

TPA6204A1

Audio Power Amplifier Evaluation Module

User's Guide

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EVM WARNINGS AND RESTRICTIONS

It is important to operate this EVM within the input voltage range of 2.5 V to 5.5 V.

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 85°C. The EVM is designed to operate properly with certain components above 85°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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Related Documentation From Texas Instruments

- **TI Plug-N-Play Audio Amplifier Evaluation Platform** (literature number SLOU011) provides detailed information on the evaluation platform and its use with TI audio evaluation modules.
- **TPA6204A1 1.7-W Mono Fully Differential Audio Power Amplifier** (literature number SLOS429) This is the data sheet for the TPA6204A1 audio amplifier integrated circuit.

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Introduction

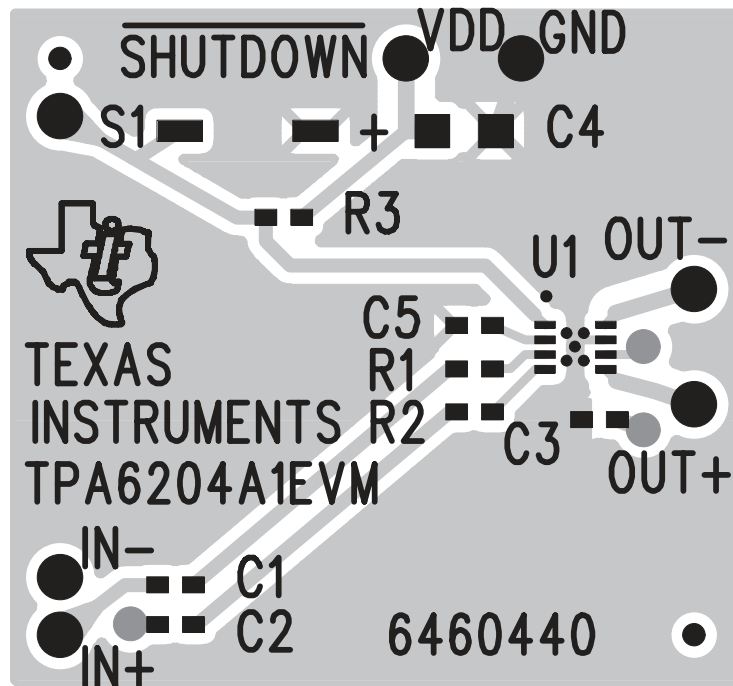
This chapter provides an overview of the Texas Instruments (TI) TPA6204A1 audio amplifier evaluation module (TPA6204A1EVM). It includes a list of EVM features, a brief illustrated description of the module, and a list of EVM specifications.

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1.1 Description

The TPA6204A1 audio power amplifier evaluation module is a complete, low-power single-channel audio power amplifier. It consists of the TI TPA6204A1 1.7-W low-voltage audio power amplifier IC along with a small number of other parts mounted on a circuit board that is approximately one and a quarter inches square (see Figure 1–1).

Figure 1–1. TI TPA6204A1 Audio Amplifier Evaluation Module



1.2 TPA6204A1 EVM Specifications

| | |
|--|-----------------------|
| Supply voltage range, V_{DD} | 2.5 V to 5.5 V |
| Power supply current rating required | 2 A |
| Continuous output power, P_O : 8- Ω BTL, $V_{DD} = 5$ V | 1.7 W |
| Audio input voltage, V_I | 0 V to V_{DD} , max |
| Minimum load impedance, Z_L | 8 Ω |

Operation

The following section describes the steps to use the TPA6204A1EVM stand-alone or with existing circuits. Connections can be made directly to the module pins or it can be wired directly into existing circuits or equipment.

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2.1 Quick Start List for Stand-Alone

2.1.1 Power Supply

- 1) Ensure that all external power sources are set to OFF.
- 2) Connect an external regulated power supply, between 2.5 V and 5.5 V to the module V_{DD} and GND pins, taking care to observe marked polarity.

2.1.2 Inputs and Outputs

- 1) Ensure that the audio source level is set to minimum.
- 2) Connect the positive lead from the audio source to the module IN+ pin and the negative lead to the IN- pin.

2.1.3 Control Inputs

- 1) SHUTDOWN: This pin is active low. A low on this pin shuts down the amplifier; a high on this pin places the amplifier in the active state. Leaving this pin floating also allows normal amplifier operation. Holding down switch (S1) places the amplifier to the active state. The absolute maximum voltage on this terminal is $VCC + 0.3 V$.

2.1.4 Power Up

- 1) Verify correct voltage and input polarity and set the external power supply to on.

The EVM should begin to operate.

- 2) Adjust the audio source level as needed.

