

LXE1722-150 AUDIOMAX EVALUATION KIT USER'S GUIDE



LXE1722-150 Evaluation Board Quick Start Guide

The LXE1722-150 Evaluation Board is a fully functional stereo class-D amplifier. Connection to a single power supply, two speakers, and an audio source is all that is required to begin evaluating the amplifier. The amplifier will support continuous output power levels up to **>110W x 2** into 2 ohm load (<1% THD+N).

Board Setting

1. **Power and Ground Connections:** The terminal JP1 is for the power supply connection. Vcc is connected to the positive polarity of the power supply or battery (+7V ~ +25V); 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 Connections:** JP5 and JP6 are the speaker outputs. JP5 is for the left channel (CH1) and JP6 is for the right channel (CH2). Connect speaker “+” and “-“ to “LOUT+/ROUT+” and “LOUT-/ROUT-“ of JP5/JP6. This evaluation board is designed for standard 4 ohm speaker loads. For different impedance speakers, the output filter values should be modified to optimize the output frequency response. Please see AudioMAX Design Resource (AN-16) for LC filter values.
3. **Audio Input Connections:** JP2, JP2A, RCA1 and RCA2 are the audio input connections. JP2/JP2A support differential audio inputs, and RCA1/RCA2 are for the single-ended audio inputs. When audio inputs are differential, the positive audio inputs are connected to LIN+/RIN+ pin, while the negative inputs are connected to LIN-/RIN- pin of the JP2/JP2A terminals. J1 and J2 jumpers are left open when using differential inputs. When audio inputs are single-ended, the inputs audio source can either be connected to terminal JP2/JP2A, or to RCA1/RCA2. In this single-ended connection, jumpers J1 and J2 must be closed so that the LIN-/RIN- audio inputs are connected to Ground.
4. **SLEEP/MUTE Connections:** JP4 is the jumper selection for ON/OFF of SLEEP and MUTE functions. To enable the amplifier, both jumpers should be set to “OFF” (SLEEP is OFF, and MUTE is OFF).
5. **Pre-amp Output Connections:** JP3 is the header for stereo, single-ended pre-amp outputs, “LPREOUT – GND – RPREOUT”. These outputs are provided to drive other crossover networks or to support additional power amplifiers such as for a Subwoofer speaker system.

