

### DESCRIPTION

The EV1740EC-00A is the evaluation board for the MP1740, a low-power mono BTL class-D audio amplifier. It is one of MPS's products in a very small WLCSP package, high efficiency, and full bridge output structure capable of delivering 3W into 4Ω speaker.

The gain of this module is set at 2V/V, and can be easily programmed by changing the input resistors.

### ELECTRICAL SPECIFICATIONS

| Parameter      | Symbol | Value     | Units |
|----------------|--------|-----------|-------|
| Supply Voltage | VIN    | 2.5 – 5.5 | V     |

### FEATURES

- 3W Into 4Ω with 5 V VIN @ 10% THD+N
- Up to 90% Efficiency
- 2.5V~5.5V Operation from a Single Supply
- Module gain is set at 2V/V
- THD+N = 0.1% @ 1.8W, 5V, 4Ω
- Internal 250kHz Switching frequency
- Low Noise (53μV Typical) with 5V VCC
- 2mA Quiescent Current and 0.5μA Shutdown Current
- Internal thermal and short-circuit protection
- Internal depop circuitry

### APPLICATIONS

- Wireless or Cellular Handsets
- PDAs
- Portable Audio

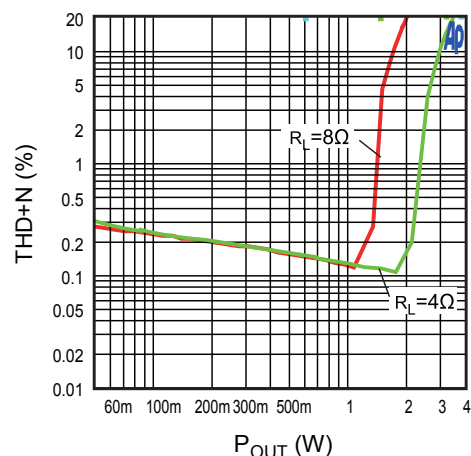
### EV1740EC-00A EVALUATION BOARD



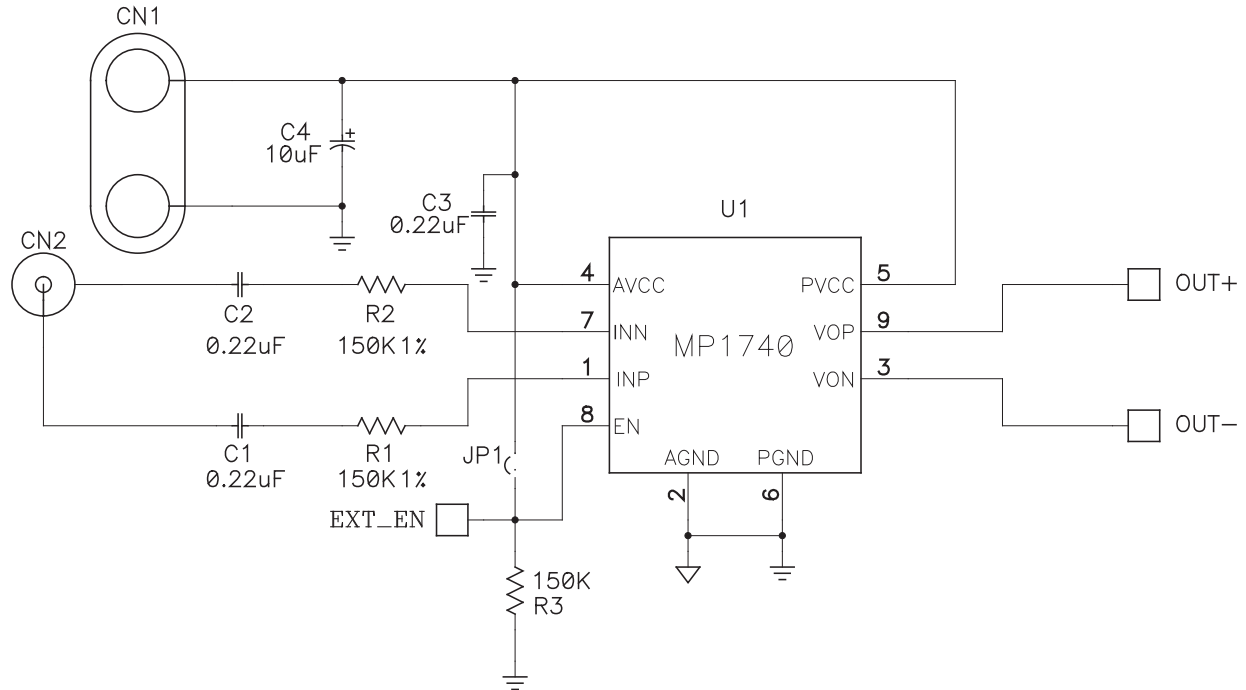
(L x W x H) 1.86" x 1.86" x 0.78"  
(4.72cm x 4.72cm x 2.0cm)

