

Tube Amplifier Output Transformers LL1688

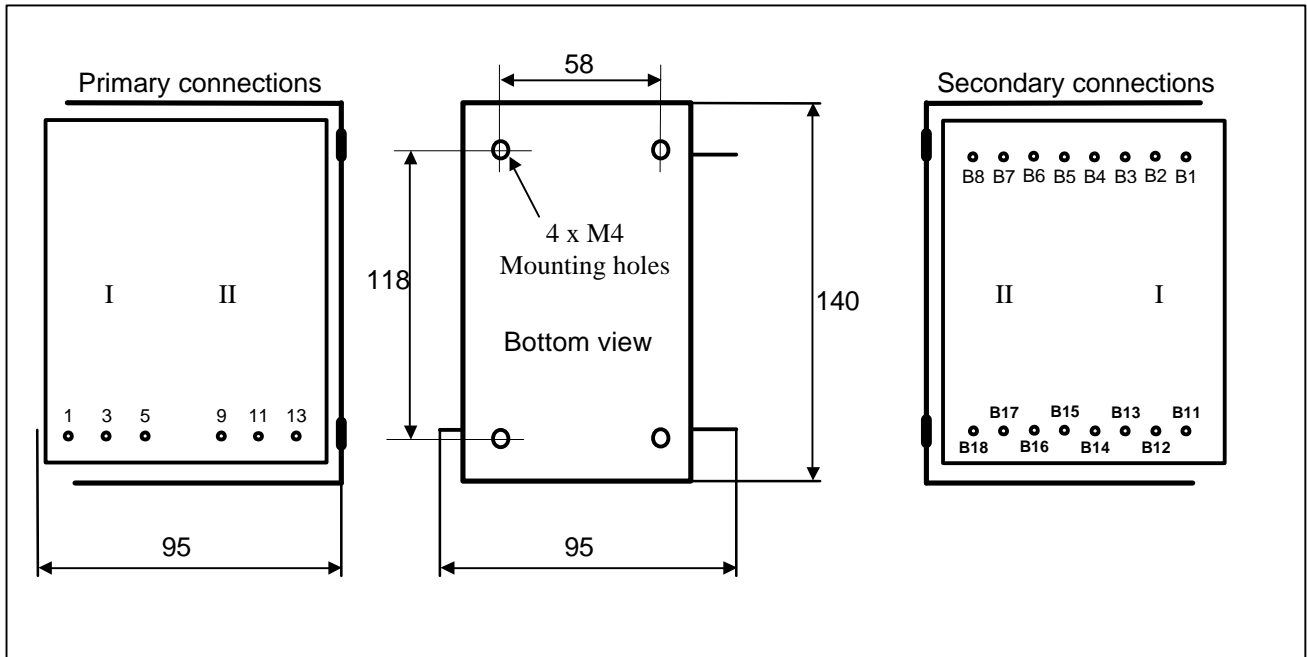
LL1688 is an output transformer, designed primarily for 845 tube amplifiers, but the LL1688 is available with different core air-gaps for different types of output stages. The transformers are highly sectioned with harmonically sized sections, which results in a minimum leakage inductance. This, combined with a low capacitance coil winding technique results in a wide frequency range.

The primary winding can be tapped for 33% UL connection.

The transformers have a special audio C-core of our own production.

The transformers are unpotted, open frame type suitable for mounting inside an amplifier housing.

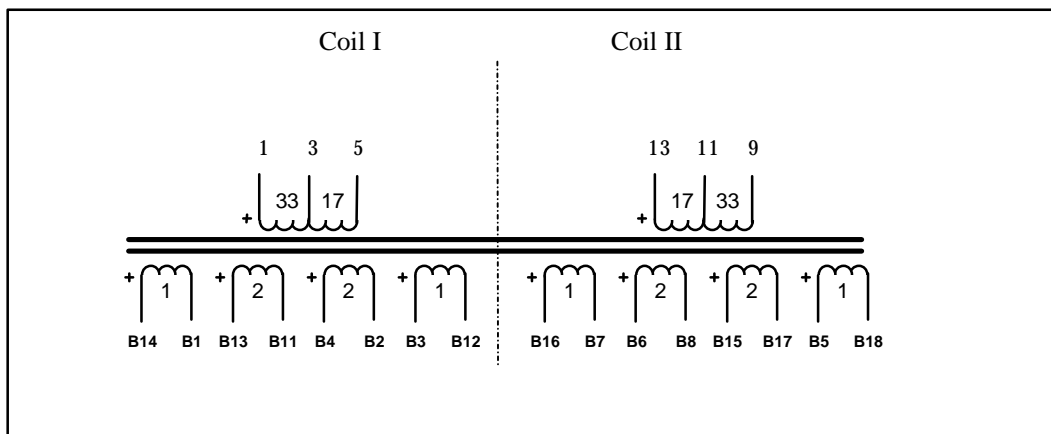
Physical dimensions, pin and mounting hole layout LL1688 (all dimensions in mm)