APPLICATION SCHEMATIC

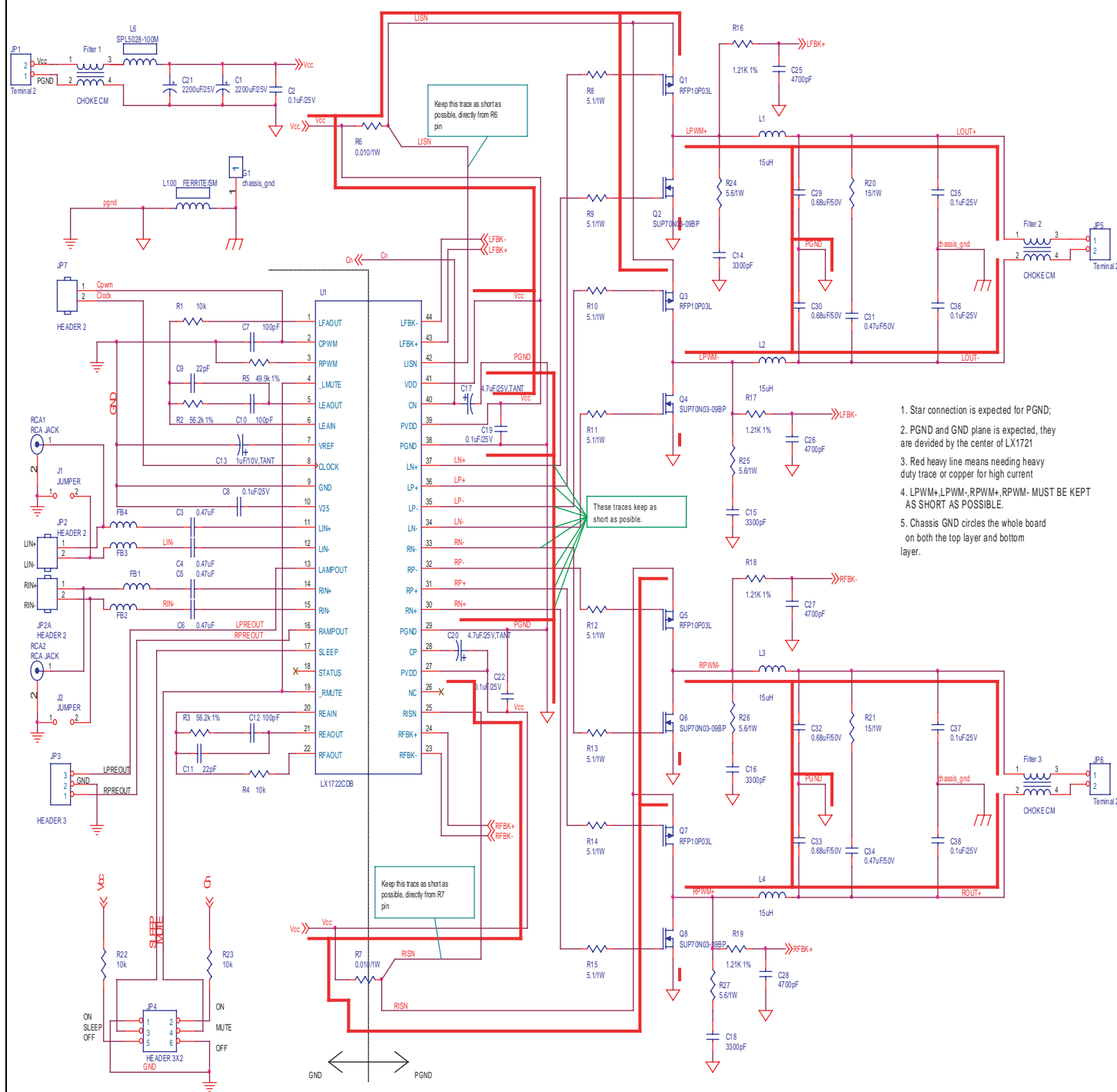


FIGURE 1 - LXE1722-150 SCHEMATIC

BILL OF MATERIALS

MISCELLANEOUS COMPONENTS

Line Item	Part Description	Manufacturer & Part #	Case	Reference Designators	Qty
1	IC, Controller	LINFINITY LX1722CDB	QSOP 44	U1	1
2	IC, P – Channel MOSFET	INTERSIL RFP10P03L	TO-220	Q1, Q3, Q5, Q7	4
3	IC, N – Channel MOSFET	VISHAY SUP70N03-09BP	TO-220	Q2, Q4, Q6, Q8	4
4	Ferrite Bead	MURATA BLM41P102SGPT	1206	L100	1
5	Choke CM (EMI common mode)		Choke	Filter1, Filter2, Filter3	3
6	Printed Circuit Board	LINFINITY SGE2813-X2	PCB	Rev. X2	1
7	Power Supply Choke	SPL5028-100M	Choke	L6	1
8	Inductor, 15uH	ABRACON AIMT-103-15uH	TH	L1, L2, L3, L4	4
9	Phono Jack, 90° Nickel Plated, White	MOUSER 161-4214	TH	RCA1	1
10	Phono Jack, 90° Nickel Plated, Red	MOUSER 161-4214	TH	RCA2	1
11	Header, Str. .100" Center, 2Pos	ANY 87220-2	TH	J1, J2, JP2, JP2A, JP7	5
12	Header, Str. .100" Center, 3Pos	ANY 87220-3	TH	JP3	1
13	Header, Double Row .100" Center, 6Pos	ANY 1/87215-2	TH	JP4	1
14	Shorting Jumpers, Open Top, Black	MOUSER 151-8030	TH	J1, J2	2
15	Terminal Block 2Pos 5mm	BLOCK MASTER 301-021-1000	TH	JP1, JP5, JP6	3

CAPACITORS

Line Item	Part Description	Manufacturer & Part #	Case	Reference Designators	Qty
1	Capacitor, 22pF, 50V, 5%	NOVACAP 0805N220J500NT AVX 08055C220JAT2A	0805	C9, C11	2
2	Capacitor, 100pF, 50V, 5%	NOVACAP 0805N101J500NT AVX 08055C101JAT2A	0805	C7, C10, C12	3
3	Capacitor, 100nF, 50V, 20%	AVX 08055C104MAT2A NOVACAP 0805B104M500NT SAMSUNG CL21B104MBNC	0805	C2, C8, C19, C22, C35, C36, C37, C38	8
4	Capacitor, 4700pF, 50V, 5%	CALCHIP GMC21CG472J50NT	0805	C25, C26, C27, C28	4
5	Capacitor, Tant 1uF, 16V, 20%	KEMET T491A105M016AS AVX TAJA105M016R	3216	C13	1
6	Capacitor, Tant 4.7uF, 25V	KEMET T491A475M016AS AVX TAJA475M016R	3216	C17, C20	2
7	Capacitor, 0.47uF, 50V, 5%	PANASONIC ECQ-V1H474JL	TH	C3, C4, C5, C6, C31, C34	6
8	Capacitor, 0.68uF, 50V	PANASONIC ECQ-V1H684JL	TH	C29, C30, C32, C33	4
9	Capacitor, 2200uF, 25V, 20%	PANASONIC EEU-FC1E222	TH	C1, C21	2

