400Hz Power Transformers Series

115VAC/26VAC Input, 5VA to 150VA

PICO Electronics, Inc.

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 larger class of 400Hz power transformers has an operating temperature range from -55°C to +130°C.

Typical applications:

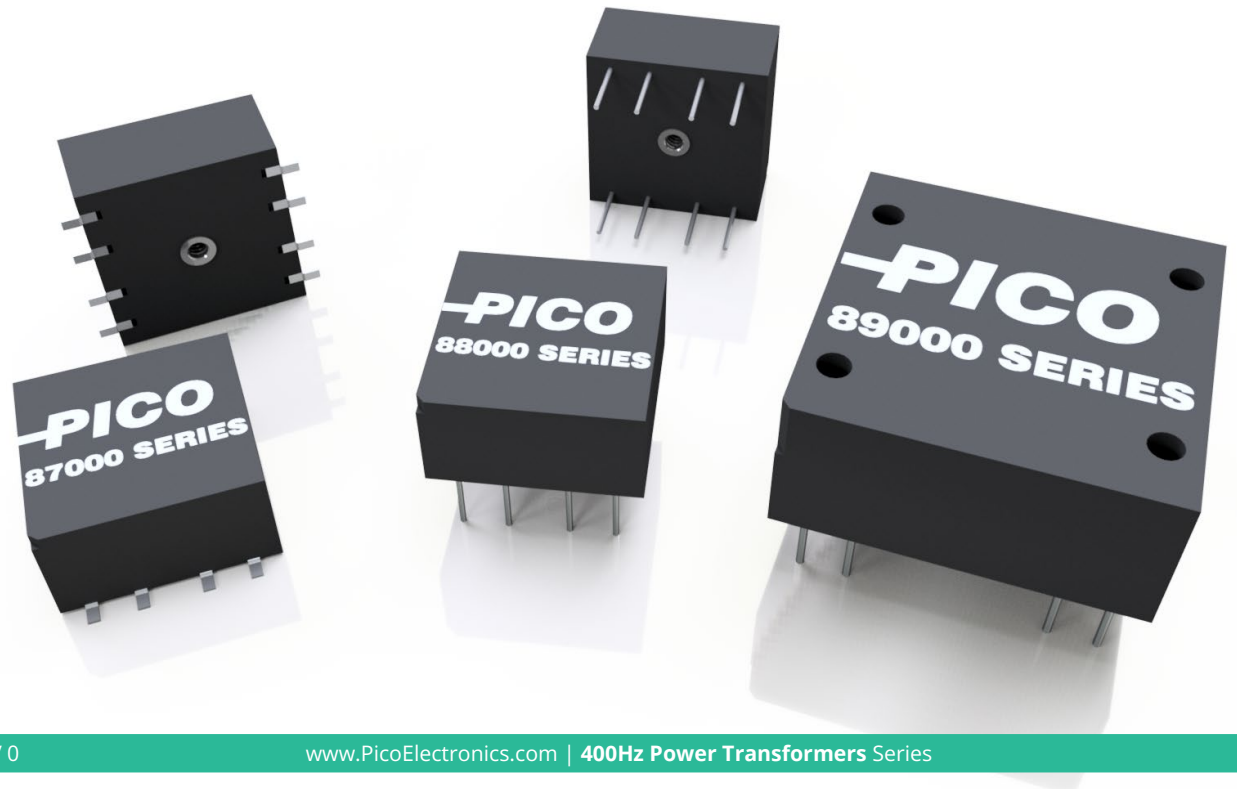
- Lighting
- Defense systems
- Air conditioning
- Avionic flight controls
- Naval electronics
- Power conversion systems
- Vehicle and aircraft navigation

