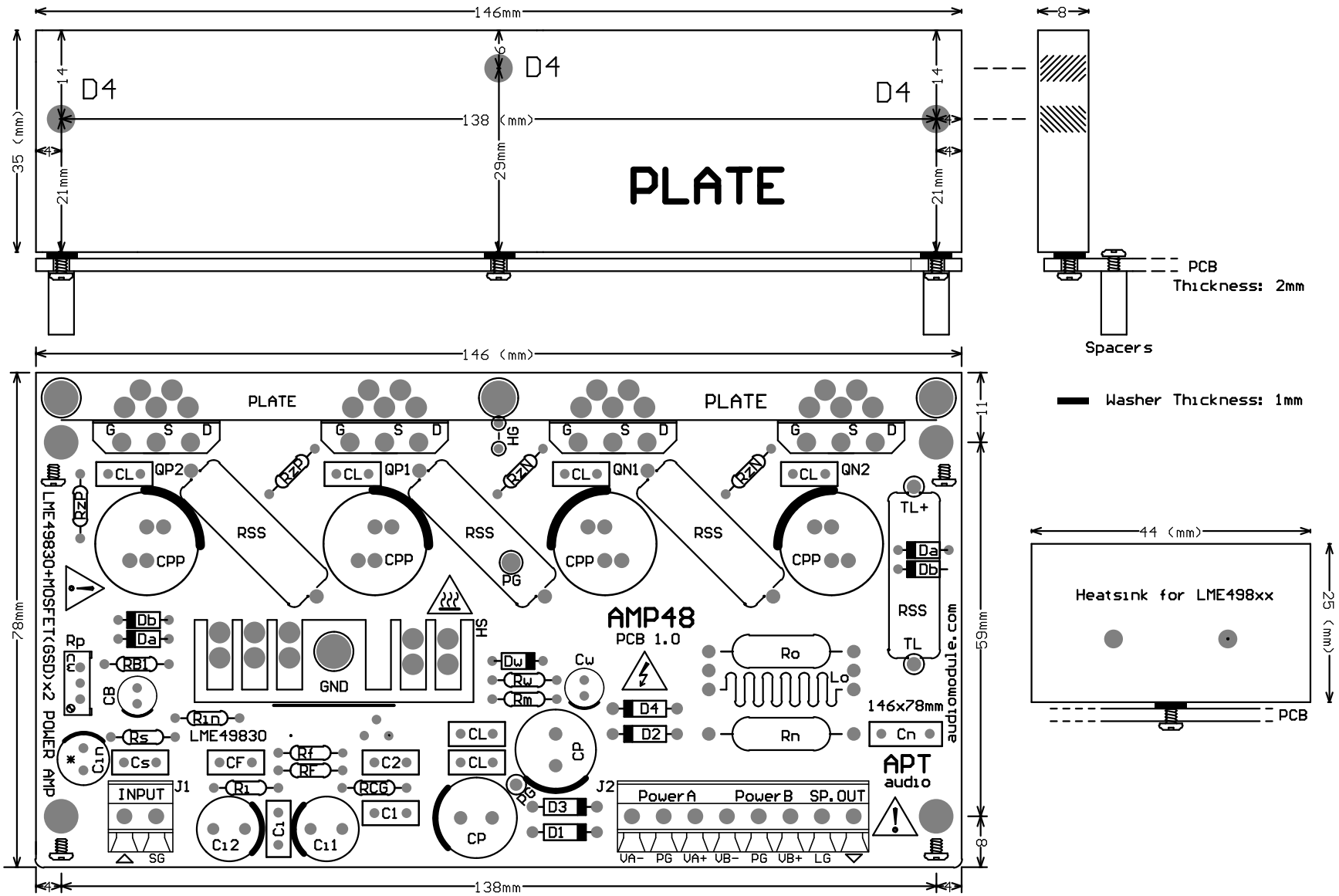

audioModule.com
"Rp" Q Quiescent Current 5
"Rp" P Quiescent Current 6
LME49830TB
LME49830
PowerA V+ (VA+)
PowerB V+ (VB+)
PowerB V- (VB-)
PowerA V- (VA-)
PowerA GND(GA)
PowerB GND(GB)
MOSFET N
MOSFET P
Test A
Test B
AMP48 (PCB1.0)
LME49830 + MOSFETx2 (GSD) POWER AMP SCH

BOM

Reference	Value	Description	Qty.
PCB	AMP48	146x68mm	1
IC	LME49830TB	NSC	1
QN1/2	2SK1058 (Matched)	N MOSFET	2
QP1/2	2SJ162 (Matched)	P MOSFET	2
Da	None		0
Dw	5V/0.5W	Zener Diode	1
Db	None		0
D1-D4	1N4007	Diode	4
Rin/Ri	560R 1% 1/4W	Metal Film	2
Rs/Rf/Rm/Rw	22K 1% 1/4W	Metal Film	4
RzN/RzP	220R 1% 1/4W	Metal Film	4
*RF	None	Open	0
RB	430R 1% 1/4W	Metal Film	1
RG	10K 1% 1/4W	Metal Film	1
RSS	0R2 5% 5W	Wound	4
Ro	10R 1% 2~3W	Metal Film	1
Rn	10R 1% 2~3W	Metal Film	1
Rp	200R	3296	1
Lo	1uH	Coil	1
CB/Cm	22uF/35V	Matsushita FC	2
Ci1/2	470uF/25V	Matsushita FC	2
CP	100uF/100V		2
CPP	220uF/63V	Matsushita FC	4
Cs/C2	100pF/100V	WIMA	2
C1	20pF/100V	Mica	1
Cv/CL	100nF/100V	CBB	7

