WIRE WOUND CHIP INDUCTORS SWI0603FT SERIES

Introductions

The SWI series are wire wound chip inductors widely used in the communication applications.
The wire wound inductors advance in higher self resonate frequency, better Q factor and much more stable performance.

Features

* Operating temperature -40 to +85°C.
* 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.

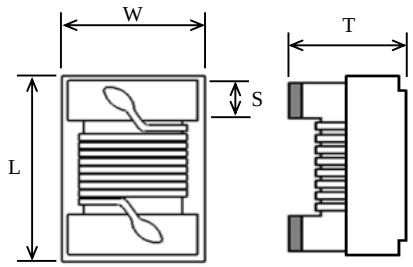
Part Number Code

SWI 0603 F T 47N J - □□

1 2 3 taping 4 5 6

1 Product Type

2 Chip Dimension



Size (inch) mm	Length (L) (inch) mm	Width (W) (inch) mm	Thickness (T) (inch) mm	Terminal (S) (Ref.) mm
SWI 0603 1608	(0.065 ± 0.008) 1.65 ± 0.20	(0.043 ± 0.008) 1.10 ± 0.20	(0.035 ± 0.008) 0.90 ± 0.20	0.33

3 Material Type F : Ferrite Material

4 Inductance Value 39N = 39nH R15 = 150nH 2R2 = 2.20µH 100 = 10µH

5 Tolerance J = ±5% K = ±10%

6 Internal Code If any

CHIP INDUCTOR SPECIFICATIONS

1. Scope

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

Ferrite Type : For higher inductance at lower frequency circuit requirement.

2. Construction

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

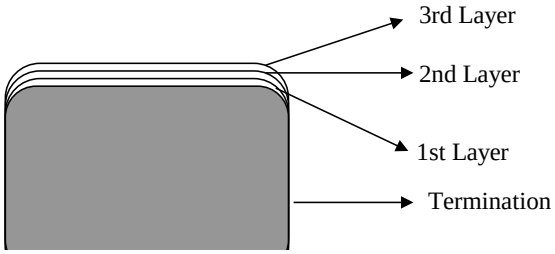
Terminals : The terminals shall consist of Ag alloy followed by Nickel, then Tin plating for easier soldering.

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 : -40°C to +85°C

4. Ingredient of terminals electrode



a) 1st layer : Ag
b) 2nd layer : Ni
c) 3rd layer : Sn

5. Characteristics

Standard Atmospheric Conditions

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

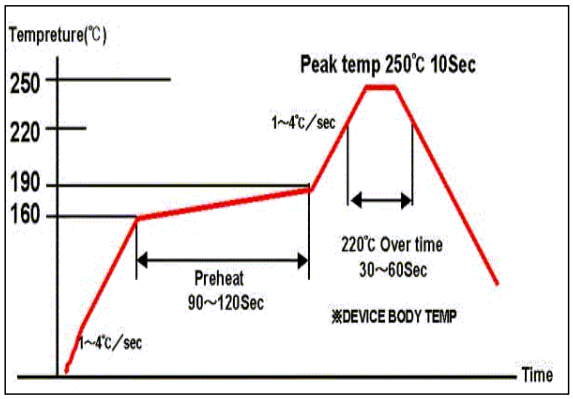
Ambient Temperature : 25°C ± 2°C

Relative Humidity : 60% to 70%

Air Pressure : 86 kPa to 106 kPa

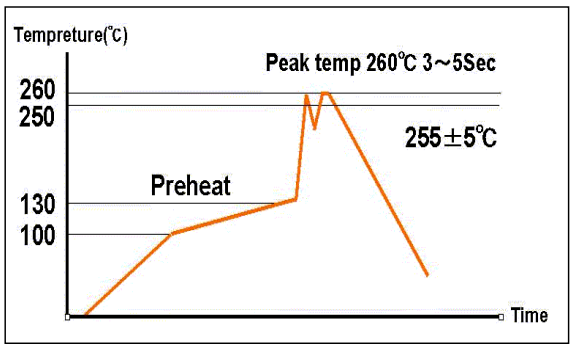
Temperature profile

a. Reflow temperature profile
(Temperature of the mounted parts surface on the printed circuit board)



