

DESCRIPTION

The EV7752-F-00A is the evaluation board for the MP7752, a 15W stereo BTL Fix Frequency Inductorless Class D Audio Amplifier. It is one of MPS' products of fully integrated audio amplifiers which dramatically reduce solution size by integrating the following:

- 240mΩ power MOSFETs
- Startup / Shutdown pop elimination
- Short circuit protection circuits
- Advanced EMI performance
- Inductorless topology

The MP7752 utilizes Bridge Tied Load output structure capable of delivering stereo 15W into 8Ω speakers. It features in automatic shutdown function which can save power in battery-used system. The PLIMIT function is useful for limiting total output power by simply adjust a DC reference voltage at PLIMIT pin. MPS Class D Audio Amplifiers exhibit the high fidelity of a Class A/B amplifier at high efficiency.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Supply Voltage	V_{DD}	5~18	V

FEATURES

- 15W Stereo BTL Output at $V_{DD} = 16V$ into 8Ω loads
- 9.5W Stereo BTL Output at $V_{DD} = 12V$ into 8Ω loads
- 90% Efficiency at 9.5W x 2 and $V_{DD}=12V$ with 8Ω load, Stereo
- Low Noise (115μV Typical)
- 5V to 18V Operation from a Single Supply

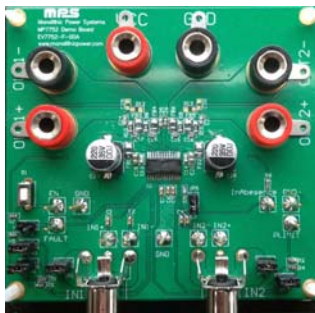
APPLICATIONS

- TV
- DVD Receiver
- Active Speakers
- Home Theater

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EV7752-F-00A EVALUATION BOARD

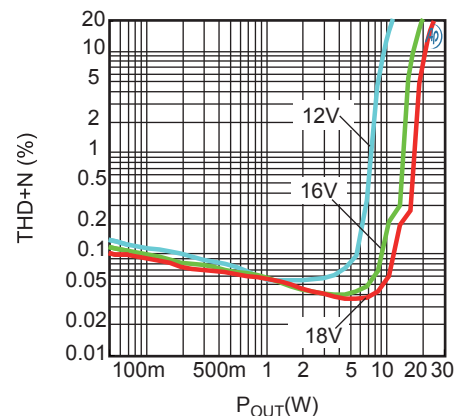


(L x W x H) 3.3" x 3.1" x 0.8"
8.5cm x 8.0cm x 2.0cm

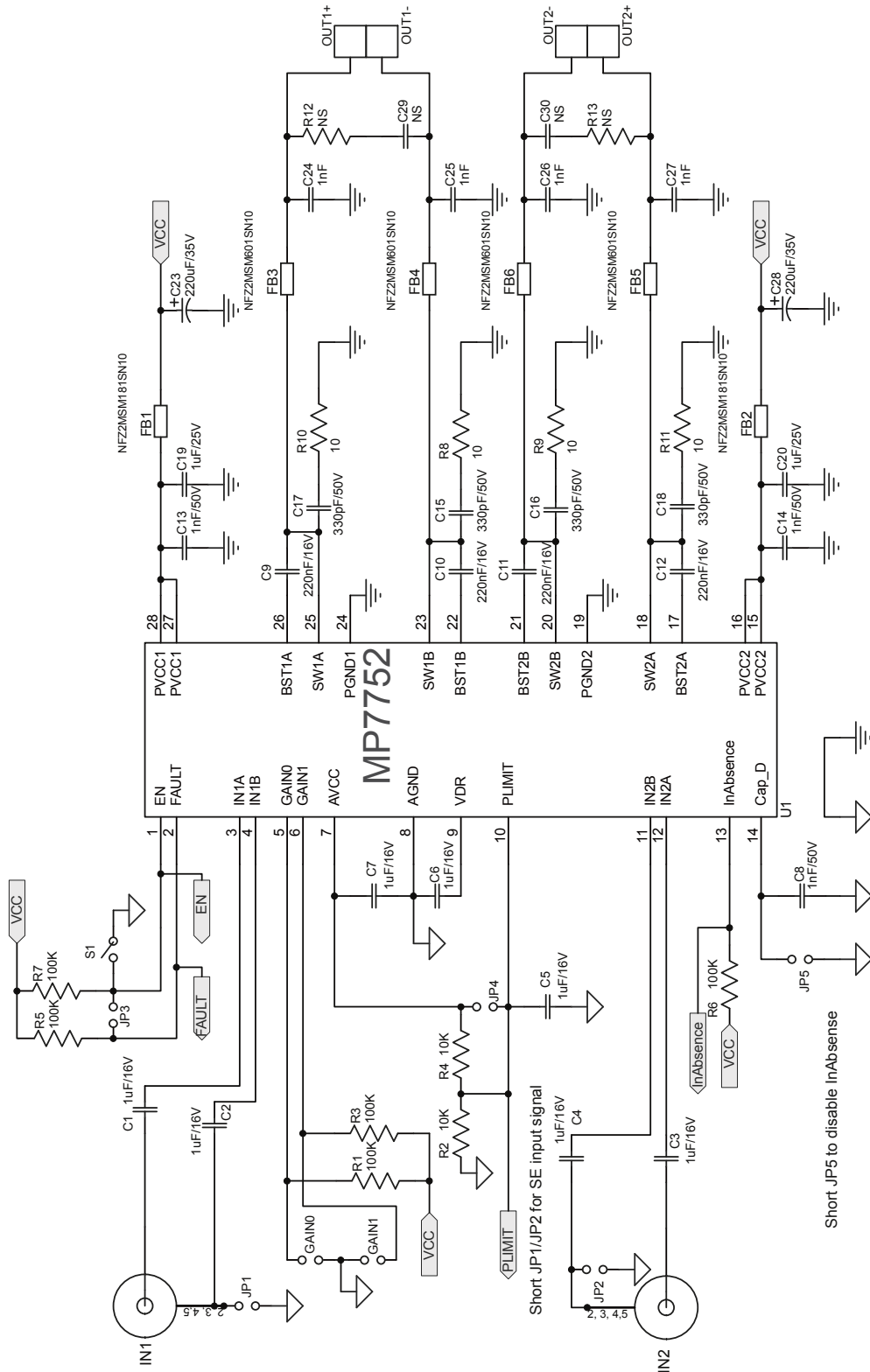
Board Number	MPS IC Number
EV7752-F-00A	MP7752GF

