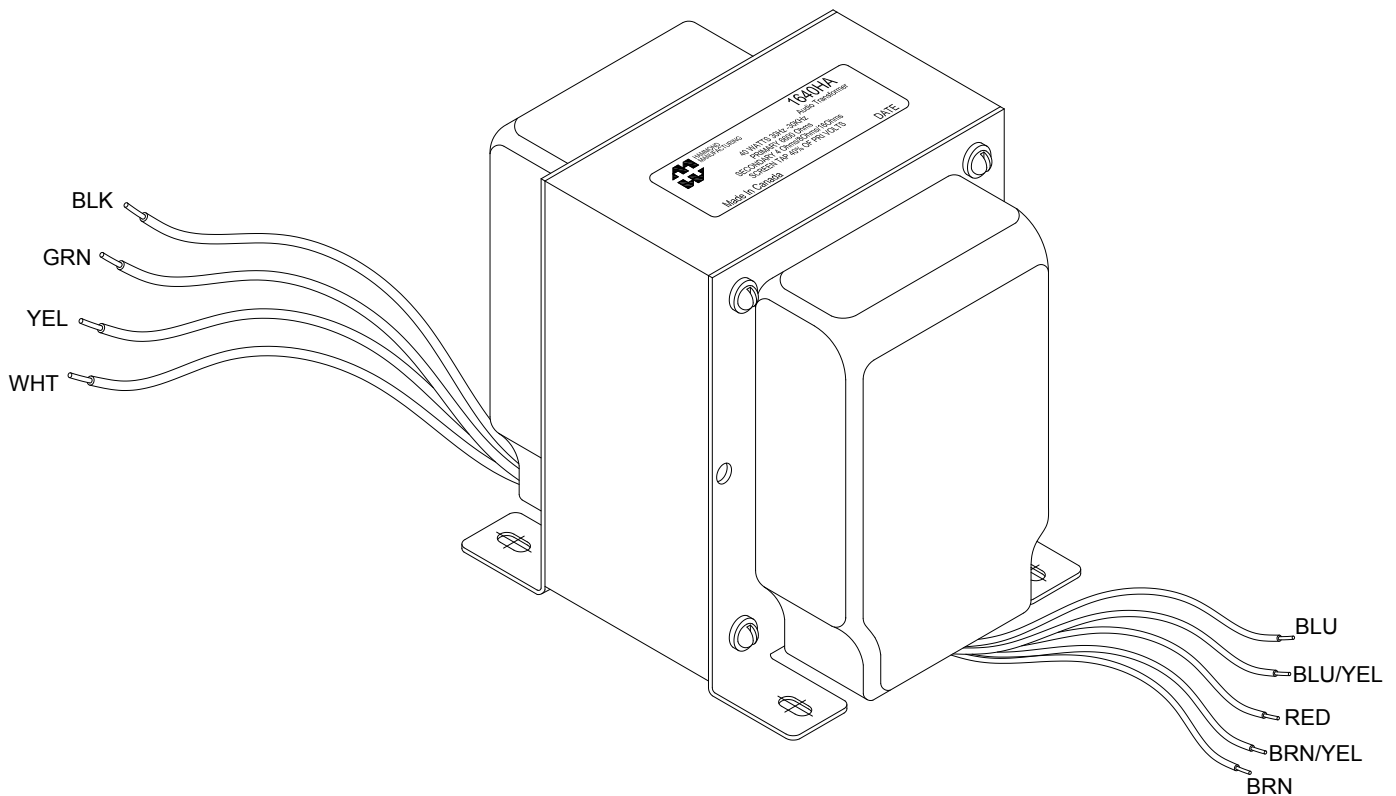




1650HA

HI-FI AUDIO OUTPUT MULTIPLE SECONDARY TRANSFORMER

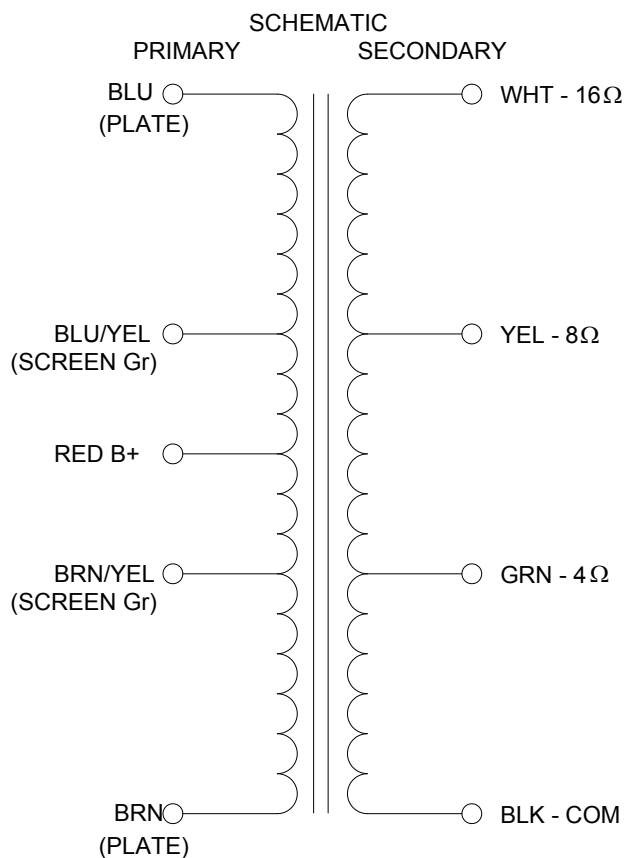
- NEW & improved version of our 1608-1650 Series multiple secondary output transformers (Re-designed secondaries for easy hook-up of secondary loads).
- Designed for push-pull tube output circuits.
- Units are designed to provide ample "headroom" at bass frequencies (Note the weight of each transformer).
- All models have a secondary tapped for 4, 8 or 16 ohm outputs.
