

## DESCRIPTION

The EV7745DF-01A is the evaluation board for the MP7745, a stereo 20W 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 MP7745 utilizes a single ended output structure capable of delivering 2x20W 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	$V_{DD}$	24	V

## FEATURES

- 2 x 20W Output at  $V_{DD} = 24V$  into a 4Ω load
- THD+N = 0.05% at 1W, 8Ω, 1kHz
- 93% Efficiency at 19W and  $V_{DD}=24V$  with 4Ω load
- Low Noise (103μV Typical)
- 9.5V to 26V Operation from a Single Supply

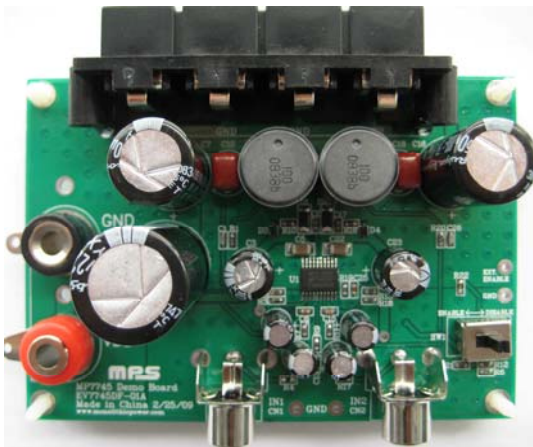
## APPLICATIONS

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

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## EV7745DF-01A EVALUATION BOARD

