PLITRON
DESIGNED BY VANDERVEEN

PAT 4142-00 Application: 6550 80 W
This 80 Watts Push Pull output transformer has a primary impedance of 4 kOhms with secondary output taps at 4 Ohms, 8 Ohms and 16 Ohms. This transformer can handle large anode voltages (560 Volts or higher), offering a mild load to the output power tubes like KT66, 6550, KT88 etc. Triode, Ultra Linear (34%) and Pentode configurations are possible. The power bandwidth starts at a low 14 Hz while extending up to 96 kHz without any form of negative feedback.

Toroidal Output Transformer for Tube Amplifiers

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Special Toroidal Output Transformer Designs

PAT-4142-00
Ratings

Type & Application	:	4 OHM		8 OHM		16 OHM		
Primary Impedance	:	Raa = 3.943		Raa = 3.961		Raa = 3.998		[kΩ]
Secondary Impedance	:	Rls = 4		Rls = 8		Rls = 16		[Ω]
Turns Ratio Np/Ns	:	Ratio = 31.397		Ratio = 22.252		Ratio = 15.807		[ ]
Ultra Linear Tapping at	:	tap = 33		tap = 33		tap = 33		[%]
-.1 dB Frequency Range [Hz to KHz](3)	:	flf = 1.659	fhf = 24.028	flf = 1.661	fhf = 23.941	flf = 1.663	fhf = 23.871	
-1 dB Frequency Range [Hz to KHz](3)	:	fl1 = 0.708	fh1 = 47.484	fl1 = 0.708	fhf = 47.385	fl1 = 0.709	fh1 = 47.303	[kHz]
-3 dB Frequency Range [Hz to KHz](3)	:	fl3 = 0.36	fh3 = 75.864	fl3 = 0.361	fhf = 75.791	fl3 = 0.361	fh3 = 75.73	[kHz]
Nominal Power (1)	:	Pn = 80		Pn = 80		Pn = 80		[W]
-3 dB Power Bandwidth starting at	:	fu = 14		fu = 14		fu = 14		[Hz]
Total Primary Inductance (2)	:	Lp = 996		Lp = 996		Lp = 996		[H]
Primary Leakage Inductance	:	lsp = 6		lsp = 6		lsp = 6		[mH]
Effective Primary Capacitance	:	cip = 1		cip = 1		cip = 1		[nF]
Total Primary DC Resistance	:	Rip = 78		Rip = 78		Rip = 78		[Ω]
Total Secondary DC Resistance	:	Ris = 0.11		Ris = 0.2		Ris = 0.28		[Ω]
Tubes Plate Resistance per section	:	ri = 2.5		ri = 2.5		ri = 2.5		[kΩ]
Insertion Loss	:	Iloss = 0.201		Iloss = 0.19		Iloss = 0.158		[dB]
Q-factor 2nd order HF roll-off (5)	:	Q = 0.621		Q = 0.62		Q = 0.62		[ ]
HF roll-off Specific Frequency (5)	:	Fo = 87.798		Fo = 87.84		Fo = 87.875		[kHz]
Quality Factor (5)	:	QF = $1.66 \cdot 10^5$		QF = $1.66 \cdot 10^5$		QF = $1.66 \cdot 10^5$		[ ]
Quality Decade Factor = log(QF) (5)	:	QDF = 5.22		QDF = 5.22		QDF = 5.22		[ ]
Tuning Factor (5)	:	TF = 1.269		TF = 1.266		TF = 1.264		[ ]
Tuning Decade Factor = log(TF) (5)	:	TDF = 0.104		TDF = 0.103		TDF = 0.102		[ ]
Frequency Decade Factor (4, 5)	:	FDF = 5.324		FDF = 5.323		1FDF = 5.322		[ ]

