

# F1B1-303010 F1B1-303012 F1B1-303015

## 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 first of three series, F1B1-303010/303012/303015. Height profiles of 1.0 mm to 1.5 mm, small footprints of 3.0 mm x 3.0 mm and broad range of inductance and current ratings, make them ideal 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.

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 suitable for price-sensitive or uncritical applications for 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 39  $\mu$ H
- Saturation Rated Current: 0.38 A to 2.3 A
- Temperature Rise Current: 0.33 to 1.9 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

# F1B1-303010/303012/303015 Series Datasheet

## PRODUCT IDENTIFICATION

**F1B1 - 303012 - 220 M**

### Type / Product Series

**F1B1** = Unshielded SMD Power Inductors

### Dimensions

**303010** = 3.0 x 3.0 x 1.0 mm

**303012** = 3.0 x 3.0 x 1.2 mm

**303015** = 3.0 x 3.0 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

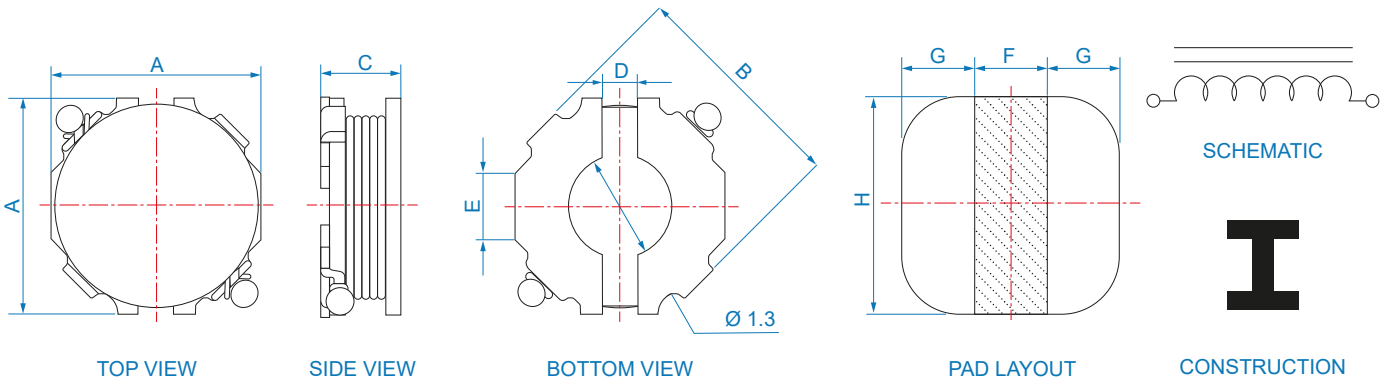
**M** =  $\pm 20\%$

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

## MECHANICAL SPECIFICATIONS

Dimensions are in mm.

SERIES	A	B	C Max	D	E	F	G	H
F1B1-303010	3.0 $\pm$ 0.2	3.2	1.0	0.5	1.0	1.0	1.0	3.0
F1B1-303012	3.0 $\pm$ 0.2	3.2	1.2	0.5	1.0	1.0	1.0	3.0
F1B1-303015	3.0 $\pm$ 0.2	3.2	1.5	0.5	1.0	1.0	1.0	3.0



- 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.

