

# F1A1-383812 F1A1-383815 F1A1-383818

## 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 second of three series, F1A1-383812/383815/383818. 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 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  $\mu$ H to 47  $\mu$ H
- Saturated Rated Current: 0.28 A to 2.0 A
- Temperature Rise Current: 0.3 A 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

- DC-DC converters in consumer, industrial & telecom electronics
- Wearable devices
- HDDs, SSDs
- Smartphones
- Digital equipment
- Laptops, digital cameras
- Filtering of supply voltages

# F1A1-383812/383815/383818 Series Datasheet

## PRODUCT IDENTIFICATION

**F1A1 - 383812 - 100 M**

**Type / Product Series**

F1A1 = Shielded 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 \***

100 = 10  $\mu$ 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**

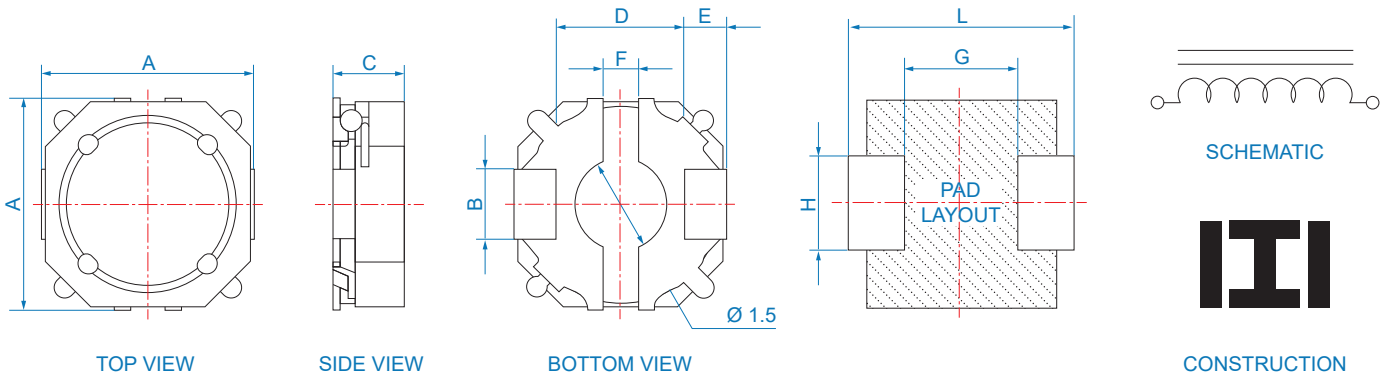
M =  $\pm 20\%$

N =  $\pm 30\%$

## MECHANICAL SPECIFICATIONS

Dimensions are in mm.

SERIES	A	B	C Max	D	E	F	G	H	L
F1A1-383812	3.8 $\pm$ 0.2	1.1	1.2	2.4	0.7	0.6	2.0	1.5	4.8
F1A1-383815	3.8 $\pm$ 0.2	1.1	1.5	2.4	0.7	0.6	2.0	1.5	4.8
F1A1-383818	3.8 $\pm$ 0.2	1.1	1.8	2.4	0.7	0.6	2.0	1.5	4.8



- 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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## ELECTRICAL SPECIFICATIONS

