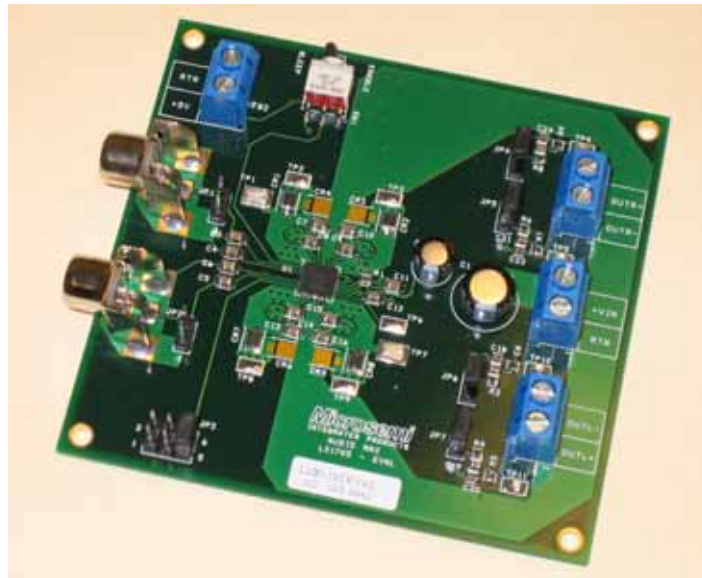


LX1705 8+8W STEREO FILTERLESS CLASS-D AMPLIFIER



INTRODUCTION TO PRODUCT

The LX1705 Evaluation Board is available from Microsemi for evaluating the performance of the LX1705 Class D Audio Amplifier Integrated Circuit. The evaluation board contains one LX1705 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, shorting the input connections, as well as setting the state of the Mute / Gain control.

KEY FEATURES

- Filter Free Operation
- 8W + 8W Output Power into 8 Ω load: THD+N < 1%
- High Efficiency, > 90%
- Full Audio Bandwidth: 20Hz to 20KHz
- Low Distortion: <0.15% @ 30% Max. Power, 1KHz
- High Signal to Noise Ratio: 90dB
- Wide Supply Voltage Range: 5.0 – 15V
- Low Quiescent Current: < 30mA
- Pop Free Turn ON/OFF
- Standby / Mute Feature
- Built-in Under Voltage Lockout
- Thermal Protection

APPLICATIONS

- LCD TV
- Car Navigation
- Portable Sound Systems
- MP3 Players

PART SPECIFIC INFORMATION

| Part Number | T _A (°C) | Package | Product |
|-------------|---------------------|----------------------------------|---|
| LX1705ILQ | -40 to 85 | Plastic MLPQ 32-Pin 5mm x 5mm | 8+8 Watt Stereo Filterless Class D Audio Amplifier |

