

### DESCRIPTION

The EV7748DF-00A is the evaluation board for the MP7748, a 2 x 20W stereo 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 single ended output structure capable of delivering 20W into 4Ω 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 <sub>DD</sub>	9.5~36	V

### FEATURES

- 2 x 20W Output at V<sub>DD</sub> = 24V into a 4Ω load
- THD+N = 0.02% at 1W, 8Ω, 1kHz
- 91% Efficiency at 20W and V<sub>DD</sub>=24V with 4Ω load
- Low Noise (103μV 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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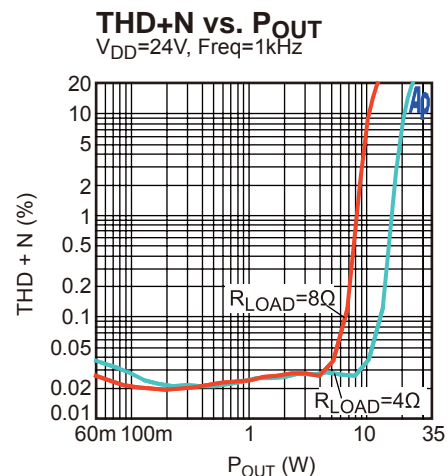
AAM (Analog Adaptive Modulation) is a Trademark of Monolithic Power Systems, Inc.