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

### F1A1-383812 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)
					25°C	100°C	
F1A1-383812-1R2N	1.2	30	100	81 (65)	1.60	1.40	1.30
F1A1-383812-2R2N	2.2	30	100	100 (80)	1.40	1.20	1.10
F1A1-383812-2R7N	2.7	30	100	125 (100)	1.20	0.90	0.92
F1A1-383812-3R3N	3.3	30	100	188 (150)	1.10	0.85	0.87
F1A1-383812-3R9N	3.9	30	100	256 (205)	1.00	0.80	0.83
F1A1-383812-4R7N	4.7	30	100	287 (230)	0.90	0.70	0.80
F1A1-383812-5R6N	5.6	30	100	380 (305)	0.80	0.60	0.75
F1A1-383812-6R8N	6.8	30	100	450 (360)	0.70	0.55	0.65
F1A1-383812-8R2N	8.2	30	100	500 (400)	0.60	0.50	0.55
F1A1-383812-100M	10.0	20	100	650 (520)	0.50	0.35	0.45
F1A1-383812-120M	12.0	20	100	687 (550)	0.45	0.30	0.40
F1A1-383812-150M	15.0	20	100	787 (630)	0.40	0.27	0.37
F1A1-383812-180M	18.0	20	100	875 (700)	0.35	0.25	0.35
F1A1-383812-220M	22.0	20	100	962 (770)	0.30	0.20	0.30

<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).

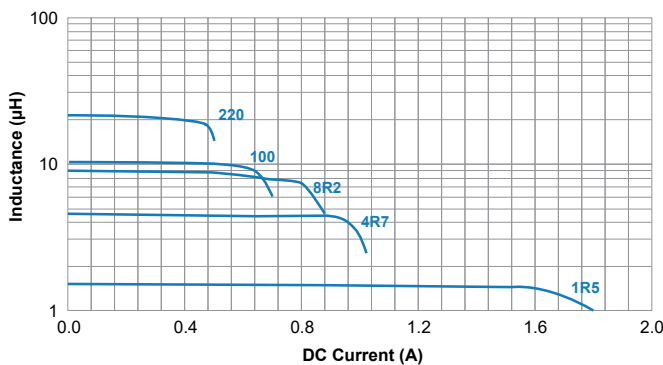
- **Test equipment**

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

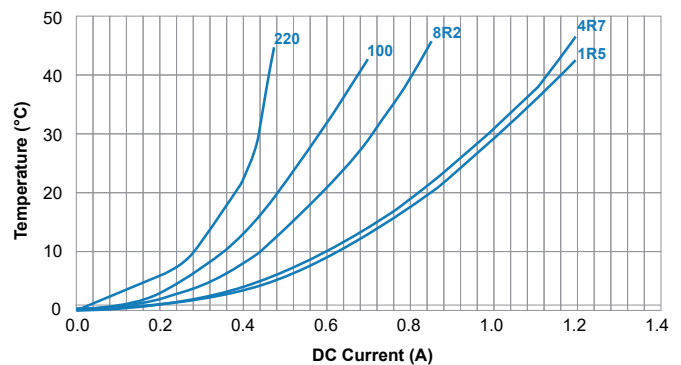
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

**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

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# F1A1-383812/383815/383818 Series Datasheet

## F1A1-383815 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)
					25°C	100°C	
F1A1-383815-1R0N	1.0	30	100	78 (62)	2.00	1.80	1.80
F1A1-383815-1R5N	1.5	30	100	94 (75)	1.70	1.50	1.70
F1A1-383815-2R2N	2.2	30	100	106 (85)	1.40	1.20	1.60
F1A1-383815-2R7N	2.7	30	100	118 (95)	1.30	1.10	1.50
F1A1-383815-3R3N	3.3	30	100	131 (105)	1.10	1.00	1.40
F1A1-383815-3R9N	3.9	30	100	143 (115)	1.00	0.90	1.30
F1A1-383815-4R7N	4.7	30	100	162 (130)	0.95	0.85	1.20
F1A1-383815-5R6N	5.6	30	100	175 (140)	0.90	0.80	1.10
F1A1-383815-6R8N	6.8	30	100	212 (515)	0.85	0.75	1.00
F1A1-383815-8R2N	8.2	30	100	237 (190)	0.80	0.70	0.95
F1A1-383815-100M	10.0	20	100	262 (210)	0.70	0.50	0.90
F1A1-383815-120M	12.0	20	100	350 (280)	0.60	0.45	0.80
F1A1-383815-150M	15.0	20	100	456 (365)	0.55	0.42	0.75
F1A1-383815-180M	18.0	20	100	506 (405)	0.50	0.40	0.70
F1A1-383815-220M	22.0	20	100	575 (460)	0.45	0.37	0.55
F1A1-383815-270M	27.0	20	100	675 (540)	0.40	0.33	0.53
F1A1-383815-330M	33.0	20	100	937 (750)	0.35	0.30	0.50
F1A1-383815-390M	39.0	20	100	1037 (830)	0.32	0.28	0.45
F1A1-383815-470M	47.0	20	100	1262 (1010)	0.28	0.22	0.43

