



## LUNDAHL ANALOGUE AUDIO TRANSFORMERS

A range of high performance PCB mounting analogue audio transformers, manufactured in Sweden. Lundahl will design variations on existing types, or completely new constructions, to meet specific needs. All housing cans are mu-metal, and pin diameters are 1.1mm, recommended PCB drill 1.5mm.

Full data and application notes for each type are available from the Lundahl website at [www.lundahl.se](http://www.lundahl.se), or from Canford Technical Support.

### New designs

#### LL1581XL Splitting transformer

In many splitting applications, the transformer must have a high immunity to common mode signals, to stray magnetic fields from eg. power transformers, and to large potential differences in receiving systems. This transformers uses Lundahl's well established two coil structure to create a transformer with a high degree of symmetry. It is built up from two primary windings (which should be used in parallel) and two secondary windings. Each secondary winding is built up from two sections, one from each coil, and a separate electrostatic shield surrounds each secondary section. This symmetric structure results in an internal cancellation of noise signals caused by external magnetic fields. It also increases immunity to ground noise between secondary systems and reduces the effect of input common mode signals. The transformer is designed so that a "direct" split can be connected in parallel across the input windings. Turns ratio 1:1+1. Dimensions: 38(l) x 24(w) x 20.5(h above PCB)mm. Weight: 61g.

#### LL1587 Mic transformer

A small sized mic input transformer, with a high permeability mu-metal core and two two-section coils with internal Faraday shields. Turns ratio 1+1:4. Dimensions: 26(l) x 17(w) x 12(h above PCB)mm. Weight: 18g.

#### LL1588 High level general purpose transformer

This can be used for mic or line input, for line output, or for galvanic isolation. The windings are arranged to give perfect symmetry if the transformer is used in phase splitting input applications. The two coils structure also greatly improves the immunity to external magnetic fields from eg. power supplies and motors. Primary and secondary windings are separated by electrostatic shields. Turns ratio 1+1:1+1. Dimensions: 47(l) x 28(w) x 24(h above PCB)mm. Weight: 115g.

