EV7770-F-01B

90W, Mono Bridge-Tied Load, Class-D Audio Amplifier Evaluation Board

DESCRIPTION

The EV7770-F-01B is the bridge-tied load (BTL) configuration evaluation board for the MP7770, which can deliver 90W into 8Ω speakers under a 36V input voltage (V_{DD}). This fully integrated audio amplifier dramatically reduces solution size by integrating 100mΩ power MOSFETs, start-up/shutdown pop elimination, and short-circuit protection (SCP) circuits.

MPS's Class-D audio amplifiers exhibit the high fidelity of a Class-A/B amplifiers at higher efficiencies. The circuit is based on MPS's proprietary variable-frequency topology, which delivers excellent linearity and fast response time, operating from a single power supply.

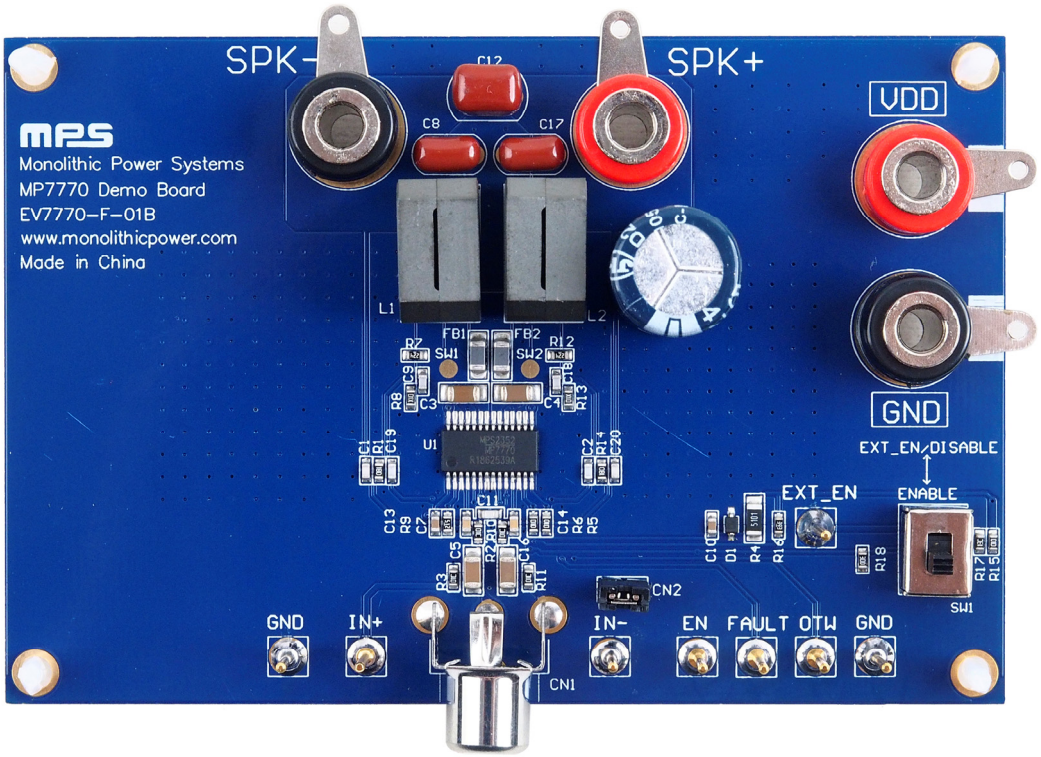
The MP7770 is available in a TSSOP-28EP package.

PERFORMANCE SUMMARY (1)

Specifications are at T_A = 25°C, unless otherwise noted.

Parameters	Conditions	Value
Input voltage (V_{DD}) range		9.5V to 36V

EV7770-F-01B EVALUATION BOARD



LxWxH (9cmx6.1cmx4cm)

Board Number	MPS IC Number
EV7770-F-01B	MP7770GF

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QUICK START GUIDE

The EV7770-F-01B evaluation board is easy to set up and use to evaluate the MP7770. It is set up from the factory for 24V bridge-tied load (BTL) operation. For more information, refer to the MP7770 datasheet. For proper measurement equipment set-up, refer to Figure 1 on page 3 and follow the steps below:

