

# 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 °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.

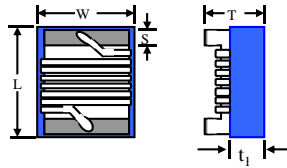
## PART NUMBER

**SWI 0603 HP 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.

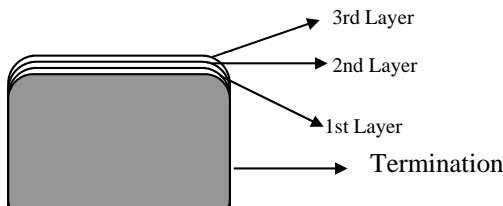
\*Terminals : SWI series terminals shall consist of MoMn alloy followed by Nickel, then Au plating for easier soldering.

**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

**4 Ingredient of terminals electrode.**



	<u><b>SWI0402HP</b></u>	<u><b>SWI0603HP</b></u>
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 :

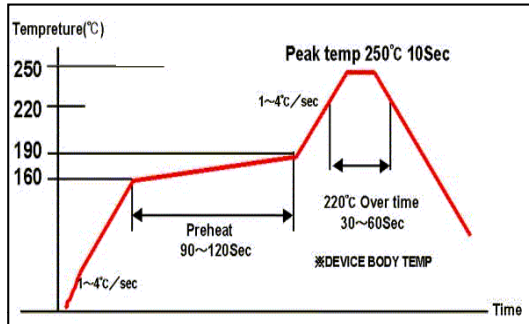
- \*Ambient Temperature : 25 °C ± 2 °C
- \*Relative Humidity : 60% to 70%
- \*Air Pressure : 86 Kpa to 106 Kpa

# CHIP INDUCTOR SPECIFICATIONS

## TEMPERATURE PROFILE

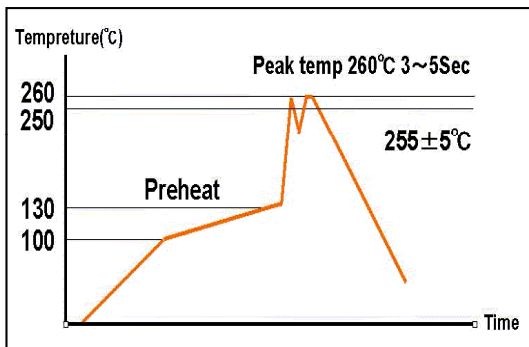
### a Reflow temperature profile

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



Recommended Peak Temperature: 250°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

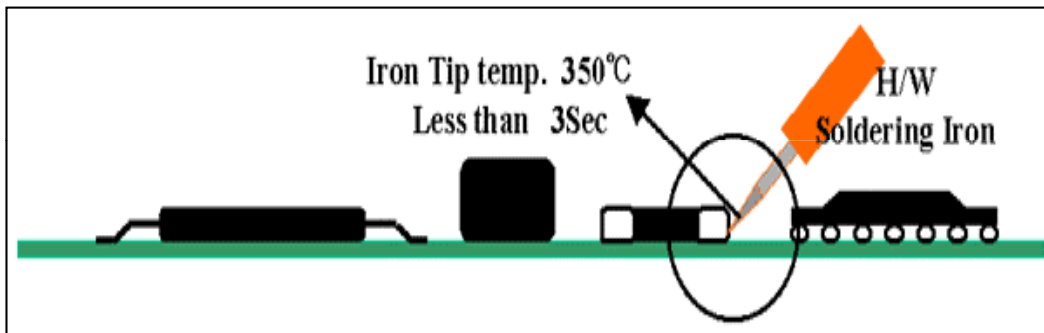
### b Dip temperature



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 :

