

# 69000 Series

25-10000 $\mu$ H, 0.25-11.5A, Shielded Power Inductor

**PICO**  
Electronics, Inc.

## 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
- High reliability for space and mission critical applications
- Miniature in size and minimalistic design
- Handle large transient direct currents
- Magnetically shielded

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

### SIZE AA

Part Number	Inductance [ $\mu$ H]	DC Current			DC Resistance [ $\Omega$ ]	Self Resonant Frequency [MHz]
		10% drop in L [A]	20% drop in L [A]	30% drop in L [A]		
69410	25	3.53	4.8	5.94	0.012	4
69420	50	2.5	3.4	4.2	0.024	3
69430	75	2.04	2.78	3.43	0.036	2.4
69440	100	1.77	2.4	2.99	0.048	2
69450	250	1.12	1.52	1.88	0.12	1.3
69460	750	0.65	0.88	1.08	0.36	0.75
69470	1000	0.56	0.76	0.94	0.48	0.65
69480	1500	0.46	0.62	0.77	0.72	0.55
69490	2500	0.35	0.48	0.59	1.2	0.4
69500	5000	0.25	0.34	0.42	2.4	0.3

### SIZE A

Part Number	Inductance [ $\mu$ H]	DC Current			DC Resistance [ $\Omega$ ]	Self Resonant Frequency [MHz]
		10% drop in L [A]	20% drop in L [A]	30% drop in L [A]		
69010	130	3	4.5	5.5	0.06	1.7
69020	210	2.5	3.5	4.5	0.11	1.4
69030	260	2.2	3.2	3.9	0.14	1.25
69040	315	2	2.9	3.5	0.17	1.14
69050	525	1.6	2.2	2.7	0.28	0.9
69060	790	1.2	1.8	2.2	0.42	0.7
69070	1050	1	1.6	1.9	0.56	0.6
69080	1300	0.95	1.4	1.7	0.7	0.4

### SIZE B

Part Number	Inductance [ $\mu$ H]	DC Current			DC Resistance [ $\Omega$ ]	Self Resonant Frequency [MHz]
		10% drop in L [A]	20% drop in L [A]	30% drop in L [A]		
69105	228	3.5	5.2	6.8	0.07	1.1
69115	323	2.7	4	5	0.105	0.9
69125	460	2.5	3.7	4.8	0.15	0.8
69135	787	1.9	2.8	3.7	0.26	0.6
69145	1050	1.6	2.4	3.2	0.34	0.5
69155	1310	1.5	2.2	2.8	0.43	0.45
69165	1600	1.3	2	2.6	0.52	0.4
69175	1840	1.2	1.8	2.4	0.6	0.38
69185	2100	1.1	1.7	2.2	0.7	0.33

## SPECIFICATIONS

### SIZE C

Part Number	Inductance	DC Current			DC Resistance	Self Resonant Frequency
	[ $\mu$ H]	10% drop in L [A]	20% drop in L [A]	30% drop in L [A]		
69205	165	5	7	9.5	0.04	1.4
69215	191	4.7	7	8.8	0.05	1.3
69225	262	4	5.6	7.5	0.07	1.1
69235	390	3.3	4.6	6.2	0.1	0.9
69245	525	2.8	4	5.3	0.14	0.8
69255	790	2.3	3.2	4.3	0.2	0.6
69265	1050	2	2.8	3.8	0.27	0.55
69275	1310	1.8	2.5	3.4	0.34	0.5
69285	1580	1.6	2.3	3	0.41	0.45
69295	1838	1.5	2.1	2.8	0.48	0.4

### SIZE D

Part Number	Inductance	DC Current			DC Resistance	Self Resonant Frequency
	[ $\mu$ H]	10% drop in L [A]	20% drop in L [A]	30% drop in L [A]		
69310	150	6.35	9.23	11.5	0.027	1.4
69320	250	4.9	7.15	9	0.045	1.2
69330	500	3.5	5	6.32	0.09	0.8
69340	750	2.8	4.13	5.16	0.135	0.65
69350	1000	2.5	3.6	4.5	0.18	0.55
69360	2500	1.55	2.26	2.8	0.45	0.35
69370	5000	1.1	1.6	2	0.9	0.25

### SIZE E

Part Number	Inductance	DC Current			DC Resistance	Self Resonant Frequency
	[ $\mu$ H]	10% drop in L [A]	20% drop in L [A]	30% drop in L [A]		
69605	1500	2.6	4.5	6	0.13	0.4
69615	2000	2.25	3.9	5.2	0.17	0.35
69625	3000	1.85	3.2	4.25	0.26	0.3
69635	4000	1.6	2.8	3.7	0.35	0.25
69645	5000	1.45	2.5	3.3	0.45	0.2
69655	7500	1.15	2	2.7	0.65	0.18
69665	10,000	1	1.75	2.35	0.85	0.15

Note 1: All Inductors have split windings (except size AA). Ratings shown in table are for series connection. Parallel connection will have 1/4 inductance at twice the DC current and 1/4 the DC resistance.

ie. Parallel connection of PICO # 69010 will have 32.5  $\mu$ H, 15m $\Omega$  DC resistance, 6A DC current at 10% drop in L.