| Board Number | IC Number |
|--------------|-----------|
| EV1740EC-00A | MP1740    |

**THD+N vs. P<sub>OUT</sub>**  
fs=1kHz, V<sub>CC</sub>=5V, Gain=2V/V  
No Weighting



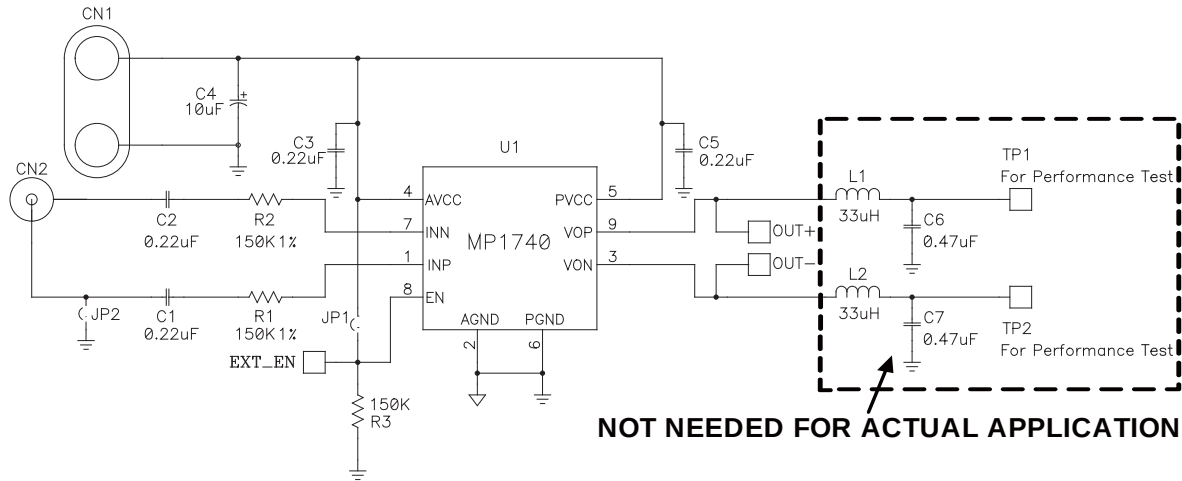
## SCHEMATICS FOR ACTUAL APPLICATION



## BILL OF MATERIALS FOR ACTUAL APPLICATION

| Qty | Ref    | Value  | Description           | Package | Manufacture | Part Number       |
|-----|--------|--------|-----------------------|---------|-------------|-------------------|
| 2   | C1, C2 | 0.22uF | Ceramic Cap, X7R, 16V | 0603    | muRata      | GRM188R71C224KA01 |
| 1   | C3     | 0.22uF | Ceramic Cap, X7R, 50V | 0805    | TDK         | C2012X7R1H224K    |
| 1   | C4     | 10uF   | Electrolytic Cap, 50V | Radial  | Rubycon     |                   |
| 2   | R1, R2 | 150kΩ  | Ceramic Res, 1%       | 0603    | Yageo       | RC0603FR-07150KL  |
| 1   | R3     | 150kΩ  | Ceramic Res, 5%       | 0603    |             | 0603SAJ01154TSE   |
| 1   | U1     |        | Amplifier             | WLCSP   | MPS         | MP1740EC          |