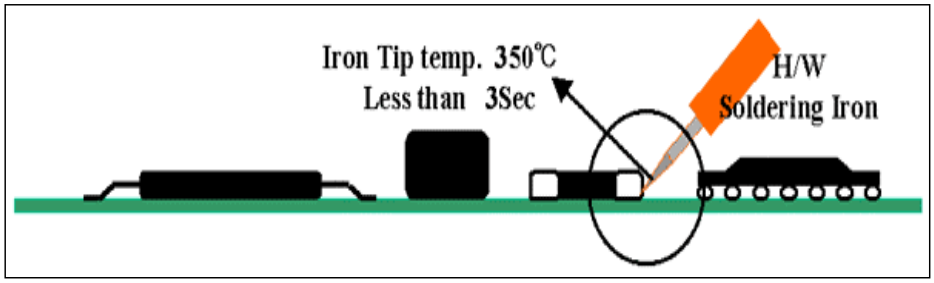
Recommended Peak Temperature：250˚C Max
250˚C up /within 10secs
Max. Reflow temperature : 260°C.
Gradient of temperature rise：av 1-4˚C/sec
Preheat：160-190˚C/within 90-120secs
220˚C up /within 30-60secs
Composition of solder Sn-3Ag-0.5Cu

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 : 350°C max / within 3 seconds.



CHIP INDUCTOR
WIRE WOUND TYPE

SWI0603 (1608) FERRITE SERIES

Specification

Part No.	Inductance [1] (nH)	Percent Tolerance	Q [2] Typ.	S.R.F. [3] Typ. (MHz)	RDC [4] Max (Ω)	IDC [5] Max (mA)
SWI0603FT 39N □-□□	39 @ 7.9 MHz	K, J	13 @ 7.9 MHz	2200	0.050	1700
SWI0603FT 68N □-□□	68 @ 7.9 MHz	K, J	15 @ 7.9 MHz	1500	0.080	1500
SWI0603FT R11 □-□□	110 @ 7.9 MHz	K, J	15 @ 7.9 MHz	1230	0.100	1000
SWI0603FT R15 □-□□	150 @ 7.9 MHz	K, J	15 @ 7.9 MHz	1050	0.093	900
SWI0603FT R20 □-□□	200 @ 7.9 MHz	K, J	15 @ 7.9 MHz	880	0.115	900
SWI0603FT R24 □-□□	240 @ 7.9 MHz	K, J	15 @ 7.9 MHz	900	0.120	850
SWI0603FT R27 □-□□	270 @ 7.9 MHz	K, J	15 @ 7.9 MHz	750	0.220	680
SWI0603FT R36 □-□□	360 @ 7.9 MHz	K, J	15 @ 7.9 MHz	700	0.210	650
SWI0603FT R39 □-□□	390 @ 7.9 MHz	K, J	15 @ 7.9 MHz	700	0.300	640
SWI0603FT R42 □-□□	420 @ 7.9 MHz	K, J	11 @ 7.9 MHz	685	0.330	610
SWI0603FT R47 □-□□	470 @ 7.9 MHz	K, J	15 @ 7.9 MHz	575	0.370	610
SWI0603FT R56 □-□□	560 @ 7.9 MHz	K, J	16 @ 7.9 MHz	515	0.490	530
SWI0603FT R60 □-□□	600 @ 7.9 MHz	K, J	16 @ 7.9 MHz	540	0.552	510
SWI0603FT R68 □-□□	680 @ 7.9 MHz	K, J	16 @ 7.9 MHz	530	0.460	490
SWI0603FT R82 □-□□	820 @ 7.9 MHz	K, J	16 @ 7.9 MHz	325	0.580	420
SWI0603FT 1R0 □-□□	1000 @ 7.9 MHz	K, J	15 @ 7.9 MHz	400	0.840	400
SWI0603FT 1R5 □-□□	1500 @ 7.9 MHz	K, J	17 @ 7.9 MHz	330	1.300	280
SWI0603FT 2R2 □-□□	2200 @ 7.9 MHz	K, J	16 @ 7.9 MHz	85	1.100	320
SWI0603FT 3R3 □-□□	3300 @ 7.9 MHz	K, J	16 @ 7.9 MHz	41	1.400	260
SWI0603FT 4R7 □-□□	4700 @ 7.9 MHz	K, J	16 @ 7.9 MHz	56	1.500	260
SWI0603FT 5R6 □-□□	5600 @ 7.9 MHz	K, J	16 @ 7.9 MHz	45	1.210	250
SWI0603FT 6R8 □-□□	6800 @ 7.9 MHz	K, J	16 @ 7.9 MHz	45	1.970	200
SWI0603FT 8R2 □-□□	8200 @ 7.9 MHz	K, J	16 @ 7.9 MHz	33	2.250	180
SWI0603FT 100 □-□□	10000 @ 2.5 MHz	K, J	12 @ 2.5 MHz	30	2.360	180
SWI0603FT 150 □-□□	15000 @ 2.5 MHz	K, J	12 @ 2.5 MHz	18	5.040	170
SWI0603FT 220 □-□□	22000 @ 2.5 MHz	K, J	12 @ 2.5 MHz	13	6.180	150

