

LX1704 2+2W STEREO FILTERLESS CLASS-D AMPLIFIER



INTRODUCTION TO PRODUCT

The LX1704 Evaluation Board is available from Microsemi for evaluating the performance of the LX1704 Class D Audio Amplifier Integrated Circuit. The evaluation board contains one LX1704 Class D Audio Amplifier IC and associated circuitry for a complete stereo amplifier, as well as low pass filter circuitry for evaluating the stereo output voltage waveforms with an Audio Analyzer or an Oscilloscope. The evaluation board contains jumper connections for connecting/disconnecting the low pass filter circuitry, and shorting the input connections.

KEY FEATURES

- Filter Free Operation
- 2W + 2W Output Power into 4 Ω load: THD+N < 1%
- High Efficiency, > 85%
- Full Audio Bandwidth: 20Hz to 20KHz
- Low Distortion: <0.15% @ 50% Max. Power, 1KHz
- High Signal to Noise Ratio: 90dB
- Wide Supply Voltage Range: 2.5 – 5.5V
- Low Quiescent Current: < 5mA
- Pop Free Turn ON/OFF
- Standby Feature
- Built-in Under Voltage Lockout
- Thermal Protection

APPLICATIONS

- Portable DVD
- Portable Sound Systems
- MP3 Players

PART SPECIFIC INFORMATION

Part Number	T _A (°C)	Package	Product
LX1704ILQ	-40 to 85	Plastic MLPQ 16-Pin 4mm x 4mm	2+2 Watt Stereo Filterless Class D Audio Amplifier

