F1C1-2016 Series

High Power Shielded SMD Inductors



Signal Transformer is introducing a new family of our lowest profile offering to date for shielded surface mount power inductors, by releasing the fourth of six series, F1C1-2016. With height profiles of 0.8 mm, 1.0 mm and 1.2 mm, a footprint of 2.0 mm x 1.6 mm and a range of inductances/currents, these parts are ideally placed in high density printed circuit boards for surface mount technology. They make their appearance in a variety of applications such as, DC/DC converters, mobile phones, LCD displays, power supply modules and VRM/PPM for use in servers.

The F1C1 family employs a unique T-core structure for the magnetic element that is composed of an iron powder alloy material, both of which increase efficiency.

Power inductors are essential components in voltage regulator topologies. Virtually every circuit that regulates power in automobiles, electronics inverters and 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 mitigating noise, in power supplies, for automotive, commercial, industrial, and high-reliability designs. They are primarily used in electrical power and electronic devices for the purpose of blocking, attenuating, or filtering high frequency noise in electrical circuits.

General Features

- Magnetically shielded construction
- High performance (I_{SAT}) realized by metal dust core
- Low loss realized with low DCR

Specifications

- Inductance Range: 0.10 to 10.0 µH
- Saturated Rated Current: 1.0 to 13.0 A
- Rated Current: 1.0 to 12.0 Arms
- Operating Temperature Range: -55°C to +125°C
- Storage Temperature Range: -55°C to +125°C

Applications

- DC/DC converter for CPU in Notebook PC
- Cellular phones, LCD displays, HDDs, DVCs, PDAs etc.
- Thin type on-board power supply module for exchanger
- VRM for server

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RoHS Compliant

REACH COMPLIANCE

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Please read our datasheet & drawing disclaimer here.

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PRODUCT IDENTIFICATION

F1C1 - 201608 - R47 M

Type / Product Series
F1C1 = High Power Shielded SMD Inductors

Dimensions
201608 = 2.0 x 1.6 x 0.8 mm
201610 = 2.0 x 1.6 x 1.0 mm
201612 = 2.0 x 1.6 x 1.2 mm

Inductance *
R47 = 0.47 µH

Inductance Tolerance
M = ±20%

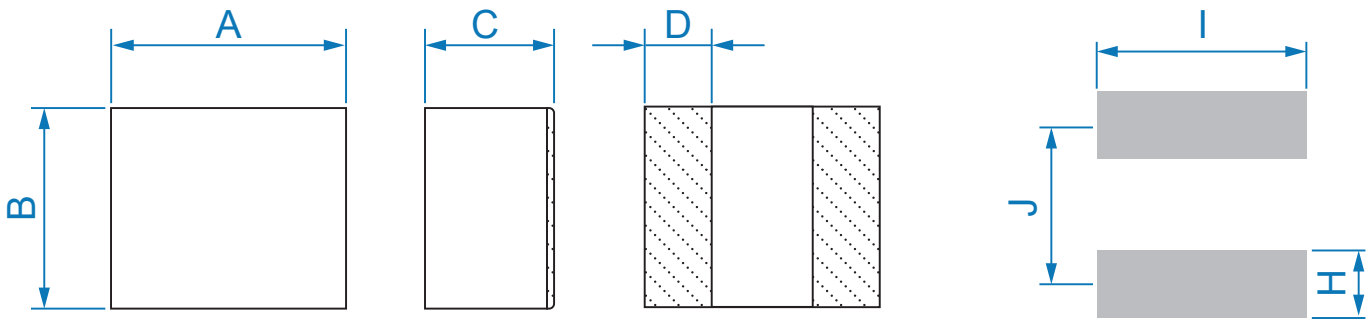
* Note: Expressed by three figures. The unit is micro henry (µH). The first and second figures are significant digits, the third figure expresses the number of zeros which follow the two figures.

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

MECHANICAL SPECIFICATIONS

Dimensions are in mm.

Series	A	B	C Max	D	H	I	J
F1C1-201608	2.0 ± 0.2	1.6 ± 0.2	0.8	0.70 ± 0.2	0.80	1.7	1.3
F1C1-201610	2.0 ± 0.2	1.6 ± 0.2	1.0	0.70 ± 0.2	0.80	1.7	1.3
F1C1-201612	2.0 ± 0.2	1.6 ± 0.2	1.2	0.70 ± 0.2	0.80	1.7	1.3



Custom versions available upon request.

