WIRE WOUND CHIP INDUCTORS
SWI HP SERIES

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, lower DCR than other 0402 & 0603. Precious tolerance of 2% is available.

FEATURES

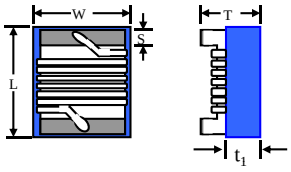
* Operating temperature -40 to +125 ^{o}C.
* Excellent solderability and resistance to soldering heat .
* Suitable for reflow soldering.
* High reliability and easy surface mount assembly.
* Wide range of inductance values are available for flexible needs.

PART NUMBER

SWI	0603	H P	33N	J	- □□
1	2		3	4	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	Width (W1) (inch) mm	(t1) (Ref.) mm
SWI 0402 1005	(0.039 ± 0.004) 1.00 ± 0.10	(0.022 ± 0.004) 0.55 ± 0.10	(0.020 ± 0.004) 0.50 ± 0.10	(0.008 ± 0.004) 0.20 ± 0.10	(0.0196 ref.) 0.50 ref.	0.2
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 = 3.3 nH
33N = 33 nH
R33 = 330 nH

4 Tolerance

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

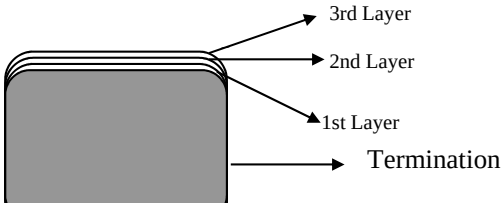
*Terminals : SWI series terminals shall consist of MoMn alloy followed by Nickel, then Au platting for easier soldering.

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^{O}C to + 125^{O}C

4 Ingredient of terminals electrode.



		SWI0402HP	SWI0603HP
a) 1st layer	:	Mo/Mn	Ag-Pd
b) 2nd layer	:	Nickel	Nickel
c) 3rd layer	:	Gold	Tin

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%

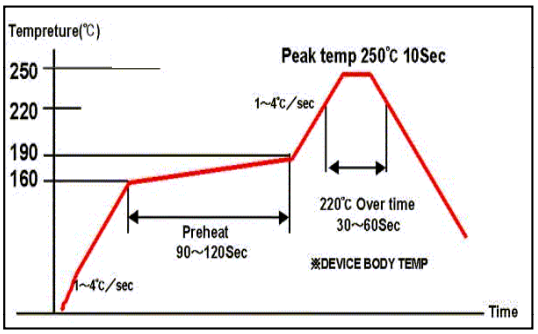
*Air Pressure : 86 Kpa to 106 Kpa

CHIP INDUCTOR SPECIFICATIONS

TEMPERATURE PROFILE

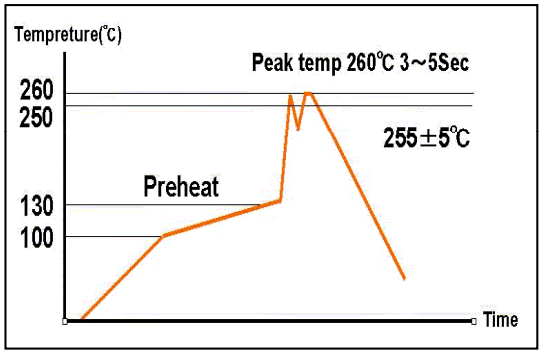
a Reflow temperature profile

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



Recommended Peak Temperature：250℃ 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

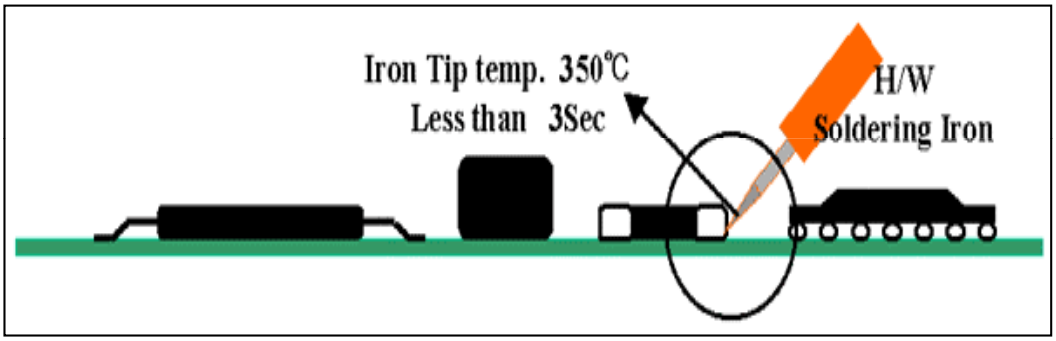
b Dip temperature



Solder bathtub temperature: 260℃ max
within 5secs.
Preheating temperature: 100～130℃
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.