<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.  $\Delta T = 40^\circ\text{C}$  ( $T_a = 25^\circ\text{C}$ ).

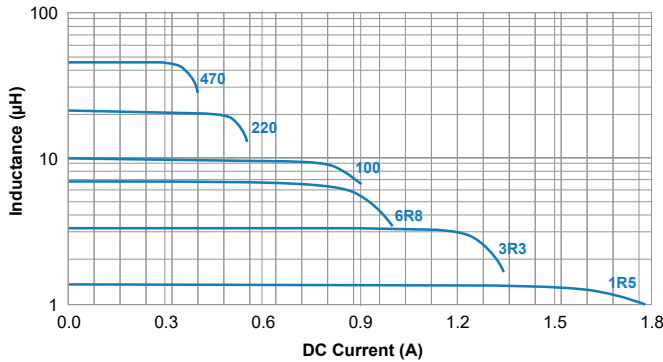
### • Test equipment

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

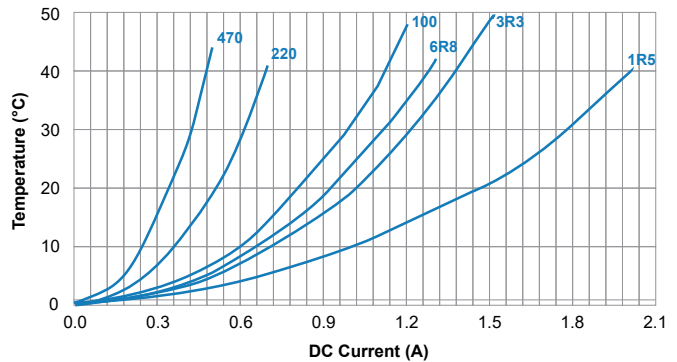
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

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

## TYPICAL PERFORMANCE CURVES



Inductance vs DC current



Temperature rise vs DC current

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# F1A1-383812/383815/383818 Series Datasheet

## F1A1-383818 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)
					25°C	100°C	
F1A1-383818-1R2N	1.2	30	100	88 (70)	2.00	1.80	1.90
F1A1-383818-1R8N	1.8	30	100	100 (80)	1.80	1.60	1.80
F1A1-383818-2R2N	2.2	30	100	113 (90)	1.60	1.40	1.70
F1A1-383818-2R7N	2.7	30	100	125 (100)	1.40	1.20	1.55
F1A1-383818-3R3N	3.3	30	100	138 (110)	1.20	1.10	1.45
F1A1-383818-3R9N	3.9	30	100	150 (120)	1.10	1.00	1.35
F1A1-383818-4R7N	4.7	30	100	162 (130)	1.00	0.90	1.25
F1A1-383818-5R6N	5.6	30	100	181 (145)	0.95	0.85	1.15
F1A1-383818-6R8N	6.8	30	100	200 (160)	0.90	0.80	1.05
F1A1-383818-8R2N	8.2	30	100	225 (180)	0.80	0.75	0.95
F1A1-383818-100M	10.0	20	100	250 (200)	0.75	0.70	0.85
F1A1-383818-120M	12.0	20	100	337 (270)	0.65	0.60	0.70
F1A1-383818-150M	15.0	20	100	393 (315)	0.60	0.55	0.65
F1A1-383818-180M	18.0	20	100	437 (350)	0.55	0.50	0.60
F1A1-383818-220M	22.0	20	100	563 (450)	0.50	0.45	0.55
F1A1-383818-270M	27.0	20	100	637 (510)	0.45	0.40	0.45
F1A1-383818-330M	33.0	20	100	712 (570)	0.40	0.35	0.40
F1A1-383818-390M	39.0	20	100	956 (765)	0.38	0.32	0.35
F1A1-383818-470M	47.0	20	100	1100 (880)	0.32	0.28	0.30

<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).

