

# F1B1-383812 F1B1-383815 F1B1-383818

## 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 second of three series, F1B1-383812/383815/383818. Height profiles of 1.2 mm to 1.8 mm, small footprints of 3.8 mm x 3.8 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 use 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 56  $\mu$ H
- Saturation Rated Current: 0.33 A to 3.2 A
- Temperature Rise Current: 0.32 to 2.3 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

# F1B1-383812/383815/383818 Series Datasheet

## PRODUCT IDENTIFICATION

**F1B1 - 383812 - 220 M**

**Type / Product Series**

**F1B1** = Unshielded SMD Power Inductors

**Dimensions**

**383812** = 3.8 x 3.8 x 1.2 mm

**383815** = 3.8 x 3.8 x 1.5 mm

**383818** = 3.8 x 3.8 x 1.8 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**

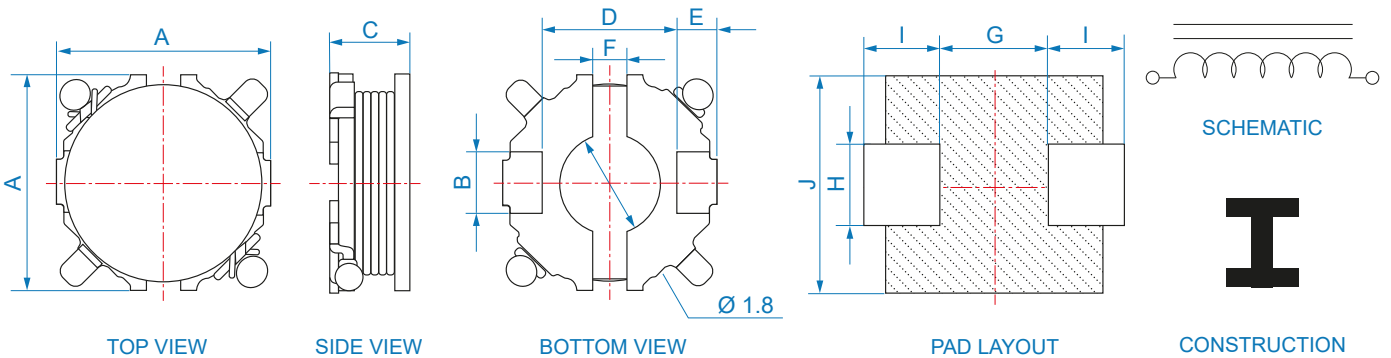
**M** =  $\pm 20\%$

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

## MECHANICAL SPECIFICATIONS

Dimensions are in mm.

SERIES	A	B	C Max	D	E	F	G	H	I	J
F1B1-383812	3.8 $\pm$ 0.2	1.1	1.2	2.4	0.7	0.6	2.0	1.5	1.4	4.0
F1B1-383815	3.8 $\pm$ 0.2	1.1	1.5	2.4	0.7	0.6	2.0	1.5	1.4	4.0
F1B1-383818	3.8 $\pm$ 0.2	1.1	1.8	2.4	0.7	0.6	2.0	1.5	1.4	4.0



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

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# F1B1-383812/383815/383818 Series Datasheet

## ELECTRICAL SPECIFICATIONS

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

### F1B1-383812 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.	
F1B1-383812-1R0M	1.0	20	100	64 (53)	2.10	2.70	2.30
F1B1-383812-1R2M	1.2	20	100	79 (64)	1.80	2.40	2.10
F1B1-383812-2R2M	2.2	20	100	102 (85)	1.50	1.80	1.78
F1B1-383812-2R7M	2.7	20	100	132 (110)	1.30	1.60	1.47
F1B1-383812-3R3M	3.3	20	100	168 (140)	1.20	1.40	1.30
F1B1-383812-3R9M	3.9	20	100	195 (162)	1.00	1.30	1.20
F1B1-383812-4R7M	4.7	20	100	240 (200)	0.90	1.20	0.90
F1B1-383812-5R6M	5.6	20	100	288 (240)	0.85	1.10	0.84
F1B1-383812-6R8M	6.8	20	100	312 (260)	0.80	1.00	0.78
F1B1-383812-8R2M	8.2	20	100	420 (350)	0.70	0.85	0.70
F1B1-383812-100M	10.0	20	100	480 (400)	0.65	0.82	0.65
F1B1-383812-120M	12.0	20	100	618 (515)	0.60	0.70	0.57
F1B1-383812-150M	15.0	20	100	732 (610)	0.52	0.65	0.52
F1B1-383812-180M	18.0	20	100	816 (680)	0.48	0.62	0.48
F1B1-383812-220M	22.0	20	100	1032 (860)	0.44	0.54	0.44
F1B1-383812-270M	27.0	20	100	1176 (980)	0.40	0.50	0.40
F1B1-383812-330M	33.0	20	100	1392 (1160)	0.36	0.45	0.38
F1B1-383812-390M	39.0	20	100	1920 (1600)	0.33	0.40	0.32

<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).