THD+N vs. P_{OUT}

$R_{LOAD}=8\Omega+66\mu H$, Freq=1kHz



EVALUATION BOARD SCHEMATIC



EV7752-F-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacture	Manufacture_PN
7	C1, C2, C3, C4, C5, C6, C7	1µF/16V	Ceramic Capacitor;16V;X7R;0603;	0603	muRata	GRM188R71C105KA12D
7	C8, C13, C14, C24, C25, C26, C27	1nF/50V	Ceramic Capacitor;50V;C0G;0603;	0603	muRata	GRM1885C1H102JA01D
4	C9, C10, C11, C12	220nF	Ceramic Capacitor;50V;X7R;0402	0402	TAIYO YUDEN	UMK105BJ224KV-F
4	C15, C16, C17, C18	330pF	Ceramic Capacitor;50V;X7R;0402;	0402	TDK	C1005X7R1H331K
2	C19, C20	1µF/50V	Ceramic Capacitor;50V;X7R;0805	0805	muRata	GRM21BR71H105KA12L
2	C23, C28	220µF/35V	Electrolytic Capacitor;35V	SMD	江海	VTD-35V220
2	C29, C30	NS				
5	R1, R3, R5, R6, R7	100k	Film Resistor;1%, Film Resistor;1%;	0603	Yageo	RC0603FR-07100KL
2	R2, R4	10k	Film Resistor;1%	0603	Yageo	RC0603FR-0710KL
4	R8, R9, R10, R11	10	Film Resistor;1%	0805	Yageo	RC0805FR-0710RL
2	R12, R13	NS	Film Resistor;1%	0805	Yageo	RC0805FR-0710RL
2	FB1, FB2	NFZ2MSM181SN10	muRata NFZ Filtler for Class D Audio Amplifier	0806	muRata	NFZ2MSM181SN10
4	FB3, FB4, FB5, FB6	NFZ2MSM601SN10	muRata NFZ Filtler for Class D Audio Amplifier	0806	muRata	NFZ2MSM601SN10
1	S1	Reset Botton	SPST Reset Botton	DIP	ANY	
9	EN, FAULT, GND, IN1+, IN1-, IN2+, IN2-, InAbsence, PLIMIT		Connector;1.0mm	DIP	ANY	
7	GAIN0, GAIN1, JP1, JP2, JP3, JP4, JP5		Connector 2Pin 2.54mm	DIP	ANY	
2	IN1, IN2		Connector, RCA Jack, R/A	DIP	ANY	
3	OUT1+, OUT2+, VCC	Banana Jack	Banana Connector;Red	DIP	ANY	
3	OUT1-, OUT2-, GND	Banana Jack	Banana Connector;Black,	DIP	ANY	
1	U1	MP7752	MP7752/TSSOP28/EP	TSSOP28 /EP	MPS	MP7752GF

