

# WIRE WOUND CHIP INDUCTORS SWI 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

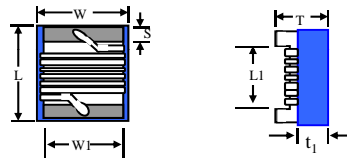
- \* Operating temperature -40 to +125 °C for ceramic series and -40 to +85°C for ferrite series.
- \* Excellent solderability and resistance to soldering heat .
- \* Suitable for reflow soldering..
- \* High reliability and easy surface mount assembly.
- \* Wide range of inductance values are available for flexible needs.
- \* Consisting of 0402 ~ 1210 size.

## PART NUMBER

**SWI 1210 C T 33N J -□□**  
**1 2 3 Taping 4 5 6 (Internal Code)**

### 1 Product Type

### 2 Chip Dimension



| Size<br>(inch)<br>mm | Length (L)<br>(inch)<br>mm     | Width (W)<br>(inch)<br>mm      | Thickness (T)<br>(inch)<br>mm  | Terminal (S)<br>(inch)<br>mm   | CT Type        |                | FT Type        |                | (t <sub>1</sub> )<br>(Ref.)<br>mm |
|----------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|
|                      |                                |                                |                                |                                | L1(Ref.)<br>mm | W1(Ref.)<br>mm | L1(Ref.)<br>mm | W1(Ref.)<br>mm |                                   |
| SWI 0402<br>1005     | (0.039 ± 0.004)<br>1.00 ± 0.10 | (0.022 ± 0.004)<br>0.55 ± 0.10 | (0.020 ± 0.004)<br>0.50 ± 0.10 | (0.008 ± 0.004)<br>0.20 ± 0.10 | 0.60           | 0.48           | -              | -              | 0.20                              |
| SWI 0603<br>1608     | (0.063 ± 0.008)<br>1.60 ± 0.20 | (0.041 ± 0.008)<br>1.05 ± 0.20 | (0.041 ± 0.008)<br>1.05 ± 0.20 | (0.014 ± 0.004)<br>0.35 ± 0.10 | 0.80           | 0.95           | -              | -              | 0.50                              |
| SWI 0805<br>2012     | (0.080 ± 0.008)<br>2.00 ± 0.20 | (0.050 ± 0.008)<br>1.25 ± 0.20 | (0.048 ± 0.008)<br>1.20 ± 0.20 | (0.016 ± 0.004)<br>0.40 ± 0.10 | 1.10           | 1.15           | 1.20           | *0.95~1.2      | 0.60                              |
| SWI 1008<br>2520     | (0.102 ± 0.008)<br>2.60 ± 0.20 | (0.083 ± 0.008)<br>2.10 ± 0.20 | (0.067 ± 0.008)<br>1.70 ± 0.20 | (0.020 ± 0.004)<br>0.50 ± 0.10 | 1.40           | 1.90           | 1.40           | *1.60~1.9      | 0.70                              |
| SWI 1210<br>3225     | (0.126 ± 0.008)<br>3.20 ± 0.20 | (0.102 ± 0.008)<br>2.60 ± 0.20 | (0.083 ± 0.008)<br>2.10 ± 0.20 | (0.020 ± 0.004)<br>0.50 ± 0.10 | 2.05           | 2.10           | 2.10           | 2.40           | 1.10                              |

### 3 Material Type

C : Ceramic Material      F : Ferrite Material

### 4 Inductance Value

3N3 = 3.3 nH      R33 = 330 nH      330 = 33 uH  
 33N = 33 nH      3R3 = 3.3 uH      101 = 100 uH

### 5 Tolerance

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

### 6 Internal Code

SWI0805FT Type      SWI1008FT Type  
 \* 0.95mm: -KY      \* 1.60mm: -KY  
 \* 1.20mm: -02, -30      \* 1.90mm: -02, -30

## 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.
- \*Ferrite Type : For higher inductance at lower frequency circuit requirement.

### 2 Construction

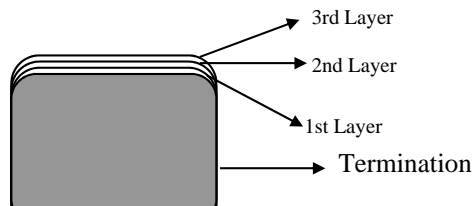
- \*Configuration & Dimension : Please refer to the attached figures and tables.
- \*Terminals : SWI series terminals shall consist of MoMn alloy or PdAg alloy followed by Nickel, then Au or solder plating for easier soldering.