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



SPECIFICATIONS

Primary				Secondary		Primary				Secondary	
Through Hole		Surface Mount		Voltage	Current	Through Hole		Surface Mount		Voltage	Current
115VAC	26VAC	115VAC	26VAC	[V]	[mA]	115VAC	26VAC	115VAC	26VAC	[V]	[mA]
88515	88015	87515	87015		1000	88535	88035	87535	87035		357
88615	88115	87615	87115		3000	88635	88135	87635	87135		1071
88715	88215	87715	87215		5000	88735	88235	87735	87235		1786
88815	88315	87815	87315	5 CT	7000	88835	88335	87835	87335	14 CT	2500
88915	88415	87915	87415		10,000	88935	88435	87935	87435		3571
89515	89015	-	-		15,000	89535	89035	-	-		5350
89715	89215	-	-		30,000	89735	89235	-	-		10,714
88520	88020	87520	87020		833	88540	88040	87540	87040		333
88620	88120	87620	87120		2500	88640	88140	87640	87140		1000
88720	88220	87720	87220		4166	88740	88240	87740	87240		1667
88820	88320	87820	87320	6 CT	5833	88840	88340	87840	87340	15 CT	2333
88920	88420	87920	87420		8333	88940	88440	87940	87440		3333
89520	89020	-	-		12,500	89540	89040	-	-		5000
89720	89220	-	-		25,000	89740	89240	-	-		10,000
88525	88025	87525	87025		555	88545	88045	87545	87045		227
88625	88125	87625	87125		1666	88645	88145	87645	87145		681
88725	88225	87725	87225		2777	88745	88245	87745	87245		1136
88825	88325	87825	87325	9 CT	3888	88845	88345	87845	87345	22 CT	1591
88925	88425	87925	87425		5555	88945	88445	87945	87445		2272
89525	89025	-	-		8330	89545	89045	-	-		3400
89725	89225	-	-		16,666	89745	89245	-	-		6818
88530	88030	87530	87030		417	88550	88050	87550	87050		208
88630	88130	87630	87130		1250	88650	88150	87650	87150		625
88730	88230	87730	87230		2083	88750	88250	87750	87250		1041
88830	88330	87830	87330	12 CT	2917	88850	88350	87850	87350	24 CT	1450
88930	88430	87930	87430		4166	88950	88450	87950	87450		2083
89530	89030	-	-		6250	89550	89050	-	-		3125
89730	89230	-	-		12,500	89750	89250	-	-		6250

SPECIFICATIONS

Primary				Secondary	
Through Hole		Surface Mount		Voltage	Current
115VAC	26VAC	115VAC	26VAC	[V]	[mA]
88555	88055	87555	87055		178
88655	88155	87655	87155		535
88755	88255	87755	87255		892
88855	88355	87855	87355	28 CT	1250
88955	88455	87955	87455		1786
89555	89055	-	-		2678
89755	89255	-	-		5357
88560	88060	87560	87060		138
88660	88160	87660	87160		416
88760	88260	87760	87260		694
88860	88360	87860	87360	36 CT	972
88960	88460	87960	87460		1389
89560	89060	-	-		2083
89760	89260	-	-		4166
88565	88065	87565	87065		104
88665	88165	87665	87165		312
88765	88265	87765	87265		521
88865	88365	87865	87365	48 CT	729
88965	88465	87965	87465		1043
89565	89065	-	-		1562
89765	89265	-	-		3125
88570	88070	87570	87070		67
88670	88170	87670	87170		200
88770	88270	87770	87270		333
88870	88370	87870	87370	75 CT	467
88970	88470	87970	87470		676
89570	89070	-	-		1000
89770	89270	-	-		2000

Primary				Secondary	
Through Hole		Surface Mount		Voltage	Current
115VAC	26VAC	115VAC	26VAC	[V]	[mA]
88575	88075	87575	87075		50
88675	88175	87675	87175		150
88775	88275	87775	87275		250
88875	88375	87875	87375	100 CT	350
88975	88475	87975	87475		500
89575	89075	-	-		750
89775	89275	-	-		1500
88580	88080	87580	87080		145
88680	88180	87680	87180		1136
88780	88280	87780	87280		227
88880	88380	87880	87380	110 CT	318
88980	88480	87980	87480		454
89580	89080	-	-		682
89780	89280	-	-		1364
88585	88085	87585	87085		43
88685	88185	87685	87185		130
88785	88285	87785	87285		217
88885	88385	87885	87385	115 CT	304
88985	88485	87985	87485		434
89585	89085	-	-		652
89785	89285	-	-		1304