PRINTED CIRCUIT BOARD LAYOUT

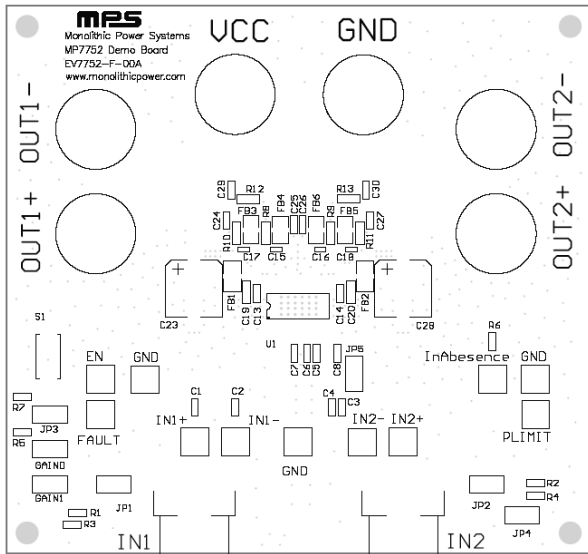


Figure 1—Top Silk Layer

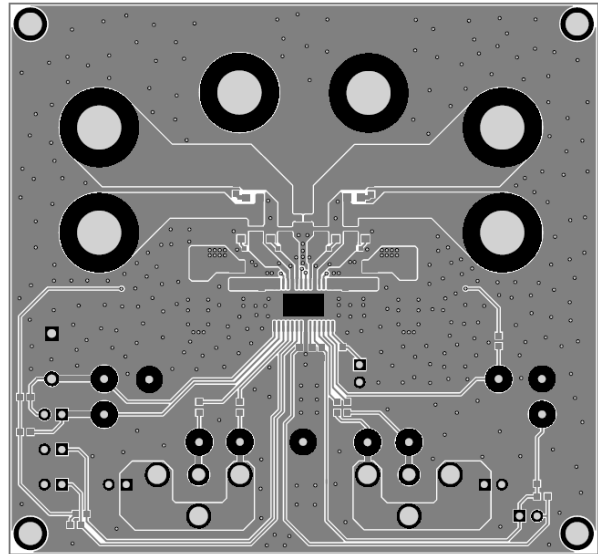


Figure 2—Top Layer

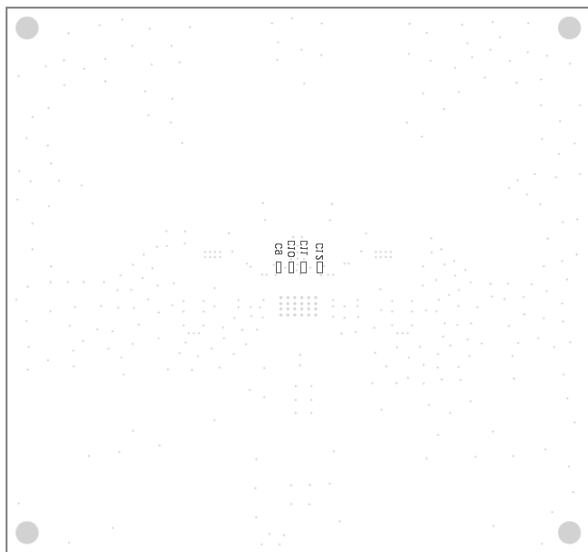


Figure 3—Bottom Silk Layer

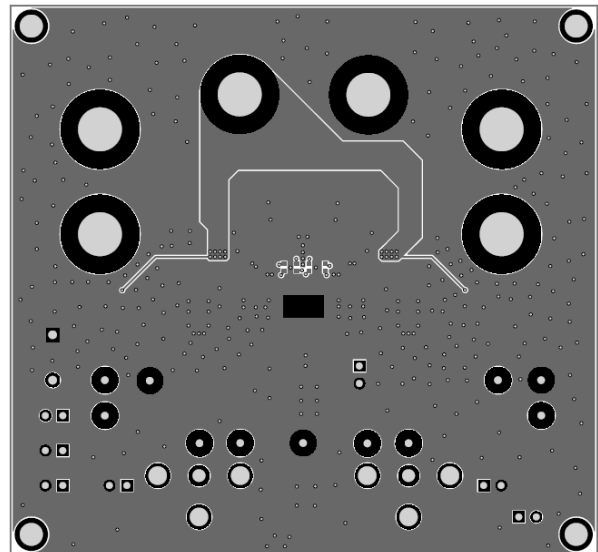


Figure 4—Bottom Layer

QUICK START GUIDE

EV7752-F-00A is set up from the factory for 5V to 18V single supply operating voltage with single-ended signal inputs. To use differential signal inputs, please remove the jumpers from JP1 and JP2.

