

# F1B1-464612 F1B1-464615

## Unshielded SMD Power Inductors

Signal Transformer is introducing the beginning of a new family of low-profile unshielded surface mount power inductors with the release of the third series in the family, F1B1-464612/464615. 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 ideal for a wide variety 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.

Compared to the shielded construction (in the same dimension, inductance value), the unshielded power inductor has a higher current carry capacity (higher saturation current rating) and is suitable for price-sensitive or uncritical uses in low power circuits, general purpose power choke or power supply applications.

Unshielded power inductors are 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)



### General Features

- Unshielded construction
- Surface mount
- Copper base with DR core
- Reduced size (small footprint) & weight
- Low Profile
- High current
- Automated process

### Specifications

- Inductance Range: 1.0  $\mu$ H to 47  $\mu$ H
- Saturation Rated Current: 0.32 A to 3.4 A
- Temperature Rise Current: 0.35 to 2.5 A
- Operating Temperature Range: -40°C to +105°C (Including coil self-temperature rise)
- Storage Temperature Range (component): -40°C to +125°C

### Applications

- Input/Output of DC-DC converters
- Power Supplies
  - Portable communication equipment
  - Camcorders
  - LCD TV's
- Mobile phones
- Digital Equipment
- Low pass frequency noise filters
- EMI noise filters

# F1B1-464612/464615 Series Datasheet

## PRODUCT IDENTIFICATION

**F1B1 - 464612 - 220 M**

**Type / Product Series**

**F1B1** = Unshielded 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 \***

**220** = 22  $\mu$ H

\* Note: Expressed by three figures. The unit is micro henry ( $\mu$ 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  $\mu$ H). In that case, all figures are significant digits.

**Inductance Tolerance**

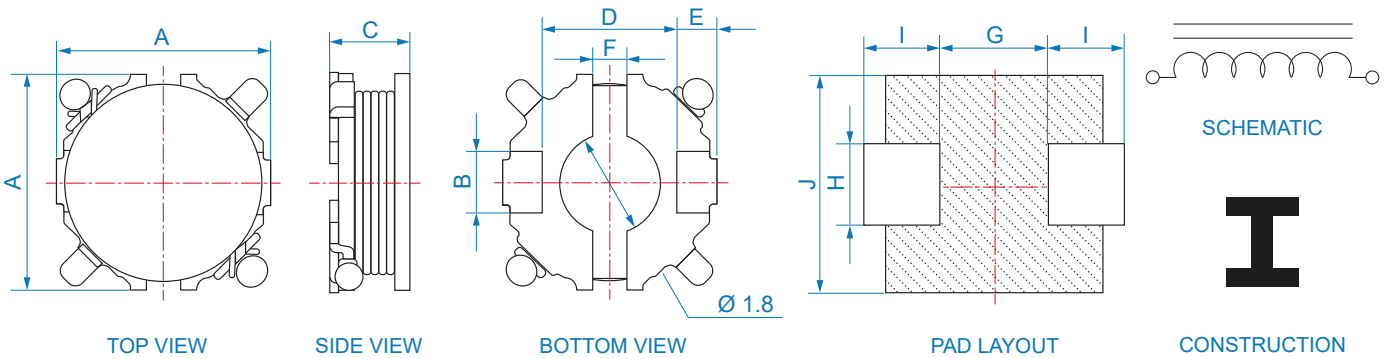
**M** =  $\pm 20\%$

**N** =  $\pm 30\%$

## MECHANICAL SPECIFICATIONS

Dimensions are in mm.

