

## FEATURES

- **COMPLETE EVALUATION FIXTURE FOR THE PCM2702E USB DIGITAL-TO-ANALOG CONVERTER**
- **ON-BOARD OUTPUT FILTER USING OPA2353UA DUAL CMOS OP AMP**
- **3.5mm STEREO MINI JACK FOR LINE LEVEL OUTPUTS**
- **PLUG-AND-PLAY OPERATION—NO SPECIAL SOFTWARE REQUIRED<sup>(1)</sup>**
- **EXTERNAL +5V POWER SUPPLY REQUIRED<sup>(2)</sup>**

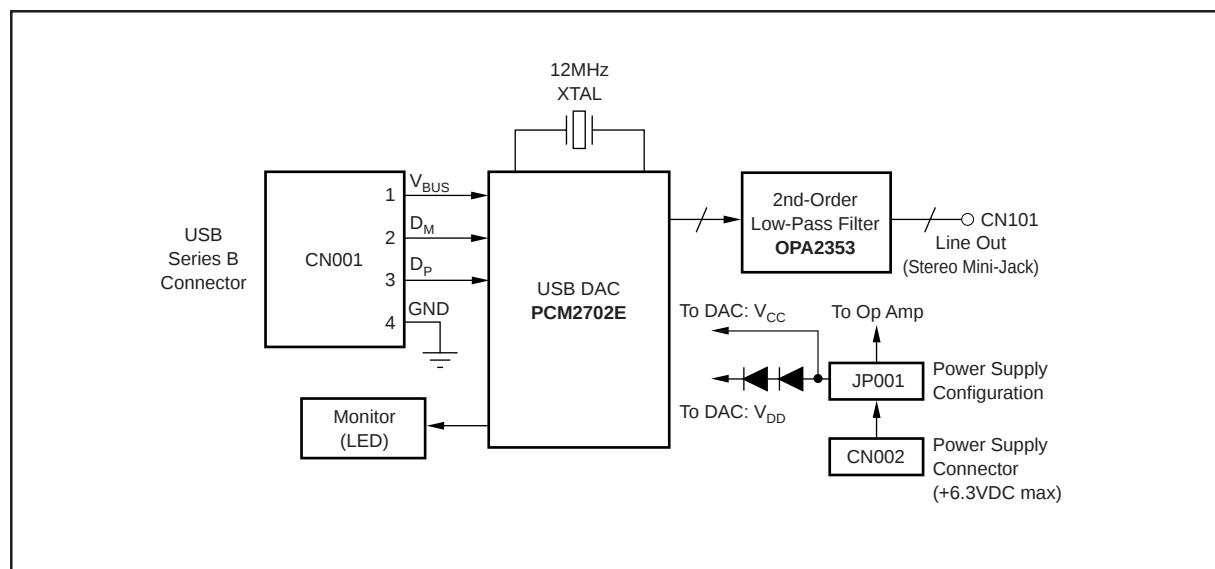
## DESCRIPTION

The DEM-PCM2702 is an evaluation platform for Burr-Brown's PCM2702E stereo audio Digital-to-Analog Converter (DAC) with an on-chip Universal Serial Bus (USB) interface controller. The board includes all necessary power supply and interface connectors needed for customer demonstration and performance measurements.

NOTES: (1) Requires Microsoft Windows® 98 or later, which includes standard device drivers for USB audio playback. (2) The PCM2702E is a self-powered device, as defined by the USB Revision 1.0 specification. Therefore, it requires an external power supply. Bus-powered operation is supported for evaluation purposes only. The PCM2702E is not compliant with USB specifications when utilized as a bus-powered device.

Windows® is a registered trademark of Microsoft Corp.

## BLOCK DIAGRAM



# HARDWARE DESCRIPTION

## PCM2702E AND OUTPUT LOW-PASS FILTERS

The PCM2702E is soldered directly to the demo board. All necessary interface and power-supply bypass components are included. A 12MHz crystal provides the reference clock source required by the on-chip clock generation circuitry. The left and right audio outputs are DC coupled to an output filter stage. An OPA2353UA dual op amp is configured as a stereo 2nd-order low-pass filter using a Multiple Feed-Back (MFB) circuit arrangement. The op amp is DC biased to +2.5 volts by connecting the PCM2702E's  $V_{COM}$  pin to the non-inverting inputs of the OPA2353UA. The outputs of the active filters are AC coupled to a 3.5mm stereo mini jack for connection to powered speakers or audio test equipment.

## CONNECTORS

CN001 is a series "B" USB connector, which is used to interface the PCM2702E to the USB port on a PC or USB hub.

CN002 is the power-supply connector, required for self-powered operation. It is designed for use with a wall-mount power supply. Maximum input voltage is +6.3VDC.

CN101 is the stereo line level output jack. Powered speakers may be connected to CN101 for demonstration purposes. Alternatively, audio measurement equipment may be connected here for performance evaluation.

## POWER SUPPLY CONFIGURATION

JP001 is used to select either self-powered or bus-powered operation. Self-powered operation requires an external power supply, connected at CN002. Bus-powered mode derives power from the  $V_{BUS}$  pin of the USB port via CN001. Figure 1 shows the available settings for JP001.

