EV0045

MP7731: Compact 25W Class D Stereo Bridged Audio Amplifier

Monolithic Power Systems

EVALUATION BOARD

General Description

The EV0045 is a stereo evaluation board featuring MPS' MP7731 Class D Full Bridge Audio Amplifier. The EV0045 can deliver 25W into a 4Ω load with a 14.5V input supply.

The MP7731 is a mono 30W Class D Audio Amplifier. It is one of MPS' second generation of fully integrated audio amplifiers which dramatically reduces solution size by integrating the following:

- **180mΩ power MOSFETs**
- **Start up / shut down pop elimination**
- **Short circuit protection circuits**
- **Mute / Standby Mode**

The MP7731 utilizes a full bridge output structure capable of delivering 30W into 4Ω speakers. As in all other MPS Class D Audio Amplifiers, this device exhibits the high fidelity of a Class A/B amplifier at efficiencies greater than 90%.

Ordering Information

Board Number	MPS IC Number
EV0045	MP7731DF

Absolute Maximum Ratings

Supply Voltage V_{IN}	18V
Enable Voltage	–0.3 to 6V
V_{SW}, V_{PIN}, V_{NIN}	-1V to V_{IN} +1V

Recommended Operating Conditions

Input Voltage V_{IN}	7.5V to 14.5V

Features

- 25W into 4Ω with 14.5V Input
- 90% Efficiency at 5W
- 7.5V to 14.5V input voltage operation
- Full Bridge output drive
- Integrated 180mΩ switches
- Turn On / Turn Off Click and Pop Suppression
- Integrated Short Circuit Protection
- Integrated Thermal shutdown
- Mute / Standby Mode

Applications

- Notebook and Multimedia Computers
- Television, Home Stereo
- DVD and VCD players

Figure 1: EV0045 Evaluation Board

Actual Size Shown (2.5"X x 1.5"Y x 0.2"Z)