### F1B1-303010 SERIES

Part Number	L ( $\mu\text{H}$ )	Tolerance ( $\pm$ %)	Test Freq. (0.1 V) (kHz)	DCR Max. (Typ.) (m $\Omega$ )	$I_{\text{SAT MAX.}}^1$ (A)		$I_{\text{RMS MAX.}}^2$ (A)
					$\Delta L/L10\%$ Typ.	$\Delta L/L30\%$ Typ.	
F1B1-303010-1R0M	1.0	20	100	91 (70)	1.50	1.90	1.70
F1B1-303010-1R2M	1.2	20	100	104 (80)	1.30	1.80	1.60
F1B1-303010-2R2M	2.2	20	100	187 (150)	1.00	1.30	1.50
F1B1-303010-3R3M	3.3	20	100	287 (230)	0.80	1.10	1.40
F1B1-303010-3R9M	3.9	20	100	312 (250)	0.70	1.00	1.30
F1B1-303010-4R7M	4.7	20	100	400 (320)	0.65	0.90	1.20
F1B1-303010-5R6M	5.6	20	100	475 (380)	0.60	0.85	1.05
F1B1-303010-6R8M	6.8	20	100	537 (430)	0.55	0.72	1.00
F1B1-303010-8R2M	8.2	20	100	662 (530)	0.50	0.68	0.90
F1B1-303010-100M	10.0	20	100	781 (625)	0.46	0.65	0.80
F1B1-303010-120M	12.0	20	100	843 (675)	0.43	0.60	0.75
F1B1-303010-150M	15.0	20	100	1200 (960)	0.38	0.50	0.70

<sup>1</sup>  $I_{\text{SAT}}$  (Saturation Rated Current): The current when the inductance becomes 30% lower than its initial value ( $T_a = 25^\circ\text{C}$  and  $T_a = 100^\circ\text{C}$ ).

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

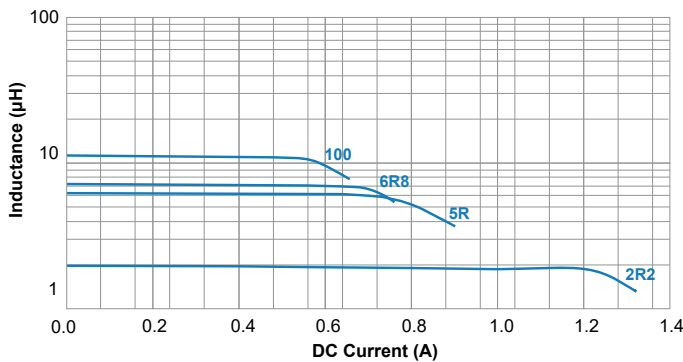
- Test equipment**

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

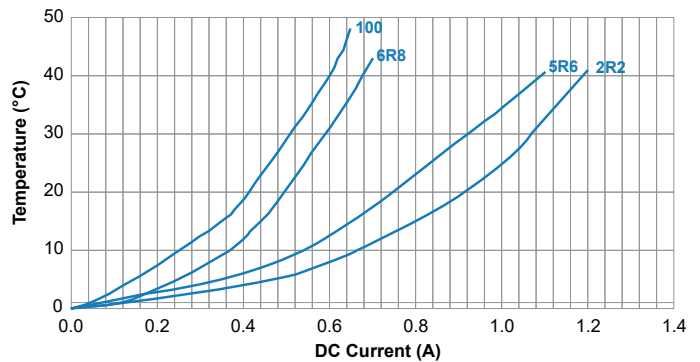
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

**$I_{\text{SAT}}$  &  $I_{\text{RMS}}$ :** measured on Agilent 4284A LCR meter with 42841A Current source or equivalent

## TYPICAL PERFORMANCE CURVES



Inductance vs DC current



Temperature rise vs DC current

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)

# F1B1-303010/303012/303015 Series Datasheet

## F1B1-303012 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.	
F1B1-303012-1R2M	1.2	20	100	78 (63)	2.10	2.40	1.59
F1B1-303012-1R5M	1.5	20	100	93 (74)	1.70	2.00	1.47
F1B1-303012-2R2M	2.2	20	100	118 (95)	1.60	1.70	1.20
F1B1-303012-2R7M	2.7	20	100	156 (125)	1.30	1.50	1.09
F1B1-303012-3R3M	3.3	20	100	175 (140)	1.20	1.40	1.03
F1B1-303012-3R9M	3.9	20	100	212 (170)	1.10	1.30	0.94
F1B1-303012-4R7M	4.7	20	100	275 (220)	1.00	1.20	0.82
F1B1-303012-5R6M	5.6	20	100	312 (250)	0.85	1.10	0.77
F1B1-303012-6R8M	6.8	20	100	350 (280)	0.80	1.00	0.71
F1B1-303012-8R2M	8.2	20	100	556 (445)	0.75	0.92	0.60
F1B1-303012-100M	10.0	20	100	650 (520)	0.70	0.78	0.55
F1B1-303012-120M	12.0	20	100	718 (575)	0.65	0.72	0.52
F1B1-303012-150M	15.0	20	100	781 (625)	0.60	0.65	0.48
F1B1-303012-180M	18.0	20	100	1068 (855)	0.55	0.58	0.41
F1B1-303012-220M	22.0	20	100	1262 (1010)	0.50	0.55	0.38
F1B1-303012-270M	27.0	20	100	1812 (1450)	0.42	0.46	0.33