## SCHEMATICS FOR TEST



## BILL OF MATERIALS FOR TEST

| Qty | Ref                   | Value  | Description           | Package  | Manufacture | Part Number         |
|-----|-----------------------|--------|-----------------------|----------|-------------|---------------------|
| 2   | C1, C2                | 0.22uF | Ceramic Cap, X7R, 16V | 0603     | muRata      | GRM188R71C224KA01   |
| 2   | C3, C5                | 0.22uF | Ceramic Cap, X7R, 50V | 0805     | TDK         | C2012X7R1H224K      |
| 1   | C4                    | 10uF   | Electrolytic Cap, 50V | Radial   | Rubycon     |                     |
| 2   | C6, C7 <sup>(1)</sup> | 0.47uF | Ceramic Cap, X7R, 16V | 0603     | muRata      | GRM188R71C474KA88D  |
| 2   | R1, R2                | 150kΩ  | Ceramic Res, 1%       | 0603     | Yageo       | RC0603FR-07150KL    |
| 1   | R3                    | 150kΩ  | Ceramic Res, 5%       | 0603     |             | 0603SAJ01154TSE     |
| 2   | L1, L2 <sup>(1)</sup> | 33uH   | Inductor 1.3A         | DS75LC   | TOKO        | DS75LC-B1047AS-330M |
| 1   | CN1                   |        | CONN/4PIN/0.100       |          |             |                     |
| 1   | CN2                   |        | Phono Jack, Female    | RCA Jack |             |                     |
| 1   | SP1                   |        | Speaker Connector/1CH |          |             |                     |
| 1   | JP1                   |        | JUMPER/2PIN           |          |             |                     |
| 1   | JP2                   |        | JUMPER/2PIN           |          |             |                     |
| 1   | U1                    |        | Amplifier             | WLCSP    | MPS         | MP1740EC            |

Note:

1). These external components are used for performance test. For audio performance test, a LC low-pass filter is required even if the analyzer has a low-pass filter. They are not needed for actual application..