TABLE 1 – PART INFORMATION

| IC | EVALUATION BOARDS |
|-----------|-------------------|
| LX1705ILQ | LX1705 EVAL KIT |

TABLE 2 – EVALUATION BOARD INFORMATION

SCHEMATIC FOR LX1705

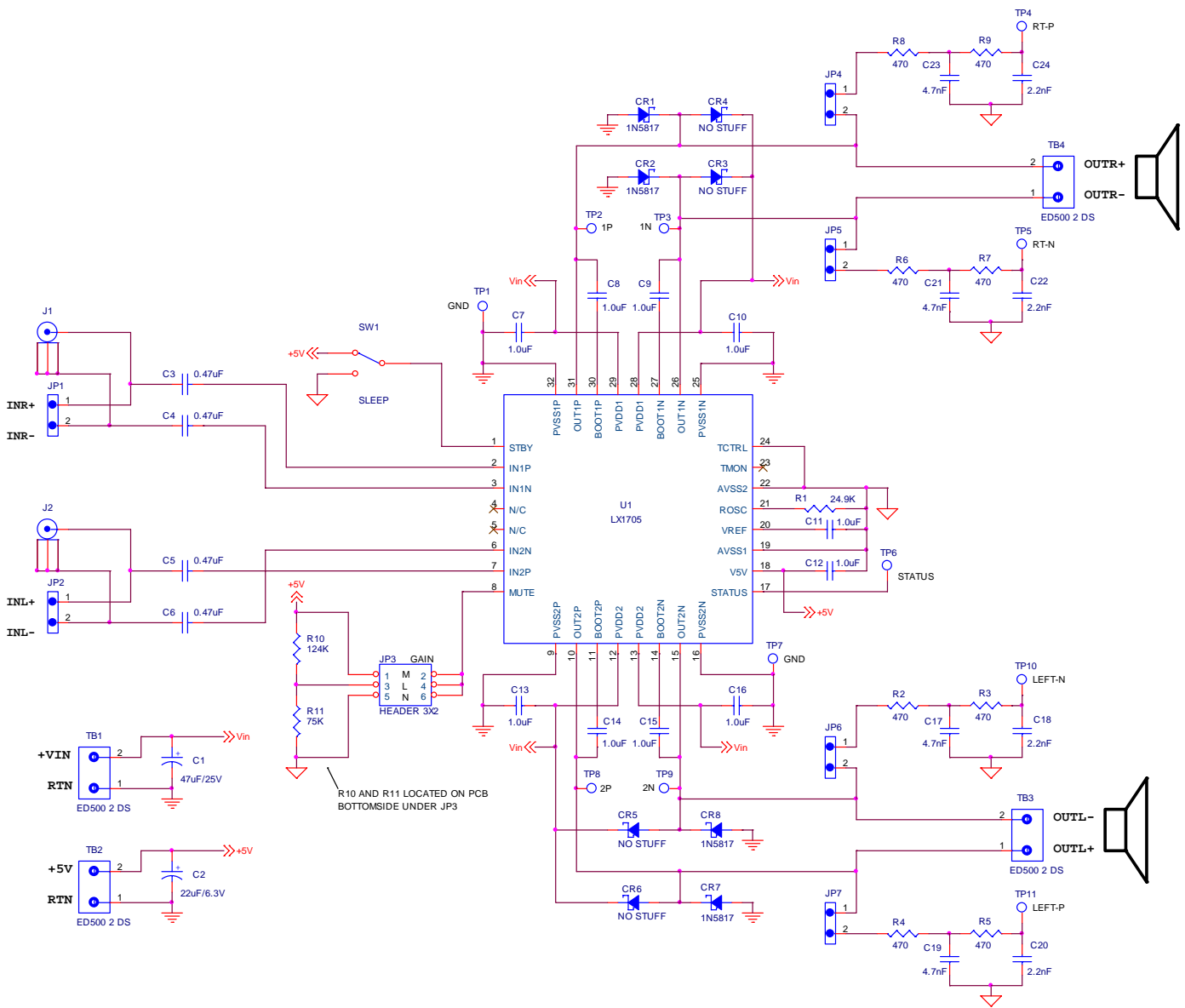
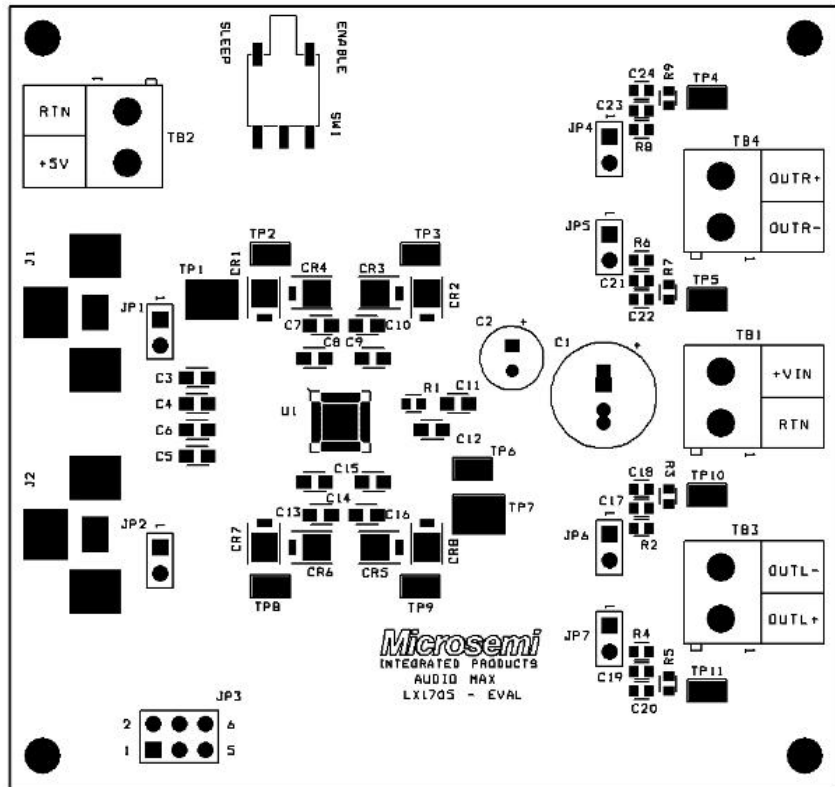