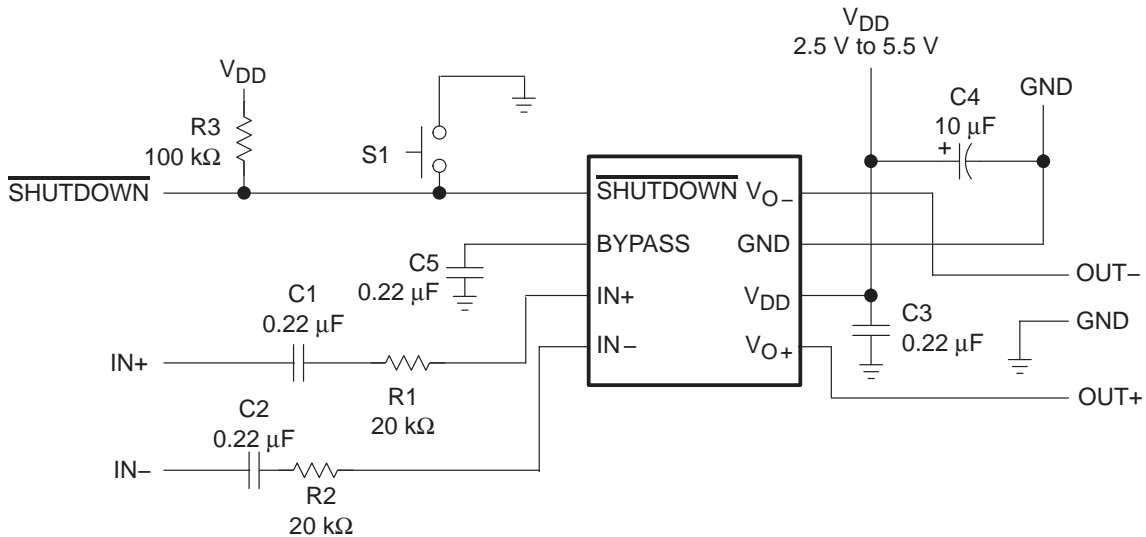
Schematic, Parts List, and PCB Layers

This chapter contains the schematic, parts list and the EVM PCB layers.

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3.1 TPA6204A1 EVM Schematic Diagram

Figure 3–1. TPA6204A1 EVM Schematic Diagram



3.2 TPA6204A1 Audio Power Amplifier Evaluation Module Parts List

Table 3–1. TPA6204A1 EVM Parts List

| Reference | Description | Size | Qty. | Manufacturer/ Part Number | Vendor/ Part Number |
|-------------------|--|-----------|------|------------------------------|---------------------------|
| C4 | Capacitor, 10 μ F, 6.3 V | A | 1 | Panasonic ECS-TOJY106R | Digi-Key PCS1106CT-ND |
| C1, C2, C3, C5 | Capacitor, 0.22 μ F, 80%/–20%, nonpolarized | 0603 | 4 | Panasonic ECJ-1VF1C224Z | Digi-Key PCC1790TR-ND |
| R1, R2 | Resistor, 20 k Ω , 1/16 W, 1% | 0603 | 2 | Panasonic ERJ-3EKF2002V | Digi-Key P200KHCT-ND |
| R3 | Resistor, 100 k Ω , 1/16 W, 1% | 0603 | 1 | Panasonic ERJ-3EKF1003V | Digi-Key PCS100KHCT-ND |
| S1 | Switch, momentary | | 1 | Panasonic P8048SCT-ND | Digi-Key P8048SCT-ND |
| | Terminal post headers | | 7 | Sullins PTC36SABN | Digi-Key S1022-36-ND |
| U1 | IC, TPA6204A1, audio amplifier, 1.7 W, mono | 8-pin QFN | 1 | TI TPA6204A1 | |
| PCB1 | PCB, TPA6204A1 EVM | | 1 | | |

Note: All items are SMD except terminal posts.

3.3 TPA6204A1EVM PCB Layers

The following illustrations depict the TPA6204A1EVM PCB layers and silkscreen. These drawings are not to scale. Gerber plots can be obtained from the product folder on www.ti.com under *Related Products – Development Tools*.

Figure 3–2. TPA6204A1 EVM Top Layer

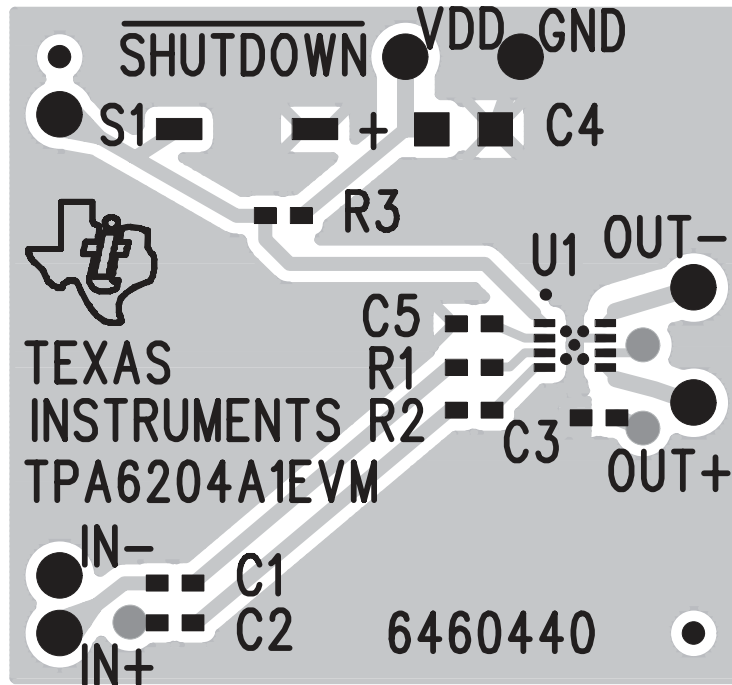


Figure 3–3. TPA6204A1 EVM Bottom Layer

