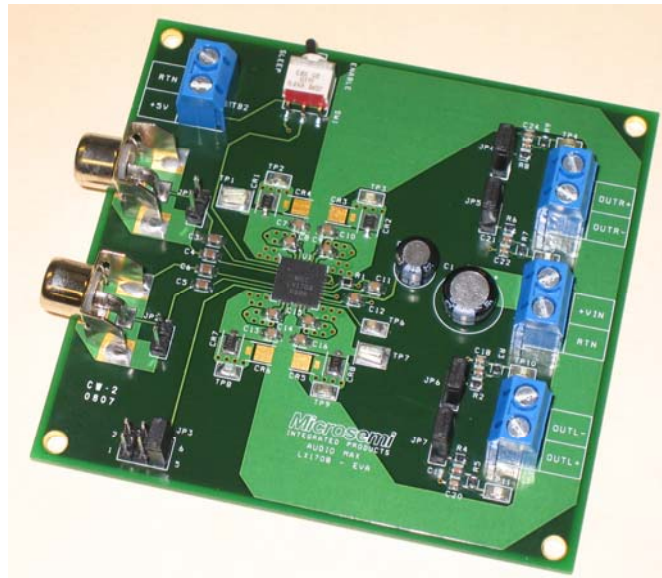


LX1708 15W+15W STEREO FILTERLESS CLASS-D AMPLIFIER



INTRODUCTION TO PRODUCT

The LX1708 Evaluation Board is available from Microsemi for evaluating the performance of the LX1708 Class D Audio Amplifier Integrated Circuit. The evaluation board contains one LX1708 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
- 12W + 12W Output Power into 4 Ω load: THD+N < 1%
- 7W + 7W Output Power into 8 Ω load: THD+N < 1%
- High Efficiency, > 90%
- Full Audio Bandwidth: 20Hz to 20KHz
- Low Distortion: <0.4% @ 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
LX1708ILQ	-40 to 85	Plastic MLPQ 32-Pin 7mm x 7mm	15+15 Watt Stereo Filterless Class D Audio Amplifier

