

F1A1-464612 F1A1-464615

Shielded SMD Power Inductors



Signal Transformer is introducing the beginning of a new family of low-profile shielded surface mount power inductors with the release of the third of three series, F1A1-464612/464615. Height profiles of 1.2 mm to 1.5 mm, small footprints of 4.6 mm x 4.6 mm and broad range of inductance and current ratings, make them idea for a wide range of applications.

Power inductors are an essential component in the voltage regulator topology. Virtually every circuit that regulates power in automobiles, electronics and DC-DC converters requires an inductor.

Magnetically shielded inductors minimize EMI while balancing small size with low DCR and high current ratings. Perfect as power chokes and for eliminating noise in power supplies in automotive, commercial, industrial, and high-reliability designs.

They are primarily used in electrical power and electronic devices for these major purposes: Choking, blocking, attenuating, or filtering/smoothing high frequency noise in electrical circuits. Storing and transferring energy in power converters (DC-DC or AC-DC) or inverters (DC-AC).

General Features

- Surface Mount
- Low profile & compact size
- Magnetically shielded construction
 - Low radiation
- High saturation & high heating current
- Copper base with DR core & RI core
- Automated process

Specifications

- Inductance Range: 1.0 μ H to 47 μ H
- Saturated Rated Current: 0.32 A to 3.0 A
- Temperature Rise Current: 0.4 A to 1.75 A
- Operating Temperature Range: -40°C to +105°C (Including coil self-temperature rise)
- Storage Temperature Range (component): -40°C to +125°C

Applications

- DC-DC converters in consumer, industrial & telecom electronics
- Wearable devices
- HDDs, SSDs
- Smartphones
- Digital equipment
- Laptops, Digital Cameras
- Filtering of Supply Voltages

PRODUCT IDENTIFICATION

F1A1 - 464612 - 100 M

Type / Product Series

F1A1 = Shielded SMD Power Inductors

Dimensions

464612 = 4.6 x 4.6 x 1.2 mm

464615 = 4.6 x 4.6 x 1.5 mm

Inductance *

100 = 10 μ H

* Note: Expressed by three figures. The unit is micro henry (μ H). The first and second figures are significant digits, the third figure expresses the number of zeros which follow the two figures.

If there is a decimal point, it is expressed by the capital letter "R" (3R8 = 3.8 μ H). In that case, all figures are significant digits.

Inductance Tolerance

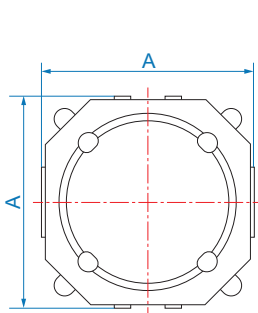
M = $\pm 20\%$

N = $\pm 30\%$

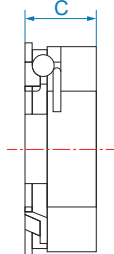
MECHANICAL SPECIFICATIONS

Dimensions are in mm.

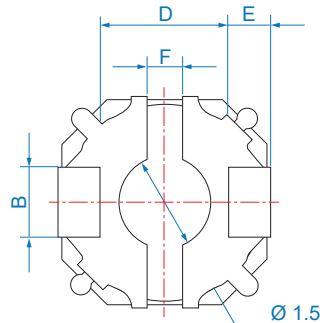
SERIES	A	B	C Max	D	E	F	G	H	L
F1A1-464612	4.6 $\pm$ 0.2	1.3	1.2	3.2	0.7	0.6	2.8	1.6	5.6
F1A1-464615	4.6 $\pm$ 0.2	1.3	1.5	3.2	0.7	0.6	2.8	1.6	5.6



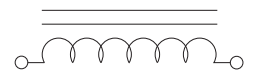
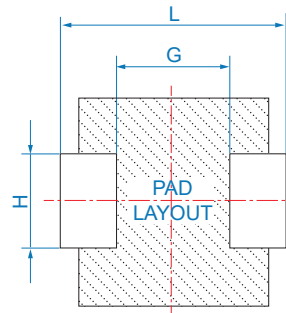
TOP VIEW



SIDE VIEW



BOTTOM VIEW



SCHEMATIC



CONSTRUCTION

- Co-planarity: 0.15 Max
- Undeclared tolerance:
X.X $\pm$ 0.25 unless stated otherwise
X.XX $\pm$ 0.15 unless stated otherwise

Custom versions available upon request.