TABLE 1 – PART INFORMATION

IC	EVALUATION BOARDS
LX1704ILQ	LX1704 EVAL KIT

TABLE 2 – EVALUATION BOARD INFORMATION

SCHEMATIC FOR LX1704

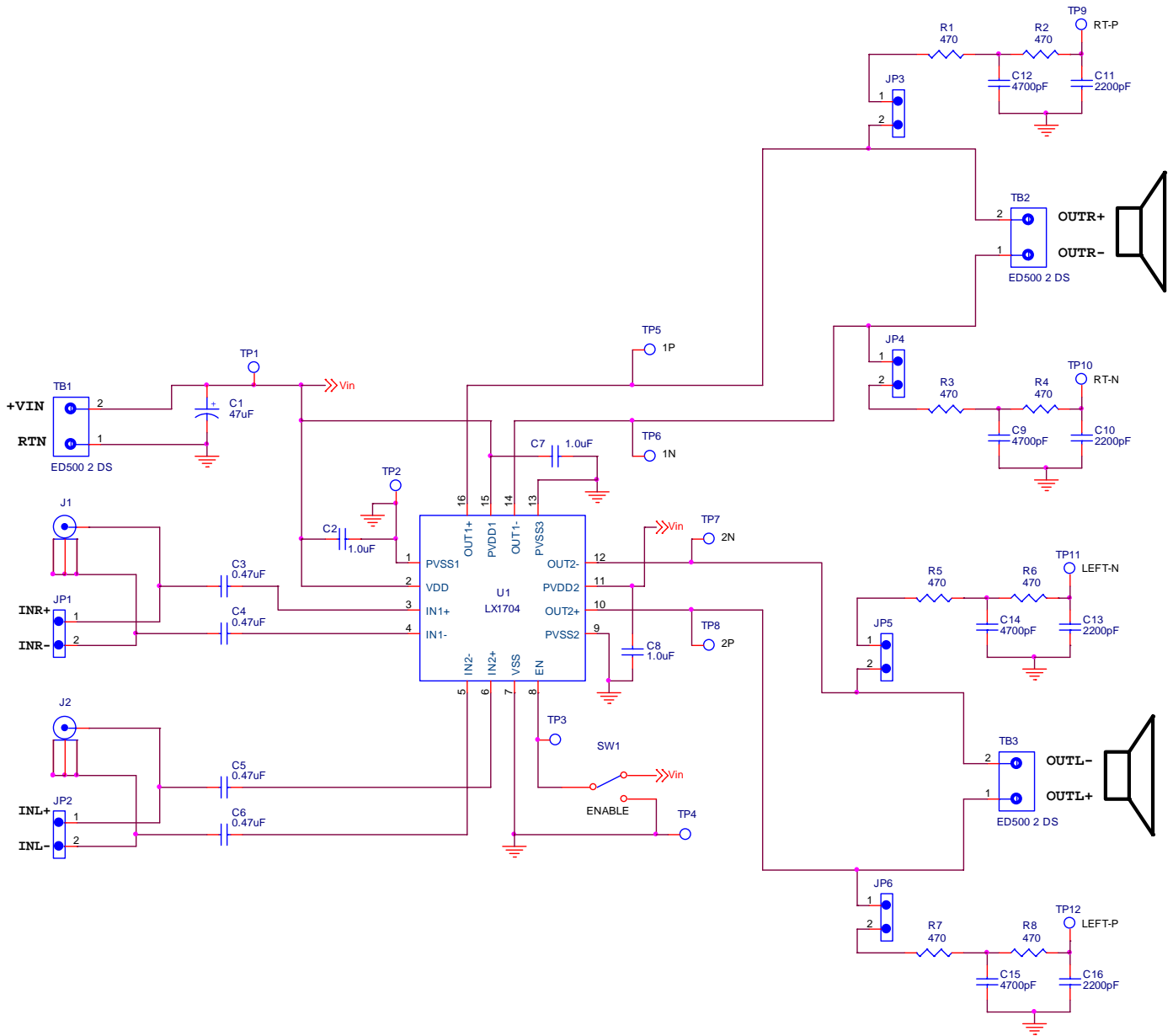


Figure 1 – LX1704 Evaluation Board Schematic

LAYOUT OF LX1704

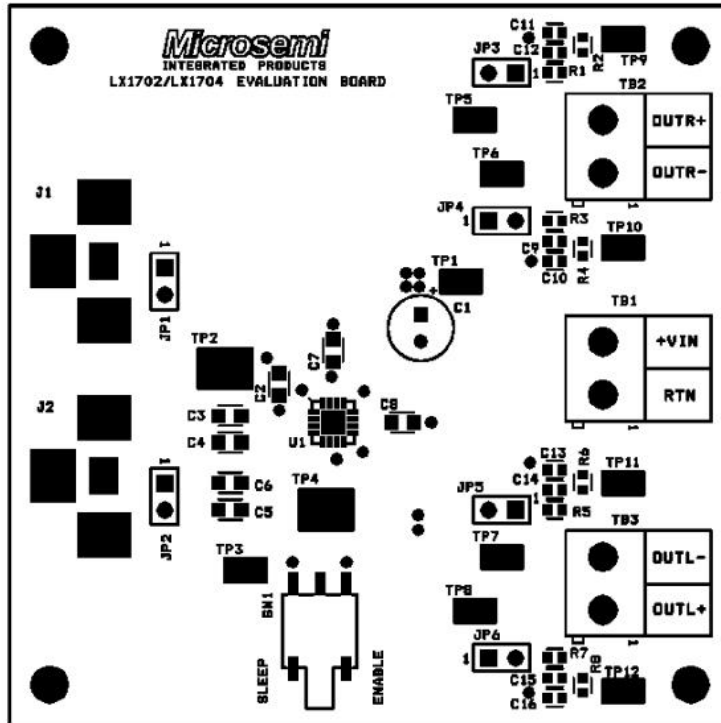


Figure 2 – LX1704 Evaluation Board Silkscreen Layer

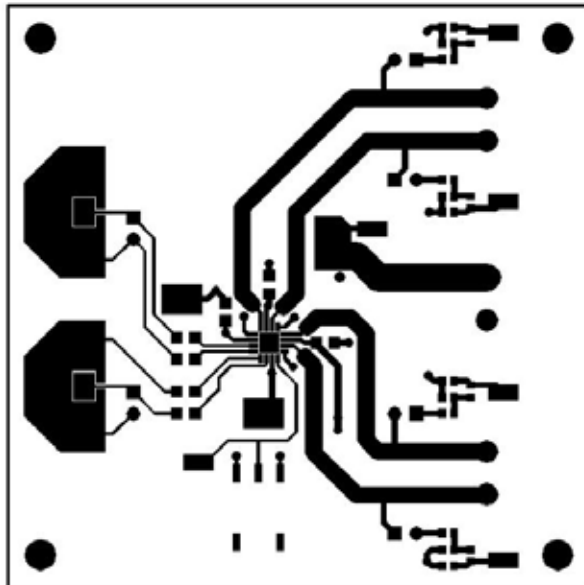


Figure 2 – Top Layer

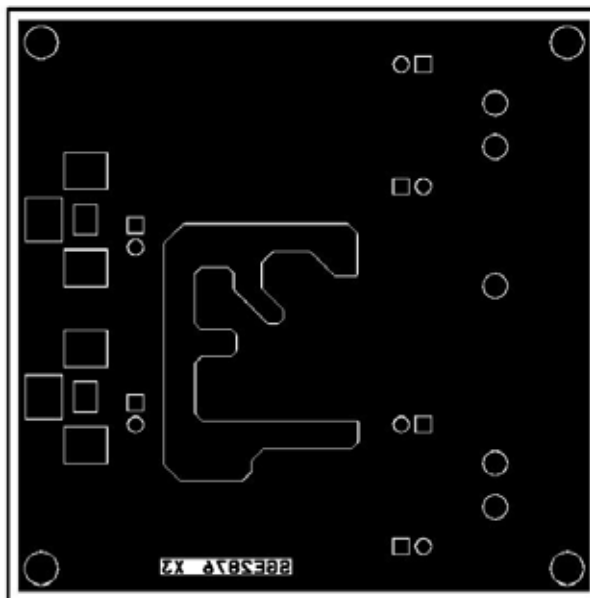


Figure 3 – Bottom Layer

LX1704 EVAL SETUP

Connections: The LX1704 Evaluation Board contains four terminal blocks for providing +5V Analog and +5 to +15 Volt Main Power supplies, and left and right output load (speaker) connections:

FUNCTION	REFERENCE	IC PIN NAME	REQUIREMENT
Main Power	TB1	PVDD PVSS VSS	+5V +/- 0.5V Input
Right Output Load	TB2	OUT1P OUT1N	4 Ohm Load
Left Output Load	TB3	OUT2P OUT2N	4 Ohm Load

In addition to the above terminal blocks, the LX1704 Evaluation Board contains two RCA Jack input connectors, Sleep Mode Switch, and 6 user configurable jumper blocks:

FUNCTION	REFERENCE	IC PIN NAME	DESCRIPTION
Right Audio Input	J1	IN1P IN1N	RCA Jack for Right Input Connection. May be Balanced or Unbalanced
Left Audio Input	J2	IN2P IN2N	RCA Jack for Left Input Connection. May be Balanced or Unbalanced
Enable / Sleep Mode	SW1	STBY	Switch for placing LX1704 in Sleep Mode
Alternate Right Input / Shorting Connector	JP1	IN1P IN1N	Alternate Right Audio Input Connection. May be used to short the input pins together (IE. for CMRR tests)

FUNCTION	REFERENCE	IC PIN NAME	DESCRIPTION
Alternate Left Input / Shorting Connector	JP2	IN2P IN2N	Alternate Left Audio Input Connection. May be used to short the input pins together (IE. for CMRR tests)

FUNCTION	REFERENCE	IC PIN NAME	DESCRIPTION
Output 40KHz Low Pass Filters	JP3 – JP6	OUT1P OUT1N OUT2P OUT2N	Jumper blocks for connecting a passive two pole, 40KHz low pass filter to each of the output drive signals. When connected provides a low pass output to test points TP9 and TP10 (Right Output), and TP11 and TP12 (Left Output). Removes switching frequency component from these test points for accurate audio frequency measurements with an oscilloscope or audio analyzer. Used for measurement purposes only; not required for normal operation.

