

Miniature 400Hz Power Transformers Series

115VAC/26VAC Input, 0.38VA to 2.4VA

PRODUCT OVERVIEW

400Hz power transformers are used in various energy conversion power supplies. They are crucial to aerospace and military industry for aircraft systems as the lightweight solution to the traditional 50/60Hz heavy electronics. The application is not limited to flight systems, but also in stationary controls, airport equipment, and vehicle mobility systems. This miniature class of 400Hz power transformers has an operating temperature range from -55°C to +130°C, with 90°C maximum ambient temperature.

Typical applications:

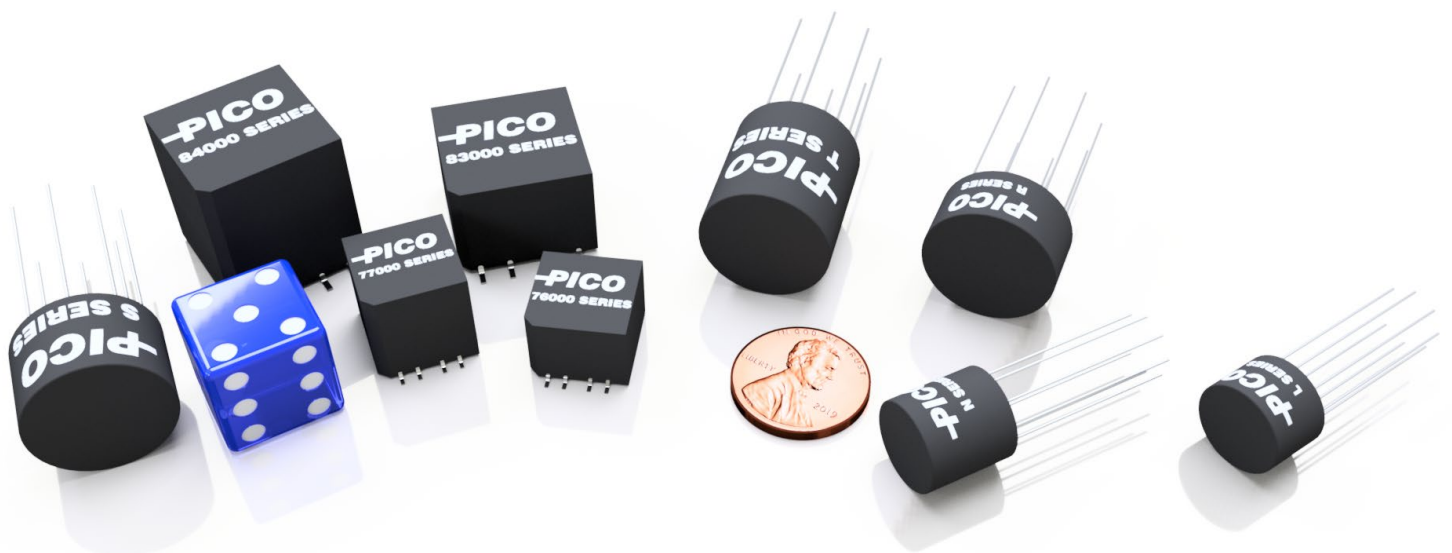
- Lighting
- Defense systems
- Air conditioning
- Avionic flight controls
- Naval electronics
- Power conversion systems
- Vehicle and aircraft navigation

FEATURES

- Extreme resistance to impact, shock, and vibration
- Manufactured to MIL-PRF-27, Class S, Grade 5
- High reliability for space and mission critical applications
- Ultra miniature in size and minimalistic design
- Design layouts in through-hole or surface mount types
- 115VAC or 26VAC primary

Contact Pico for part number of available options:

- Screening and qualification criteria to flight standard
- Fully RoHS compliant or with exemption 7(a)
- Modifications to mechanical design and electrical characteristics
- Custom new design and parameters