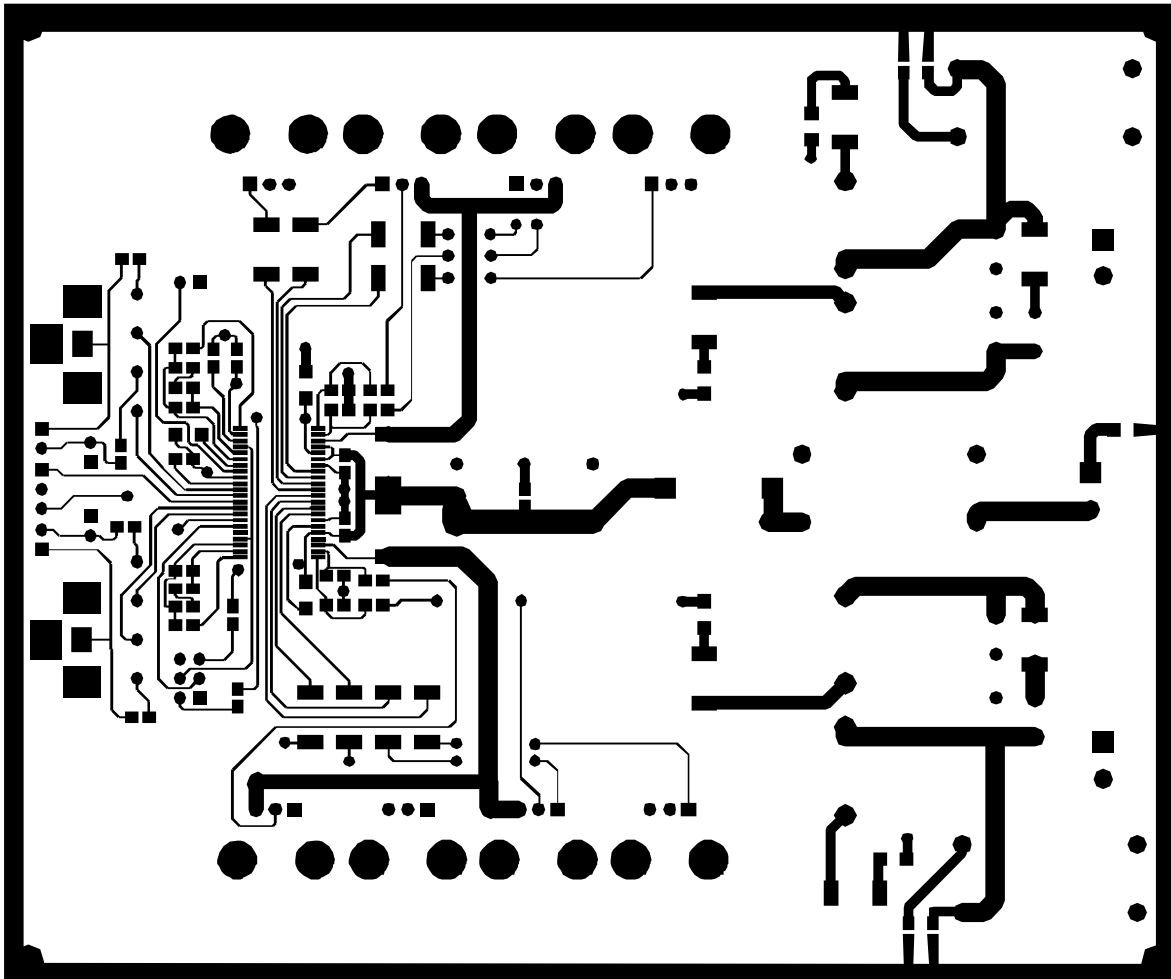
RESISTORS

Line Item	Part Description	Manufacturer & Part #	Case	Reference Designators	Qty
1	Resistor, 10K, 5%, 1/8W	ASJ CR21J103T	0805	R1, R3, R22, R23	4
2	Resistor, 1.21K, 1%, 1/8W	ASJ CR21F1211T	0805	R16, R17, R18, R19	4
3	Resistor, 49.9K, 1%, 1/8W	ASJ CR21F4992T	0805	R5	1
4	Resistor, 56.2K, 1%, 1/8W	ASJ CR21F5622T	0805	R2, R4	2
5	Resistor, 5.1 Ohm, 5%, 1W	KOA RM73B3A5R1J ROHM MCR100JZHJ5R1	2512	R8, R9, R10, R11, R12, R13, R14, R15	8
6	Resistor 15 Ohm, 5%, 1W	KOA RM73B3A150J ROHM MCR100JZHJ150	2512	R20, R21	2
7	Resistor, 0.01 Ohm, 1W, 5%	VISHAY WSL2512R010FRE4	2512	R6, R7	2
8	Resistor, 0 Ohm, 5% 0805	ASJ CR21J000T	0805	FB1, FB2, FB3, FB4	4

Note: L6, Filter1/2/3 & R24/R25/R26/R27 are optional for EMI reduction.