## PRINTED CIRCUIT BOARD LAYOUT

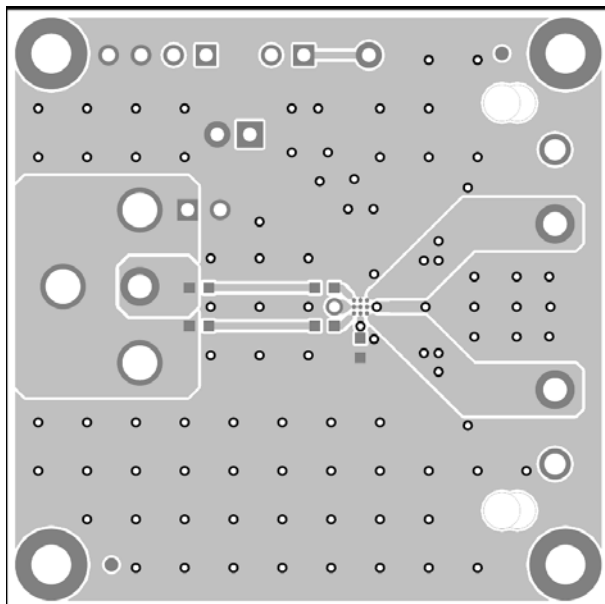


Figure 1—Top Layer

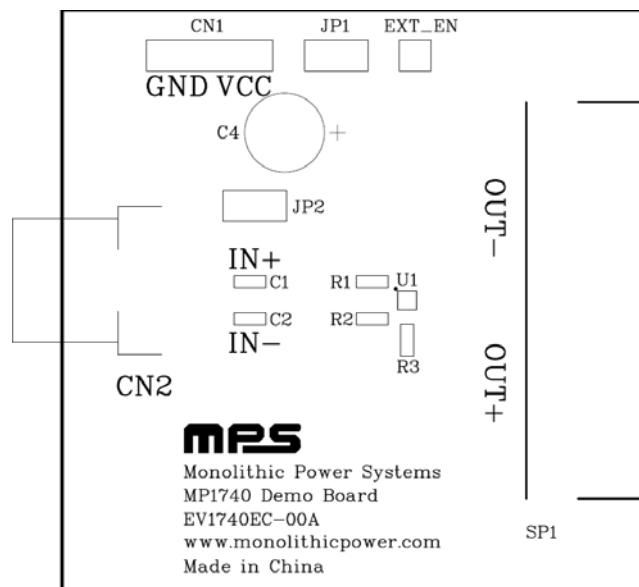


Figure 2—Top silk Layer

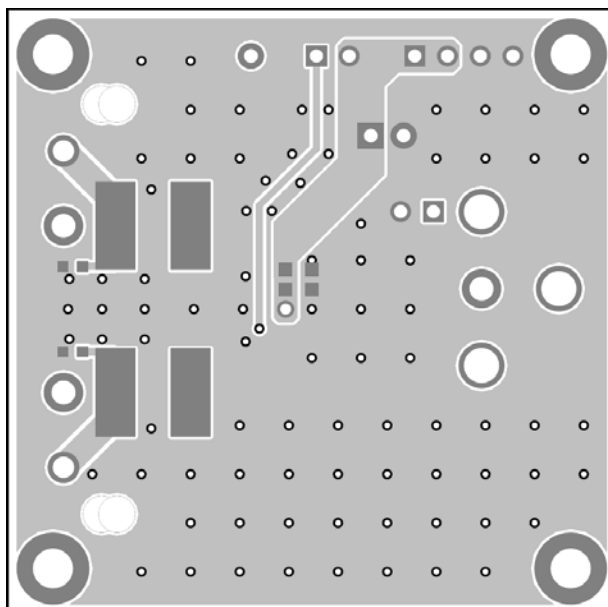


Figure 3—Bottom Layer

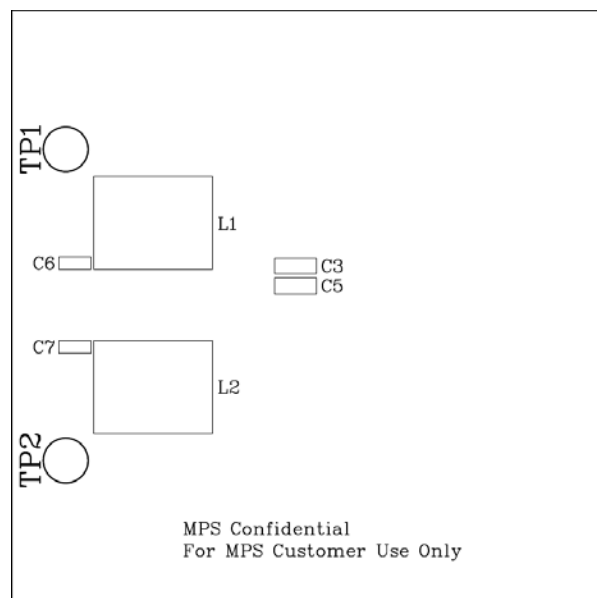


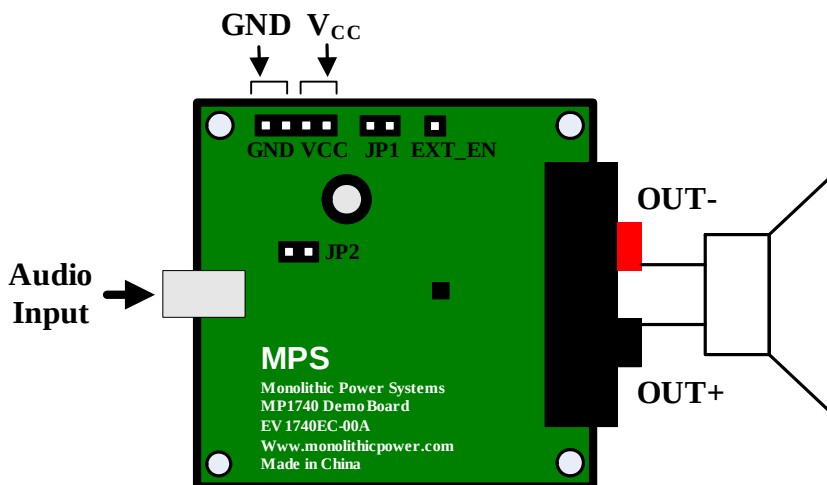
Figure 4—Bottom Silk Layer

## QUICK START GUIDE

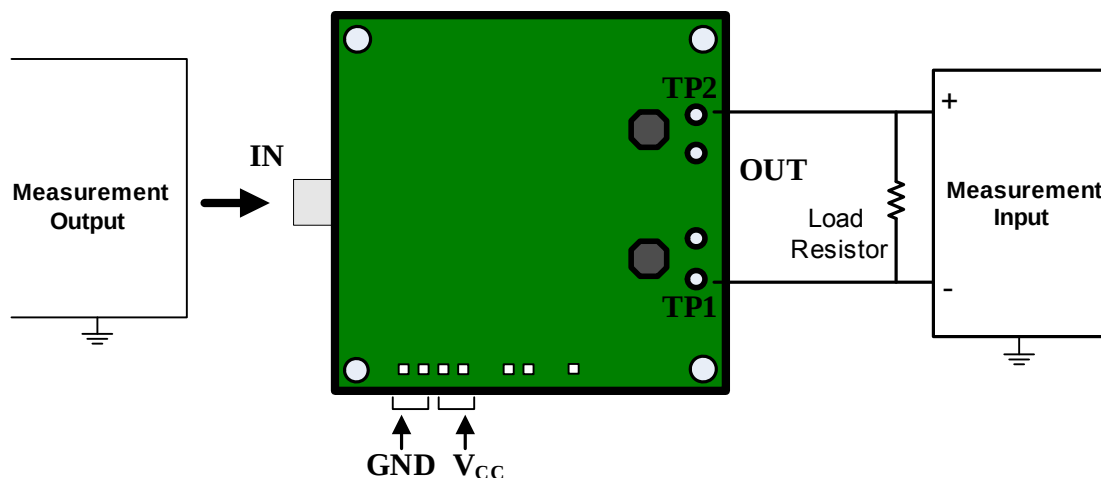
This board is set up from the factory for MP1740EC evaluation, which is a mono BTL low-power class-D audio amplifier (see Figure 5).

For audio performance test, the LC low-pass filter is required even if the analyzer has a low-pass filter. So please use TP1 and TP2 for output terminals (see Figure 6).

For more information, consult the MP1740 datasheet.



**Figure 5. Connection for Mono BTL output (Top viewer)**



**Figure 6. Connection for Audio Performance Test measure (Bottom viewer)**

### 1. Setup Condition for 5V Operation

- a Ensure that all external power sources are set to off.
- b Adjust the power supply to 5V (do not turn on).
- c Connect the power supply to the VCC terminals.
- d Ensure that the audio input signal source level is set to minimum.
- e Connect the audio input signal source to the amplifier inputs.

- f Connect the outputs to the external speakers.
- g Ensure that the jumper JP1 is installed for active mode, or leave JP1 open and drive EN pin with the external TTL level logic.
- h Verify that no shunt is across jumper JP2 for differential input mode, it's installed only for single-ended input.

## **2. Power on**

- a Verify correct voltage and input polarity and set the external power supply to on
- b Adjust the input signal source level as needed. Then audio should be heard from the speaker.

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