Startup Guide for TICore260BTL PFFB V1

TPA3255 BTL Stereo Class-D Amplifier

Specifications

Recommended Supply Voltage	48V DC
Max Working Voltage	53.5V DC
Output Power (1% THD+N)	150W-8Ω, 260W-4Ω
Voltage gain	10.9
Input sensitivity	3V RMS
Input impedance	10K Ω
Input configuration	SE / Balanced input jumper
Load impedance	4Ω or 8Ω
Idle dissipation	4W at 48V DC
Footprint	148mm x 100mm x 40mm (L * W * H)

Required Parts for Option A

Note: The 4pcs high current inductors are already included in Option B.

Quantity	Description	Part / Manufacturer No.
2	DIP-8 Opamp (or SOIC-8 w/adapter)	LME49860 (with DIP-8 adapter)
1	Heatsink for TPA3255 chip	ATS-TI1OP-519-C1-R3
4	1800uF to 2200uF, 63V Capacitor	EEU-FC1J182
4	Inductors, high current	VER2923-103KL
1	CPU thermal grease	Arctic MX-2
1	Heatsink Plaster	STARS-922

Required Tools

- Philips screw driver
- Soldering lead 0.8mm
- Temperature controlled soldering iron

Notes

Use heat sink plaster or PCB glue under the inductors so that it will secure them from vibration.

PFFB configuration is more sensitive to open load conditions than pre-filter feedback mode. Do not run the amp without speaker connected while feeding it with signal on the input. Feeding the amp with signal in the input while there is no load will make the output become unstable and might cause the amp to fail.

The module requires 3Vrms input to run the amp into full power.

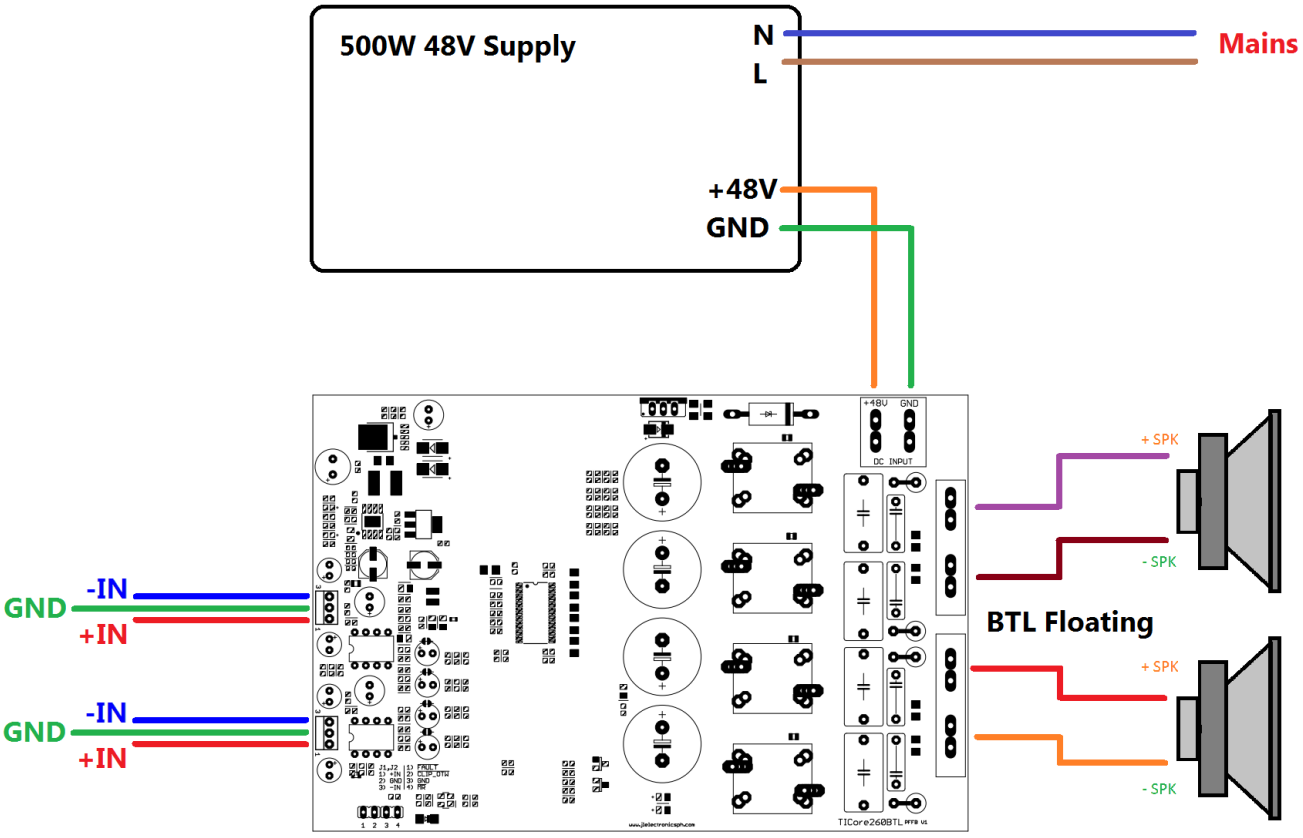
Make sure that the power supply is fully discharged when connecting or disconnecting power wires on the module.