<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).

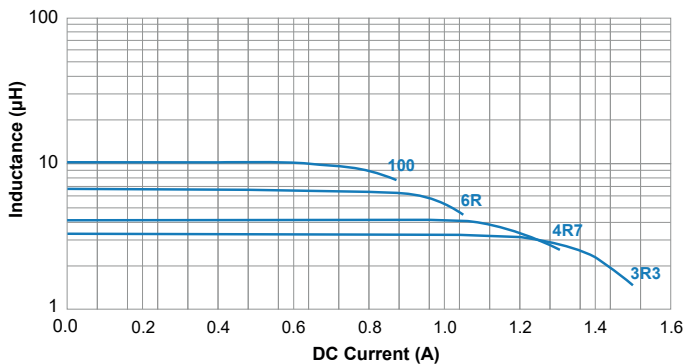
### • Test equipment

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

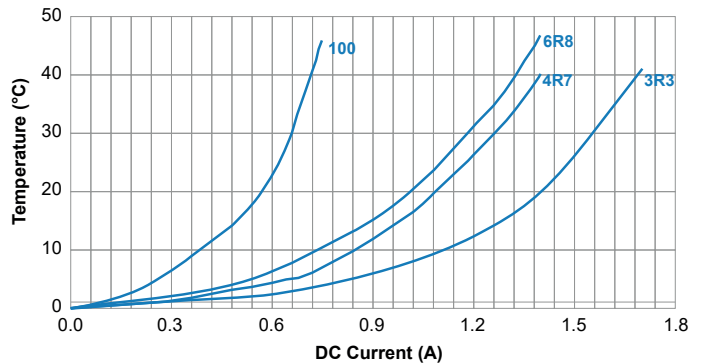
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

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

## TYPICAL PERFORMANCE CURVES



Inductance vs DC current



Temperature rise vs DC current

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)

# F1B1-303010/303012/303015 Series Datasheet

## F1B1-303015 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.	
F1B1-303015-1R2M	1.2	20	100	88 (70)	2.30	2.60	1.90
F1B1-303015-1R5M	1.5	20	100	100 (80)	2.00	2.40	1.80
F1B1-303015-2R2M	2.2	20	100	119 (95)	1.70	2.10	1.60
F1B1-303015-2R7M	2.7	20	100	144 (115)	1.60	1.90	1.50
F1B1-303015-3R3M	3.3	20	100	156 (125)	1.50	1.80	1.40
F1B1-303015-3R9M	3.9	20	100	169 (135)	1.30	1.70	1.30
F1B1-303015-4R7M	4.7	20	100	225 (180)	1.20	1.50	1.20
F1B1-303015-5R6M	5.6	20	100	250 (200)	1.10	1.40	1.05
F1B1-303015-6R8M	6.8	20	100	300 (240)	1.00	1.30	1.00
F1B1-303015-8R2M	8.2	20	100	325 (260)	0.90	1.10	0.95
F1B1-303015-100M	10.0	20	100	437 (350)	0.85	1.00	0.90
F1B1-303015-120M	12.0	20	100	487 (390)	0.75	0.90	0.70
F1B1-303015-150M	15.0	20	100	700 (560)	0.65	0.80	0.60
F1B1-303015-180M	18.0	20	100	938 (750)	0.60	0.75	0.55
F1B1-303015-220M	22.0	20	100	1050 (840)	0.55	0.70	0.50
F1B1-303015-270M	27.0	20	100	1312 (1050)	0.50	0.58	0.45
F1B1-303015-330M	33.0	20	100	1562 (1250)	0.45	0.52	0.40
F1B1-303015-390M	39.0	20	100	1750 (1400)	0.40	0.48	0.37

<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).