Hookup: The following is a demonstration scenario that can be used to evaluate the LX1704:

- 1) Connect suitable loads to the left and right output connectors, TB2 and TB3, respectively. The loads may consist of a speaker (4 Ohms), or speaker simulator (resistor with series inductance). Due to the filterless design, a pure resistive load is not recommended for audio measurements; however, the LX1704 IC will drive a pure resistive load without failure.
- 2) Insure that the Sleep Mode switch, SW1, is in the "SLEEP" position.
- 3) Connect a +5 +/- 0.5 Volt power source to terminal block TB1. **Insure that this supply is switched off before connecting to TB1.**
- 4) Connect the left and right input connectors, J2 and J1, respectively, to a suitable audio source (generator or audio analyzer output). Insure that jumper blocks JP1 and JP2 are open.
- 5) Enable the +5V power source.
- 6) Insure that Jumpers JP3 – JP6 are installed. Connect an oscilloscope or audio analyzer input differentially across right channel output test points TP9(+) and TP10(-), and left channel output test points TP12(+) and TP11(-).

- 7) Enable the LX1704 by placing the sleep mode switch, SW1, in the "ENABLE" position.
- 8) Adjust the input level for the desired output level. At this point the LX1704 Evaluation Board should be fully operational, and should drive the output loads to a voltage level 10X greater than the input level.