Miniature 400Hz Power Transformers Series | Power Transformer **PICO**

SPECIFICATIONS

Primary				Secondary		Primary				Secondary	
Through Hole		Surface Mount		Voltage [V]	Current [mA]	Through Hole		Surface Mount		Voltage [V]	Current [mA]
115V	26V	115V	26V			115V	26V	115V	26V		
L-8948	L-8951	76900	76902	5 CT	75	L-8934	L-8959	76886	76909	18 CT	20.8
N-6948	N-6951	77900	77902		150	N-6934	N-6959	77886	77909		41.7
R-20650	R-20815	82650	82815		204	R-20685	R-20850	82685	82850		56.7
S-21650	S-21815	83650	83815		338	S-21685	S-21850	83685	83850		93.9
T-22650	T-22815	84650	84815		480	T-22685	T-22850	84685	84850		133
L-8947	L-8952	76899	76903	6.3 CT	59.5	L-8933	L-8961	76885	76911	20 CT	18.8
N-6947	N-6952	77899	77903		119	N-6933	N-6961	77885	77911		37.5
R-20655	R-20820	82655	82820		162	R-20690	R-20855	82690	82855		51
S-21655	S-21820	83655	83820		268	S-21690	S-21855	83690	83855		84.5
T-22655	T-22820	84655	84820		381	T-22690	T-22855	84690	84855		120
L-8946	L-8953	76898	76904	8 CT	47	L-8932	L-8962	76884	76912	22 CT	17
N-6946	N-6953	77898	77904		94	N-6932	N-6962	77884	77912		34
R-20660	R-20825	82660	82825		128	R-20695	R-20860	82695	82860		46.4
S-21660	S-21825	83660	83825		211	S-21695	S-21860	83695	83860		76.8
T-22660	T-22825	84660	84825		300	T-22695	T-22860	84695	84860		109
L-8945	L-8954	76897	76905	10 CT	37.5	L-8930	L-8963	76882	76913	24 CT	15.5
N-6945	N-6954	77897	77905		75	N-6930	N-6963	77882	77913		31
R-20665	R-20830	82665	82830		102	R-20700	R-20865	82700	82865		42.5
S-21665	S-21830	83665	83830		169	S-21700	S-21865	83700	83865		70.4
T-22665	T-22830	84665	84830		240	T-22700	T-22865	84700	84865		100
L-8940	L-8956	76892	76906	12.8 CT	29	L-8929	L-8964	76881	76914	28 CT	13.4
N-6940	N-6956	77892	77906		58.6	N-6929	N-6964	77881	77914		26.8
R-20670	R-20835	82670	82835		79.7	R-20705	R-20870	82705	82870		36.4
S-21670	S-21835	83670	83835		132	S-21705	S-21870	83705	83870		60.4
T-22670	T-22835	84670	84835		188	T-22705	T-22870	84705	84870		85.7
L-8937	L-8957	76889	76907	14 CT	26.8	L-8927	L-8966	76879	76916	31 CT	12
N-6937	N-6957	77889	77907		53.6	N-6927	N-6966	77879	77916		24
R-20675	R-20840	82675	82840		72.9	R-20710	R-20875	82710	82875		32.9
S-21675	S-21840	83675	83840		121	S-21710	S-21875	83710	83875		54.5
T-22675	T-22840	84675	84840		171	T-22710	T-22875	84710	84875		77.4
L-8935	L-8958	76887	76908	16 CT	23	L-8925	L-8967	76877	76917	36 CT	10.4
N-6935	N-6958	77887	77908		47	N-6925	N-6967	77877	77917		20.8
R-20680	R-20845	82680	82845		63.8	R-20715	R-20880	82715	82880		28.3
S-21680	S-21845	83680	83845		106	S-21715	S-21880	83715	83880		46.9
T-22680	T-22845	84680	84845		150	T-22715	T-22880	84715	84880		66.7