SERIES	A	B	C Max	D	E	F	G	H	I	J
F1B1-464612	4.6 $\pm$ 0.3	1.3	1.2	3.2	0.7	0.6	2.8	1.6	1.4	5.0
F1B1-464615	4.6 $\pm$ 0.3	1.3	1.5	3.2	0.7	0.6	2.8	1.6	1.4	5.0



- 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.**



128 Atlantic Avenue, Lynbrook, NY 11563  
Toll Free 866-239-5777 | Tel 516-239-5777 | Fax 516-239-7208  
sales@signaltransformer.com | techhelp@signaltransformer.com

[belfuse.com/signal](http://belfuse.com/signal)

## ELECTRICAL SPECIFICATIONS

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

### F1B1-464612 SERIES

Part Number	L ( $\mu\text{H}$ )	Tolerance ( $\pm$ %)	Test Freq. (0.1 V) (kHz)	DCR Max. (Typ.) (m $\Omega$ )	I <sub>SAT</sub> MAX. <sup>1</sup> (A)		I <sub>RMS</sub> MAX. <sup>2</sup> (A)
					$\Delta$ L/L10% Typ.	$\Delta$ L/L30% Typ.	
F1B1-464612-1R0M	1.0	20	100	66 (55)	2.50	3.00	2.50
F1B1-464612-1R8M	1.8	20	100	90 (75)	1.80	2.20	2.10
F1B1-464612-2R2M	2.2	20	100	108 (90)	1.50	2.00	1.94
F1B1-464612-3R3M	3.3	20	100	138 (115)	1.20	1.60	1.72
F1B1-464612-4R7M	4.7	20	100	192 (160)	1.00	1.40	1.45
F1B1-464612-5R6M	5.6	20	100	210 (175)	0.95	1.30	1.39
F1B1-464612-6R8M	6.8	20	100	240 (200)	0.85	1.20	1.30
F1B1-464612-8R2M	8.2	20	100	288 (240)	0.80	1.00	1.19
F1B1-464612-100M	10.0	20	100	384 (320)	0.71	0.92	1.00
F1B1-464612-120M	12.0	20	100	432 (360)	0.65	0.85	0.97
F1B1-464612-150M	15.0	20	100	492 (410)	0.60	0.78	0.90
F1B1-464612-180M	18.0	20	100	720 (600)	0.55	0.70	0.75
F1B1-464612-220M	22.0	20	100	768 (640)	0.45	0.65	0.59
F1B1-464612-270M	27.0	20	100	1056 (880)	0.43	0.60	0.47
F1B1-464612-330M	33.0	20	100	1224 (1020)	0.40	0.56	0.44
F1B1-464612-390M	39.0	20	100	1476 (1230)	0.35	0.50	0.40
F1B1-464612-470M	47.0	20	100	1700 (1420)	0.32	0.42	0.37

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

<sup>2</sup> I<sub>RMS</sub> (Temperature Rise Current): The current when the temperature of coil increases up to max.  $\Delta T = 40^\circ\text{C}$  (Ta = 25°C).

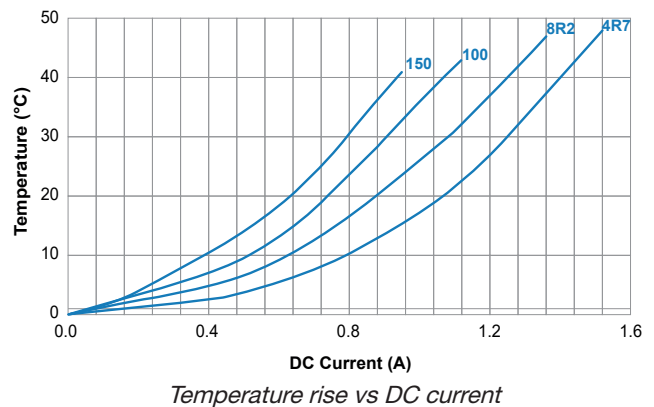
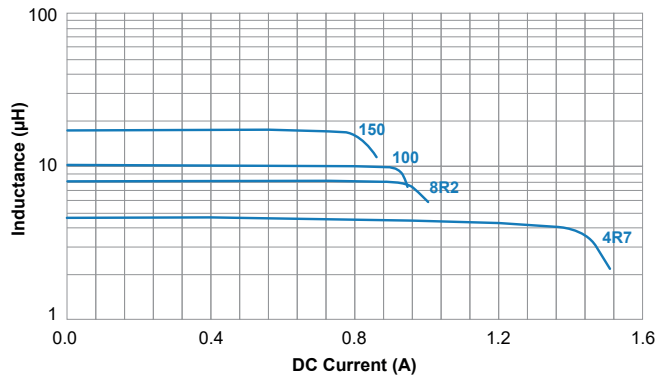
#### • Test equipment

**L:** measured on Agilent 4284A LCR meter or equivalent

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

**I<sub>SAT</sub> & I<sub>RMS</sub>:** measured on Agilent 4284A LCR meter with 42841A Current source or equivalent

## TYPICAL PERFORMANCE CURVES



Custom versions available upon request.



