

DESCRIPTION

The EV7748DF-00B is the BTL(Bridge Tied Load) configuration evaluation board for the MP7748, a 60W Mono Class D Audio Amplifier. It is one of MPS' products of fully integrated audio amplifiers which dramatically reduce solution size by integrating the following:

- 250mΩ power MOSFETs
- Startup / Shutdown pop elimination
- Short circuit protection circuits

The MP7748 utilizes a Bridge Tied Load output structure capable of delivering 60W into 8Ω speakers. MPS Class D Audio Amplifiers exhibit the high fidelity of a Class A/B amplifier at high efficiency. The circuit is based on the MPS' AAM™ proprietary variable frequency topology that delivers excellent linearity, fast response time and operates on a single power supply.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Supply Voltage	V _{DD}	9.5~36	V

FEATURES

- 50W Output at V_{DD} = 24V into a 6Ω load
- 60W Output at V_{DD} = 30V into a 8Ω load
- THD+N = 0.03% at 1W, 8Ω, 1kHz
- Up to 94% Efficiency
- Low Noise (144μV Typical)
- 9.5V to 36V Operation from a Single Supply

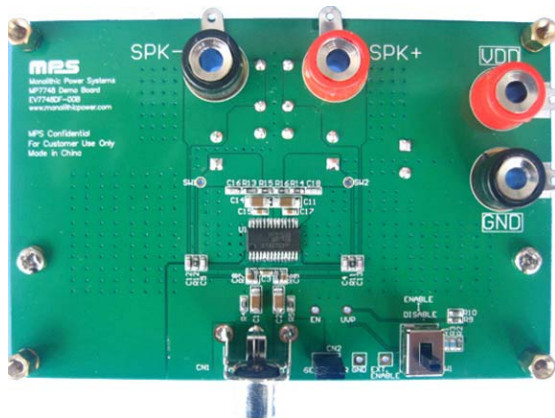
APPLICATIONS

- Flat Panel TV
- Portable Docking Stations
- Surround Sound DVD Systems
- Televisions
- Multimedia Computers
- Home Stereo Systems

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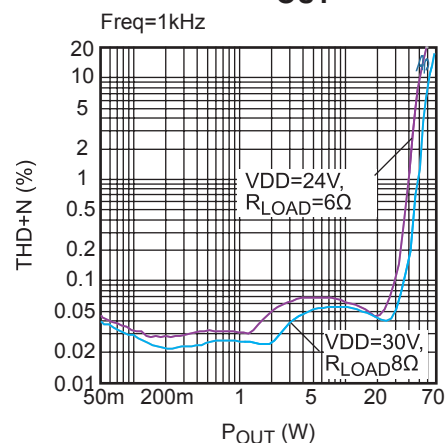
EV7748DF-00B EVALUATION BOARD



