



## Toroidal Output Transformer for Tube Amplifiers

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### PAT-4147-00 Ratings

Type & Application	:	Plitron / VDV PAT-4152-00	
Primary Impedance	:	Raa = 3.545	[kΩ]
Secondary Impedance	:	Rls = 6	[Ω]
Turns Ratio Np/Ns	:	Ratio = 24.306	[ ]
Ultra Linear Tapping at	:	tap= 0	[%]
-.1 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	flf = 2.694	fhf = 47.997
-1 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	fl1 = 1.149	fh1 = 94.206
-3 dB Frequency Range [Hz to KHz] <sup>(3)</sup>	:	fl3 = 0.585	fh3 = 149.763
Nominal Power <sup>(1)</sup>	:	Pn = 100	[W]
-3 dB Power Bandwidth starting at	:	fu = 24	[Hz]
Total Primary Inductance <sup>(2)</sup>	:	Lp = 682	[H]
Primary Leakage Inductance	:	lsp = 2.5	[mH]
Effective Primary Capacitance	:	cip = 0.5	[nF]
Total Primary DC Resistance	:	Rip = 75	[Ω]
Total Secondary DC Resistance	:	Ris = 0.15	[Ω]
Tubes Plate Resistance per section	:	ri = 4	[kΩ]
Insertion Loss	:	lloss = 0.196	[dB]
Q-factor 2nd order HF roll-off <sup>(5)</sup>	:	Q = 0.624	[ ]
HF roll-off Specific Frequency <sup>(5)</sup>	:	Fo = 172.213	[kHz]
Quality Factor <sup>(5)</sup>	:	QF = 2.728·10 <sup>5</sup>	[ ]
Quality Decade Factor = log(QF) <sup>(5)</sup>	:	QDF = 5.436	[ ]
Tuning Factor <sup>(5)</sup>	:	TF = 0.939	[ ]
Tuning Decade Factor = log(TF) <sup>(5)</sup>	:	TDF = -0.027	[ ]
Frequency Decade Factor <sup>(4,5)</sup>	:	FDF = 5.408	[ ]

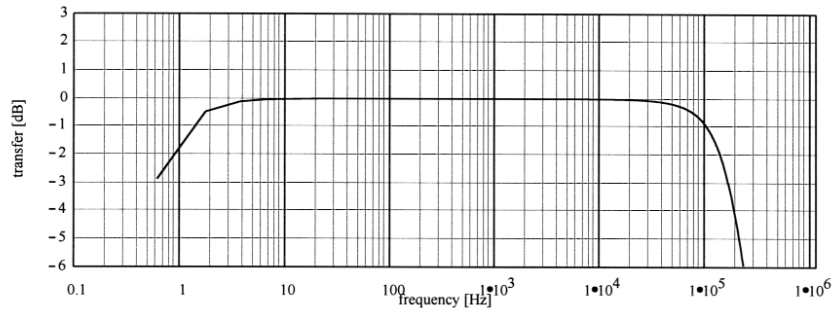
- (1): calculated under the conditions of balancing the DC-currents and the AC-anode voltages of the powertubes driving the transformer  
 (2): maximum value, measured over secondary, transfered to primary  
 (3): calculation at 1 mWatt in Rls; ri and Rls are pure Ohmic  
 (4): defined as  $FDF = \log(fh3/fl3) = \text{number of frequency decades transfered}$   
 (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 October 26, 1995

## Special Toroidal Output Transformer Designs

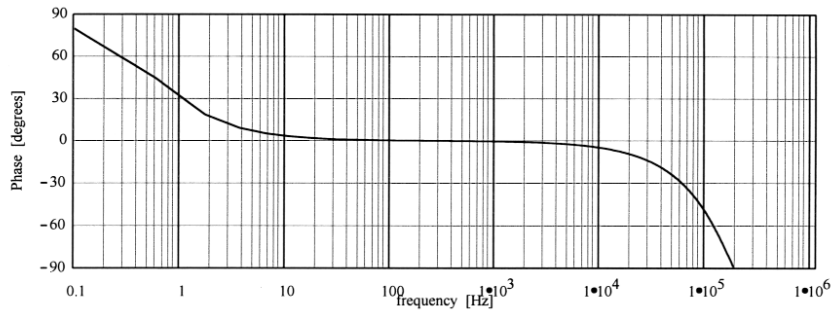


# PAT-4147-00 Response Curves

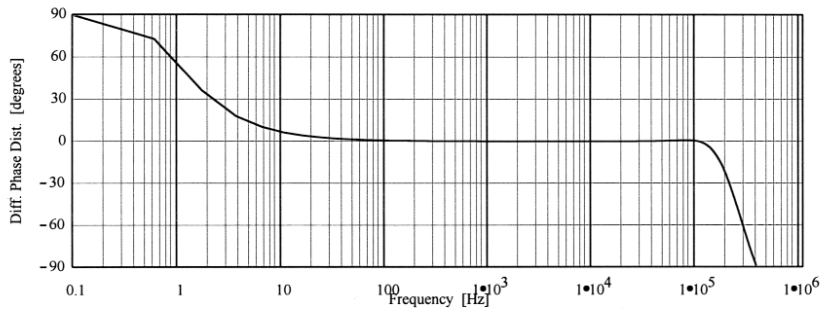
Frequency Response; Vertical 1 dB/div; Horizontal .1 Hz to 1 MHz (3)



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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