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SPECIFICATIONS

Primary				Secondary		Primary				Secondary	
Through Hole		Surface Mount		Voltage [V]	Current [mA]	Through Hole		Surface Mount		Voltage [V]	Current [mA]
115V	26V	115V	26V			115V	26V	115V	26V		
L-8924	L-8968	76876	76918	39 CT	9.6	L-8905	L-8977	76857	76926	88 CT	4.2
N-6924	N-6968	77876	77918		19.2	N-6905	N-6977	77857	77926		8.5
R-20720	R-20885	82720	82885		26.2	R-20755	R-20920	82755	82920		11.6
S-21720	S-21885	83720	83885		43.3	S-21755	S-21920	83755	83920		19.2
T-22720	T-22885	84720	84885		61.5	T-22755	T-22920	84755	84920		27.3
L-8923	L-8969	76875	76919	43 CT	8.7	L-8902	L-8978	76854	76927	100 CT	3.7
N-6923	N-6969	77875	77919		17.4	N-6902	N-6978	77854	77927		8.5
R-20725	R-20890	82725	82890		23.7	R-20760	R-20925	82760	82925		10.2
S-21725	S-21890	83725	83890		39.3	S-21760	S-21925	83760	83925		16.9
T-22725	T-22890	84725	84890		55.8	T-22760	T-22925	84760	84925		24
L-8922	L-8971	76874	76920	48 CT	7.8	L-8900	L-8979	76852	76928	115 CT	3.2
N-6922	N-6971	77874	77920		15.6	N-6900	N-6979	77852	77928		6.5
R-20730	R-20895	82730	82895		21.1	R-20765	R-20930	82765	82930		8.9
S-21730	S-21895	83730	83895		35.2	S-21765	S-21930	83765	83930		14.7
T-22730	T-22895	84730	84895		50	T-22765	T-22930	84765	84930		20.9
L-8920	L-8972	76872	76921	56 CT	6.6	R-20770	R-20935	82770	82935	123 CT	8.3
N-6920	N-6972	77872	77921		13.2	S-21770	S-21935	83770	83935		13.7
R-20735	R-20900	82735	82900		18.2	T-22770	T-22935	84770	84935	19.5	
S-21735	S-21900	83735	83900		30.2	R-20775	R-20940	82775	82940	138 CT	7.4
T-22735	T-22900	84735	84900		42.9	S-21775	S-21940	83775	83940		12.2
L-8917	L-8973	76869	76922	63 CT	6	T-22775	T-22940	84775	84940	174	17.4
N-6917	N-6973	77869	77922		11.9	R-20780	R-20945	82780	82945		157 CT
R-20740	R-20905	82740	82905		16.2	S-21780	S-21945	83780	83945	10.8	
S-21740	S-21905	83740	83905		26.9	T-22780	T-22945	84780	84945	15.3	
T-22740	T-22905	84740	84905		38.2	R-20785	R-20950	82785	82950	175 CT	5.8
L-8915	L-8974	76867	76923	68 CT	5.5	S-21785	S-21950	83785	83950		9.6
N-6915	N-6974	77867	77923		11	T-22785	T-22950	84785	84950	13.7	
R-20745	R-20910	82745	82910		15	R-20790	R-20955	82790	82955	200 CT	5.1
S-21745	S-21910	83745	83910		24.9	S-21790	S-21955	83790	83955		8.4
T-22745	T-22910	84745	84910		35.3	T-22790	T-22955	84790	84955	12	
L-8910	L-8976	76862	76925	80 CT	4.6	S-21795	S-21960	83795	83960	220 CT	7.7
N-6910	N-6976	77862	77925		9.4	T-22795	T-22960	84795	84960		10.9
R-20750	R-20915	82750	82915		12.1	S-21800	S-21965	83800	83965	250 CT	6.8
S-21750	S-21915	83750	83915		21.1	T-22800	T-22965	84800	84965		9.6
T-22750	T-22915	84750	84915		30	S-21805	S-21970	83805	83970	275 CT	6.1
					T-22805	T-22970	84805	84970	8.7		
						S-21810	S-21975	83810	83975	310 CT	5.4
						T-22810	T-22975	84810	84975		7.7

SPECIFICATIONS

GENERAL

Parameter	Condition	Min.	Typ.	Max.	Units
Operating Frequency		380	400	420	Hz
Load Regulation	Output voltage adjusted to nominal value at half load	17	-	24	%
Dielectric Strength	60Hz	200	-	868	V _{RMS}
Insulation Resistance	300VDC to 500VDC	10	-	-	GΩ
Operating Temperature Range	Ambient with temperature rise	-55	-	+130	°C
Storage Temperature Range	Ambient	-55	-	+90	°C
Size	See mechanical drawings				
Weight	L & 76000 Series	-	5	-	grams
	N & 77000 Series	-	7.5	-	
	R & 82000 Series	-	12	-	
	S & 83000 Series	-	17	-	
	T & 84000 Series	-	28	-	
Case	Through hole models	Epoxy Insulated Metal			
	Surface mount models	Glass Reinforced Polymer			
Potting	Vacuum Impregnated Epoxy				
Box Package (W x H x L)	L & N Series	6.42 (163.07) x 0.79 (20.07) x 10.50 (266.70)			inches (mm)
	R, S, & T Series	2.35 (59.69) x 1.29 (32.77) x 9.45 (240.03)			
Tube Packaging (W x H x L)	Surface mount models	See drawing			inches (mm)
Tape & Reel Packaging	Upon request				
Moisture Sensitivity Level	SMT only	Level 3			

