

DESCRIPTION

The EV7740DN-01B is the evaluation board for the MP7740, a stereo 15W 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 MP7740 utilizes a single ended output structure capable of delivering 15W 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

- 15W Output at V_{DD} = 24V into a 4Ω load
- THD+N = 0.05% at 1W, 8Ω, 1KHz
- 90% Efficiency at 15W and V_{DD}=24V with 4Ω load
- Low Noise (103μV Typical)
- 9.5V to 36V Operation from a Single Supply

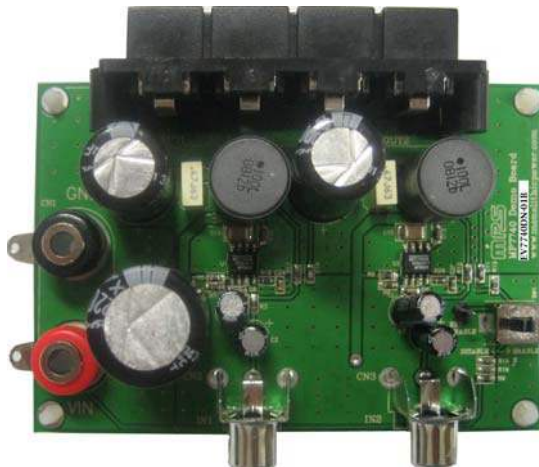
APPLICATIONS

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

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AAM (Analog Adaptive Modulation) is a Trademark of Monolithic Power Systems, Inc.

EV7740 EVALUATION BOARD

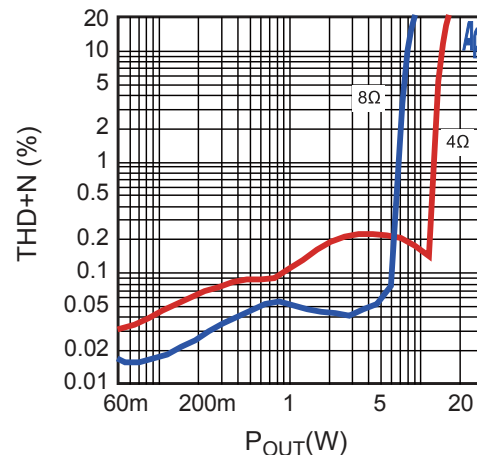


Dimensions (2.4"X x 3.5"Y x 1.2"Z)