128 Atlantic Avenue, Lynbrook, NY 11563  
Toll Free 866-239-5777 | Tel 516-239-5777 | Fax 516-239-7208  
sales@signaltransformer.com | techhelp@signaltransformer.com

[belfuse.com/signal](http://belfuse.com/signal)

# F1B1-464612/464615 Series Datasheet

## F1B1-464615 SERIES

Part Number	L ( $\mu\text{H}$ )	Tolerance ( $\pm$ %)	Test Freq. (0.1 V) (kHz)	DCR Max. (Typ.) (m $\Omega$ )	I <sub>SAT</sub> MAX. <sup>1</sup> (A)		I <sub>RMS</sub> MAX. <sup>2</sup> (A)
					$\Delta$ L/L10% Typ.	$\Delta$ L/L30% Typ.	
F1B1-464615-1R2M	1.2	20	100	78 (65)	3.40	4.00	2.35
F1B1-464615-1R5M	1.5	20	100	96 (80)	3.00	3.50	2.00
F1B1-464615-2R2M	2.2	20	100	108 (90)	2.60	3.00	1.95
F1B1-464615-2R7M	2.7	20	100	120 (100)	2.50	2.70	1.80
F1B1-464615-3R3M	3.3	20	100	138 (115)	2.10	2.50	1.70
F1B1-464615-3R9M	3.9	20	100	156 (130)	1.90	2.20	1.60
F1B1-464615-4R7M	4.7	20	100	174 (145)	1.80	2.10	1.50
F1B1-464615-5R6M	5.6	20	100	204 (170)	1.60	1.80	1.35
F1B1-464615-6R8M	6.8	20	100	222 (185)	1.40	1.70	1.30
F1B1-464615-8R2M	8.2	20	100	264 (220)	1.30	1.60	1.20
F1B1-464615-100M	10.0	20	100	306 (255)	1.20	1.50	1.00
F1B1-464615-120M	12.0	20	100	396 (330)	1.10	1.30	0.95
F1B1-464615-150M	15.0	20	100	450 (375)	1.00	1.20	0.90
F1B1-464615-180M	18.0	20	100	564 (470)	0.92	1.10	0.80
F1B1-464615-220M	22.0	20	100	660 (550)	0.85	1.00	0.70
F1B1-464615-270M	27.0	20	100	912 (760)	0.75	0.85	0.55
F1B1-464615-330M	33.0	20	100	1182 (985)	0.65	0.80	0.45
F1B1-464615-390M	39.0	20	100	1380 (1150)	0.60	0.70	0.40
F1B1-464615-470M	47.0	20	100	1730 (1440)	0.55	0.64	0.35

<sup>1</sup> I<sub>SAT</sub> (Saturation Rated Current): The current when the inductance becomes 30% lower than its initial value (T<sub>a</sub> = 25°C and T<sub>a</sub> = 100°C).

<sup>2</sup> I<sub>RMS</sub> (Temperature Rise Current): The current when the temperature of coil increases up to max.  $\Delta T = 40^\circ\text{C}$  (T<sub>a</sub> = 25°C).