OPTIONAL DESIGN CRITERIA

Test	Standard	Description
Vibration	MIL-STD-202	Method 204, Vibration, High Frequency
Shock	MIL-STD-202	Method 213, Shock (Specified Pulse)
Immersion	MIL-STD-202	Method 104, Immersion
Moisture Resistance	MIL-STD-202	Method 106, Moisture Resistance
Flammability	MIL-STD-202	Method 111, Flammability (External Flame)
Thermal Shock	MIL-STD-202	Method 107, Thermal Shock

OPTIONAL SCREENING AND QUALIFICATION

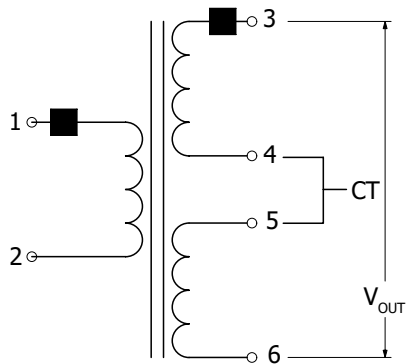
Standard	Screening & Qualification	Test ⁽²⁾
MIL-PRF-27	a.) Group A inspection Level-T - Table VII b.) Qualification inspection, Grade 5 - Table V	I. Thermal Shock II. Vibration III. Burn-in IV. Induced Voltage V. Shock VI. Dielectric Withstanding Voltage (at reduced pressure) VII. Insulation Resistance VIII. Electrical Characteristics IX. Visual and Mechanical Examination (External) X. Life XI. Radiographic Inspection
MIL-STD-981	a.) Group A screening tests - Table VI b.) Group B tests - Table XII, Class S	
EEE-INST-002, Section M1	a.) Magnetics Screening Req. - Table 2 b.) Magnetics Part Qual. - Table 3	

Note 2: Screening and qualification tests are not limited to the options in the chart above. Each standard may also be stringent or exclude certain tests from one another. Please contact Pico for specific application needs and for Pico part number.