SPECIFICATIONS

GENERAL

Parameter	Condition	Min.	Typ.	Max.	Units
Operating Frequency		380	400	420	Hz
Load Regulation		-	-	8	%
Dielectric Withstanding Voltage	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	See mechanical drawings				
Case	Glass Reinforced Polymer				
Potting	Vacuum Impregnated Epoxy				
Box Packaging (L x W x H)		11.56 x 8.92 x 1.4 (293.624 x 226.568 x 35.56)			inches (mm)
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

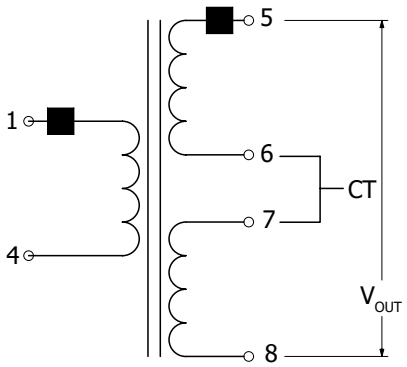
OPTIONAL SCREENING AND QUALIFICATION

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	

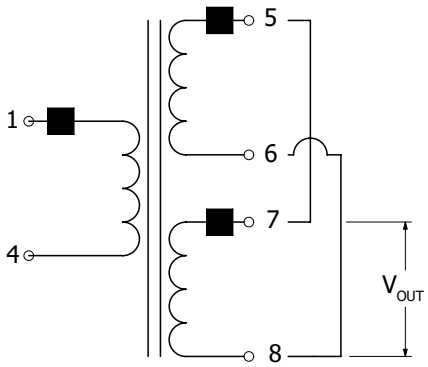
Note 2: Screening and qualification tests are not limited to the options in the chart above. Each standard may also be stringent or exclude certain tests from one another. Please contact Pico for specific application needs and for Pico part number.

ELECTRICAL SCHEMATIC

SERIES CONNECTION



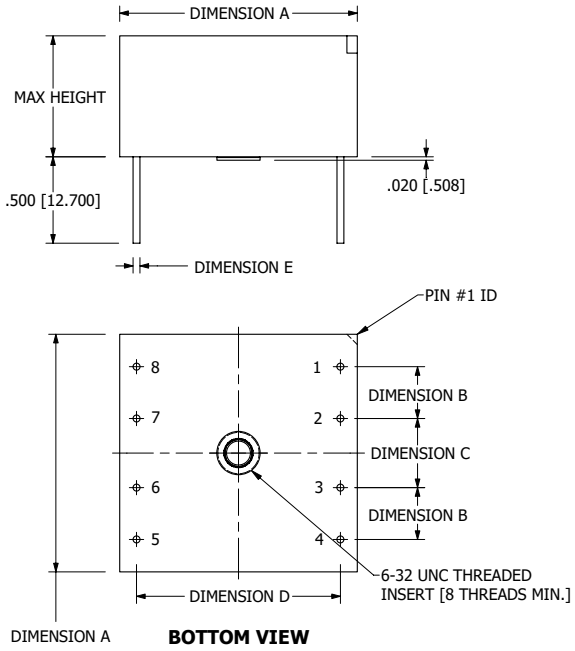
PARALLEL CONNECTION



NOTES
a. TERMINAL 2 & 3 HAVE NO CONNECTION. MECHANICAL STABILITY ONLY.
b. 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