Multi-device configuration

Kindly refer to SLAA787 application note for running multiple modules using the same power supply and/or chassis.

https://www.ti.com/lit/pdf/slaa787

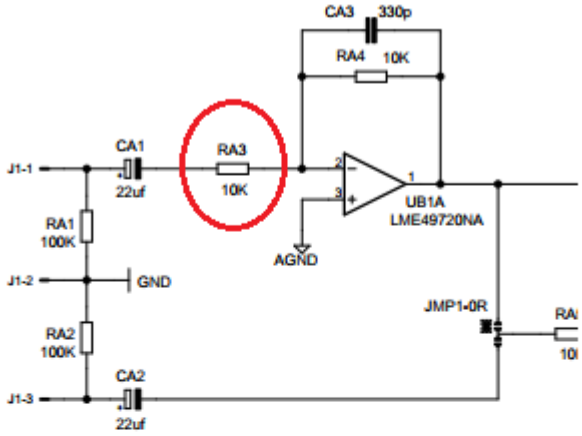
Simplified Wiring Diagram

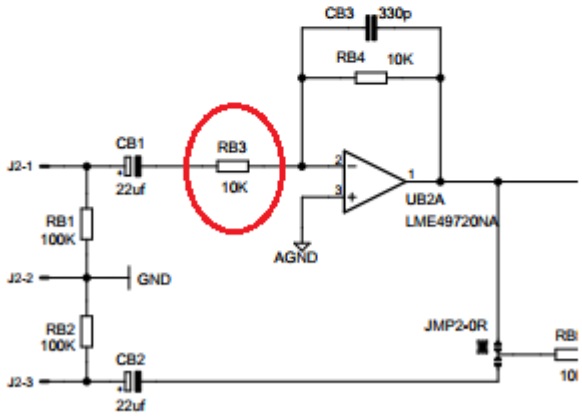


- For single ended input, put a solder blob on 'SE' jumper under the PCB. Then use +IN and GND wiring.
- For balanced input, put a solder blob on 'BAL' jumper under the PCB.
- -SPK of left and right speakers are floating! WARNING: Do not connect to GND

Increase gain on single ended input mode

- replace RA3 and RB3 with 6.8K, 0603, 0.05% resistors which will add ~1.47x gain. Input sensitivity will become ~2Vrms. Input impedance will be reduced to 6.8K ohms.
Set JMP1 and JMP2 to SE mode by placing a solder blob. Once RA3 and RB3 resistors were changed, you cannot use it on balanced mode.

