EV7721DF-00A

10W Stereo Class D Single Ended Audio Amplifier EV Board

The Future of Analog IC Technology

DESCRIPTION

The EV7721DF-00A is the evaluation board for the MP7721, a stereo 10W Class D Audio Amplifier. It is one of MPS' productions of fully integrated audio amplifiers which dramatically reduces solution size by integrating the following:

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

The MP7721 utilizes a single ended output structure capable of delivering 2x10W into 8Ω speakers. MPS Class D Audio Amplifiers exhibit the high fidelity of a Class A/B amplifier at efficiencies greater than 90%. 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.

FEATURES

- 10W Output at V_{DD} = 24V into a 8Ω load
- THD+N = 0.06% at 1W, 8Ω
- 93% Efficiency at 10W
- Low Noise (190μV Typical)
- 9.5V to 24V Operation from a Single Supply
- Mute/Standby Modes (Sleep)

APPLICATIONS

- Flat Panel and Projection Televisions
- DVD and Surround Sound Systems
- Flat Panel Monitors
- Multimedia Computers
- Home Stereo Systems

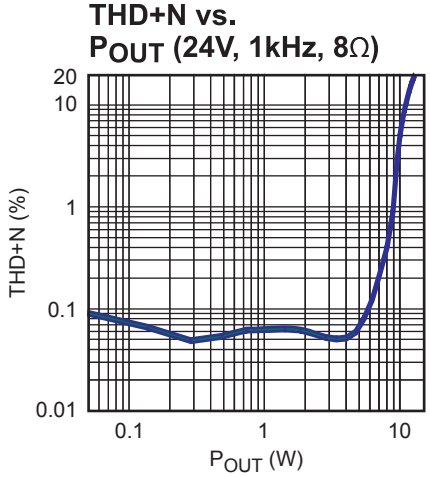
ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Supply Voltage	V_{DD}	24	V

