Data Sheet

Customer:

Product: Multilayer Ceramic Chip Inductor – SFI Series

Size : 0201/0402/0603/

Issued Date: 26-Apr-2016

Edition: Ver. 2

Record of change

Date	Ver.	Description	Page
26-Sep.-2014	1		
26-Apr.-2016	2	Add Hi-Q and Hi-frequency items	

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26-Sep.-2014	26-Sep.-2014	26-Sep.-2014	
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MULTILAYER CHIP INDUCTOR SFI SERIES

■ Introductions

The SFI series multilayer chip inductors are widely used in high frequency application.

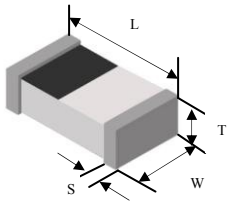
Such as cellular phone, WLAN, RF Module, Computers and Communications peripheral.

■ Features

* Excellent solderability and high heat resistance for either flow or reflow soldering.
* No cross coupling between inductors due to magnetic shield. Ideal for high-density installation.
* Superior Q characteristics guaranteed over the wide frequency allow high frequency application up to 10GHz
* A ceramic material construction for high frequency application up to 10GHz.

■ Chip Dimension

Unit (mm)



Terminal: Ag/Ni/Sn

Size	Length (L)	Width (W)	Thickness (T)	Terminal (S)
SFI 0201	0.60 ± 0.05	0.30 ± 0.05	0.30 ± 0.05	0.12 ± 0.05
SFI 0402	1.00 ± 0.15	0.50 ± 0.15	0.50 ± 0.15	0.25 ± 0.10
SFI 0603	1.60 ± 0.15	0.80 ± 0.15	0.80 ± 0.15	0.30 ± 0.20

■ Part Numbering

SFI	0603	C	T	3N3	J	□□
SERIES	SIZE	PERFORMANCE	PACKAGE	INDUCTANCE	TOLERANCE	INTERNAL CODE
	0201	C = Standard	T= Tape&Reel	3N3= 3.3nH	B= ±0.10nH	
	0402	I = Hi Frequency		33N= 33nH	C= ±0.20nH	
	0603	Q = Hi Q		R33= 0.33uH	S= ±0.30nH	
					G= ±2%	
					H= ±3%	
					J= ±5%	
					K= ±10%	

