

WIRE WOUND CHIP INDUCTORS SWI CS SERIES

INTRODUCTION

The SWI series are wire wound chip inductors widely used in the communication applications such as cellular phones, cable modem, ADSL, repeaters, Bluetooth, and other electronic devices. The wire wound inductors advance in higher self resonate frequency, better Q factor, and much more stable performance. Precious tolerance of 2% is available.

FEATURES

- * Operating temperature -40 to +125 °C for ceramic series and -40 to +85°C for ferrite series.
- * Excellent solderability and resistance to soldering heat .
- * Suitable for reflow soldering.
- * High reliability and easy surface mount assembly.
- * Wide range of inductance values are available for flexible needs.

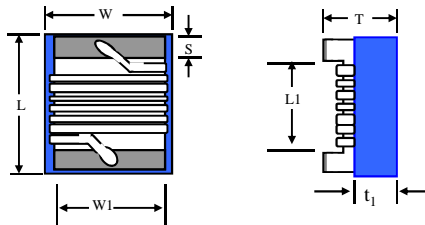
PART NUMBER

SWI 0603 C S 33N J - □□

1 2 3 Taping 4 5 Internal Code

1 Product Type

2 Chip Dimension



Size (inch) mm	Length (L) (inch) mm	Width (W) (inch) mm	Thickness (T) (inch) mm	Terminal (S) (inch) mm	(t ₁) (Ref.) mm
SWI 0603 1608	(0.065 ± 0.008) 1.65 ± 0.20	(0.045 ± 0.008) 1.15 ± 0.20	(0.035 ± 0.008) 0.90 ± 0.20	(0.012 ± 0.004) 0.30 ± 0.10	0.50
SWI 0805 2010	(0.090 ± 0.008) 2.28 ± 0.20	(0.067 ± 0.008) 1.70 ± 0.20	(0.050 ± 0.008) 1.28 ± 0.20	0.51	0.60

3 Material Type

C : Ceramic Material

4 Inductance Value

3N3 = 3.3 nH
33N = 33 nH
R33 = 330 nH

5 Tolerance

B = ± 0.20nH G = ± 2 % K = ± 10 %
S = ± 0.30nH J = ± 5 %

CHIP INDUCTOR SPECIFICATIONS

1 Scope

This specification applies to fixed inductors of the following types used in electronic equipment :

*Ceramic Type : For lower inductance with high Q factor at high frequency and stable circuit requirement.

2 Construction

*Configuration

& Dimension : Please refer to the attached figures and tables.

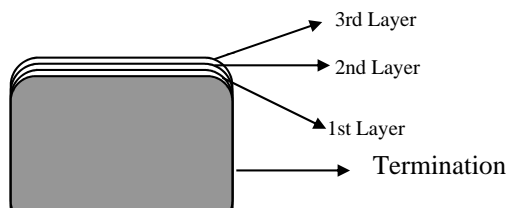
*Terminals : Terminals shall consist of Ag-Pd or Mo-Mn alloy followed by Nickel then Sn or Au plating for easier soldering.

3 Operating Temperature Range

Operating Temperature Range is the scope of ambient temperature at which the inductor can be operated continuously at rated current.

*Temp. Range : Ceramic Material : - 40°C to + 125°C

4 Ingredient of terminals electrode.



Ceramic Type

- a) 1st layer : Ag
- b) 2nd layer : Nickel
- c) 3rd layer : Au

5 Characteristics

Standard Atmospheric Conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows :

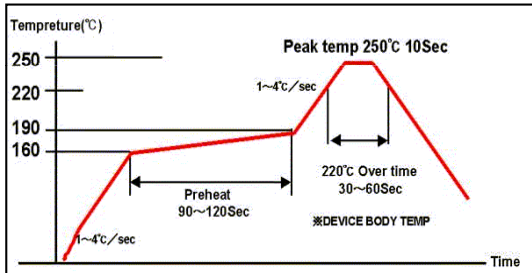
- *Ambient Temperature : 25 °C ± 2 °C
- *Relative Humidity : 60% to 70%
- *Air Pressure : 86 Kpa to 106 Kpa

CHIP INDUCTOR SPECIFICATIONS

TEMPERATURE PROFILE

a Reflow temperature profile

(Temperature of the mounted parts surface on the printed circuit board)



Recommended Peak Temperature: 250°C Max

250°C up /within 10secs

Max. Reflow temperature : 260°C.