1. Inductance is measured in Agilent/HP-4287A RF LCR meter with Agilent/HP-16193 fixture.
2. Q is measured in Agilent/HP-4287A RF LCR meter with Agilent/HP-16193 fixture.
3. SRF is measured in ENA E5071B network analyzer or equivalent.
4. RDC is measured in Agilent/HP-4287A LCR meter or equivalent.
5. For 15°C Rise.

RELIABILITY TEST

ITEM		CONDITION	SPECIFICATION
Electrical Characteristics	Inductance and Tolerance	Measuring Frequency : As shown in Product Table Measuring Temperature : + 25 °C	Within Specified Tolerance
	Quality Factor		
	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 +85°C at frequency specified in Product Table.	+ 25 to 500 ppm / °C TCL = $\frac{L1 - L2}{L1(T1-T2)} \times 10^6$ (ppm /°C)
Mechanical 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 dynometer force gauge shall be applied to any side of the component.	0603 series ≥ 0.40kg
	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% Change In Q: No more than 10% Change In Appearance: Without distinct damage
	Thermal Shock Test	Each cycle shall consist of 30 minutes at -40°C followed by 30 minutes at +85°C with 5 minutes maximum transition time between temperature extremes. Test duration is 10 cycles.	

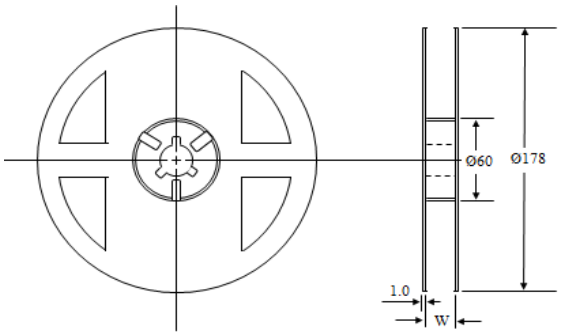
RELIABILITY TEST

ITEM		CONDITION	SPECIFICATION
Endurance Characteristics	Solderability	Dip pads in flux and dip in solder pot containing lead free solder at 240±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±5°C for 5±2 seconds.	Change In Inductance: No more than 5% Change In Q: No more than 10% Change In Appearance : Without distinct damage
	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.	
	Cold Temperature Storage	Inductors shall be stored at temperature of -40°C ± 2°C for 1000 hours (+48 -0hrs). Then inductors shall be subjected to standard atmospheric conditions for 1 hour. After that, measurement shall be made.	
	High Temperature Storage	Inductors shall be stored at temperature of 85°C ± 2°C for 1000 hours (+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 the test at 500 hours and 1000 hours. Then inductors are to be tested after 1 hour at room temperature.	

