



**PAT 4152-00 Application: Solid State 80 W**  
 This special transformer is designed for solid state amplification, in "tube-like" Push Pull circuitry. The primary impedance is 310 Ohms with a secondary output tap at 5 Ohms. Because this transformer will be driven by low impedance transistors or FETs, the frequency range extends up to 282 kHz while the amplifier will be damped with a Q of 0.4. This large damping will prevent any overshoot of the 1 kHz square wave response, thus creating a very stable sound reproduction, even with speakers with difficult impedances, such as electrostatics. This transformer is a challenge for new "old fashioned" solid state amplifier designs with output transformers. Restudy of the first generation solid-state amplifiers might show new ways to advanced sound reproduction with solid state amplifiers with output transformers. This new wide bandwidth toroidal output transformer will be the start of the new generation designs.

## Toroidal Output Transformer for Tube Amplifiers

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## PAT-4152-00 Ratings

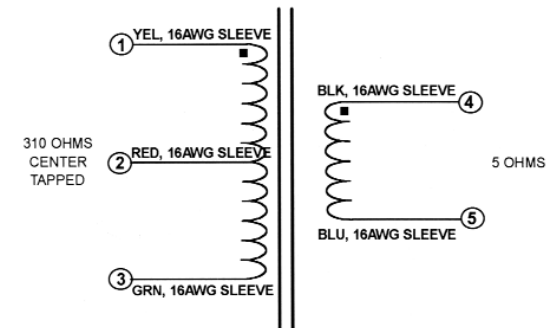
Type & Application	:	Plitron / VDV PAT-4152-00	
Primary Impedance	:	Raa = 0.311	[k $\Omega$ ]
Secondary Impedance	:	Rls = 5	[ $\Omega$ ]
Turns Ratio Np/Ns	:	Ratio = 7.882	[ ]
Ultra Linear Tapping at	:	tap=0	[%]
-1 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	f1f = 1.027	fhf = 64.656
-1 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	f11 = 0.438	f11 = 146.306
-3 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	f13 = 0.223	f13 = 282.228
Nominal Power <sup>(1)</sup>	:	Pn = 80	[W]
-3 dB Power Bandwidth starting at	:	fu = 20	[Hz]
Total Primary Inductance <sup>(2)</sup>	:	Lp = 90	[H]
Primary Leakage Inductance	:	lsp = 0.312	[mH]
Effective Primary Capacitance	:	Cip = 0.6	[nF]
Total Primary DC Resistance	:	Rip = 8.5	[ $\Omega$ ]
Total Secondary DC Resistance	:	Ris = 0.126	[ $\Omega$ ]
Tubes Plate Resistance per section	:	ri = 0.1	[k $\Omega$ ]
Insertion Loss	:	lloss = 0.222	[dB]
Q-factor 2nd order HF roll-off <sup>(5)</sup>	:	Q = 0.4	[ ]
HF roll-off Specific Frequency <sup>(5)</sup>	:	Fo = 597.106	[kHz]
Quality Factor <sup>(5)</sup>	:	QF = 2.885 $\cdot$ 10 <sup>5</sup>	[ ]
Quality Decade Factor = log(QF) <sup>(5)</sup>	:	QDF = 5.46	[ ]
Tuning Factor <sup>(5)</sup>	:	TF = 4.391	[ ]
Tuning Decade Factor = log(TF) <sup>(5)</sup>	:	TDF = 0.643	[ ]
Frequency Decade Factor <sup>(4,5)</sup>	:	fdf = 6.103	[ ]

## Special Toroidal Output Transformer Designs



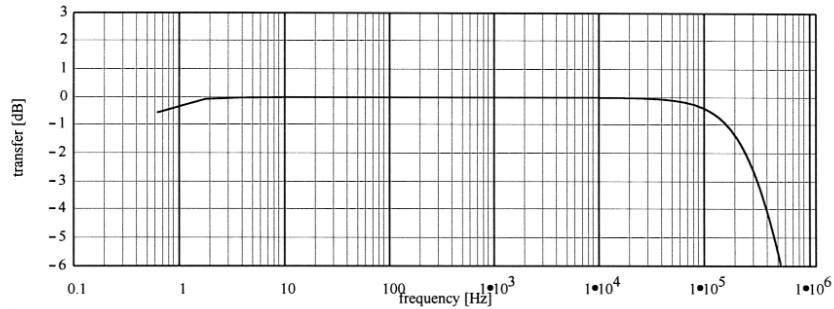
This OPT couples Transistors and not tubes to the loudspeaker. Now semiconductors can be used as a replacement of tubes, while having high efficiency. The special tonal characteristics of the OPT will combine very well with the transistors into a sweet sounding, non feedback semiconductor amplifier.