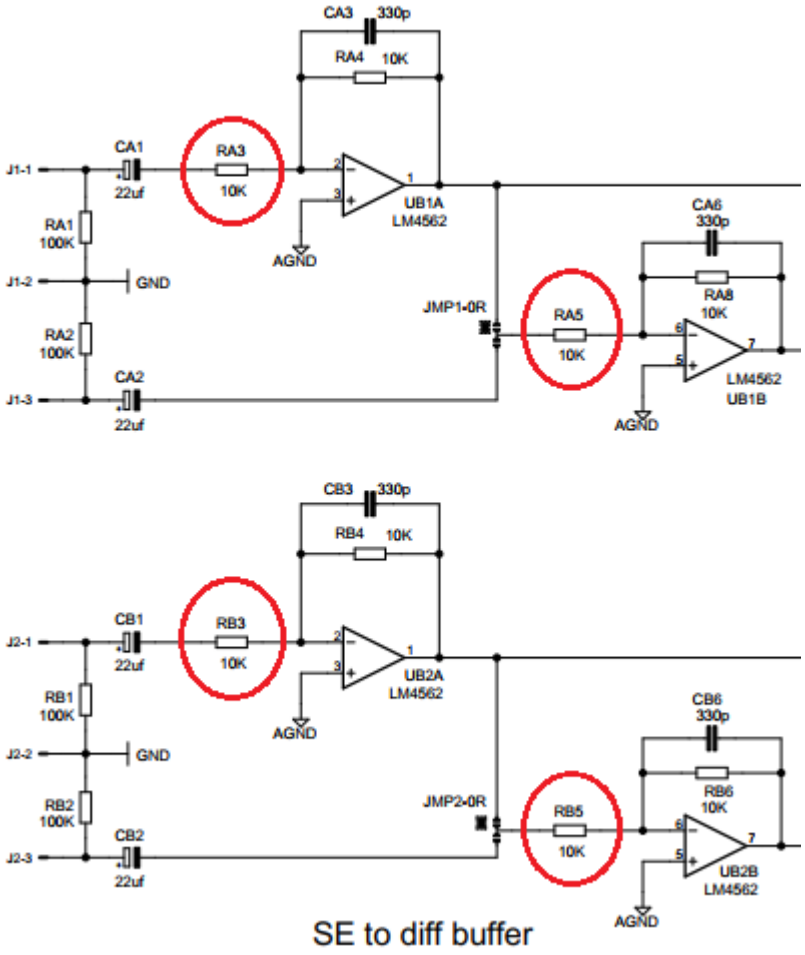




SE to diff buffer

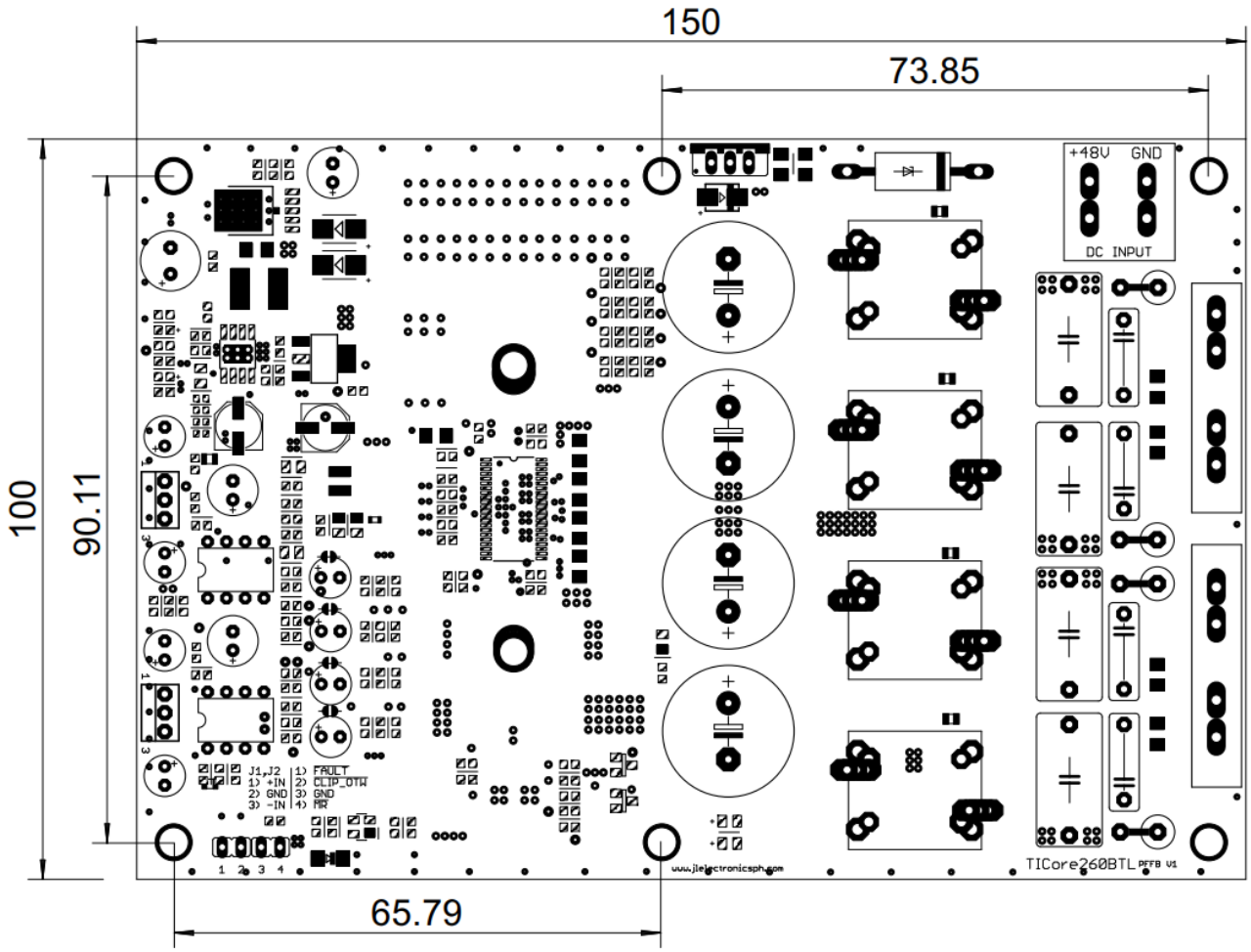
Increase gain on balanced input mode

- replace RA3, RB3, RA5, RB5 with 6.8K, 0603, 0.05% resistors which will add ~1.47x gain.
- Input sensitivity will become ~2Vrms. Input impedance will be reduced to 6.8K ohms.
- Set JMP1 and JMP2 to BAL mode by placing a solder blob.
- Once RA3, RB3, RA5, RB5 resistors were changed, you cannot use it on single ended mode.