TABLE 1 – PART INFORMATION

IC	EVALUATION BOARDS
LX1708ILQ	LX1708 EVAL KIT

TABLE 2 – EVALUATION BOARD INFORMATION

SCHEMATIC FOR LX1708

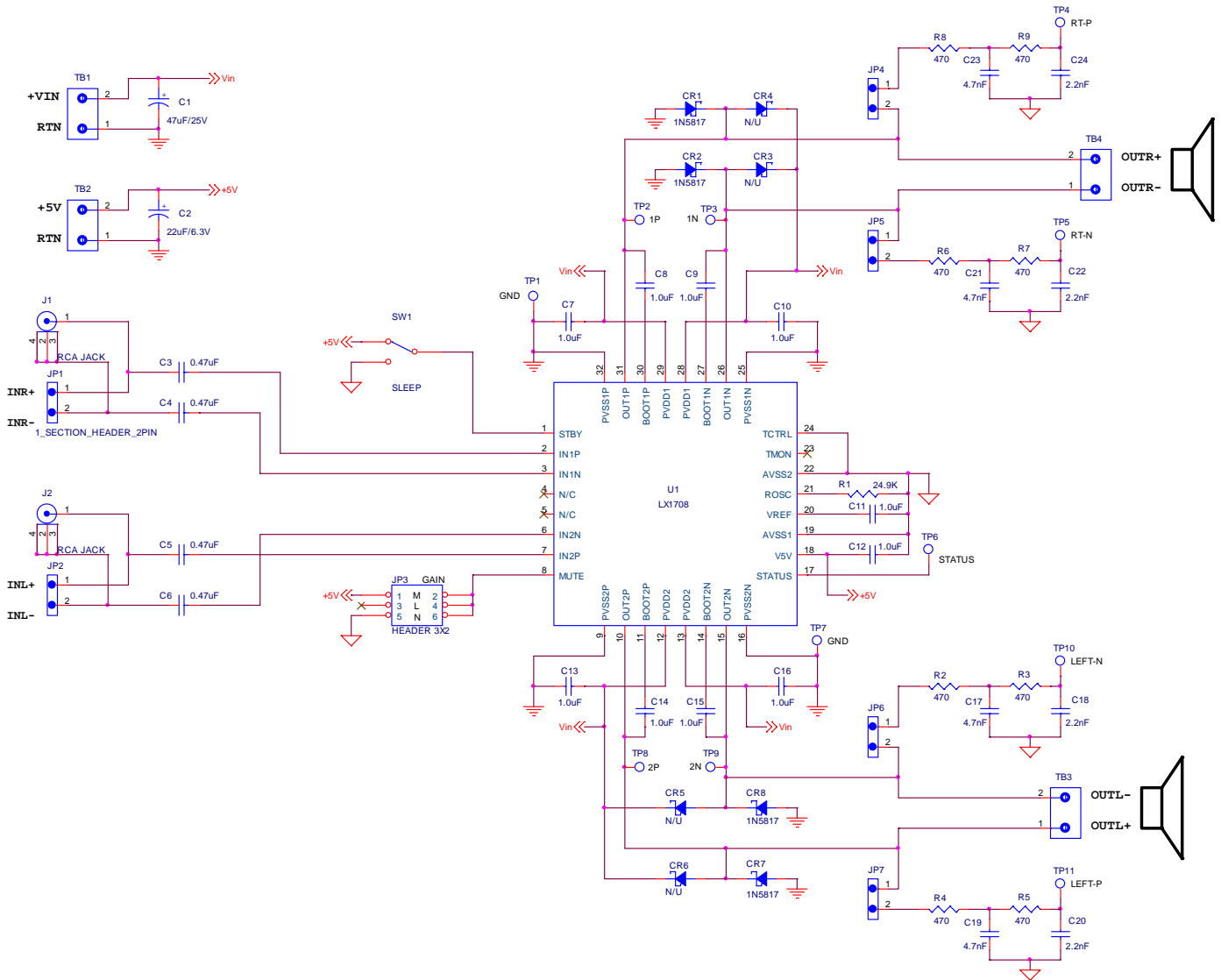
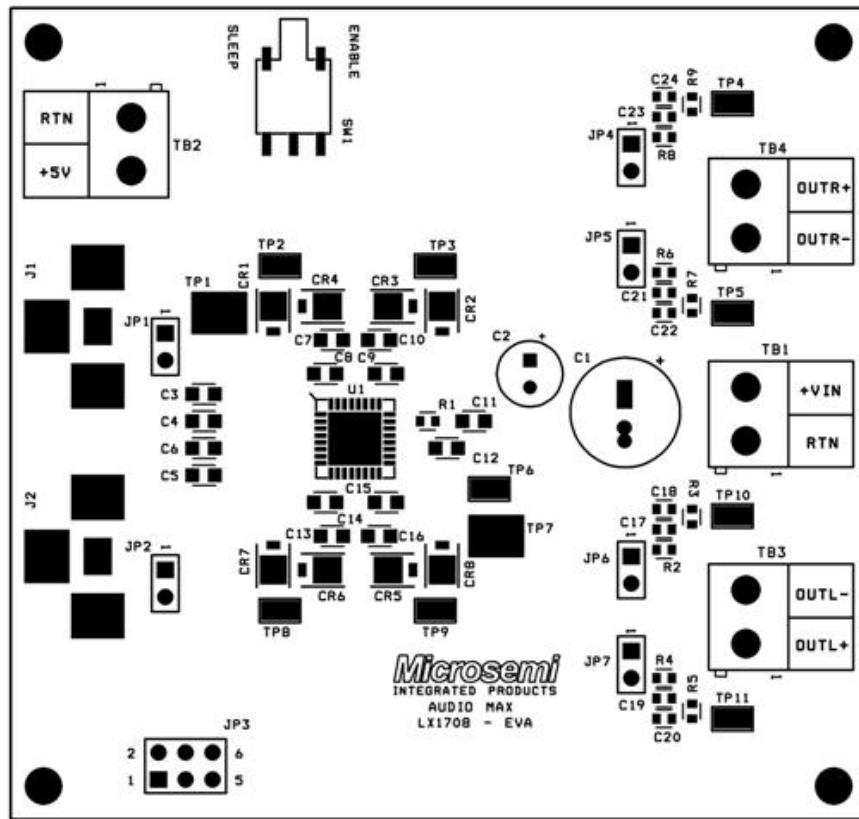


Figure 1 – LX1708 Evaluation Board Schematic

LAYOUT OF LX1708



TOP SOLDERMASK
TOP SILKSCREEN

Figure 2 – LX1708 Evaluation Board Silkscreen Layer

Note: Evaluation Board Dimensions (L X H) = 3.175 in. X 3.000 in.

