



**PAT 4148-00 Application: EL34 40 W**

This 40 Watt Push Pull output transformer is designed specially for speakers with impedances of 8 Ohms and 16 Ohms. The frequency range extends up to 84 kHz. The power bandwidth starts at 14 Hz. Primary impedance is 4300 Ohms. Pentode configuration, as well as Ultra Linear (at 40 % taps) and triode configurations are possible. This design has a special mild high frequency roll-off ( $Q = 0.4$  is below critical damping) in which negative feedback will cause no transformer instabilities.

**Toroidal Output Transformer for Tube Amplifiers**

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**PAT-4148-00 Ratings**

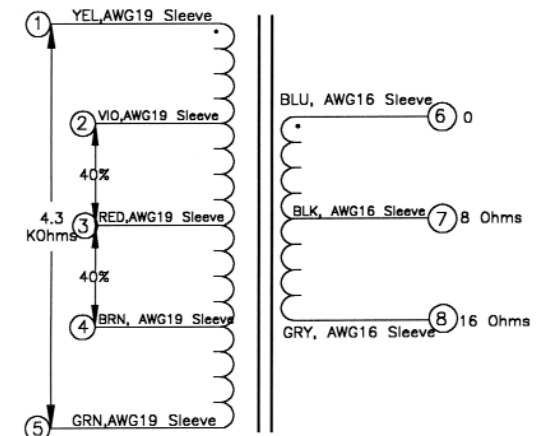
Type & Application	:	Plitron / VDV PAT-4148-00	
Primary Impedance	:	Raa = 4.302	[k $\Omega$ ]
Secondary Impedance	:	Rls = 8	[ $\Omega$ ]
Turns Ratio Np/Ns	:	Ratio = 23.189	[ ]
Ultra Linear Tapping at	:	tap= 40	[%]
-.1 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	flf = 2.234	fhf = 19.494
-1 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	fl1 = 0.953	fh1 = 44.084
-3 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	fl3 = 0.485	fh3 = 84.874
Nominal Power <sup>(1)</sup>	:	Pn = 40	[W]
-3 dB Power Bandwidth starting at	:	fu = 14	[Hz]
Total Primary Inductance <sup>(2)</sup>	:	Lp = 966	[H]
Primary Leakage Inductance	:	lsp = 1.808	[mH]
Effective Primary Capacitance	:	Cip = 0.7	[nF]
Total Primary DC Resistance	:	Rip = 147	[ $\Omega$ ]
Total Secondary DC Resistance	:	Ris = 0.251	[ $\Omega$ ]
Tubes Plate Resistance per section	:	ri = 4.3	[k $\Omega$ ]
Insertion Loss	:	lloss = 0.276	[dB]
Q-factor 2nd order HF roll-off <sup>(5)</sup>	:	Q = 0.407	[ ]
HF roll-off Specific Frequency <sup>(5)</sup>	:	Fo = 175.162	[kHz]
Quality Factor <sup>(5)</sup>	:	QF = 5.343 $\cdot 10^5$	[ ]
Quality Decade Factor = log(QF) <sup>(5)</sup>	:	QDF = 5.728	[ ]
Tuning Factor <sup>(5)</sup>	:	TF = 0.328	[ ]
Tuning Decade Factor = log(TF) <sup>(5)</sup>	:	TDF = -0.485	[ ]
Frequency Decade Factor <sup>(4,5)</sup>	:	fdf = 5.243	[ ]

- (1): calculated under the conditions of balancing the DC-currents and the AC-anode voltages of the powertubes driving the transformer
- (2): maximum value, measured over secondary, transfered to primary
- (3): calculation at 1 mWatt in Rls; ri and Rls are pure Ohmic
- (4): defined as  $fdf = \log(fh3/fl3) =$  number of frequency decades transfered
- (5): ir. Menno van der Veen; Theory and Practise of Wide Bandwidth Toroidal Output Transformers; preprint 3887, 97th AES Convention San Francisco
- (C): Copyright 1994 Vanderveen; Version 1.7; design date May 29, 1996