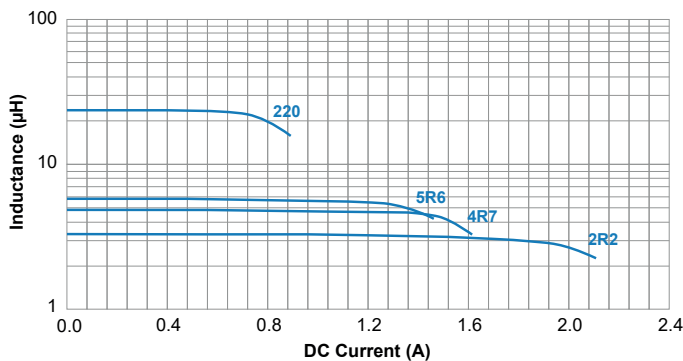
### • Test equipment

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

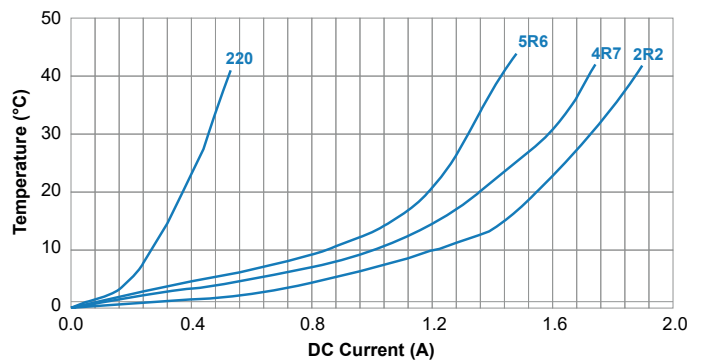
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

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

## TYPICAL PERFORMANCE CURVES



Inductance vs DC current



Temperature rise vs DC current

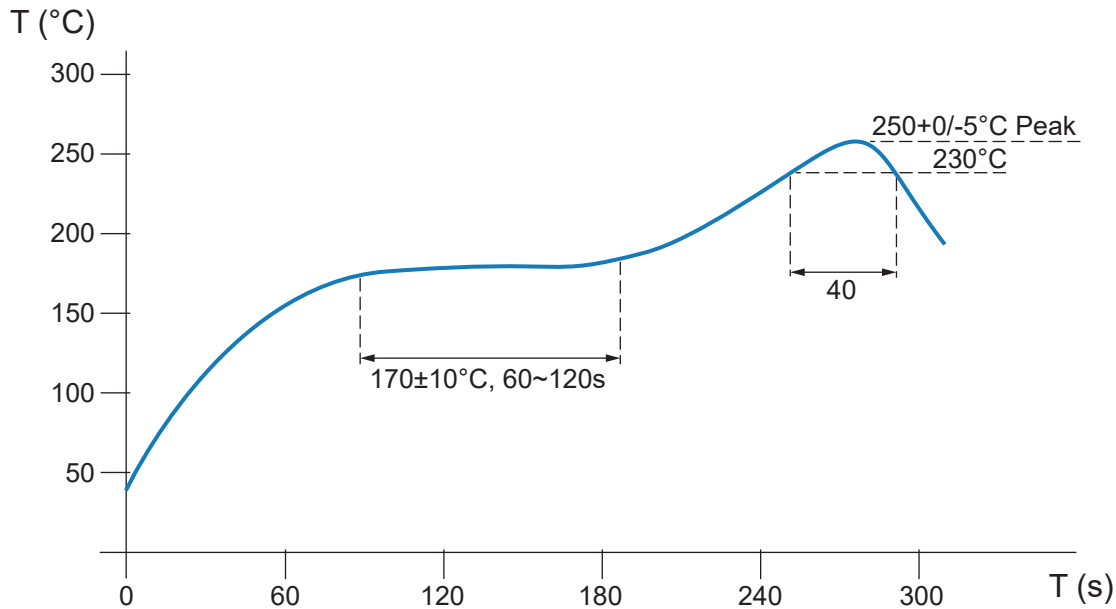
Custom versions available upon request.