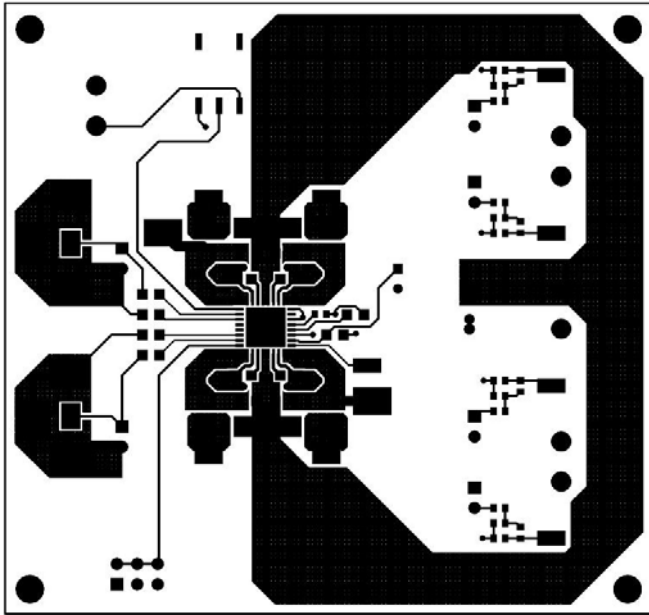


Figure 2 – Top Layer

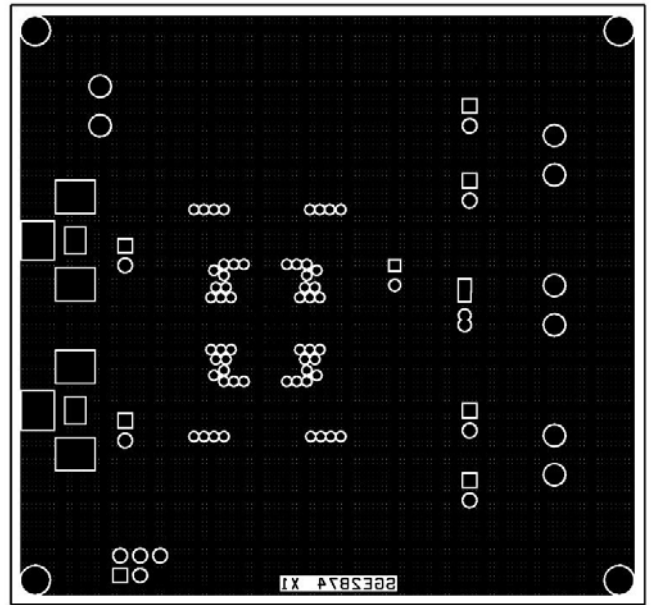


Figure 3 – Bottom Layer

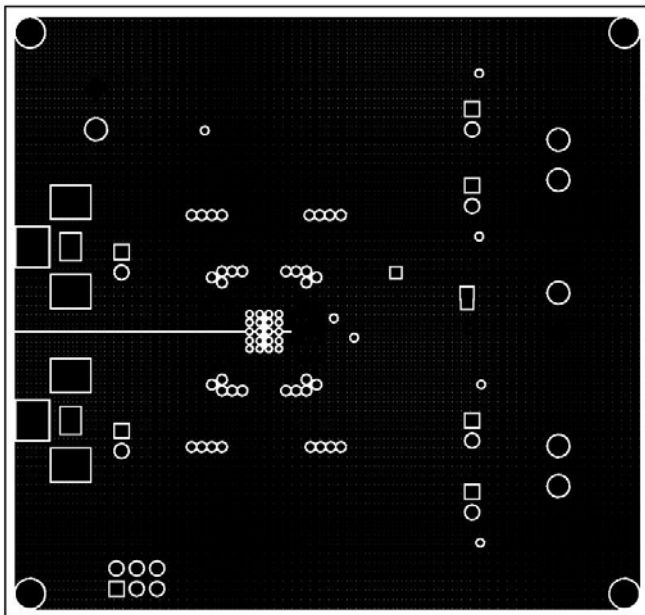


Figure 4 – Inner 2 Layer

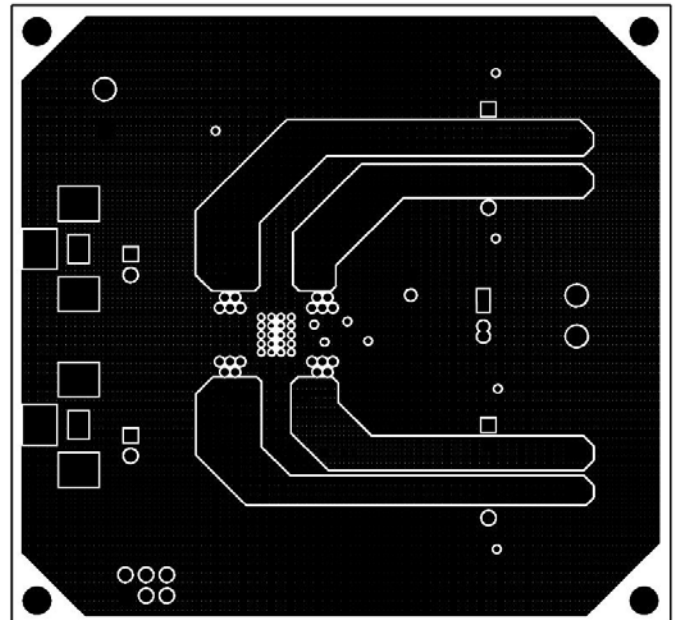


Figure 5 – Inner 3 Layer

LX1708 EVAL SETUP

Connections: The LX1708 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 LX1708 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 LX1708 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 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
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 LX1708:

- 1) Connect suitable loads to the left and right output connectors, TB3 and TB4, respectively. 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 LX1708 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, respectively, 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 LX1708 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 LX1708 Evaluation Board should be fully operational, and should drive the output loads to the level set by the gain control and the input level.