- Enclosed (shielded), 4 slot, above chassis Type "X" mounting.
- Manufactured with plastic coil forms for coil support and insulation.
- Frequency response 30Hz. to 30Khz. at full rated power (+/- 1db max. - ref. 1Khz) minimum.
- Insulated flexible leads 8" min.
- Included 40% screen taps for Ultra-Linear operation (if desired).
- Typical applications - Push-Pull: triode, Ultra-Linear pentode, pentode and tetrode connected audio output.



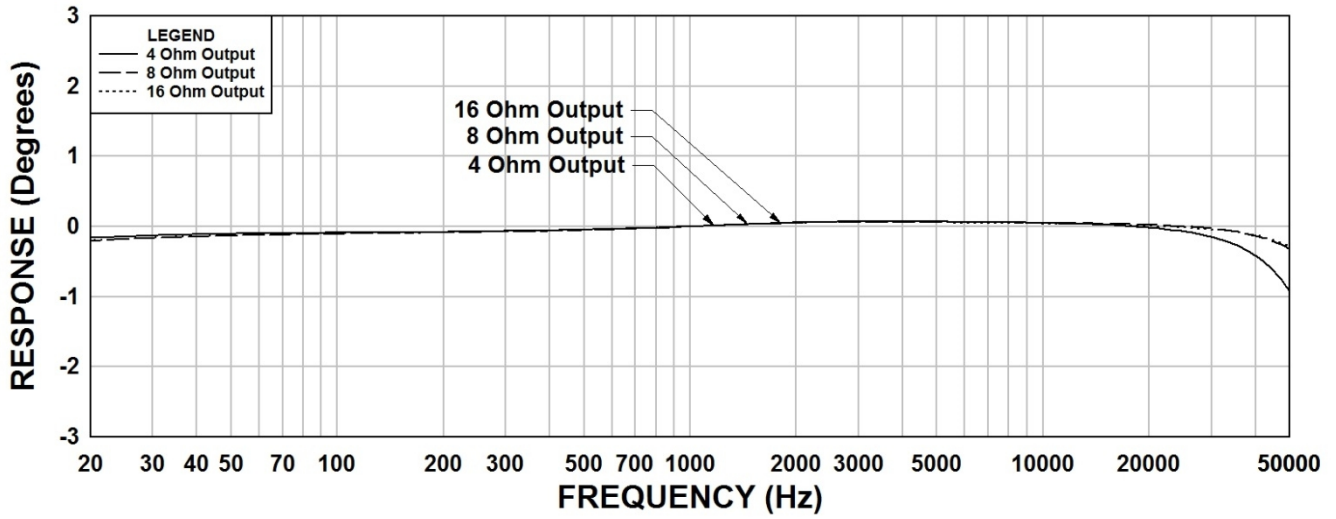
*For Full Dimensional Details see page 4