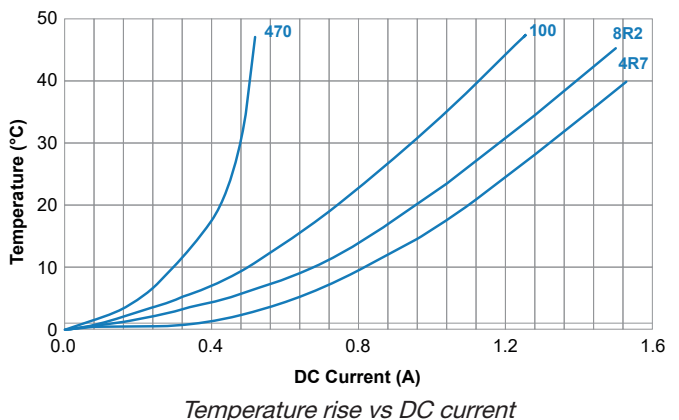
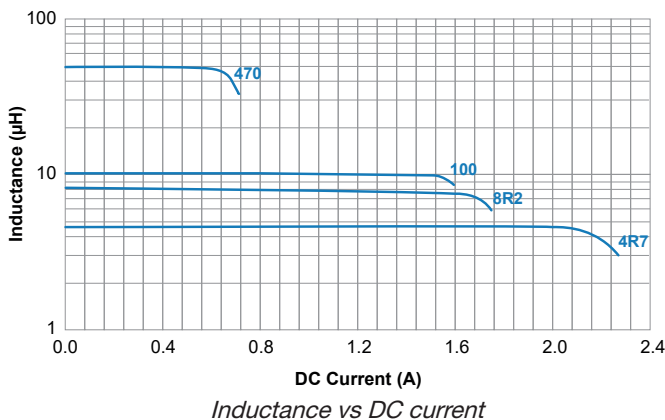
### • Test equipment

**L:** measured on Agilent 4284A LCR meter or equivalent

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

**I<sub>SAT</sub> & I<sub>RMS</sub>:** measured on Agilent 4284A LCR meter with 42841A Current source or equivalent

## TYPICAL PERFORMANCE CURVES



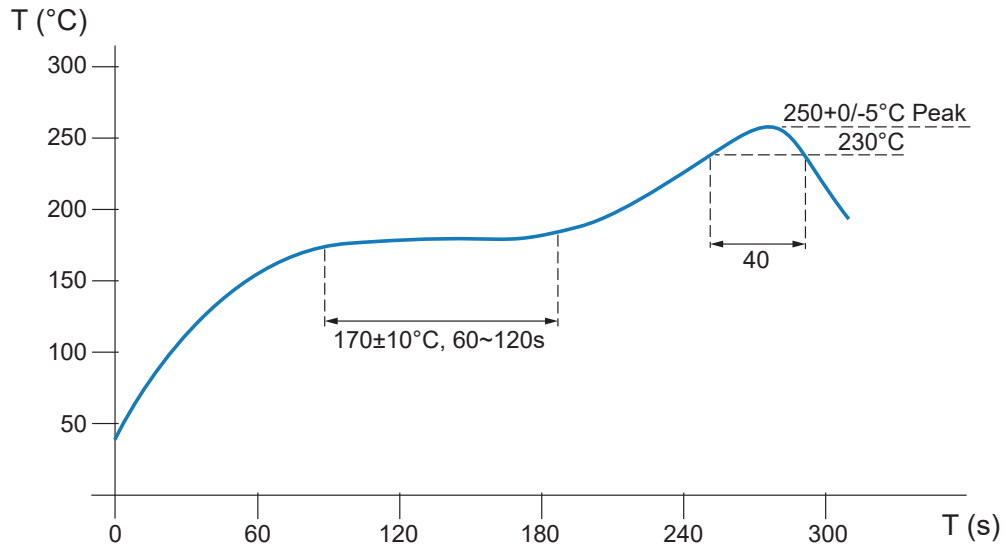
Custom versions available upon request.