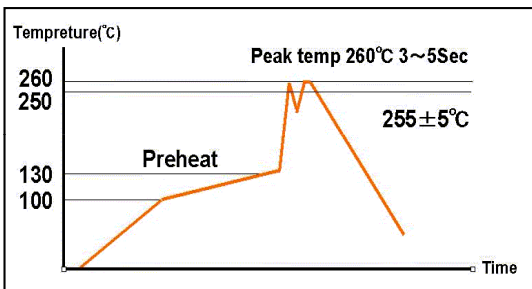
Gradient of temperature rise: av 1-4°C/sec

Preheat: 160-190°C/within 90-120secs

220°C up /within 30-60secs

Composition of solder Sn-3Ag-0.5Cu

b Dip temperature



Solder bathtub temperature: 260°C max within 5secs.

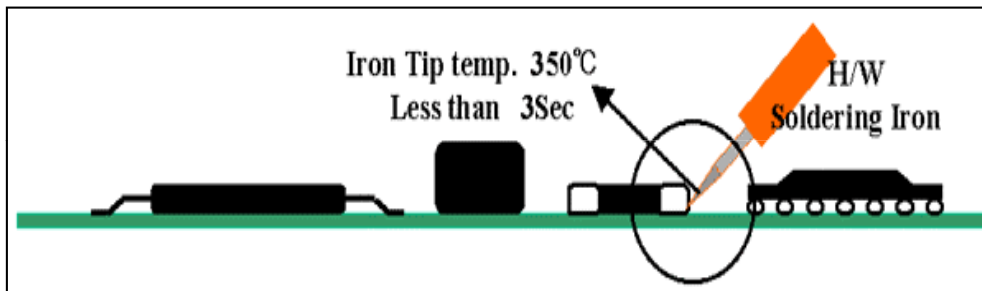
Preheating temperature: 100~130°C deposit solder temperature.

Composition of solder Sn-3Ag-0.5Cu

c Soldering iron tip temperature :

Recommended Temperature : 350°C max / within 3 seconds.

Maximum Temperature : 380°C max / within 3 seconds.