### 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
- : Ferrite Material : - 40°C to + 85°C

### 4 Ingredient of terminals electrode.



|              | <u>Ceramic Type</u> | <u>Ferrite Type</u> |
|--------------|---------------------|---------------------|
| a) 1st layer | : Mo/Mn or W or Ag  | Ag/Pd               |
| b) 2nd layer | : Nickel            | Nickel              |
| c) 3rd layer | : Gold              | Sn                  |

### 5 Characteristics

#### Standard Atmospheric Conditions

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

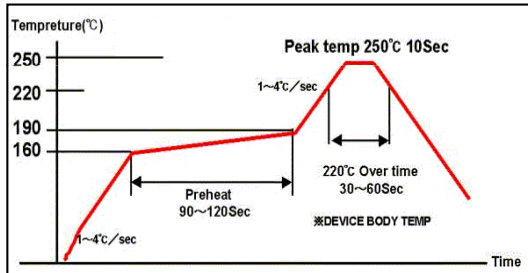
- Ambient Temperature : 25 °C ± 2 °C
- Relative Humidity : 60% to 70%
- Air Pressure : 86 Kpa to 106 Kpa

# CHIP INDUCTOR SPECIFICATIONS

## TEMPERATURE PROFILE

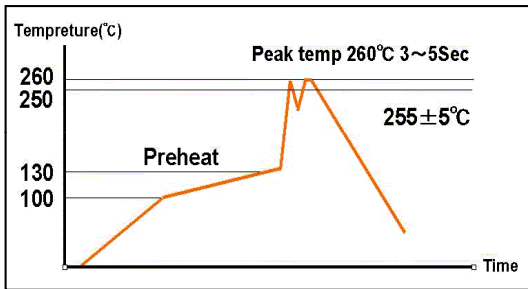
### a Reflow temperature profile

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



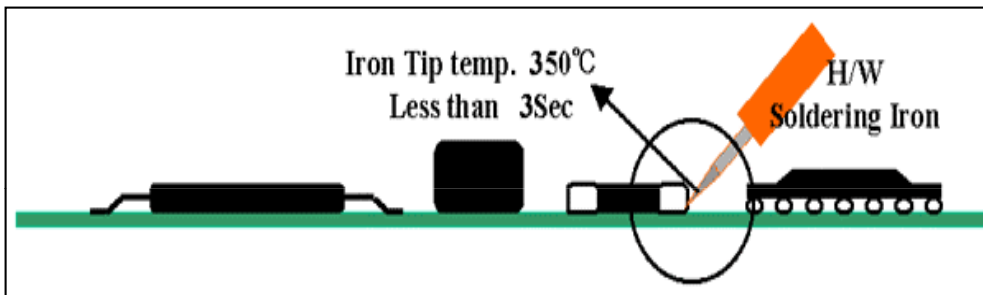
Recommended Peak Temperature: 250°C Max  
 250°C up /within 10secs  
 Max. Reflow temperature : 260°C.  
 Gradient of temperature rise: av 1-4°C/sec  
 Preheat: 160-190°C/within 90-120secs  
 220°C up /within 30-60secs  
 Composition of solder Sn-3Ag-0.5Cu