(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 Fransico

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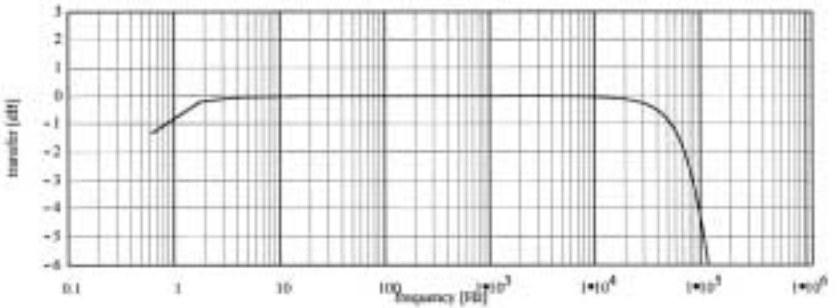
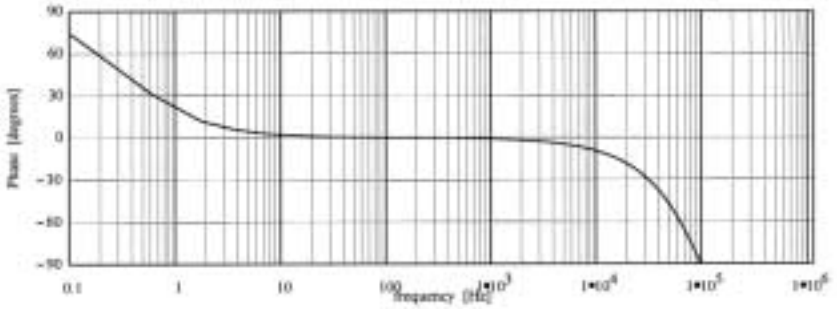
Response Curves

4 OHM

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

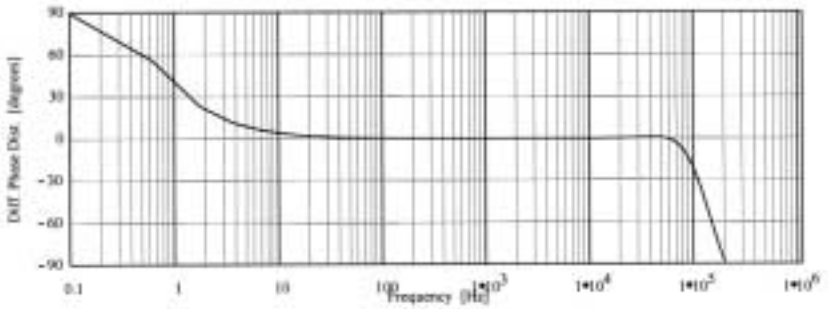


Phase Response; Vertical 30 deg./div; Horizontal .1 Hz to 1 MHz



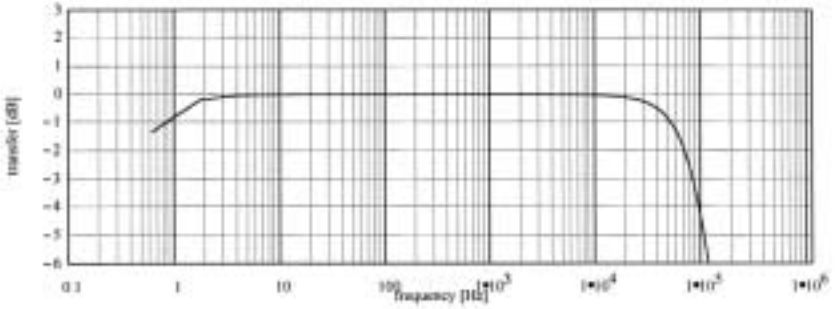
Differential Phase Distortion; vert. 30 deg./div; hor .1 Hz to 1 MHz