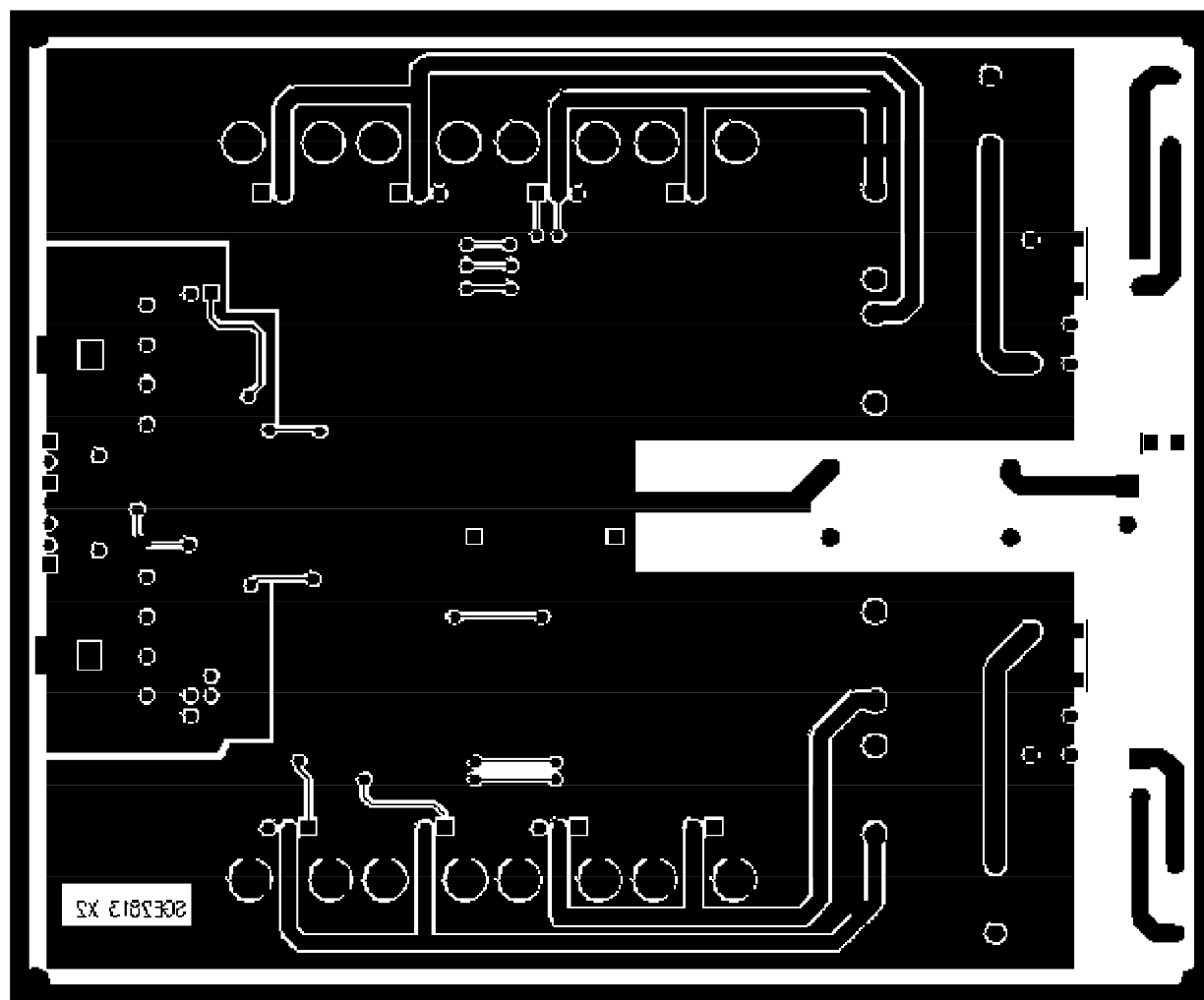
BOARD LAYOUT

FIGURE 2 - COMPONENTS LAYER LAYOUT



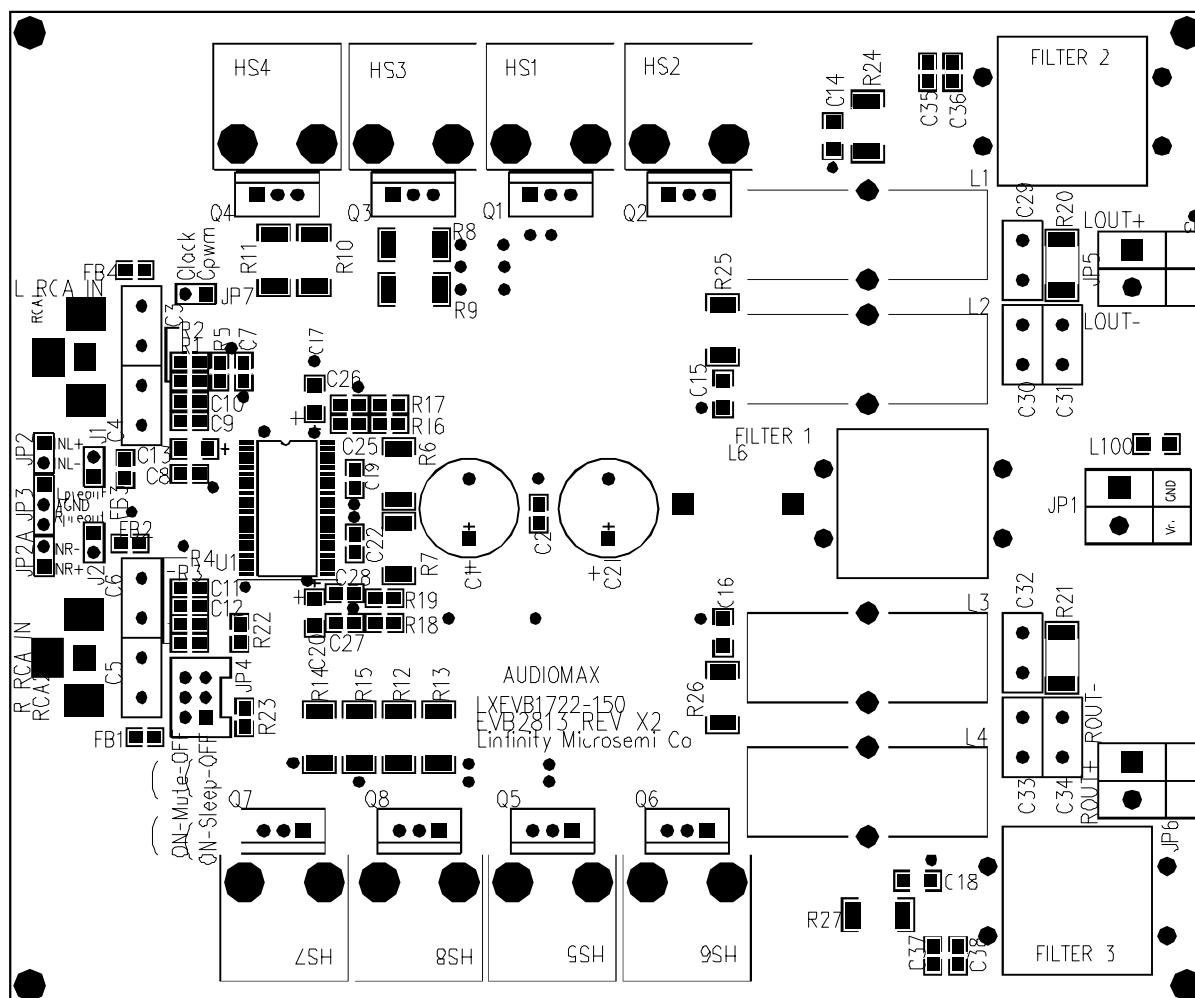
BOARD LAYOUT (CONTINUED)

FIGURE 3 – SOLDER LAYER LAYOUT



BOARD LAYOUT (CONTINUED)

FIGURE 4 - LXE1722-150 COMPONENTS PLACEMENT



ABSOLUTE MAXIMUM RATINGS

Unless otherwise specified, the following specifications apply over the operating ambient temperature $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$