## SPECIFICATIONS

### GENERAL

Parameter	Condition	Min.	Typ.	Max.	Units
Dielectric Withstanding Voltage	60Hz	-	200	-	V <sub>RMS</sub>
Insulation Resistance	200VDC	10	-	-	GΩ
Size	See mechanical drawings				
Operating Temperature Range	Ambient with temperature rise	-55	-	+130	°C
Storage Temperature Range	Ambient	-55	-	+130	°C
Weight					grams
Case	Epoxy Insulated Metal				
Potting	Vacuum Impregnated Epoxy				
Box Packaging	Length x Width x Height	11.56 x 8.92 x 1.4 (293.624 x 226.568 x 35.56)			inches (mm)

### OPTIONAL DESIGN CRITERIA

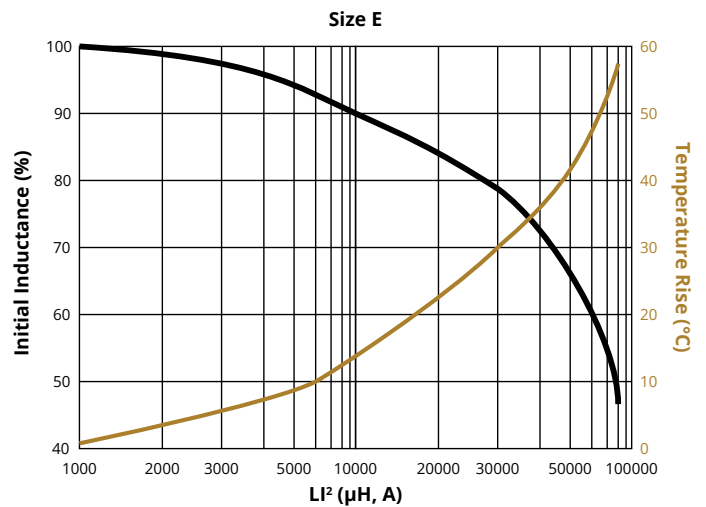
