CUSTOMER :

SPEC NO.:	**D-0601-011-F**
DATE :	**May.24, 2024**

RoHS Compliant

SPECIFICATIONS

Product Description : Wire Wound Chip Inductor

Part Number : SWI0603CT SERIES

Customer Part Number :

[For Customer Approval Only]

Date :

Approved By	Verified By	Rechecked By	Checked By

Approved By	Verified By	Prepared By
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WIRE WOUND CHIP INDUCTORS SWI0603CT 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. Precious tolerance of 2% is available.

Features

* Operating temperature -40 to +125°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.

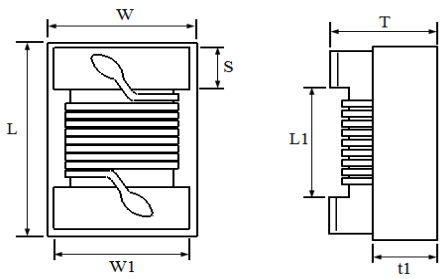
Part Number Code

SWI 0603 C T 33N 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) (inch) mm	L1 (Ref.) mm	W1 (Ref.) mm	(t1) (Ref.) mm
SWI 0603 1608	(0.063 ± 0.008) 1.60 ± 0.20	(0.041 ± 0.008) 1.05 ± 0.20	(0.041 ± 0.008) 1.05 ± 0.20	(0.014 ± 0.004) 0.35 ± 0.10	0.80	0.95	0.50

3 Material Type C : Ceramic Material

4 Inductance Value 3N3 = 3.3nH 33N = 33nH R33 = 330nH

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

6 Internal Code If any

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.

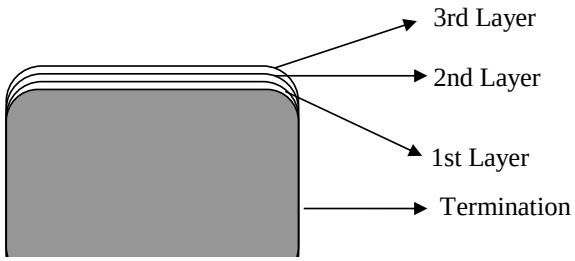
Terminals : The terminals shall consist of Ag alloy followed by Nickel, then Gold for easier soldering.

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 +125°C

4. Ingredient of terminals electrode



a) 1st layer : Ag
b) 2nd layer : Ni
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 :

