Wire Wound Chip Inductors

SWI0603HP Series

ABC ELECTRONICS GROUP.
AOBA Technology (M) Sdn. Bhd.

INTRODUCTION

The SWI HP 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 lower DCR than other 0603. Precious tolerance of 2% is available.

FEATURES

- Operating temperature -40 to +125°C for ceramic 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.

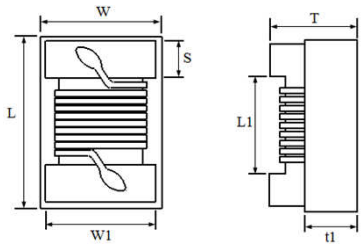
PART NUMBER

SWI 0603 HP 33N J - □□

1 2 3 4 5

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	Width (W1) (inch) mm	(t1) (Ref.) mm
SWI0603 1608	(0.071 max.) 1.80 max.	0.044 max. 1.12 max.	0.040 max. 1.02 max.	(0.014 ± 0.004) 0.36 ± 0.10	(0.03 ref.) 0.76 ref.	0.5

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

4 Tolerance B = ±0.2nH S = ±0.3nH G = ±2% J = ±5% K = ±10%

5 Internal Code

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.

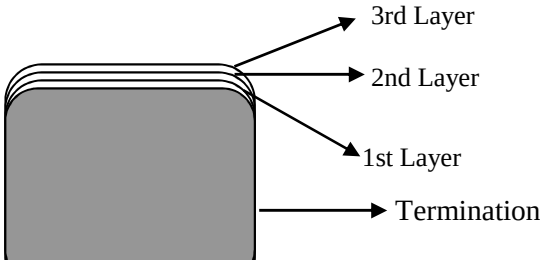
*Terminals : Consist of Ag alloy followed by Nickel, then Au platting for easier soldering.

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 ~ +125°C

4 Ingredient of terminals electrode



Ceramic Type :

1st Layer : Ag

2nd Layer : Nickel (Ni)

3rd Layer : Gold (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

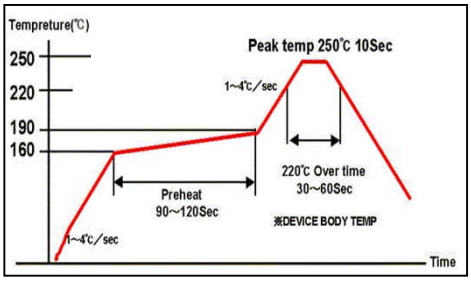
Relative Humidity : 60% to 70%

Air Pressure : 86Kpa to 106Kpa

Temperature Profile

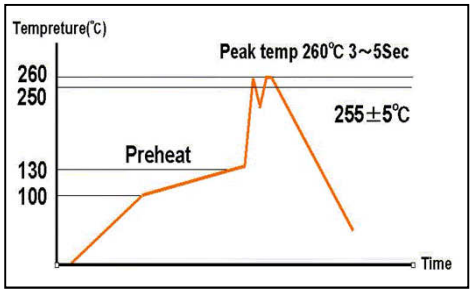
1 Reflow Temperature Profile

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



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

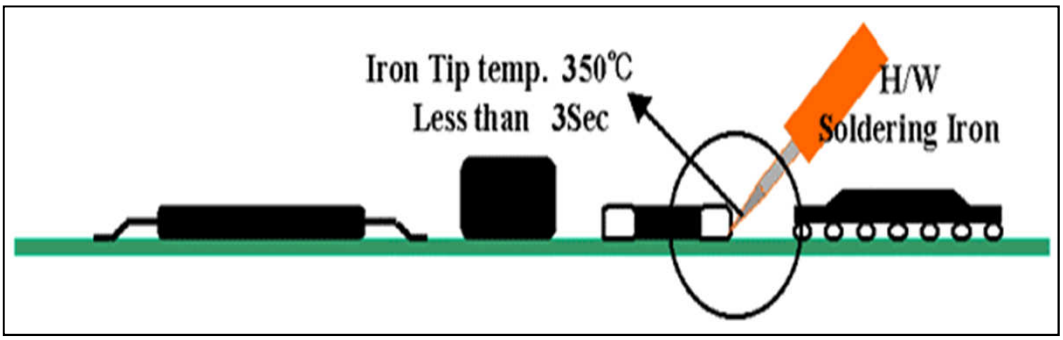
2 Dip Temperature



Solder bathtub temperature : 260℃ max
within 5secs.
Preheating temperature : 100～130℃
deposit solder temperature.
Composition of solder Sn-3Ag-0.5Cu

3 Soldering iron tip temperature :

Recommended temperature : 350°C max / within 3 seconds.
Maximum temperature : 380°C max / within 3 seconds.