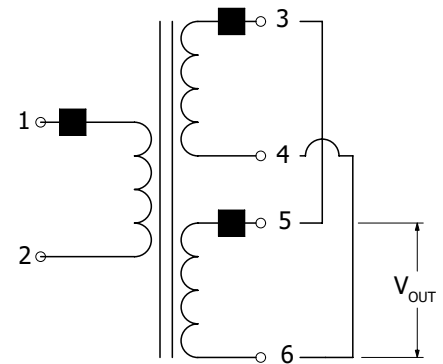
ELECTRICAL SCHEMATIC

THROUGH HOLE MODELS

SERIES CONNECTION

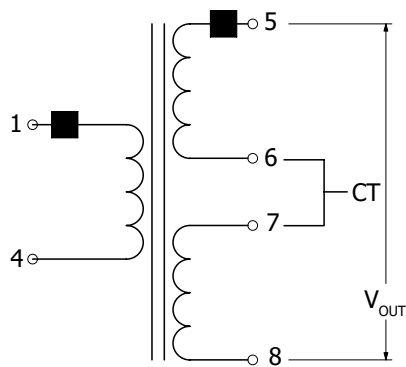


PARALLEL CONNECTION

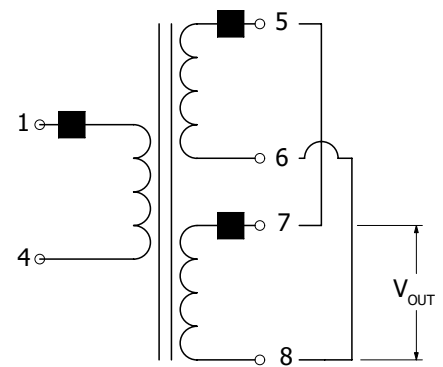


SURFACE MOUNT MODELS

SERIES CONNECTION

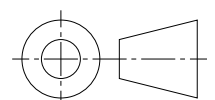


PARALLEL CONNECTION



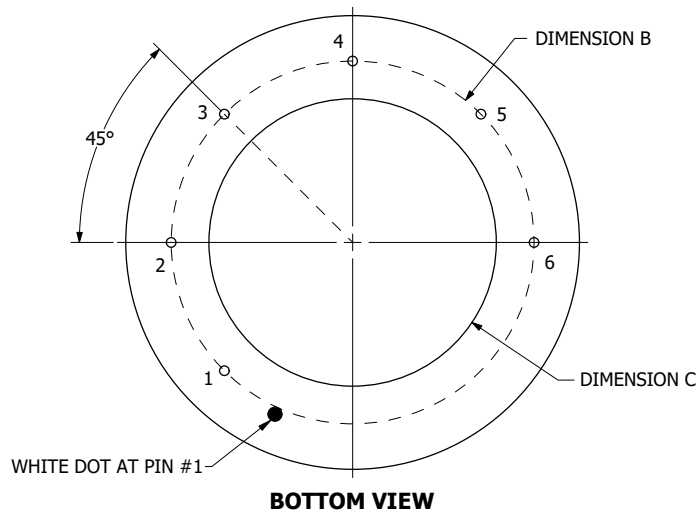
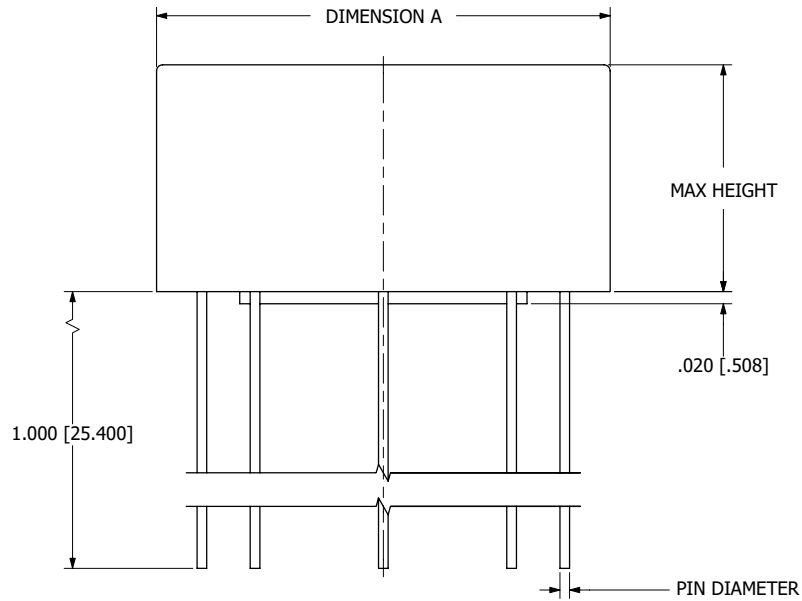
NOTES

- Please note that for through hole plug-ins 400Hz transformers, there are 6 pins which are not the same as the typical 7 pins design for series L, N, R, S, & T.
- Pins that are not shown here, but are physically there on the component, are only for mechanical stability on the PCB.
- CT stands for "center-tap", where the total number of turns is evenly split between the top half and bottom half of a complete winding.



MECHANICAL DRAWINGS

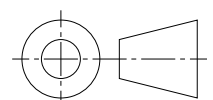
THROUGH HOLE MODELS



Series	Max Height	Diameter Dimension			Pin
		A	B	C	
L	.350 (8.89)	.510 (12.95)	.350 (8.89)	.218 (5.54)	.016 (0.41)
N	.500 (12.70)				.016 (0.41)
R	.375 (9.53)	.750 (19.05)	.600 (15.24)	.475 (12.07)	.016 (0.41)
S	.520 (13.21)				.020 (0.51)
T	.820 (20.83)				.020 (0.51)