■ Electrical Specification

MULTILAYER CHIP INDUCTOR SFI SERIES

■ Size 0201 Type Hi-Q Type

Inductance	Tolerance	Q Factor	L/Q	Q (Typical) // Freq.(MHz)					SRF	RDC	IDC
(nH)		min.	Freq. (MHz)	500	800	1800	2000	2400	(GHz) Min.	(Ω) Max.	(mA) Max.
0.6	B, C, S	13	500	>24	>32	>54	>57	>65	10	0.06	600
0.7	B, C, S	13	500	>24	>32	>54	>57	>65	10	0.06	550
0.8	B, C, S	13	500	>24	>32	>54	>57	>65	10	0.07	550
0.9	B, C, S	13	500	>24	>32	>54	>57	>65	10	0.07	550
1	B, C, S	13	500	24	32	54	57	65	10	0.08	520
1.1	B, C, S	13	500	19	26	45	47	55	10	0.11	440
1.2	B, C, S	13	500	19	25	43	44	52	10	0.12	420
1.3	B, C, S	13	500	19	25	40	42	47	10	0.12	420
1.4	B, C, S	13	500	19	24	39	41	47	10	0.11	440
1.5	B, C, S	13	500	19	24	39	41	46	10	0.12	420
1.6	B, C, S	13	500	19	24	39	41	46	10	0.13	410
1.7	B, C, S	13	500	19	24	39	41	46	10	0.15	380
1.8	B, C, S	13	500	19	24	39	41	46	10	0.15	380
1.9	B, C, S	13	500	18	24	38	40	45	10	0.18	350
2	B, C, S	13	500	17	24	38	39	44	10	0.23	300
2.1	B, C, S	13	500	17	24	37	39	44	10	0.24	300
2.2	B, C, S	13	500	17	24	38	40	43	10	0.25	290
2.3	B, C, S	13	500	17	24	37	39	43	10	0.2	330
2.4	B, C, S	13	500	17	23	36	38	42	10	0.22	310
2.5	B, C, S	13	500	17	23	35	36	40	9.6	0.2	330
2.6	B, C, S	13	500	17	22	34	35	39	9.4	0.2	330
2.7	B, C, S	13	500	17	22	34	35	39	9.2	0.22	310
2.8	B, C, S	13	500	17	22	34	35	39	8.9	0.24	300
2.9	B, C, S	13	500	17	22	34	35	39	8.8	0.26	280
3	B, C, S	13	500	17	22	34	35	39	8.6	0.26	280
3.1	B, C, S	13	500	17	22	34	35	39	8.5	0.28	270
3.2	B, C, S	13	500	17	22	33	35	39	8.2	0.28	270
3.3	B, C, S	13	500	18	23	34	36	40	8.1	0.3	270
3.4	B, C, S	13	500	17	23	33	35	39	8	0.3	270
3.5	B, C, S	13	500	17	23	33	35	39	7.9	0.34	250
3.6	B, C, S	13	500	16	23	33	35	39	7.7	0.38	240
3.7	B, C, S	13	500	16	23	33	35	38	7.6	0.4	230
3.8	B, C, S	13	500	16	22	33	35	38	7.5	0.42	230
3.9	B, C, S	13	500	16	22	33	35	38	7.4	0.42	230
4.3	B, C, S	13	500	16	21	32	34	37	6.8	0.44	220
4.7	B, C, S	13	500	16	22	33	35	38	6.2	0.45	220
5.1	B, C, S	13	500	17	22	34	36	38	5.9	0.46	210
5.6	B, C, S	13	500	16	21	33	34	37	5.5	0.46	210
6.2	B, C, S	13	500	18	23	34	35	37	5.1	0.48	210
6.8	G, H, J	13	500	17	22	32	33	35	4.9	0.5	200
7.5	G, H, J	13	500	16	21	31	33	34	4.7	0.5	200
8.2	G, H, J	13	500	16	21	31	32	34	4.3	0.56	190
9.1	G, H, J	13	500	16	20	30	31	32	4.1	0.72	170
10	G, H, J	13	500	16	20	28	29	31	3.8	0.8	160
12	G, H, J	13	500	16	20	27	28	28	3.4	0.8	160
15	G, H, J	13	500	15	19	24	24	23	2.6	0.85	160
18	G, H, J	13	500	15	19	23	24	22	2.3	1	140
22	G, H, J	13	500	15	19	22	23	20	1.9	1.2	130
27	G, H, J	13	500	15	19	15	13	8	1.8	1.6	120
33	G, H, J	11	500	14	15	8	5	-	1.8	2.2	110
39	G, H, J	11	500	14	15	6	-	-	1.6	2.3	100
47	G, H, J	11	500	14	15	-	-	-	1.5	2.6	100
56	G, H, J	11	500	13	13	-	-	-	1.4	2.8	80
68	G, H, J	11	500	13	11	-	-	-	1.2	3.2	80
82	G, H, J	10	500	12	10	-	-	-	1.1	3.8	70
100	G, H, J	10	500	12	10	-	-	-	1	4	60

* Tolerance: B=±0.1nH , C=±0.2nH , S=±0.3nH, G=±2%, H=±3%, J=±5%
* Operating Temperature: -55℃ to +125℃
* Unspecified values are available on request.