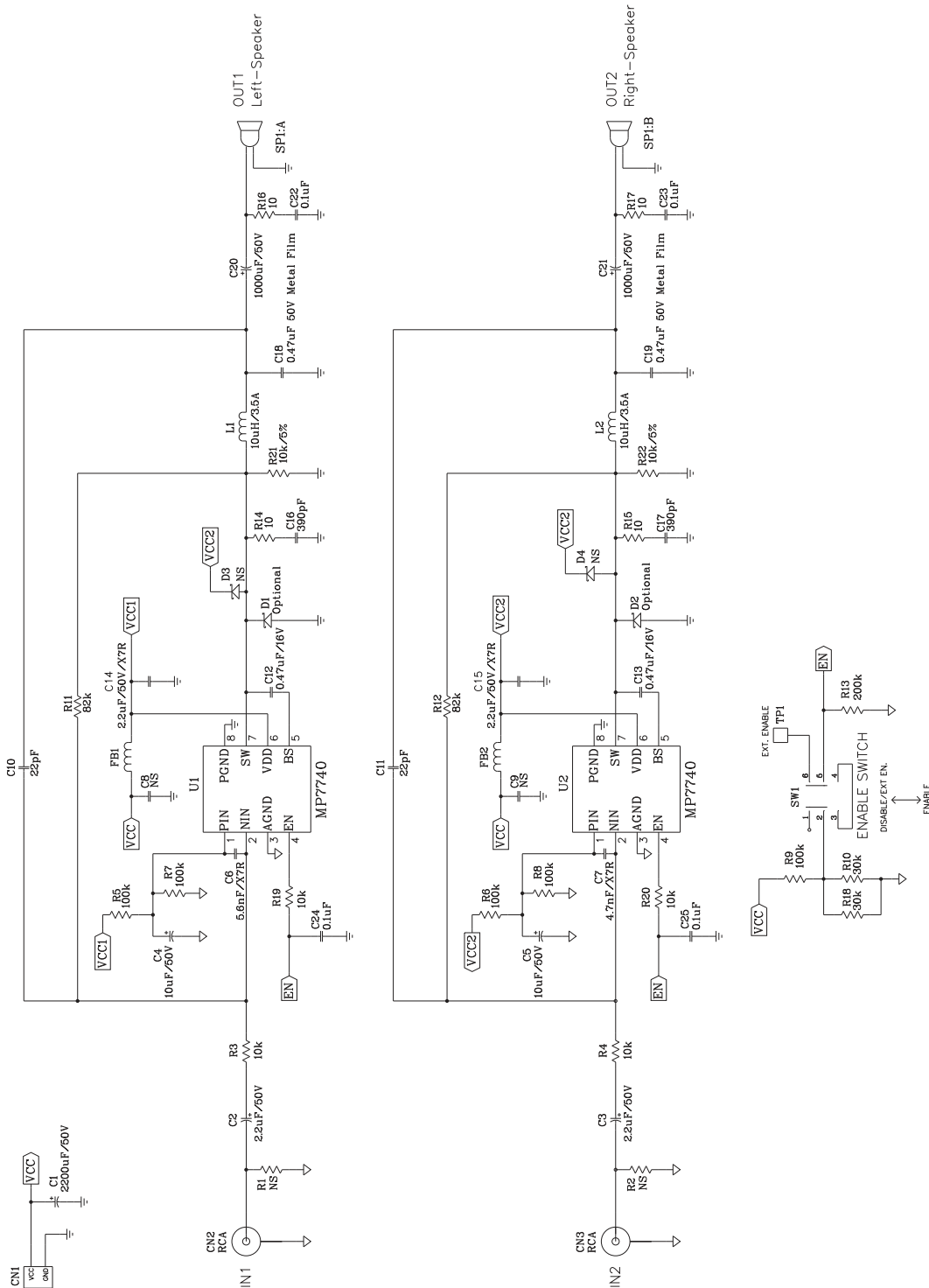
| Board Number | MPS IC Number |
|--------------|---------------|
| EV7740DN-01B | MP7740 |

