

Miniature Power Inductor Series

0.04-20mH, 0.060-3.88A, Power Inductor

PRODUCT OVERVIEW

Pico power inductors are built to smoothly transmit direct current across various DC-DC converters and switching regulators. They can provide low core losses and are used to store energy, which the electromotive force can filter out frequency noise and reduce signal loss. Energy storage can also allow higher power consumption in system designs. These power inductors are ideal for filtering out noise and ripple spikes in many applications. Pico has a diverse portfolio of power inductors ranging in mechanical size, mounting options, current rating, and inductance rating.

Typical applications:

- DC-DC Converters
- Switching Regulators
- Radar & Communication Systems
- Step-up or Step-down Transformers
- Aviation Power Systems
- Automotive & EVs
- Medical Equipment

FEATURES

- Extreme resistance to impact, shock, and vibration
- Manufactured to MIL-PRF-27 Grade 5, Class S (Except Size 0 which is Class V)
- High reliability for space and mission critical applications
- Ultra miniature in size and minimalistic design
- Design layouts in through-hole, or surface mount
- Magnetically shielded (through-hole only)
- Terminal solderability per MIL-STD-202, Method 208

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 Power Inductor Series | Power Inductor **PICO**

SPECIFICATIONS

Through Hole	Surface Mount	Inductance		DC Current		DC Resistance		Self Resonant Frequency [MHz]	Size Reference
		Parallel [mH] typ.	Series [mH] typ.	Parallel [A]	Series [A]	Parallel [Ω]	Series [Ω]		
41020	41320	5	20	0.12	0.06	13.5	54	0.275	1
42105	42405			0.2	0.1	7.25	29	0.207	2
43103	43403			0.28	0.14	5	20	0.23	3
44500	-			0.44	0.22	3.1	12.4	0.21	4
45107	-			0.58	0.29	2.55	10.2	0.18	5
41040	41340	3.75	15	0.14	0.07	10.125	40.5	0.32	1
42125	42425			0.24	0.12	5.5	22	0.24	2
43123	43423			0.32	0.16	3.75	15	0.235	3
44520	-			0.46	0.23	2.325	9.3	0.28	4
45127	-			0.66	0.33	1.925	7.7	0.245	5
40050	40350	2.5	10	0.1	0.05	18.75	75	0.4	0
41060	41360			0.16	0.08	6.75	27	0.38	1
42145	42445			0.28	0.14	3.65	14.6	0.39	2
43143	43443			0.4	0.2	2.5	10	0.34	3
44560	-			0.62	0.31	1.55	6.2	0.29	4
45147	-			0.8	0.4	1.275	5.1	0.3	5
40070	40370	1.875	7.5	0.116	0.058	14	56	0.5	0
41080	41380			0.2	0.1	5.075	20.3	0.45	1
42165	42465			0.34	0.17	2.75	11	0.43	2
43163	43463			0.48	0.24	1.875	7.5	0.39	3
44580	-			0.76	0.38	1.175	4.7	0.35	4
45167	-			0.98	0.49	0.95	3.8	0.34	5
40090	40390	1.25	5	0.142	0.071	9.5	38	0.65	0
41100	41400			0.24	0.12	3.375	13.5	0.6	1
42185	42485			0.42	0.21	1.825	7.3	0.49	2
43183	43483			0.6	0.3	1.25	5	0.55	3
44600	-			0.94	0.47	0.775	3.1	0.46	4
45187	-			1.2	0.6	0.65	2.6	0.41	5
40110	40410	0.75	3	0.182	0.091	5.5	22	0.8	0
41120	41420			0.32	0.16	2.025	8.1	0.71	1
42205	42505			0.54	0.27	1.1	4.4	0.65	2
43203	43503			0.76	0.38	0.75	3	0.57	3
44620	-			1.2	0.6	0.475	1.9	0.6	4
45207	-			1.56	0.78	0.375	1.5	0.55	5
40130	40430	0.5	2	0.224	0.112	4.5	18	1	0
41140	41440			0.38	0.19	1.35	5.4	0.95	1
42225	42525			0.66	0.33	0.725	2.9	0.85	2
43223	43523			0.94	0.47	0.5	2	0.8	3
44640	-			1.48	0.74	0.325	1.3	0.7	4
45227	-			1.9	0.95	0.25	1	0.65	5