MULTILAYER CHIP INDUCTOR SFI SERIES

■ Size 0402 Standard Type

Inductance	Tolerance	Q Factor	L/Q	Q (Typical) // Freq.(MHz)			SRF	RDC	IDC
(nH)		min.	Freq. (MHz)	100	800	1000	(GHz) Min.	(Ω) Max.	(mA) Max.
1	S	8	100	11	34	36	10	0.1	400
1.1	S	8	100	11	34	36	10	0.1	400
1.2	S	8	100	11	34	36	10	0.1	400
1.3	S	8	100	11	34	36	10	0.1	400
1.5	S	8	100	11	34	36	6	0.1	300
1.6	S	8	100	11	32	35	6	0.1	300
1.8	S	8	100	11	30	34	6	0.1	300
2	S	8	100	10	29	33	6	0.2	300
2.2	S	8	100	10	29	33	6	0.2	300
2.4	S	8	100	10	29	32	6	0.2	300
2.7	S	8	100	10	29	32	6	0.2	300
3	S	8	100	10	29	32	6	0.2	300
3.3	S	8	100	10	29	32	6	0.2	300
3.6	S	8	100	10	28	31	4	0.2	300
3.9	S	8	100	10	28	31	4	0.2	300
4.3	S	8	100	10	28	31	4	0.2	300
4.7	S	8	100	10	28	31	4	0.2	300
5.1	S	8	100	10	28	30	4	0.3	300
5.6	S	8	100	10	28	30	4	0.3	300
6.2	S	8	100	10	27	30	3.9	0.3	300
6.8	J, K	8	100	10	27	30	3.9	0.3	300
7.5	J, K	8	100	10	27	30	3.7	0.4	300
8.2	J, K	8	100	10	27	30	3.6	0.4	300
9.1	J, K	8	100	10	27	30	3.4	0.4	300
10	J, K	8	100	10	27	30	3.2	0.4	300
12	J, K	8	100	10	26	29	2.7	0.5	300
15	J, K	8	100	10	26	28	2.3	0.5	300
18	J, K	8	100	10	25	27	2.1	0.6	300
20	J, K	8	100	10	25	26	2	0.6	300
22	J, K	8	100	10	25	25	1.9	0.6	300
27	J, K	8	100	10	25	23	1.6	0.7	300
33	J, K	8	100	10	22	22	1.3	0.8	200
39	J, K	8	100	10	22	19	1.2	1	200
43	J, K	8	100	10	21	16	1.1	1.1	200
47	J, K	8	100	10	21	16	1	1.1	200
56	J, K	8	100	10	18	13	0.75	1.2	200
68	J, K	8	100	10	18	9	0.75	1.4	180
82	J, K	8	100	10	13	-	0.75	2.4	150
100	J, K	8	100	10	12	-	0.7	2.6	150
120	J, K	8	100	10	-	-	0.6	2.8	150
150	J, K	8	100	10	-	-	0.55	3.2	100
180	J, K	8	100	10	-	-	0.5	3.7	100
220	J, K	8	100	12	-	-	0.45	4	100
270	J, K	8	100	12	-	-	0.4	4.5	100
330	J, K	6	50	-	-	-	0.35	7	50

* Tolerance: S=±0.3nH, J=±5%, K=±5%
* Operating Temperature: -55℃ to +125℃
* Unspecified values are available on request.