SWI 0603CS (1608) CERAMIC SERIES

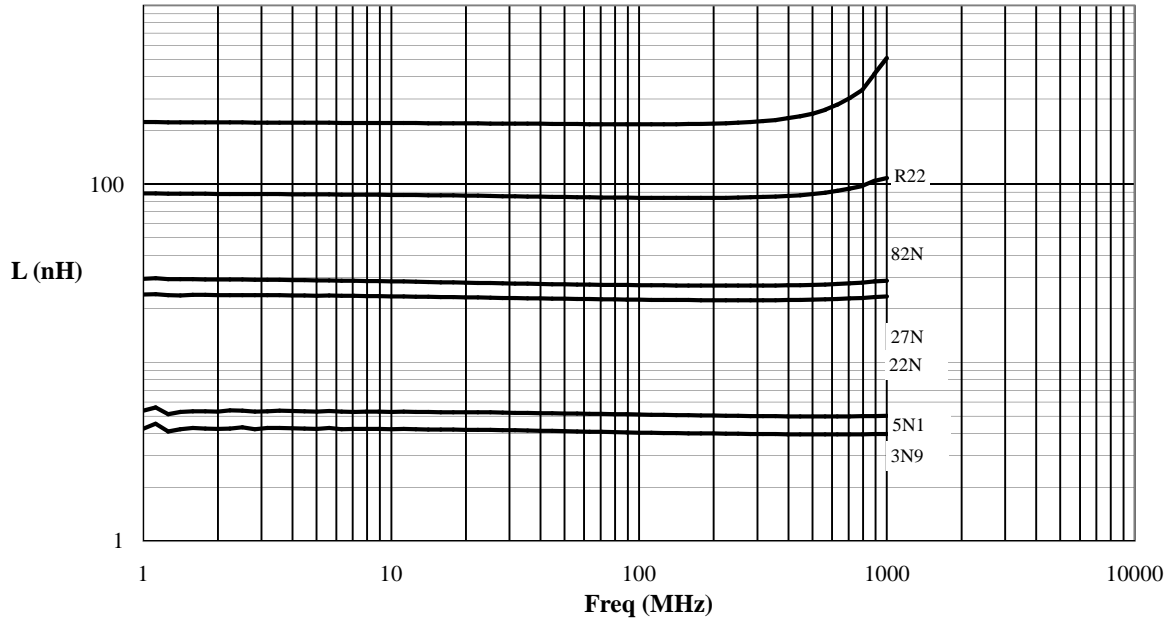
Part No.	Inductance ¹ (nH)	Percent Tolerance	Q ² Min	S.R.F. ³ Min (MHz)	RDC ⁴ Max (Ω)	IDC ⁵ Max (mA)
SWI 0603 CS 1N6 □-□□	1.6 @ 250MHz	B,S,K	18 @ 250MHz	12500	0.030	700
SWI 0603 CS 1N8 □-□□	1.8 @ 250MHz	B,S,K	16 @ 250MHz	>8500	0.045	700
SWI 0603 CS 2N2 □-□□	2.2 @ 250MHz	B,S,K	13 @ 250MHz	>8500	0.110	700
SWI 0603 CS 3N3 □-□□	3.3 @ 250MHz	J,K	35 @ 250MHz	6000	0.045	700
SWI 0603 CS 3N6 □-□□	3.6 @ 250MHz	J,K	22 @ 250MHz	6000	0.070	700
SWI 0603 CS 3N9 □-□□	3.9 @ 250MHz	J,K	22 @ 250MHz	6900	0.070	700
SWI 0603 CS 4N3 □-□□	4.3 @ 250MHz	J,K	22 @ 250MHz	5900	0.070	700
SWI 0603 CS 4N7 □-□□	4.7 @ 250MHz	J,K	20 @ 250MHz	5800	0.080	700
SWI 0603 CS 5N1 □-□□	5.1 @ 250MHz	J,K	18 @ 250MHz	5700	0.150	700
SWI 0603 CS 5N6 □- I	5.6 @ 250MHz	J,K	16 @ 250MHz	5500	0.190	700
SWI 0603 CS 6N2 □-□□	6.2 @ 250MHz	J,K	25 @ 250MHz	5800	0.100	700
SWI 0603 CS 6N8 □-□□	6.8 @ 250MHz	G,J,K	27 @ 250MHz	5800	0.100	700
SWI 0603 CS 7N5 □-□□	7.5 @ 250MHz	G,J,K	28 @ 250MHz	4800	0.100	700
SWI 0603 CS 8N2 □-□□	8.2 @ 250MHz	G,J,K	28 @ 250MHz	4700	0.100	700
SWI 0603 CS 8N7 □-□□	8.7 @ 250MHz	G,J,K	28 @ 250MHz	4600	0.100	700
SWI 0603 CS 9N5 □-□□	9.5 @ 250MHz	G,J,K	28 @ 250MHz	5400	0.100	700
SWI 0603 CS 10N □-□□	10 @ 250MHz	G,J,K	31 @ 250MHz	4800	0.100	700
SWI 0603 CS 11N □-□□	11 @ 250MHz	G,J,K	30 @ 250MHz	4000	0.100	700
SWI 0603 CS 12N □-□□	12 @ 250MHz	G,J,K	32 @ 250MHz	4000	0.100	700
SWI 0603 CS 13N □-□□	13 @ 250MHz	G,J,K	38 @ 250MHz	3600	0.100	700
SWI 0603 CS 15N □-□□	15 @ 250MHz	G,J,K	35 @ 250MHz	4000	0.120	700
SWI 0603 CS 16N □-□□	16 @ 250MHz	G,J,K	35 @ 250MHz	3300	0.120	700
SWI 0603 CS 18N □-□□	18 @ 250MHz	G,J,K	35 @ 250MHz	3100	0.120	700