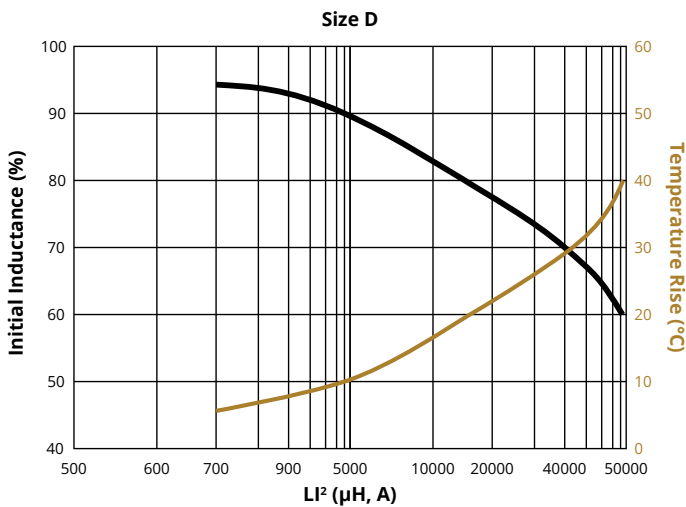
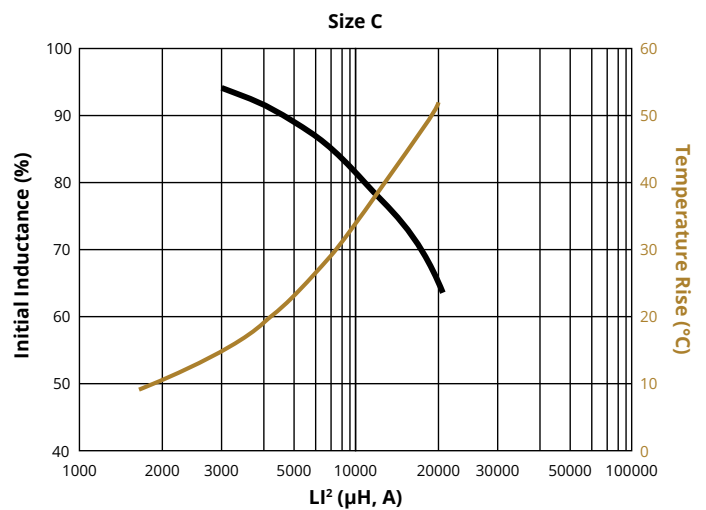
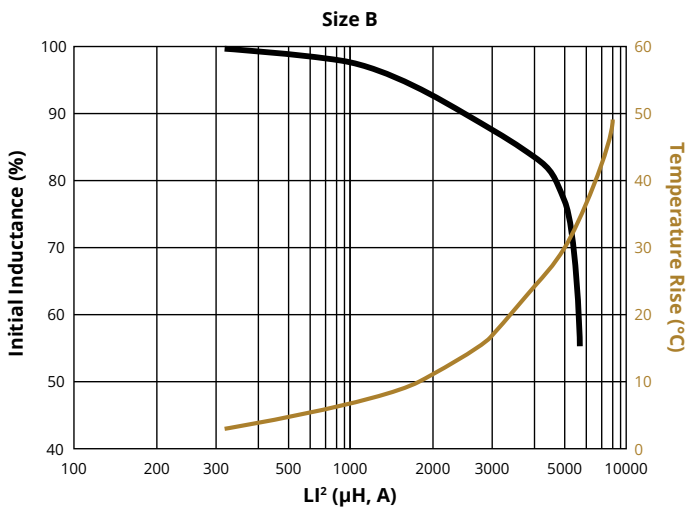
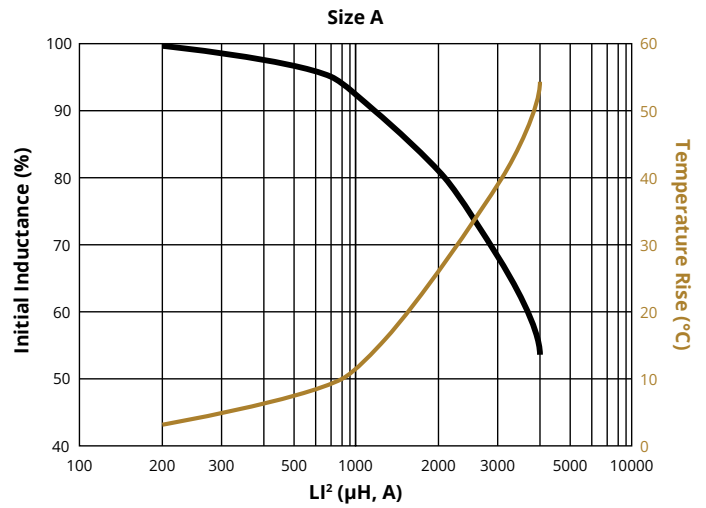
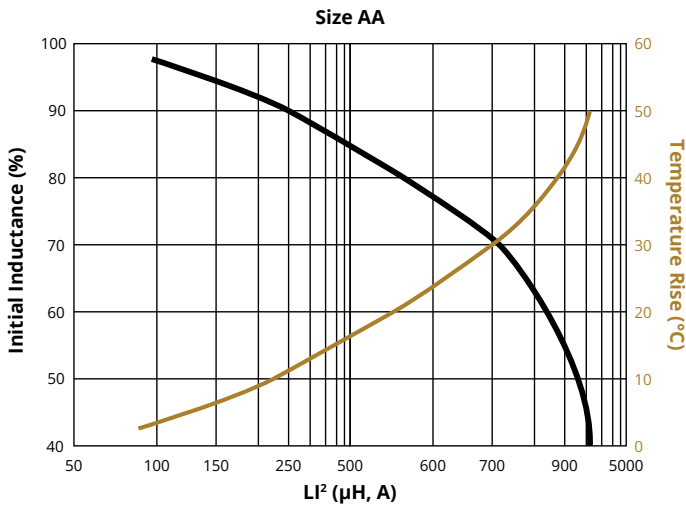
Test	Standard	Description
Vibration	MIL-STD-202	Method 204, Vibration, High Frequency
Shock	MIL-STD-202	Method 213, Shock (Specified Pulse)
Immersion	MIL-STD-202	Method 104, Immersion
Moisture Resistance	MIL-STD-202	Method 106, Moisture Resistance
Flammability	MIL-STD-202	Method 111, Flammability (External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