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ELECTRICAL SPECIFICATIONS

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

F1C1-201608 SERIES

Part Number	Inductance L_0 (µH)	Tolerance (± %)	DCR Max. (mΩ)	I_{SAT} (A)		I_{RMS} (A)	
				Max.	Typ.	Max.	Typ.
F1C1-201608-R22M	0.22	20	19	5.6	6.1	5.9	6.6
F1C1-201608-R24M	0.24	20	20	5.5	6.0	5.8	6.5
F1C1-201608-R33M	0.33	20	24	5.3	5.8	4.8	5.5
F1C1-201608-R47M	0.47	20	27	5.0	5.5	4.4	4.6
F1C1-201608-R68M	0.68	20	44	4.2	4.6	3.5	3.8
F1C1-201608-1R0M	1.00	20	60	3.1	3.3	3.3	3.6
F1C1-201608-1R5M	1.50	20	85	2.8	3.0	2.8	3.1
F1C1-201608-2R2M	2.20	20	140	2.3	2.5	2.0	2.2
F1C1-201608-3R3M	3.30	20	220	1.8	2.1	1.5	1.8
F1C1-201608-4R7M	4.70	20	290	1.5	1.7	1.4	1.6
F1C1-201608-100M	10.0	20	800	0.9	1.0	0.9	1.0

F1C1-201610 SERIES

Part Number	Inductance L_0 (µH)	Tolerance (± %)	DCR Max. (mΩ)	I_{SAT} (A)		I_{RMS} (A)	
				Max.	Typ.	Max.	Typ.
F1C1-201610-R10M	0.10	20	12	8.4	9.0	8.0	8.5
F1C1-201610-R15M	0.15	20	14	8.0	8.7	7.0	7.6
F1C1-201610-R22M	0.22	20	18	7.5	8.2	6.3	6.9
F1C1-201610-R24M	0.24	20	19	7.4	8.0	6.2	6.8
F1C1-201610-R33M	0.33	20	22	6.5	7.0	5.3	5.7
F1C1-201610-R47M	0.47	20	25	5.5	6.3	5.0	5.5
F1C1-201610-R68M	0.68	20	32	4.7	5.2	4.3	4.6
F1C1-201610-1R0M	1.00	20	43	4.2	4.6	4.1	4.5
F1C1-201610-1R5M	1.50	20	100	2.9	3.2	2.3	2.6
F1C1-201610-2R2M	2.20	20	130	2.8	3.0	2.1	2.5
F1C1-201610-3R3M	3.30	20	170	2.0	2.3	1.5	1.7
F1C1-201610-4R7M	4.70	20	220	1.8	2.0	1.4	1.6
F1C1-201610-100M	10.0	20	580	1.1	1.4	0.7	1.0

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F1C1-201612 SERIES

Part Number	Inductance L_0 (µH)	Tolerance (± %)	DCR Max. (mΩ)	I_{SAT} (A)		I_{RMS} (A)	
				Max.	Typ.	Max.	Typ.
F1C1-201612-R10M	0.10	20	6.0	11.5	13.0	10.0	12.0
F1C1-201612-R15M	0.15	20	10	10.5	12.0	9.0	10.0
F1C1-201612-R24M	0.24	20	11	8.7	9.2	8.6	9.1
F1C1-201612-R33M	0.33	20	15	7.3	7.8	7.2	7.7
F1C1-201612-R47M	0.47	20	17	6.0	6.7	6.0	6.7
F1C1-201612-R68M	0.68	20	23	5.3	6.0	5.3	6.0
F1C1-201612-1R0M	1.00	20	36	4.5	5.0	4.5	5.0
F1C1-201612-1R5M	1.50	20	50	3.5	4.0	3.5	4.0
F1C1-201612-2R2M	2.20	20	90	2.7	3.1	2.9	3.3
F1C1-201612-3R3M	3.30	20	165	2.3	2.7	2.0	2.4

Notes:

1. Referenced ambient temperature: 25 °C
2. Test Condition: 1 MHz, 1.0 Vrms
3. I_{SAT}: DC current (A) that will cause L_0 to drop approximately 30%
   I_{RMS}: DC current (A) that will cause an approximate ΔT of 40 °C
4. Operating temperature range includes self-temperature rise.
5. The products' temperature (ambient + temp rise) should not exceed 125 °C under the worst case operating condition. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all could affect the operating temperature, which should be verified in the end application.
6. The rated current as listed, is either the saturation current or the heating current, depending on which value is lower.