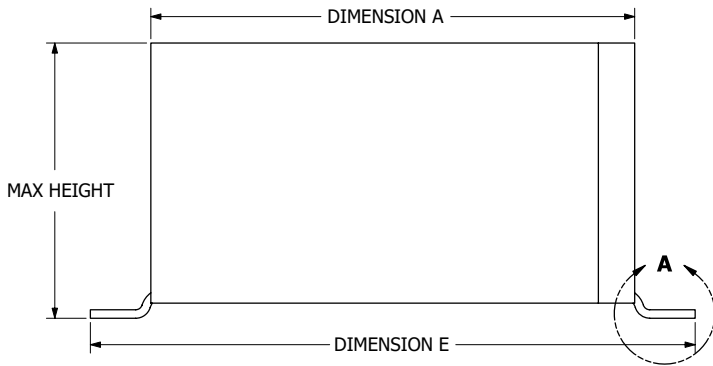
NOTES

- a. ALL DIMENSIONS ARE IN INCHES, [] = MM
- b. TERMINALS ARE CLOCKWISE FROM PIN #1

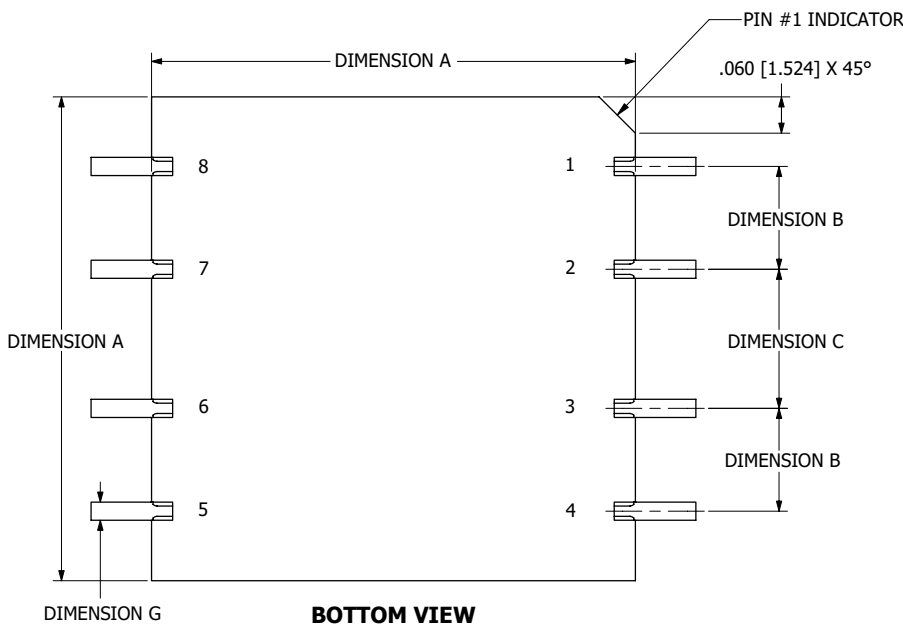
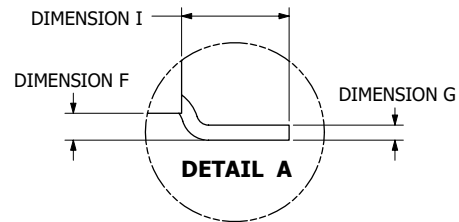


MECHANICAL DRAWINGS

SURFACE MOUNT MODELS



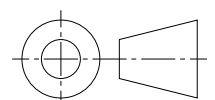
LEAD DETAILS



Series	Max Height	Dimension							
		A	B	C	D	E	F	G	I
76000	.415 (10.54)	.550 (13.97)	.095 (2.41)	.135 (3.43)	.010 (.25)	.670 (17.02)	.015 (.38)	.020 (.51)	.060 (1.52)
77000	.565 (14.35)								
82000	.455 (11.56)	.800 (20.32)	.170 (4.32)	.230 (5.84)	.014 (.35)	1.00 (25.40)	.025 (.63)	.030 (.76)	.100 (2.54)
83000	.605 (15.37)								
84000	.915 (23.24)								