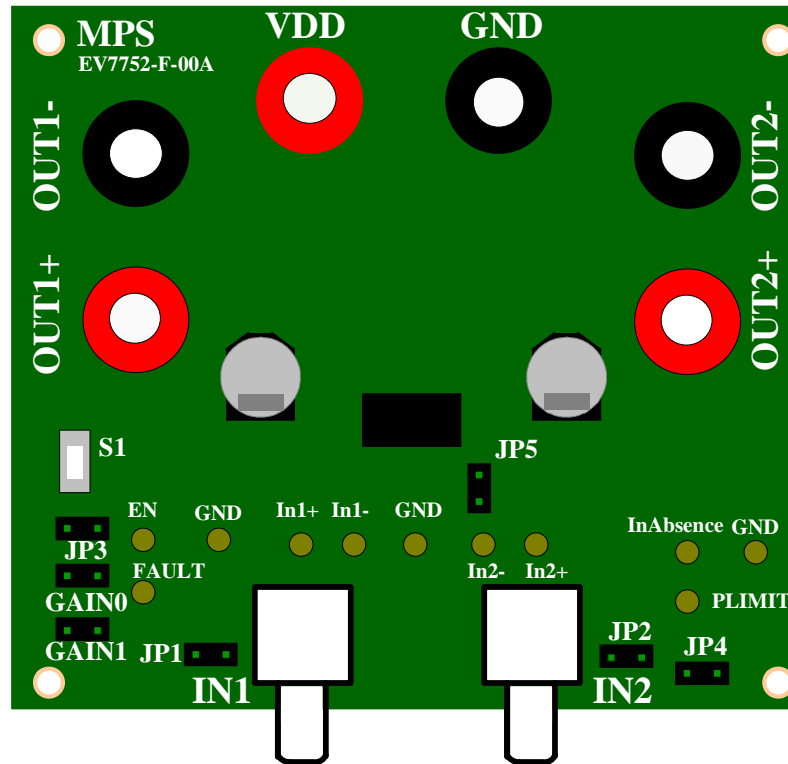


Figure 5—EV7752-F-00A Connection Diagram

1. Power, Signal and Load Impedance Requirements
 - a. Power supply: 5V to 18V (12V typical), 3A maximum (1.8A typical).
 - b. 0V to 2VRMS (max) audio signal source.
 - c. Speaker: typically 4Ω to 8Ω (8Ω typical);
2. Setup Condition for 12V Operation
 - a. Adjust the DC power supply to 12V (do not turn on).
 - b. Connect the outputs to the external speakers.
 - c. Connect the DC power supply to the power input terminals.
 - d. Set the voltage gain by GAIN0 and GAIN1 jumpers, default voltage gain=20dB.
 - e. Set the PLIMIT voltage to target output power level. Default setting is 1/2 AVCC, 2.75V equivalent.
 - e. Connect the audio input signal source to the amplifier inputs (IN1 and IN2).
3. Music Turn-on/off Sequence
 - a. Push button S1 to disable this EVB, release S1 to enable (default position).
 - b. Turn-on/off the power supply.

APPLICATION INFORMATION

1. Typical Output Power vs. PLIMIT Voltage Table

Table 1: Power Limit Typical Operation

Test Condition	PLIMIT Voltage	Output Voltage (Vp-p)	Output Power (~10% THD)
VDD=12V, Vin=1Vrms, Load=8Ω, Gain=20dB	0.80V	14.9	5.0W
VDD=16V, Vin=1Vrms, Load=8Ω, Gain=20dB	0.80V	14.9	5.0W
VDD=16V, Vin=1Vrms, Load=8Ω, Gain=20dB	1.44V	23.6	10.0W
VDD=18V, Vin=1Vrms, Load=8Ω, Gain=20dB	1.44V	23.6	10.0W

PLIMIT adjust methods:

- Adjust resistor divider R2 and R4 to set PLIMIT reference voltage.
- Short JP4 to connect PLIMIT pin to AVCC directly. (disable power limit function)

2. Voltage Gain Setting Table

Table 2: Gain Setting

GAIN0	GAIN1	Typical GAIN (dB)	Typical Input Impedance (kΩ)
0	0	20	75
1	0	26	50
0	1	32	30
1	1	36	20

3. InAbsence Function

InAbsence function and its delay time are controlled by JP5 and C8.

- Short JP5 to disable InAbsence function.
- Adjust C_R to set delay time after input signal is absence. Delay time is defined as:

$$T_{\text{delay}} = 1.6 \times 10^8 \times C_R [\text{sec}]$$

C_R = C8 in EV7752-F-00A, a 1nF capacitor provides ~160ms delay time.

For more information, please consult MP7752 datasheet.

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