R040312

Pin spacing module: 5.08 mm (0.2")
Row spacing: 91 mm approx.
Weight: 4 kg
Turns ratio: 50 + 50 : 1 + 2 + 2 + 1 + 1 + 2 + 2 + 1

Winding schematics:



LL1688			
Turns ratio:	50 + 50 : 1 + 2 + 2 + 1 + 1 + 2 + 2 + 1		
Static resistance of primary (all in series)	260 Ω (130Ω + 130Ω)		
Static resistance of secondary windings (in -> out)	0.3Ω, 0.7Ω, 0.7Ω, 0.4Ω		
Primary leakage inductance (all in series)	7 mH		
Max recommended primary DC current (heat dissip. 10W)	200mA		
Max. primary <u>signal</u> voltage r.m.s. at 30 Hz (all in series)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Push-Pull (1.6T) 1220V</td> <td style="width: 50%; text-align: center;">Single End (0.7T) 530V</td> </tr> </table>	Push-Pull (1.6T) 1220V	Single End (0.7T) 530V
Push-Pull (1.6T) 1220V	Single End (0.7T) 530V		

Isolation between primary and secondary windings / between windings and core: 4 kV / 2 kV

Electrical characteristics

Primary Load Impedance, Max power and power loss.

	Sec. connection for 4/8/16 W (See next page)		
	-B/C	B/C/D	C/D/E
	Primary Load Impedance (transformer copper resistance included)		
LL1688	20.5 kΩ	9.2 kΩ	5.5 kΩ
	Power and Loss		
Max. Power, P-P at 30 Hz	72W	160W	320W
Max. Power, S.E. at 30 Hz	15W	30W	60W
Power loss across transformer	0.15 dB	0.25 dB	0.5 dB

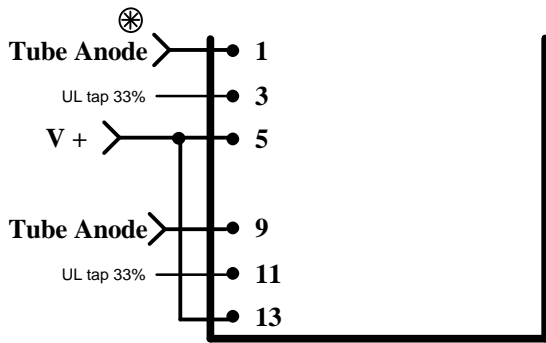
Primary DC Current Core Air-gap and Primary inductance

	LL1688/70mA
Core Airgap (delta/2)	240 μ
Single end standing current for 0.9 Tesla (recommended operating point)	70mA
Primary inductance	70 H

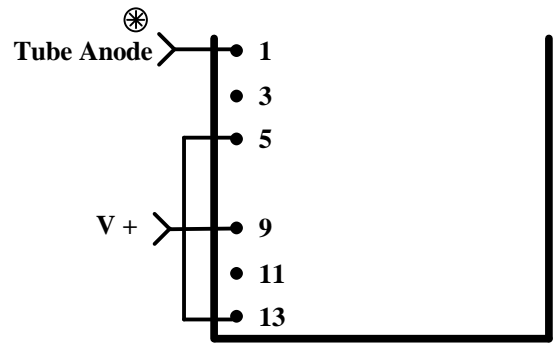
Frequency response, LL1688/70mA

(source impedance 2.2k, load impedance 10 ohms. Primary winding is series, secondary winding "alt. C".
Secondary winding not grounded. Primary signal level approx 10V)
10 Hz – 25kHz +0 / -1 dB
5Hz – 33 kHz +0 / -3 dB