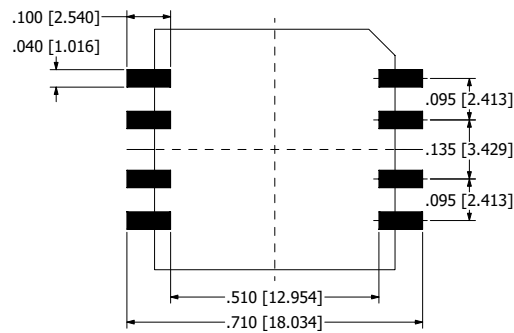
NOTES

- a. ALL DIMENSIONS ARE IN INCHES, [] = MM
- b. TERMINALS ARE CLOCKWISE FROM PIN #1
- c. PIN #4 HAS NO CONNECTION

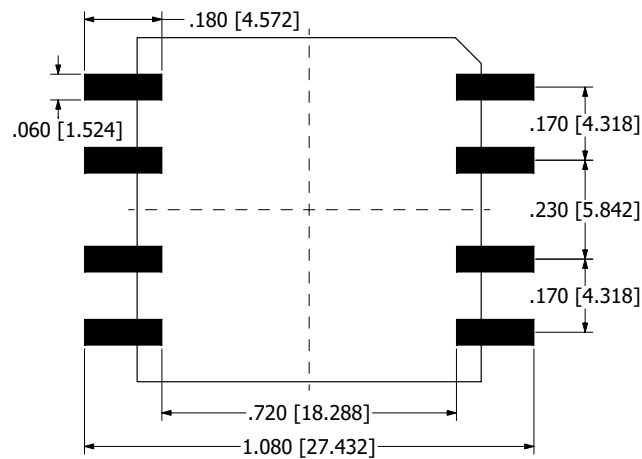


RECOMMENDED LAND PATTERN DIMENSIONS

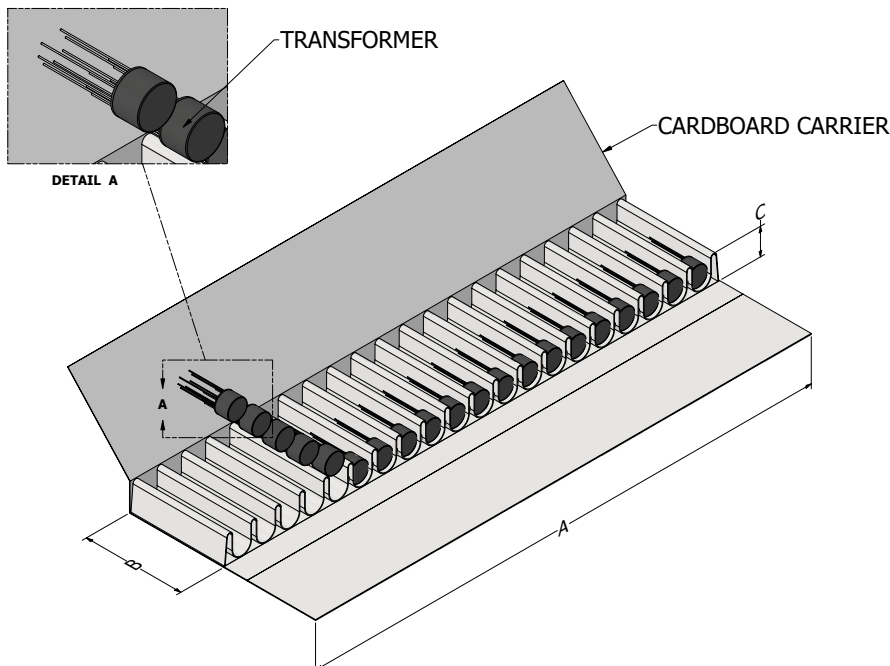
76000 & 77000 SERIES



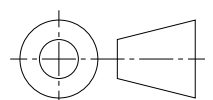
82000, 83000 & 84000 SERIES



BOX PACKAGING - L, N, R, S & T SERIES

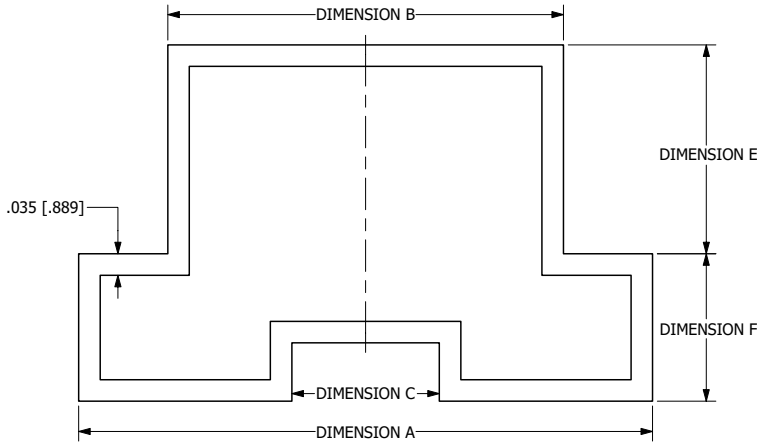


Series	Dimension		
	A	B	C
L & N	10.5 [266.7]	6.42 [163.068]	0.79 [20.066]
R, S & T	9.45 [240.03]	2.35 [59.69]	1.29 [32.766]