SWI 0603 CS 20N □-□□	20 @ 250MHz	G,J,K	35 @ 250MHz	3100	0.120	700
SWI 0603 CS 22N □-□□	22 @ 250MHz	G,J,K	35 @ 250MHz	3000	0.150	700
SWI 0603 CS 23N □-□□	23 @ 250MHz	G,J,K	38 @ 250MHz	2850	0.140	700
SWI 0603 CS 24N □-□□	24 @ 250MHz	G,J,K	35 @ 250MHz	2650	0.140	700
SWI 0603 CS 27N □-□□	27 @ 250MHz	G,J,K	35 @ 250MHz	2800	0.200	600
SWI 0603 CS 30N □-□□	30 @ 250MHz	G,J,K	37 @ 250MHz	2250	0.144	600
SWI 0603 CS 33N □-□□	33 @ 250MHz	G,J,K	36 @ 250MHz	2300	0.200	600
SWI 0603 CS 36N □-□□	36 @ 250MHz	G,J,K	36 @ 250MHz	2080	0.200	600
SWI 0603 CS 39N □-□□	39 @ 250MHz	G,J,K	36 @ 250MHz	2200	0.210	600
SWI 0603 CS 43N □-□□	43 @ 250MHz	G,J,K	38 @ 250MHz	2000	0.220	600
SWI 0603 CS 47N □-□□	47 @ 200MHz	G,J,K	35 @ 200MHz	2000	0.230	600
SWI 0603 CS 51N □-□□	51 @ 200MHz	G,J,K	32 @ 200MHz	1950	0.240	600
SWI 0603 CS 56N □-□□	56 @ 200MHz	G,J,K	32 @ 200MHz	1900	0.250	600
SWI 0603 CS 68N □-□□	68 @ 200MHz	G,J,K	32 @ 200MHz	1700	0.350	600
SWI 0603 CS 72N □-□□	72 @ 150MHz	G,J,K	34 @ 150MHz	1700	0.490	400
SWI 0603 CS 82N □-□□	82 @ 150MHz	G,J,K	30 @ 150MHz	1700	0.580	400
SWI 0603 CS R10 □-□□	100 @ 150MHz	G,J,K	34 @ 150MHz	1400	0.580	400
SWI 0603 CS R11 □-□□	110 @ 150MHz	G,J,K	33 @ 150MHz	1350	0.610	300
SWI 0603 CS R12 □-□□	120 @ 150MHz	G,J,K	30 @ 150MHz	1300	0.650	300
SWI 0603 CS R15 □-□□	150 @ 100MHz	G,J,K	30 @ 150MHz	990	0.850	280
SWI 0603 CS R18 □-□□	180 @ 100MHz	G,J,K	25 @ 100MHz	990	1.000	250
SWI 0603 CS R22 □-□□	220 @ 100MHz	G,J,K	25 @ 100MHz	900	1.800	250
SWI 0603 CS R27 □-□□	270 @ 100MHz	G,J,K	25 @ 100MHz	822	2.100	200
SWI 0603 CS R33 □-□□	330 @ 100MHz	J,K	25 @ 100MHz	500	2.300	150
SWI 0603 CS R39 □-□□	390 @ 100MHz	J,K	25 @ 100MHz	350	2.900	130