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Through Hole	Surface Mount	Inductance ⁽¹⁾		DC Current		DC Resistance		Self Resonant Frequency [MHz]	Size Reference
		Parallel [mH] typ.	Series [mH] typ.	Parallel [A]	Series [A]	Parallel [Ω]	Series [Ω]		
40150	40450	0.25	1	0.316	0.158	2	8	1.65	0
41160	41460			0.54	0.27	0.675	2.7	1.5	1
42245	42545			0.94	0.47	0.375	1.5	1.2	2
43243	43543			1.32	0.66	0.25	1	1.1	3
44660	-			2	1	0.155	0.62	1.05	4
45247	-			2.6	1.3	0.125	0.5	1	5
40170	40470	0.1875	0.750	0.364	0.182	1.5	6	1.7	0
41180	41480			0.62	0.31	0.5	2	1.55	1
42265	42565			1.08	0.54	0.25	1	1.4	2
43263	43563			1.52	0.76	0.188	0.75	1.4	3
44680	-			2.4	1.2	0.118	0.47	1.2	4
45267	-			3.2	1.6	0.095	0.38	1.15	5
40190	40490	0.125	0.5	0.448	0.224	1.25	5	2.3	0
41200	41500			0.76	0.38	0.325	1.3	2.1	1
42285	42585			1.32	0.66	0.165	0.66	1.9	2
43283	43583			1.86	0.93	0.125	0.5	1.6	3
44700	-			2.94	1.47	0.078	0.31	1.5	4
45287	-			3.8	1.9	0.063	0.25	1.45	5
40210	40510	0.0625	0.25	0.632	0.316	0.475	1.9	3.3	0
41220	41520			1.06	0.53	0.165	0.66	3	1
42305	42605			1.86	0.93	0.083	0.33	2.5	2
43303	43603			2.6	1.3	0.063	0.25	2.4	3
44720	-			4.16	2.08	0.04	0.16	2.1	4
45307	-			5.4	2.7	0.033	0.13	2.01	5
40230	40530	0.025	0.1	1	0.5	0.188	0.75	4.5	0
41240	41540			1.56	0.78	0.075	0.3	4	1
42325	42625			2.7	1.35	0.043	0.17	3.9	2
43323	43623			3.9	1.95	0.028	0.11	3.5	3
44740	-			6.16	3.08	0.018	0.07	3.3	4
45327	-			7.76	3.88	0.015	0.06	3.2	5
40250	40550	0.01	0.04	1.58	0.79	0.1	0.4	5.5	0
41260	41560			2.36	1.18	0.035	0.141	5	1
42345	42645			4.06	2.03	0.018	0.07	4.5	2
43343	43643			5.36	2.68	0.015	0.06	4.5	3

Note 1: Inductance measured at 0.1V_{RMS}, 10kHz and zero DC current. Tolerance is -5% to +10%.

Note 2: Temperature rise at rated D.C. current is <30°C. Size 0 is <50°C.

Note 3: Maximum ambient is 100°C.

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SPECIFICATIONS

GENERAL

Parameter	Condition	Min.	Typ.	Max.	Units	
Dielectric Withstanding Voltage	60Hz	-	200	-	V _{RMS}	
Insulation Resistance	300VDC	10	-	-	GΩ	
Operating Temperature Range	Ambient with temperature rise	Class S	-55	-	+130	°C
		Class V	-55	-	+155	°C
Storage Temperature Range	Ambient	-55	-	+90	°C	
Size	See mechanical drawings					
Weight	See mechanical drawings					
Case	Through hole models	Epoxy Insulated Metal				
	Surface mount models	Glass Reinforced Polymer				
Potting	Vacuum Impregnated Epoxy					
Box Packaging (L x W x H)	Through hole models	10.5 x 6.42 x 0.79 (266.7 x 163.068 x 20.066)			inches (mm)	
Tube Packaging (W x H x L)	Surface mount models	40000 Series	0.70 x 0.46 x 20.0 (17.780 x 11.684 x 508)		inches (mm)	
		41000 Series	0.77 x 0.49 x 20.0 (19.660 x 12.446 x 508)			
		42000 Series	0.87 x 0.55 x 20.0 (22.098 x 13.843 x 508)			
		43000 Series	0.99 x 0.64 x 20.0 (25.146 x 16.256 x 508)			
Tape & Reel Packaging	Upon request					
Moisture Sensitivity Level	Surface mount models	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