### 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 : 350°C max / within 3 seconds.



WIRE WOUND CHIP INDUCTOR

**SWI 0805 (2012) FERRITE SERIES**

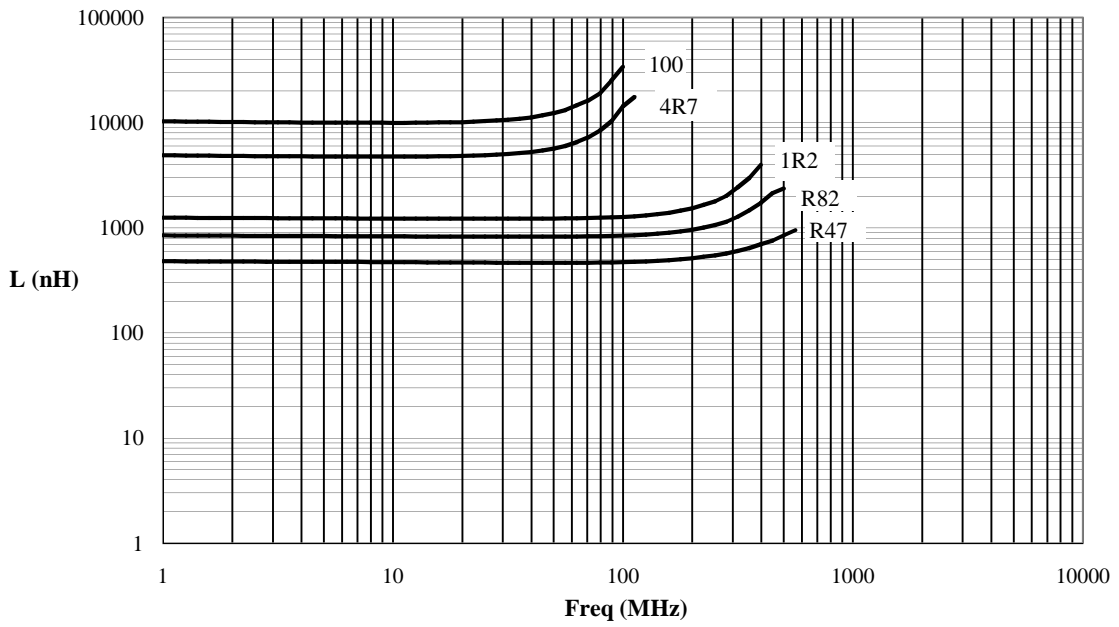
| Part No.             | Inductance <sup>1</sup><br>(uH) | Percent<br>Tolerance | Q <sup>2</sup><br>Min | S.R.F. <sup>3</sup> |            | RDC <sup>4</sup> |     | IDC <sup>5</sup><br>Max<br>(mA) | Marking |
|----------------------|---------------------------------|----------------------|-----------------------|---------------------|------------|------------------|-----|---------------------------------|---------|
|                      |                                 |                      |                       | Min<br>(MHz)        | Max<br>(Ω) | Max              | Min |                                 |         |
| SWI 0805 FT R47 □-□□ | 0.47 @ 25.2 MHz                 | K, J                 | 45 @ 100 MHz          | 375                 | 0.95       | 500              | R47 |                                 |         |
| SWI 0805 FT R56 □-□□ | 0.56 @ 25.2 MHz                 | K, J                 | 45 @ 100 MHz          | 340                 | 1.10       | 450              | R56 |                                 |         |
| SWI 0805 FT R68 □-□□ | 0.68 @ 25.2 MHz                 | K, J                 | 35 @ 100 MHz          | 188                 | 1.20       | 400              | R68 |                                 |         |
| SWI 0805 FT R82 □-□□ | 0.82 @ 25.2 MHz                 | K, J                 | 35 @ 100 MHz          | 215                 | 1.50       | 300              | R82 |                                 |         |
| SWI 0805 FT 1R0 □-□□ | 1.0 @ 25.2 MHz                  | K, J                 | 35 @ 50 MHz           | 200                 | 2.13       | 180              | 1R0 |                                 |         |
| SWI 0805 FT 1R2 □-□□ | 1.2 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 200                 | 2.60       | 150              | 1R2 |                                 |         |
| SWI 0805 FT 1R5 □-□□ | 1.5 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 200                 | 2.90       | 130              | 1R5 |                                 |         |
| SWI 0805 FT 1R8 □-□□ | 1.8 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 120                 | 3.00       | 120              | 1R8 |                                 |         |
| SWI 0805 FT 2R2 □-□□ | 2.2 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 110                 | 3.10       | 110              | 2R2 |                                 |         |
| SWI 0805 FT 2R7 □-□□ | 2.7 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 100                 | 3.50       | 100              | 2R7 |                                 |         |
| SWI 0805 FT 3R3 □-□□ | 3.3 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 70                  | 2.30       | 210              | 3R3 |                                 |         |
| SWI 0805 FT 3R9 □-□□ | 3.9 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 60                  | 2.50       | 200              | 3R9 |                                 |         |
| SWI 0805 FT 4R7 □-□□ | 4.7 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 50                  | 2.80       | 180              | 4R7 |                                 |         |
| SWI 0805 FT 5R6 □-□□ | 5.6 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 45                  | 3.00       | 160              | 5R6 |                                 |         |
| SWI 0805 FT 6R8 □-□□ | 6.8 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 45                  | 3.20       | 130              | 6R8 |                                 |         |
| SWI 0805 FT 8R2 □-□□ | 8.2 @ 7.96 MHz                  | K, J                 | 15 @ 7.96 MHz         | 40                  | 3.50       | 120              | 8R2 |                                 |         |
| SWI 0805 FT 100 □-□□ | 10 @ 2.52 MHz                   | K, J                 | 15 @ 2.52 MHz         | 40                  | 5.00       | 80               | 100 |                                 |         |
| SWI 0805 FT 150 □-□□ | 15 @ 2.52 MHz                   | K, J                 | 15 @ 2.52 MHz         | 40                  | 3.20       | 80               | 150 |                                 |         |

1. Inductance is measured in HP-4285A Precision LCR meter/  
HP-4287A RF LCR meter with HP-16193 fixture.
2. Q is measured in HP-4285A Precision LCR meter,  
HP-4287A RF LCR meter with HP-16193 fixture.