PACKING INFORMATION

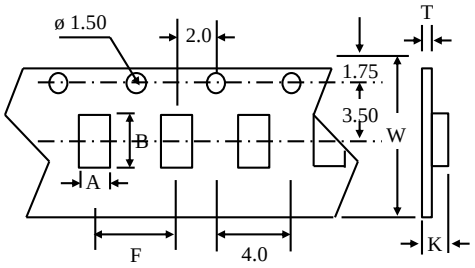
Packing Quantity

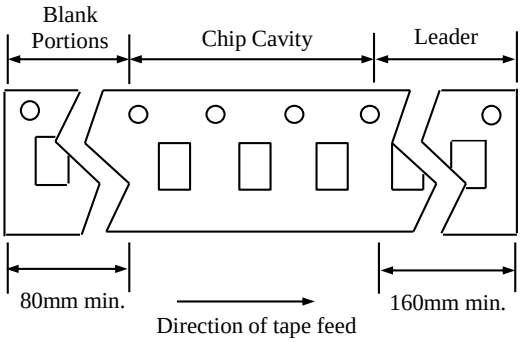
Type	Pcs / Reel
SWI0603	3,000



Dimensions (unit: mm)

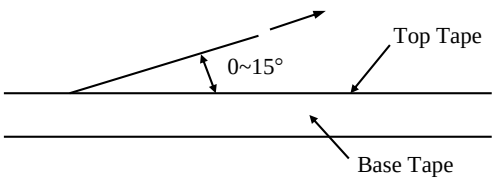
Type	Chip Cavity		Insert Pitch	Tape Thickness	
	A	B	F	K	T
SWI0603	1.35	1.90	4.00	1.15	0.28



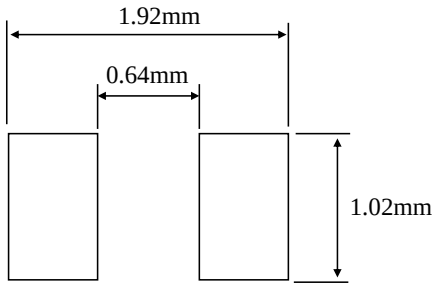


Top Tape Strength

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



Recommended Pattern



SAFETY NOTES & PRECAUTION

1. Products may not be used in applications that directly affect the personal safety or cause significant impacts and losses to society. If you apply to these applications, please be sure to contact us at first to confirm.

2. The storage period is less than 12 months. Ensure to follow the storage conditions (Temperature: 5 to 30°C, Humidity: 10 to 60% RH or less). If the storage period is exceeded the limit, the electrodes might be deteriorate/oxidized and affect soldering. Solderability should be checked if this period is exceeded.
Other storage precaution:
a) Products should be stored on the pallet for the prevention of the influence from humidity, dust and so on.
b) Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.
c) Do not unpack the minimum package until immediately before use. After unpacking, re-seal promptly or store in deciccator with a desiccant.
d) Do not store product in bulk to prevent coils and parts being damaged.

3. Do not use or store in locations where there are corrosive gases (salt, acid, alkali, etc.).

4. Soldering condition for mounting should be within the specification range.
If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.

5. When using, try to avoid excessive mechanical impact on the product such as collision / drop…etc.

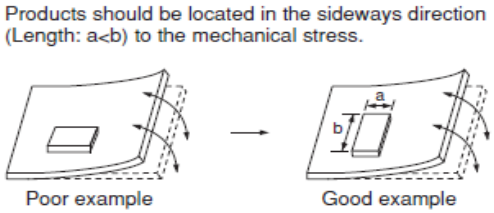
6. When assembling a printed circuit board with a new mounted chip, be careful to avoid assembly deformation of the circuit board that may cause the overall or partial distortion of the circuit board such as at screw tightening position.

7. Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the thermal design.

8. Do not expose the products to magnets or magnetic fields.

9. If you would like to use this products for more stringent safety or reliability of performance and/or quality requirements, or its failure, malfunction or trouble may cause serious damage to society, individuals or property, or you have special requirement beyond the specification or condition in the catalogue, please contact us.

10. PCB should be designed so that products are not subjected to the mechanical stress caused by warping of the board as shown below. Bending and twisting of PCB will cause excessive mechanical stress and lead to crack in the product as well.



11. Cleaning brush shall not touch the winding portion of the product to prevent the breaking of wire. Cleaning could cause failure and degradation of a product.

12. Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock. Product could be damaged by external mechanical pressure, stacked under heavy object, as well as strong shaking and drop.