WIRE WOUND CHIP INDUCTOR

SWI0603HP (1608) CEREMIC SERIES

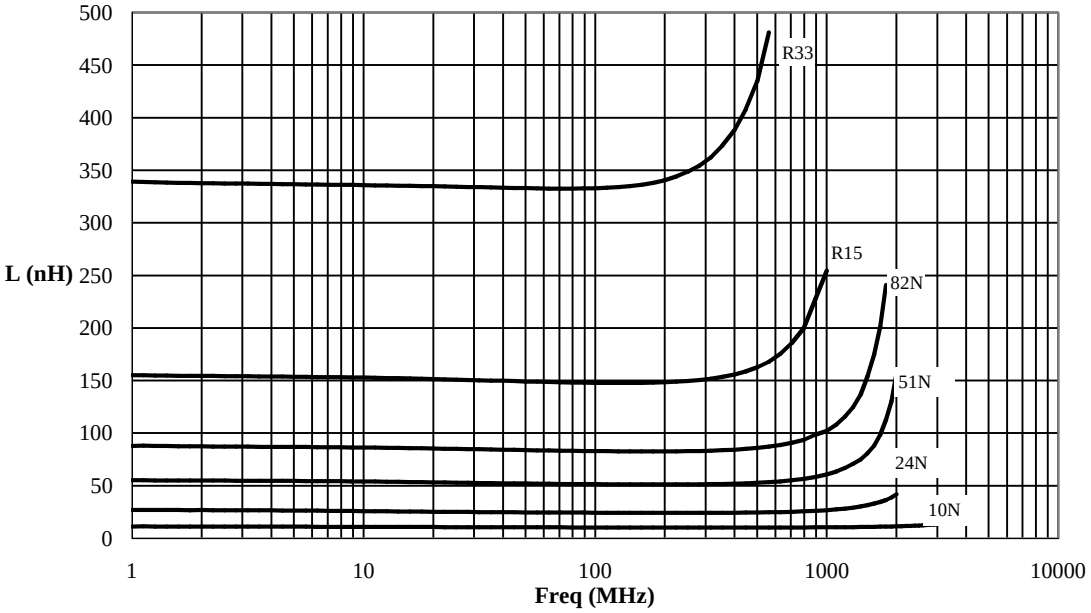
Part No.	Inductance [1] (nH)	Percent Tolerance	Q [2] Min	Q (typ) @250MHz	Q (typ) @900MHz	S.R.F. [3] Min (MHz)	RDC [4] Max (Ω)	IDC [5] Max (mA)	Marking
SWI 0603 HP 1N7 □-□□	1.7 @ 250 MHz	B, S	24 @ 250 MHz	31	50	8500	0.033	2100	-
SWI 0603 HP 2N2 □-□□	2.2 @ 250 MHz	B, S	13 @ 250 MHz	15	27	7000	0.150	900	-
SWI 0603 HP 3N3 □-□□	3.3 @ 250 MHz	B, S	35 @ 250 MHz	37	64	6900	0.035	1700	-
SWI 0603 HP 3N6 □-□□	3.6 @ 250 MHz	B, S	35 @ 250 MHz	42	67	6900	0.035	1700	-
SWI 0603 HP 3N9 □-□□	3.9 @ 250 MHz	B, S	30 @ 250 MHz	39	62	6900	0.039	1600	-
SWI 0603 HP 4N3 □-□□	4.3 @ 250 MHz	B, S	30 @ 250 MHz	40	64	6000	0.045	1500	-
SWI 0603 HP 4N7 □-□□	4.7 @ 250 MHz	B, S	22 @ 250 MHz	29	50	5800	0.090	1100	-
SWI 0603 HP 5N1 □-□□	5.1 @ 250 MHz	B, J, K	20 @ 250 MHz	27	46	5700	0.108	1000	-
SWI 0603 HP 6N2 □-□□	6.2 @ 250 MHz	B, J, K	35 @ 250 MHz	44	68	5800	0.050	1400	-
SWI 0603 HP 6N8 □-□□	6.8 @ 250 MHz	B, J, K	35 @ 250 MHz	50	79	5800	0.050	1400	-
SWI 0603 HP 7N2 □-□□	7.2 @ 250 MHz	B, J, K	35 @ 250 MHz	47	71	4800	0.052	1400	-
SWI 0603 HP 7N5 □-□□	7.5 @ 250 MHz	B, J, K	35 @ 250 MHz	46	74	4800	0.070	1300	-
SWI 0603 HP 8N2 □-□□	8.2 @ 250 MHz	B, J, K	35 @ 250 MHz	45	69	4300	0.054	1400	-
SWI 0603 HP 8N7 □-□□	8.7 @ 250 MHz	B, J, K	30 @ 250 MHz	38	61	4600	0.100	1000	-
SWI 0603 HP 9N1 □-□□	9.1 @ 250 MHz	J, K	28 @ 250 MHz	35	57	4300	0.108	1000	-
SWI 0603 HP 9N5 □-□□	9.5 @ 250 MHz	J, K	35 @ 250 MHz	50	76	5000	0.060	1350	-