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ELECTRICAL SPECIFICATIONS

Electrical specifications for all part numbers measured at 25°C unless stated otherwise.

F1A1-464612 SERIES

Part Number	L (μH)	Tolerance (± %)	Test Freq. (0.1 V) (kHz)	DCR Max. (Typ.) (mΩ)	I SAT MAX. ¹ (A)		I RMS MAX. ² (A)
					25°C	100°C	
F1A1-464612-1R0N	1.0	30	100	75 (60)	2.10	1.90	1.70
F1A1-464612-1R5N	1.5	30	100	89 (71)	1.80	1.60	1.60
F1A1-464612-2R2N	2.2	30	100	106 (85)	1.40	1.20	1.50
F1A1-464612-2R7N	2.7	30	100	125 (100)	1.30	1.10	1.40
F1A1-464612-3R3N	3.3	30	100	150 (120)	1.20	1.00	1.30
F1A1-464612-4R7N	4.7	30	100	196 (157)	1.10	0.95	1.20
F1A1-464612-5R6N	5.6	30	100	256 (205)	1.00	0.80	1.05
F1A1-464612-6R8N	6.8	30	100	312 (250)	0.90	0.75	1.00
F1A1-464612-8R2N	8.2	30	100	362 (290)	0.80	0.65	0.90
F1A1-464612-100M	10.0	20	100	450 (360)	0.70	0.60	0.80
F1A1-464612-120M	12.0	20	100	500 (400)	0.65	0.55	0.75
F1A1-464612-150M	15.0	20	100	700 (560)	0.60	0.50	0.70
F1A1-464612-180M	18.0	20	100	775 (620)	0.50	0.40	0.60
F1A1-464612-220M	22.0	20	100	1025 (820)	0.45	0.38	0.55
F1A1-464612-270M	27.0	20	100	1162 (930)	0.40	0.35	0.50
F1A1-464612-330M	33.0	20	100	1300 (1040)	0.38	0.32	0.45
F1A1-464612-390M	39.0	20	100	1500 (1200)	0.35	0.30	0.43
F1A1-464612-470M	47.0	20	100	1625 (1300)	0.32	0.28	0.40

¹ I SAT (Saturation Rated Current): The current when the inductance becomes 30% lower than its initial value (Ta = 25°C and Ta = 100°C).

² I RMS (Temperature Rise Current): The current when the temperature of coil increases up to max. ΔT = 40°C (Ta = 25°C).

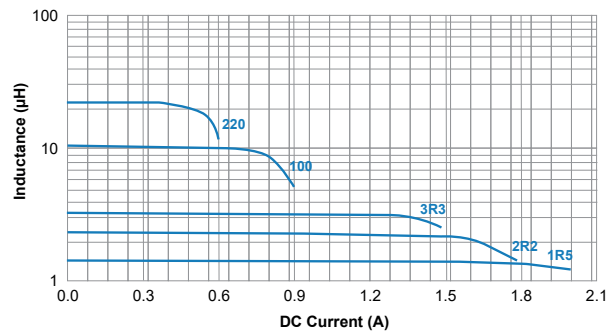
• Test equipment

L: measured on Agilent 4284A LCR meter or equivalent

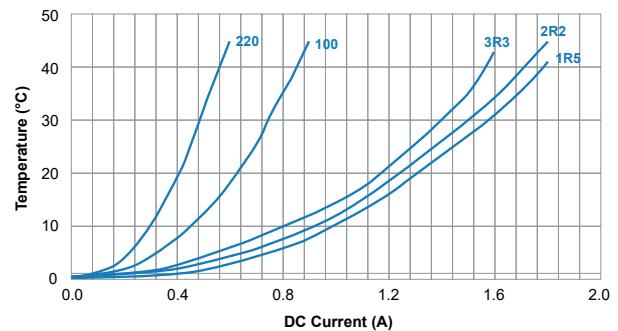
DCR: measured on Chroma 16502 micro-ohm meter or equivalent

I SAT & I RMS: measured on Agilent 4284A LCR meter with 42841A Current source or equivalent