MULTILAYER CHIP INDUCTOR SFI SERIES

■ **Size 0603 Standard Type**

Inductance	Tolerance	Q Factor	L/Q	Q (Typical) // Freq.(MHz)			SRF	RDC	IDC
(nH)		min.	Freq. (MHz)	100	800	1000	(GHz) Min.	(Ω) Max.	(mA) Max.
1	S	8	100	13	70	80	10	0.05	500
1.2	S	8	100	13	60	70	10	0.05	500
1.5	S	8	100	13	47	68	6	0.1	500
1.8	S	8	100	13	45	61	6	0.1	500
2.2	S	8	100	13	45	60	6	0.1	500
2.7	S	10	100	13	44	55	6	0.12	500
3.3	S	10	100	13	43	50	6	0.15	500
3.9	S	10	100	13	43	50	6	0.16	500
4.7	S	10	100	13	43	50	6	0.2	500
5.6	S	10	100	14	42	48	5	0.25	500
6.8	J, K	10	100	14	43	50	5	0.3	500
8.2	J, K	10	100	14	43	48	4.5	0.35	500
10	J, K	12	100	15	45	50	3.5	0.4	300
12	J, K	12	100	18	48	50	3	0.45	300
15	J, K	12	100	18	48	50	2.3	0.5	300
18	J, K	12	100	16	48	51	2.2	0.55	300
22	J, K	12	100	16	45	48	2	0.6	300
27	J, K	12	100	16	45	45	1.7	0.65	300
33	J, K	12	100	16	45	41	1.5	0.7	300
39	J, K	12	100	17	40	48	1.4	0.7	300
47	J, K	12	100	17	35	35	1.2	0.7	300
56	J, K	12	100	17	35	30	1.1	0.75	300
68	J, K	12	100	17	30	20	0.9	0.85	300
82	J, K	8	100	15	22	-	0.8	1	300
100	J, K	8	100	15	16	-	0.7	1.2	300
120	J, K	8	50	15	-	-	0.6	1.4	200
150	J, K	8	50	15	-	-	0.5	1.6	200
180	J, K	8	50	15	-	-	0.4	1.9	200
220	J, K	8	50	15	-	-	0.35	2.4	200
270	J, K	8	50	16	-	-	0.35	2.6	150
330	J, K	8	50	16	-	-	0.35	2.8	150
390	J, K	8	50	16	-	-	0.3	3.2	150
430	J, K	8	50	16	-	-	0.28	3.4	150
470	J, K	8	50	15	-	-	0.25	3.6	150
560	J, K	8	50	15	-	-	0.25	4	100
680	J, K	8	50	15	-	-	0.25	4.5	100

* Tolerance: S=±0.3nH, J=±5%, K=±5%
* Operating Temperature: -40℃ to +85℃
* Unspecified values are available on request.

MULTILAYER CHIP INDUCTOR SFI SERIES

■ Size 0402 Hi-frequency Type

Inductance	Tolerance	Q Factor	L/Q	Q (Typical) // Freq.(MHz)						SRF	RDC	IDC
(nH)		min.	Freq. (MHz)	100	300	500	800	1800	2000	(GHz) Min.	(Ω) Max.	(mA) Max.
1	S	5	100	9	16	20	25	28	31	>8.50	0.1	500
1.2	S	5	100	9	15	18	24	27	31	>8.50	0.12	500
1.5	S	5	100	7	12	16	20	21	29	>8.50	0.15	500
1.8	S	5	100	7	12	16	20	21	29	>8.50	0.17	500
2.2	S	5	100	7	12	16	20	21	30	>8.50	0.17	500
2.7	S	5	100	7	12	16	20	21	29	>8.50	0.2	500
3.3	S	5	100	7	12	15	19	20	27	>8.50	0.22	400
3.9	S	5	100	7	12	15	20	21	28	7.5	0.25	400
4.7	S	5	100	7	12	15	19	20	27	6.5	0.28	400
5.6	S	5	100	8	12	15	20	22	30	6.5	0.3	400
6.8	S	5	100	8	12	15	20	22	30	6.5	0.35	400
8.2	S	5	100	8	12	15	19	21	30	6.5	0.38	350
10	J, K	5	100	8	13	16	21	23	32	4.7	0.42	350
12	J, K	5	100	8	13	16	20	23	27	4.3	0.47	350
15	J, K	5	100	8	12	15	19	22	28	4	0.5	300
18	J, K	5	100	8	13	16	21	24	32	4	0.6	250
22	J, K	5	100	8	13	17	22	26	31	3.5	0.7	200
27	J, K	5	100	8	14	18	23	26	32	3	0.8	200
33	J, K	5	100	8	14	17	23	27	32	2.5	0.9	200
39	J, K	5	100	8	14	18	23	27	32	2	1	200
47	J, K	7	100	9	14	18	22	24	29	2.4	2.2	100
56	J, K	7	100	9	14	18	23	24	29	2.3	2.5	100
68	J, K	7	100	9	14	17	22	24	29	2.2	2.7	100
82	J, K	7	100	8	13	17	20	20	16	2.1	2.9	100
100	J, K	7	100	8	13	17	20	20	13	2	3.2	100

* Tolerance: S=±0.3nH, J=±5%, K=±5%
* Operating Temperature: -55℃ to +125℃
* Unspecified values are available on request.