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**

- 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

**Custom versions available upon request.**



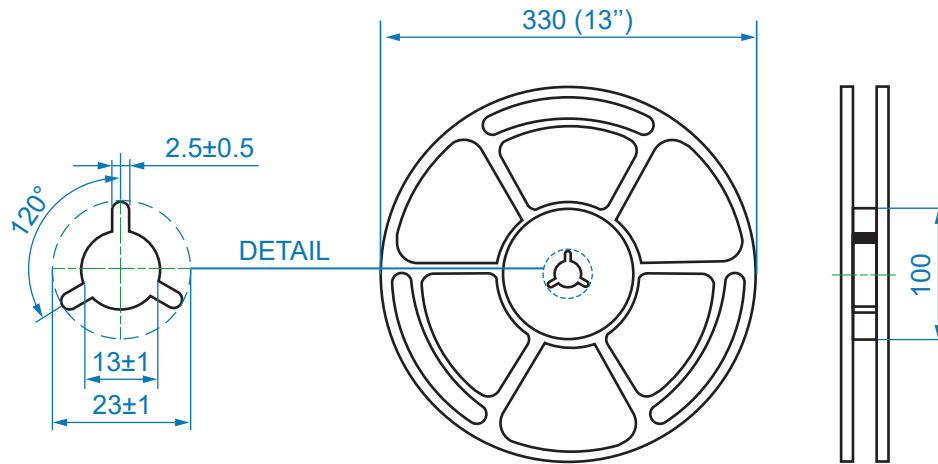
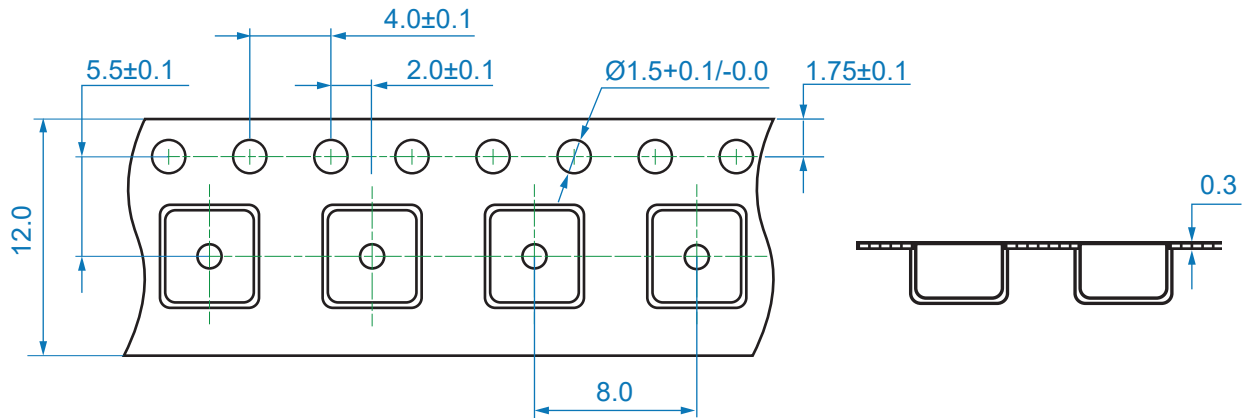
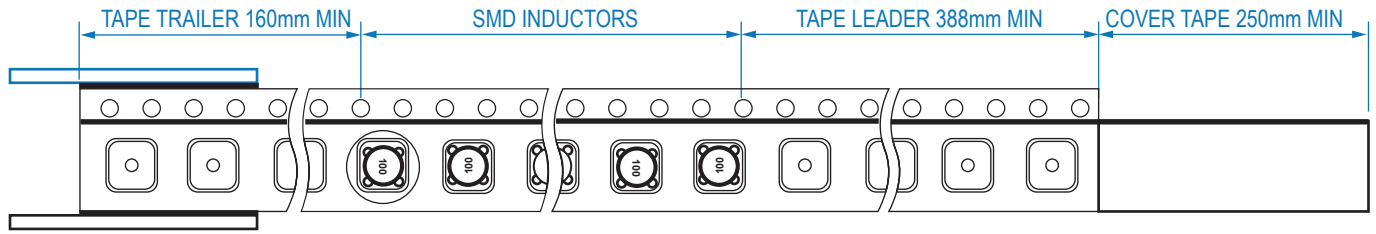
128 Atlantic Avenue, Lynbrook, NY 11563  
 Toll Free 866-239-5777 | Tel 516-239-5777 | Fax 516-239-7208  
 sales@signaltransformer.com | techhelp@signaltransformer.com