**Special Toroidal Output Transformer Designs**

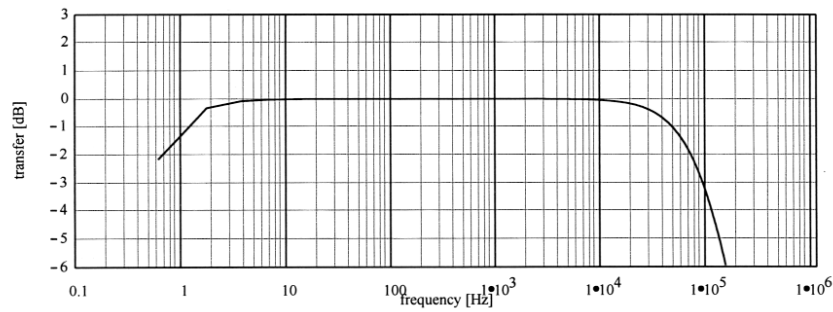


**Schematic**

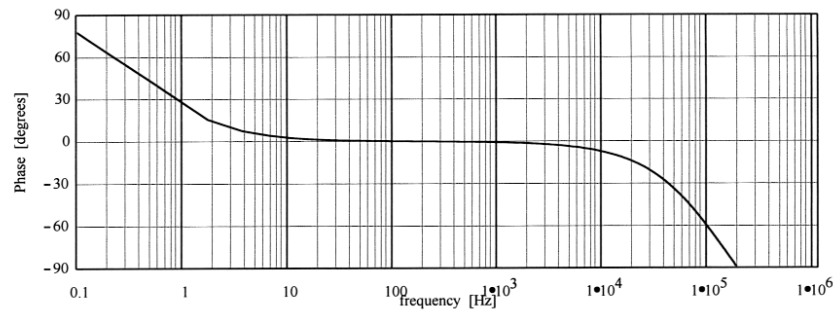


# PAT-4148-00 Response Curves

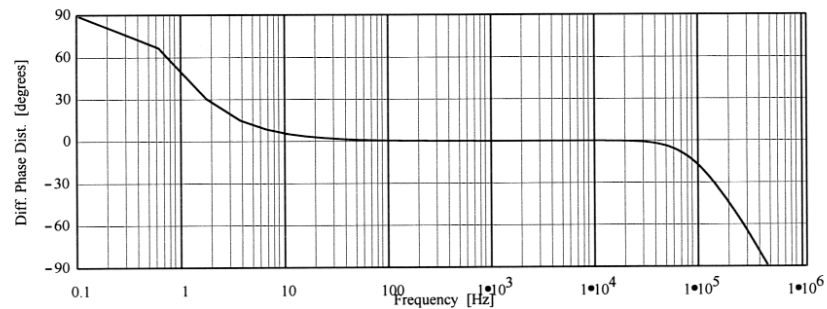
Frequency Response; Vertical 1 dB/div; Horizontal .1 Hz to 1 MHz (3)



Phase Response; Vertical 30 deg./div; Horizontal .1 Hz to 1 MHz

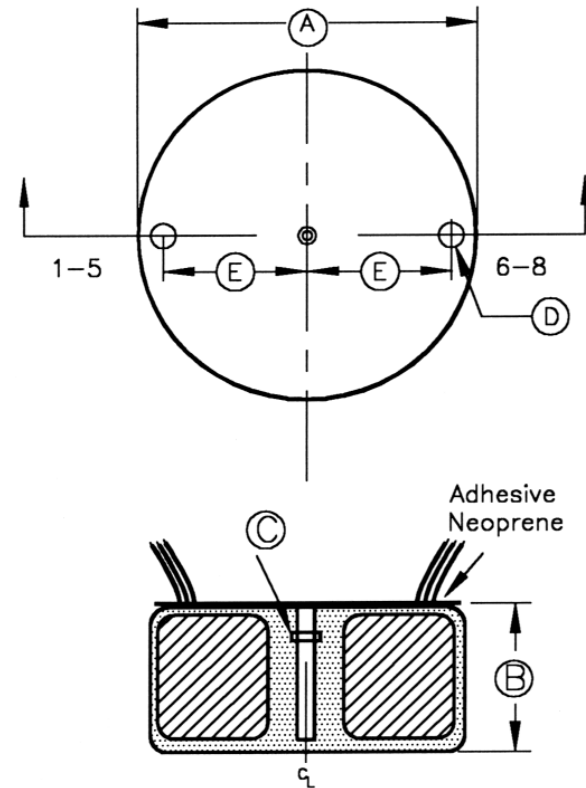


Differential Phase Distortion; vert. 30 deg./div; hor. .1 Hz to 1 MHz  
See: W.M.Leach, Differential Time Delay...; JAES sept.89 pp.709-715



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# Mechanical



REF	Dimension, in mm
A	152.0mm nominal
B	89.0mm nominal
C	5/16-18T-NUT
D	20.0mm +/- 5mm
E	50.0 +/- 5mm

Weight: 4.4kg  
Lead Length: 200mm (+/- 10mm)