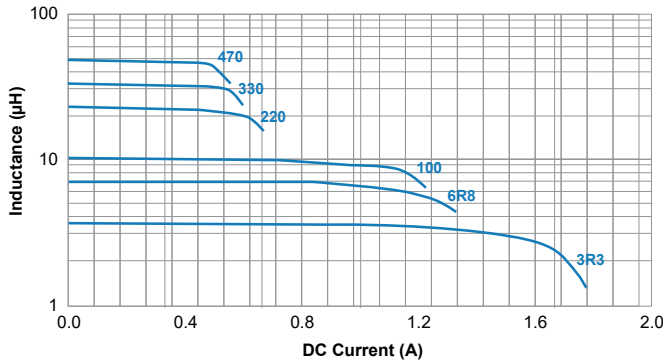
### • Test equipment

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

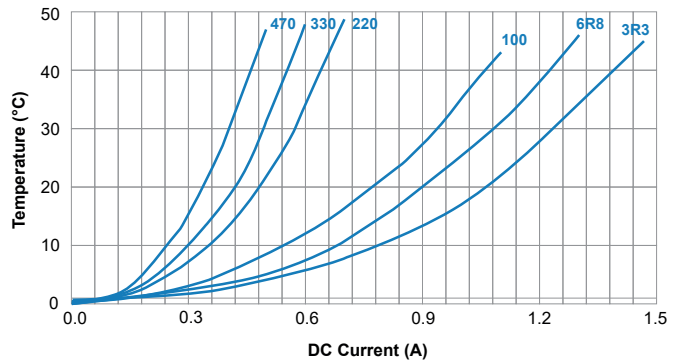
**DCR:** measured on Chroma 16502 micro-ohm meter or equivalent

**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

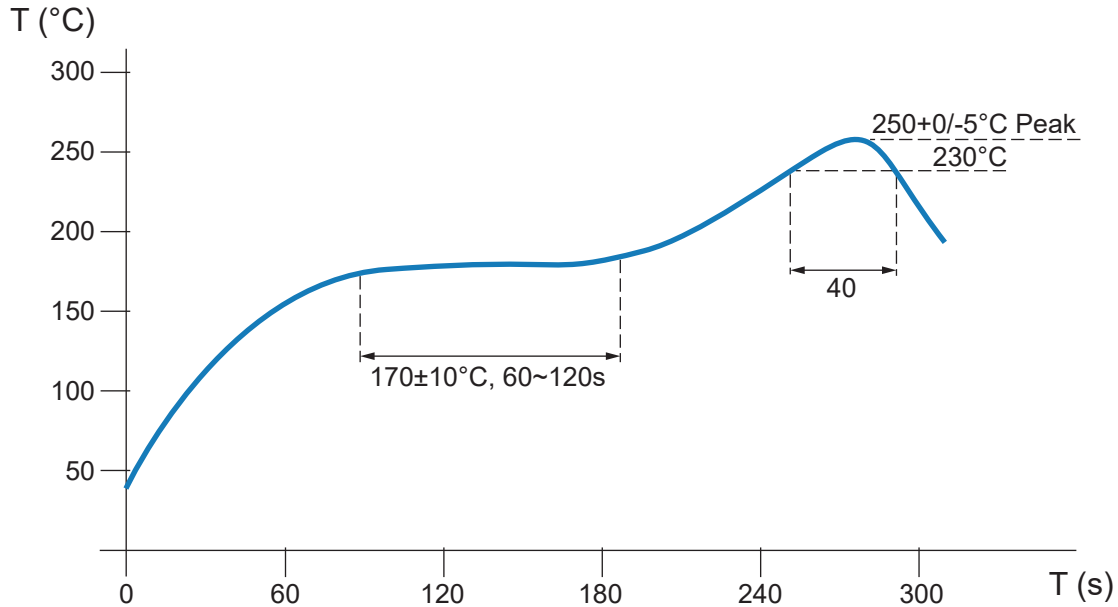
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## RECOMMENDED REFLOW SOLDERING CONDITIONS