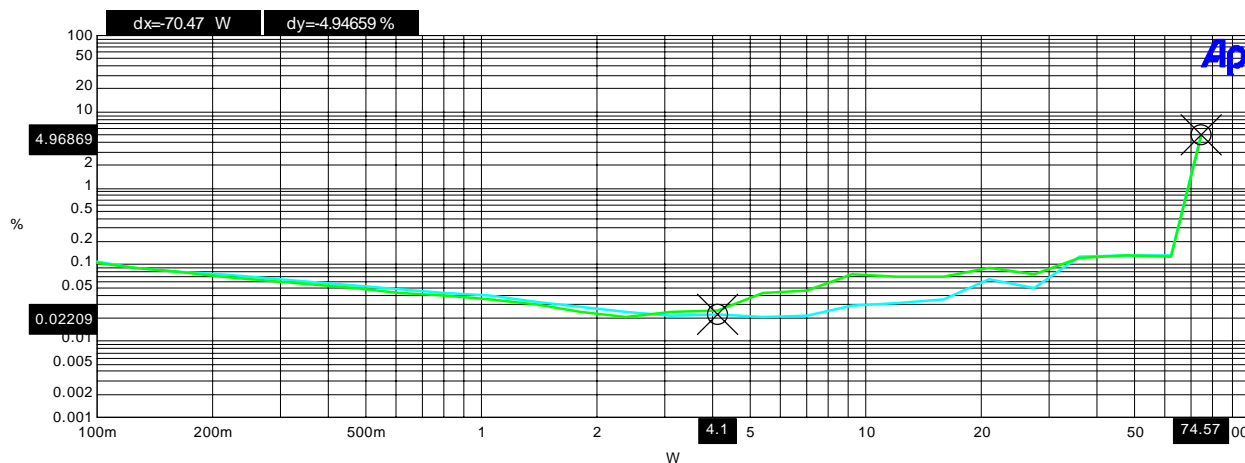
Parameter	Symbol	Test Conditions	LX1722-150			Units
			Min	Typ	Max	
Supply Voltage	VCC		7		25	V
Supply Current	IDD	VCC=25V			12	A
Quiescent Current	IQ	VCC=25V, Output Open		200		mA
Sleep, Status		VCC = 25V	-0.3		VCC + 0.3	V
RPWM, CPWM, Mute		VCC = 25V	-0.3		VCC + 0.3	V
LIN+, LIN-, RIN+, RIN-	VIN	VCC = 25V	-0.3		VCC + 0.3	V
LPREOUT, RPREOUT	VPRE	VCC = 25V	-0.3		VCC + 0.3	V
Clock Frequency	FOSC	VCC = 25V	250	330	500	KHz