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



WIRE WOUND CHIP INDUCTOR

**SWI0402HP (1005) CERAMIC SERIES**

Part No.	Inductance <sup>1</sup> (nH)	Percent Tolerance	Q <sup>2</sup> Min	S.R.F. <sup>3</sup> Min (MHz)	RDC <sup>4</sup> Max (Ω)	IDC <sup>5</sup> Max (mA)
SWI 0402 HP 2N0 □-□□	2.0 @ 250 MHZ	B, S	22	8500	0.038	2100
SWI 0402 HP 2N2 □-□□	2.2 @ 250 MHZ	B, S	22	8500	0.038	2100
SWI 0402 HP 2N7 □-□□	2.7 @ 250 MHZ	B, S	22	8500	0.056	1500
SWI 0402 HP 3N3 □-□□	3.3 @ 250 MHZ	K, J, B	23	8500	0.045	1700
SWI 0402 HP 3N6 □-□□	3.6 @ 250 MHZ	K, J, B	23	8500	0.045	1700
SWI 0402 HP 3N9 □-□□	3.9 @ 250 MHZ	K, J, B	23	8500	0.045	1700
SWI 0402 HP 4N3 □-□□	4.3 @ 250 MHZ	K, J, B	22	7150	0.055	1500
SWI 0402 HP 4N7 □-□□	4.7 @ 250 MHZ	K, J, B	20	6850	0.075	1400
SWI 0402 HP 5N1 □-□□	5.1 @ 250 MHZ	K, J, B	23	6800	0.085	1300
SWI 0402 HP 5N6 □-□□	5.6 @ 250 MHZ	K, J, B	23	6500	0.055	1500
SWI 0402 HP 6N2 □-□□	6.2 @ 250 MHZ	K, J, B	25	5800	0.065	1400
SWI 0402 HP 6N8 □-□□	6.8 @ 250 MHZ	K, J, B	25	5800	0.065	1400
SWI 0402 HP 7N5 □-□□	7.5 @ 250 MHZ	K, J, B	25	5400	0.080	1400
SWI 0402 HP 8N2 □-□□	8.2 @ 250 MHZ	K, J, B	25	5400	0.085	1300
SWI 0402 HP 8N7 □-□□	8.7 @ 250 MHZ	K, J, B	25	5000	0.085	1300
SWI 0402 HP 9N0 □-□□	9.0 @ 250 MHZ	K, J, B	25	5000	0.085	1300
SWI 0402 HP 9N5 □-□□	9.5 @ 250 MHZ	K, J, B	25	4700	0.095	1200
SWI 0402 HP 10N □-□□	10 @ 250 MHZ	K, J, G	25	4700	0.085	1300
SWI 0402 HP 11N □-□□	11 @ 250 MHZ	K, J, G	25	4700	0.090	1300
SWI 0402 HP 12N □-□□	12 @ 250 MHZ	K, J, G	26	4400	0.090	1100
SWI 0402 HP 13N □-□□	13 @ 250 MHZ	K, J, G	25	4200	0.140	900
SWI 0402 HP 15N □-□□	15 @ 250 MHZ	K, J, G	26	3900	0.130	1000
SWI 0402 HP 16N □-□□	16 @ 250 MHZ	K, J, G	26	3700	0.130	850
SWI 0402 HP 18N □-□□	18 @ 250 MHZ	K, J, G	26	3550	0.140	850
SWI 0402 HP 19N □-□□	19 @ 250 MHZ	K, J, G	26	3500	0.145	850
SWI 0402 HP 20N □-□□	20 @ 250 MHZ	K, J, G	26	3500	0.155	800
SWI 0402 HP 21N □-□□	21 @ 250 MHZ	K, J, G	26	3300	0.160	800
SWI 0402 HP 22N □-□□	22 @ 250 MHZ	K, J, G	26	3300	0.160	800
SWI 0402 HP 23N □-□□	23 @ 250 MHZ	K, J, G	26	3300	0.190	700
SWI 0402 HP 24N □-□□	24 @ 250 MHZ	K, J, G	26	3150	0.180	650
SWI 0402 HP 25N □-□□	25 @ 250 MHZ	K, J, G	25	3150	0.180	650
SWI 0402 HP 26N □-□□	26 @ 250 MHZ	K, J, G	25	3150	0.170	700
SWI 0402 HP 27N □-□□	27 @ 250 MHZ	K, J, G	26	3200	0.220	600
SWI 0402 HP 30N □-□□	30 @ 250 MHZ	K, J, G	25	2900	0.275	500
SWI 0402 HP 33N □-□□	33 @ 250 MHZ	K, J, G	25	2800	0.320	490
SWI 0402 HP 36N □-□□	36 @ 250 MHZ	K, J, G	26	2800	0.360	480
SWI 0402 HP 37N □-□□	37 @ 250 MHZ	K, J, G	25	2700	0.430	470
SWI 0402 HP 39N □-□□	39 @ 250 MHZ	K, J, G	25	2600	0.430	450
SWI 0402 HP 40N □-□□	40 @ 250 MHZ	K, J, G	26	2600	0.430	450
SWI 0402 HP 43N □-□□	43 @ 250 MHZ	K, J, G	26	2500	0.500	450
SWI 0402 HP 47N □-□□	47 @ 200 MHZ	K, J, G	22	2400	0.550	420
SWI 0402 HP 51N □-□□	51 @ 200 MHZ	K, J	22	2300	0.750	360
SWI 0402 HP 56N □-□□	56 @ 200 MHZ	K, J	22	2070	0.850	330
SWI 0402 HP 68N □-□□	68 @ 200 MHZ	K, J	22	1840	0.950	320