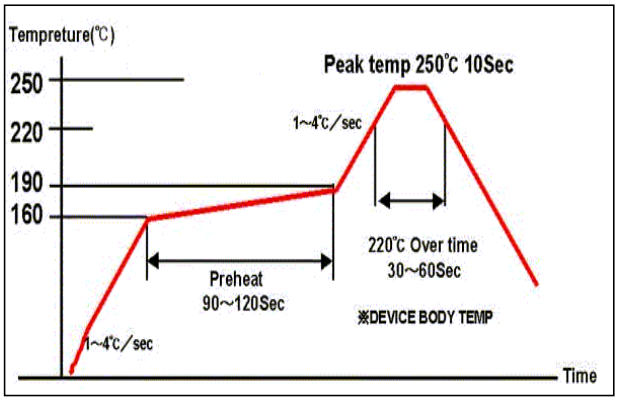
Ambient Temperature : 25°C ± 2°C

Relative Humidity : 60% to 70%

Air Pressure : 86 kPa to 106 kPa

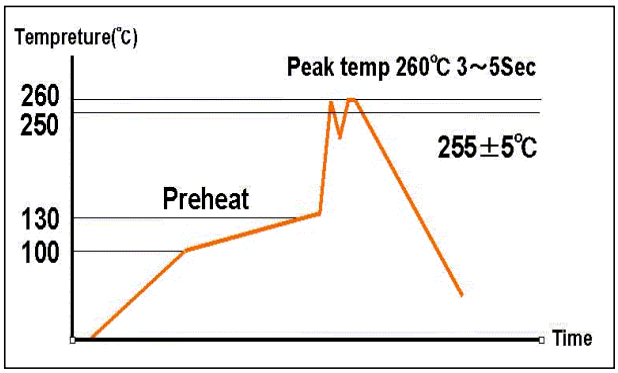
Temperature profile

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



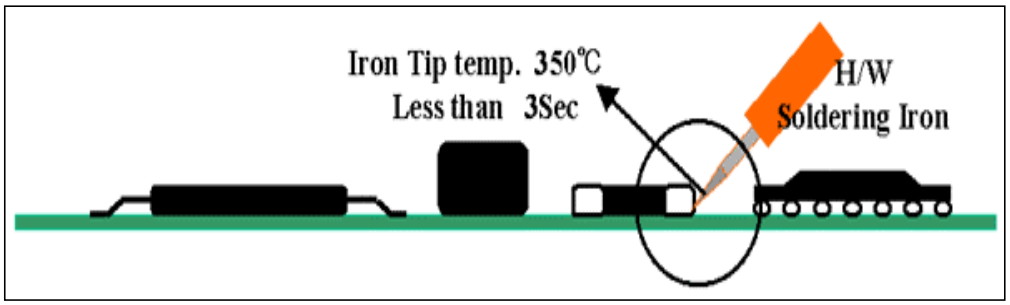
Recommended Peak Temperature：250°C Max
250°C up /within 10secs
Max. Reflow temperature : 260°C.
Gradient of temperature rise：av 1-4°C/sec
Preheat：160-190°C/within 90-120secs
220°Cup /within 30-60secs
Composition of solder Sn-3Ag-0.5Cu