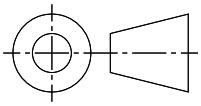
THROUGH HOLE MODELS



BOTTOM VIEW

Series	Max Height	Dimension					Weight (grams)
		A	B	C	D	E	
88000 & 88500	.700 (17.78)	1.375 (34.93)	.300 (7.62)	.400 (10.16)	1.180 (29.97)	.040 (1.01)	52
88100 & 88600	.825 (20.95)	1.500 (38.10)	.300 (7.62)	.500 (12.70)	1.330 (33.75)	.040 (1.01)	65
88200 & 88700	.825 (20.95)	1.625 (41.28)	.300 (7.62)	.700 (17.78)	1.400 (35.56)	.040 (1.01)	100
88300 & 88800	.925 (23.49)	1.750 (44.45)	.300 (7.62)	.800 (20.32)	1.570 (39.88)	.040 (1.01)	145
88400 & 88900	1.025 (26.03)	2.000 (50.80)	.300 (7.62)	.900 (22.86)	1.800 (45.72)	.052 (1.32)	195

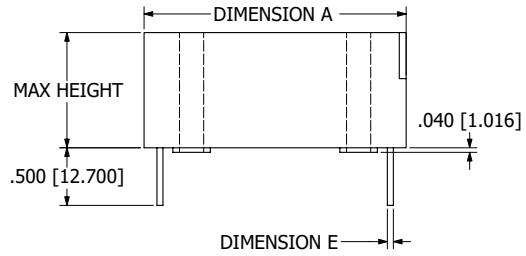
NOTES
a. ALL DIMENSIONS ARE IN INCHES, [ ] = MM
b. TERMINALS ARE CLOCKWISE FROM PIN #1

