

## *Data Sheet*

Customer: \_\_\_\_\_

Product: Multilayer Ceramic Chip Inductor – SFI Series \_\_\_\_\_

Size : 0201/0402/0603/ \_\_\_\_\_

Issued Date: 03-June-2020 \_\_\_\_\_

Edition: Ver. 4 \_\_\_\_\_

### Record of change

Date	Ver.	Description	Page
26-Sep.-2014	1		
26-Apr.-2016	2	Add Hi-Q and Hi-frequency items	
26-May.-2020	3	Revised Hi-Q items	
03-Jun.-2020	4	Revised Hi-Freq. items	

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Prepared by	Checked by	Approved by	Accepted by (customer)
26-Sep.-2014	26-Sep.-2014	26-Sep.-2014	
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# MULTILAYER CHIP INDUCTOR

# SFI SERIES

## ■ Introductions

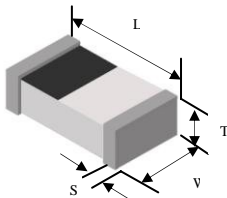
The SFI series multilayer chip inductors are widely used in high frequency application. Such as cellular phone, WLAN, RF Module, Computers and Communications peripheral.

## ■ 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.

Unit (mm)


## ■ Chip Dimension



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

<b>SFI</b>	<b>0603</b>	<b>C</b>	<b>T</b>	<b>3N3</b>	<b>J</b>	
SERIES	SIZE	PERFORMANCE	PACKAGE	INDUCTANCE	TOLERANCE	INTERNAL CODE
	0201	C = Standard	T= Tape&Reel	N30= 0.3nH	B= ±0.10nH	
	0402	H = Hi Frequency		3N3= 3.3nH	C= ±0.20nH	
	0603	Q = Hi Q		33N= 33nH	S= ±0.30nH	
				R33= 0.33uH	G= ±2%	
					H= ±3%	
					J= ±5%	

- **Electrical Specification**
- **Size 0201 Type Hi-Q Type**

Inductance (nH)	Tolerance	Q Factor	L/Q	SRF	DC Resistance	Rated Current
		min.	Freq. (MHz)	(GHz) Min.	(Ω) Max.	(mA) Max.
0.3	B, C	11	500	18	0.07	850
0.4	B, C	11	500	18	0.07	850
0.5	B, C	11	500	18	0.08	850
0.6	B, C	11	500	18	0.08	850
0.7	B, C	12	500	18	0.09	750
0.8	B, C	12	500	18	0.10	750
0.9	B, C	12	500	18	0.12	700
1	B, C	12	500	17	0.14	600
1.1	B, C	12	500	17	0.14	600
1.2	B, C	12	500	15	0.14	600
1.3	B, C	12	500	15	0.15	600
1.4	B, C	12	500	14	0.15	600
1.5	B, C	12	500	13.5	0.15	600
1.6	B, C	12	500	13	0.15	600
1.7	B, C	12	500	12.5	0.19	500
1.8	B, C	12	500	12.5	0.20	500
1.9	B, C	12	500	12.5	0.20	450
2	B, C	12	500	12.5	0.20	450
2.1	B, C	12	500	12	0.22	450
2.2	B, C	12	500	12	0.22	450
2.3	B, C	12	500	11.5	0.24	450
2.4	B, C	12	500	11	0.25	450
2.5	B, C	12	500	11	0.25	450
2.6	B, C	12	500	11	0.25	450
2.7	B, C	12	500	11	0.25	450
2.8	B, C	12	500	9.5	0.25	450
2.9	B, C	12	500	9.5	0.25	450
3	B, C	12	500	9.5	0.25	450
3.1	B, C	12	500	9.5	0.30	450
3.2	B, C	12	500	9.5	0.30	450
3.3	B, C	12	500	9.5	0.30	400
3.4	B, C	12	500	8	0.30	400
3.5	B, C	12	500	8	0.30	400
3.6	B, C	12	500	8	0.30	400
3.7	B, C	12	500	7	0.30	400
3.8	B, C	12	500	7	0.35	350
3.9	B, C	12	500	6.5	0.35	350
4.3	H, J	12	500	6.5	0.40	350
4.7	H, J	12	500	6.5	0.40	350
5.1	H, J	12	500	6.5	0.40	350
5.6	H, J	12	500	6	0.44	300
6.2	H, J	12	500	6	0.50	300
6.8	H, J	12	500	5.4	0.53	300
7.5	H, J	12	500	4.8	0.55	250
8.2	H, J	12	500	4.8	0.62	250
9.1	H, J	12	500	4.5	0.65	250
10	H, J	11	500	4.0	0.70	250
12	H, J	11	500	3.7	0.75	250
15	H, J	11	500	3.1	0.85	250
18	H, J	11	500	2.8	1.00	200
22	H, J	9	500	2.5	1.20	150
27	H, J	9	500	1.8	1.80	140
33	H, J	7	300	1.7	2.10	120
39	H, J	7	300	1.5	2.40	120