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

# F1B1-303010/303012/303015 Series Datasheet

## TAPE & REEL SPECIFICATIONS

Dimension unit: mm



Taping specification: EIA -481 Compliant

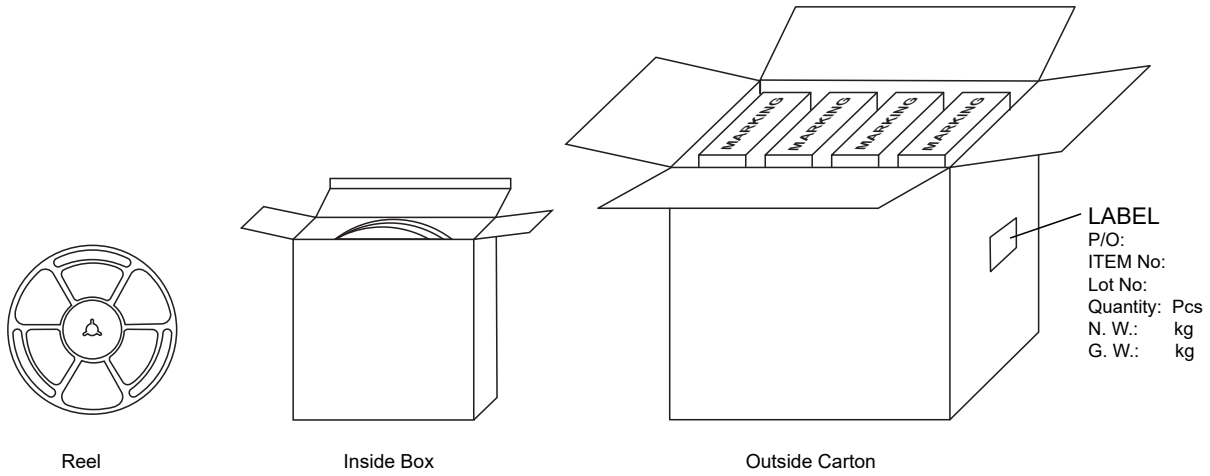
Custom versions available upon request.



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
F1B1-303010	4000	20000	80000
F1B1-303012	4000	20000	80000
F1B1-303015	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