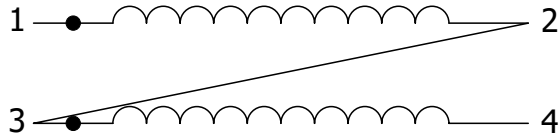
Standard	Screening & Qualification	Test ⁽²⁾
MIL-PRF-27	a.) Group A inspection Level-T - Table VII b.) Qualification inspection, Grade 5 - Table V	I. Thermal Shock II. Vibration III. Burn-in IV. Induced Voltage V. Shock VI. Dielectric Withstanding Voltage (at reduced pressure) VII. Insulation Resistance 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 4: 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.

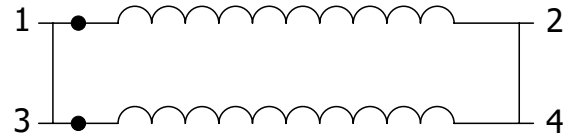
ELECTRICAL SCHEMATIC

THROUGH HOLE MODELS

SERIES CONNECTION

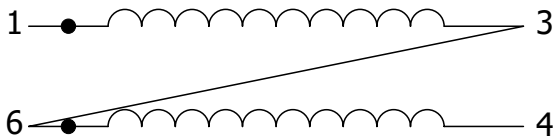


PARALLEL CONNECTION

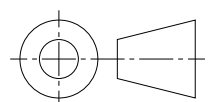
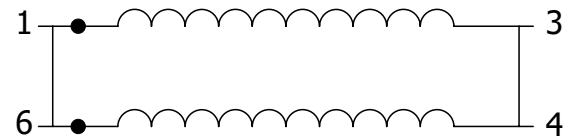


SURFACE MOUNT MODELS

SERIES CONNECTION



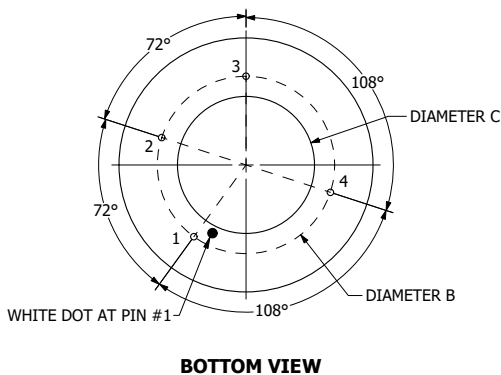
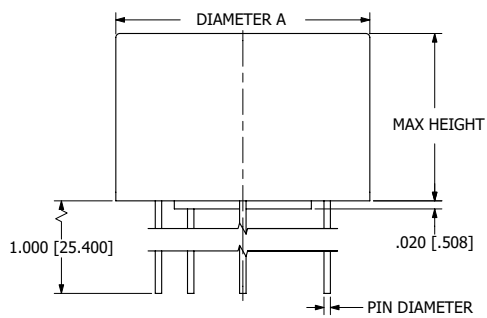
PARALLEL CONNECTION