### OPTIONAL SCREENING AND QUALIFICATION

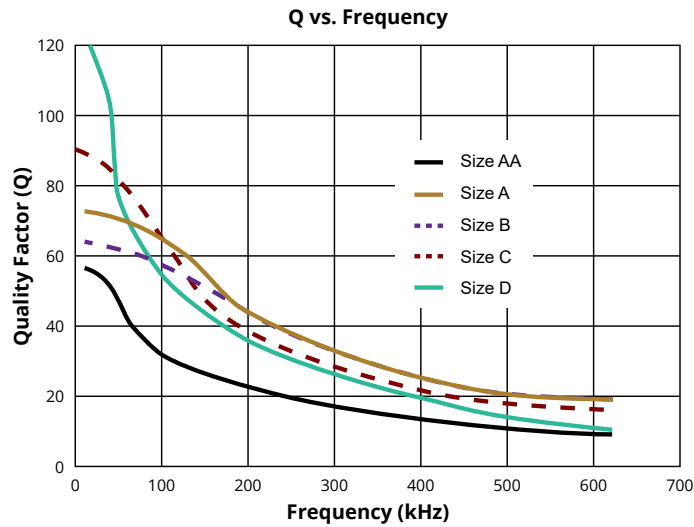
Standard	Screening & Qualification	Test <sup>(2)</sup>
MIL-PRF-27	a.) Group A inspection Level-T - Table VII b.) Qualification inspection, Grade 5 - Table V	I. Thermal Shock II. Vibration III. Burn-in IV. Induced Voltage V. Shock VI. Dielectric Withstanding Voltage (at reduced pressure) VII. Insulation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

DATA CURVES



DATA CURVES



ELECTRICAL SCHEMATIC

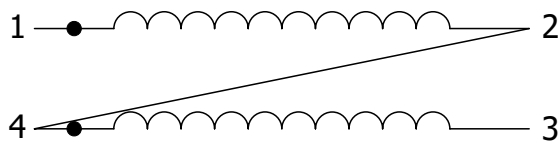
SIZE AA

25%

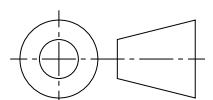
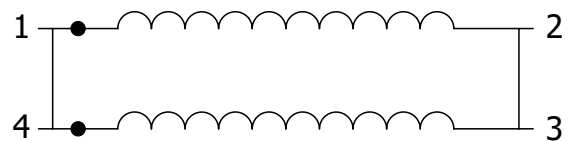


SIZE A, B, C, D & E

SERIES CONNECTION

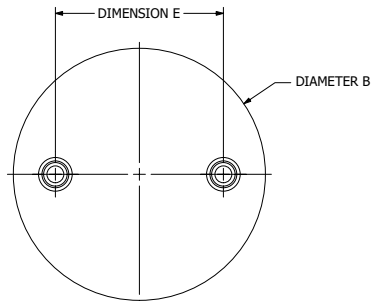
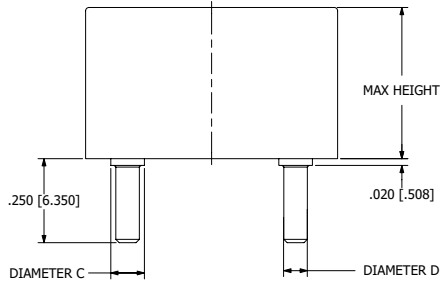


PARALLEL CONNECTION



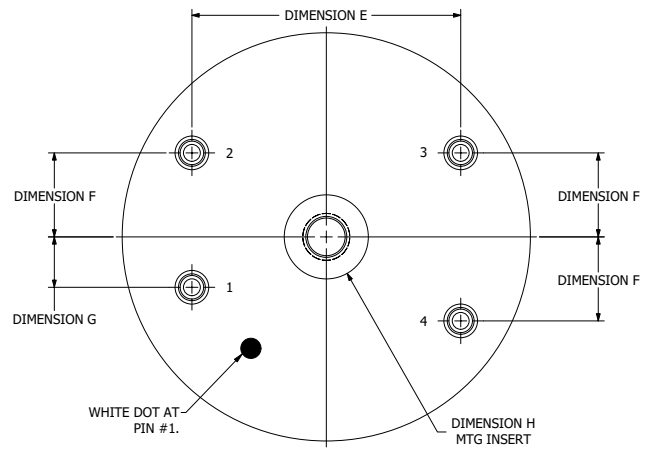
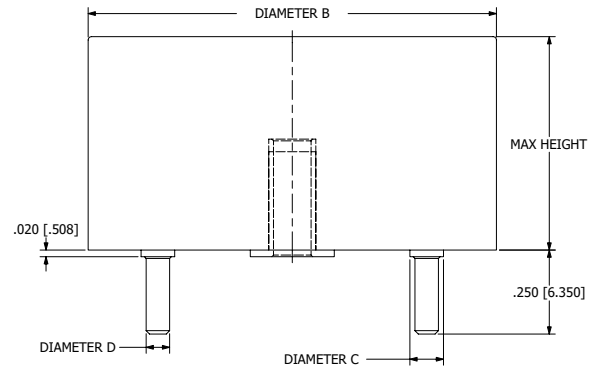
MECHANICAL DRAWINGS