### EV7748DF-00A EVALUATION BOARD

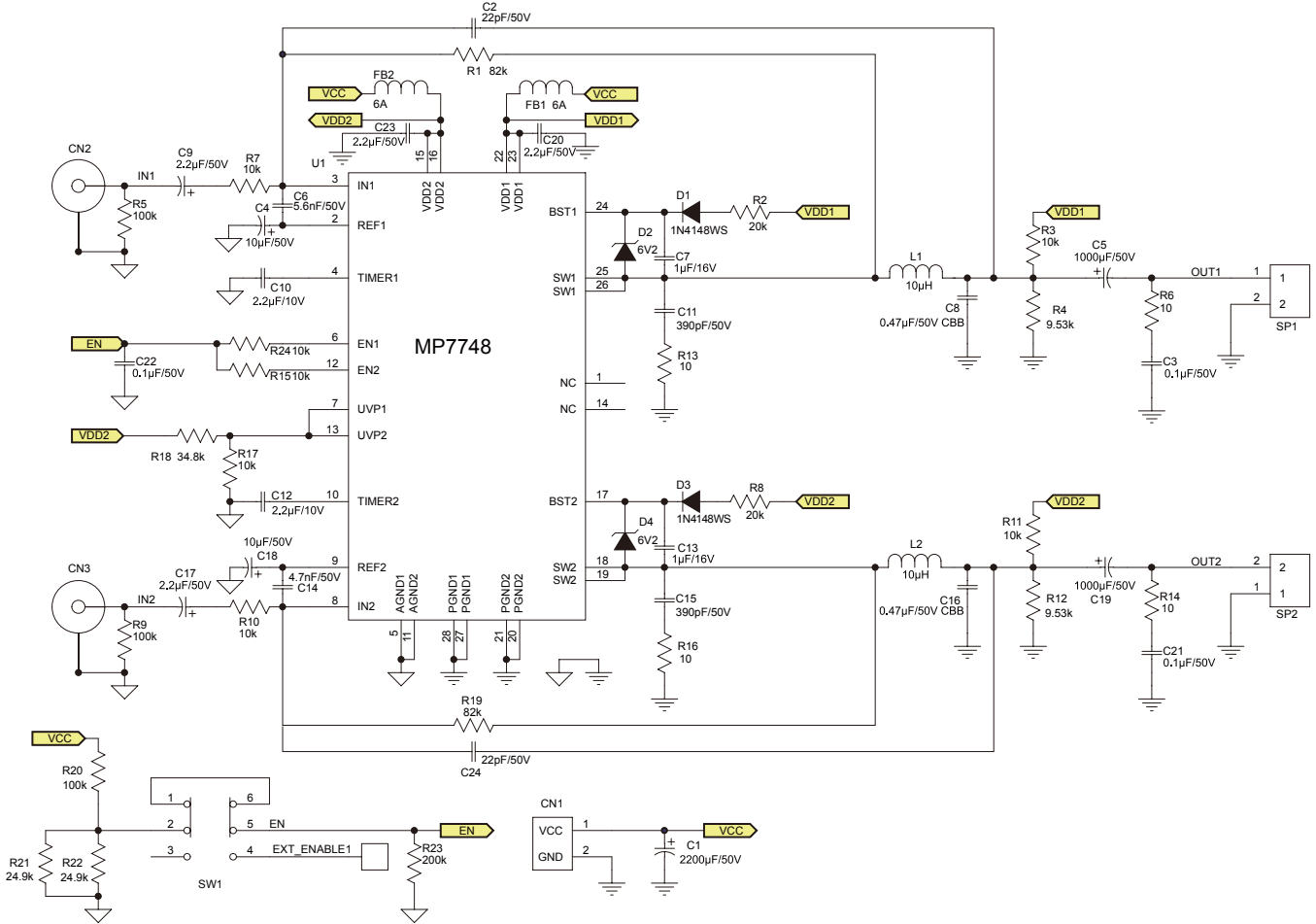


(L x W x H) 3.5" x 2.5" x 1.2"  
9.0cm x 6.3cm x 3.0cm

Board Number	MPS IC Number
EV7748DF-00A	MP7748DF



## EVALUATION BOARD SCHEMATIC



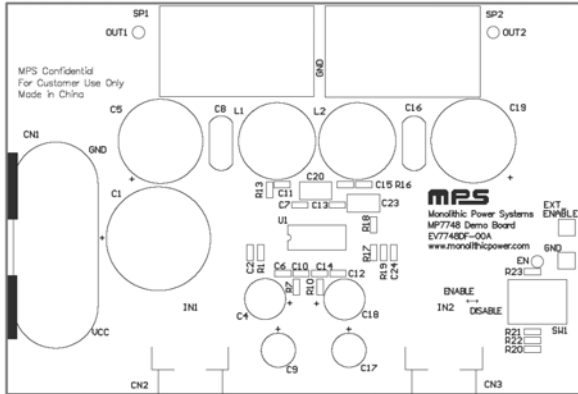
## EV7748DF-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	R1, R19	82kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-0782KL
2	R2, R8	20kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-0720KL
7	R3, R7, R10, R11, R15, R17, R24	10kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-0710KL
2	R4, R12	9.53kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-079K53L
1	R5, R9,R20	100kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-07100KL
2	R6, R14	10Ω	Film Resistor; 1%	1206	Yageo	RC1206FR-0710RL
2	R13, R16	10Ω	Film Resistor; 1%	0603	Yageo	RC0603FR-0710RL
1	R18	34.8kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-0734K8L
2	R21, R22	24.9kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-0724K9L
1	R23	200kΩ	Film Resistor; 1%	0603	Yageo	RC0603FR-07200KL
1	C1	2200μF	Electrolytic Capacitor; 50V;	Radial	Rubycon	
2	C2, C24	22pF	Ceramic Capacitor; 50V; C0G; 0603	0603	TDK	C1608C0G1H220J
3	C3, C21, C22	0.1μF	Ceramic Capacitor; 50V; X7R; 0603	0603	muRata	GRM188R71H104KA 93D
2	C4, C18	10μF	Electrolytic Capacitor; 100V;	Radial	Rubycon	
2	C5, C19	1000μF	Electrolytic Capacitor; 50V;	Radial	Rubycon	
1	C6	5.6nF	Ceramic Capacitor; 50V; X7R; 0603	0603	muRata	GRM188R71H562KA 01
2	C7, C13	1μF	Ceramic Capacitor; 16V; X7R; 0603	0603	muRata	GRM188R71C105KA 12D
2	C8, C16	0.47μF	Film Capacitor; 50V; CBB	Radial	Panasonic	
2	C9, C17	2.2μF	Electrolytic Capacitor; 50V;	Radial	Rubycon	
2	C10, C12	2.2μF	Ceramic Capacitor; 10V; X7R; 0603	0603	muRata	GRM188R71A225KE 15
2	C11, C15	390pF	Ceramic Capacitor; 50V; C0G; 0603	0603	TDK	C1608C0G1H391J
1	C14	4.7nF	Ceramic Capacitor; 50V; X7R; 0603	0603	TDK	C1608X7R1H472K
2	C20, C23	2.2μF	Ceramic Capacitor; 50V; X7R; 1210	1206	muRata	GRM31CR71H225K A88L
2	FB1, FB2	6A	Ferrite bead	1206	LION	PB321611-320
2	D1, D3	1N414 8WS	Diode; 75V; 0.15A	SOD-323	Diodes	1N4148WS-7-F
2	D2, D4	BZT52 C6V2S	Zener Diode; 6.2V; 5mA/200mW	SOD-323	Diodes	BZT52C6V2S-7-F
2	L1, L2	10μH	Inductor; 10μH; 18mΩ; 3.61A	Radial	Toko	13RHBP-A7502HY- 100M