TYPICAL PERFORMANCE CURVES



Inductance vs DC current



Temperature rise vs DC current

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F1A1-464612/464615 Series Datasheet

F1A1-464615 SERIES

Part Number	L	Tolerance	Test Freq. (0.1 V)	DCR Max. (Typ.)	I SAT MAX. ¹		I RMS MAX. ²
					(A)	(A)	
	(μH)	(± %)	(kHz)	(mΩ)	25°C	100°C	(A)
F1A1-464615-1R0N	1.0	30	100	81 (65)	3.00	2.60	1.75
F1A1-464615-1R2N	1.2	30	100	100 (80)	2.50	2.20	1.70
F1A1-464615-1R8N	1.8	30	100	121 (97)	2.20	1.80	1.65
F1A1-464615-2R7N	2.7	30	100	137 (110)	2.00	1.70	1.60
F1A1-464615-3R3N	3.3	30	100	150 (120)	1.80	1.60	1.55
F1A1-464615-3R9N	3.9	30	100	168 (135)	1.60	1.40	1.45
F1A1-464615-4R7N	4.7	30	100	187 (150)	1.50	1.20	1.35
F1A1-464615-5R6N	5.6	30	100	212 (170)	1.40	1.10	1.25
F1A1-464615-6R8N	6.8	30	100	230 (185)	1.30	1.05	1.15
F1A1-464615-8R2N	8.2	30	100	250 (200)	1.20	1.00	1.05
F1A1-464615-100M	10.0	20	100	312 (250)	1.00	0.85	0.95
F1A1-464615-120M	12.0	20	100	356 (285)	0.85	0.80	0.85
F1A1-464615-150M	15.0	20	100	475 (380)	0.80	0.70	0.80
F1A1-464615-180M	18.0	20	100	618 (495)	0.75	0.65	0.70
F1A1-464615-220M	22.0	20	100	692 (554)	0.65	0.58	0.65
F1A1-464615-270M	27.0	20	100	980 (785)	0.60	0.50	0.55
F1A1-464615-330M	33.0	20	100	1068 (855)	0.55	0.45	0.50
F1A1-464615-390M	39.0	20	100	1200 (960)	0.50	0.40	0.45
F1A1-464615-470M	47.0	20	100	1710 (1370)	0.45	0.38	0.42

¹ I SAT (Saturation Rated Current): The current when the inductance becomes 30% lower than its initial value (Ta = 25°C and Ta = 100°C).

² I RMS (Temperature Rise Current): The current when the temperature of coil increases up to max. ΔT = 40°C (Ta = 25°C).

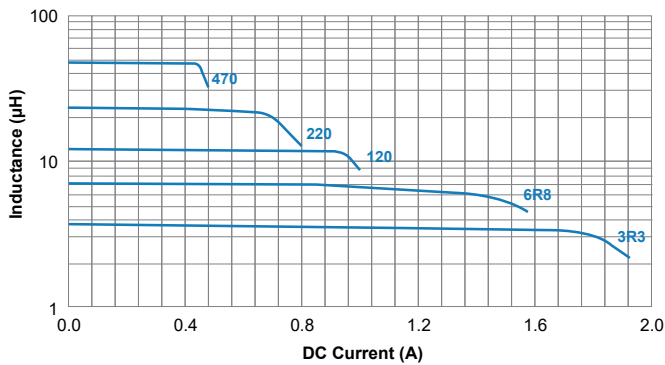
• Test equipment

L: measured on Agilent 4284A LCR meter or equivalent

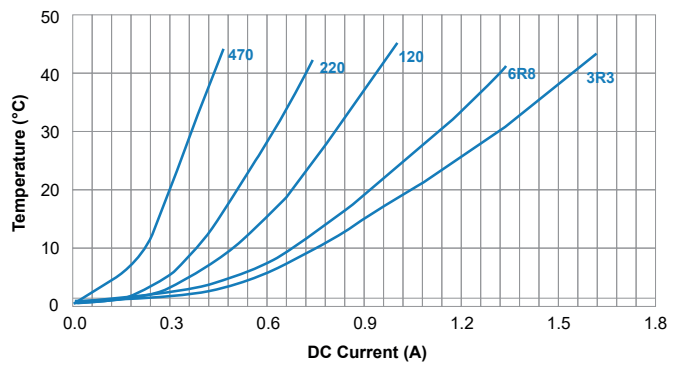
DCR: measured on Chroma 16502 micro-ohm meter or equivalent