1. If using this evaluation board with a differential signal source, remove the CN2 jumper.
2. Power Requirements:
   a. Power supply: 9.5V to 36V, 5A maximum
   b. Audio signal source: $0V_{RMS}$ to $2V_{RMS}$ (max)
   c. Speaker: 4Ω to 8Ω (typical)
3. For 24V operation:
   a. Adjust the power supply to 24V. Do not turn on the power supply.
   b. Connect the SPK+ terminal to the positive terminal of the speaker and the SPK- terminals to the negative terminal of the speaker.
   c. Connect the input power supply to the VDD terminal and input ground to the GND terminal.
   d. Set the enable switch to the “disabled” position.
   e. Connect the audio input signal source to the amplifier input (CN1).
   f. Turn on the power supply.
4. 36V operation modifications (minimum resistance load is 6Ω):
   a. Refer to Table 3 in the MP7770 datasheet for frequency optimization.
   b. Change R16 to 64.3kΩ to set the VDD shutdown voltage to 30V.
   c. Adjust the power supply to 36V. Do not turn on the power supply.
   d. Follow steps b through f from step 2 above.
5. 12V operation modifications:
   a. Refer to Table 3 in the MP7770 datasheet for frequency optimization.
   b. Change R16 to 16.9kΩ to set the VDD shutdown voltage to 9.5V.
   c. Adjust R15 to 27kΩ so that the EN voltage (V_{EN}) is high enough when the input voltage (V_{DD}) is 12V.
   d. Adjust the power supply to 12V. Do not turn on the power supply.
   e. Follow steps b through f from step 2 above.
6. Music turn-on sequence:
   a. Set the enable switch to the “enabled” position.
7. Music Turn-Off Sequence:
   a. Set the enable switch to the “disabled” position.
   b. Turn off the power supply.

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Table 1 shows the OTW and FAULT pin settings for error reporting.

Table 1: OTW or FAULT Indication

Pin Settings		Error Reporting Description		
FAULT	OTW	Over-Temperature (OT) Warning	Over-Temperature Protection (OTP)	Over-Current Protection (OCP)
0	0	0	0	0
0	1	1	0	0
1	0	0	0	1
1	1	0	1	0

Figure 1 shows the measurement equipment set-up.