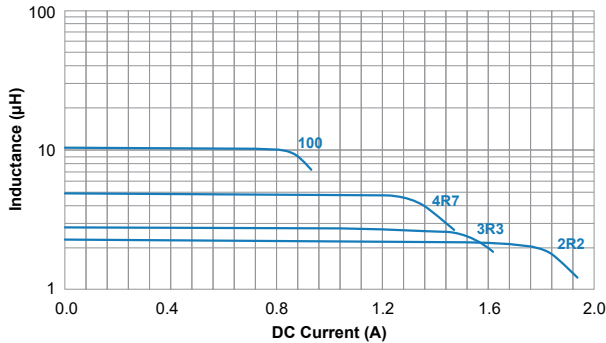
#### • Test equipment

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

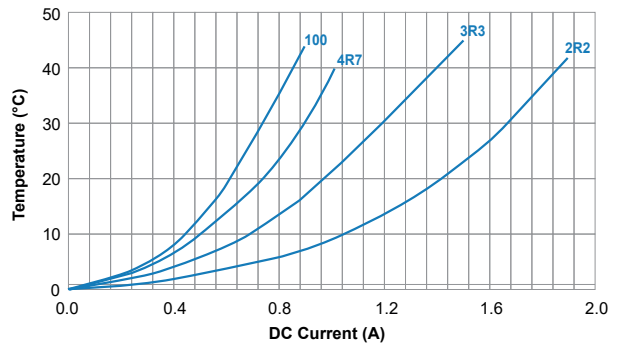
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

**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

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# F1B1-383812/383815/383818 Series Datasheet

## F1B1-383815 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.	
F1B1-383815-1R0M	1.0	20	100	78 (65)	2.50	3.00	2.20
F1B1-383815-2R2M	2.2	20	100	108 (90)	1.90	2.30	1.85
F1B1-383815-3R3M	3.3	20	100	126 (105)	1.40	2.00	1.70
F1B1-383815-3R9M	3.9	20	100	150 (125)	1.20	1.70	1.65
F1B1-383815-4R7M	4.7	20	100	168 (140)	1.10	1.60	1.40
F1B1-383815-6R8M	6.8	20	100	228 (190)	0.95	1.30	1.30
F1B1-383815-8R2M	8.2	20	100	264 (220)	0.90	1.20	1.20
F1B1-383815-100M	10.0	20	100	300 (250)	0.85	1.10	1.10
F1B1-383815-120M	12.0	20	100	378 (315)	0.78	1.00	1.00
F1B1-383815-150M	15.0	20	100	444 (370)	0.68	0.90	0.90
F1B1-383815-180M	18.0	20	100	564 (470)	0.62	0.80	0.79
F1B1-383815-220M	22.0	20	100	636 (530)	0.52	0.72	0.72
F1B1-383815-270M	27.0	20	100	900 (750)	0.48	0.65	0.60
F1B1-383815-330M	33.0	20	100	1188 (990)	0.45	0.58	0.52
F1B1-383815-390M	39.0	20	100	1344 (1120)	0.42	0.55	0.48
F1B1-383815-470M	47.0	20	100	1752 (1460)	0.37	0.50	0.39

<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).