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

SWI 0603 (1608) CERAMIC SERIES

Specification

Part No.	Inductance [1] (nH)	Percent Tolerance	Q [2] Min [2]	Q [2] Typical @900MHz	S.R.F. [3] Min (MHz)	RDC [4] Max (Ω)	IDC [5] Max (mA)	Marking
SWI0603CT 1N6 □-□□	1.6 @ 250 MHz	B, S	24	40	12500	0.030	700	-
SWI0603CT 1N8 □-□□	1.8 @ 250 MHz	B, S	16	35	12500	0.045	700	-
SWI0603CT 2N0 □-□□	2.0 @ 250 MHz	B, S	16	31	6900	0.080	700	-
SWI0603CT 3N9 □-□□	3.9 @ 250 MHz	B, S	22	51	6900	0.080	700	-
SWI0603CT 4N3 □-□□	4.3 @ 250 MHz	B, S	22	45	5900	0.080	700	-
SWI0603CT 4N7 □-□□	4.7 @ 250 MHz	B, S	20	47	5800	0.130	700	-
SWI0603CT 5N1 □-□□	5.1 @ 250 MHz	K, J	20	47	5700	0.140	700	-
SWI0603CT 5N6 □-□□	5.6 @ 250 MHz	K, J	16	40	5500	0.150	700	-
SWI0603CT 6N8 □-□□	6.8 @ 250 MHz	K, J, B	30	63	5800	0.110	700	-
SWI0603CT 7N5 □-□□	7.5 @ 250 MHz	K, J, B	28	64	4800	0.106	700	-
SWI0603CT 8N2 □-□□	8.2 @ 250 MHz	K, J, B	30	72	4600	0.100	700	-
SWI0603CT 8N7 □-□□	8.7 @ 250 MHz	K, J	28	66	4600	0.109	700	-
SWI0603CT 9N1 □-□□	9.1 @ 250 MHz	K, J	28	60	4000	0.135	700	-
SWI0603CT 9N5 □-□□	9.5 @ 250 MHz	K, J	28	62	4500	0.135	700	-
SWI0603CT 10N □-□□	10 @ 250 MHz	K, J, G	30	66	3800	0.130	700	-
SWI0603CT 11N □-□□	11 @ 250 MHz	K, J	33	68	4000	0.090	700	-
SWI0603CT 12N □-□□	12 @ 250 MHz	K, J, G	35	72	4000	0.130	700	-
SWI0603CT 13N □-□□	13 @ 250 MHz	K, J	38	75	4000	0.106	700	-
SWI0603CT 15N □-□□	15 @ 250 MHz	K, J, G	35	68	4000	0.170	700	-
SWI0603CT 16N □-□□	16 @ 250 MHz	K, J	34	66	3300	0.170	700	-
SWI0603CT 18N □-□□	18 @ 250 MHz	K, J, G	38	77	3100	0.170	700	-
SWI0603CT 20N □-□□	20 @ 250 MHz	K, J, G	38	72	3000	0.220	700	-
SWI0603CT 22N □-□□	22 @ 250 MHz	K, J, G	38	70	3000	0.220	700	-
SWI0603CT 24N □-□□	24 @ 250 MHz	K, J, G	37	75	2650	0.135	700	-
SWI0603CT 27N □-□□	27 @ 250 MHz	K, J, G	40	75	2800	0.220	600	-
SWI0603CT 30N □-□□	30 @ 250 MHz	K, J, G	45	57	2300	0.220	600	-
SWI0603CT 33N □-□□	33 @ 250 MHz	K, J, G	43	78	2300	0.220	600	-
SWI0603CT 36N □-□□	36 @ 250 MHz	K, J	43	70	2200	0.250	600	-
SWI0603CT 39N □-□□	39 @ 250 MHz	K, J, G	43	66	2200	0.250	600	-
SWI0603CT 43N □-□□	43 @ 250 MHz	K, J, G	38	62	2000	0.280	600	-
SWI0603CT 47N □-□□	47 @ 200 MHz	K, J, G	40	65	2000	0.280	600	-
SWI0603CT 51N □-□□	51 @ 200 MHz	K, J, G	40	66	1900	0.310	600	-
SWI0603CT 56N □-□□	56 @ 200 MHz	K, J, G	40	66	1900	0.310	600	-
SWI0603CT 62N □-□□	62 @ 200 MHz	K, J	40	60	1700	0.340	600	-
SWI0603CT 68N □-□□	68 @ 200 MHz	K, J, G	40	57	1700	0.340	600	-
SWI0603CT 72N □-□□	72 @ 150 MHz	K, J, G	35	60	1700	0.490	400	-
SWI0603CT 82N □-□□	82 @ 150 MHz	K, J, G	35	58	1700	0.540	400	-
SWI0603CT 90N □-□□	90 @ 150 MHz	K, J	35	52	1700	0.540	400	-
SWI0603CT R10 □-□□	100 @ 150 MHz	K, J, G	35	51	1400	0.630	400	-
SWI0603CT R11 □-□□	110 @ 150 MHz	K, J, G	35	22	1400	0.630	400	-
SWI0603CT R12 □-□□	120 @ 150 MHz	K, J, G	35	45	1300	0.650	300	-
SWI0603CT R13 □-□□	130 @ 150 MHz	K, J	35	40	1000	0.920	280	-
SWI0603CT R15 □-□□	150 @ 150 MHz	K, J, G	35	33	1000	0.920	280	-
SWI0603CT R18 □-□□	180 @ 100 MHz	K, J, G	30	26	1000	1.250	240	-
SWI0603CT R20 □-□□	200 @ 100 MHz	K, J	30	23	1000	1.250	240	-
SWI0603CT R21 □-□□	210 @ 100 MHz	K, J	27	23	1000	1.700	200	-
SWI0603CT R22 □-□□	220 @ 100 MHz	K, J, G	30	23	1000	1.700	200	-
SWI0603CT R24 □-□□	240 @ 100 MHz	K, J	30	15	1000	1.700	200	-
SWI0603CT R27 □-□□	270 @ 100 MHz	K, J, G	30	10	1000	1.800	170	-
SWI0603CT R33 □-□□	330 @ 100 MHz	K, J	25	-	450	2.000	150	-
SWI0603CT R39 □-□□	390 @ 100 MHz	K, J	20	-	350	2.000	170	-

1. Inductance is measured in HP-4287A RF LCR meter with HP-16193 fixture.
2. Q is measured in HP-4287A RF LCR meter with HP-16193 fixture. Test frequency same as Inductance.
3. SRF is measured in ENA E5071B network analyzer or equivalent.
4. RDC is measured in HP-4338B milliohm meter or equivalent.
5. For 15 °C Rise.