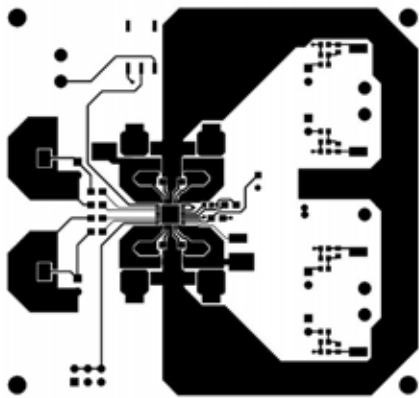
Figure 1 – LX1705 Evaluation Board Schematic

LAYOUT OF LX1705



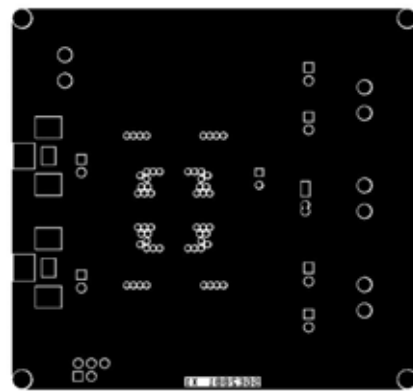
TOP SOLDERMASK
TOP SILKSCREEN

Figure 2 – LX1705 Evaluation Board Silkscreen Layer



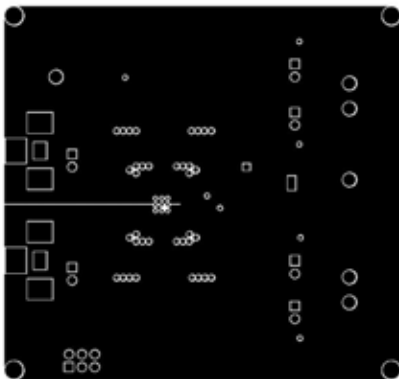
TOP LAYER 1

Figure 2 – Top Layer



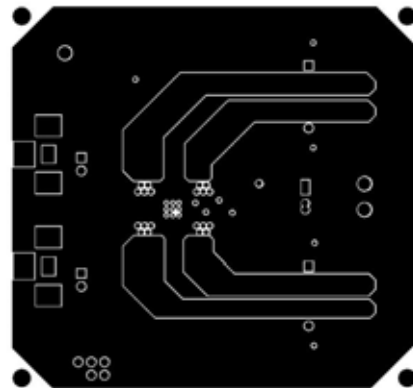
2 3BYAJ MOTT08

Figure 3 – Bottom Layer



INNER LAYER 1

Figure 4 – Inner 2 Layer



INNER LAYER 2

Figure 5 – Inner 3 Layer

LX1705 EVAL SETUP

Connections: The LX1705 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 |
|-------------------|-----------|----------------|----------------------|
| +5V Analog | TB2 | V5V AVSS | 5V +/- 0.5V Input |
| Main Power | TB1 | PVDD PVSS | +5V to +15V Input |
| Left Output Load | TB3 | OUT2P OUT2N | 8 to 4 Ohm Load |
| Right Output Load | TB4 | OUT1P OUT1N | 8 to 4 Ohm Load |

In addition to the above terminal blocks, the LX1705 Evaluation Board contains two RCA Jack input connectors, Sleep Mode Switch, and 7 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 LX1705 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) |
| Alternate Left Input / Shorting | JP2 | IN2P IN2N | Alternate Left Audio Input Connection. May be used to short the input pins |

| FUNCTION | REFERENCE | IC PIN NAME | DESCRIPTION |
|-------------------------------|-----------|----------------------------------|---|
| Connector | | | together (IE. for CMRR tests) |
| Mute / Gain Control | JP3 | MUTE | Three position jumper block for providing Mute / Gain Control: Position 1 = Mute Position 2 = Low Gain (20dB) Position 3 = High Gain (26dB) |
| Output 40KHz Low Pass Filters | JP4 – JP7 | 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 TP4 and TP5 (Right Output), and TP10 and TP11 (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 LX1705:

