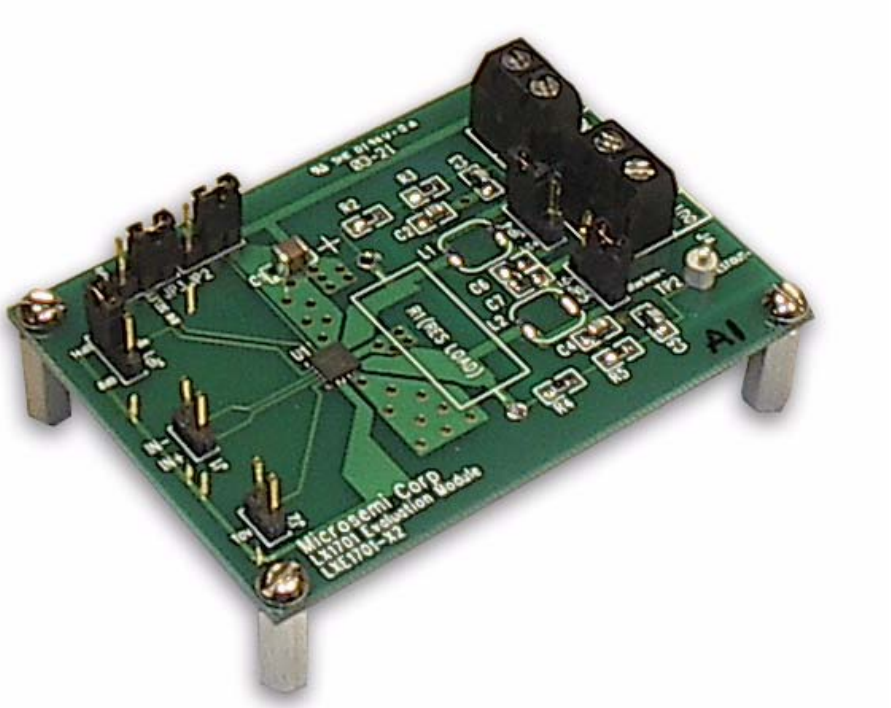
LXE1701 AUDIOMAX EVALUATION KIT USER'S GUIDE



Microsemi
LINFINITY DIVISION

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LXE1701 Evaluation Board Quick Start Guide

The LXE1701 Evaluation Board is a fully functional filterless mono class-D amplifier. Connection to a single power supply, even two AA batteries, one speaker, and an audio source like portable player or computer is all that is required to begin evaluating the amplifier. The amplifier will support continuous output power levels up to 2*W* into 4 Ω load (<10% THD+N).

Board Setting

1. Power and Ground Connections: The terminal J3 is for the power supply connection. VBAT is connected to the positive polarity of the power supply or battery (+1.8V ~ +5V); the GND is connected to the negative polarity of the power supply or battery. Please make sure your power supply polarity connection and supply voltage is correct before you start to evaluate the board.

2. Speakers Connection: J4 is the speaker output. Connect speaker "+" and "-" to "OUT+/OUT+". This evaluation board is designed for > 4 Ω speaker loads.

3. Audio Input Connection: J1 is the audio input connection. The positive audio inputs are connected to IN+ pin, while the negative inputs are connected to IN- pin. For single-ended audio input, the audio signal is connected to IN+ and ground connected to IN-.

4. "Enable/Disable" Jumper Setting: JP2 is the jumper for "Enable/Disable". Enable jumper must be closed for normal system operation.

5. "BW_SEL" (Bandwidth Selection) Jumper Setting: JP3 is for low frequency cut off corner frequency selection. There are two choices: one is 20Hz if "20Hz" position is closed; another one is 300Hz if "300Hz" position is closed.

6. "Gain" Jumper Setting: JP1 is the jumper for system gain selection. There are also two choices: 14dB if "14dB" position is closed; 8dB if "8dB" position is closed.

7. Output Selection Jumper Setting: JP4 & JP5 is the jumpers for LC filter or filterless output selection. Default setting is filterless output, which "filterless+" and "filterless-" positions are closed. L1/L2, C6/C7 are optional components for LC filter output when "LC+" and "LC-" positions are closed. L1/L2 could be inductors, or Ferrite Beads for long speaker wires output to speaker.