SWI0603HP Series

Part No.	Inductance [1] (nH)	Tolerance	Q [2] Min	S.R.F.[3] Min (MHz)	RDC [4] Max (Ω)	IDC [5] Max (mA)	Marking
SWI0603HP 1N7 □-□□	1.7 @ 250MHz	B, S	24 @ 250MHz	8500	0.033	2100	-
SWI0603HP 2N2 □-□□	2.2 @ 250MHz	B, S	13 @ 250MHz	7000	0.150	900	-
SWI0603HP 3N3 □-□□	3.3 @ 250MHz	B, S	35 @ 250MHz	6900	0.035	1700	-
SWI0603HP 3N6 □-□□	3.6 @ 250MHz	B, S	35 @ 250MHz	6900	0.035	1700	-
SWI0603HP 3N9 □-□□	3.9 @ 250MHz	B, S	30 @ 250MHz	6900	0.039	1600	-
SWI0603HP 4N3 □-□□	4.3 @ 250MHz	B, S	30 @ 250MHz	6000	0.045	1500	-
SWI0603HP 4N7 □-□□	4.7 @ 250MHz	B, S	22 @ 250MHz	5800	0.090	1100	-
SWI0603HP 5N1 □-□□	5.1 @ 250MHz	K, J, B	20 @ 250MHz	5700	0.108	1000	-
SWI0603HP 6N2 □-□□	6.2 @ 250MHz	K, J, B	35 @ 250MHz	5800	0.050	1400	-
SWI0603HP 6N8 □-□□	6.8 @ 250MHz	K, J, B	35 @ 250MHz	5800	0.050	1400	-
SWI0603HP 7N2 □-□□	7.2 @ 250MHz	K, J, B	35 @ 250MHz	4800	0.052	1400	-
SWI0603HP 7N5 □-□□	7.5 @ 250MHz	K, J, B	35 @ 250MHz	4800	0.070	1300	-
SWI0603HP 8N2 □-□□	8.2 @ 250MHz	K, J, B	35 @ 250MHz	4300	0.054	1400	-
SWI0603HP 8N7 □-□□	8.7 @ 250MHz	K, J, B	30 @ 250MHz	4600	0.100	1000	-
SWI0603HP 9N1 □-□□	9.1 @ 250MHz	K, J	28 @ 250MHz	4300	0.108	1000	-
SWI0603HP 9N5 □-□□	9.5 @ 250MHz	K, J	35 @ 250MHz	5000	0.060	1350	-
SWI0603HP 10N □-□□	10 @ 250MHz	K, J, G	35 @ 250MHz	4800	0.060	1350	-
SWI0603HP 11N □-□□	11 @ 250MHz	K, J, G	35 @ 250MHz	4200	0.060	1350	-
SWI0603HP 12N □-□□	12 @ 250MHz	K, J, G	35 @ 250MHz	4000	0.078	1200	-
SWI0603HP 15N □-□□	15 @ 250MHz	K, J, G	38 @ 250MHz	4000	0.085	1100	-
SWI0603HP 16N □-□□	16 @ 250MHz	K, J, G	38 @ 250MHz	3300	0.085	1100	-
SWI0603HP 18N □-□□	18 @ 250MHz	K, J, G	38 @ 250MHz	3100	0.078	1200	-
SWI0603HP 22N □-□□	22 @ 250MHz	K, J, G	40 @ 250MHz	3000	0.120	950	-
SWI0603HP 23N □-□□	23 @ 250MHz	K, J, G	40 @ 250MHz	2850	0.120	950	-
SWI0603HP 24N □-□□	24 @ 250MHz	K, J, G	40 @ 250MHz	2650	0.080	1100	-
SWI0603HP 27N □-□□	27 @ 250MHz	K, J	40 @ 250MHz	2800	0.125	950	-
SWI0603HP 30N □-□□	30 @ 250MHz	K, J, G	40 @ 250MHz	2400	0.130	920	-
SWI0603HP 33N □-□□	33 @ 250MHz	K, J, G	40 @ 250MHz	2300	0.170	680	-
SWI0603HP 36N □-□□	36 @ 250MHz	K, J, G	40 @ 250MHz	2300	0.150	750	-
SWI0603HP 39N □-□□	39 @ 250MHz	K, J, G	40 @ 250MHz	2200	0.180	680	-
SWI0603HP 43N □-□□	43 @ 250MHz	K, J, G	40 @ 250MHz	2100	0.170	810	-
SWI0603HP 47N □-□□	47 @ 200MHz	K, J, G	38 @ 200MHz	2000	0.200	680	-
SWI0603HP 51N □-□□	51 @ 200MHz	K, J, G	38 @ 200MHz	1900	0.250	660	-
SWI0603HP 56N □-□□	56 @ 200MHz	K, J, G	38 @ 200MHz	1900	0.230	700	-
SWI0603HP 68N □-□□	68 @ 200MHz	K, J, G	38 @ 200MHz	1700	0.280	650	-