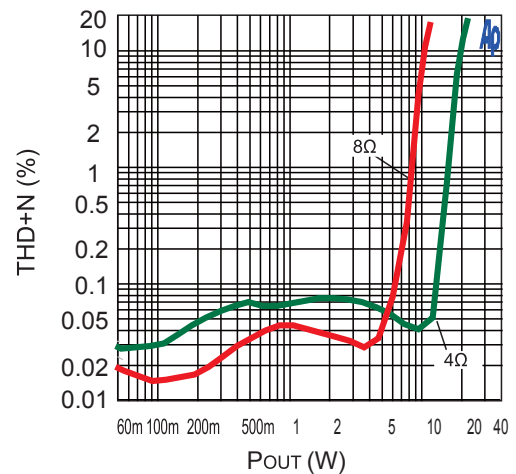


(L x W x H) 3.5" x 2.5" x 1.2"  
9.0cm x 6.3cm x 3.0cm

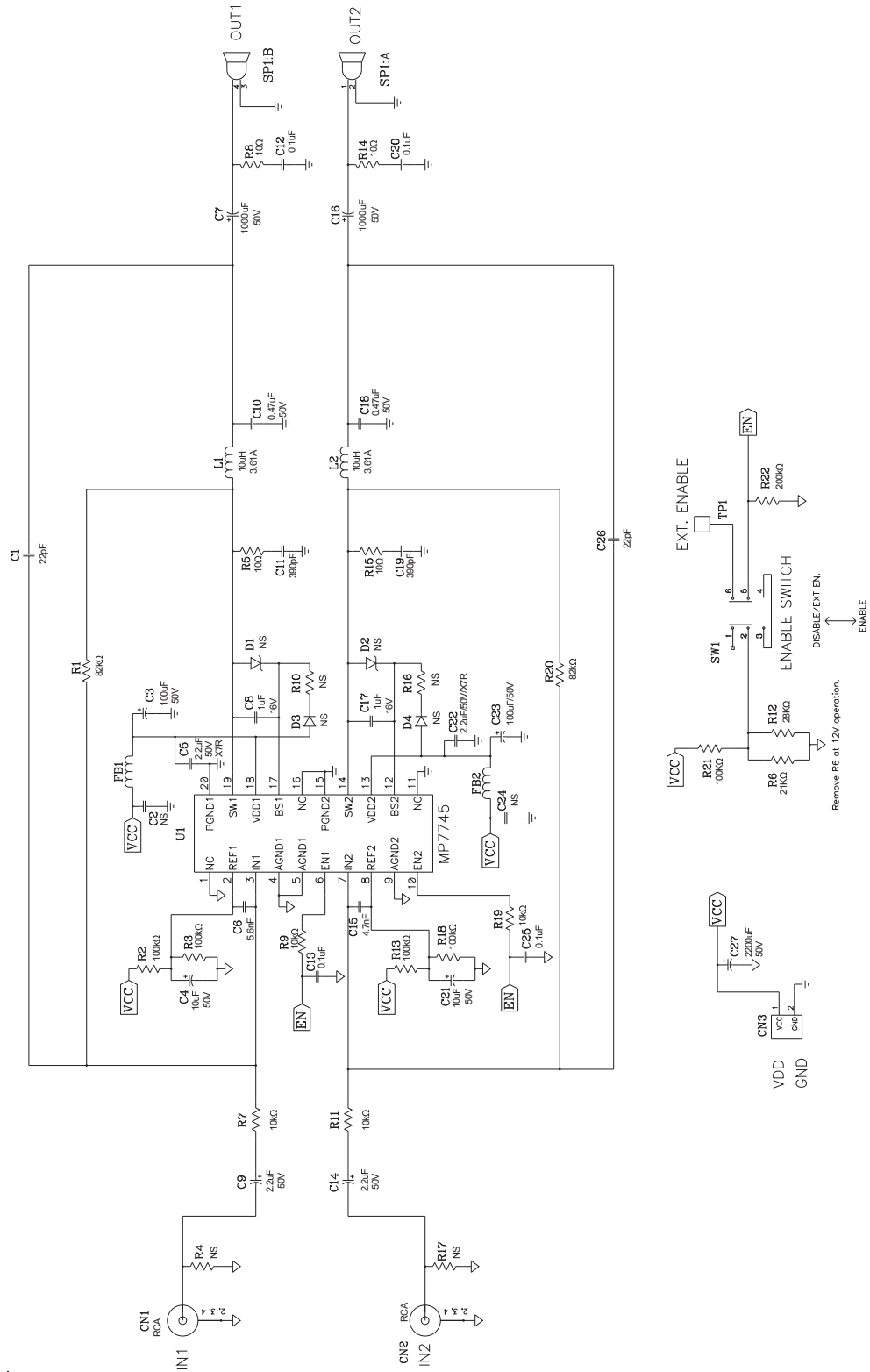
Board Number	MPS IC Number
EV7745DF-01A	MP7745DF