1650HA ELECTRICAL SPECIFICATIONS****Schematic and Hook Up Data**

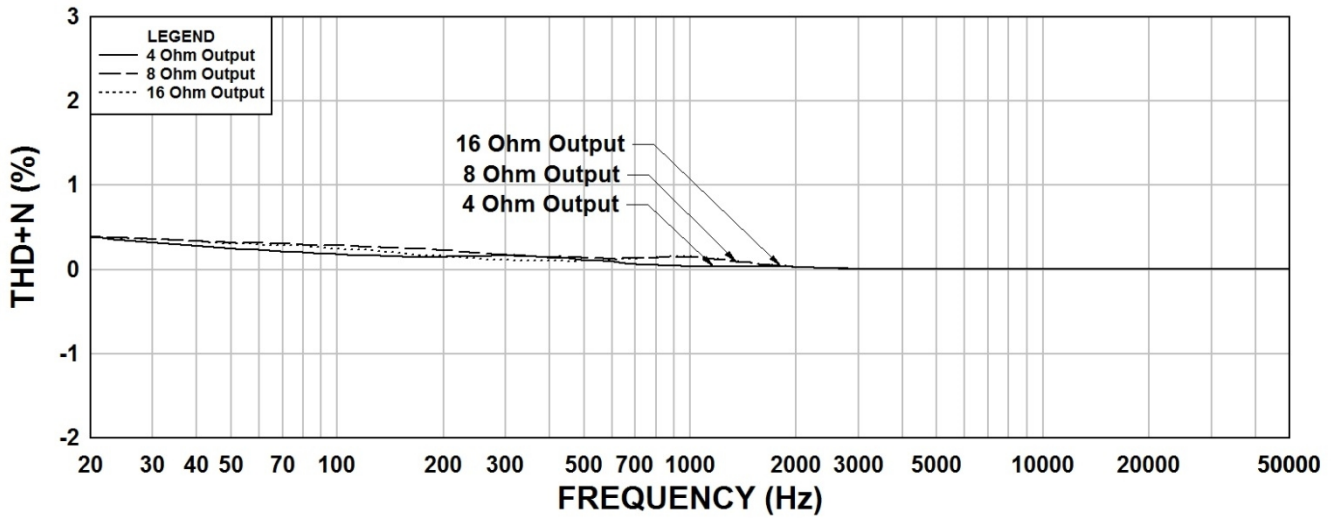
Characteristic	Typical
Input Impedance	6600 Ω
Output Impedance	4 Ω /8 Ω /16 Ω
Output Power	40Watts
Primary - DCR	
Blue – Brown	146.5 Ω
Secondary DCR	
Black – Green	225m Ω
Black – Yellow	259m Ω
Black – White	319m Ω
Leakage Inductance	@ 1.0kHz, 1.0V SC
Primary – Blue – Brown	297.7mH
Inductance	@ 1.0kHz, 1.0V OC
Primary – Blue – Brown	11.3Hy
Black – Green	158.6mH
Black – Yellow	214.5mH
Black – White	283.6mH
Impedance	@ 1.0kHz, 1.0V OC
Primary – Blue – Brown	70K Ω
Black – Green	217.6 Ω
Black – Yellow	403.9 Ω
Black – White	710.2 Ω
Frequency Response	See graphs for specific response, Typ. ± 1.0 db from 30Hz to 30KHz
Dielectric Strength	2000Vrms
Temperature Range	-40 To 105 $^{\circ}$ C



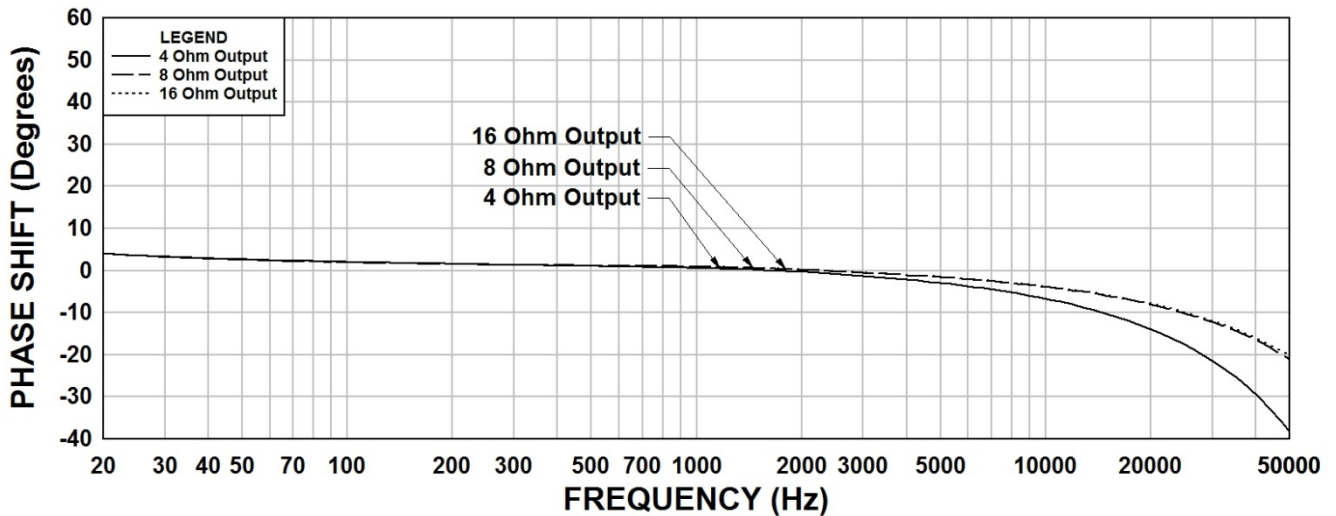
1650HA Frequency Response $R_s = 6.6K$ Ohms