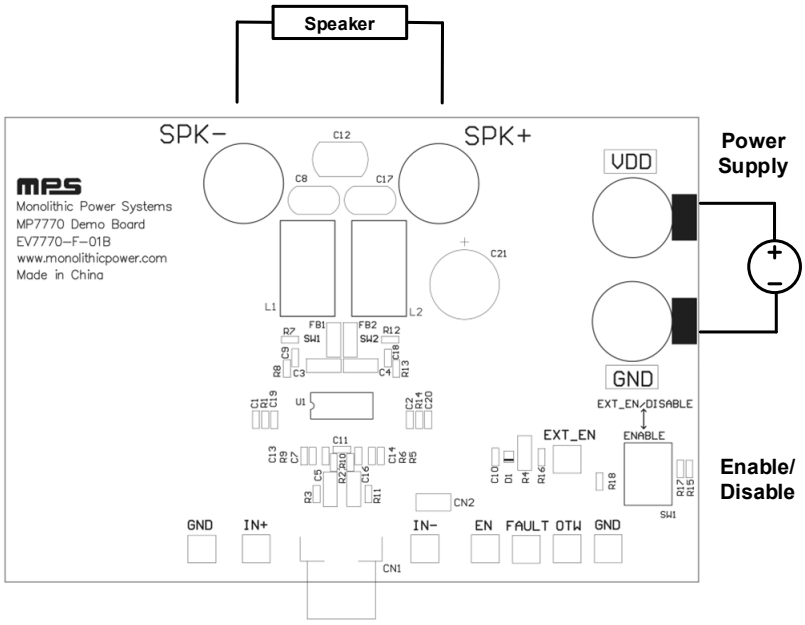

Figure 1: Measurement Equipment Set-Up

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EVALUATION BOARD SCHEMATIC

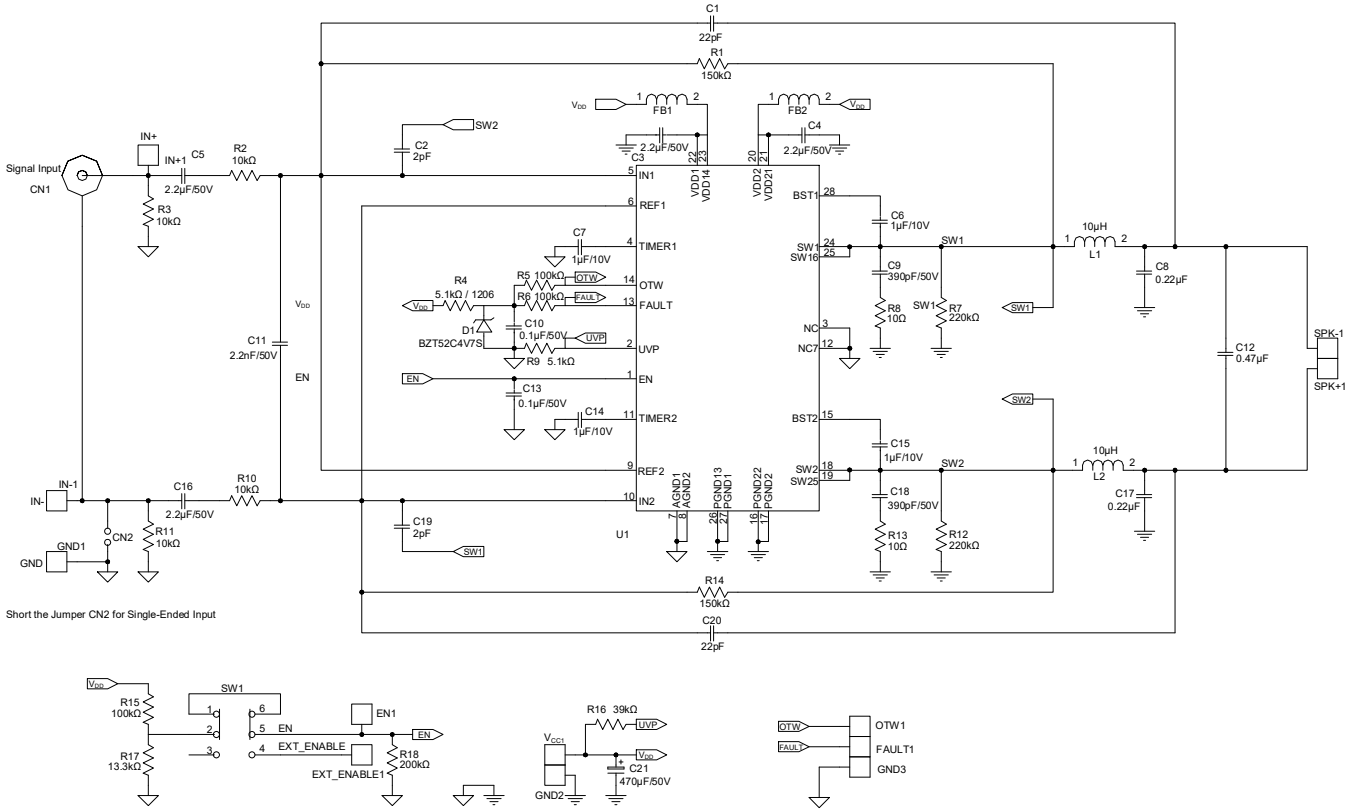

Figure 2: Evaluation Board Schematic

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EV7770-F-01B BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
2	C1, C20	22pF	Ceramic capacitor, 50V, C0G	0603	TDK	C1608C0G1H220J
2	C2, C19	2pF	Ceramic capacitor, 50V, C0G	0603	TDK	C1608C0G1H020CT
4	C3, C4, C5, C16	2.2μF	Ceramic capacitor, 50V, X7R	1206	Murata	GCM31CR71H225KA55L
4	C6, C7, C14, C15	1μF	Ceramic capacitor, 10V, X7R	0603	Wurth	885012206026
2	C8, C17	0.22μF	Ceramic capacitor, 50V, CBB	DIP	Panasonic	ECQV1H224JL
2	C9, C18	390pF	Ceramic capacitor, 50V, C0G	0603	TDK	C1608C0G1H391J
2	C10, C13	0.1μF	Ceramic capacitor, 50V, X7R	0603	Murata	GRM188R71H104KA93D
1	C11	2.2nF	Ceramic capacitor, 50V, C0G	0603	Murata	GRM1885C1H222JA01D
1	C12	0.47μF	Ceramic capacitor, 50V, CBB	DIP	Panasonic	ECQV1H474JL
1	C21	470μF	Electrolytic capacitor, 50V	DIP	Jianghai	CD263-50V470
2	R1, R14	150kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-07150KL
4	R2, R3, R10, R11	10kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0710KL
1	R4	5.1kΩ	Film resistor, 1%	1206	Yageo	RC1206FR-075K1L
3	R5, R6, R15	100kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-07100KL
2	R7, R12	220kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-07220KL
2	R8, R13	10Ω	Film resistor, 1%	0603	Yageo	RC0603FR-0710RL
1	R9	5.1kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-075K1L
1	R16	39kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0739KL
1	R17	13.3kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0713K3L
1	R18	200kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-07200KL
2	FB1, FB2	6A	Magnetic bead	1206	Murata	BLM31PG330SN1
2	L1, L2	10μH	Inductor, 8.5A, 9mΩ, 16mmx14mmx8mm, foot pitch 8.8mm	DIP	Wurth	7444011480100
1	D1	5mA	Zener diode, 4.7V	SOD-323	Diodes, Inc.	BZT52C4V7S-7-F
1	CN1	12mm	RCA connector	DIP	Any	
1	CN2	2.54mm	Male SIP connector	DIP	Any	
1	VDD	11mm	Female banana connector, red	DIP	Any	
1	GND	11mm	Female banana connector, black	DIP	Any	
1	SPK+	24mm	Female banana connector, red	DIP	Any	
1	SPK-	24mm	Female banana connector, black	DIP	Any	
1	SW1	9mm	DPDT switch	DIP	Any	