LX1708 TYPICAL TEST HOOKUP

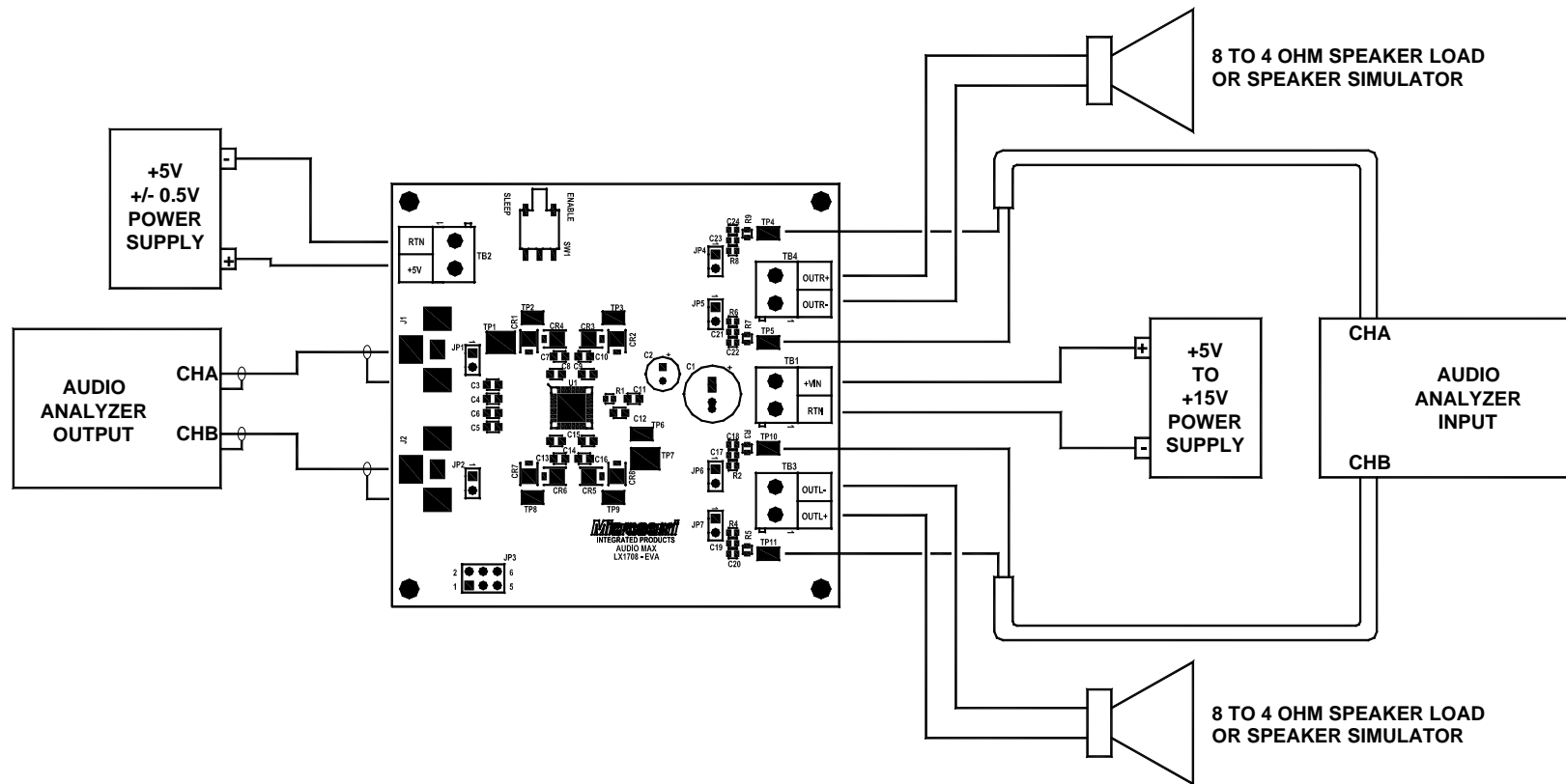


Figure 3 – LX1708 Typical Test Setup

LX1708 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	LX1708ILQ	7X7 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	SGE2874 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.