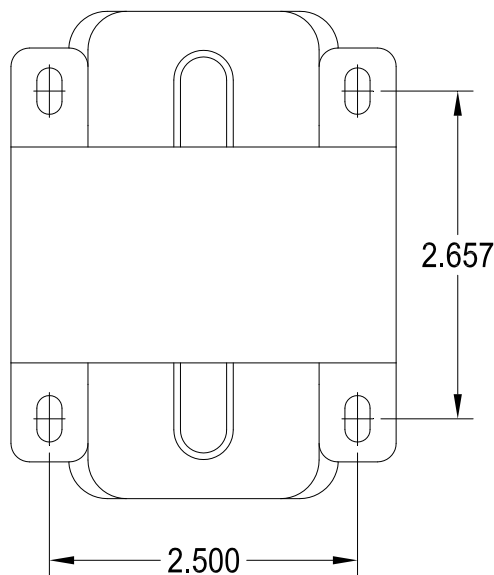
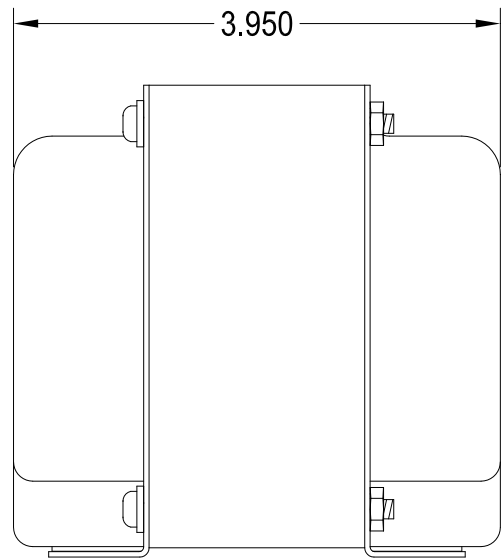
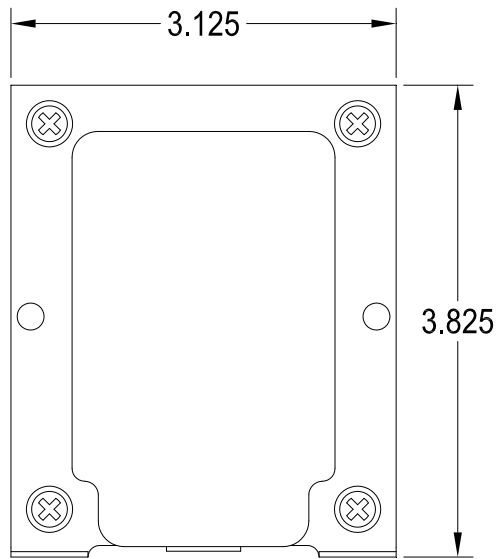
1650HA THD+N $R_s = 6.6K$ Ohms



1650HA Phase Shift $R_s = 6.6K$ Ohms



Dimensional Details:

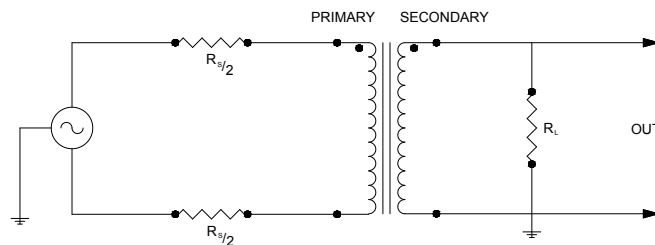


Label:

	HAMMOND MANUFACTURING.	1650HA
	40WATTS 30Hz - 30KHz	BLK - GRN - YEL - WHT COM - 4OHM - 8OHM - 16OHM BLU - RED - BRN: 6600 OHMS CT BRN/YEL & BLU/YEL SCREEN TAPS 40% OF PRI VOLTS
Made In Canada		DATE

TYPICAL TEST CIRCUIT

Measurement instruments
 Hp4192a impedance analyzer
 Hp3456a DVM
 Keithley 2002 DVM
 D scope series iii audio analyzer
 Wayne Kerr 3255B with a 3265B



* All graphs input level 20dbu.
 ** The results are typical and are subject to normal manufacturing and electrical tolerances.