### THD+N vs. $P_{OUT}$

$V_{DD}=24V$ , Freq=1kHz, A-wtd



EVALUATION BOARD SCHEMATIC



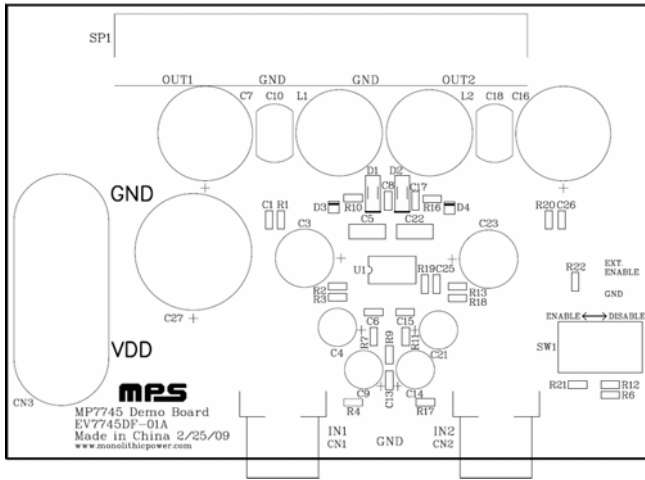
**EV7745DF-01A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C26	22pF	Ceramic Capacitor,50V,C0G	0603	muRata	GRM1885C1H220JA01D
2	C2, C24	NS				
2	C3, C23	100uF	Electrolytic Cap., 50V	Radial	Rubycon	
2	C4, C21	10uF	Electrolytic Cap., 50V	Radial	Rubycon	
2	C5, C22	2.2uF	Ceramic Capacitor,50V,X7R	1206	muRata	GRM31CR71H225KA88L
1	C6	5.6nF	Ceramic Capacitor, 50V,X7R	0603	muRata	GRM188R71H562KA01
2	C7,C16	1000uF	Electrolytic Cap., 50V	Radial	Rubycon	
2	C8,C17	1uF	Ceramic Capacitor,16V,X7R	0603	muRata	GRM188R71C105KA1
2	C9,C14	2.2uF	Electrolytic Cap., 50V	Radial	Rubycon	
2	C10,C18	0.47uF	FILM,50V	Radial	any	
2	C11, C19	390pF	Ceramic Capacitor,50V,C0G	0603	muRata	GRM1885C1H3901JA01D
2	C12,C20	0.1uF	Ceramic Capacitor, 50V,X7R	0805	muRata	GRM21BR71H104KA01L
2	C13,C25	0.1uF	Ceramic Capacitor, 50V,X7R	0603	muRata	GRM188R71H104KA93D
1	C15	4.7nF	Ceramic Capacitor, 50V,X7R	0603	muRata	GRM188R71H472KA01D
1	C27	2200uF	Electrolytic Cap, 50V	Radial	Rubycon	
2	R1,R20	82.5KΩ	Film Res., 1%	0603	Yageo	RC0603FR-0782K5L
5	R2,R3, R13, R18, R21	100KΩ	Film Res., 1%	0603	Yageo	RC0603FR-07100KL
4	R4,R17, R10,R16	NS				
2	R5,R15	10Ω	Film Res., 5%	0603		0603SAJ0100T5E
1	R6	21KΩ	Film Res., 1%	0603	Yageo	RC0603FR-0721KL
2	R8,R14	10Ω	Film Res., 5%	0805		CR05T05NJ10R
4	R7,R9, R11,R19	10KΩ	Film Res., 1%	0603	Yageo	RC0603FR-0710KL
1	R12	28KΩ	Film Res., 1%	0603	Yageo	RC0603FR-0728KL
1	R22	200KΩ	Film Res., 5%	0603	Yageo	RC0603JR-07200KL
2	D2,D1, D3,D4	NS				
2	FB1, FB2		Ferrite Bead, 6A	1206	LION	PB321611-320

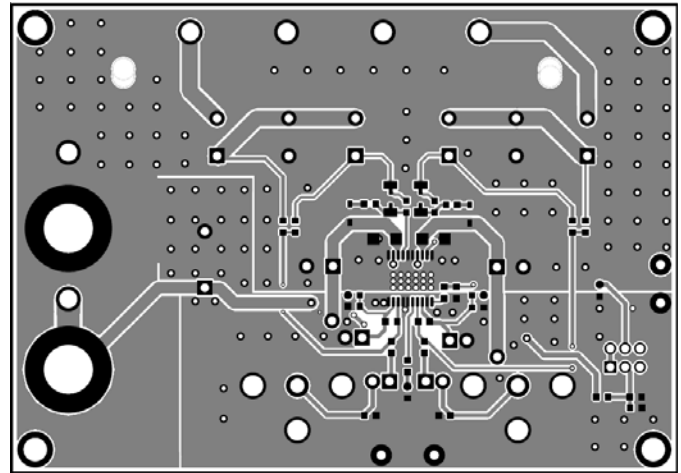
**EV7745DF-01A BILL OF MATERIALS** *(continued)*

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	L1, L2	10uH	Inductor, 3.61A	Radial	Toko	10RHBP-#A671HN-100L
1	U1		Class D Audio Amplifier	TSSOP20F	MPS	MP7745DF
1	SW1		Switch slide DPDT 12V .1A L=4			
1	CN3		Banana Jack Connector			
2	CN1, CN2		Phono Jack, Female			
1	TP1		Test point PC MINI .040"D			
1	SP1		Speaker Connector			