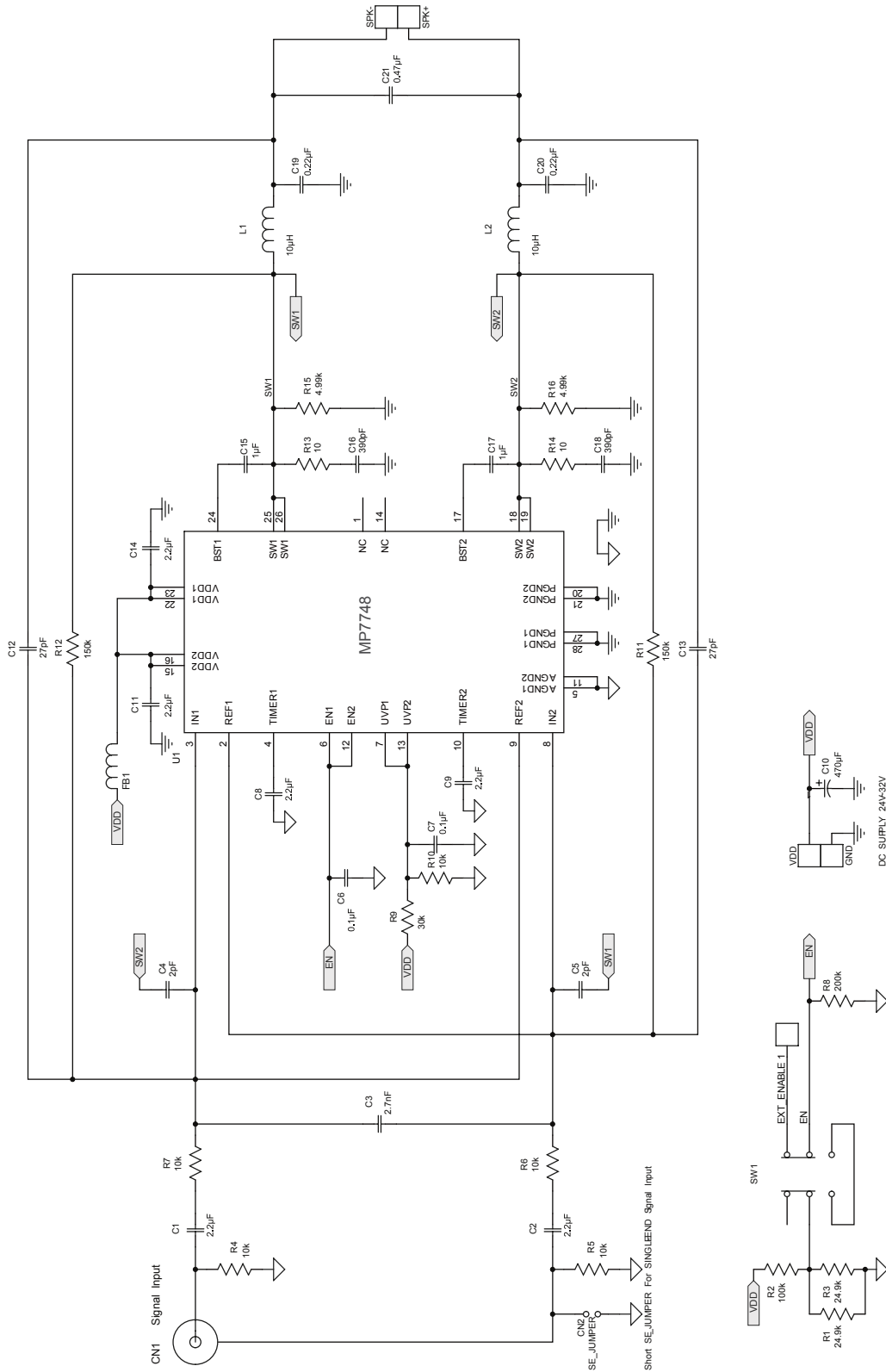
(L x W x H) 4.0" x 2.7" x 1.9"
10.2cm x 6.8cm x 4.7cm