GRAPHS

LINFINITY Microsemi

LX1722 THD+N vs. Power
4OHM

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Color	Line Style	Thick	Data	Axis	Cursor1	Cursor2
Cyan	Solid	2	Anlr.THd+N Ratio	Left	*4.96869 %	*0.02209 %
Green	Solid	2	Anlr.THd+N Ratio	Left	4.79020 %	0.02464 %

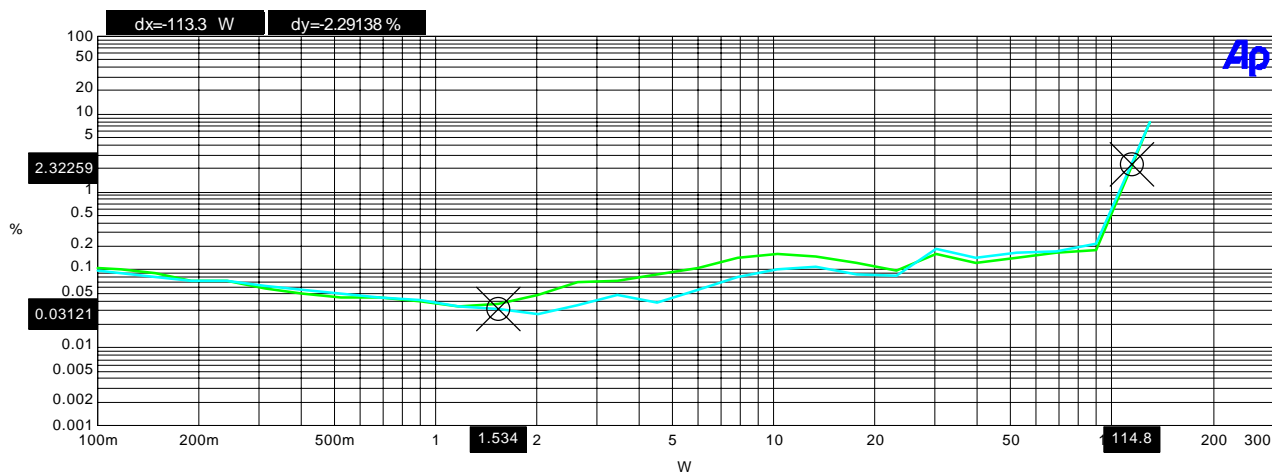
10Hz ~ 22KHz BPF, f=1KHz, 25VDC, 4ohm load
Cyan -- Channel 1; Green -- Channel 2

thdvspwr-4ohm-orig.at1

LINFINITY Microsemi

LX1722 THD+N vs. Power
2OHM

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Color	Line Style	Thick	Data	Axis	Cursor1	Cursor2
Cyan	Solid	2	Anlr.THd+N Ratio	Left	*2.32259 %	*0.03121 %
Green	Solid	2	Anlr.THd+N Ratio	Left	2.15622 %	0.03694 %