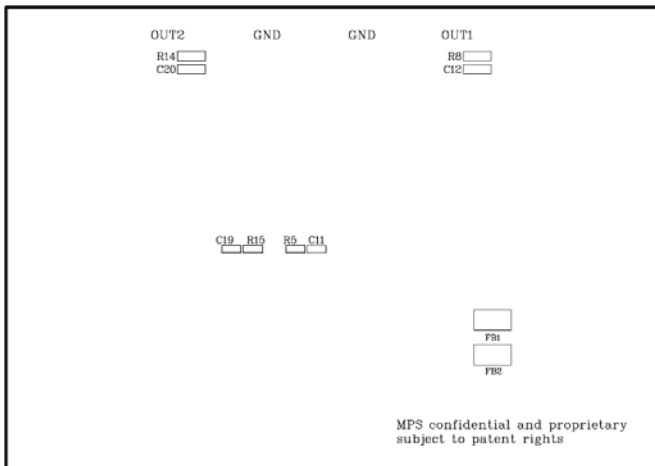
**PRINTED CIRCUIT BOARD LAYOUT**



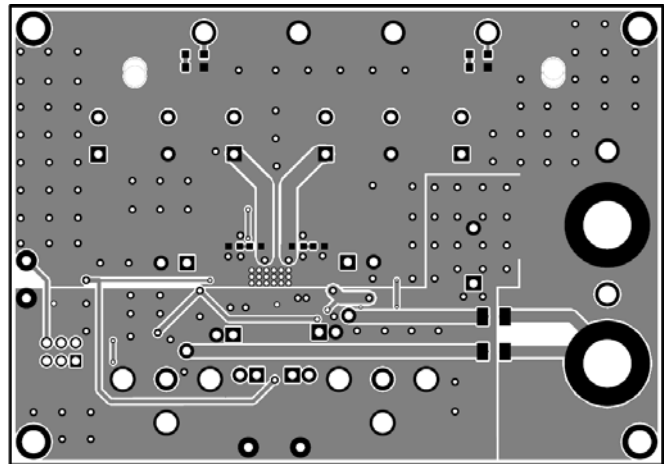
**Figure 1—Top Silk Layer**



**Figure 2—Top Layer**



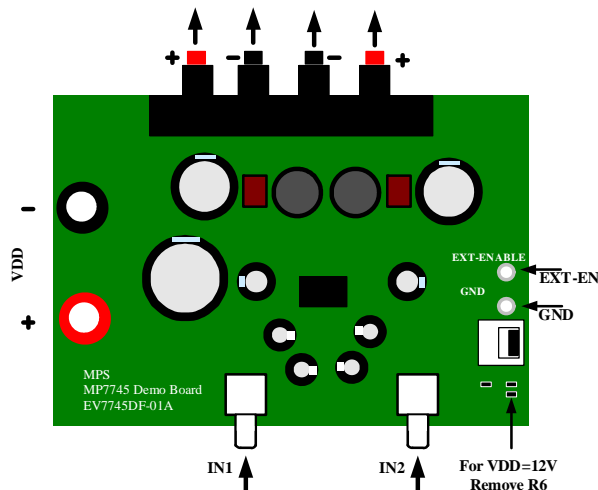
**Figure 3—Bottom Silk Layer**



**Figure 4—Bottom Layer**

## QUICK START GUIDE

This board set up from the factory for 24V operation. To use with a 12V power supply, adjust the components as specified in the 12V Operation Modifications section below. For more information, consult the MP7745 datasheet.



**Figure 5—EV7745DF-01A Connection Diagram**

1. Power Requirements
  - a. Power supply: 9.5V to 26V, 3.5A maximum.
  - b. 0V to 1.3V<sub>RMS</sub> (max) audio signal source.
  - c. Speaker: 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 V<sub>DD</sub> terminals.
  - d. Set the enable switch to the DISABLE position.
  - e. Connect the audio input signal source to the amplifier inputs (IN1, IN2).
  - f. Turn on the power supply to apply power to the board.
3. 12V Operation Modifications
  - a. Change C6 to 3.3nF and C15 to 2.2nF components.
  - b. Remove R6 from the demo board.
  - c. Adjust the power supply to 12V (do not turn on).
  - d. Do as step b~f specified in Section 2.
4. Music Turn-On Sequence
  - a. Set the enable switch to the ENABLE position.
5. Music Turn-Off Sequence
  - a. Set the enable switch to the DISABLE position.
  - b. Turn off power supply.

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