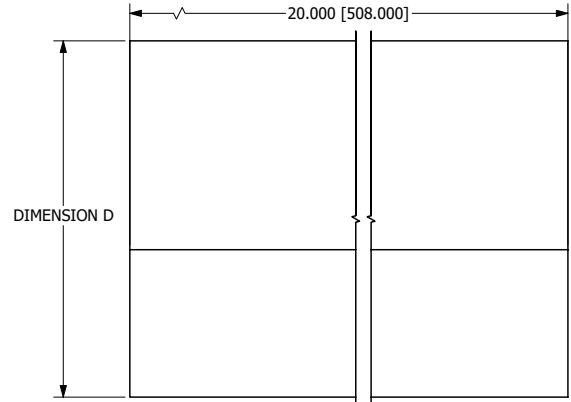


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TUBE PACKAGING - 76000, 77000, 82000, 83000 & 84000 SERIES

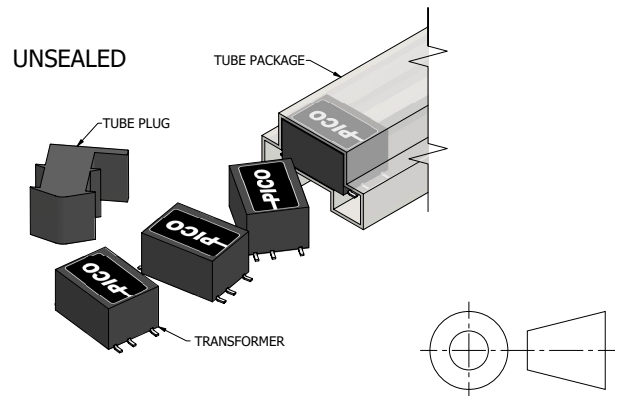
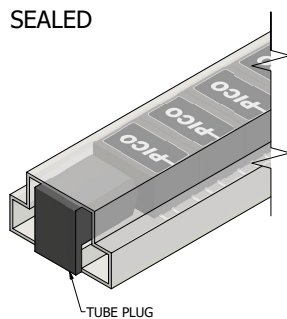


PLAN VIEW



ELEVATION VIEW

Series	Dimension					
	A	B	C	D	E	F
76000	.934 [23.724]	.644 [16.358]	.240 [6.096]	.580 [14.732]	.340 [8.636]	.240 [6.096]
77000	.934 [23.724]	.644 [16.358]	.240 [6.096]	.730 [18.542]	.490 [12.446]	.240 [6.096]
82000	1.240 [31.496]	.950 [24.130]	.480 [12.192]	.610 [15.494]	.390 [9.906]	.220 [2.558]
83000	1.170 [29.718]	.880 [22.352]	.430 [10.922]	.745 [18.923]	.505 [12.827]	.240 [6.096]
84000	1.170 [29.718]	.880 [22.352]	.430 [10.922]	1.140 [28.956]	.830 [21.082]	.310 [7.874]



Pico warrants each product manufactured by us and sold by us or an authorized representative, to be free from defects in material and workmanship. If properly used, it will perform within its applicable specifications for a period of one year after original shipment. Pico's obligation under this guarantee is limited to repairing or replacing our product to the original purchaser. This warranty is in lieu of all other warranties, express or implied and constitutes fulfillment of our obligations to the purchaser. We do not guarantee that the products can be used for a particular purpose other than those solely covered by the product's specifications. Pico must be notified if the product must meet particular certifications and/or standards. We assume no liability, in any event, for consequential damages, for anticipated or lost profits, incidental damages or loss of time or other losses incurred by the purchaser or any third party in connection with products covered by this warranty or otherwise. The purchaser will indemnify and hold Pico harmless for any damages, losses, costs, etc. from usage not within the product's specifications. Pico must be consulted before usage of its products in a nuclear, radioactive or space environment.

We reserve the right to discontinue products without notice, We reserve the right to make modifications to any existing catalog products without notice, at any time, without the obligation to modify units previously sold.