8. Test Set Up: R1/R2/R3/R4/R5 & C2/C3/C4/C5 are components for test purpose (refer to next page schematic), they are not necessary for the real application circuit. They make a second order RC filter cutting off the high switching frequency, to measure the audio signal more precisely. R1 is an on-board load, can be 4~16Ω, 2W resistor, you also can connect a resistor load off the board through the output terminal without on-board load. The probes just touch "TESTOUT+" and "TESTOUT-" test points, you can measure audio performance of the board

Actually this evaluation board is added a lot of optional components, or for test purpose, also some headers, terminals for input and output, they are not necessary for the real application. The real component for this system is only one: C1, for the power supply ripple. Another application board we made only has this one component on the board except for the IC, you can find the schematic and picture in the page? It is sold separately.

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APPLICATION SCHEMATIC

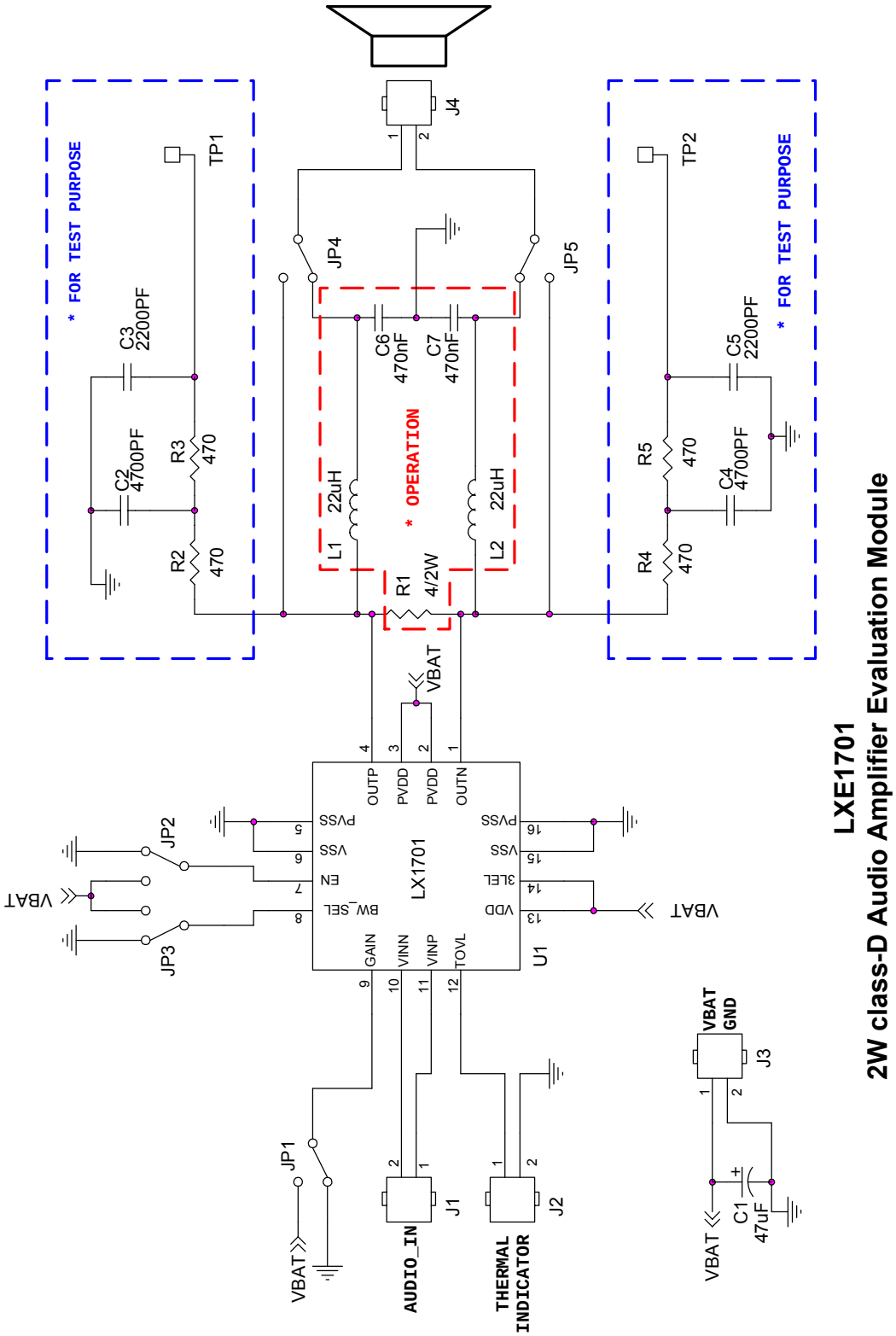
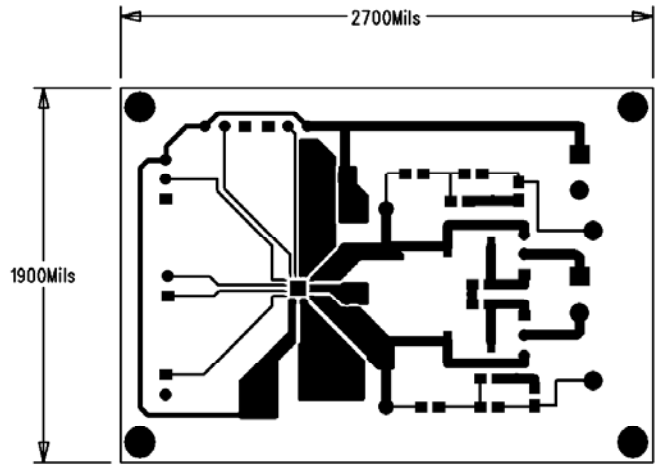
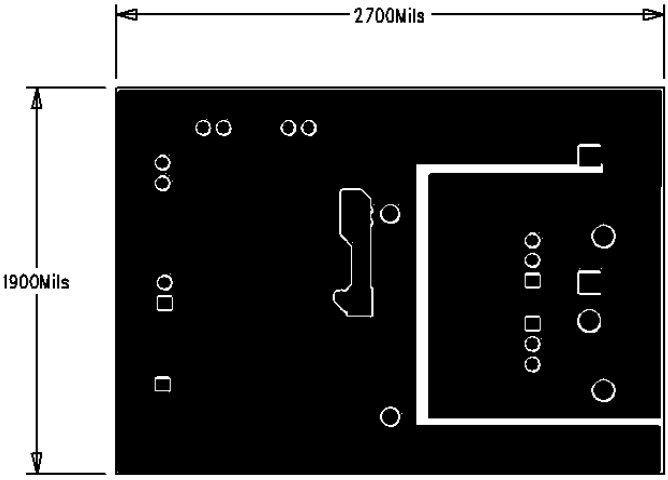