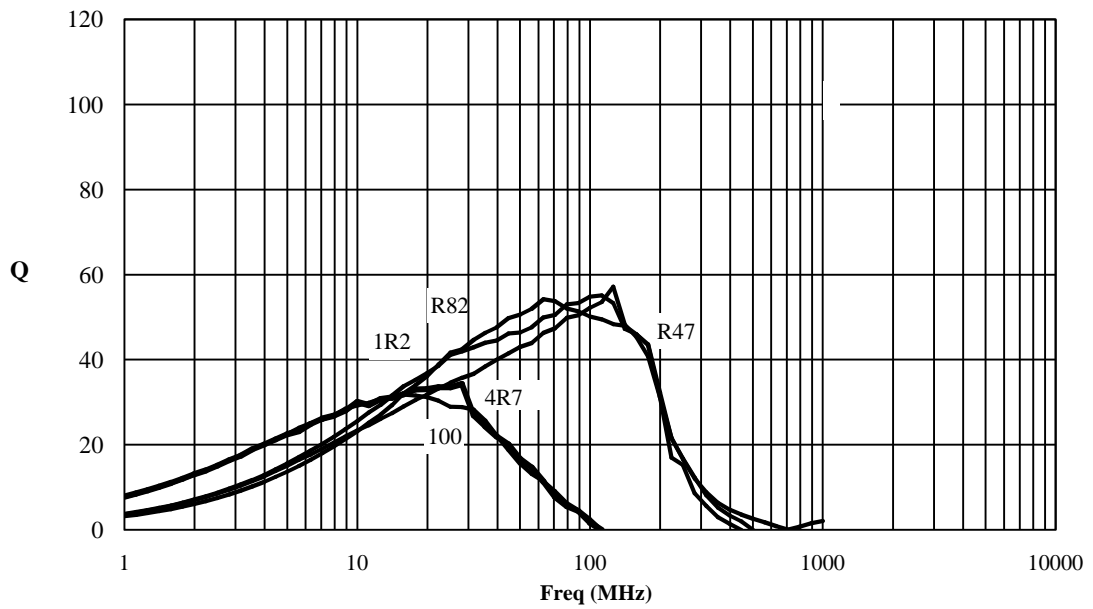
3. SRF is measured in ENA E5071B network analyzer
4. RDC is measured in HP-4338B milliohmmeter.
5. For 15 °C Rise.  
Unit weight = 0.0084g ( for ref. )

**SWI 0805 (2012) FERRITE SERIES**

**L vs Freq Plot**



**Q vs Freq Plot**



**SPECIFICATION**

|                                   | ITEM  | CONDITION  | SPECIFICATION  |
|-----------------------------------|---|--|--|
| <b>Mechanical Characteristics</b> | Inductance and Tolerance                    | Measuring Frequency :<br>As shown in Product Table   | Within Specified Tolerance   |
|                                   | Quality Factor                              | Measuring Temperature :<br>+ 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 + 85°C at frequency specified in Product Table.  | + 25 to 500 ppm / °C<br><br>TCL = $\frac{L1 - L2}{L1(T1-T2)} \times 10^6$ (ppm /°C)  |
|                                   | <b>Electrical Characteristics</b>           | Component Adhesion (Push Test)   | The component shall be reflow soldered onto a P. C. Board ( 240 °C ± 5°C for 20 seconds ). Then a dynamometer force gauge shall be applied to any side of the component. |
| Drop Test                         |   | The inductor shall be dropped two times on the concrete floor or the vinyl tile from 1M naturally.   | Change In Inductance:<br>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:<br>No more than 10%<br><br>Change In Appearance:<br>Without distinct damage   |