Figure 2: EV0045 Stereo Full Bridge Schematic

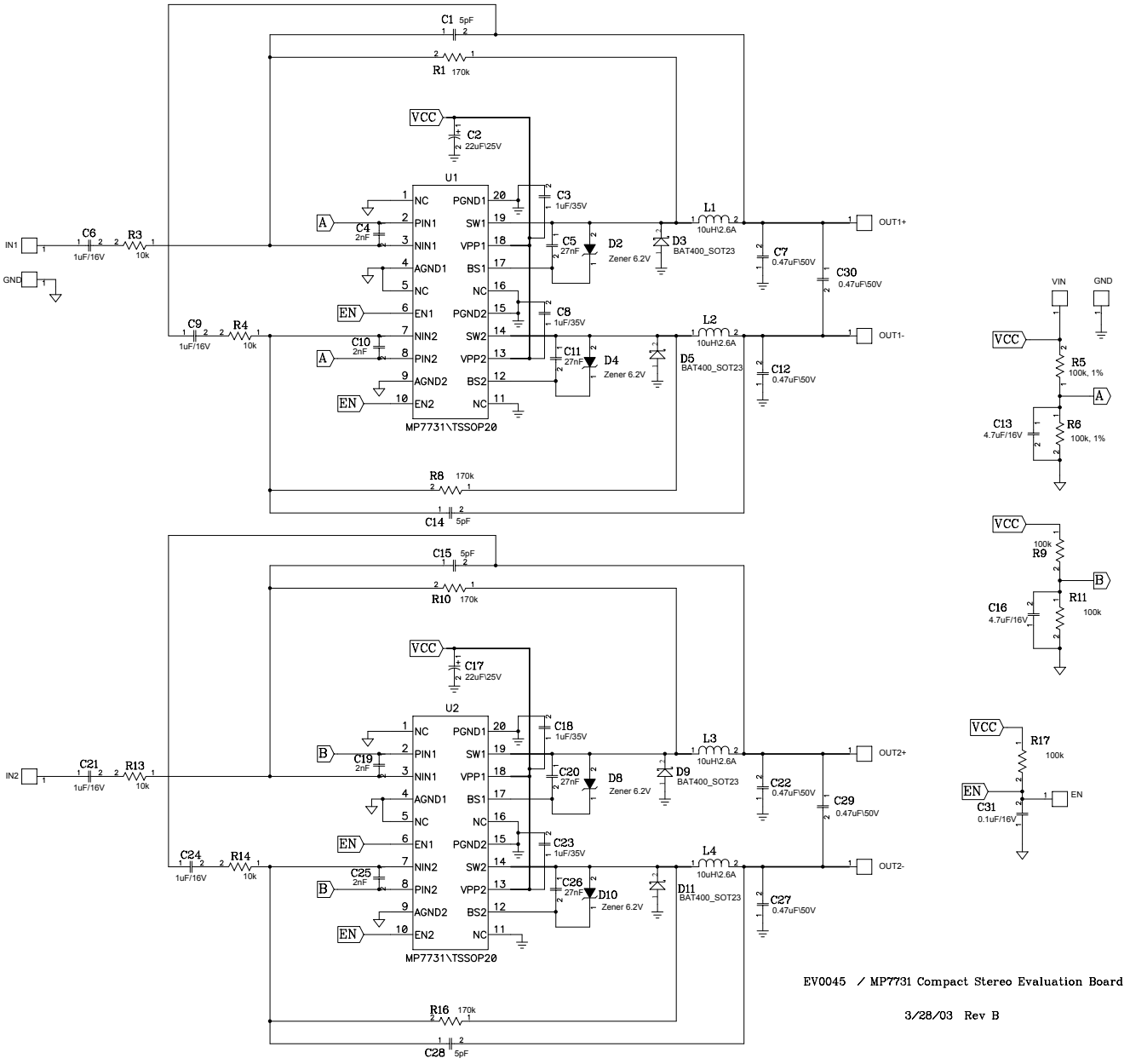
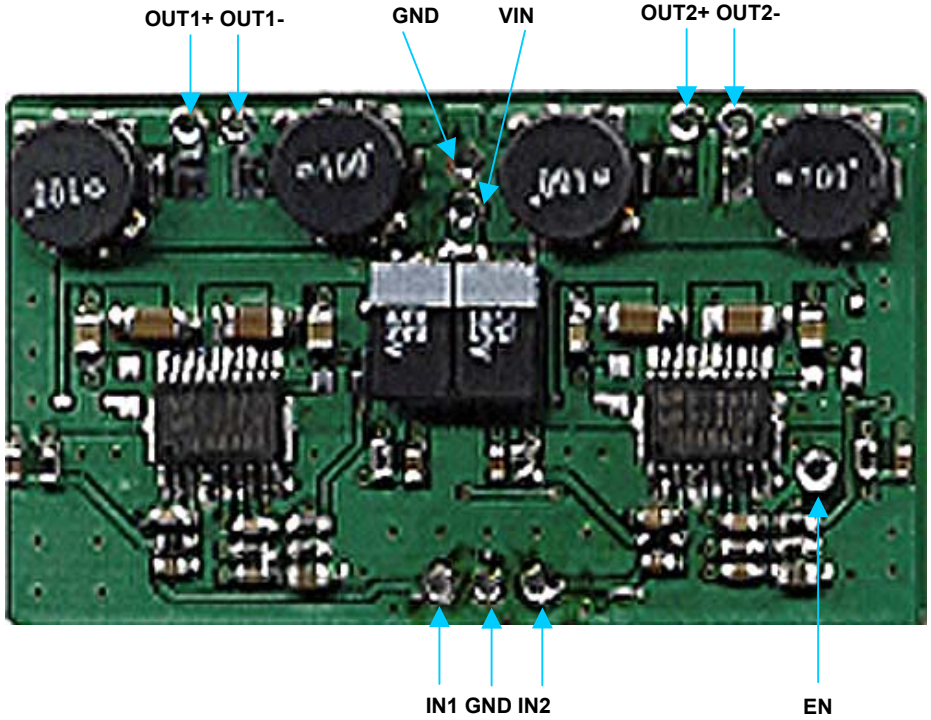