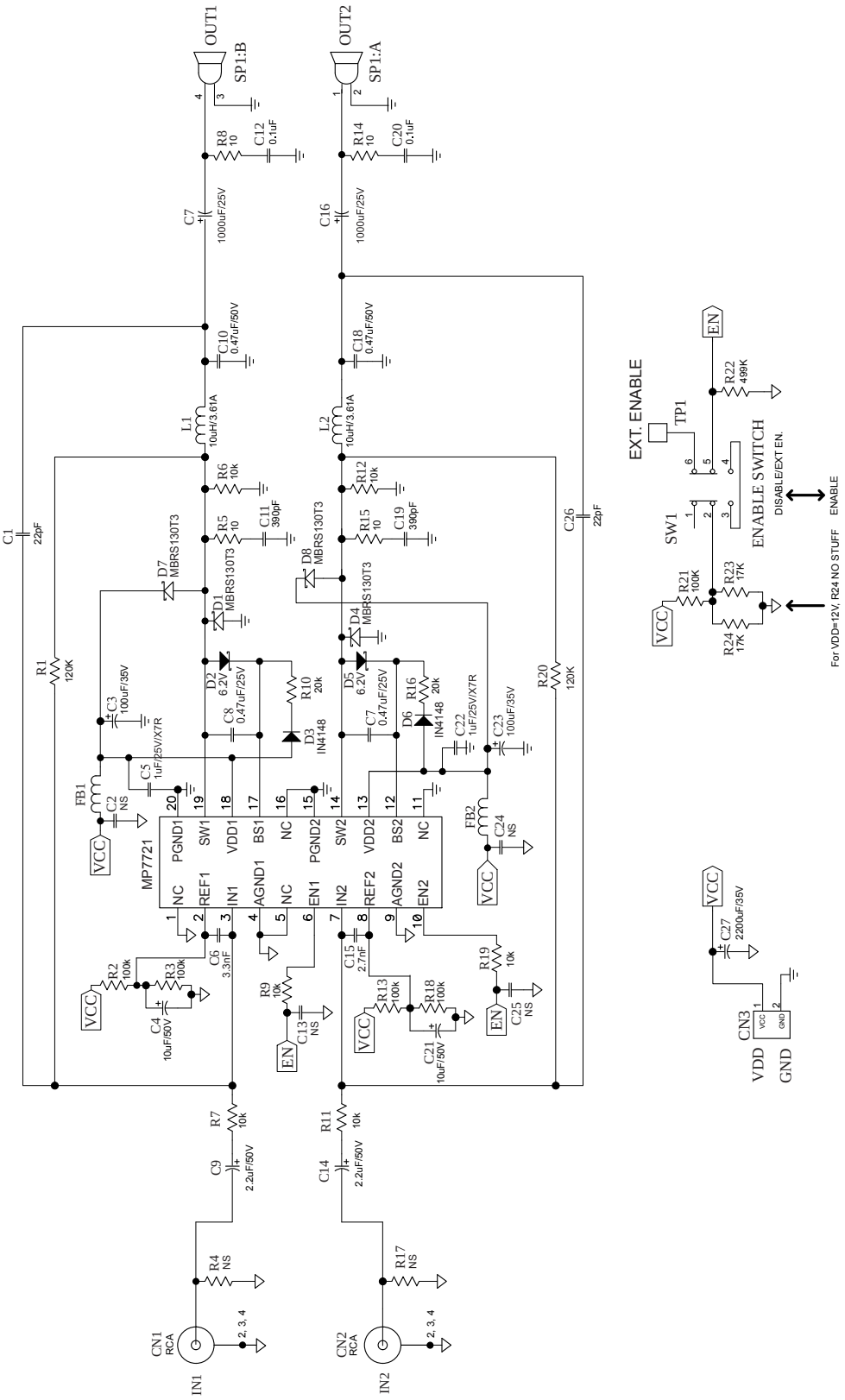
EV7721DF-00A EVALUATION BOARD

(L x W x H) 3.5" x 2.4" x 1.2"
8.9cm x 6.1cm x 3.0cm

Board Number	MPS IC Number
EV7721DF-00A	MP7721DF



EVALUATION BOARD SCHEMATIC



EV7721DF-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
2	C1, C26	22pF	Ceramic Cap., 50V, C0G	0603	muRata	GRM1885C1H220JA01D
4	C2, C13, C24, C25	NS	Not Stuffed			
2	C3, C23	100µF	Electrolytic Cap., 35V	Radial	Rubycon	
2	C4, C21	10µF	Electrolytic Cap., 50V	Radial	Rubycon	
2	C5, C22	1µF	Ceramic Cap., 25V, X7R	1206	TDK	C3216X7R1H105K
1	C6	3.3nF	Ceramic Cap., 50V, X7R	0603	TDK	C1608X7R1H332K
2	C7, C16	1µF	Electrolytic Cap., 25V	Radial	Rubycon	
2	C8, C17	0.47µF	Ceramic Cap., 25V, X7R	0805	muRata	GRM21BR71E474KA01L
2	C9, C14	2.2µF	Electrolytic Cap., 50V	Radial	Rubycon	
2	C10, C18	0.47µF	FILM, 50V	Radial	Any	
2	C11, C19	390pF	Ceramic Cap., 50V, C0G	0603	muRata	GRM1885C1H391JA01D
2	C12, C20	0.1µF	Ceramic Cap., 50V, X7R	1206	muRata	GMR21BR71H104KA01L
1	C15	2.7nF	Ceramic Cap., 50V, X7R	0603	TDK	C1608X7R1H272K
1	C27	2200µF	Electrolytic Cap., 35V	Radial	Rubycon	
2	R10, R16	20kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0720KL
2	R23, R24	17kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0716K9L
1	R22	499kΩ	Film Res., 1%	0603	Yageo	RC0603FR-07499KL
2	R5, R15	10Ω	Film Res., 1%	0603	Yageo	RC0603FR-0710RL
6	R6, R7, R9, R11, R12, R19	10kΩ	Film Res., 1%	0603		RC0603FR-0710KL
5	R2, R3, R13, R18, R21	100kΩ	Film Res., 1%	0805	Yageo	9C08052A1003FKHFT
2	R1, R20	120kΩ	Film Res., 1%	0805	Yageo	9C08052A1203FKHFT
2	R4, R17	NS	Not Stuffed			
2	R8, R14	10Ω	Film Res., 1%	1206	Yageo	9C12063A10R0FKHFT
4	D1, D4, D7, D8	MBRS130T3	Diode Schottky, 30V, 1A	SMB	Diodes Inc	B130B
2	D3, D6	1N4148	Diode Switch, 75V, 200mW	SOD-323	Diodes Inc	1N4148WS-7-f
2	D2, D5	6.2V	Diode Zener, 500mW	SOD-123	Diodes Inc	BZT52C6V2

EV7721DF-00A BILL OF MATERIALS *(continued)*

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
2	FB1, FB2		Ferrite Bead, 6A	1206	Steward	HI1206T500R-10
2	L1, L2	10µH	Inductor, 3.61A	Radial	Toko	13RHBP-A7502HY-100M
1	SP1		Speaker Connector			
1	SW1		DPDT Slide Switch 12V .1A			
1	TP1		Test Point/EXT.EN			
1	CN3		Banana Jack Connector			
2	CN1, CN2		Phono Jack, Female			
1	U1		Class-D Audio Amplifier	TSSOP20F	MPS	MP7721DF