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

# MULTILAYER CHIP INDUCTOR

# SFI SERIES

## ■ Size 0402 Standard Type

Inductance (nH)	Tolerance	Q Factor	L/Q	Q (Typical) // Freq.(MHz)			SRF	RDC	IDC
		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°C to +125°C Unspecified values are available on request.

■ Size 0603 Standard Type

Inductance (nH)	Tolerance	Q Factor min.	L/Q Freq. (MHz)	Q (Typical) // Freq.(MHz)			SRF (GHz) Min.	RDC (Ω) Max.	IDC (mA) Max.
				100	800	1000			
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°C to +85°C  
 \* Unspecified values are available on request.

■ **Size 0402 Hi-frequency Type**

Inductance (nH)	Tolerance	Q Factor	L/Q	SRF	DC Resistance	Rated Current
		min.	Freq. (MHz)	(GHz) Min.	(Ω) Max.	(mA) Max.
0.3	B	8	100	10	0.08	1000
0.4	B	8	100	10	0.08	1000
0.5	B	8	100	10	0.08	1000
0.6	B	8	100	10	0.08	1000
0.7	B	8	100	10	0.08	1000
0.8	B	8	100	10	0.08	1000
1	B, C	8	100	10	0.08	1000
1.1	B, C	8	100	10	0.08	1000
1.2	B, C	8	100	10	0.09	1000
1.3	B, C	8	100	10	0.09	1000
1.5	B, C	8	100	10	0.1	1000
1.6	B, C	8	100	10	0.1	1000
1.8	B, C	8	100	10	0.12	900
2	B, C	8	100	10	0.12	900
2.2	B, C	8	100	10	0.13	900
2.4	B, C	8	100	10	0.13	800
2.7	B, C	8	100	6	0.16	800
3	B, C	8	100	6	0.16	800
3.3	B, C	8	100	6	0.16	800
3.6	B, C	8	100	6	0.2	700
3.9	B, C	8	100	6	0.2	700
4.3	B, C	8	100	6	0.2	700
4.7	B, C	8	100	6	0.2	700
5.1	B, C	8	100	5.3	0.23	600
5.6	B, C	8	100	4.5	0.23	600
6.2	B, C	8	100	4.5	0.25	600
6.8	G, H, J	8	100	4.5	0.25	600
7.5	G, H, J	8	100	4.2	0.28	500
8.2	G, H, J	8	100	3.7	0.28	500
9.1	G, H, J	8	100	3.4	0.3	500
10	G, H, J	8	100	3.4	0.3	500
12	G, H, J	8	100	3	0.45	400
15	G, H, J	8	100	2.5	0.55	400
18	G, H, J	8	100	2.2	0.65	300
22	G, H, J	8	100	1.9	0.7	300
27	G, H, J	8	100	1.7	0.8	300
33	G, H, J	8	100	1.6	0.9	200
39	G, H, J	8	100	1.2	1.0	200
47	G, H, J	8	100	1.1	1.1	200
56	G, H, J	8	100	1	1.1	200
68	G, H, J	8	100	0.8	1.2	200
82	J	8	100	0.6	1.3	200
100	J	8	100	0.6	1.6	200
120	J	8	100	0.6	1.6	150
150	J	8	100	0.55	3.2	140

\* Tolerance: Tolerance: B=±0.1nH , C=±0.2nH , S=±0.3nH, H=±3%, J=±5%

\* Operating Temperature: -55°C to +125°C

\* Unspecified values are available on request.