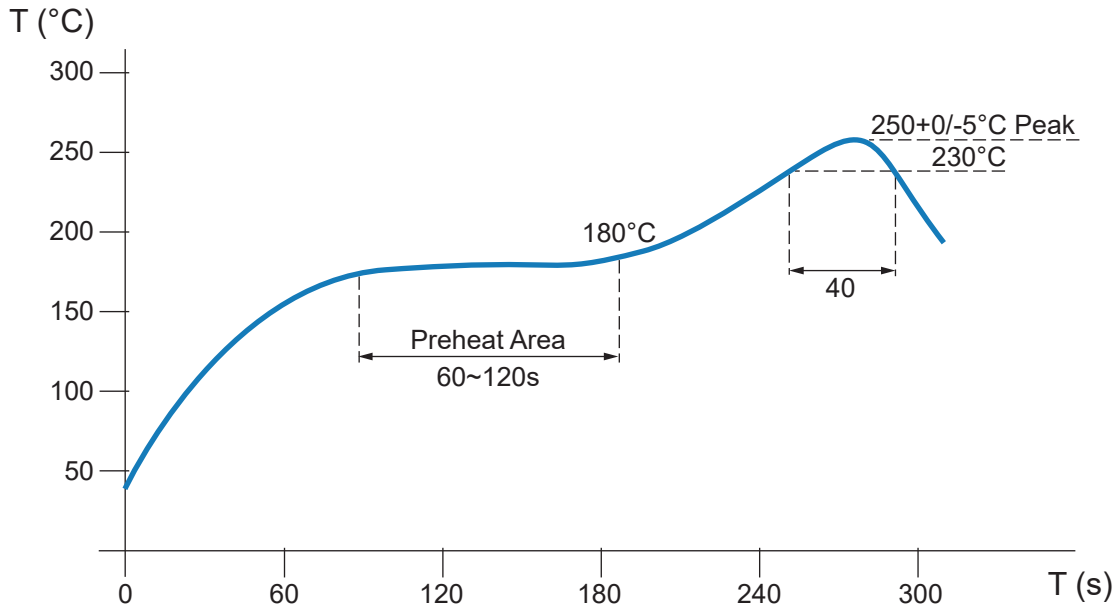
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RECOMMENDED REFLOW SOLDERING CONDITIONS



- **Note**
  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.
  Number of reflow soldering: No more than 2 times.

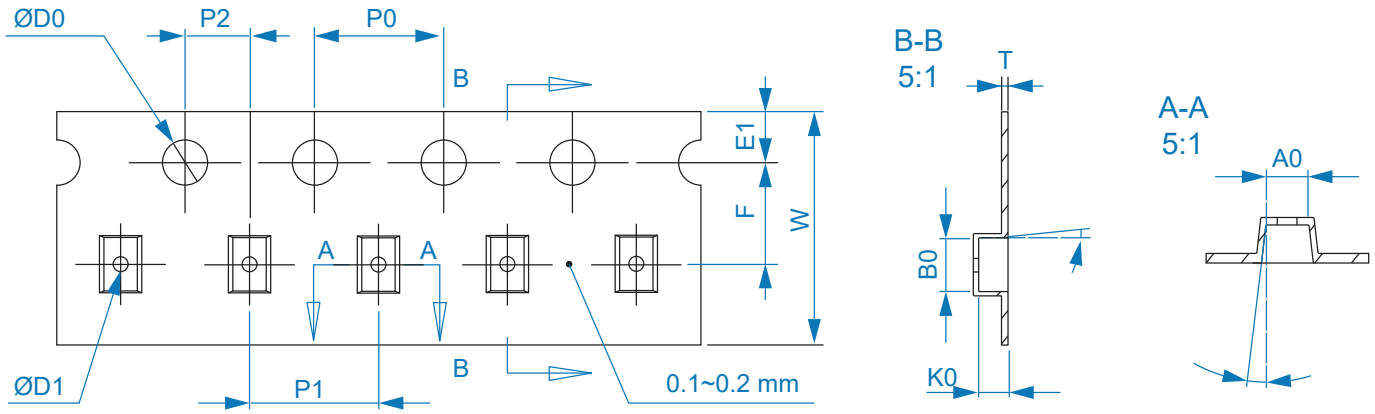
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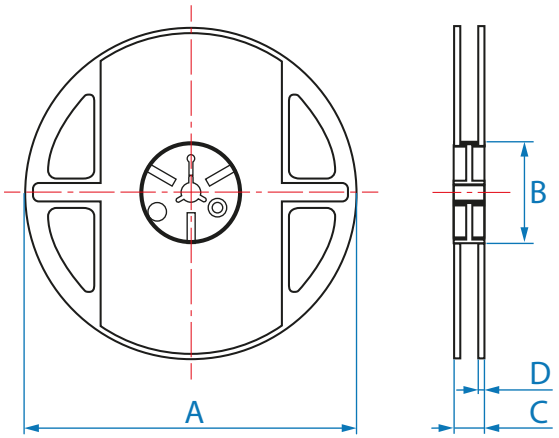
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TAPE & REEL SPECIFICATIONS