FIGURE 1 - LXE1701 SCHEMATIC

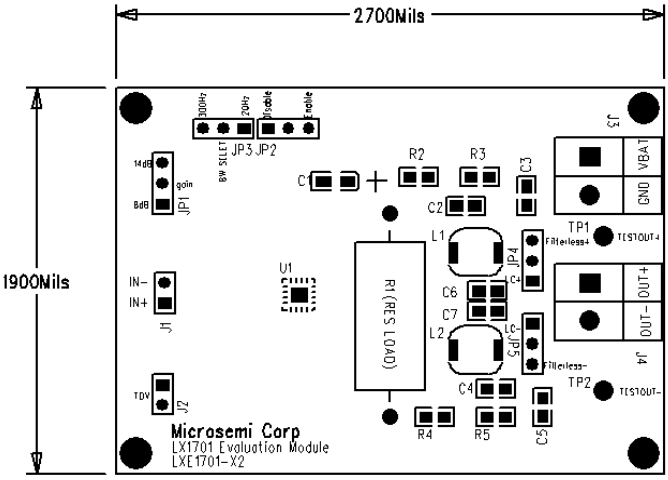
BOARD LAYOUT



COMPONENT LAYER



Solder Layer



Components placement

FIGURE 2 - LXE1701 PCB LAYOUT

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TEST PROCEDURES

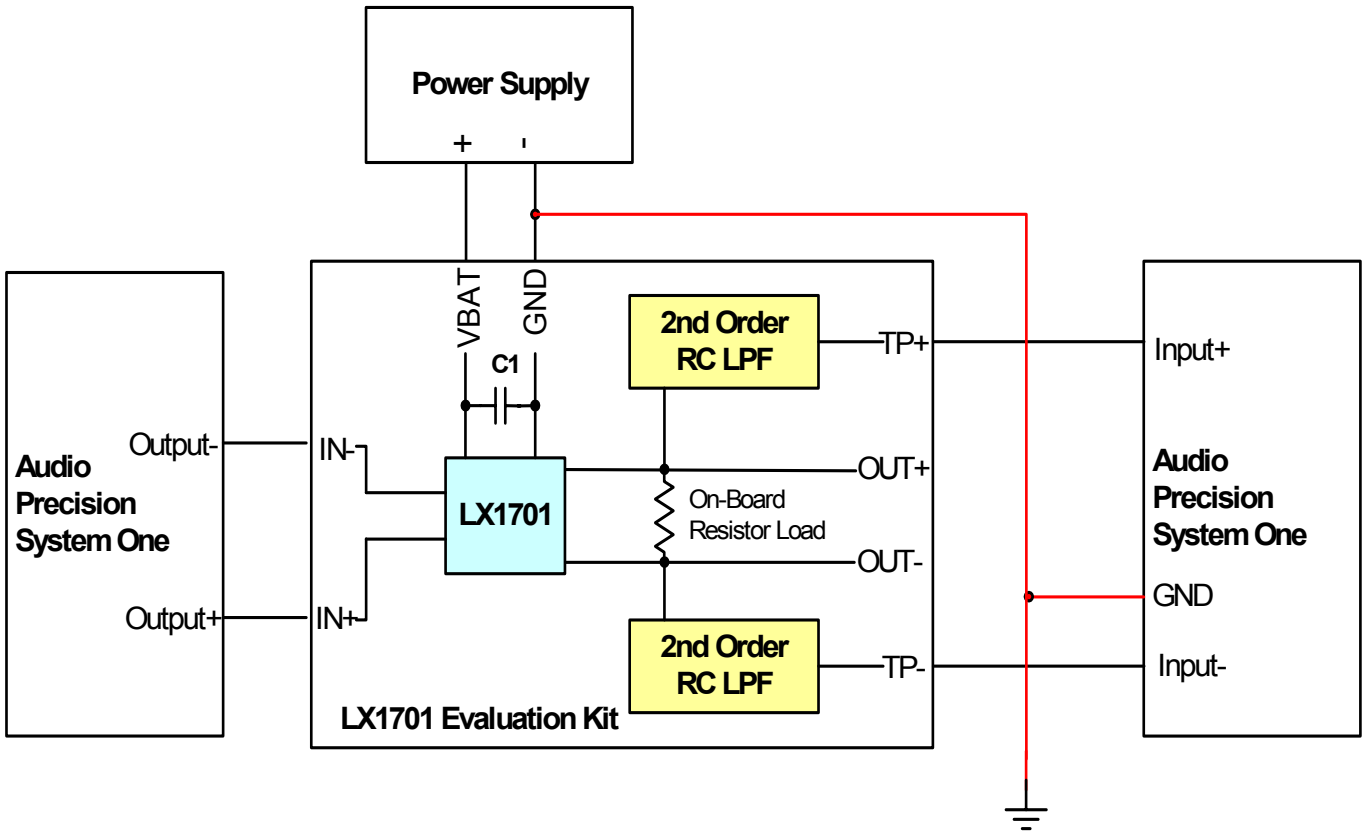

FIGURE 3 - LXE1701 TEST SYSTEM SETUP

- **Default Settings:**

  Equipments: Audio Precision SYSTEM 1,

  Oscilloscope,

  Power Supply ~+5V;

  Supply Voltage: 1.8V/3.3V/5.0V 3 corner voltages

  On-Board passive LPF: 40KHz cut off frequency (-3dB)

  On-Board resistor load: 4/8 Ω, 2W

  AP settings: 10Hz ~ 22KHz BPF

TEST PROCEDURES(CONT.)