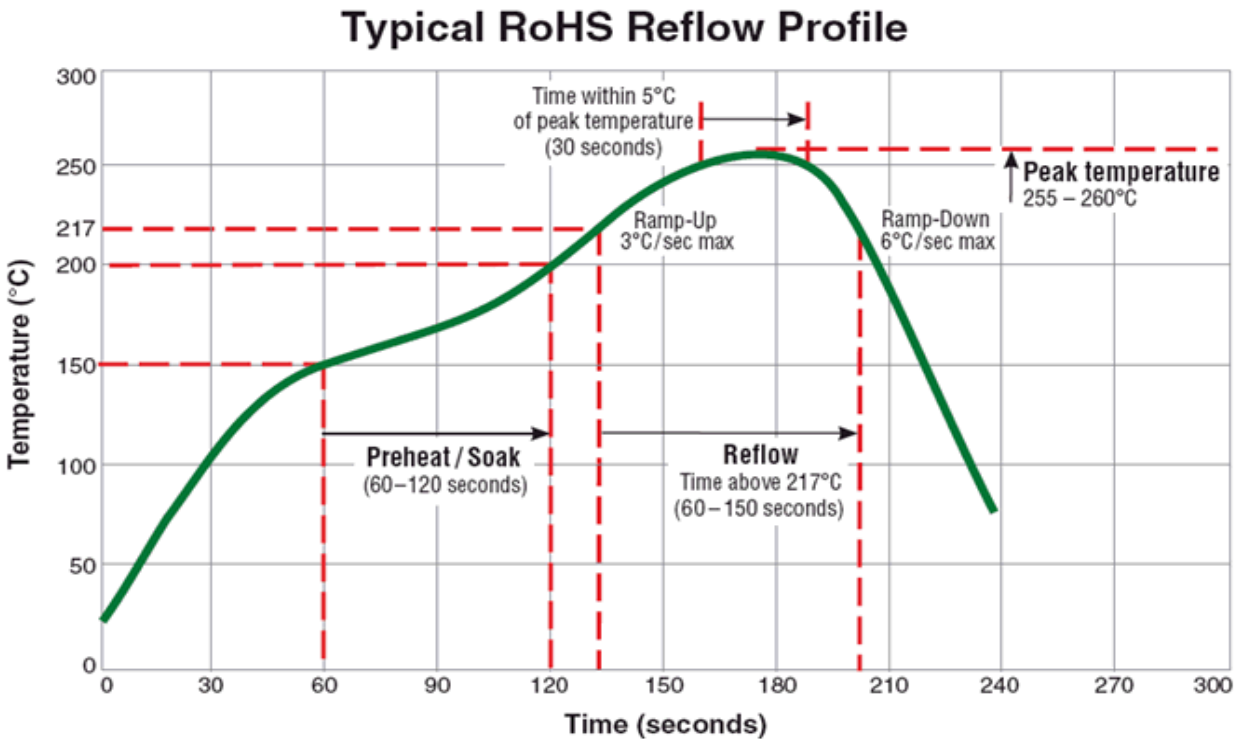
■ Size 0603 Hi-frequency Type

Inductance	Tolerance	Q Factor	L/Q	Q (Typical) // Freq.(MHz)						SRF	RDC	IDC
(nH)		min.	Freq. (MHz)	100	300	500	800	1800	2000	(GHz) Min.	(Ω) Max.	(mA) Max.
10	J, K	8	100	10	22	28	35	39	45	>6.00	0.6	500
12	J, K	8	100	10	18	23	26	32	42	6	0.7	500
15	J, K	8	100	12	22	28	35	39	42	5.5	0.8	500
18	J, K	8	100	10	18	22	25	30	43	5.2	0.9	300
22	J, K	8	100	12	21	27	34	37	37	5	1	300
27	J, K	8	100	10	18	24	26	32	38	4.8	1.2	300
33	J, K	8	100	12	21	27	33	35	31	4.5	1.4	300
39	J, K	8	100	11	20	26	32	34	29	4	1.5	200
47	J, K	8	100	12	20	26	31	34	27	3.5	1.6	200
56	J, K	8	100	11	20	26	31	34	24	3	1.8	200
68	J, K	8	100	10	18	21	24	28	10	2.8	2	200
82	J, K	8	100	10	19	22	26	26	15	2.5	2.2	200
100	J, K	8	100	10	19	24	27	25	-	2	2.5	150
120	J, K	8	100	10	19	23	26	24	-	1.6	2.8	150
150	J, K	8	100	10	18	24	26	23	-	1.4	3	150
180	J, K	8	100	10	17	22	23	-	-	1	3.4	150