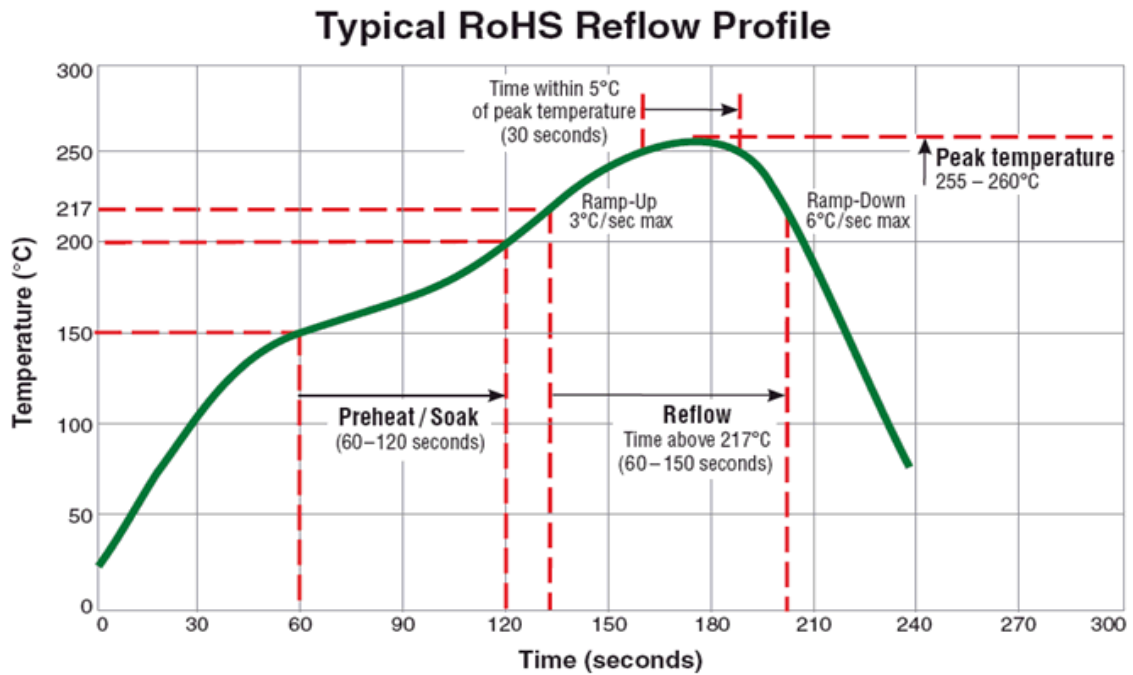
■ Size 0603 Hi-frequency Type

Inductance (nH)	Tolerance	Q Factor	L/Q	SRF	DC Resistance	Rated Current
		min.	Freq. (MHz)	(MHz) Min.	(Ω) Max.	(mA) Max.
1	S	8	100	10000	0.05	1000
1.2	S	8	100	10000	0.05	1000
1.5	S	8	100	10000	0.10	1000
1.8	S	8	100	10000	0.10	1000
2.2	S	8	100	8000	0.10	1000
2.7	S	10	100	7000	0.13	1000
3.3	S	10	100	6000	0.13	1000
3.9	S	10	100	6000	0.15	1000
4.7	S	10	100	5000	0.20	1000
5.6	S	10	100	4000	0.23	600
6.8	J	10	100	4000	0.25	600
8.2	J	10	100	3500	0.28	600
10	J	12	100	3400	0.30	600
12	J	12	100	2600	0.35	600
15	J	12	100	2300	0.40	600
18	J	12	100	2000	0.45	600
22	J	12	100	1600	0.50	600
27	J	12	100	1400	0.55	600
33	J	12	100	1200	0.60	600
39	J	12	100	1100	0.65	500
47	J	12	100	900	0.70	500
56	J	12	100	900	0.75	500
68	J	12	100	700	0.85	400
82	J	12	100	600	0.95	300
100	J	12	100	600	1.00	300
120	J	8	50	500	1.20	300
150	J	8	50	500	1.20	300
180	J	8	50	400	1.30	300
220	J	8	50	400	1.50	300
270	J	8	50	400	1.90	200
330	J	8	50	350	2.10	200
390	J	8	50	350	2.30	150
470	J	8	50	300	2.60	150