* □: Please specify the inductance tolerance for the first □. B (±0.20nH), S (±0.30nH), G (±2%), J (±5%), or K (±10%)

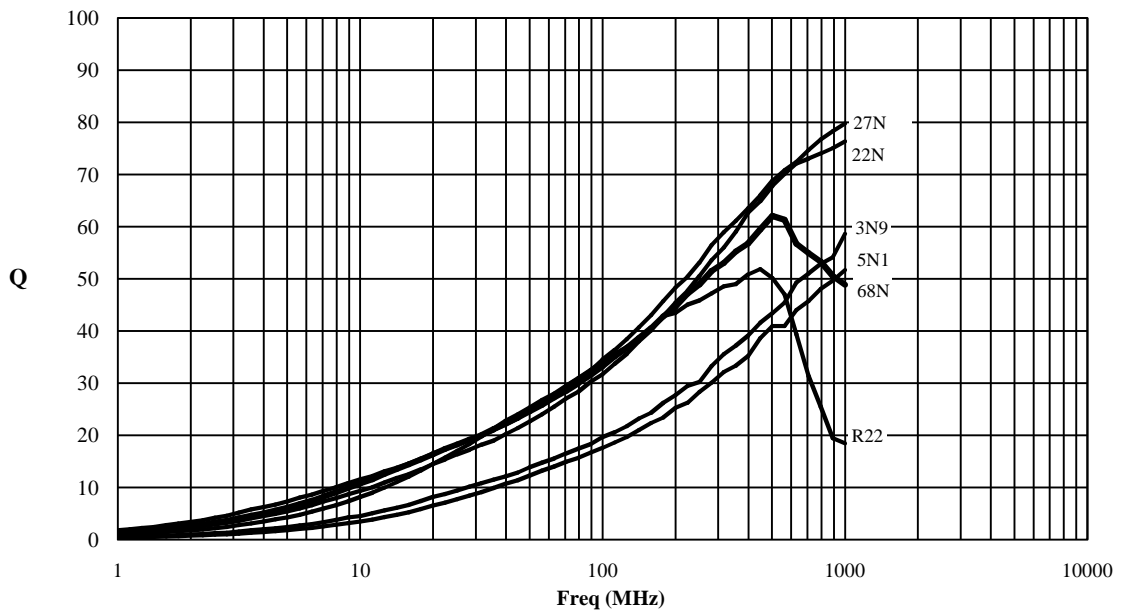
- Inductance is measured in HP-4287A RF LCR meter with HP-16193 fixture.
- Q is measured in HP-4287A RF LCR meter with HP-16193 fixture.
- SRF is measured in ENA E5071B network analyzer
- RDC is measured in HP-4338B milliohmmeter.
- For 15 °C Rise.
Unit weight = 0.0037g ref. (For CS series).
Unit weight = 0.0049g ref. (For SWI0603CT5N6X).

SWI 0603CS (1608) CERAMIC SERIES

L vs Freq Plot



Q vs Freq Plot



SPECIFICATION

	ITEM	CONDITION	SPECIFICATION
Mechanical Characteristics	Inductance and Tolerance	Measuring Frequency : As shown in Product Table	Within Specified Tolerance
	Quality Factor	Measuring Temperature : + 25 °C	
	Insulation Resistance	Measured at 100V DC between inductor terminals and center of case.	1000 mega ohms minimum
	Dielectric Withstanding Voltage	Measured at 500V AC between inductor terminals and center of case for a maximum of 1 minute.	No damage occurs when the test voltage is applied.
	Temperature Coefficient of Inductance (TCL)	Over - 40 °C to + 125°C at frequency specified in Product Table.	+ 25 to 500 ppm / °C $TCL = \frac{L1 - L2}{L1(T1-T2)} \times 10^6$ (ppm / °C)
Electrical Characteristics	Component Adhesion (Push Test)	The component shall be reflow soldered onto a P. C. Board (240 °C ± 5°C for 20 seconds). Then a dynameter force gauge shall be applied to any side of the component.	0603 series - 900g minimum 0805 series - ≥1.0Kg
	Drop Test	The inductor shall be dropped two times on the concrete floor or the vinyl tile from 1M naturally.	Change In Inductance: No more than 5%
	Thermal Shock Test	Each cycle shall consist of 30 minutes at -40 °C followed by 30 minutes at +85 °C with a 20-second maximum transition time between temperature extremes. Test duration is 10 cycles.	Change In Q: No more than 10% Change In Appearance: Without distinct damage