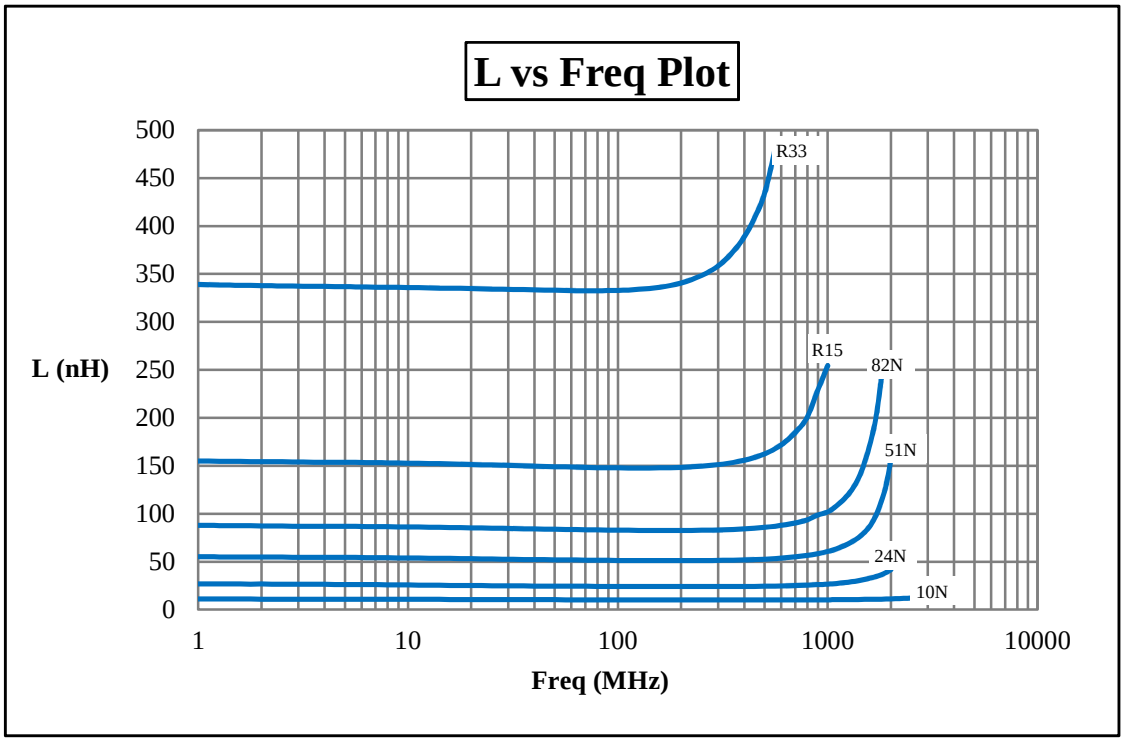
SWI0603HP Series

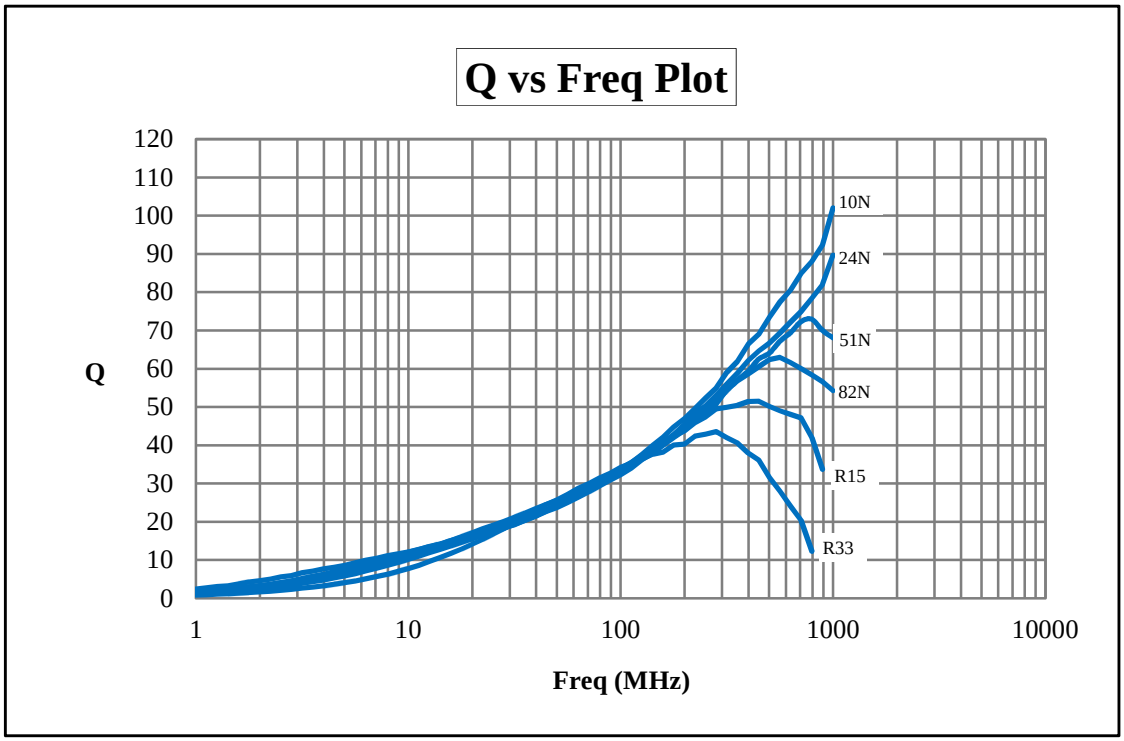
Part No.	Inductance [1] (nH)	Tolerance	Q [2] Min	S.R.F.[3] Min (MHz)	RDC [4] Max (Ω)	IDC [5] Max (mA)	Marking
SWI0603HP 72N □-□□	72 @ 150MHz	K, J, G	34 @ 150MHz	1700	0.350	580	-
SWI0603HP 75N □-□□	75 @ 150MHz	K, J, G	34 @ 150MHz	1700	0.420	550	-
SWI0603HP 82N □-□□	82 @ 150MHz	K, J, G	34 @ 150MHz	1600	0.460	510	-
SWI0603HP 91N □-□□	91 @ 150MHz	K, J, G	34 @ 150MHz	1500	0.420	550	-
SWI0603HP R10 □-□□	100 @ 150MHz	K, J, G	34 @ 150MHz	1400	0.540	470	-
SWI0603HP R11 □-□□	110 @ 150MHz	K, J, G	33 @ 150MHz	1350	0.540	470	-
SWI0603HP R12 □-□□	120 @ 150MHz	K, J, G	33 @ 150MHz	1300	0.650	420	-