SWI 0603 HP 10N □-□□	10 @ 250 MHz	G, J, K	35 @ 250 MHz	50	82	4800	0.060	1350	-
SWI 0603 HP 11N □-□□	11 @ 250 MHz	G, J, K	35 @ 250 MHz	54	82	4200	0.060	1350	-
SWI 0603 HP 12N □-□□	12 @ 250 MHz	G, J, K	35 @ 250 MHz	52	80	4000	0.078	1200	-
SWI 0603 HP 15N □-□□	15 @ 250 MHz	G, J, K	38 @ 250 MHz	54	83	4000	0.085	1100	-
SWI 0603 HP 16N □-□□	16 @ 250 MHz	G, J, K	38 @ 250 MHz	53	78	3300	0.085	1100	-
SWI 0603 HP 18N □-□□	18 @ 250 MHz	G, J, K	38 @ 250 MHz	51	71	3100	0.078	1200	-
SWI 0603 HP 22N □-□□	22 @ 250 MHz	G, J, K	40 @ 250 MHz	55	75	3000	0.120	950	-
SWI 0603 HP 23N □-□□	23 @ 250 MHz	G, J, K	40 @ 250 MHz	55	75	2850	0.120	950	-
SWI 0603 HP 24N □-□□	24 @ 250 MHz	G, J, K	40 @ 250 MHz	50	66	2650	0.080	1100	-
SWI 0603 HP 27N □-□□	27 @ 250 MHz	J, K	40 @ 250 MHz	53	68	2800	0.125	950	-
SWI 0603 HP 30N □-□□	30 @ 250 MHz	G, J, K	40 @ 250 MHz	55	66	2400	0.130	920	-
SWI 0603 HP 33N □-□□	33 @ 250 MHz	G, J, K	40 @ 250 MHz	51	55	2300	0.170	680	-
SWI 0603 HP 36N □-□□	36 @ 250 MHz	G, J, K	40 @ 250 MHz	55	63	2300	0.150	750	-
SWI 0603 HP 39N □-□□	39 @ 250 MHz	G, J, K	40 @ 250 MHz	55	58	2200	0.180	680	-
SWI 0603 HP 43N □-□□	43 @ 250 MHz	G, J, K	40 @ 250 MHz	52	53	2100	0.170	810	-
SWI 0603 HP 47N □-□□	47 @ 200 MHz	G, J, K	38 @ 200 MHz	51	50	2000	0.200	680	-
SWI 0603 HP 51N □-□□	51 @ 200 MHz	G, J, K	38 @ 200 MHz	50	46	1900	0.250	660	-
SWI 0603 HP 56N □-□□	56 @ 200 MHz	G, J, K	38 @ 200 MHz	53	46	1900	0.230	700	-