- **THD+N vs. Output Power**

  Tested signal frequency f=1KHz, through On-Board PC LPF to minimize the switching noise, keep measuring accuracy

- **THD+N vs. Frequency**

  Tested signal level Po=100mW, sweep input signal frequency from 20Hz to 20KHz, through On-Board PC LPF to minimize the switching noise, keep measuring accuracy

- **Frequency response**

  Tested signal level Po=100mW, sweep input signal frequency from 20Hz to 20KHz, not through On-Board PC LPF, directly test it from OUT+ and OUT-

  Change JP3, the BandWidth selection jumper to change the HPF cutoff frequency, then measure it

- **Signal-to-Noise Ratio (SNR)**

  Input short, output through TP1 and TP2 into AP input, AP is set up with FFT digital analyzer function, A-weighted filter, 0dB as maximum output power with 1%THD+N

- **Efficiency**

  Output power vs. power supply power, since resistor is acting as a load even at high switching frequency, the On-Board load resistor is removed and the output through OUT+/OUT- into a speaker load because the speaker can act as an inductor to cut off the higher switching frequency to keep measuring accuracy. Tested signal is f=1KHz sine wave.

- **GAIN**

  Same procedure with frequency response, set 0dB as input signal level

  Change JP1, the gain selection jumper to change its gain, and measure it

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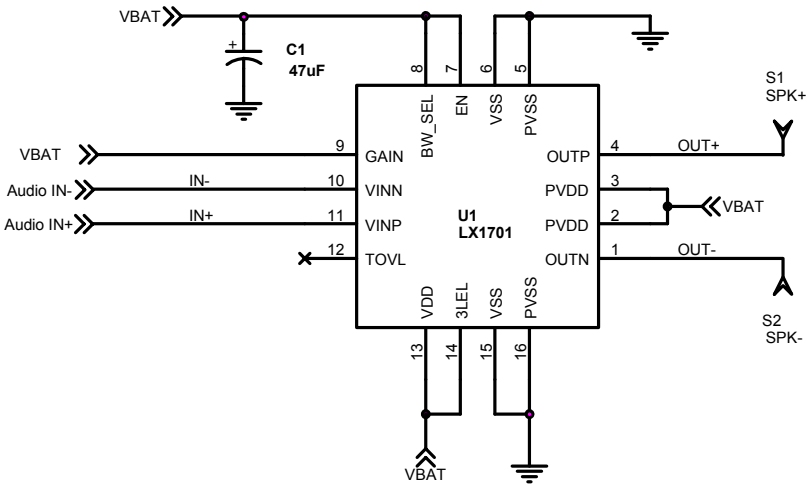
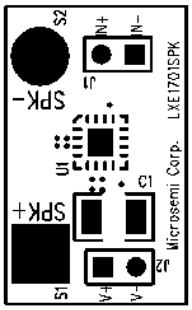
APPLICATIONS

LXE1701SPK* is evaluation/application module; it has very compact size (22mm x 13mm). On the board, there are only two components, one is LX1701, and another is a surface mount CAP 4.7uF. It is easy for users to directly embed this module into speaker, connect to the audio source and 2 or 3 "AA" size batteries, and then plug-play!

*** - It is sold separately.**





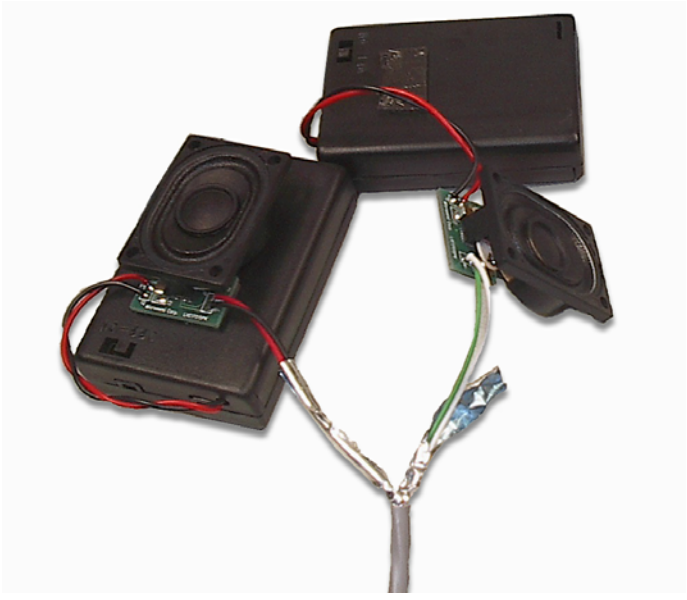


FIGURE 4 - LXE1701SPK EVALUATION/APPLICATION MODULE

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