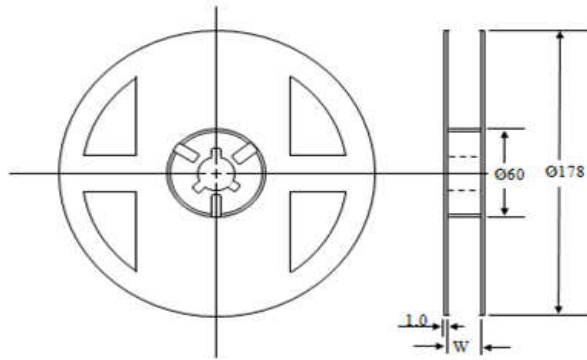
SPECIFICATION

	ITEM	CONDITION	SPECIFICATION
Endurance Characteristics	Solderability	Dip pads in flux and dip in solder pot containing lead free solder at 240 °C ± 5°C for 5 seconds.	A minimum of 80% of the metalized area must be covered with solder.
	Resistance to Soldering Heat	Dip the components into flux and dip into solder pot containing lead free solder at 260 °C ± 5 °C for 5 ± 2 seconds.	Change In Inductance: No more than 5%
	Vibration (Random)	Inductors shall be randomly vibrated at amplitude of 1.5mm and frequency of 10 - 55 Hz: 0.04 G / Hz for a minimum of 15 minutes per axis for each of the three axes.	Change In Q: No more than 10%
	Cold Temperature Storage	Inductors shall be stored at temperature of -40 °C ± 2 °C for 1000hrs (+ 48 -0 hrs.) Then inductors shall be subjected to standard atmospheric conditions for 1 hour. After that, measurement shall be made.	Change In Appearance : Without distinct damage
	High Temperature Storage	Inductors shall be stored at temperature of 85 °C ± 2 °C for 1000hrs (+48 - 0hrs.) Then inductors shall be subjected to standard atmospheric conditions for 1 hour. After that, measurement shall be made.	
	Moisture Resistance	Inductors shall be stored in the chamber at 45 °C at 90 - 95 R. H. for 1000 hours. Then inductors are to be tested after 2 hours at room temperature.	Inductors shall not have a shorted or open winding.
	High Temperature with Loaded	Inductors shall be stored in the chamber at +85 °C for 1000 hours with rated current applied. Inductors shall be tested at the beginning of test at 500 hours and 1000 hours. Then inductors are to be tested after 1 hour at room temperature.	

PACKAGING INFORMATION

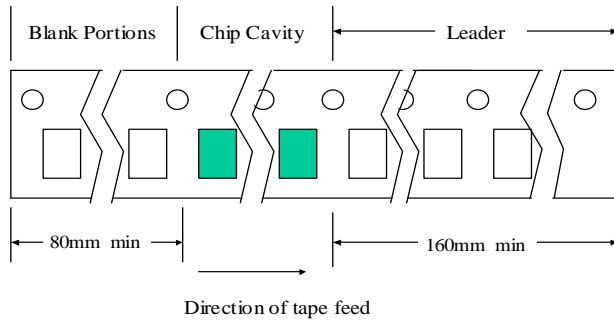
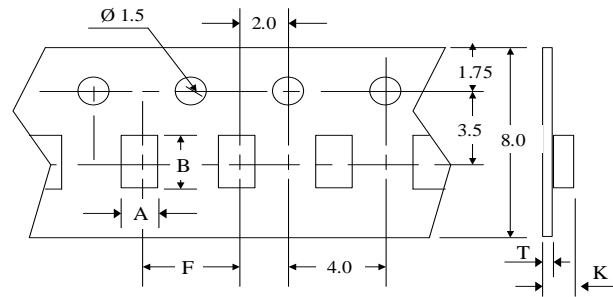
Packing Quantity

Type	Pcs / Reel
SWI0603CS	3,000
SWI0805CS	2,000



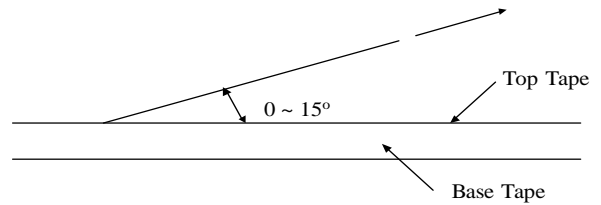
Dimensions (unit: m/m)

Type	Chip Cavity		Insert Pitch	Tape Thickness		
	A	B	F	K	T	W
SWI0603CS	1.25	1.80	4.00	1.05	0.20	8.00
SWI0805CS	1.42	2.26	4.00	1.30	0.20	8.00



Top Tape Strength

The top tape requires a peel-off force of 0.2 to 0.7N in the direction of the arrow as illustrated below.



Dimensions (unit : m/m)

TYPE	A	B	C
SWI0603CS	1.92	0.64	1.27
SWI0805CS	2.60	0.75	1.30

Recommended Pattern