128 Atlantic Avenue, Lynbrook, NY 11563  
Toll Free 866-239-5777 | Tel 516-239-5777 | Fax 516-239-7208  
sales@signaltransformer.com | techhelp@signaltransformer.com

[belfuse.com/signal](http://belfuse.com/signal)

## 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**

a) Solder reflow temperature:  $+250^\circ\text{C}$  max. for maximum 10 seconds

b) It is not recommended to solder inductors by soldering iron

c) Please contact us for details

**Custom versions available upon request.**

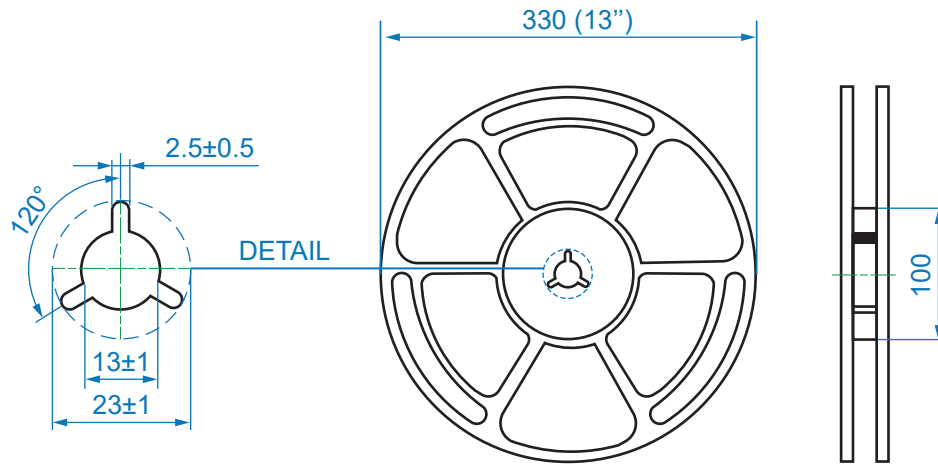
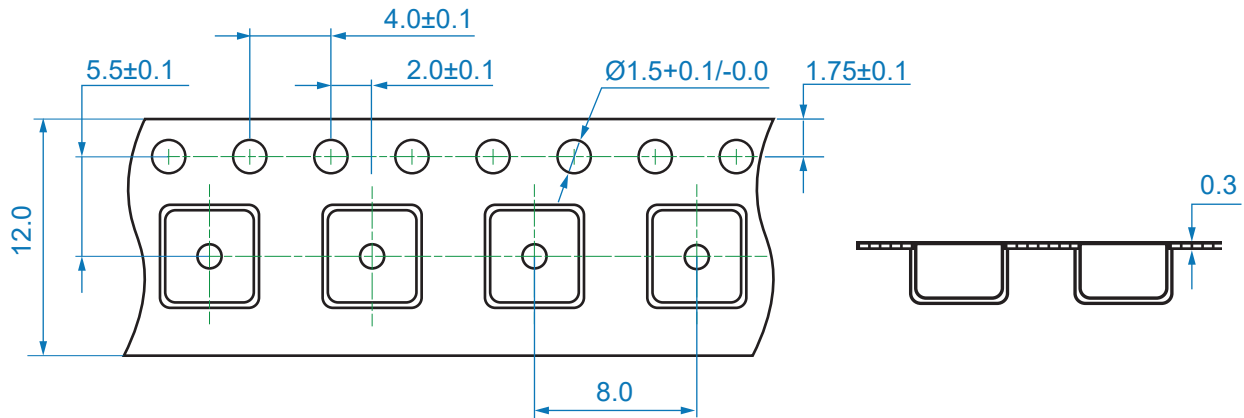
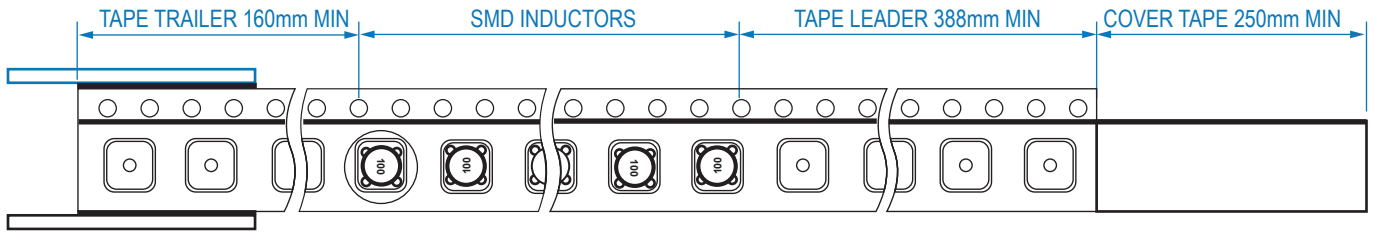