## Schematic

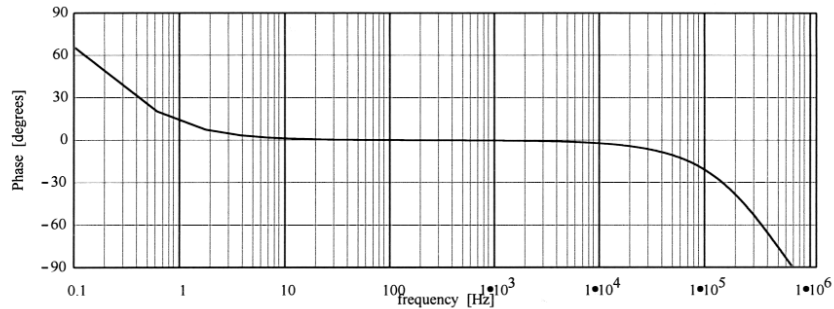


# PAT-4152-00 Response Curves

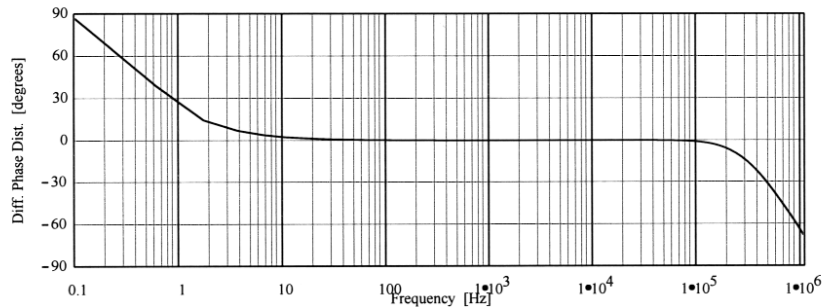
Frequency Response; Vertical 1 dB/div; Horizontal .1 Hz to 1 MHz (3)



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

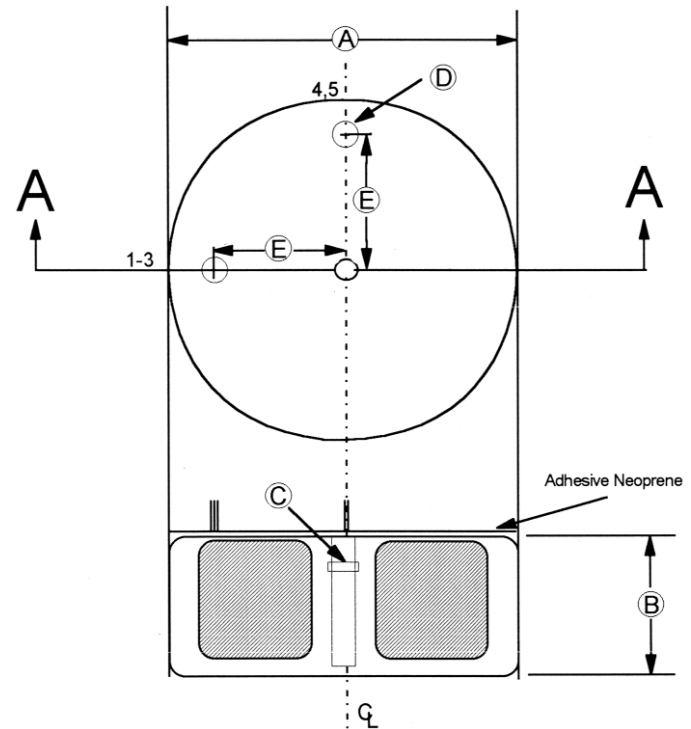


Differential Phase Distortion; vert. 30 deg./div; hor. .1 Hz to 1 MHz  
See: W.M.Leach, Differential Time Delay..; JAES sept.89 pp.709-715



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# Mechanical



REF	Dimension, in mm
A	152.4 nominal
B	88.9 nominal
C	5/16-18T-NUT
D	20 +/- 5 (2 places)
E	70 +/- 5 (2 places)

Weight: 4.1kg  
Lead Length: 200mm (+/- 10mm)