Reference	Value	Description	Qty.
*CF	None	Open	0
Cin	10uF	BP	1
Cn	100nF/250V	CBB	1
J1	2P -5.0mm	2Px1	1
J2	8P -5.0mm	3Px2+2P	1
HS	Heat Sink	For Chip	1
Plate	Meter Plate	For Output Stage	1
Washer	M3	Fiber	4
Spacers	F-F 8 or 10mm	Copper	4
Screw	M3-5mm	Steel	8
Scerw	M3-6mm	Steel	6
Scerw	M3-10mm	Steel	4
Insulator	TO-3PL Silicone	MOSFET /Chip	5

SIZE


146mm
D4
D4
D4
PLATE
35 (mm)
138 (mm)
29mm
21mm
14
6
8
PCB
Thickness: 2mm
Spacers
Washer Thickness: 1mm
146 (mm)
78mm
59mm
11
8
138mm
PLATE
PLATE
LME49830+MOSFET(GSD)x2 POWER AMP
AMP48
PCB 1.0
audiomodule.com
146x78mm
APT
audio
GND
LME49830
INPUT
J1
J2
PowerA
PowerB
SP.OUT
VA- PG VA+ VB- PG VB+ LG
SG
RSS
TL+
TL
Heatsink for LME498xx
44 (mm)
25 (mm)
PCB

Kit Installation

1) Welding sequent according to the height of components from low to high.
   < Small-power resistors → Diode → Film Capacitors → Wiring terminal → Power resistance → Inductance →Electrolytic capacitors→ **Chip*** → **Transistors**** >

   ***** *The **chip** (LME49830) mounted on heat sink (HS) with the screws. The silicone insulator film must be placed. Note screw tightness, to prevent chip fracture. Then Chip and Heat sink mounted on PCB. Place the fiber washer between the Assembly and PCB.*

   ***The **transistors** mounted on the plate with screws, The silicone insulator film must be placed. Then transistors and plate mounted on PCB with screws. Place the fiber washer between the Assembly and PCB.*
   ***** ***The chip and Transistor need heat conductive silicon grease***

2) To check whether there is any lost parts or mistakes on polarity after welding.
3) Welding chip and MOSFET, the electric iron of the shell need grounding.
4) Input capacitor “Cin”, There are two effects of this capacitor, the first role is behind the circuit with a high pass filter, the other is DC-blocking capacitors. High-quality amplifiers will usually cancel it, and has improved sound quality. However, if the signal source circuit has a larger DC output or cause amplifier exception, Then the capacitor must be installed.

Port

Mark	Name	
p	Signal Input	J1
SG	Signal GND	
VA- (Power A)	VAS Negative voltage Input	J2
GA (Power A)	VAS GND	
VA+ (Power A)	VAS Positive voltage Input	
VB- (Power B)	OS Negative voltage Input	
GB (Power B)	OS GND	
VB+ (Power B)	OS Positive voltage Input	
LG	Loudspeaker GND	
q	Signal Output	

GA and GB Common ground
Dual PSU Mode: *Power A input voltage should be regulated*
Power A input voltage must be higher 5~10V than Power B
Single PSU Mode: *Only Power B*

Voltage Amplification Stage (VAS: Power A) DC ± 43~53V
Output Stage (OS: Power B) DC ± 33~43V

Debugging

1) Parameter design to quiescent current adjustment range AMP48 (Renesas) Vbias=1.12~1.52V and I_Q=80~140mA
   (MOSFET parameters, VGS poor consistency. Each module of the minimum and maximum quiescent current may not be consistent.)
2) Before power on, turn the multi-turn resistance "Rp" P clockwise to the end-term.
3) MultiMate ready DC millvolt stalls, measuring the voltage across power resistor “Rss” (Test A -Schematic), It would be easy to use alligator clips.
4) Input short circuit, Output load is not connected. Then Power on AMP48. Observation MultiMate reading, The value will rise slowly, the metal plate temperature will gradually rise. Over time, values will change in a small area.
5) Q Rotate “Rp”, quiescent current will increase. AMP48 quiescent current adjustment proposed in the 100 ~ 110mA. (I_Q=URaed/Rss)
   (Usually, MOSFET power amplifier requires higher quiescent current than bipolar power amplifier, In order to reduce the level of harmonic distortion.)
6) Power off AMP48 first, then prepared to Test B. Typically, the DC output range in 0~10 mV.
7) Preferably between DC power and AMP48, series FUSE. After these tests, AMP48 can conduct an audition.
8) Normal use, you must configure the heat sink for the AMP48. And use heat conductive silicon grease.
   (In order to avoid high temperature heat sink, should be chosen large heat sink, or adjust the quiescent current at low level.)

***** Usually, MOS amplifier quiescent current to be adjusted higher, relative to the BJT amplifier. In order to obtain low harmonic distortion. 80mA quiescent current will produce a great heat, so large solid heat sink is required. If you need to lower the minimum quiescent current, you need to reduce the value of resistor Rb.***

Attention

1) Wrong wiring will result in module damage.
2) Electrical Safety
3) Heat sink and the metal plate surface temperature will be higher.

For help, please email us: hi@audiomodule.com