SWI 0603 HP 68N □-□□	68 @ 200 MHz	G, J, K	38 @ 200 MHz	50	39	1700	0.280	650	-
SWI 0603 HP 72N □-□□	72 @ 150 MHz	G, J, K	34 @ 150 MHz	50	38	1700	0.350	580	-
SWI 0603 HP 75N □-□□	75 @ 150 MHz	G, J, K	34 @ 150 MHz	46	35	1700	0.420	550	-
SWI 0603 HP 82N □-□□	82 @ 150 MHz	G, J, K	34 @ 150 MHz	51	36	1600	0.460	510	-
SWI 0603 HP 91N □-□□	91 @ 150 MHz	G, J, K	34 @ 150 MHz	48	33	1500	0.420	550	-
SWI 0603 HP R10 □-□□	100 @ 150 MHz	G, J, K	34 @ 150 MHz	52	32	1400	0.540	470	-
SWI 0603 HP R11 □-□□	110 @ 150 MHz	G, J, K	33 @ 150 MHz	46	29	1350	0.540	470	-
SWI 0603 HP R12 □-□□	120 @ 150 MHz	G, J, K	33 @ 150 MHz	50	33	1300	0.650	420	-
SWI 0603 HP R15 □-□□	150 @ 150 MHz	G, J, K	30 @ 150 MHz	46	22	1150	0.820	390	-
SWI 0603 HP R18 □-□□	180 @ 100 MHz	G, J, K	28 @ 100 MHz	48	20	1050	1.200	320	-
SWI 0603 HP R20 □-□□	200 @ 100 MHz	G, J, K	28 @ 100 MHz	45	10	1000	1.300	310	-
SWI 0603 HP R21 □-□□	210 @ 100 MHz	G, J, K	28 @ 100 MHz	48	12	1000	1.900	280	-
SWI 0603 HP R22 □-□□	220 @ 100 MHz	G, J, K	28 @ 100 MHz	47	16	950	1.900	280	-
SWI 0603 HP R25 □-□□	250 @ 100 MHz	G, J, K	28 @ 100 MHz	46	-	900	2.000	260	-
SWI 0603 HP R27 □-□□	270 @ 100 MHz	G, J, K	28 @ 100 MHz	48	-	900	2.200	260	-
SWI 0603 HP R30 □-□□	300 @ 100 MHz	G, J, K	28 @ 100 MHz	44	-	780	2.700	220	-
SWI 0603 HP R33 □-□□	330 @ 100 MHz	G, J, K	28 @ 100 MHz	43	-	750	2.900	200	-
SWI 0603 HP R36 □-□□	360 @ 100 MHz	G, J, K	28 @ 100 MHz	45	-	720	3.800	180	-
SWI 0603 HP R39 □-□□	390 @ 100 MHz	G, J, K	28 @ 100 MHz	43	-	700	3.800	180	-