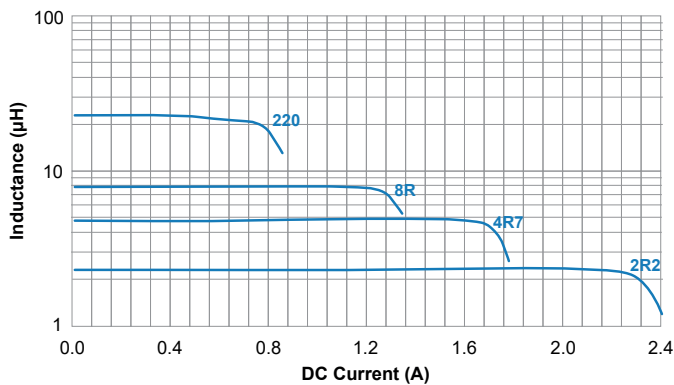
### Test equipment

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

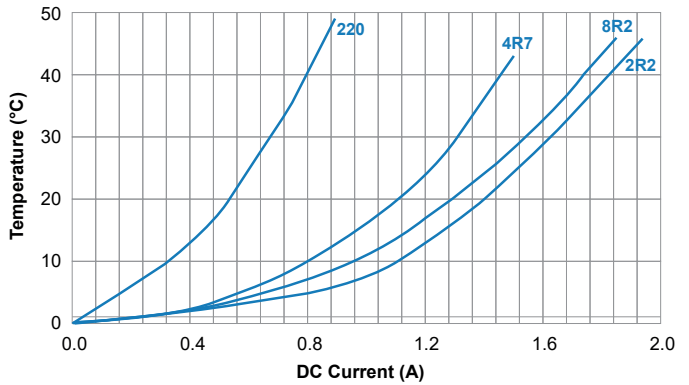
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

**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



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# F1B1-383812/383815/383818 Series Datasheet

## F1B1-383818 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.	
F1B1-383818-1R0M	1.0	20	100	68 (56)	3.20	3.60	2.20
F1B1-383818-1R5M	1.5	20	100	90 (75)	2.40	2.80	1.85
F1B1-383818-2R2M	2.2	20	100	108 (90)	2.00	2.30	1.66
F1B1-383818-2R7M	2.7	20	100	118 (98)	1.70	2.10	1.59
F1B1-383818-3R3M	3.3	20	100	130 (108)	1.60	2.00	1.50
F1B1-383818-3R9M	3.9	20	100	140 (116)	1.50	1.90	1.45
F1B1-383818-4R7M	4.7	20	100	162 (135)	1.30	1.70	1.37
F1B1-383818-5R6M	5.6	20	100	178 (148)	1.20	1.60	1.27
F1B1-383818-6R8M	6.8	20	100	198 (165)	1.10	1.50	1.20
F1B1-383818-8R2M	8.2	20	100	222 (185)	1.00	1.30	1.13
F1B1-383818-100M	10.0	20	100	252 (210)	0.90	1.20	1.06
F1B1-383818-120M	12.0	20	100	294 (245)	0.85	1.10	0.98
F1B1-383818-150M	15.0	20	100	384 (320)	0.75	1.00	0.86
F1B1-383818-180M	18.0	20	100	432 (360)	0.70	0.92	0.80
F1B1-383818-220M	22.0	20	100	564 (470)	0.60	0.82	0.70
F1B1-383818-270M	27.0	20	100	630 (525)	0.55	0.75	0.67
F1B1-383818-330M	33.0	20	100	804 (670)	0.50	0.65	0.55
F1B1-383818-390M	39.0	20	100	906 (755)	0.47	0.62	0.51
F1B1-383818-470M	47.0	20	100	1260 (1050)	0.43	0.56	0.43
F1B1-383818-560M	56.0	20	100	1620 (1350)	0.38	0.50	0.38

<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).

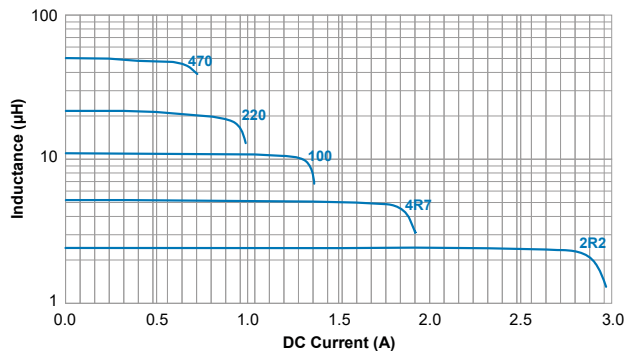
### • Test equipment

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

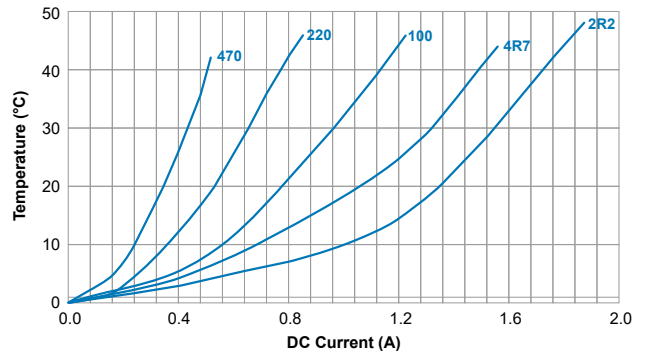
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