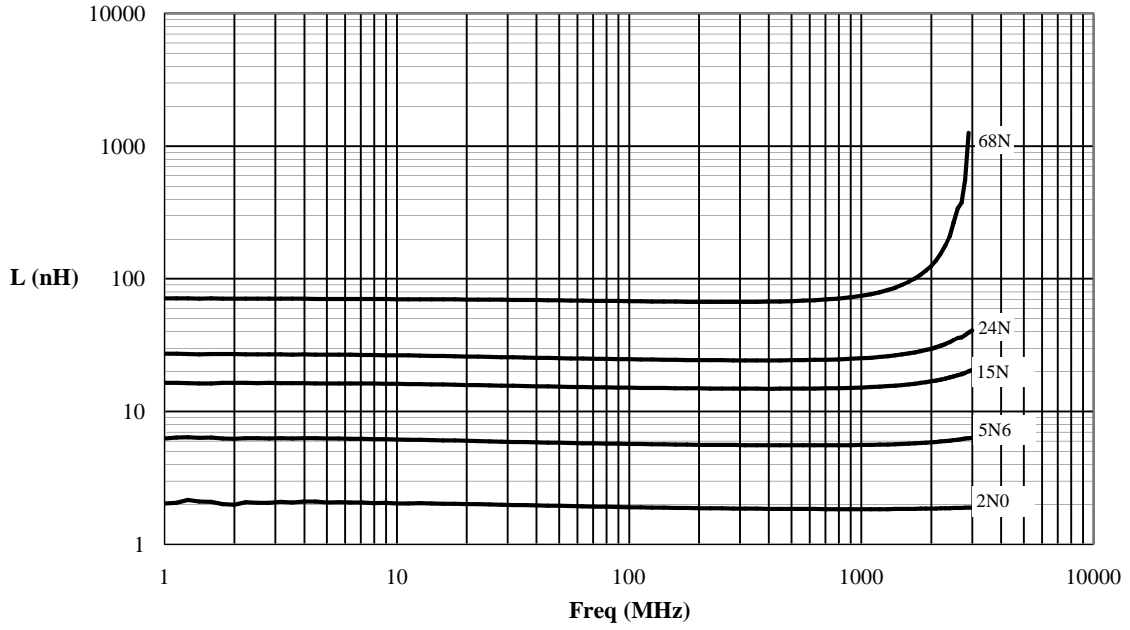
- When ordering, please specify **tolerance**  
Tolerance : B=±0.20nH, S=±0.30nH, G=±2%, J=±5%, K=±10%
- Inductance is measured in HP-4287A RF LCR meter with HP-16193 fixture.
- SRF is measured in ENA E5071B network analyzer

- RDC is measured in HP-4338B millohmmeter.
- For 25 °C Rise.