THD+N vs. P_{OUT}

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



EVALUATION BOARD SCHEMATIC



EV7740DN-01B BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Manufacturer P/N |
|-----|--------------------|----------|-----------------------------|---------|--------------|---------------------|
| 1 | C1 | 2200uF | Electrolytic Capacitor, 50V | Radial | Rubycon | |
| 2 | C2,C3 | 2.2uF | Electrolytic Capacitor, 50V | Radial | Rubycon | |
| 2 | C4,C5 | 10uF | Electrolytic Capacitor, 50V | Radial | Rubycon | |
| 1 | C6 | 5.6nF | Ceramic Capacitor, 50V, X7R | 0603 | muRata | GRM188R71H562KA01 |
| 1 | C7 | 4.7nF | Ceramic Capacitor, 50V,X7R | 0603 | muRata | GRM188R71H472KA01 |
| 2 | C8,C9 | NS | Not Stuffed | | | |
| 2 | C10,C11 | 22pF | Ceramic Capacitor, 50V,C0G | 0603 | muRata | GRM1885C1H220JA01D |
| 2 | C12, C13 | 0.47uF | Ceramic Capacitor, 16V,X7R | 0603 | muRata | GRM188R71C474KA88D |
| 2 | C14,C15 | 2.2uF | Ceramic Capacitor, 50V,X7R | 1206 | muRata | GRM31CR71H225KA88L |
| 2 | C16, C17 | 390pF | Ceramic Capacitor, 50V,C0G | 0603 | muRata | GRM1885C1H3901JA01 |
| 2 | C18, C19 | 0.47uF | FILM,50V | Radial | any | |
| 2 | C20,C21 | 1000uF | Electrolytic Capacitor, 50V | Radial | Rubycon | |
| 4 | C22,C23, C24,C25 | 0.1uF | Ceramic Capacitor, 50V,X7R | 0603 | muRata | GRM188R71H104KA93D |
| 2 | D1, D2, | Optional | Diode Schottky, 40V, 3A | SMA | Diodes | B340LA |
| 2 | D3, D4 | NS | Not Stuffed | | | |
| 2 | FB1, FB2 | | Ferrite Bead, 6A | 1206 | LION | PB321611-320 |
| 1 | SW1 | | DPDT Slide Switch | | | |
| 2 | CN2,CN3 | | Phono Jack, Female | | | |
| 1 | CN1 | | Banana Jack Connector | | | |
| 1 | TP1 | | Test Point/EXT.EN | | | |
| 1 | SP1 | | Speaker Connector | | | |
| 2 | L1, L2 | 10uH | Inductor, 3.61A | Radial | Toko | 10RHBP-#A671HN-100L |
| 2 | R1,R2 | NS | Not Stuffed | | | |
| 4 | R3, R4, R19,R20, | 10kΩ | Film Resistor, 1% | 0603 | Yageo | RC0603FR-0710KL |
| 5 | R5,R6, R7,R8, R9 | 100kΩ | Film Resistor, 1% | 0603 | Yageo | RC0603FR-07100KL |
| 2 | R10,R18 | 30.1kΩ | Film Resistor, 1% | 0603 | Yageo | RC0603FR-0730K1L |
| 2 | R11, R12 | 82.5kΩ | Film Resistor, 1% | 0603 | Yageo | RC0603FR-0782K5L |
| 1 | R13 | 200kΩ | Film Resistor, 5% | 0603 | Yageo | RC0603JR-07200KL |
| 4 | R14, R15, R16, R17 | 10Ω | Film Resistor, 1% | 0603 | Yageo | RC0603FR-0710RL |
| 2 | R21,R22 | 10kΩ | Film Resistor, 5% | 0603 | Yageo | RC0603FR-0711RL |
| 2 | U1,U2 | | Class D Audio Amplifier | SOIC8E | MPS | MP7740DN |