MECHANICAL DRAWINGS

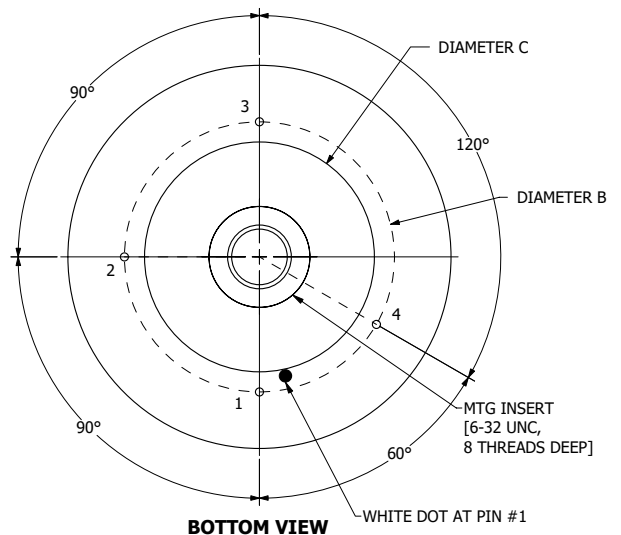
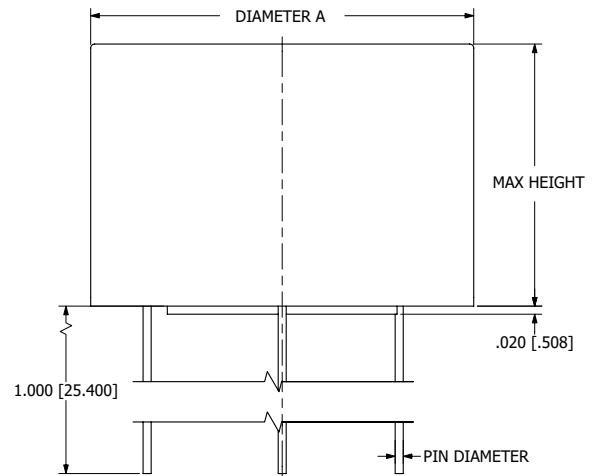
THROUGH HOLE MODELS

FIGURE 1



BOTTOM VIEW

FIGURE 2

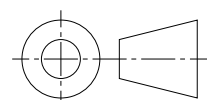


BOTTOM VIEW

Series	Max Height	Diameter Dimension			PIN	Insert	Typ. Weight (grams)	Size
		A	B	C				
40000	.250 (6.350)	.320 (8.128)	.210 (5.334)	.13 (3.302)	.012 (.305)	-	1.1	0
41000	.280 (7.112)	.410 (10.414)	.260 (6.604)	.160 (4.064)	.012 (.305)	-	2.0	1
42000	.340 (8.636)	.500 (12.700)	.350 (8.890)	.250 (6.350)	.012 (.305)	-	3.6	2
43000	.415 (10.541)	.630 (16.002)	.440 (11.176)	.340 (8.636)	.016 (.406)	-	7.2	3
44000	.500 (12.700)	.800 (20.320)	.560 (14.224)	.460 (11.684)	.016 (.406)	-	15.9	4
45000	.650 (16.510)	.950 (24.130)	.670 (17.018)	.570 (14.478)	.020 (.508)	6 - 32 UNC 8 Threads Deep	28.1	5