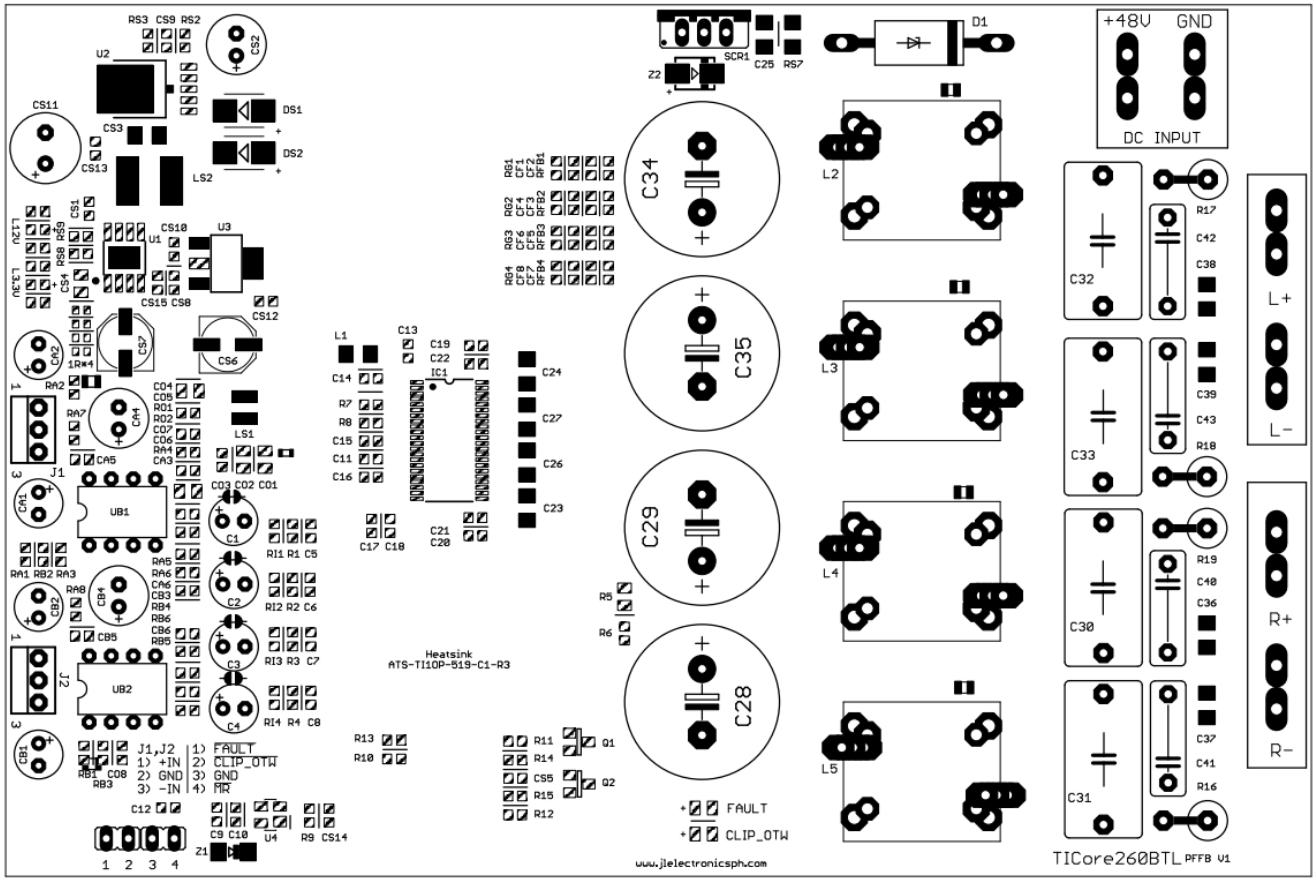


SE to diff buffer

PCB Dimensions



Top Legend


+48V
GND
DC INPUT
L+
L-
R+
R-
J1
J2
J1,J2
1) +IN
2) GND
3) -IN
1) FAULT
2) CLIP_OTW
3) GND
4) MR
FAULT
CLIP_OTW
Heatsink
ATS-TI10P-B1S-C1-R3
www.jlelectronicsph.com
TICore260BTL PFFB V1

SMT Bill Of Materials

Designator	Value	Footprint
C23, C24, C25, C26, C27, CS3	1uF, 100V	1206
C5, C6, C7, C8, C12	100pF	0603
C10, C13, C14, C18, CA5, CB5, CO3, CO5, CO7, CO8, CS5, CS8, CS12, CS14	100nF	0603
C9, C11, C15, C17, CS1, CS10, CS13	1uF	0603
C16	47nF	0603
C19, C20, C21, C22, CS9	33nF	0603
C36, C37, C38, C39	1nF	1206
CA3, CA6, CB3, CB6	330pF	0603
CS6, CS7	47uF, 25V	SMD 6.3x5.3
CO1, CO2, CO4, CO6, CS4	10uF	0805
CF1, CF2, CF3, CF4, CF5, CF6, CF7, CF8	220pf	0603
CS15	10nf	0603
DS1, DS2	SS320BF	SMA
FAULT, CLIP_OTW	0805 Red LED	0805
L3.3V, L12V	0603 White LED	0603
L1	10uH	1206
LS1	10uH, 720mA	SMD,3.0x3.0mm
LS2	100uH, 1A	SMD,6x6.3x4.5mm
Q1, Q2	2N7002	SOT-23
R1, R2, R3, R4, R11, R14, RS1, RS4	100R	0603
R5	75K	0805
RA1, RA2, RB1, RB2	100K	0603
R6, RS6	12K	0603
R7	22K	0603
R8	30K	0603