**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

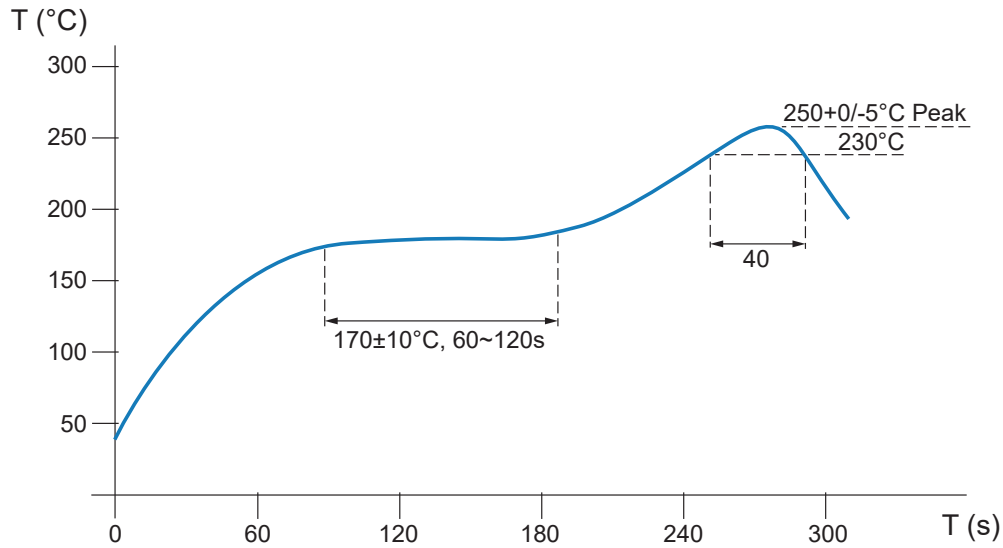
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## RECOMMENDED REFLOW SOLDERING CONDITIONS



- **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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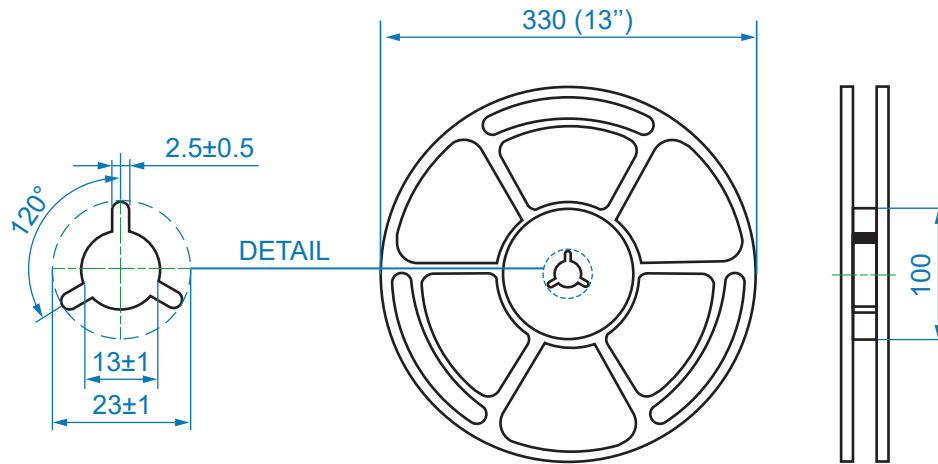
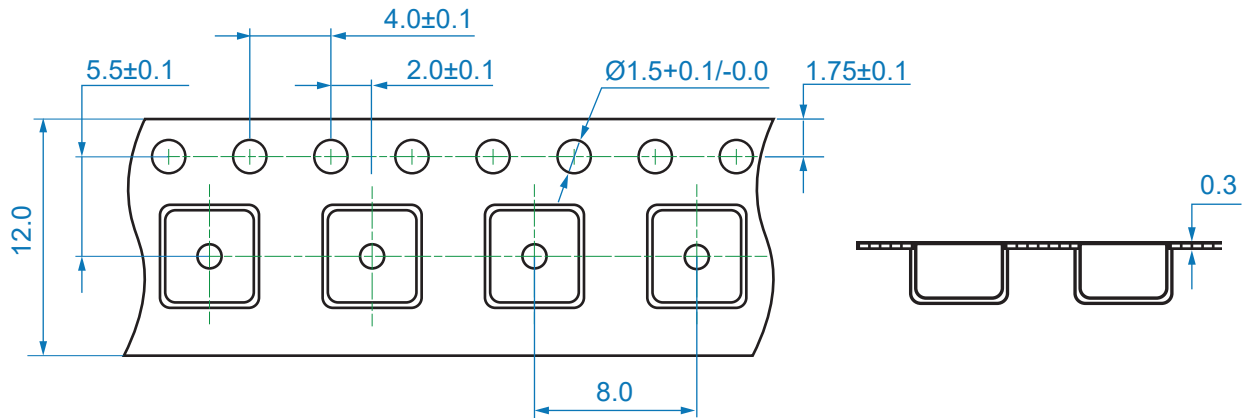
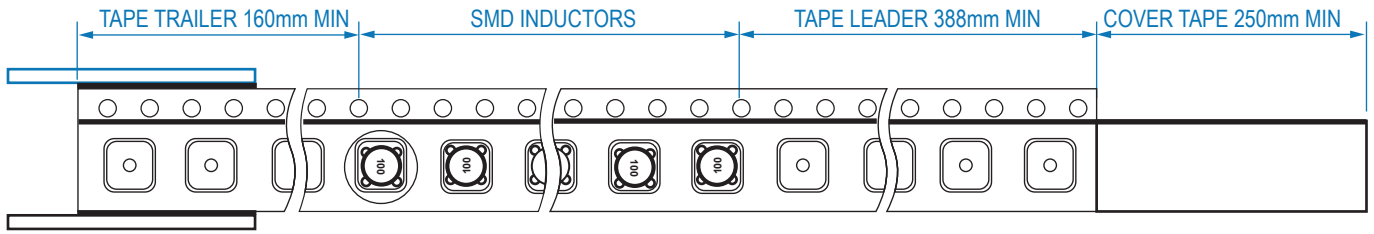
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# F1B1-383812/383815/383818 Series Datasheet