1. When ordering, please specify **tolerance.**
   Tolerance : B=±0.20nH, S=±0.30nH, G=±2%, J=±5%, K=±10%
2. Q is measured in HP-4287A RF LCR meter with HP-16193 fixture.
3. SRF is measured in ENA E5071B network analyzer.
4. RDC is measured in HP-4338B millohmeter.
5. For 25 °C Rise.

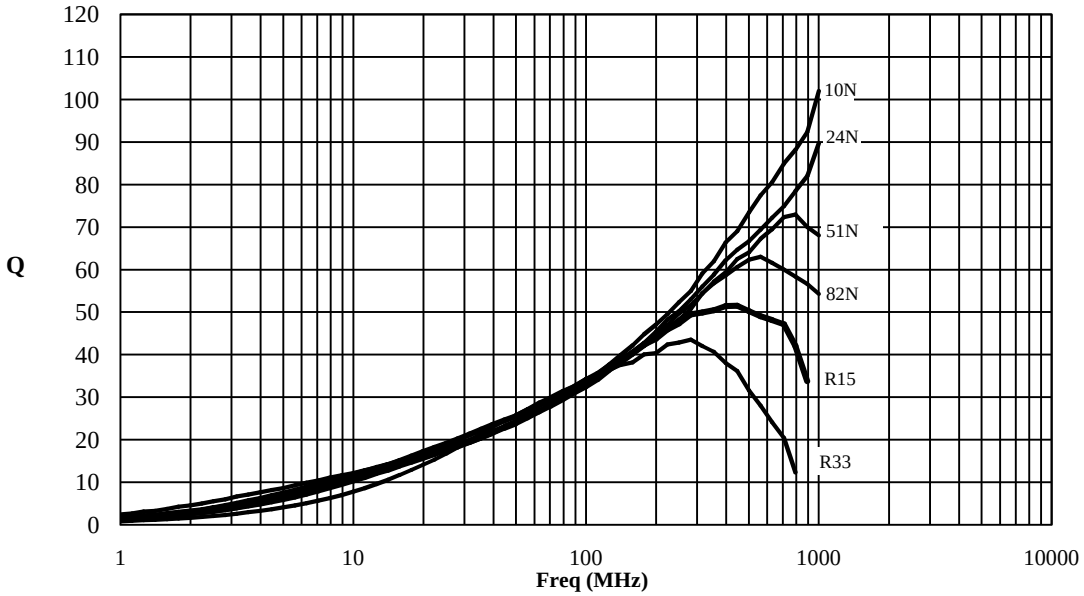
Unit weight = 0.0037g (for ref.)

SWI 0603HP (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 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 125 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 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 20-second maximum transition time between temperature extremes. Test duration is 10 cycles.	

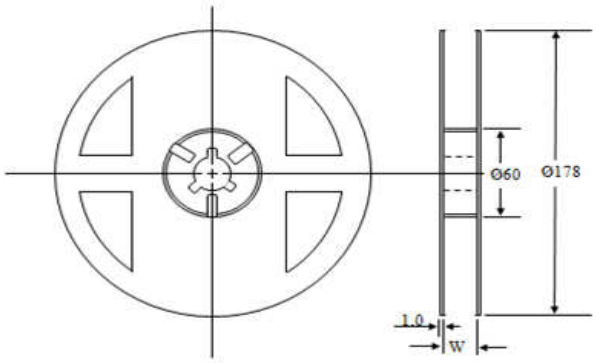
SPECIFICATION

	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% 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 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 - 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

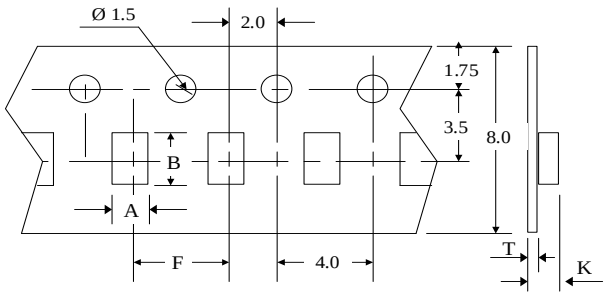
Packing Quantity

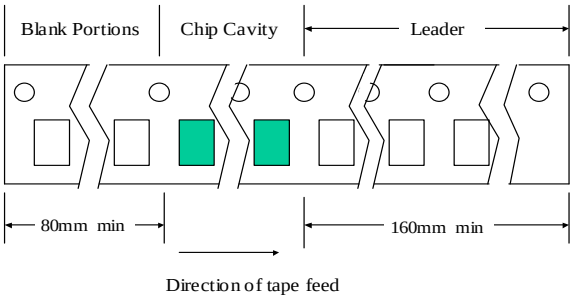
Type	Pcs / Reel
SWI0402HP	10,000
SWI0603HP	3,000



Dimensions (unit: m/m)

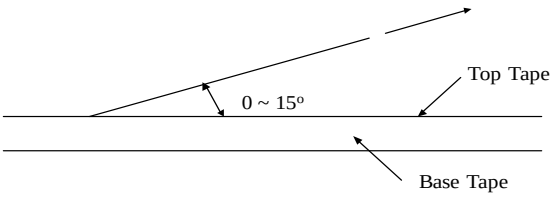
Type	Chip Cavity		Insert Pitch	Tape Thickness		
	A	B	F	K	T	W
SWI0402HP	0.70	1.20	2.00	-	0.70	8.00
SWI0603HP	1.15	1.80	4.00	0.95	0.20	8.00





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
SWI0402HP	1.20	0.45	0.65
SWI0603HP	1.92	0.64	1.27

Recommended Pattern