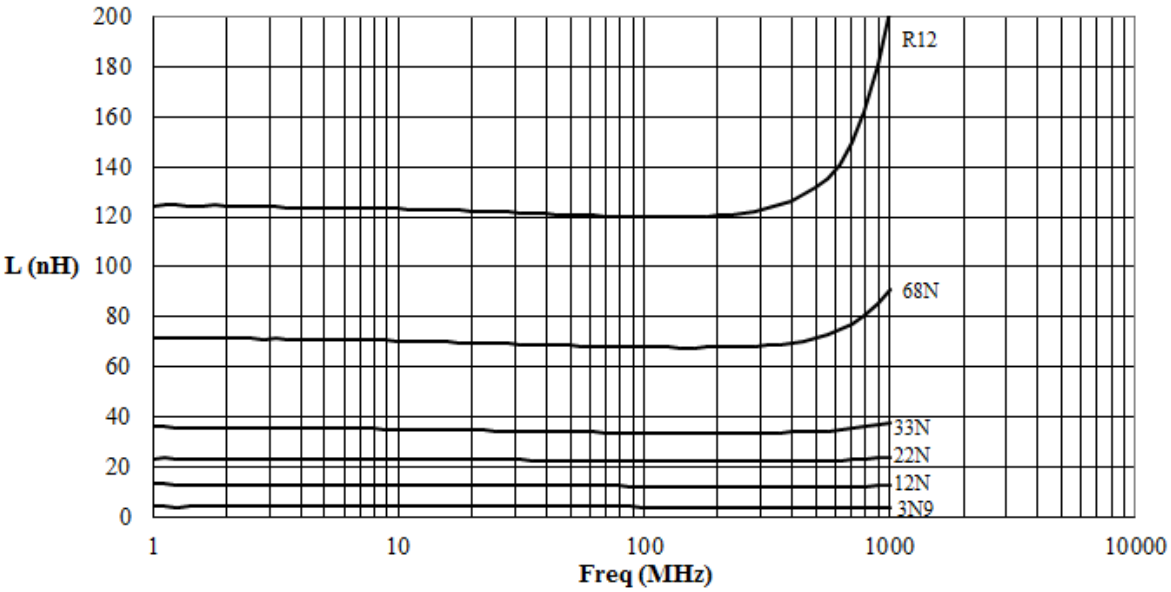
Unit weight = 0.0049g (for ref.)