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EV7770-F-01B BILL OF MATERIALS *(continued)*

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
8	EN, EXT_EN, FAULT, OTW, GND, IN+, IN-, GND	1mm	1mm needle	DIP	Any	
1	U1	MP7770	Class-D Audio Amplifier	TSSOP-28EP	MPS	MP7770GF

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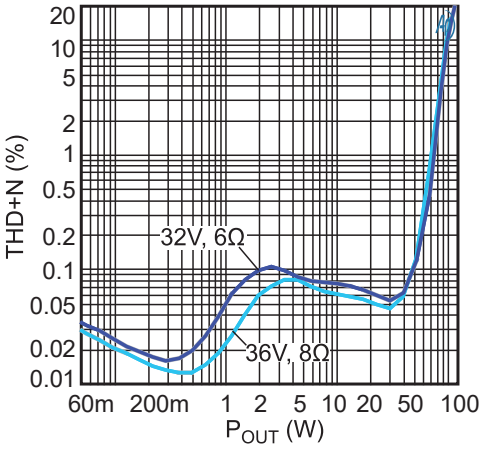
EVB TEST RESULTS

THD+N vs. P_{OUT}
Signal Frequency=1kHz



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PCB LAYOUT

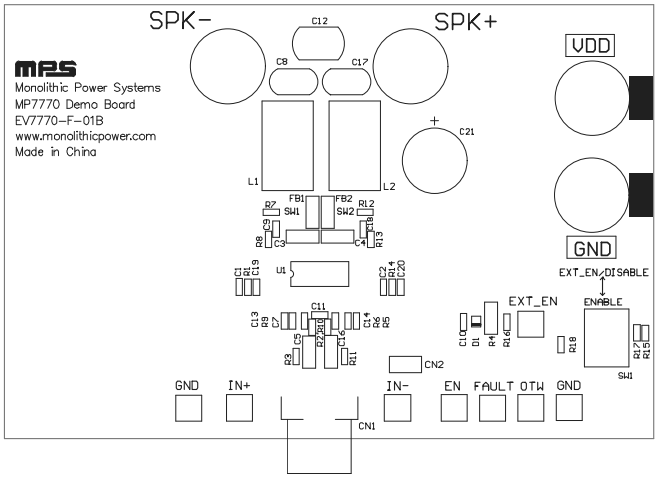

Figure 3: Top Silk

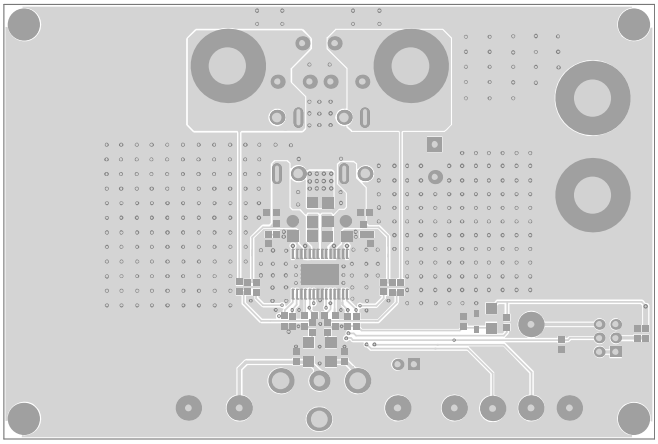

Figure 4: Top Layer

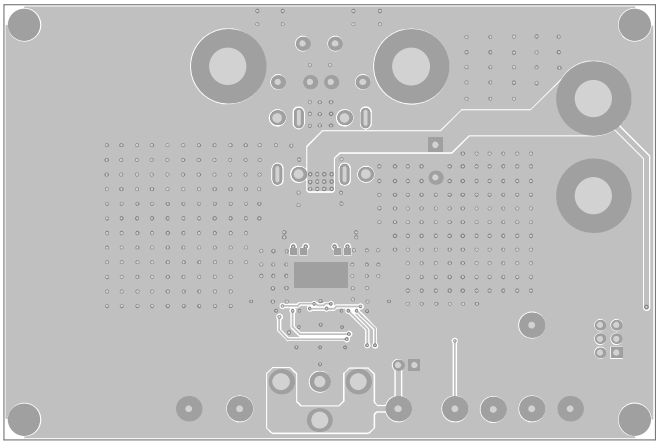

Figure 5: Bottom Layer

Figure 6: Bottom Silk

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REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	6/3/2026	Initial Release	-

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