Table 1: EV0045 Stereo Full Bridge Bill of Materials

Component	Description	Package	Qty
U1, U2	MP7731DF	TSSOP20	2
D3, D5, D9, D11	BAT400	SOT23	4
C6, C9, C21, C24	1µF, 16V	0603	4
C4, C10, C19, C25	2nF	0603	4
C1, C14, C15, C28	5pF	0603	4
C31	0.1µF	0603	1
C13, C16	4.7µF, 16V	0805	2
C5, C11, C20, C26	27nF	0805	4
C3, C8, C18, C23	1µF, 35V	1206	4
C7, C12, C22, C27, C29, C30	0.47µF, 50V, Meta	1210	6
L1, L2, L3, L4	10µH, 2.6A, Toko 8RDY	D300\P200	4
R3, R4, R13, R14	10KΩ	0603	4
R5, R6, R9, R11, R17	100KΩ	0603	5
R1, R8, R10, R16	170KΩ	0603	4
C2, C17	22µF, 25V, Tantulum	7343	2
D2, D4, D8, D10	Zener	SOD323	4
		Total	**58**

Evaluation Board Operation



Power Requirements

1. Power supply: 18V
2. 0 -1V_{RMS} (max) audio signal source, ≤ 600Ω
3. Speaker: 4Ω or 8Ω:

Setup Condition for 12V Operation

1. Connect speaker outputs to OUT1+, OUT-, OUT2+, OUT2- respectively.
2. Connect the audio inputs to IN1, GND, IN2 respectively.
3. Adjust the power supply to 7.5V ≤ V_{IN} ≤ 14.5V, (do not turn on)
4. Connect the power supply to the VIN, GND terminals
5. Connect a logic signal to the EN pin (do not turn on)
6. Apply power to the board
7. Apply a voltage >2V to the EN pin to enable the MP7731.
8. Audio should be heard from the speaker(s)
9. Disconnect the supply to the EN pin to disable the MP7731.

Figure 3: Top Silkscreen Layer

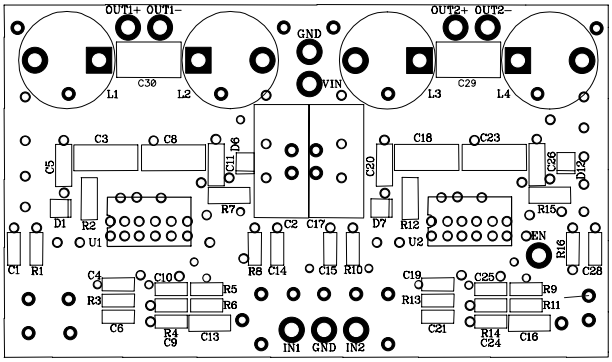


Figure 4: Top Layer

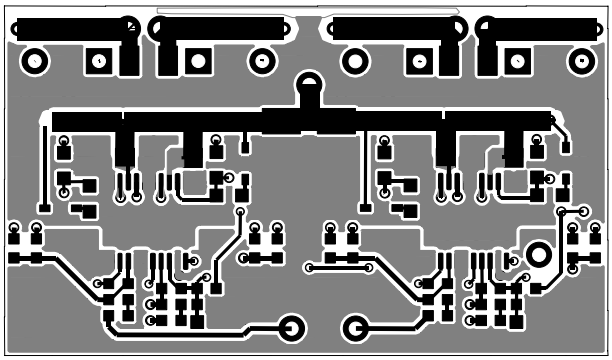


Figure 5: Bottom Layer

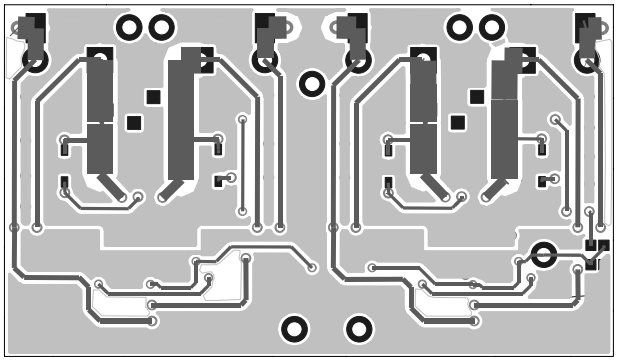


Figure 6: Bottom Silkscreen Layer