NOTES

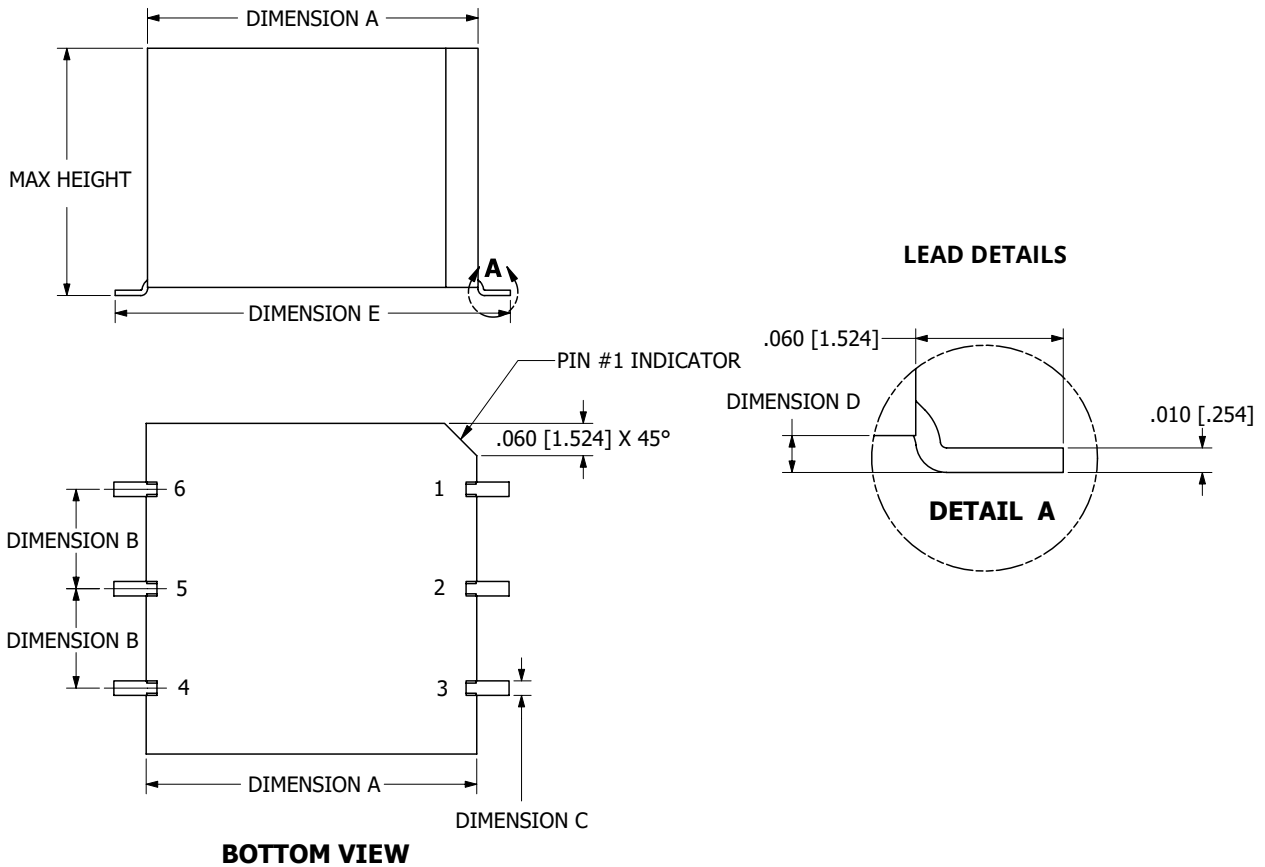
- a. ALL DIMENSIONS ARE IN INCHES, [] = MM
- b. TERMINALS ARE CLOCKWISE FROM PIN #1



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MECHANICAL DRAWINGS

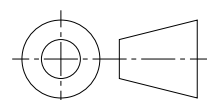
SURFACE MOUNT MODELS



Series	Max Height	Dimension					Typ. Weight (grams)	Size
		A	B	C	D	E		
40000	.280 (7.11)	.325 (8.26)	.085 (2.16)	.020 (0.51)	.012 (0.30)	.445 (11.30)	1.0	0
41000	.310 (7.87)	.400 (10.16)	.115 (2.92)	.020 (0.51)	.012 (0.30)	.520 (13.21)	2.0	1
42000	.365 (9.27)	.495 (12.57)	.140 (3.56)	.027 (0.69)	.015 (0.38)	.615 (15.62)	3.7	2
43000	.460 (11.68)	.615 (15.62)	.185 (4.70)	.027 (0.69)	.015 (0.38)	.735 (18.66)	7.1	3