	LL1528	LL1538	LL1527	LL1530	LL1532	LL1570	LL1571	LL1636	
Type	Microphone Input								
Dims: LengthxWidthxHeight above PCB	38x24x17	38x24x17	38x24x17	38x23x16	28x17x15	38x24x17	38x24x17	30x22.5x14.5	
Turns ratio:	1+1:2.5+2.5	1+1:5	1+1:1+1	1+1:3.5+3.5	1+1:2	1+1:1+1	1+1:1.75+1.75	1+1+1+1:10+10	
Pin Layout: (Viewed from pins side – i.e. tracks side of PCB)									
Windings schematic									
Spacing between pins (pitch)	5.08mm (0.2")	5.08mm (0.2")	5.08mm (0.2")	5.08mm (0.2")	3.81mm (0.15")	5.08mm (0.2")	5.08mm (0.2")	2.54mm (0.1")	
Spacing between rows of pins	27.94mm (1.1")	27.94mm (1.1")	27.94mm (1.1")	27.94mm (1.1")	20.32mm (0.8")	27.94mm (1.1")	27.94mm (1.1")	22.86mm (0.9")	
Offset of earth pin from adjacent row	2.54mm (0.1")	2.54mm (0.1")	2.54mm (0.1")	2.54mm (0.1")	N/A	2.54mm (0.1")	2.54mm (0.1")	N/A	
Weight	46g	46g	48g	46g	25g	48g	48g	27g	
Static resistance of each primary (Note 2)	42ohm	44ohm	42ohm	42ohm	70ohm	50ohm	50ohm	10ohm	
Static resistance of (each) secondary (Note 2)	450ohm	880ohm	45ohm	790ohm	180ohm	50ohm	175ohm	415ohm	
Distortion (THD) at 50Hz	+0dBu 0.2% +10dBu 1% (Note 5)	+0dBu 0.2% +10dBu 1% (Note 7)	+6dBu 0.1% +16dBu <1% (Note 9)	+6dBu 0.1% +16dBu <1% (Note 11)	+0dBu 0.2% +10dBu 1% (Note 13)	+6dBu 0.2% +16dBu <1% (Note 15)	+6dBu 0.1% +16dBu <1% (Note 17)	-2dBu <0.5% (Note 19)	
Self resonance point	>80kHz	>120kHz	>200kHz	>100kHz	>200kHz	>250kHz	>200kHz	>250kHz	
Optimum load for best square-wave response	9kohm in series with 3nF (Note 5 & 6)	No termination necessary (Note 7 & 8)	3-4kohm (Note 9 & 10)	10kohm in series with 220pF (Note 11)	2kohm in series with 1.6nF (Note 13)	3kohm in series with 1nF (Note 16)	4kohm in series with 0.3nF (Note 17 & 18)	8kohm typically (Note 19)	
Frequency response with optimum source and load impedances	10Hz-40kHz ±0.3dB	10Hz-100kHz ±0.3dB	10Hz-150kHz ±0.2dB	20Hz-30kHz ±0.3dB	10Hz-50kHz ±0.3dB	10Hz-200kHz ±0.5dB	10Hz-100kHz ±0.5dB	10Hz-25kHz ±1dB 10Hz-90kHz ±1.5dB	
Isolation between windings/ between windings and shield	4kV/2kV	4kV/2kV	4kV/2kV	4kV/2kV	3kV/1.5kV	4kV/2kV	4kV/2kV	3kV/1.5kV	
Typical source impedance (Note 1)	200/800ohm	200/800ohm	200/800ohm	200/800ohm	600ohm	200/800ohm	200/800ohm	25/100/400ohm	
Input (Output) balance at 15kHz	>60dB	>60dB (Note 8)	>60dB	>60dB (Note 12)	>60dB	>60dB	>60dB	>60dB	
Special Notes:	<b>Note 5</b> 1 First figure for parallel, second for series connection of primary. 2 Total value half this when parallel connected, double when series connected	<b>Note 7</b> Primaries connected in parallel, source impedance 200ohm	<b>Note 9</b> Primaries connected in parallel, source impedance 800ohm	<b>Note 11</b> Primaries connected in parallel, source impedance 800ohm	<b>Note 13</b> Primaries connected in parallel, source impedance 600ohm	<b>Note 15</b> Primaries connected in parallel, source impedance 600ohm	<b>Note 17</b> Primaries connected in parallel, source impedance 800ohm	<b>Note 19</b> Primaries connected in parallel, source impedance 50ohm	
General notes:	All windings must always be connected (either series or parallel) for optimum performance. Screen/cores should always be earthed.	<b>Note 6</b> Connection 1:5	<b>Note 8</b> Connection 1:5	<b>Note 10</b> Secondaries in series	<b>Note 12</b> 1:7	<b>Note 16</b> Secondaries in series	<b>Note 18</b> Secondaries in series		