SWI0603HP R15 □-□□	150 @ 150MHz	K, J, G	30 @ 150MHz	1150	0.820	390	-
SWI0603HP R18 □-□□	180 @ 100MHz	K, J, G	28 @ 100MHz	1050	1.200	320	-
SWI0603HP R20 □-□□	200 @ 100MHz	K, J, G	28 @ 100MHz	1000	1.300	310	-
SWI0603HP R21 □-□□	210 @ 100MHz	K, J, G	28 @ 100MHz	1000	1.900	280	-
SWI0603HP R22 □-□□	220 @ 100MHz	K, J, G	28 @ 100MHz	950	1.900	280	-
SWI0603HP R25 □-□□	250 @ 100MHz	K, J, G	28 @ 100MHz	900	2.000	260	-
SWI0603HP R27 □-□□	270 @ 100MHz	K, J, G	28 @ 100MHz	900	2.200	260	-
SWI0603HP R30 □-□□	300 @ 100MHz	K, J, G	28 @ 100MHz	780	2.700	220	-
SWI0603HP R33 □-□□	330 @ 100MHz	K, J, G	28 @ 100MHz	750	2.900	200	-
SWI0603HP R36 □-□□	360 @ 100MHz	K, J, G	28 @ 100MHz	720	3.800	180	-
SWI0603HP R39 □-□□	390 @ 100MHz	K, J, G	28 @ 100MHz	700	3.800	180	-