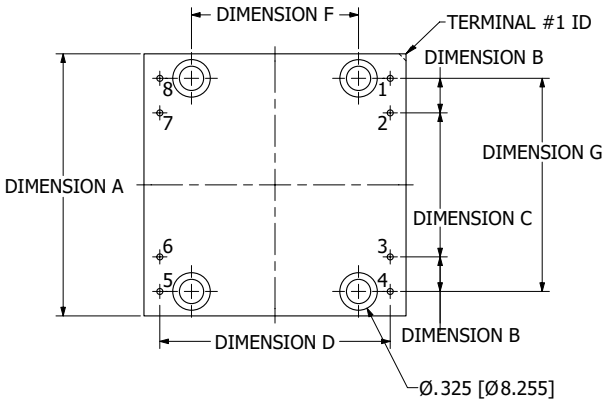


MECHANICAL DRAWINGS

THROUGH HOLE MODELS

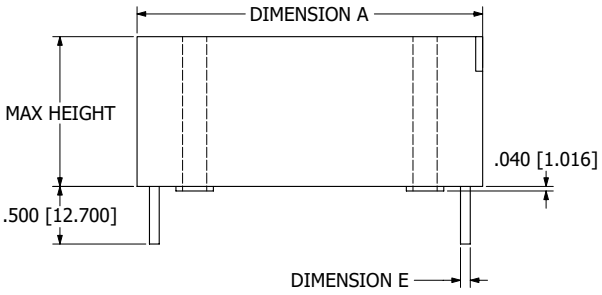
89000 & 89500 SERIES

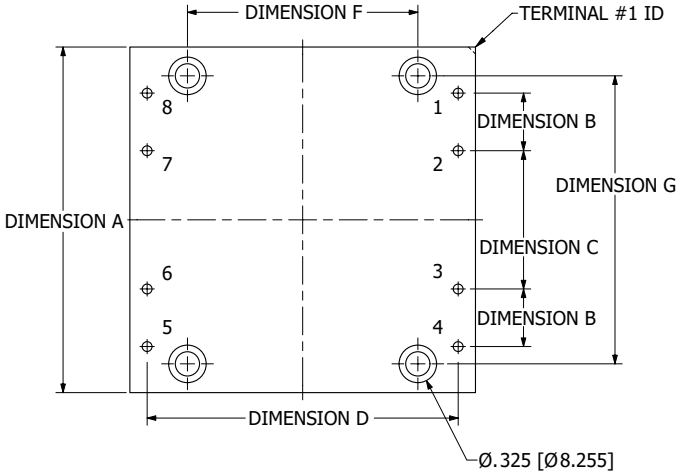




BOTTOM VIEW

89200 & 89700 SERIES





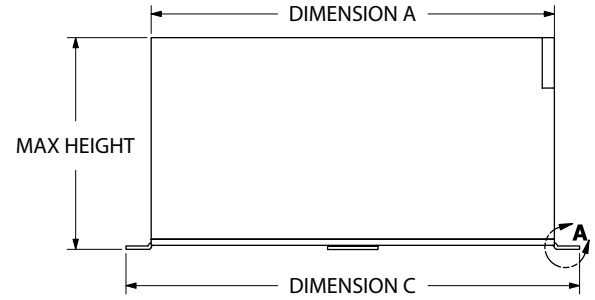
BOTTOM VIEW

Series	Max Height	Dimension							Weight (grams)
		A	B	C	D	E	F	G	
89000 & 89500	1.000 (25.40)	2.275 (57.78)	.300 (7.62)	1.250 (31.75)	2.000 (50.60)	.052 (1.32)	1.450 (36.83)	1.850 (47.00)	252
89200 & 89700	1.300 (33.02)	3.000 (76.20)	.500 (12.70)	1.200 (30.48)	2.700 (68.58)	.085 (2.16)	2.000 (50.80)	2.500 (63.50)	525

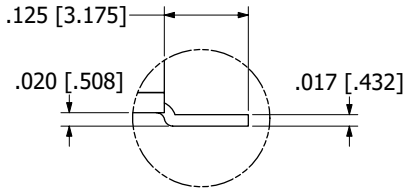
NOTES
a. ALL DIMENSIONS ARE IN INCHES, [ ] = MM
b. TERMINALS ARE CLOCKWISE FROM PIN #1