10Hz ~ 22KHz BPF, 25VDC, 2ohm load, 1KHz
Cyan -- CH1, 1KHz; Green -- CH2,

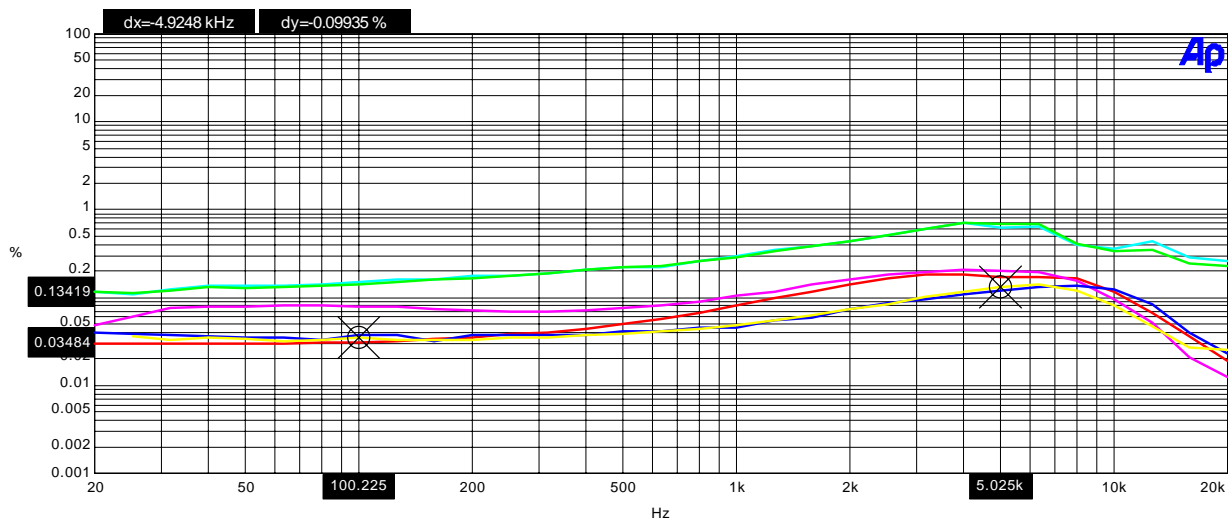
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GRAPHS

LINFINITY Microsemi

LX1722 THD+N vs. Frequency
4OHM

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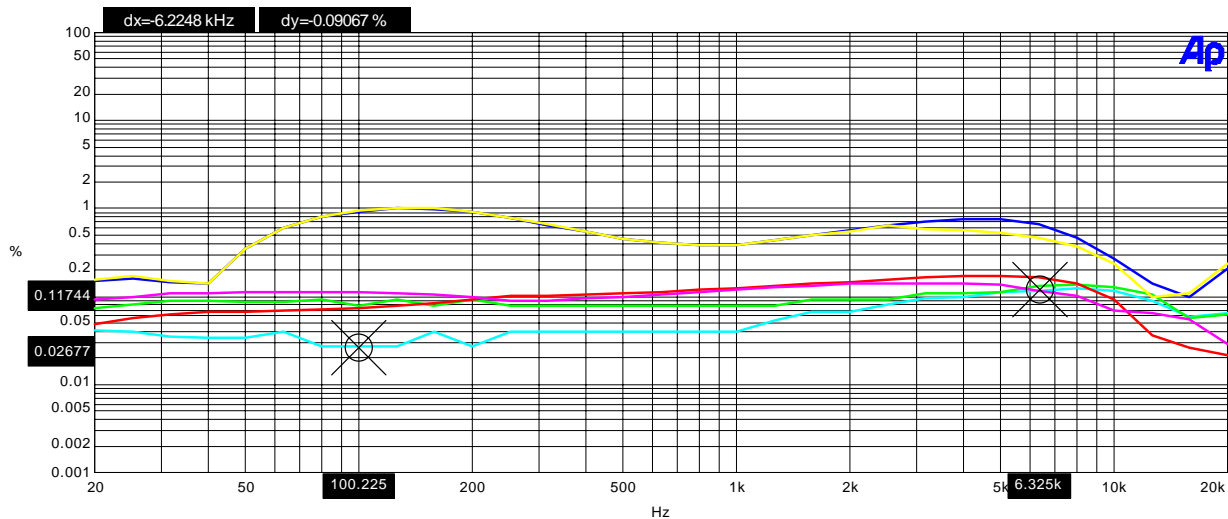
10Hz ~ 22KHz BPF, 4ohm load, 25VDC
 Cyan -- CH1; Green -- CH2; ---- Pout=70W;
 Red -- CH1; Magenta -- CH2; ---- Pout=10W;
 Blue -- CH1; Yellow -- CH2; ---- Pout=1W;

thdvsfreq_4ohm-orig.at1

LINFINITY Microsemi

LX1722 THD+N vs. Frequency
2OHM

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10Hz ~ 22KHz BPF, 2ohm load, 25VDC
 Cyan -- CH1; Green -- CH2; ---- Pout=1W;
 Red -- CH1; Magenta -- CH2; ---- Pout=10W;
 Blue -- CH1; Yellow -- CH2; ---- Pout=110W;