I SAT & I RMS: measured on Agilent 4284A LCR meter with 42841A Current source or equivalent

TYPICAL PERFORMANCE CURVES



Inductance vs DC current



Temperature rise vs DC current

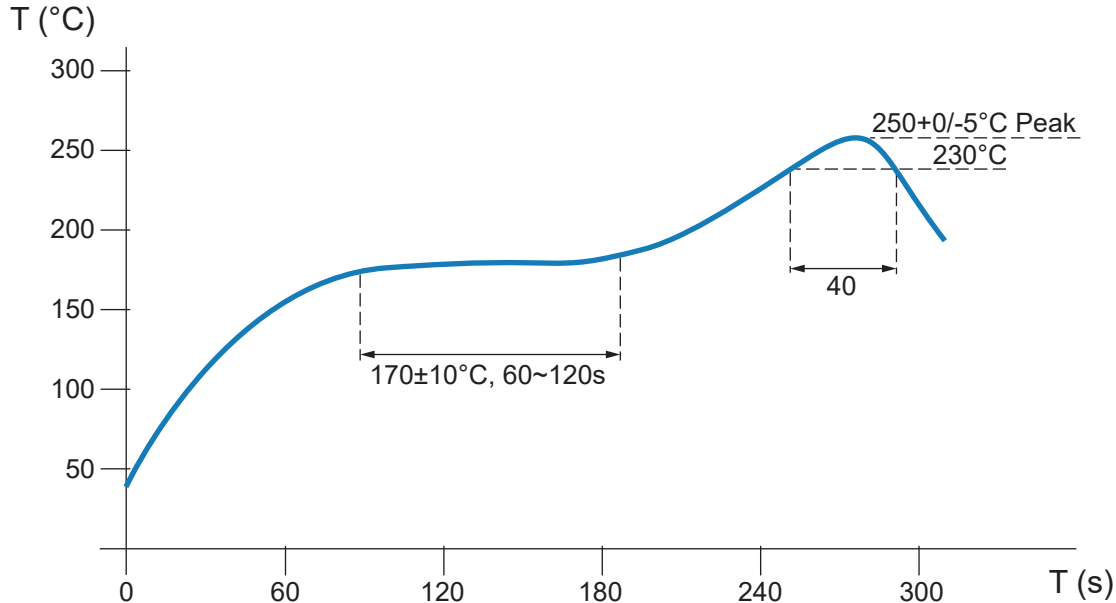
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RECOMMENDED REFLOW SOLDERING CONDITIONS



- ADD**

The recommended reflow conditions as above graph, is set according to our soldering equipment.

Since various manufactures may have different reflow soldering equipment, products, process conditions, set methods, etc., when setting the reflow conditions, please adjust and confirm according to users' environment/equipment.

- Notice**

- Solder reflow temperature: $+250^{\circ}\text{C}$ max. for maximum 10 seconds
- It is not recommended to solder inductors by soldering iron
- Please contact us for details