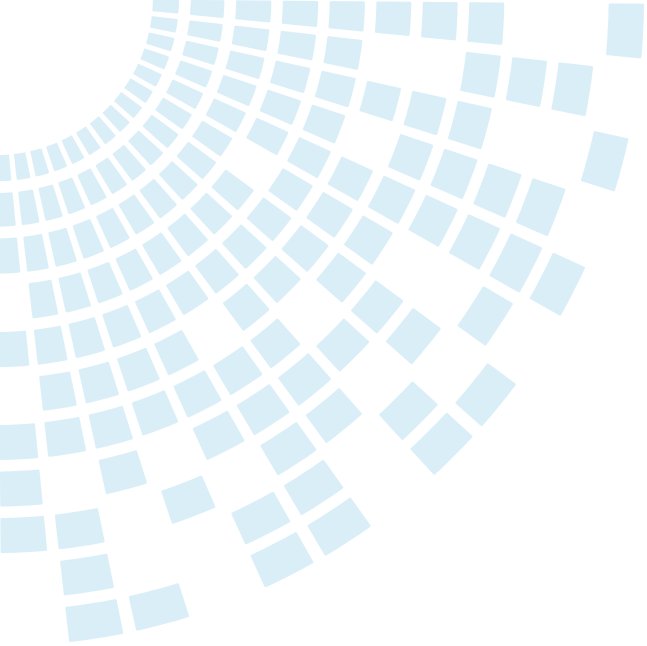
**Custom versions available upon request.**



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

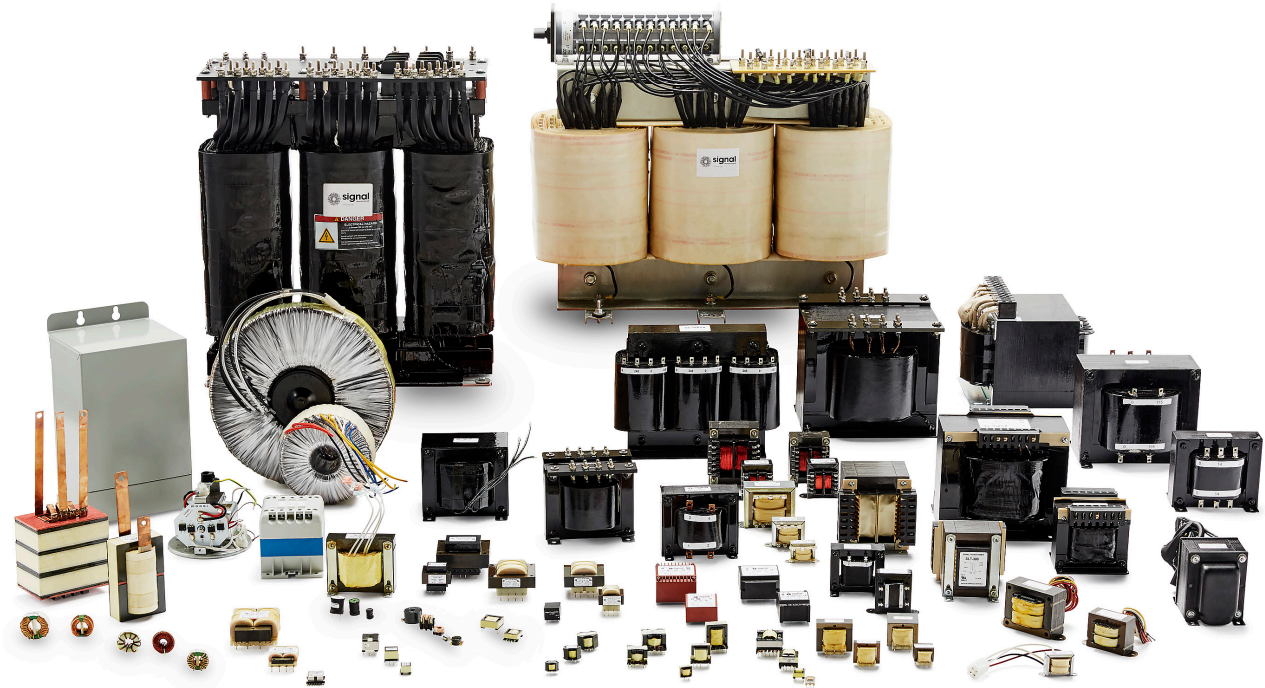
[belfuse.com/signal](http://belfuse.com/signal)





## 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)**