- **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

**Custom versions available upon request.**



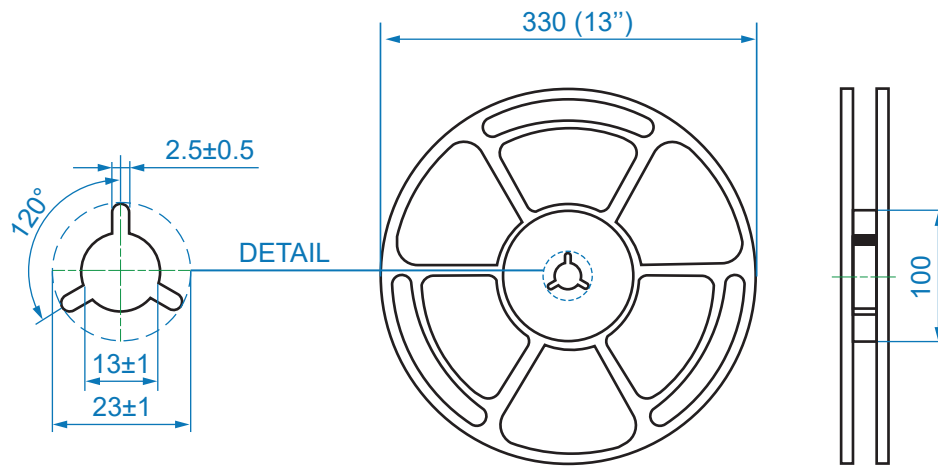
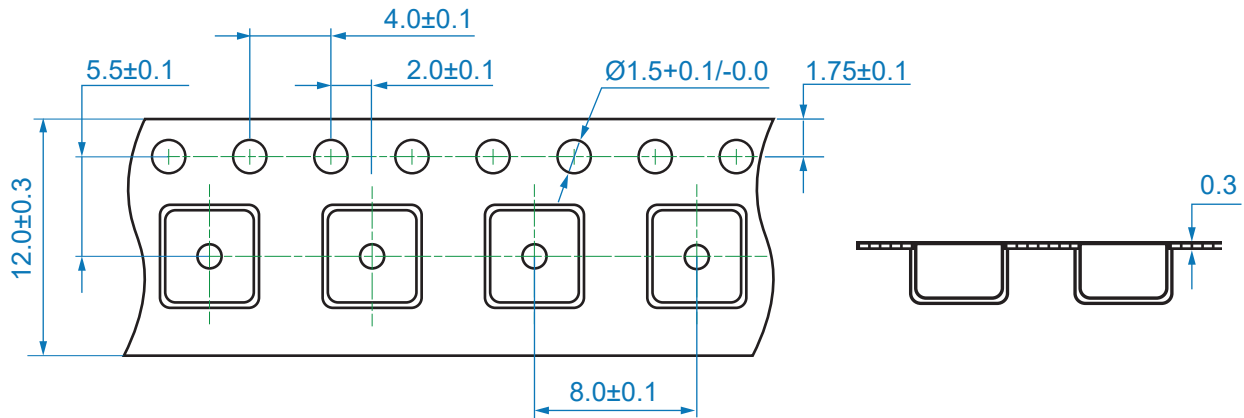
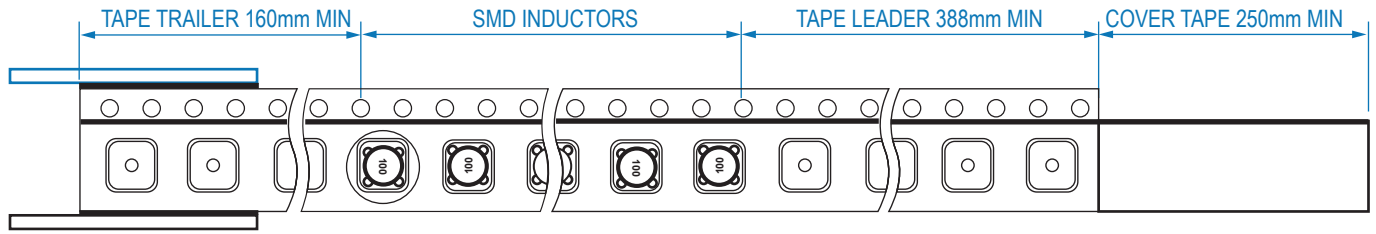
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# F1A1-383812/383815/383818 Series Datasheet