Tape dimensions (units in mm)

Series	W	P0	P1	P2	D	D1	T	A0	B0	K0	E1	F
F1C1-201608	8±0.3	4±0.1	4±0.1	2±0.1	1.5+0.1/-0	1.0	0.23±0.05	1.90±0.05	2.35±0.05	1.00±0.05	1.75±0.1	3.50±0.1
F1C1-201610	8±0.3	4±0.1	4±0.1	2±0.1	1.5+0.1/-0	1.0	0.23±0.05	1.90±0.05	2.35±0.05	1.20±0.05	1.75±0.1	3.50±0.1
F1C1-201612	8±0.3	4±0.1	4±0.1	2±0.1	1.5+0.1/-0	1.0	0.23±0.05	1.90±0.05	2.35±0.05	1.40±0.05	1.75±0.1	3.50±0.1



Reel dimensions (units in mm)

Series	A	B	C	D
F1C1-201608	178 + 2.0	60 ± 1.0	9.0 ± 0.5	1.0 + 0.2
F1C1-201610	178 + 2.0	60 ± 1.0	9.0 ± 0.5	1.0 + 0.2
F1C1-201612	178 + 2.0	60 ± 1.0	9.0 ± 0.5	1.0 + 0.2

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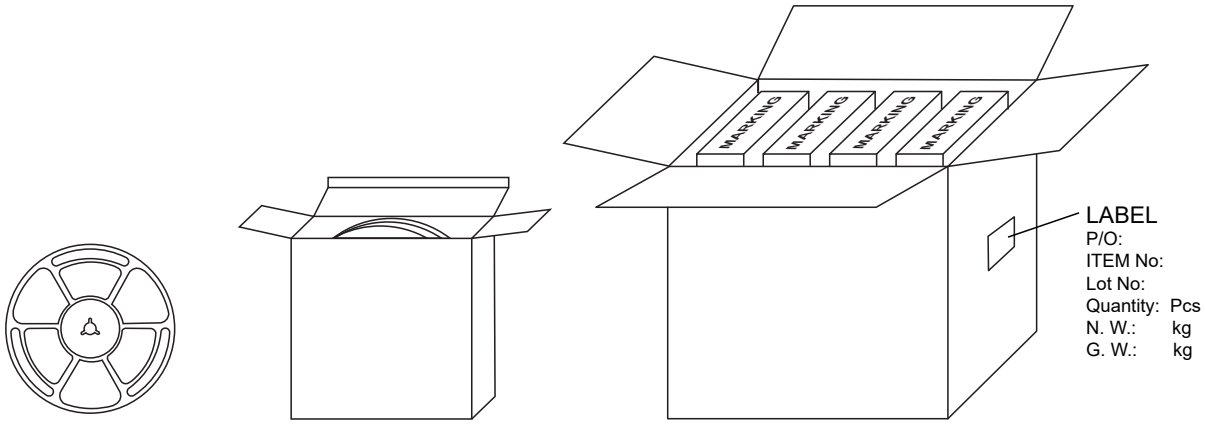
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PACKAGING SPECIFICATIONS



Reel Inside Box Outside Carton

Series	Packaging Quantity (pcs)		
	Reel	Inside box	Outside carton
F1C1-201608	3000	12000	144000
F1C1-201610	3000	12000	144000
F1C1-201612	3000	12000	144000

Storage Conditions

a) Temperature and humidity conditions < 35°C and < 35 - 65 %
b) Moisture Sensitivity Level (MSL): Level 1
c) Recommendations: inductors should be used within 6 months from the time of delivery
d) Cartons must be placed in correct direction which is indicated on carton, otherwise the reel or wire will be deformed
e) Storage conditions as below are inappropriate:
- Stored in high electrostatic environment
- Stored in direct sunshine. rain, snow or condensation
- Exposed to sea wind or corrosive gases, such as C12, H_2S, NH_3, $S0_2$, $N0_2$, etc

f) Products are used in PCB's with greater than 1.6 mm thickness. For thinner boards, alternate products are available.

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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.



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