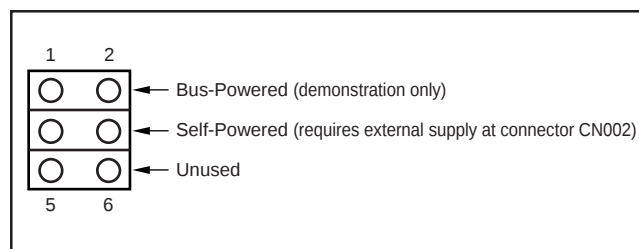


FIGURE 1. Power-Supply Configuration Using JP001.

## LED INDICATORS

Two Light Emitting Diodes (LED) are included for visual indication of playback and bus status. D004, the Playback indicator, is illuminated when the PCM2702E plays audio data received from the USB bus. D005, the Suspend indicator, is illuminated when the USB bus suspends audio data transmission to the PCM2702E.

## SCHEMATIC AND PCB LAYOUT

The complete circuit diagram of the DEM-PCM2702 evaluation fixture is shown in Figure 2.

The DEM-PCM2702 is a 2-layer printed circuit board. Figure 3 shows the printed circuit board layout, including silk screen, top layer (component side) and bottom layer (solder side).

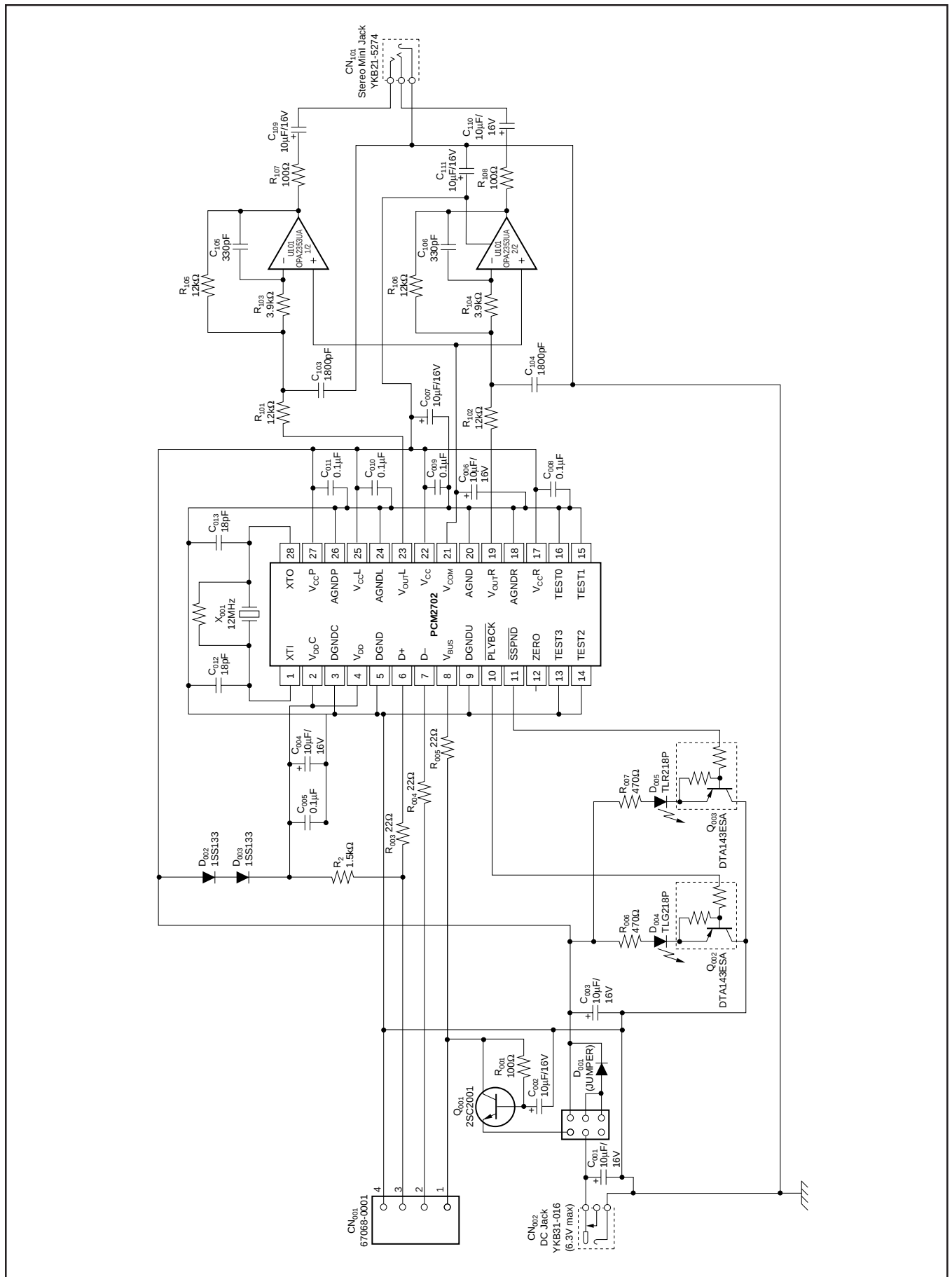
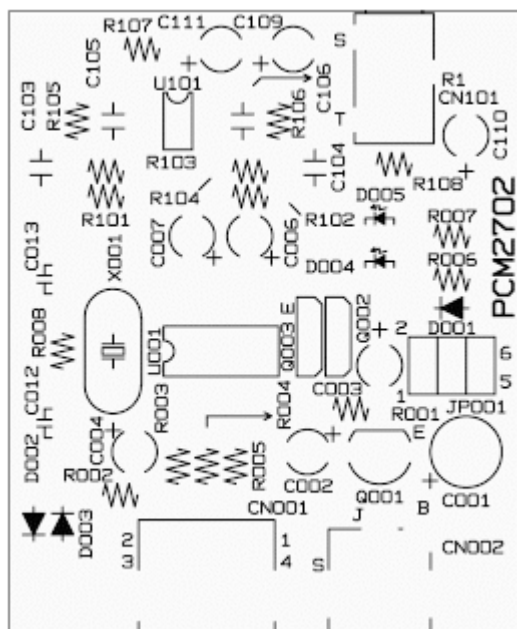
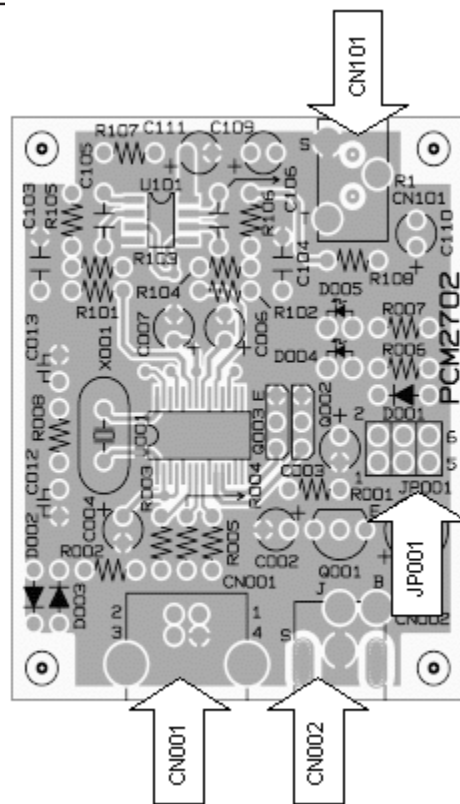