When ordering, please specify tolerance
Tolerance : B=±0.20nH, S=±0.30nH, G=±2%, J=±5%, K=±10%

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.
3. SRF is measured in ENA E5071B network analyzer or equivalent.
4. RDC is measured in HP-4338B milliohmeter or equivalent.
5. For 25 °C Rise.

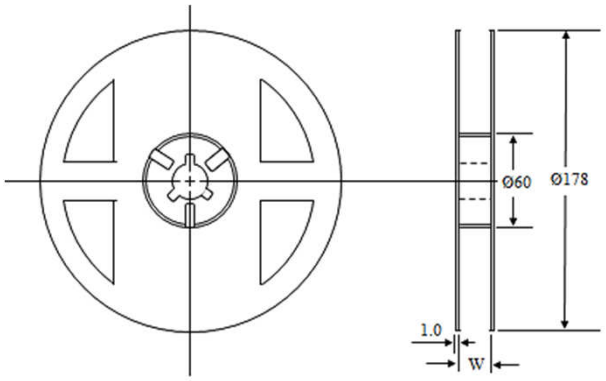
Remarks :
Unit weight = 0.0037g (for ref.)


L vs Freq Plot
L (nH)
500
450
400
350
300
250
200
150
100
50
0
1
10
100
1000
10000
Freq (MHz)
R33
R15
82N
51N
24N
10N

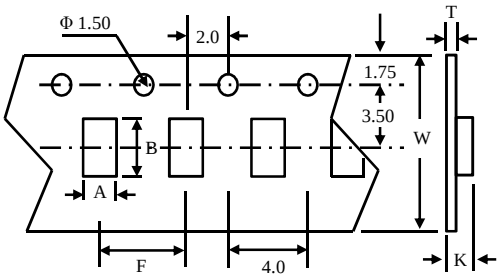

Q vs Freq Plot
Q
120
110
100
90
80
70
60
50
40
30
20
10
0
1
10
100
1000
10000
Freq (MHz)
10N
24N
51N
82N
R15
R33

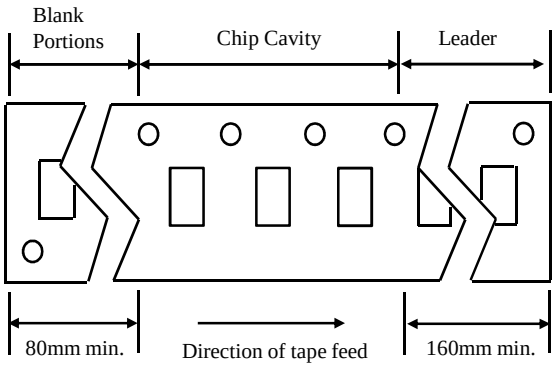
ITEM		CONDITION	SPECIFICATION
Electrical Characteristics	Inductance and Tolerance	Measuring Frequency : As shown in Product Table Measuring Temperature : +25°C	Within Specified Tolerance
	Quality Factor		
	Insulation Resistance	Measured at 100V DC between inductor terminals and center of case.	1000 mega 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.	0402 series - 350g minimum 0603 series - 900g minimum
	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 a 5 minutes transition time between temperature extremes. Test duration is 10 cycles.	
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% 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 10-55Hz : 0.04G/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 1000hrs (+48 -0 hrs.) 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 1000hrs (+48 -0 hrs.) 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.	

Type	Pcs/Reel
SWI0603	3,000



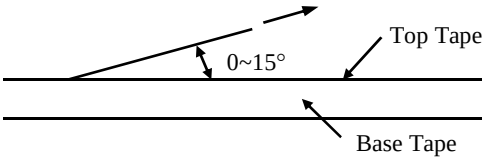
Type	Chip Cavity		Insert Pitch	Tape Thickness		
	A	B	F	K	T	W
SWI0603	1.16	1.90	4.00	0.95	0.22	8.00





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
SWI0603	1.92	0.64	1.27

Recommended Pattern