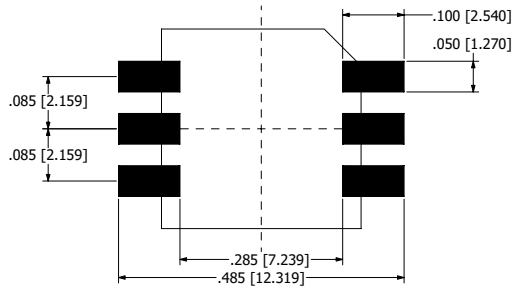
NOTES

- a. ALL DIMENSIONS ARE IN INCHES, [] = MM
- b. TERMINALS ARE CLOCKWISE FROM PIN #1
- c. PIN #2 & #5 HAVE NO CONNECTION

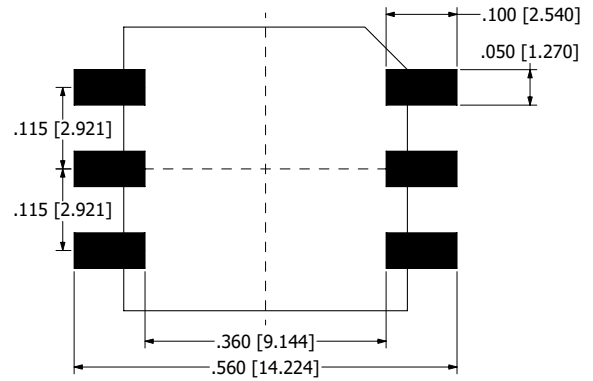


RECOMMENDED LAND PATTERN DIMENSIONS

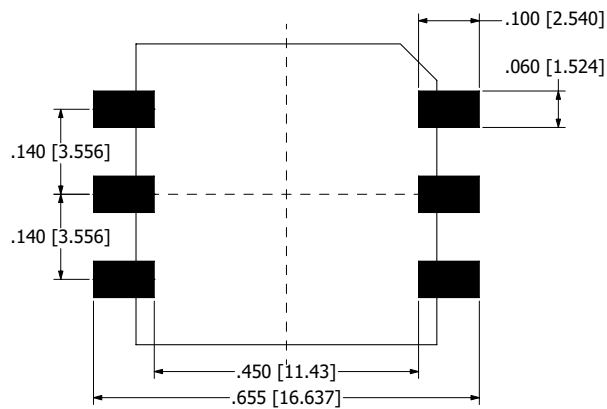
40000 SERIES (SIZE 0)



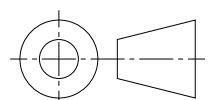
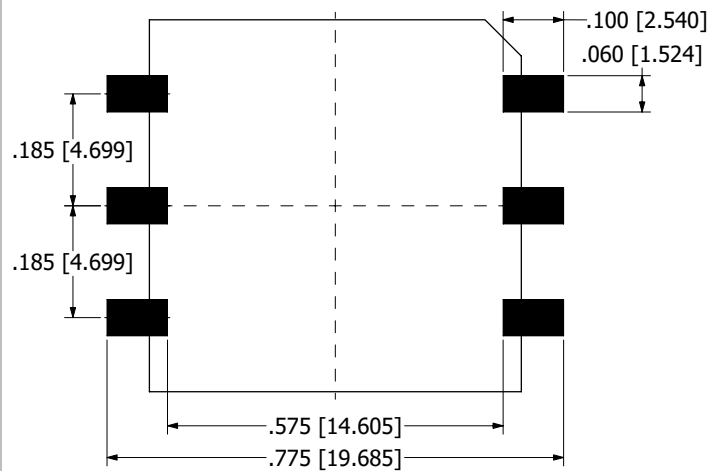
41000 SERIES (SIZE 1)