- 1) Connect suitable loads to the left and right output connectors, TB3 and TB4, respectfully. The loads may consist of a speaker (4 or 8 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 LX1705 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 TB2. **Insure that this supply is switched off before connecting to TB2.**
- 4) Connect a +5 to +15 Volt power source to terminal block TB1. Insure that this source has enough current to handle the required audio output power. **Insure that this supply is switched off before connecting to TB1.**
- 5) Enable the +5V and the +5V to +15V power sources.
- 6) Connect the left and right input connectors, J2 and J1, respectfully, to a suitable audio source (generator or audio analyzer output).

- Insure that jumper blocks JP1 and JP2 are open.
- 7) Place the Mute / Gain control jumper block, JP3, in either the high gain (position 3) or low gain (position 2) by installing a jumper to the appropriate position.
 - 8) Insure that Jumpers JP4 – JP7 are installed. Connect an oscilloscope or audio analyzer input differentially across right channel output test points TP4(+) and TP5(-), and left channel output test points TP11(+) and TP10(-).
 - 9) Enable the LX1705 by placing the sleep mode switch, SW1, in the “ENABLE” position.
 - 10) Adjust the input level for the desired output level. At this point the LX1705 Evaluation Board should be fully operational, and should drive the output loads to the level set by the gain control and the input level.