128 Atlantic Avenue, Lynbrook, NY 11563  
 Toll Free 866-239-5777 | Tel 516-239-5777 | Fax 516-239-7208  
 sales@signaltransformer.com | techhelp@signaltransformer.com

[belfuse.com/signal](http://belfuse.com/signal)

## TAPE & REEL SPECIFICATIONS

Dimension unit: mm



Taping specification: EIA -481 Compliant

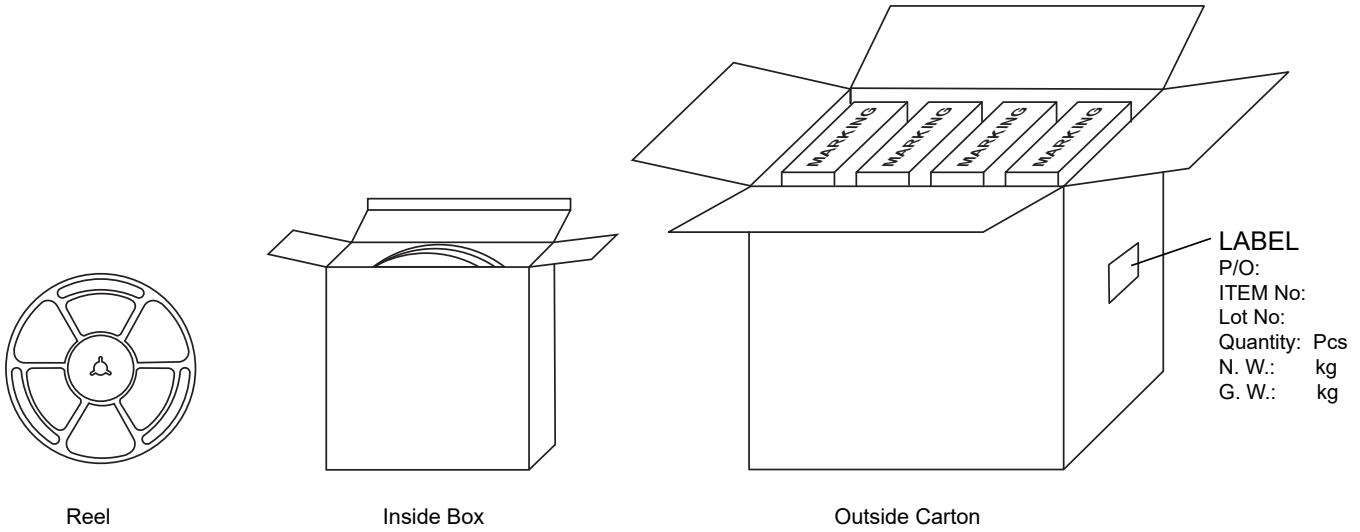
**Custom versions available upon request.**



128 Atlantic Avenue, Lynbrook, NY 11563  
Toll Free 866-239-5777 | Tel 516-239-5777 | Fax 516-239-7208  
sales@signaltransformer.com | techhelp@signaltransformer.com

[belfuse.com/signal](http://belfuse.com/signal)

## PACKAGING SPECIFICATIONS



Series	Packaging Quantity (pcs)		
	Reel	Inside box	Outside carton
F1B1-464612	4000	20000	80000
F1B1-464615	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

**Custom versions available upon request.**



128 Atlantic Avenue, Lynbrook, NY 11563  
 Toll Free 866-239-5777 | Tel 516-239-5777 | Fax 516-239-7208  
 sales@signaltransformer.com | techhelp@signaltransformer.com

[belfuse.com/signal](http://belfuse.com/signal)



## 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:**

128 Atlantic Avenue  
Lynbrook, NY 11563

**Toll Free +1 866-239-5777**

Tel +1 516-239-5777

Fax +1 516-239-7208

sales@signaltransformer.com  
techhelp@signaltransformer.com

[belfuse.com/signal](https://www.belfuse.com/signal)