Primary connections, Push-Pull

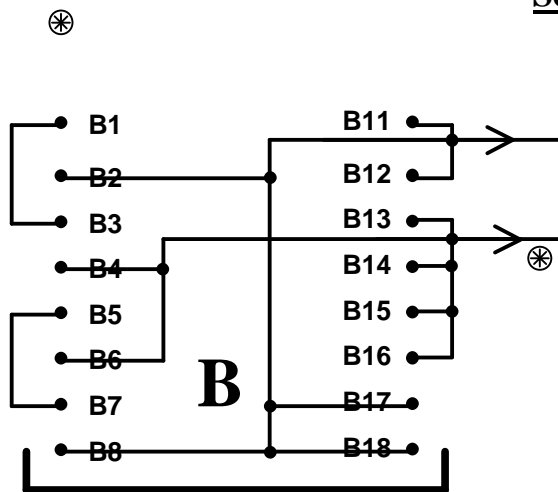


Primary connections, Singe End

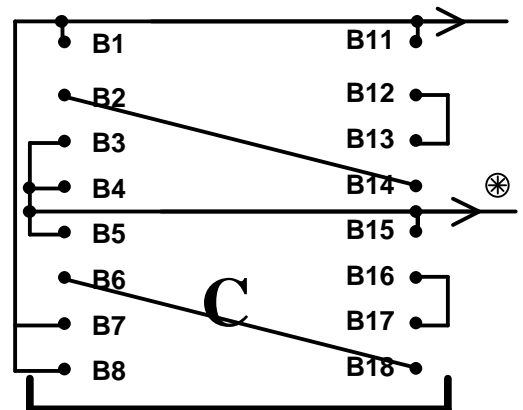


Secondary connections

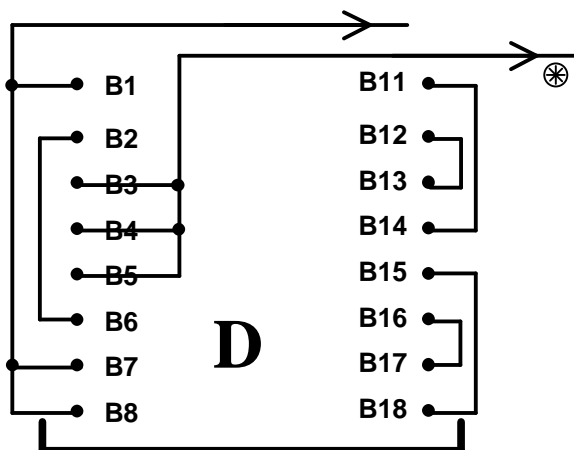
⊗ Indicates phase



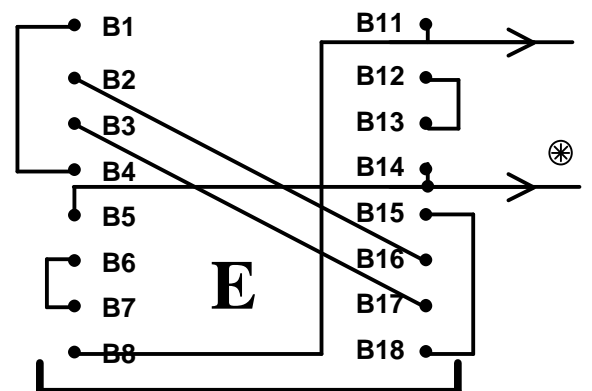
Max secondary Voltage RMS @ 30 Hz	
P-P: 25V	SE : 11V
Sec. copper resistance 0.15 Ω	Windings in series 2



Max secondary Voltage RMS @ 30 Hz	
P-P: 37V	SE : 16V
Sec. copper resistance 0.2 Ω	Windings in series 3



Max secondary Voltage RMS @ 30 Hz	
P-P: 50V	SE : 22V
Sec. copper resistance 0.5 Ω	Windings in series 4



Max secondary Voltage RMS @ 30 Hz	
P-P: 74V	SE : 32V
Sec. copper resistance 1 Ω	Windings in series 6