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

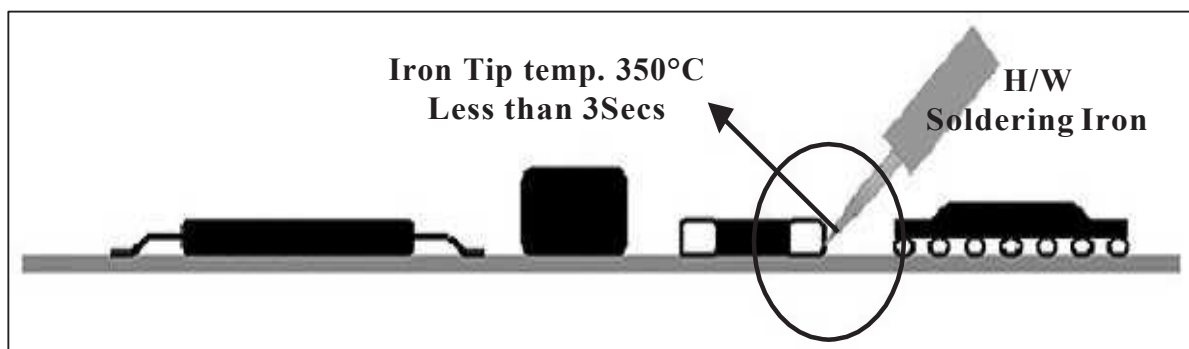
■ **Soldering Profile**

**Reflow Soldering**



**Manual Soldering**

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



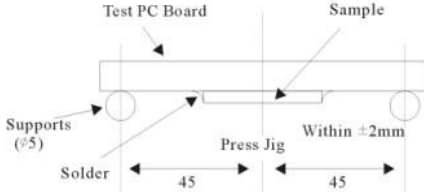


# MULTILAYER CHIP INDUCTOR

# SFI SERIES

## ■ Specification & Test Method

### Mechanical Characteristics

Item	Requirement	Test Condition
Bending Strength	No mechanical damage shall be observed	<p>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.</p> <p>Mounting Samples</p> 
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

### Electrical Characteristics

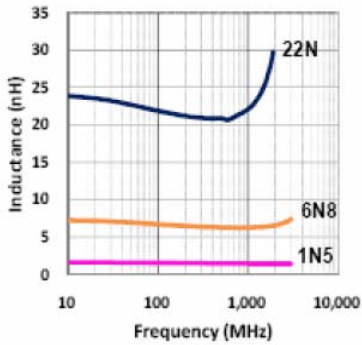
Item	Requirement	Test Condition
Inductance	In Within specified tolerance	<p>Temperature: 20±1°C            Relative Humidity: 45 to 85%RH Atmospheric Pressure: 86 to 106kpa Measuring equipment and fixture:            0201: E991A+HP16197A            0402&amp; 0603: E991A+HP16192A            Test Signal: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