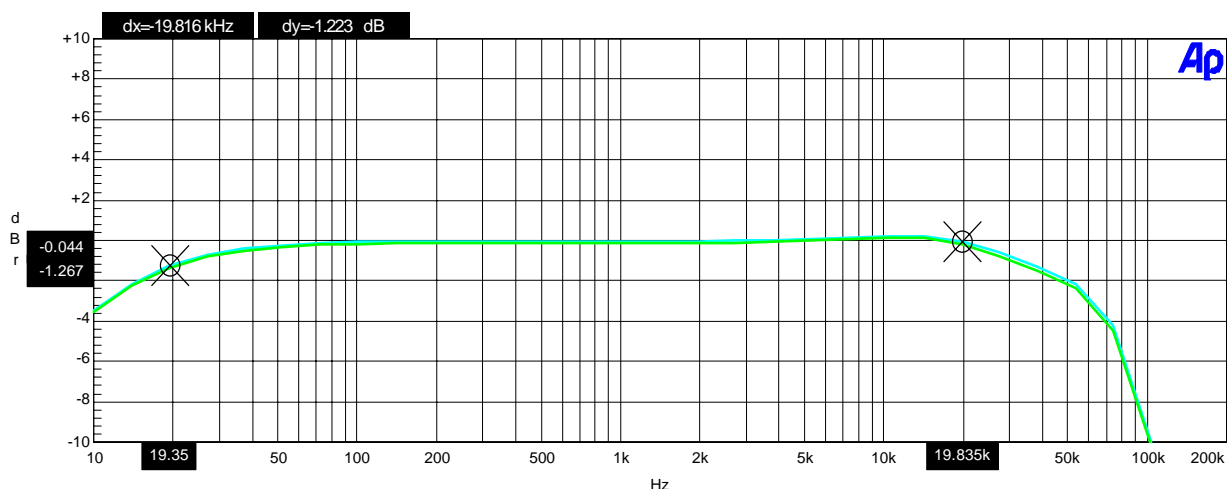
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GRAPHS

LINFINITY Microsemi

LX1722 Frequency Response
40HM

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Color	Line Style	Thick	Data	Axis	Cursor1	Cursor2
Cyan	Solid	2	Anlr.Ampl	Left	*-0.044 dBr	*-1.267 dBr
Green	Solid	2	Anlr.Ampl	Left	-0.188 dBr	-1.367 dBr

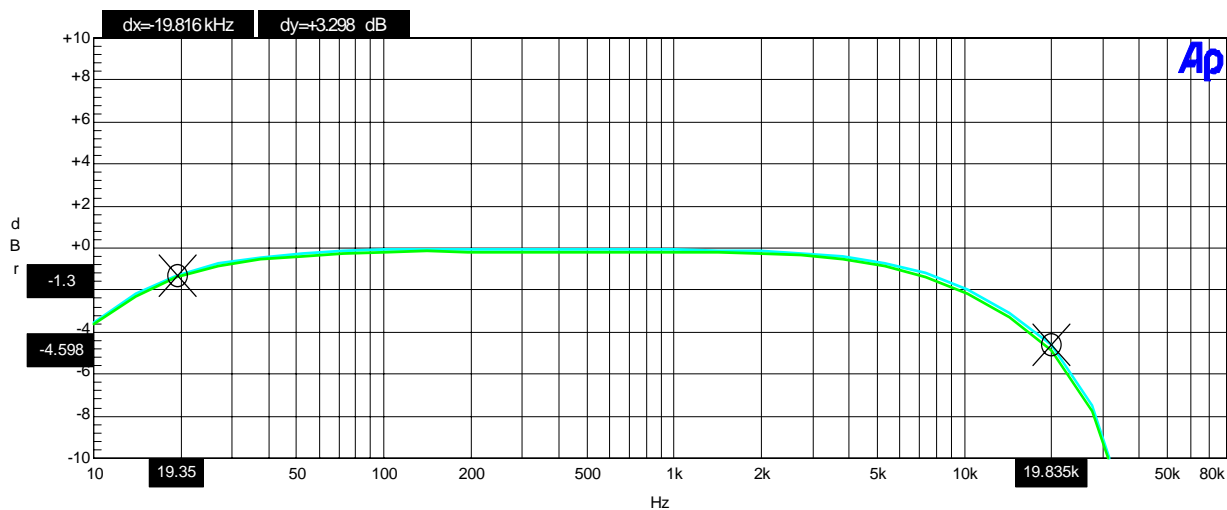
25VDC, 1W output, 10~80KHz BPF, 4ohm Load
Cyan - CH1; Green - CH2

fr-80k.-4ohm.at1

LINFINITY Microsemi

LX1722 Frequency Response
20HM

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Color	Line Style	Thick	Data	Axis	Cursor1	Cursor2
Cyan	Solid	2	Anlr.Ampl	Left	*-4.598 dBr	*-1.300 dBr
Green	Solid	2	Anlr.Ampl	Left	-4.847 dBr	-1.399 dBr

25VDC, 1W output, 10~30KHz BPF, 2ohm Load
Cyan - CH1; Green - CH2

fr-80k.-2ohm.at1