FIGURE 1



BOTTOM VIEW

FIGURE 2

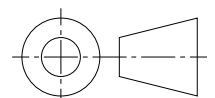


BOTTOM VIEW

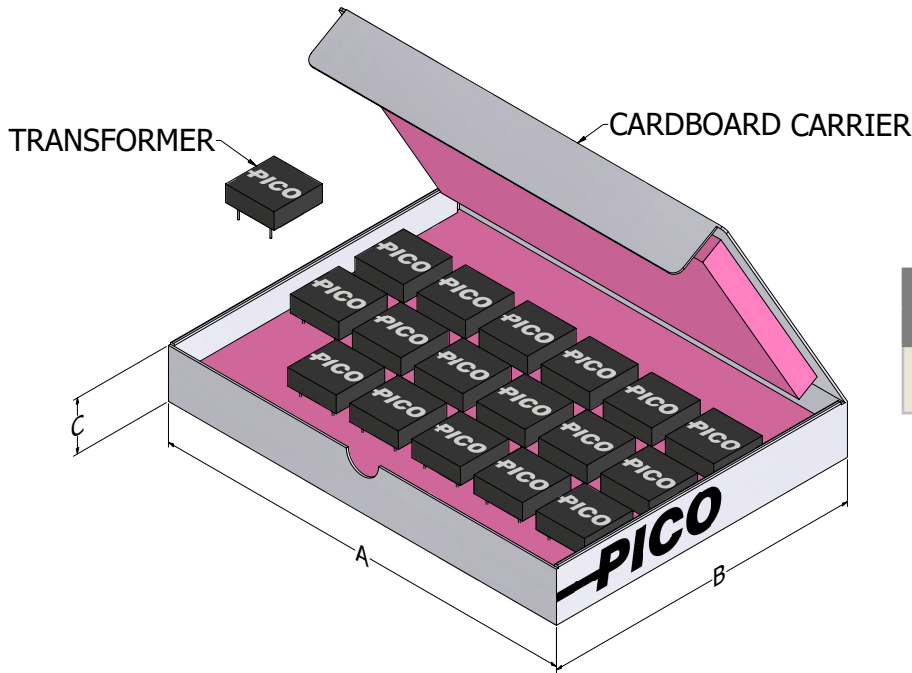
Size	Dimension / Diameter								Insert	Typ. Weight (grams)
	A	B	C	D	E	F	G	H		
AA	.450 (11.400)	.750 (19.100)	.100 (2.540)	.070 (1.780)	.500 (12.700)	-	-	-	-	7
A	.560 (14.200)	.960 (24.00)	.100 (2.540)	.070 (1.780)	.600 (15.200)	.200 (5.100)	.100 (2.500)	.250 (6.350)	4 - 40 UNC 5 Threads min.	23
B	.635 (16.100)	1.215 (30.900)	.100 (1.780)	.070 (1.780)	.800 (20.300)	.250 (6.400)	.150 (3.800)	.250 (6.350)	4 - 40 UNC 5 Threads min.	44
C	.720 (18.300)	1.330 (33.800)	.125 (3.200)	.094 (2.400)	.900 (22.900)	.250 (6.400)	.150 (3.800)	.312 (7.920)	6 - 32 UNC 6 Threads min.	60
D	.760 (19.300)	1.500 (38.100)	.125 (3.200)	.094 (2.400)	1.100 (27.900)	.300 (7.600)	.200 (5.100)	.312 (7.920)	6 - 32 UNC 6 Threads min.	80
E	1.100 (27.900)	2.150 (54.600)	.150 (3.800)	.125 (3.200)	1.700 (43.200)	.400 (10.200)	.300 (7.600)	.312 (7.920)	6 - 32 UNC 6 Threads min.	170

NOTES

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



BOX PACKAGING



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

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.

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