R9, R10, R13	47K	0603
R12, R15, RI1, RI2, RI3, RI4	2.7K	0603
RS5	3.3K	0603
RA3, RA4, RA5, RA6, RB3, RB4, RB5, RB6, RO1, RO2, RS3, RG1, RG2, RG3, RG4	10K	0603
RA7, RA8	22R	0603
RS7	10K	1206
RS9	2K	0603
RS2	1K	0603
RFB1, RFB2, RFB3, RFB4, RS8	18K	0603
RS10, RS11, RS12, RS13	1R	0402

U2	XL7015	TO-252-5
U3	AMS1117-3.3	SOT-223
U4	MIC6315-29D4UY	SOT-143
Z1	1SMAF4759A	SMA
Z2	5.6V Zener	Minimelf
IC1	TPA3255DDVR	HTSSOP-44

THT Bill Of Materials

Designator	Value	Manufacturer Part #	Footprint
SCR1	SCR	TYN612MRG	TO-220AB
JDC, JGND, L+, L-, R+, R-	Faston Tab		
J1, J2	3pin, 2.54mm		
4pin Header	4pin 2.54mm		
D1	TVS 53V	1.5KE62A	DO-201
C1, C2, C3, C4, CA1, CA2, CB1, CB2	22uF, 16V	UES1C220MEM	E2.5-7
CA4, CB4	100uF, 16V		E2.5-8
CS2	47uF, 63V		
C28, C29, C34, C35	2200uF, 63V	UHW1J222MHD	E7.5-18
C30, C31, C32, C33	1uF, 275VAC		
C40, C41, C42, C43	220n, 275VAC		P=10mm
CS11	470uf, 25V	25YXJ470MFFC10X12.5	E3.5-8
R16, R17, R18, R19	1 ohm, 3W		
L2, L3, L4, L5	10uH	VER2923-103KL	
ATS-TI1OP-519-C1-R3	Heatsink		
	Fiber washer		
	Heatsink Screws		
	Thermal Pad		
	Brass Standoffs		