	LL1531	LL1540	LL1545A	LL1517	LL1539	LL2811	LL5402	LL7401
Type		Line Input				Line Output		
Dims: LengthxWidthxHeight above PCB	28x17x15	38x24x17	37x22,5x14,5	47x34x18	47x34x21	31x26x23	43x28x21	47x34x17
Turns ratio:	1+1:2	1+1:1+1	1+1+1+1:2+2	1+1:1+1	2+2:1+1	1+1:1+1	2+2:1+1	1+1:1+1
Pin Layout: (Viewed from pins side - i.e. tracks side of PCB)								
Windings schematic			See note 1					
Spacing between pins (pitch)	3.81mm (0.5")	5.08mm (0.2")	2.54mm (0.1")	5.08mm (0.2")	5.08mm (0.2")	2.54mm (0.1")	5.08mm (0.2")	5.08mm (0.2")
Distance between rows of pins	20.32mm (0.8")	27.94mm (1.1")	22.86mm (0.9")	35.56mm (1.4")	35.56mm (1.4")	22.86mm (0.9")	30.48mm (1.1")	35.56mm (1.4")
Offset of earth pin from adjacent row	-	2.54mm (0.1")	-	-	-	-	-	-
Weight	25g	47g	46g	105g	130g	65g	92g	92g
Static resistance of each primary (Note 2)	500ohm	610ohm	147ohm	9.2ohm	20ohm	45W	30W	9W
Static resistance of (each) secondary (Note 2)	1.3kW	800W	295W	9.5W	20W	45W	7W	9W
Leakage inductance of secondaries	-	-	-	0.3mH	0.6mH	<1mH	0.2mH	50µH
No load impedance at 50Hz	-	-	-	<1Kohm, +20dBu (Note 19)	<2Kohm, +20dBu (Note 19)	<750ohm, +20dBu (Note 19)	>800ohm, +20dBu (Note 26)	<700ohm, +20dBu (Note 19)
Optimum source impedance	-	-	-	Minus 18ohm	Minus 40ohm	Minus 90ohm	Minus 15W	Minus 9W
Balance of input/output	>60dB	>50dB	>40dB	>60dB (Note 10)	>65dB (Note 14)	>55dB (Note 20)	>60dB (Note 22)	>60dB (Note 24)
Distortion (THD) at 50Hz	+10dBu 0.2% +20dBu 1% (Note 5)	+20dBu <0.1% +30dBu <1% (Note 7)	+22dBu <0.2%	(Special note 4)	(Special note 4)	(Special note 4)	(Special note 4)	(Special note 4)
Self resonance point	>80kHz	>60kHz	>200kHz	-	-	-	-	-
Optimum load for best square-wave response	8kohm in series with 1.2nF	22kohm in series with 1nF (Note 6)	6.7kohm + 470pF	-	-	-	-	-
Frequency response with optimum source and load impedances	20Hz-30kHz ±0.3dB	5Hz-50kHz ±0.2dB (Note 8)	10Hz-70kHz ±0.5dB (Note 9)	10Hz-80kHz ±0.3dB (Note 13)	10Hz-80kHz ±0.3dB (Note 16)	10Hz-100kHz ±0.3dB (Note 21)	20Hz-40kHz ±0.3dB (Note 23)	20Hz-80kHz ±0.3dB (Note 25)
Maximum output level @50Hz	-	-	-	+28dBu (Note 11)	+32dBu (Note 15)	+30dBu	+22dBu	+22dBu
Isolation between windings/ between windings and shield	3kV/1.5kV	4kV/2kV	3kV/1.5kV	4kV/2kV	4kV/2kV	4kV/2kV	4kV/2kV	4kV/2kV
General notes: All windings must always be connected (either series or parallel) for optimum performance. Screen/cores should always be earthed. <b>Note 1</b> There are a variety of connection alternatives, which are shown on the LL1545A data sheet, available at www.lundahl.se or from Canford's Technical Support. <b>Note 2</b> Total value half this when parallel connected, double when series connected <b>Note 4</b> Less than 0.1% distortion can be achieved using mixed feedback drive circuits	<b>Note 5</b> Primaries connected in series, source impedance 600ohm  <b>Note 6</b> Source impedance 600ohm	<b>Note 7</b> Source impedance 600ohm  <b>Note 8</b> Source 600 6.7k + 470pF load 15kohm	<b>Note 9</b> Source impedance 600ohm, load 6.7kW + 470pF in parallel with 56kohm	<b>Note 10</b> According to IRT, source <10ohm, load 600ohm  <b>Note 11</b> Secondary in series, load 600ohm  <b>Note 12</b> Achieved with mixed feedback drive circuit, load 600ohm  <b>Note 13</b> Source 10ohm, load 600ohm	<b>Note 14</b> According to IRT, source <10ohm, load 600ohm  <b>Note 15</b> Load 600ohm  <b>Note 16</b> @10dBu, source <10ohm, load 600ohm  <b>Note 17</b> At midband with 600ohm	<b>Note 18</b> Primary in series  <b>Note 19</b> Primaries in series, primary level  <b>Note 20</b> According to IRT, source <10ohm, load 600ohm  <b>Note 21</b> Source 10ohm, load 600ohm, 0dBu	<b>Note 22</b> According to IRT, source <10ohm, load 600ohm  <b>Note 23</b> Load 600ohm	<b>Note 24</b> According to IRT, source <10ohm, load 600ohm  <b>Note 25</b> Load 600ohm  <b>Note 26</b> Primaries in parallel

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- 23-101 LUNDAHL LL1527
- 23-102 LUNDAHL LL1528
- 23-104 LUNDAHL LL1530
- 23-111 LUNDAHL LL1531
- 23-105 LUNDAHL LL1532
- 23-103 LUNDAHL LL1538
- 23-132 LUNDAHL LL1539
- 23-112 LUNDAHL LL1540
- 23-113 LUNDAHL LL1545A
- 23-106 LUNDAHL LL1570
- 23-107 LUNDAHL LL1571
- 23-110 LUNDAHL LL1581XL
- 23-109 LUNDAHL LL1587
- 23-114 LUNDAHL LL1588
- 23-108 LUNDAHL LL1636
- 23-133 LUNDAHL LL2811
- 23-134 LUNDAHL LL5402
- 23-135 LUNDAHL LL7401