* Tolerance: J=±5%, K=±5%
* Operating Temperature: -40℃ to +85℃
* Unspecified values are available on request.

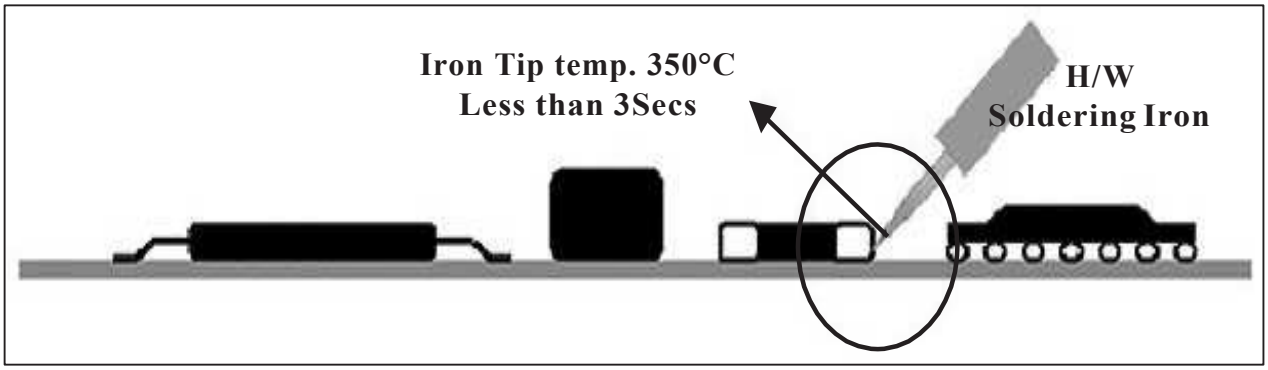
■ Soldering Profile

Reflow Soldering



Manual Soldering

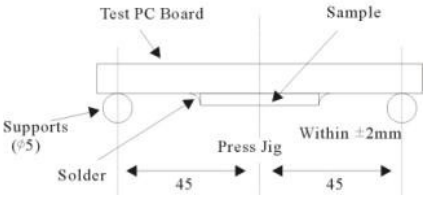
Soldering iron tip temperature: 350°C max / within 3 seconds.



MULTILAYER CHIP INDUCTOR SFI SERIES

■ Specification & Test Method

Mechanical Characteristics

Item	Requirement	Test Condition
Bending Strength	No mechanical damage shall be observed	Solder the chip to test jig then apply a force in the direction shown in below. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock. Mounting Samples 
Solderability	More than 75% of the terminal electrode part shall be covered with fresh solder	Immerse a test sample into a methanol solution containing rosin, preheat it at 150 to 180°C for 3 to 5 seconds and immerse into molten solder of 245±5°C for 5±0.5 seconds.
Resistance to Soldering Heat	No visible damage	Immerse a test sample into a methanol solution containing resin, preheat it at 150 to 180°C for 2 to 3 minutes and immerse into molten solder of 260±5°C for 10±0.5 seconds so that both terminal electrodes are completely submerged.
Appearance	In accordance with specification	Inductors shall be visually inspected for visible evidence of defect
Dimension	In accordance with dimension specification	Dimension shall be measured with caliper or micrometer