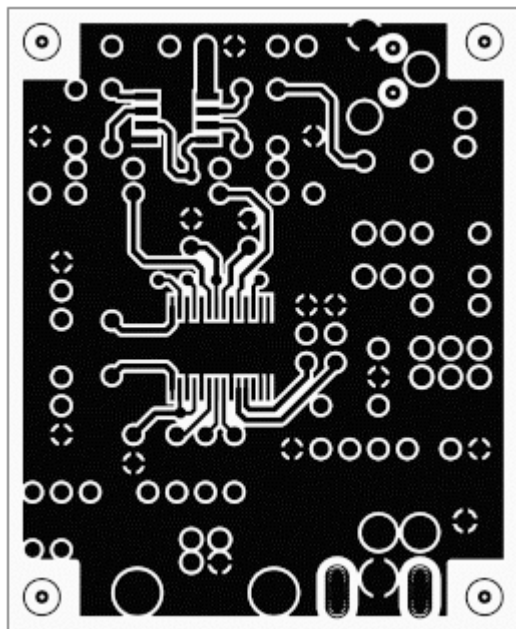
FIGURE 2. Schematic for the DEM-PCM2702.



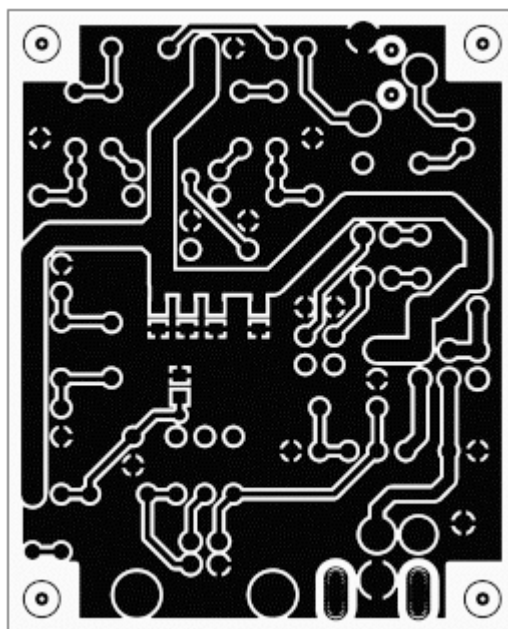
Silk Screen



Component Placement



Top Layer (component side)



Bottom Layer (solder side)

FIGURE 3. Printed Circuit Board Layout for the DEM-PCM2702.

## **IMPORTANT NOTICE**

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customers are responsible for their applications using TI components.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.