See: W.M.Leach, Differential Time Delay..; JAES sept.89 pp.709-715

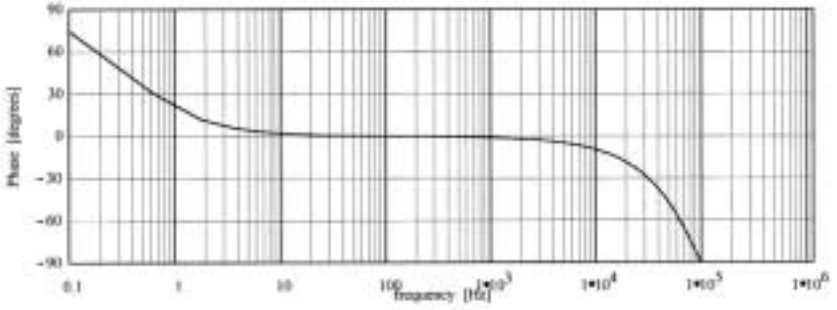


8 OHM

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



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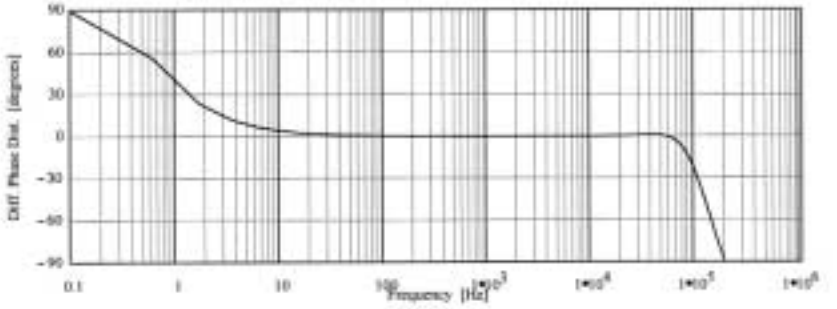
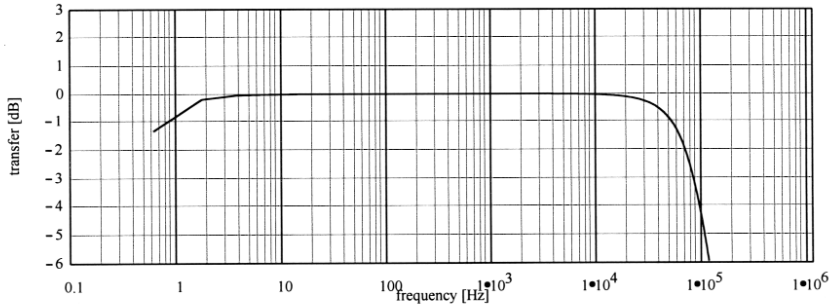


PAT–4142-00

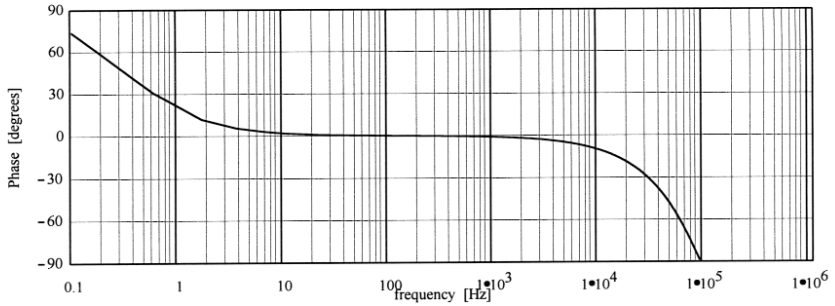
Response Curves

16 OHM

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



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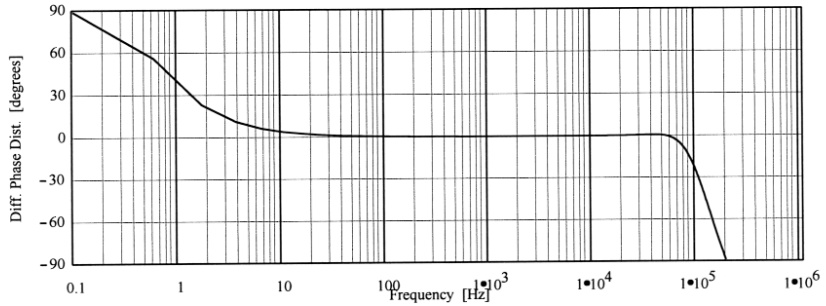
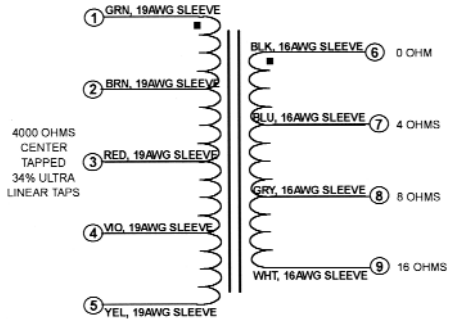
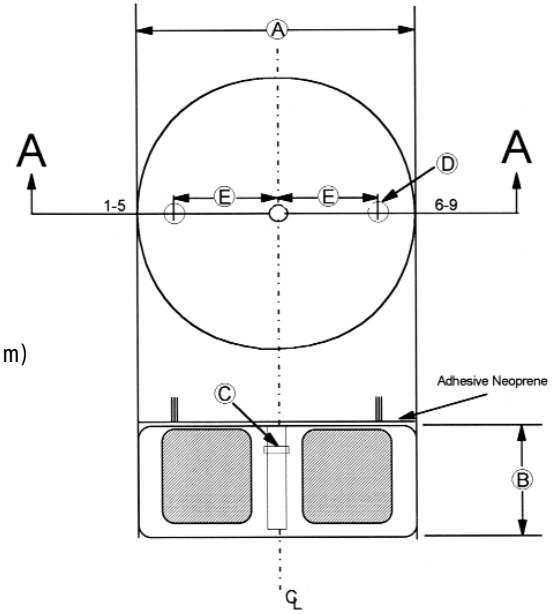


Schematic



Mechanical

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



Weight: 5.2kg
Lead Length: 200mm (+/- 10mm)

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