MECHANICAL DRAWINGS

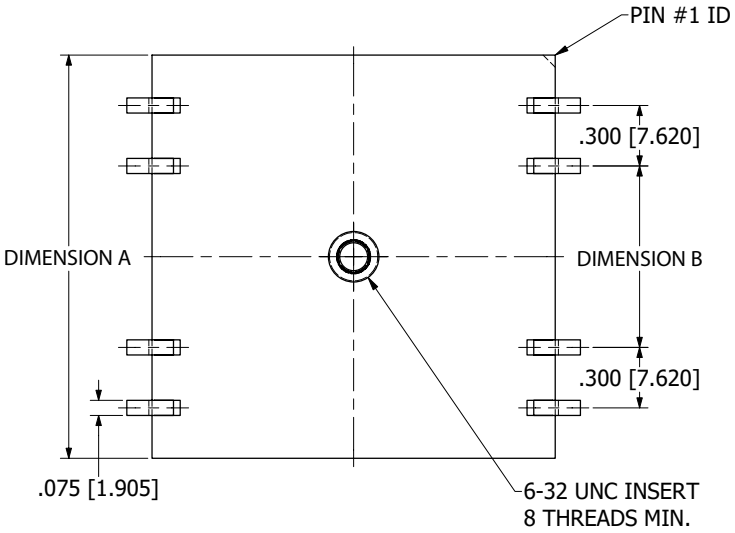
SURFACE MOUNT MODELS



LEAD DETAILS



DETAIL A



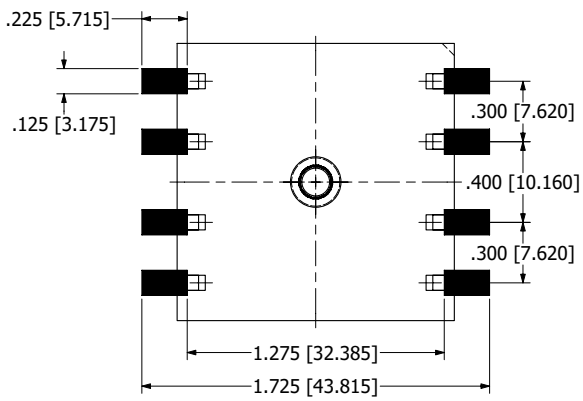
BOTTOM VIEW

Series	Max Height	Dimension A	Dimension B	Dimension C	Insert	Weight (grams)
87000 & 87500	.725 (18.42)	1.375 (34.93)	.400 (10.16)	1.625 (41.27)	6 - 32 UNC	52
87100 & 87600	.850 (20.32)	1.500 (38.10)	.500 (12.70)	1.750 (44.45)		65
87200 & 87700	.850 (21.59)	1.625 (41.28)	.700 (17.78)	1.875 (47.63)		100
87300 & 87800	.950 (24.13)	1.750 (44.45)	.800 (20.32)	2.000 (50.80)		145
87400 & 87900	1.050 (26.67)	2.000 (50.80)	.900 (22.86)	2.250 (57.15)		195

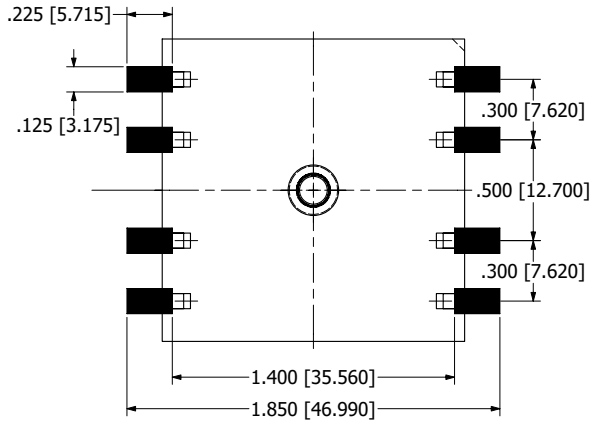
NOTES
a. ALL DIMENSIONS ARE IN INCHES, [ ] = MM
b. TERMINALS ARE CLOCKWISE FROM PIN #1
c. PIN #3 HAS NO CONNECTION