# MULTILAYER CHIP INDUCTOR

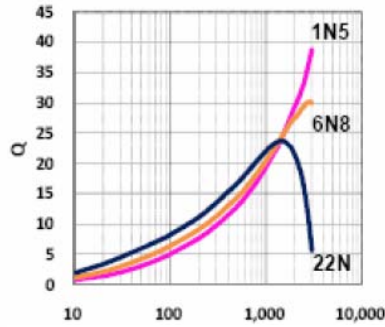
## Typical Electrical Characteristic

# SFI SERIES

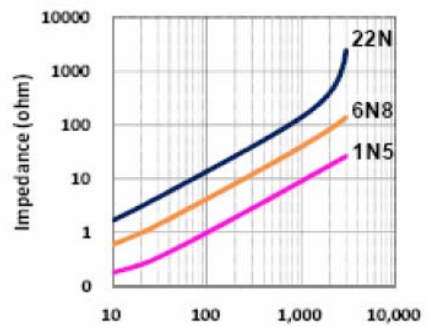
**L vs Frequency SFI0201 Hi-Q**



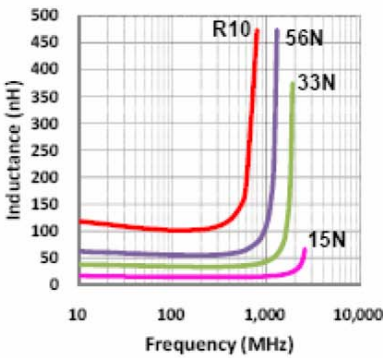
**Q vs Frequency SFI0201 Hi-Q**



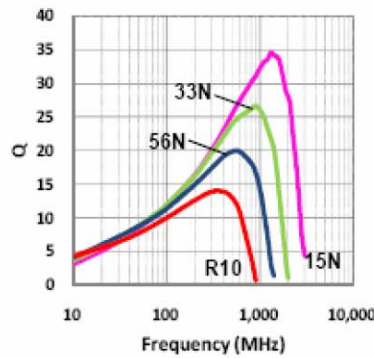
**Z vs Frequency SFI0201 Hi-Q**



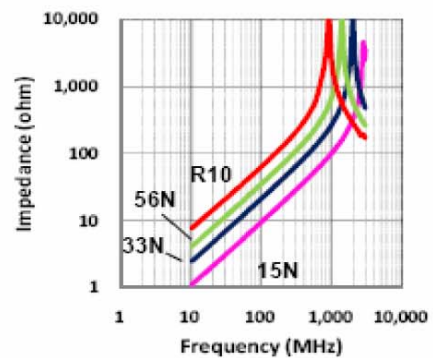
**L vs Frequency SFI0402 Hi-Freq.**



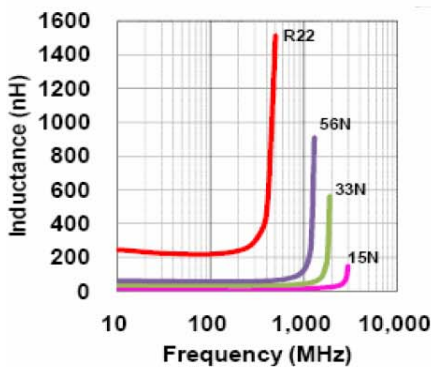
**Q vs Frequency SFI0402 Hi-Freq.**



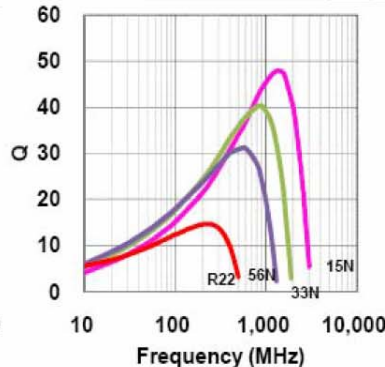
**Z vs Frequency SFI0402 Hi-Freq.**



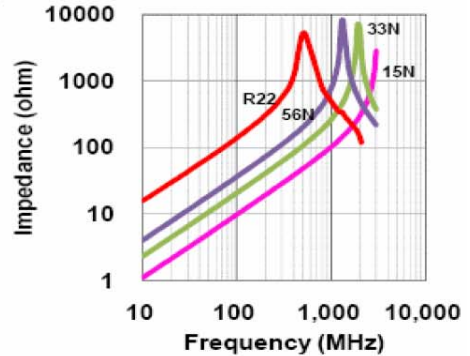
**L vs Frequency SFI0603 Hi-Freq.**



**Q vs Frequency SFI0603 Hi-Freq.**



**Z vs Frequency SFI0603 Hi-Freq.**



# MULTILAYER CHIP INDUCTOR

# SFI SERIES

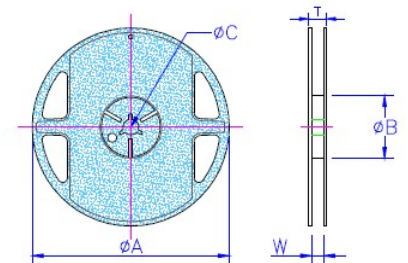
## Climatic Characteristics

Item	Requirements	Test Condition
Thermal Shock	No visible damage Inductance variation within 10% Q variation within 20%	0201/0402 series: -55°C for 30±3 min→125°C for 30±3 min 0603 series: -40°C for 30±3 min→85°C for 30±3 min Transforming interval: max. 20 seconds Test cycle: 100 cycle 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°C 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°C 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°C; 0603 series: 85±2°C Time: 1000±24 hours Applied current: Rated current The chip shall be stabilized at normal condition for 1~2 hours Before measuring

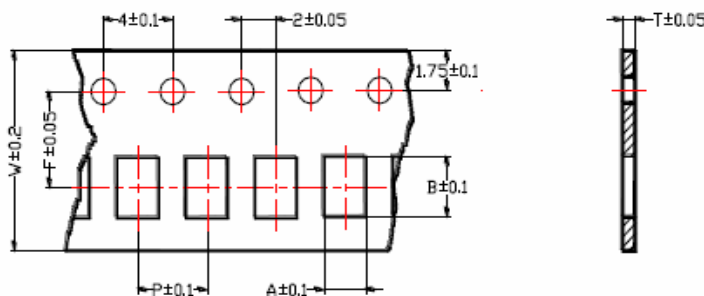
## ■ Packaging

### 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