Board Number	MPS IC Number
EV7748DF-00B	MP7748DF

THD+N vs. P_{OUT}



EVALUATION BOARD SCHEMATIC



EV7748DF-00B BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	2.2 μ F	Ceramic Capacitor;25V;X7R	1206	TDK	C3216X7R1E225K
1	C3	2.7nF	Ceramic Capacitor;50V;X7R	0603	LION	0603B272K500T
2	C4, C5	2pF	Ceramic Capacitor;50V;C0G	0603	TDK	C1608C0G1H020C
2	C6, C7	0.1 μ F	Ceramic Capacitor;16V;X7R	0603	muRata	GRM188R71C104KA01 D
2	C8, C9	2.2 μ F	Ceramic Capacitor;10V;X7R	0603	muRata	GRM188R71A225KE15
1	C10	470 μ F	Electrolytic Capacitor;50V	DIP	Panasonic	ECQV1J475JM
2	C11, C14	2.2 μ F	Ceramic Capacitor;50V;X7R	1210	TDK	C3225X7R1H225K
2	C12, C13	27 μ F	Ceramic Capacitor;50V;C0G	0603	muRata	GRM1885C1H270JA01
2	C15, C17	1 μ F	Ceramic Capacitor;16V;X7R	0603	muRata	GRM188R71C105KA12 D
2	C16, C18	390pF	Ceramic Capacitor;50V;C0G	0603	TDK	C1608C0G1H391J
2	C19, C20	0.22 μ F	Film Capacitor;50V;CBB	DIP	Panasonic	ECQV1H224JL
1	C21	0.47 μ F	Film Capacitor;50V;CBB	DIP	Panasonic	ECQV1H474JL
2	R1, R3	24.9k	Film Resistor;1%	0603	Yageo	RC0603FR-0724K9L
1	R2	100k	Film Resistor;1%	0603	Yageo	RC0603FR-07100KL
5	R4, R5, R6, R7, R10	10k	Film Resistor;1%	0603	Yageo	RC0603FR-0710KL
1	R8	200k	Film Resistor;1%	0603	Yageo	RC0603FR-07200KL
1	R9	30k	Film Resistor;1%	0603	Yageo	RC0603FR-0730KL
2	R11, R12	150k	Film Resistor;1%	0603	Yageo	RC0603FR-07150KL
2	R13, R14	10	Film Resistor;1%	0603	Yageo	RC0603FR-0710RL
2	R15, R16	4.99k	Film Resistor;1%	0603	Yageo	RC0603FR-074K99L
1	FB1	4A	Magnetic Bead;4A	1206	WURTH	74292115
2	L1, L2	10 μ H	Inductor;10 μ H;18m Ω ;3.61A	DIP	TOKO	13RHBP-A7502HY-100M
1	CN1	RCA	RCA Connector	DIP		
1	CN2	JUMPER	2.54MM JUMPER	DIP		
2	SPK+, VDD		Connector;Red	DIP		
2	GND, SPK-		Connector;Black	DIP		
1	SW1		DPDT Switch	DIP		
1	Heat-Sink		100mm*16.5mm*16mm	DIP		
1	U1	MP7748 DF	MP7748/TSSOP28/EP	TSSOP28/EP	MPS	MP7748DF R1