PRINTED CIRCUIT BOARD LAYOUT

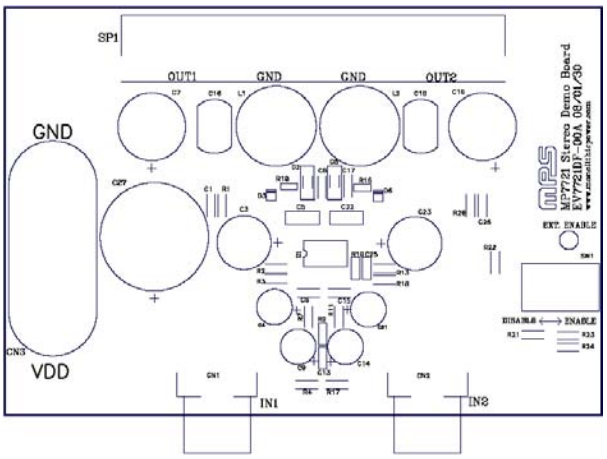


Figure 1—Top Silk Layer

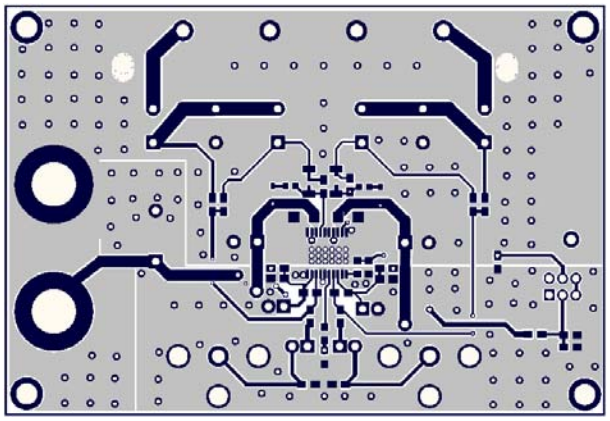


Figure 2—Top Layer

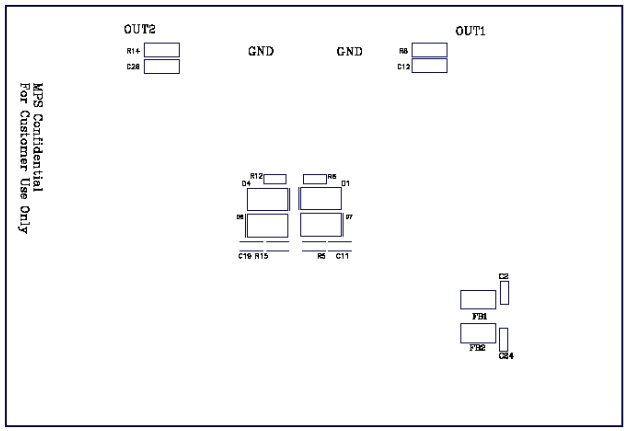


Figure 3—Bottom Silk Layer

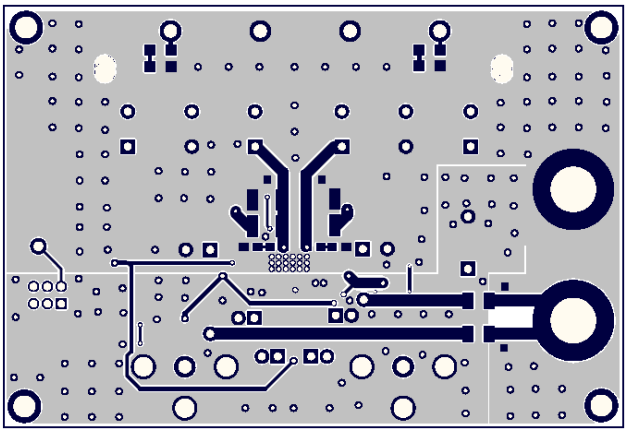


Figure 4—Bottom Layer

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 MP7721 datasheet.

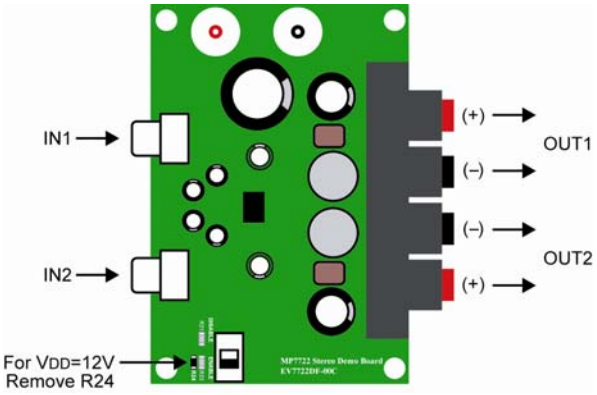


Figure 5—EV7721DF-00A Connection Diagram

1. Power Requirements
    a. Power supply: 9.5V to 24V, 3A maximum.
    b. 0V to 1V_{RMS} (max) audio signal source.
    c. Speaker: 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_{DD} 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 2.2nF and C15 to 1.8nF components.
    b. Remove R24 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.