LX1705 TYPICAL TEST HOOKUP

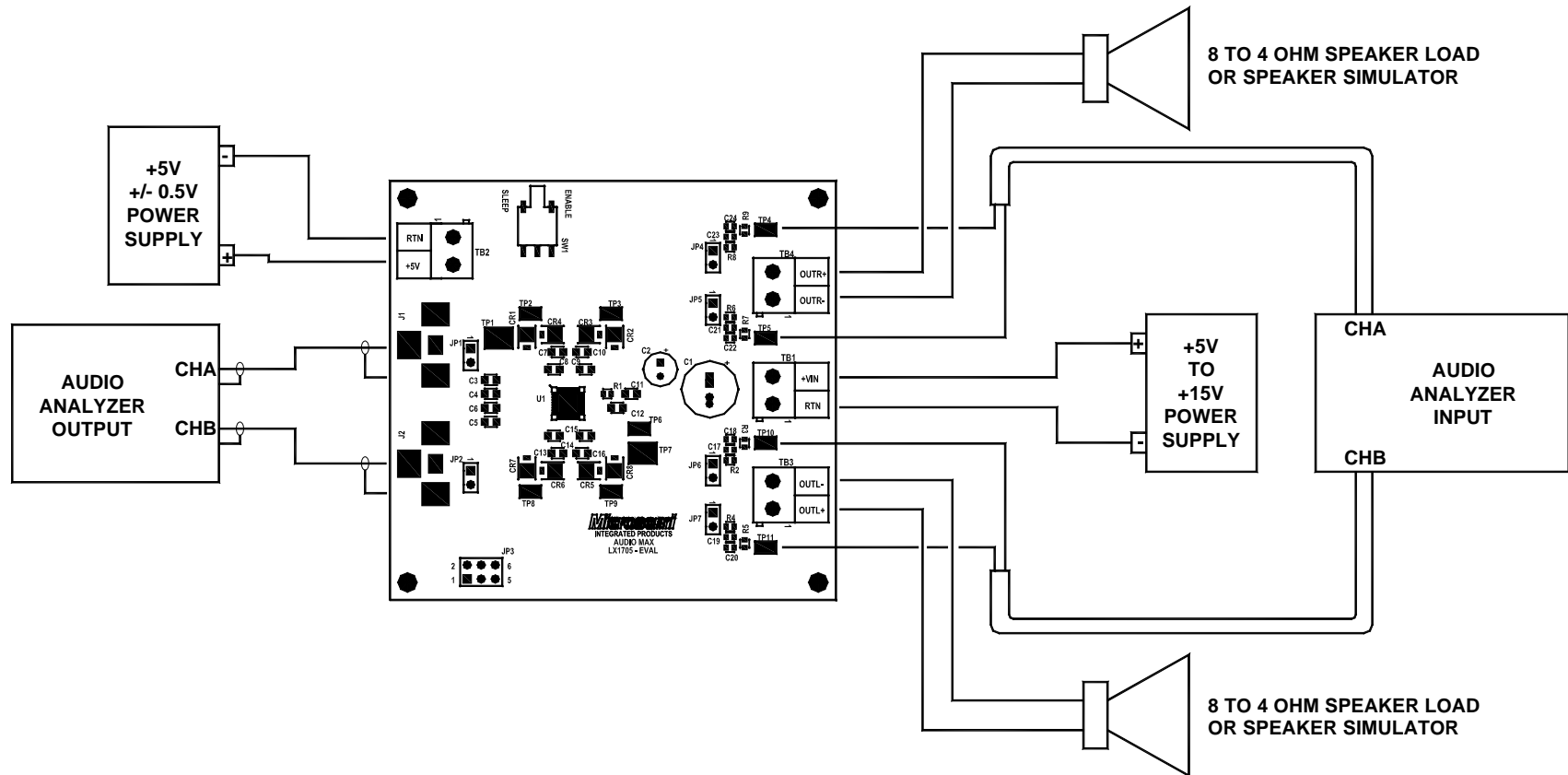


Figure 3 – LX1705 Typical Test Setup

LX1705 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 | LX1705ILQ | 5X5 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 | - | TP1, TP7 | 2 |
| 5 | Terminal, Subminiature Style Test Point | Keystone | 5015 | - | TP2 – TP6, TP8 – TP11 | 9 |
| 6 | Terminal Block 2 position/ 7mm spacing | Blockmaster | 301-021-1000 | - | TB1 – TB4 | 4 |
| 7 | Header 3 pos. Vertical, 0.100 pin spacing | 3M | 926142-01-03 | - | JP3 | 1 |
| 8 | Header 2 pos Vertical, 0.100 pin spacing | 3M | 929450-01-02 | - | JP1, JP2, JP4 – JP7 | 6 |
| | | | | | | 2 |
| | | | | | | 2 |
| 9 | Printed Circuit Board | Microsemi | SGE2881 X1 | | | 1 |

CAPACITORS

| Line Item | Part Description | Part Number | | Case | Reference Designators | Qty |
|-----------|---|-------------|---------------|-------|-----------------------|-----|
| 1 | Capacitor, Ceramic, 1uF, 16V, 10% | Panasonic | ECJ-2FB1C105K | 0805 | C7 – C16 | 10 |
| 2 | Capacitor, Ceramic, 0.47uF, 16V, 10% | Panasonic | ECJ-2YB1C474K | 0805 | C3 – C6 | 4 |
| 3 | Capacitor, Ceramic, 4700pF, 50V, 10% | Panasonic | ECJ-1VB1H472K | 0603 | C17, C19, C21, C23 | 4 |
| 4 | Capacitor, Ceramic, 2200pF, 50V, 10% | Panasonic | ECJ-1VB1H222K | 0603 | C18, C20, C22, C24 | 4 |
| 5 | Capacitor, Electrolytic, 47uF, 35V, 20% KS series | Panasonic | ECEA1VKS470i | 8X5mm | C1 | 1 |
| 6 | Capacitor, Electrolytic, 22uF, 35V, 20% KS series | Panasonic | ECEA1VKS220i | 6X5mm | C2 | 1 |

RESISTORS

| Line Item | Part Description | Part Number | | Case | Reference Designators | Qty |
|-----------|-------------------------------|-------------|---------------|------|-----------------------|-----|
| 1 | Resistor, 24.9K, 1%, 1/10W | Panasonic | ERJ-3EKF2492V | 0603 | R1 | 1 |
| 2 | Resistor, 470 Ohms, 5%, 1/10W | Panasonic | ERJ-3GSY471 | 0603 | R2 – R9 | 8 |
| 3 | Resistor, 124K, 1%, 1/10W | Panasonic | ERJ-3EKF1243V | 0603 | R10 | 1 |
| 4 | Resistor, 75.0k, 1%, 1/10W | Panasonic | ERJ-3EKF7502V | 0603 | R11 | 1 |
| | | | | | | |
| | | | | | | |

OPTIONAL DIODES*

| Line Item | Part Description | Part Number | | Case | Reference Designators | Qty |
|-----------|--|-------------|---------|-----------|-----------------------|-----|
| 1 | Diode, Schottky, UPS5817 Powermite SMT | Microsemi | UPS5817 | Powermite | CR1, CR2, CR7, CR8 | 4 |
| | | | | | | |

* These diodes provide reduced distortion and are optional.