RECOMMENDED LAND PATTERN DIMENSIONS

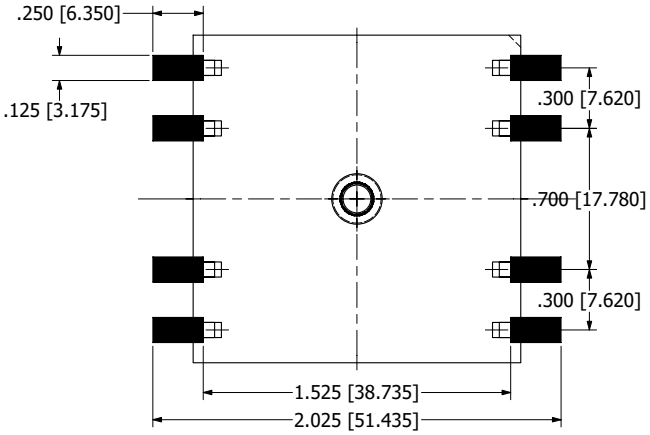
87000 & 87500 SERIES



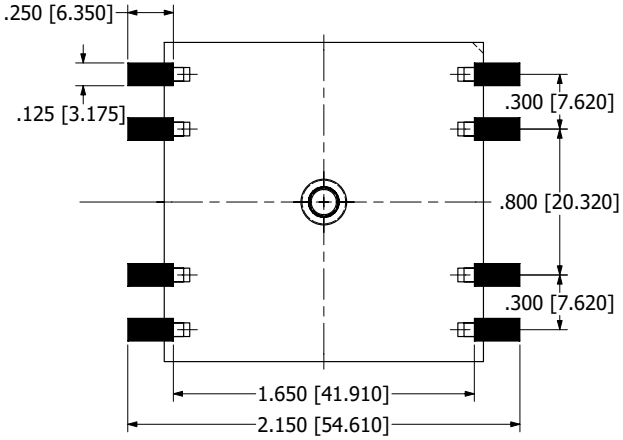
87100 & 87600 SERIES



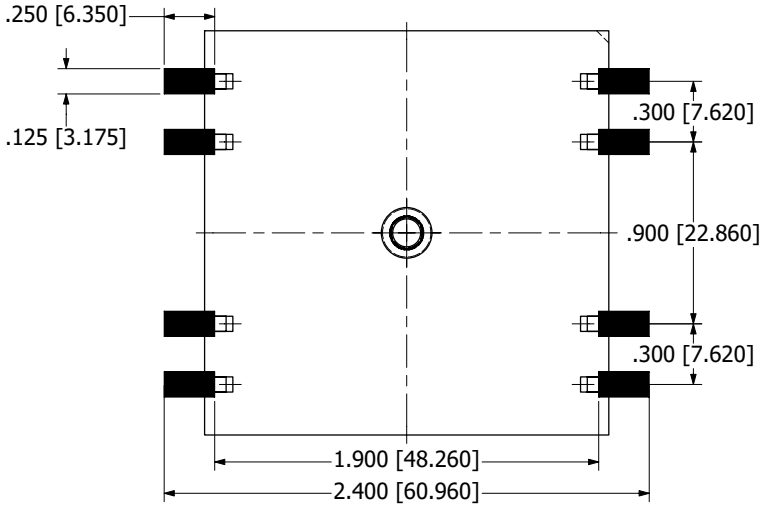
87200 & 87700 SERIES



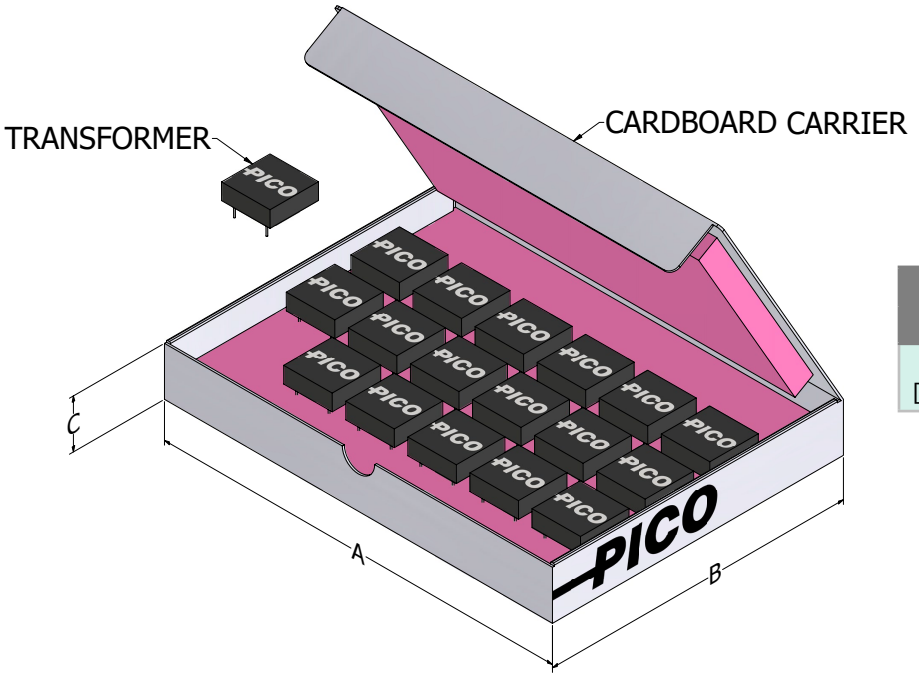
87300 & 87800 SERIES



87400 & 87900 SERIES



BOX PACKAGING



Dimension		
A	B	C
11.56 [293.624]	8.92 [226.568]	1.4 [35.56]