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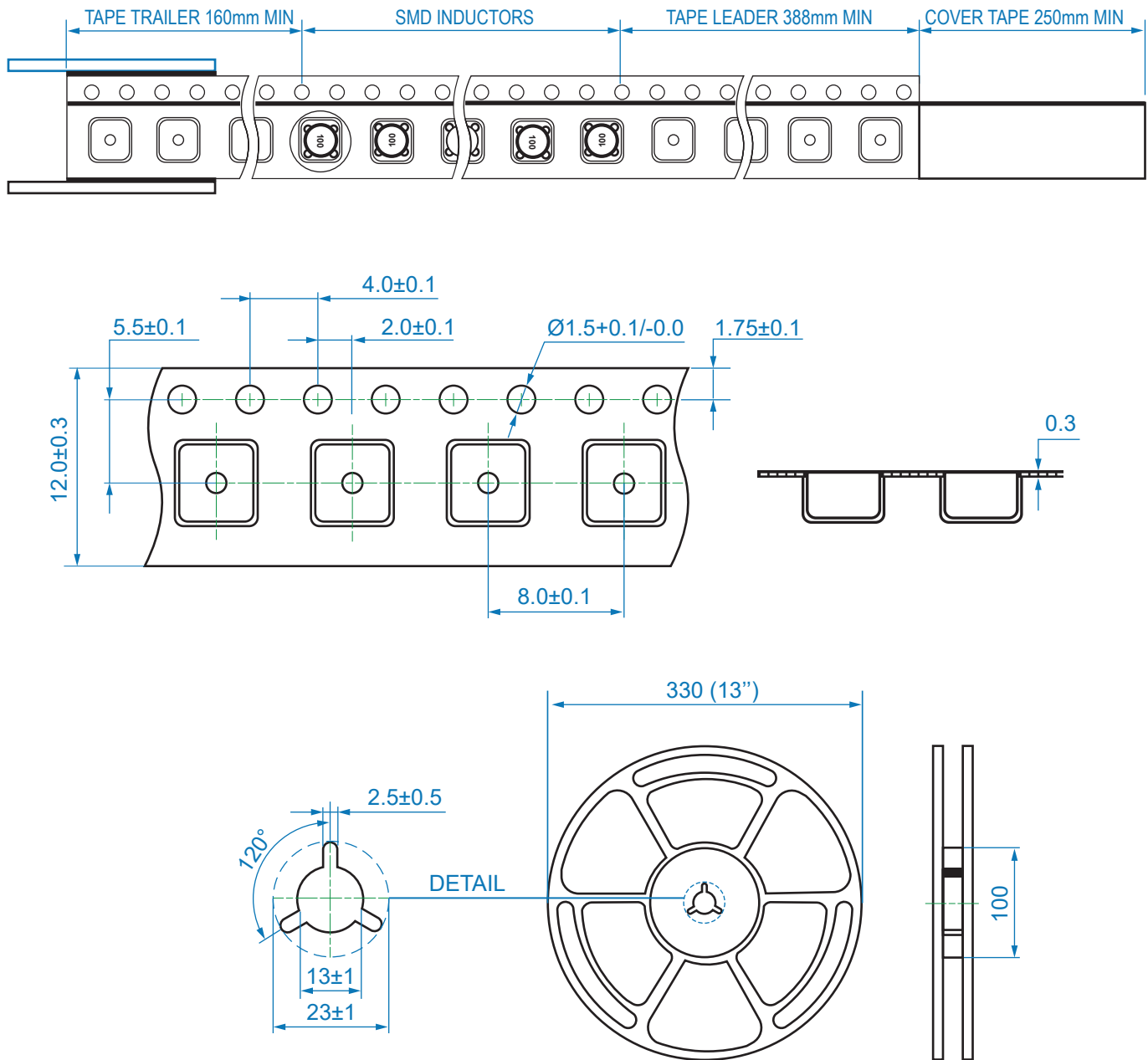


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TAPE & REEL SPECIFICATIONS

Dimension unit: mm



Taping specification: EIA -481 Compliant

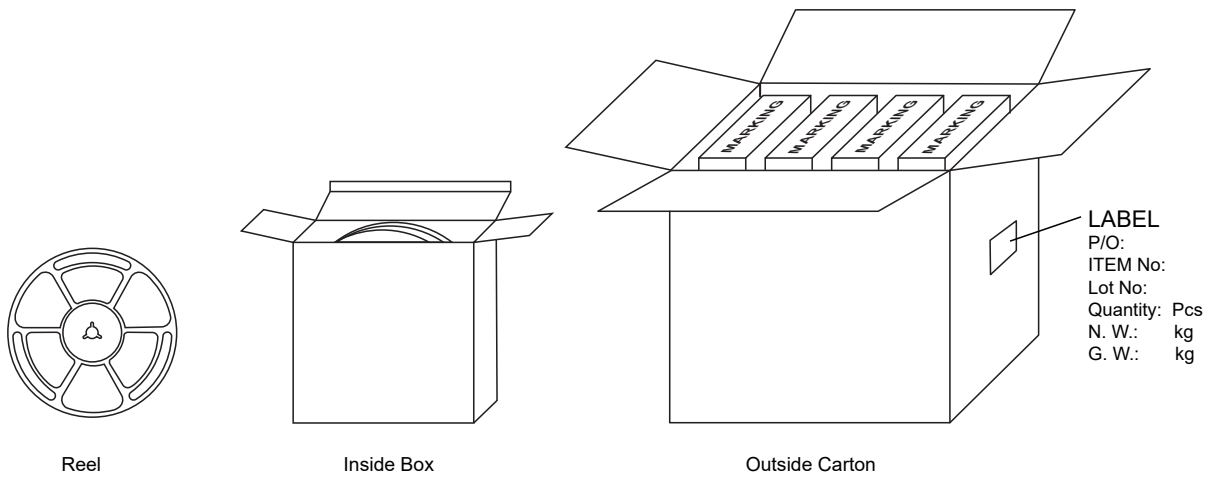
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PACKAGING SPECIFICATIONS