Electrical Characteristics

Item	Requirement	Test Condition
Inductance	In Within specified tolerance	Temperature: 20±1°C Relative Humidity: 45 to 85%RH Atmospheric Pressure: 86 to 106kpa Measuring equipment and fixture: 0201: E991A+HP16197A 0402& 0603: E991A+HP16192A Test Signal: -20dBm or 50mV Test compensation(for 0201 high Q): Product true value= test value + compensation value. for L<3.6nH, compensation value is 0.25nH; for 3.6nH≦L<6.8nH, compensation value is 0.43nH; for 6.8 nH≦L<9.1nH, compensation value is 0.5nH; for L≧9.1nH, compensation value is 0.85nH;
Q Value	In accordance with electrical specification	Temperature: 20±1°C Relative Humidity: 45 to 85%RH Atmospheric Pressure: 86 to 106kpa
DC Resistance	In accordance with electrical specification	Temperature: 20±1°C Relative Humidity: 45 to 85%RH Atmospheric Pressure: 86 to 106kpa Measuring equipment: HP 4338

MULTILAYER CHIP INDUCTOR SFI SERIES

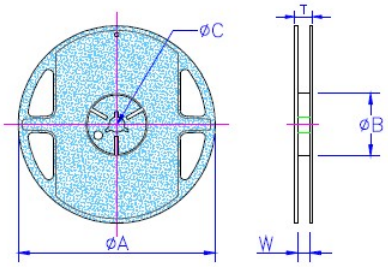
Climatic Characteristics

Item	Requirements	Test Condition
Thermal Shock	No visible damage Inductance variation within 10% Q variation within 20%	0201/0402 series: -55℃ for 30±3 min→125℃ for 30±3 min 0603 series: -40℃ for 30±3 min→85℃ for 30±3 min Transforming interval: max. 20 seconds Test cycle: 100 cycles The chip shall be stabilized at normal condition for 1~2 hours Before measuring
Damp Heat (Steady States)	No visible damage. Inductance variation within 10%. Q variation within 20%.	Temperature: 60±2℃ Humidity: 90~95% RH. Time: 1000±24 hours The chip shall be stabilized at normal condition for 1~2 hours Before measuring
Loading Under Damp Heat	No visible damage. Inductance variation within 10%. Q variation within 20%.	Temperature: 60±2℃ Humidity: 90~95% RH. Time: 1000±24 hours Applied current: Rated current The chip shall be stabilized at normal condition for 1~2 hours Before measuring
Loading at High Temperature (Life Test)	No visible damage. Inductance variation within 10%. Q variation within 20%.	Temperature: 0201/0402 series: 125±2℃; 0603 series: 85±2℃ Time: 1000±2 hours Applied current: Rated current The chip shall be stabilized at normal condition for 1~2 hours Before measuring

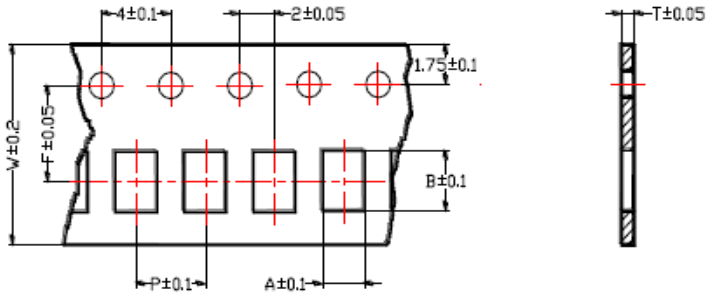
■ Packaging

Packaging Quantity & Reel Specifications

Type	ΦA	ΦB	ΦC	W	T	Quantity (EA)
SFI0201	178±2.0	60±0.5	13±0.3	9±0.3	12±1.0	15000
SFI0402	178±2.0	60±0.5	13±0.3	9±0.3	12±1.0	10000
SFI0603	178±2.0	60±0.5	13±0.3	9±0.3	12±1.0	4000



Taping Specifications



Unit: mm

Type	A	B	T	W	P	F
SFI0201	0.38	0.68	0.42	8	2	3.5
SFI0402	0.65	1.12	0.60	8	2	3.5
SFI0603	1.10	1.80	0.95	8	4	3.5