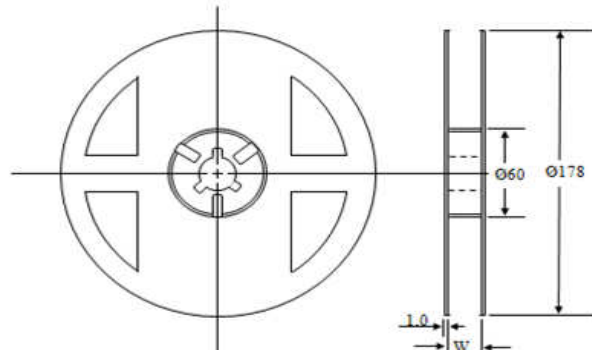
## SPECIFICATION

|                                      | ITEM                         | CONDITION  | SPECIFICATION   |
|--------------------------------------|------------------------------|--|---|
| <b>Endurance<br/>Characteristics</b> | Solderability                | Dip pads in flux and dip in solder pot containing lead free solder at $240\text{ }^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 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 $260\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for $5 \pm 2$ seconds.   | Change In Inductance:<br>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:<br>No more than 10%                                    |
|                                      | Cold Temperature Storage     | Inductors shall be stored at temperature of $-40\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ 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 :<br>Without distinct damage                   |
|                                      | High Temperature Storage     | Inductors shall be stored at temperature of $85\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ 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 $45\text{ }^{\circ}\text{C}$ 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 $+85\text{ }^{\circ}\text{C}$ 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

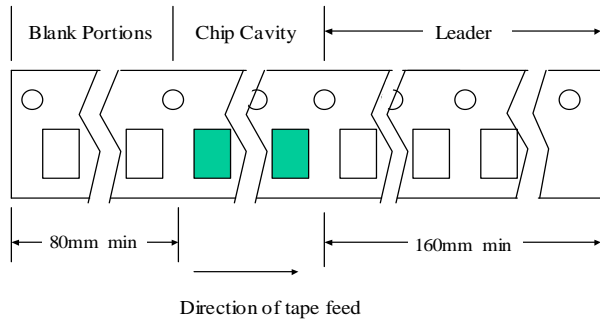
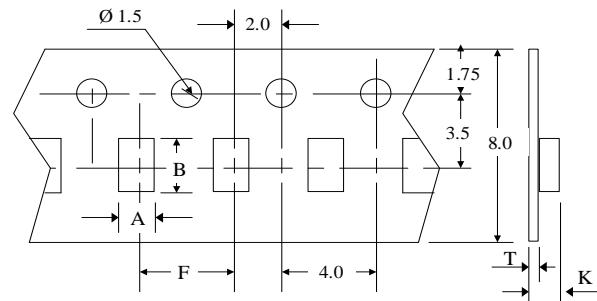
**Packing Quantity**

| Type    | Pcs / Reel |
|---------|------------|
| SWI0402 | 10,000     |
| SWI0603 | 3,000      |
| SWI0805 | 2,000      |
| SWI1008 | 2,000      |
| SWI1210 | 2,000      |



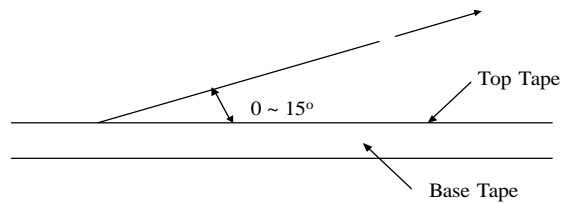
**Dimensions (unit: m/m)**

| Type    | Chip Cavity |      | Insert Pitch | Tape Thickness |      |      |
|---------|-------------|------|--------------|----------------|------|------|
|         | A           | B    | F            | K              | T    | W    |
| SWI0402 | 0.70        | 1.20 | 2.00         | -              | 0.70 | 8.00 |
| SWI0603 | 1.40        | 1.90 | 4.00         | 1.15           | 0.20 | 8.00 |
| SWI0805 | 1.42        | 2.26 | 4.00         | 1.30           | 0.20 | 8.00 |
| SWI1008 | 2.23        | 2.73 | 4.00         | 1.80           | 0.20 | 8.00 |
| SWI1210 | 2.69        | 3.56 | 4.00         | 2.40           | 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    |
|---------|------|------|------|
| SWI0402 | 1.20 | 0.45 | 0.65 |
| SWI0603 | 1.90 | 0.65 | 1.00 |
| SWI0805 | 2.60 | 0.75 | 1.30 |
| SWI1008 | 3.00 | 1.20 | 2.20 |
| SWI1210 | 4.00 | 1.70 | 2.82 |

**Recommended Pattern**