PRINTED CIRCUIT BOARD LAYOUT

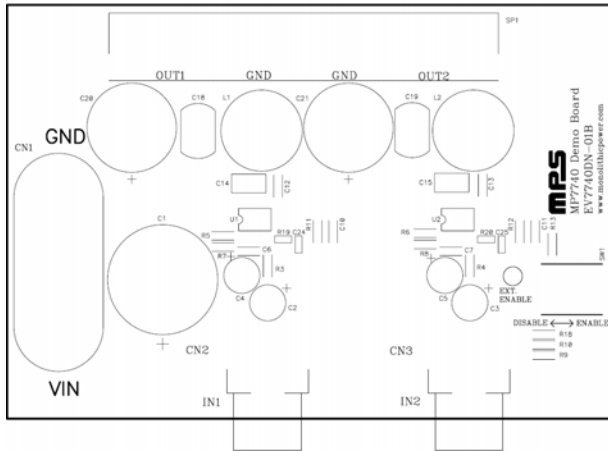


Figure 1—Top Silk Layer

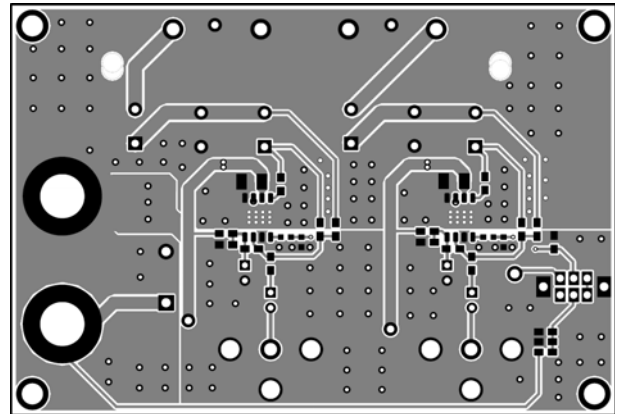


Figure 2—Top Layer

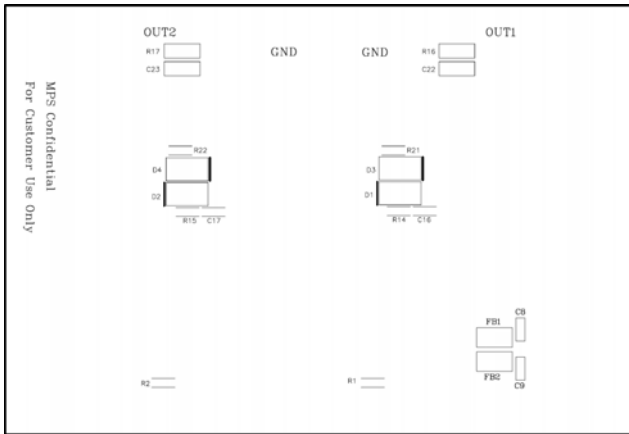


Figure 3—Bottom Silk Layer

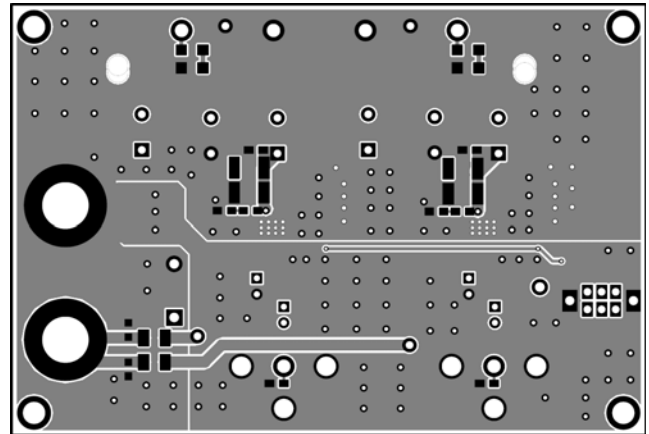


Figure 4—Bottom Layer

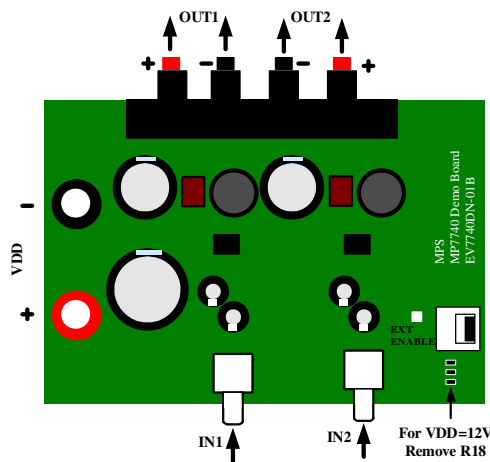


Figure 5—EV7740DN-01B Connection Diagram

QUICK START GUIDE

1. This board set up from the factory for 24V operation. To use with 36V power supply, adjust the components as specified in the 36V Operation Modifications section below. To use with 12V power supply, adjust the components as specified in the 12V Operation Modifications section below. For more information, consult the MP7740 datasheet.
2. Power Requirements
 - a. Power supply: 9.5V to 36V, 3A maximum.
 - b. 0V to 1.5V_{RMS} (max) audio signal source.
 - c. Speaker: 4Ω to 8Ω (for 12 V and 24V operation). 6Ω to 8Ω (for 36V operation)
3. 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.
4. 36V Operation Modifications
 - a. Change C6 to 8.2nF and C7 to 6.8nF components.
 - b. Adjust the power supply to 36V (do not turn on).
 - c. Select 6Ω to 8Ω speaker.
 - d. Do as step b~f specified in Section 3.
5. 12V Operation Modifications
 - a. Change C6 to 3.3nF and C7 to 2.2nF components.
 - b. Remove R18 from the demo board.
 - c. Adjust the power supply to 12V (do not turn on).
 - d. Do as step b~f specified in Section 3.
6. Music Turn-On Sequence

Set the enable switch to the ENABLE position.
7. Music Turn-Off Sequence
 - a. Set the enable switch to the DISABLE position.
 - b. Turn off power supply.

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