## TAPE & REEL SPECIFICATIONS

Dimension unit: mm



Taping specification: EIA -481 Compliant

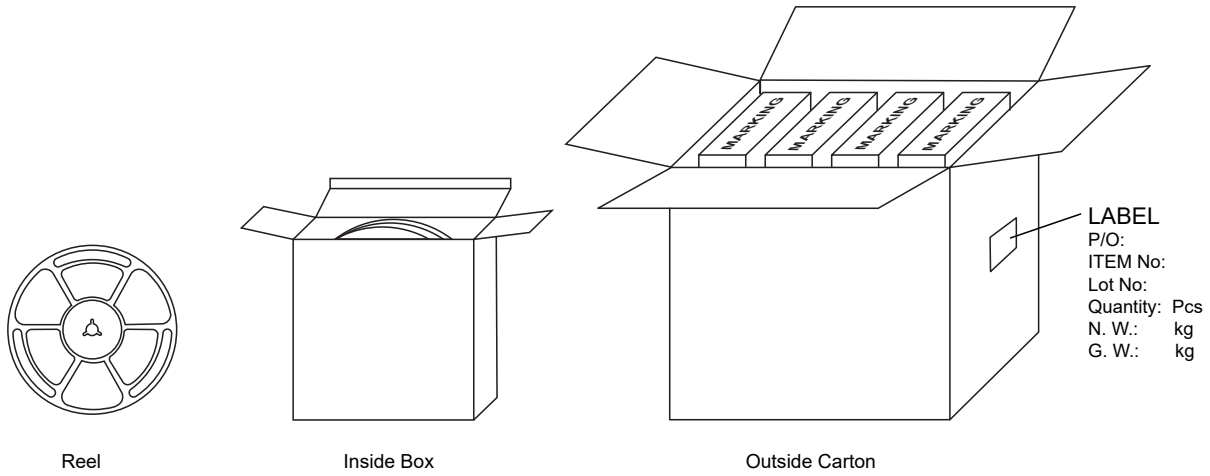
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## PACKAGING SPECIFICATIONS



Series	Packaging Quantity (pcs)		
	Reel	Inside box	Outside carton
F1A1-383812	4000	20000	80000
F1A1-383815	4000	20000	80000
F1A1-383818	3500	17500	70000