PRINTED CIRCUIT BOARD LAYOUT

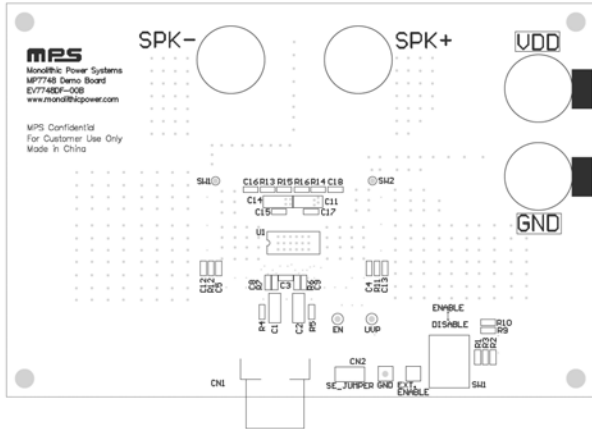


Figure 1—Top Silk Layer

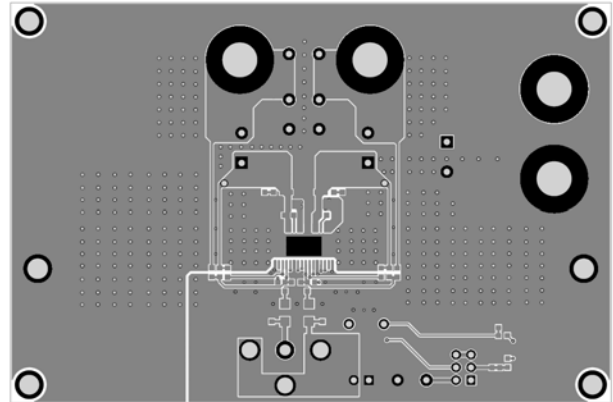


Figure 2—Top Layer

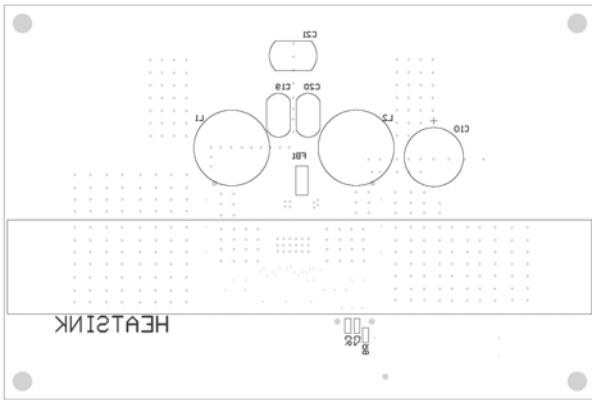


Figure 3—Bottom Silk Layer

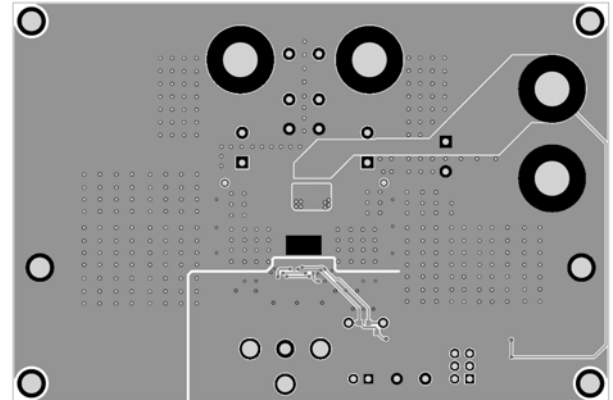


Figure 4—Bottom Layer

QUICK START GUIDE

This board is set up from the factory for 24V BTL operation. To use with 30V (12V) power supply, adjust the components as specified in the 30V (12V) Operation Modifications section below. To use differential input, remove the jumper CN2. For more information, consult the MP7748 datasheet.

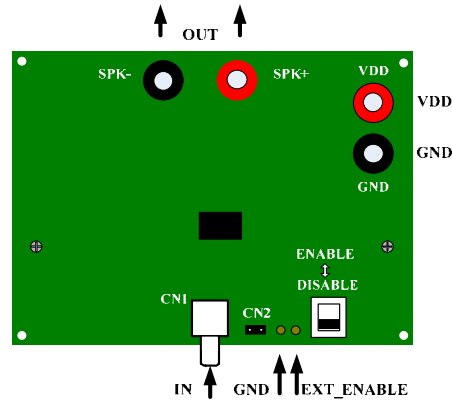


Figure 5—EV7748DF-00B Connection Diagram

1. Power Requirements
 - a. Power supply: 9.5V to 36V, 4.5A maximum.
 - b. 0V to 1.5VRMS (max) audio signal source.
 - c. Speaker: typically 6Ω to 8Ω.
2. Setup Condition for 24V Operation
 - a. Adjust the power supply to 24V (do not turn on).
 - b. Connect the outputs to the external speakers.
 - c. Connect the power supply to the VDD terminals.
 - d. Set the enable switch to the DISABLE position.
 - e. Connect the audio input signal source to the amplifier input (CN1).
 - f. Turn on the power supply.
3. 30V Operation Modifications (minimum resistance load is 8 Ω)
 - a. Refer to MP7748 Data Sheet Table 2 for frequency optimization.
 - b. Adjust the power supply to 30V (do not turn on).
 - c. Do as step b~f specified in Section 2.
4. 12V Operation Modifications
 - a. Refer to MP7748 Data Sheet Table 2 for frequency optimization
 - b. Change R18 to 12.4kΩ to set 9V VDD shutdown voltage, Change R13 and R14 to 2.2K.
 - c. Remove R1 to make sure EN signal is high enough @ 12V VDD.
 - d. Adjust the power supply to 12V (do not turn on).
 - e. Do as step b~f specified in Section 2.
5. Music Turn-On Sequence

Set the enable switch to the ENABLE position.
6. Music Turn-Off Sequence
 - a. Set the enable switch to the DISABLE position.
 - b. Turn off the power supply.

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