Series	Packaging Quantity (pcs)		
	Reel	Inside box	Outside carton
F1A1-464612	4000	20000	80000
F1A1-464615	4000	20000	80000

- Storage Conditions**

- Temperature and humidity conditions < 35°C and < 35 - 65 %
- Recommendations: Inductors should be used within 6 months from the time of delivery
- Packaging material should be kept away from where chlorine and sulfur exist

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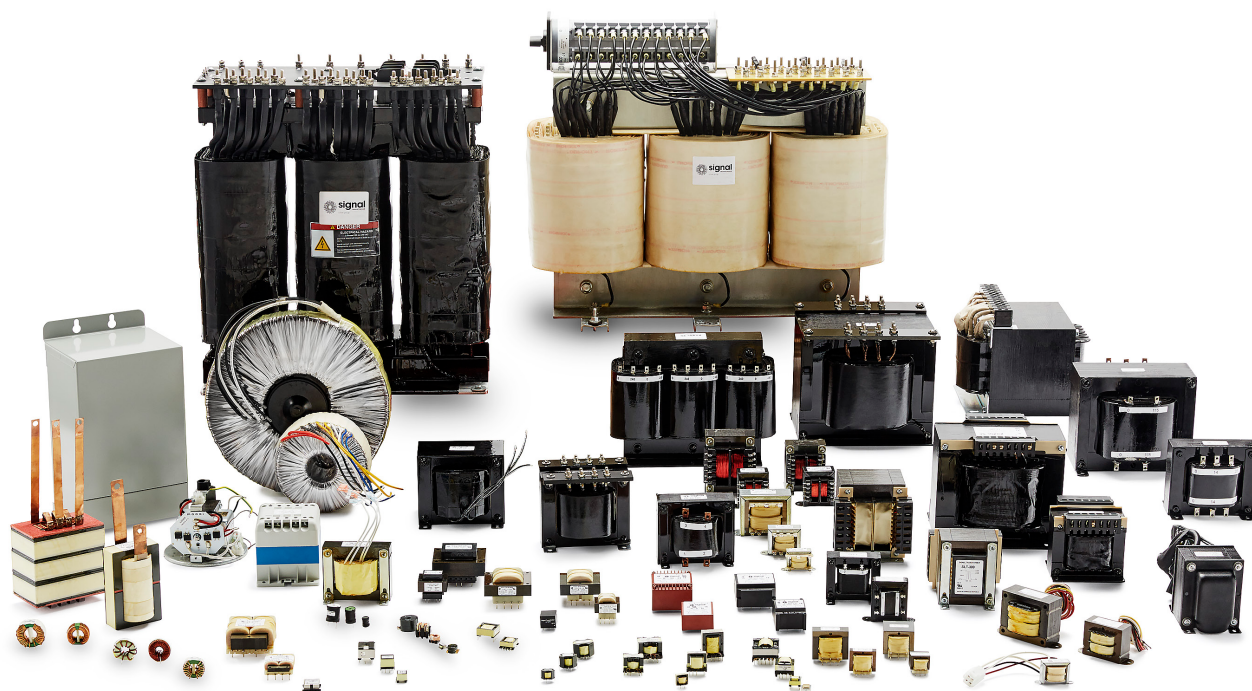


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About Signal Transformer

Signal Transformer is known as the world's leader of wire wound magnetic solutions since 1959. With over 50 years of experience manufacturing transformers, chokes, inductors and custom or modified standard products. Signal offers not only the most comprehensive line of certified standard power conversion products, with our vast engineering, manufacturing and regulatory resources; Signal Transformer excels in the design and manufacturer of cost effective, specialized platforms.



**For more information,
please contact us:**

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