- **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

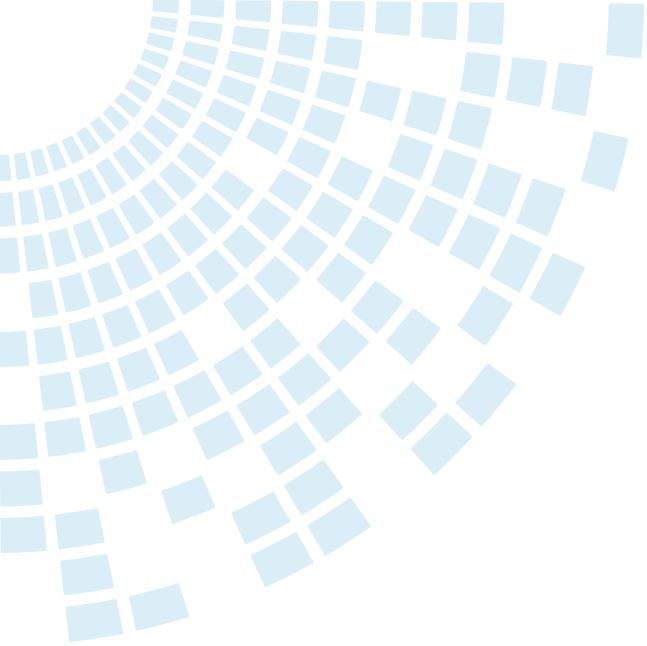
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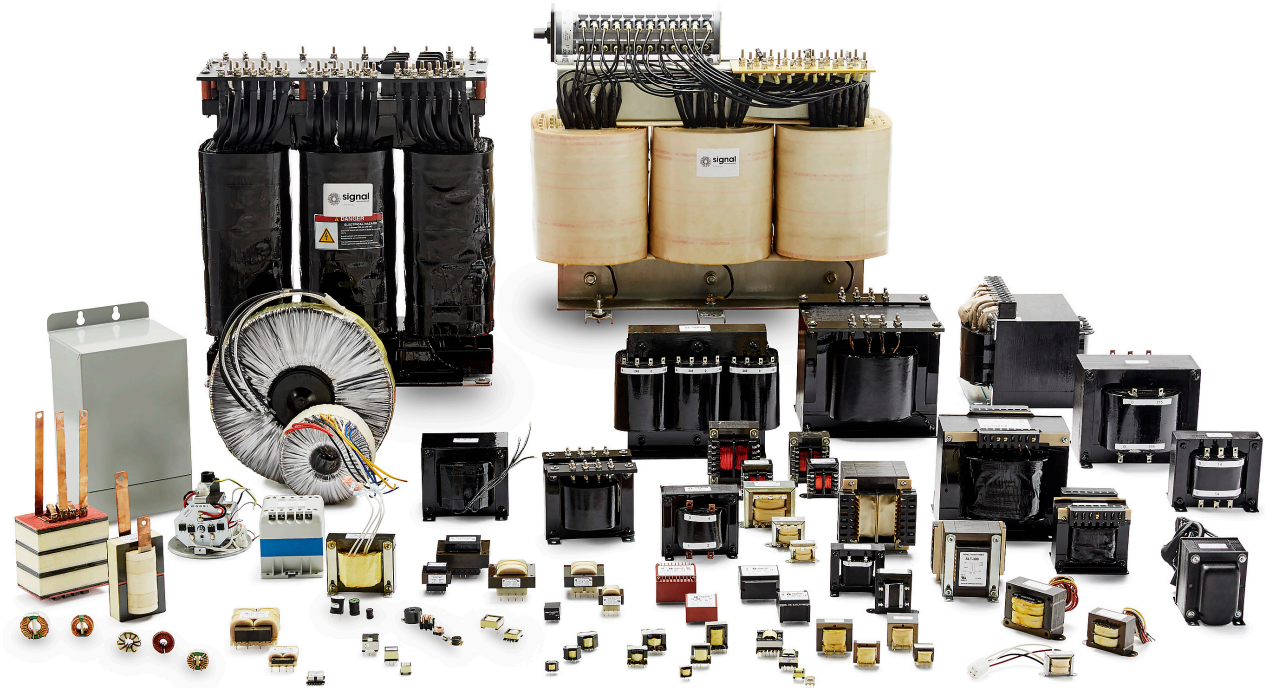
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## About Signal Transformer

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,  
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