## TAPE & REEL SPECIFICATIONS

Dimension unit: mm



Taping specification: EIA -481 Compliant

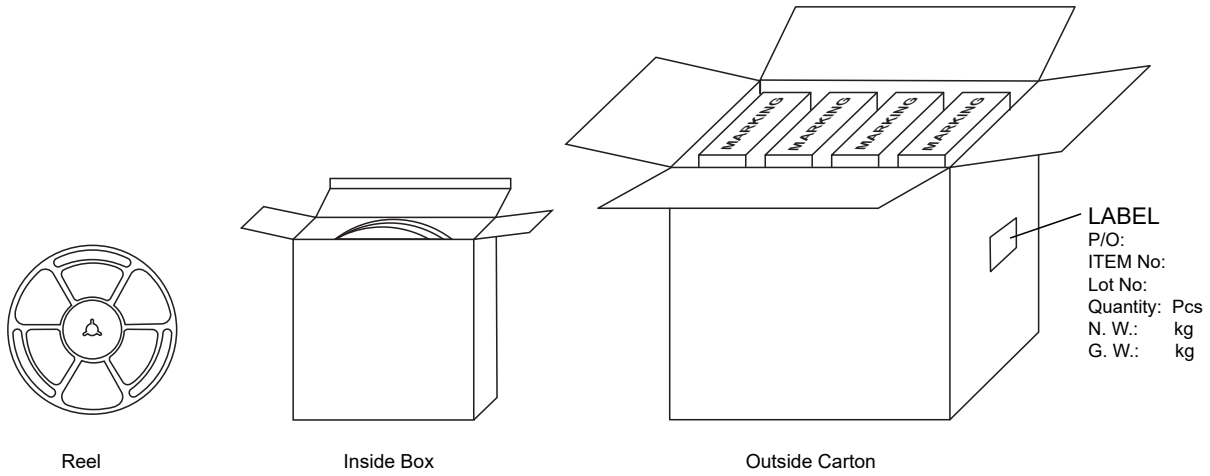
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## PACKAGING SPECIFICATIONS



Series	Packaging Quantity (pcs)		
	Reel	Inside box	Outside carton
F1B1-383812	4000	20000	80000
F1B1-383815	4000	20000	80000
F1B1-383818	3500	17500	70000

- **Storage Conditions**

- Temperature and humidity conditions  $< 35^{\circ}\text{C}$  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