LX1704 TYPICAL TEST HOOKUP

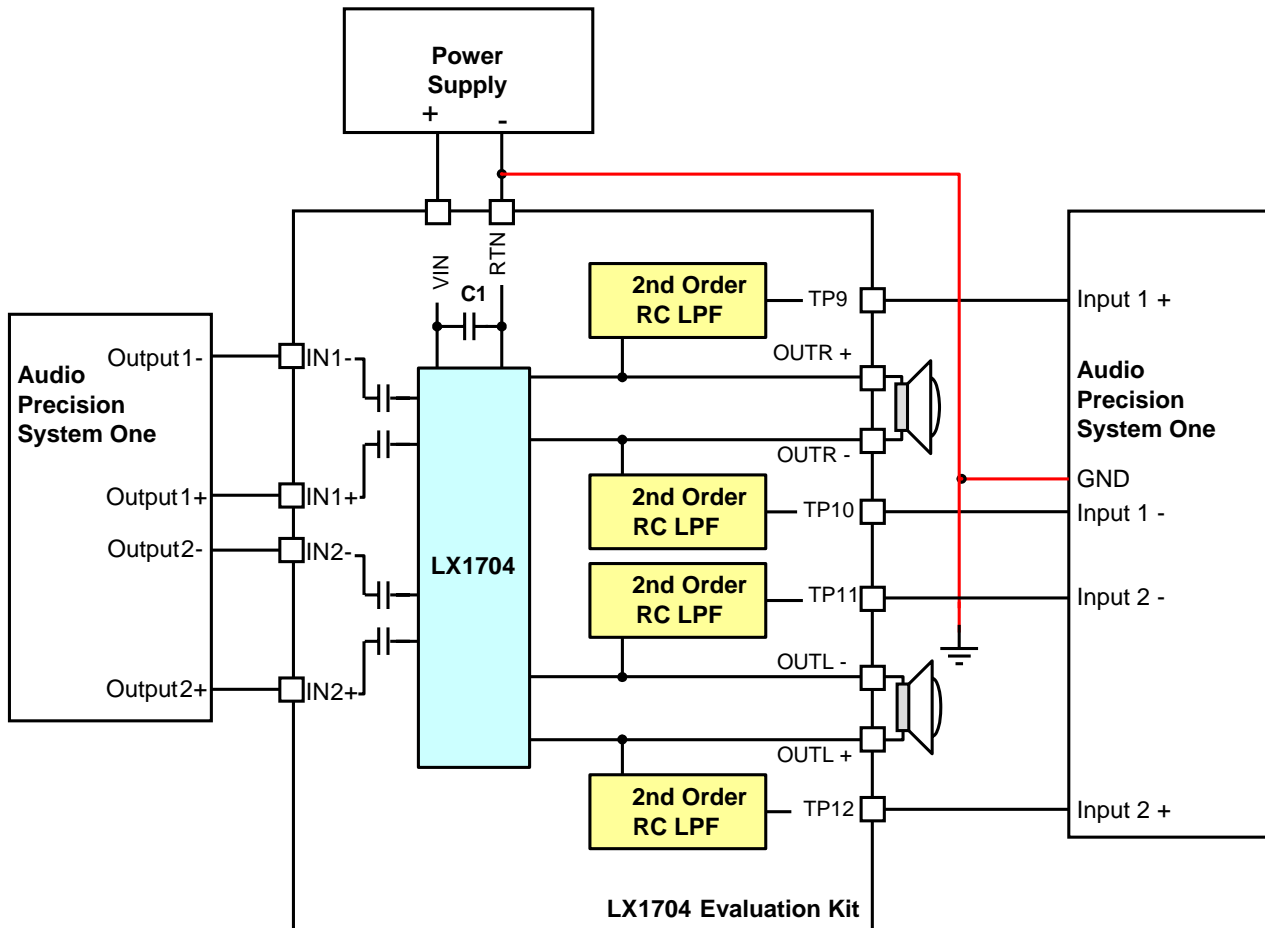


Figure 3 – LX1704 Typical Test Setup

Note: speaker load may be simulated with an 4 Ohm resistor in series with a 33uH inductor.

LX1704 EVALUATION BOARD BILL OF MATERIALS

MISCELLANEOUS COMPONENTS

Line Item	Part Description	Manufacturer & Part #		Case	Reference Designators	Qty
1	Microsemi IC – Class D Audio Amplifier	MICROSEMI	LX1704ILQ	\$x\$ MLPQ	U1	1
2	RCA Phono Jack	Keystone	901	-	J1, J2	2
3	Switch, SPDT, SMT Subminiature	C&K	GT11MSAKE	-	SW1	1
4	Terminal, Compact Style Test Point	Keystone	5016	-	TP2, TP4	2
5	Terminal, Subminiature Style Test Point	Keystone	5015	-	TP1, TP3, TP5 – TP12	10
6	Terminal Block 2 position/ 5mm spacing	Blockmaster	301-021-1000	-	TB1 – TB3	3
7	Header 2 pos Vertical, 0.100 pin spacing	3M	929450-01-02	-	JP1- JP6	6
8	Printed Circuit Board	Microsemi	SGE2876 X3			1

CAPACITORS

Line Item	Part Description	Part Number		Case	Reference Designators	Qty
1	Capacitor, Ceramic, 1uF, 10V, 10%	Panasonic	ECJ-2FB1A105K	0805	C2, C7, C8	3
2	Capacitor, Ceramic, 0.47uF, 16V, 10%	Panasonic	ECJ-2YB1C474K	0805	C3 – C6	4
3	Capacitor, Ceramic, 4700pF, 50V, 10%	Panasonic	ECJ-1VB1H472K	0603	C9, C12, C14, C15	4
4	Capacitor, Ceramic, 2200pF, 50V, 10%	Panasonic	ECJ-1VB1H222K	0603	C10, C11, C13, C16	4
5	Capacitor, Electrolytic, 47uF, 35V, 20% KS series	Panasonic	ECEA1VKS470i	8X5mm	C1	1

RESISTORS

Line Item	Part Description	Part Number		Case	Reference Designators	Qty
1	Resistor, 470 Ohms, 5%, 1/10W	Panasonic	ERJ-3GSY471	0603	R1 – R8	8