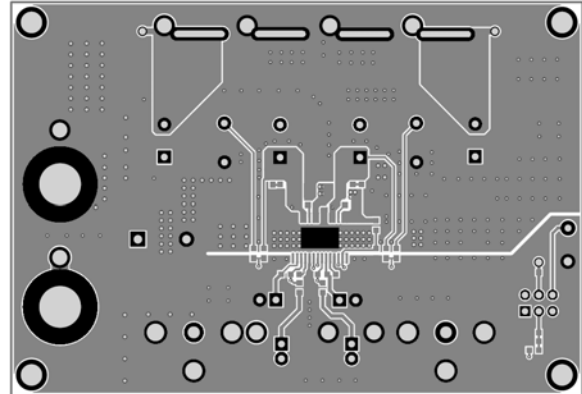
**EV7748DF-00A BILL OF MATERIALS (Continued)**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	CN1		Connector; Red and Black			
2	CN2, CN3		RCA Connector			
2	SP1, SP2		Speaker Connector			
1	SW1		DIP Switch	DIP		
1	U1		Class D Audio Amplifier	TSSOP28E	MPS	MP7748DF

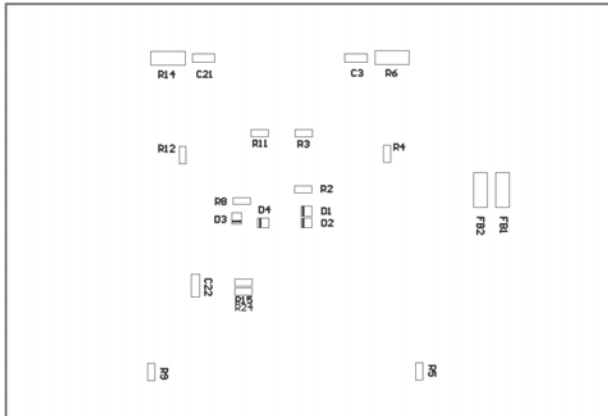
**PRINTED CIRCUIT BOARD LAYOUT**



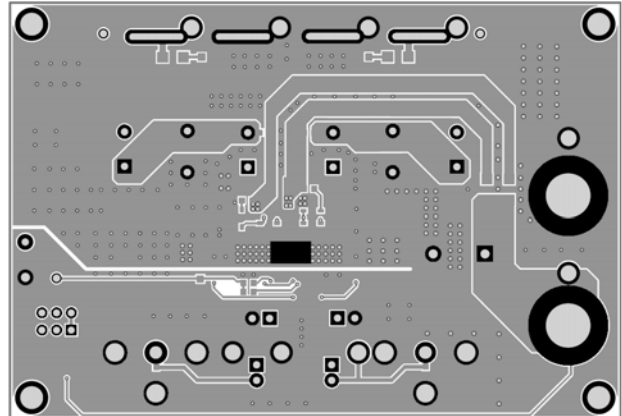
**Figure 1—Top Silk Layer**



**Figure 2—Top Layer**



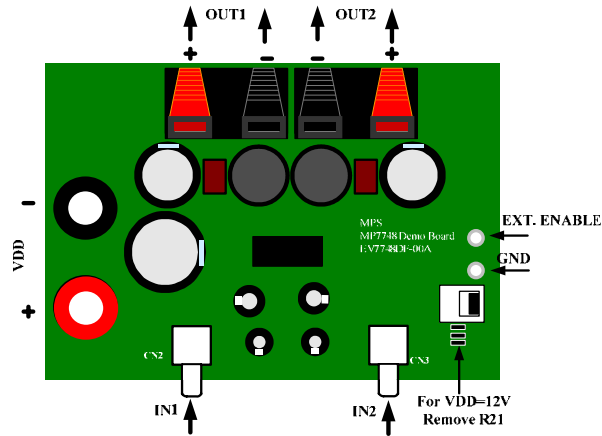
**Figure 3—Bottom Silk Layer (Mirror)**



**Figure 4—Bottom Layer (Mirror)**

## QUICK START GUIDE

This board is set up from the factory for 24V operation. To use with 36V (12V) power supply, adjust the components as specified in the 36V (12V) Operation Modifications section below. For more information, consult the MP7748 datasheet.



**Figure 5—EV7748DF-00A 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 4Ω 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 inputs (CN2, CN3).
  - f. Turn on the power supply.
3. 36V Operation Modifications
  - a. Change C6 to 8.2nF and C14 to 6.8nF.
  - b. Change R18 to 64.9k Ω to set 30V VDD shutdown voltage.
  - c. Adjust the power supply to 36V (do not turn on).
  - d. Do as step b~f specified in Section 2.
4. 12V Operation Modifications
  - a. Change C6 to 3.3nF and C14 to 2.2nF.
  - b. Change R18 to 15kΩ to set 10V VDD shutdown voltage.
  - c. Remove R21 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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