CHIP INDUCTOR
WIRE WOUND TYPE

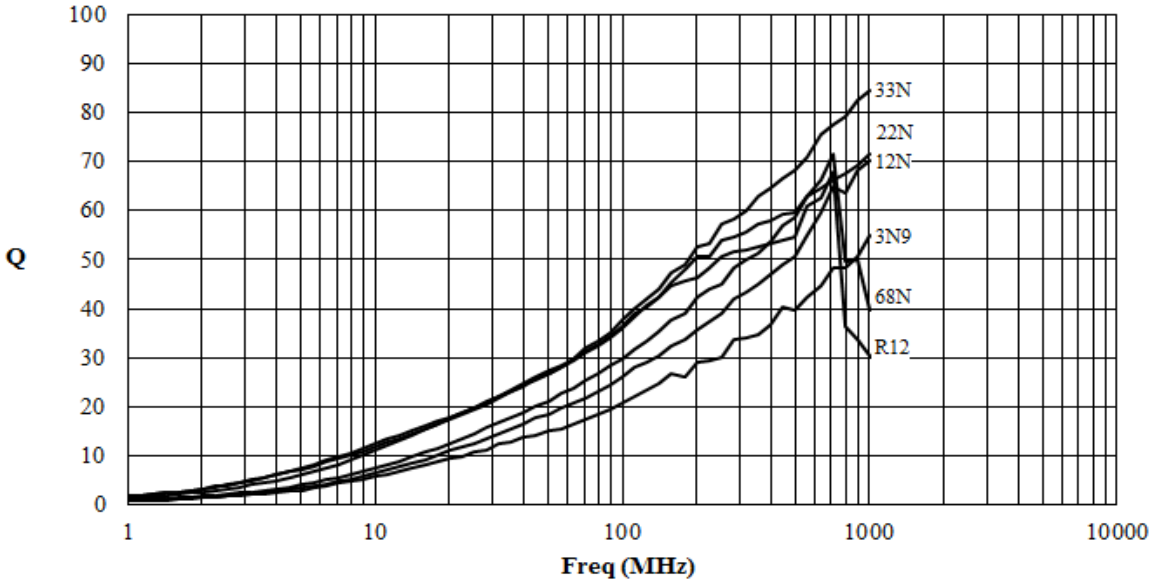
SWI 0603 (1608) CERAMIC SERIES

Specification

L vs Freq Plot



Q vs Freq Plot



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 - ≥ 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% 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.	

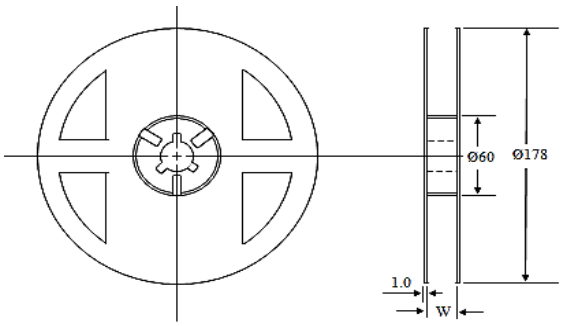
RELIABILITY TEST

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 -0h). 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 -0h). 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

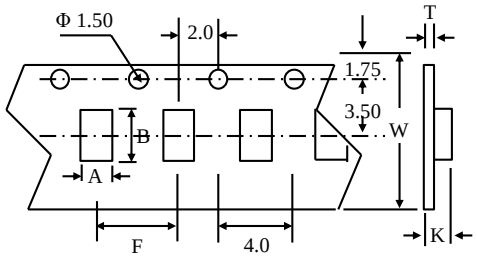
Packing Quantity

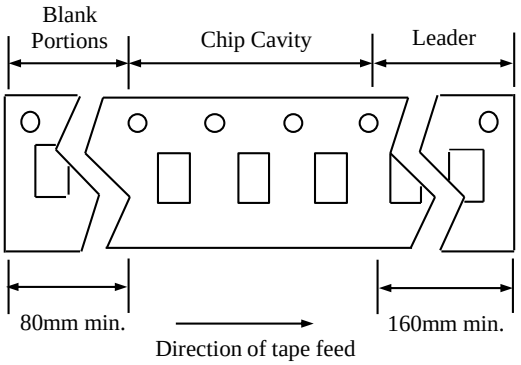
Type	Pcs / Reel
SWI0603	3,000



Dimensions (unit : mm)

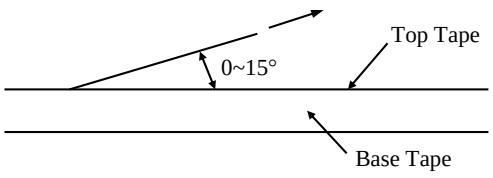
Type	Chip Cavity		Insert Pitch	Tape Thickness		
	A	B	F	K	T	W
SWI0603	1.35	1.90	4.00	1.15	0.28	8.00



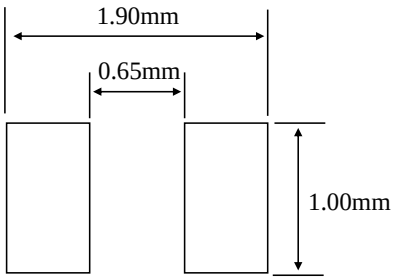


Top Tape Strength

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



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.

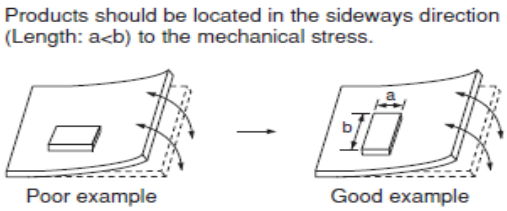
6. When assembling a printed circuit board with a new mounted chip, be careful to avoid assembly deformation of the circuit board that may cause the overall or partial distortion of the circuit board such as at screw tightening position.

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.