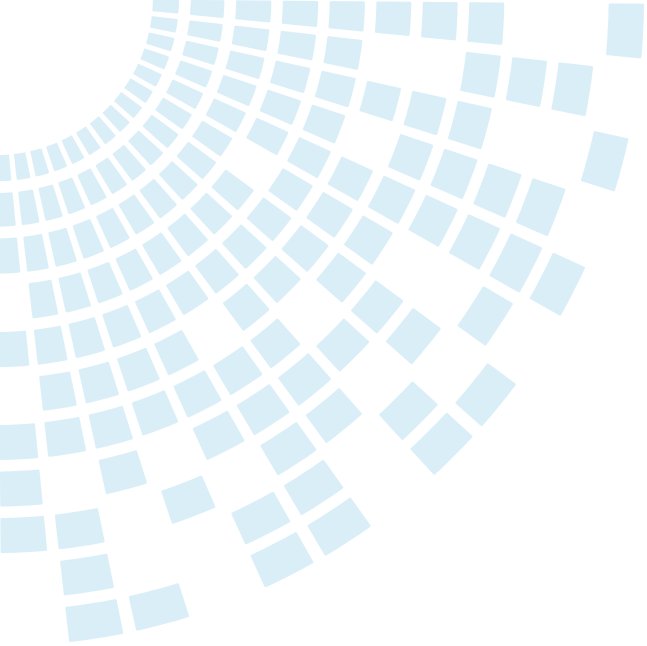
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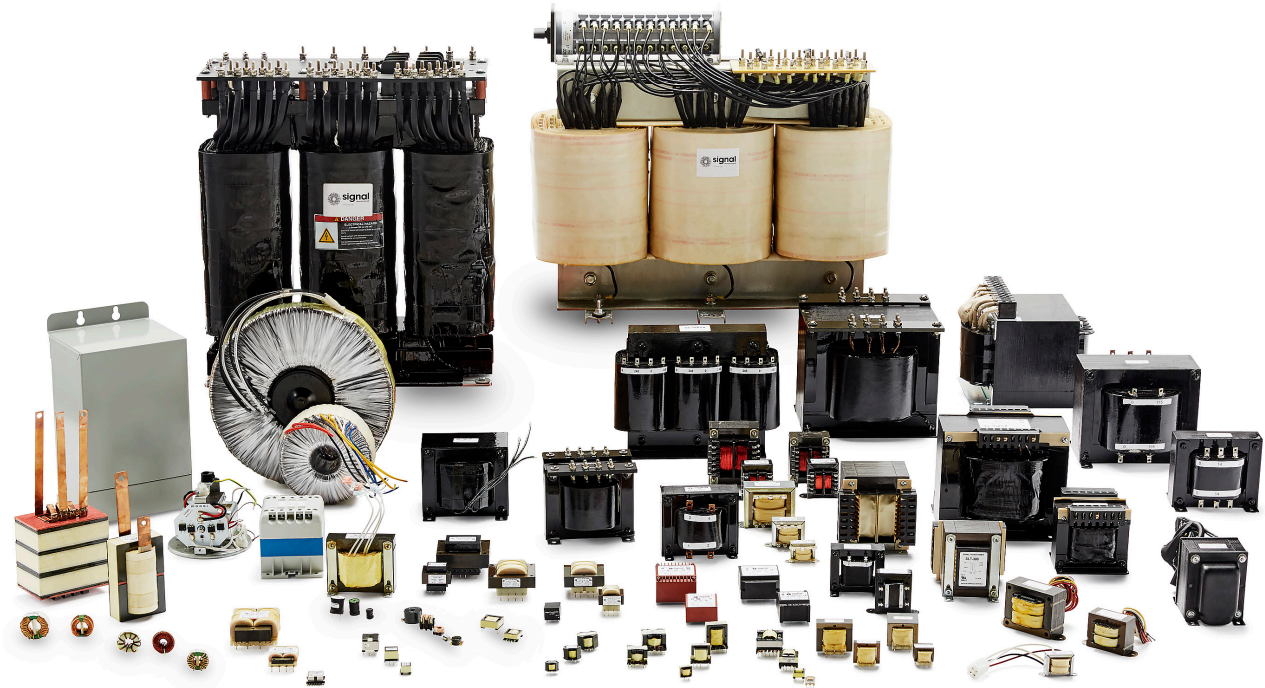
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## About Signal Transformer

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,  
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