42000 SERIES (SIZE 2)

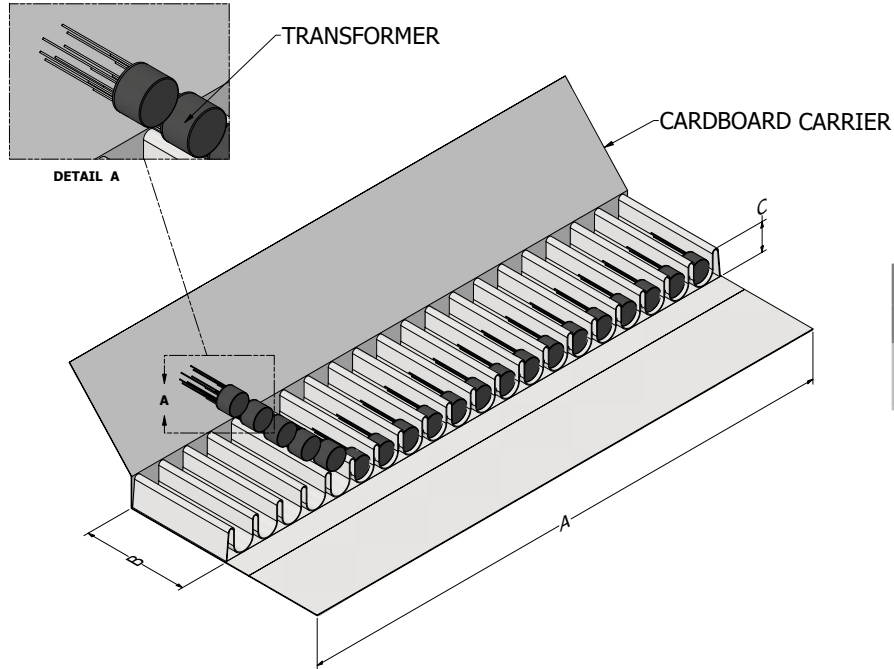


43000 SERIES (SIZE 3)



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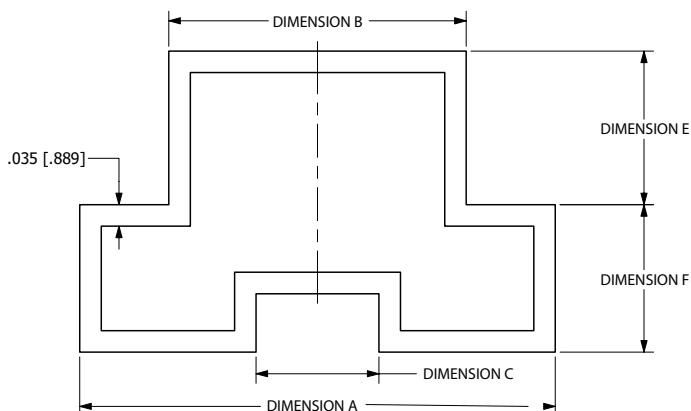
BOX PACKAGING - THROUGH HOLE MODELS



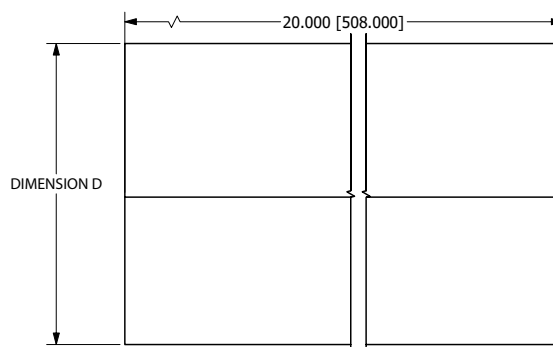
Dimension		
A	B	C
10.5	6.42	0.79
[266.7]	[163.068]	[20.066]

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TUBE PACKAGING

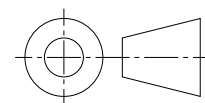
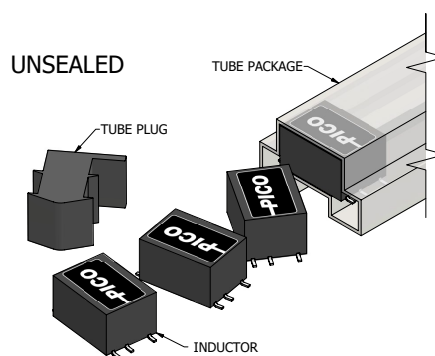
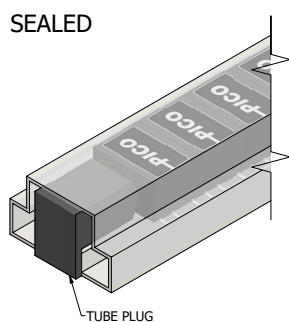


PLAN VIEW



ELEVATION VIEW

Series (Size)	Dimension					
	A	B	C	D	E	F
40000 (Size 0)	.700 [17.780]	.410 [10.414]	.150 [3.810]	.460 [11.684]	.220 [5.588]	.240 [6.096]
41000 (Size 1)	.774 [19.660]	.484 [12.294]	.200 [5.080]	.490 [12.446]	.250 [6.350]	.240 [6.096]
42000 (Size 2)	.870 [22.098]	.580 [14.732]	.300 [7.620]	.545 [13.843]	.305 [7.747]	.240 [6.096]
43000 (Size 3)	.990 [25.146]	.700 [17.780]	.400 [10.160]	.640 [16.256]	.400 [10.160]	.240 [6.096]



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.