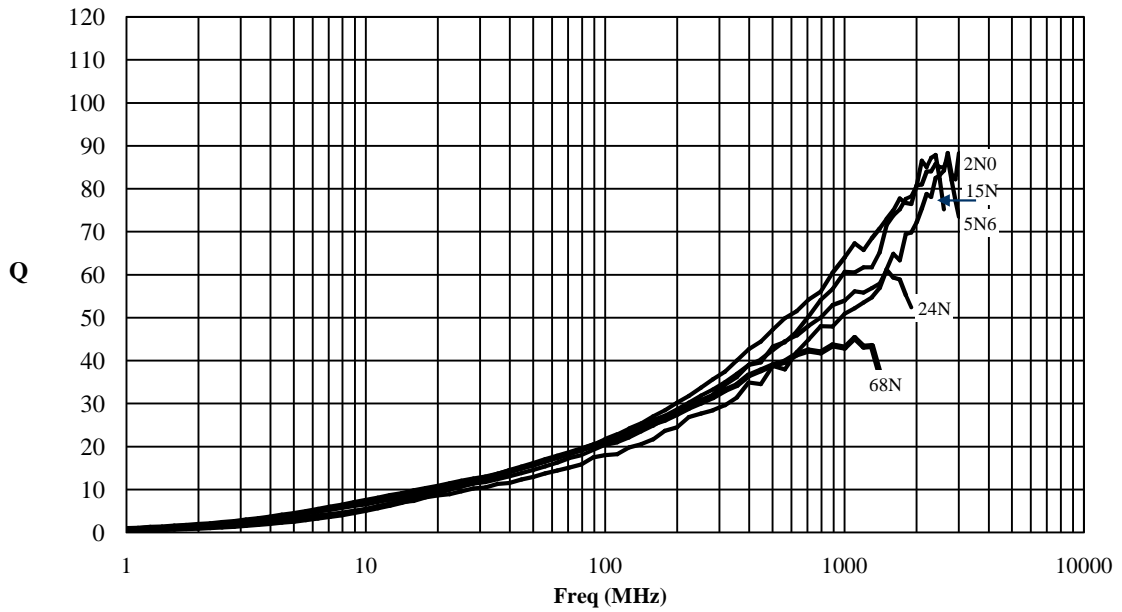
Remarks:  
Unit weight = 0.0008g ( for ref. )  
Without marking on the top surface of the produ

**SWI 0402HP (1005) CERAMIC SERIES**

**L vs Freq Plot**



**Q vs Freq Plot**



**SPECIFICATION**

	ITEM	CONDITION	SPECIFICATION
<b>Mechanical Characteristics</b>	Inductance and Tolerance	Measuring Frequency : As shown in Product Table	Within Specified Tolerance
	Quality Factor	Measuring Temperature : + 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 125 ppm / °C $TCL = \frac{L1 - L2}{L1(T1-T2)} \times 10^6$ (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: 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: No more than 10%  Change In Appearance: Without distinct damage

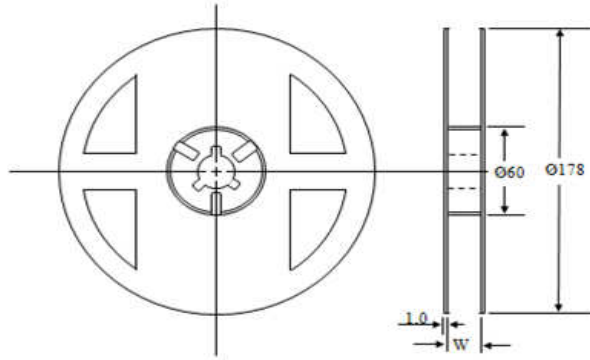
**SPECIFICATION**

	ITEM	CONDITION	SPECIFICATION
<b>Endurance Characteristics</b>	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%
	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: No more than 10%
	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.	Change In Appearance : Without distinct damage
	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

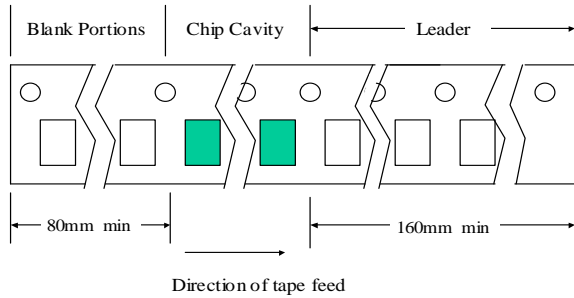
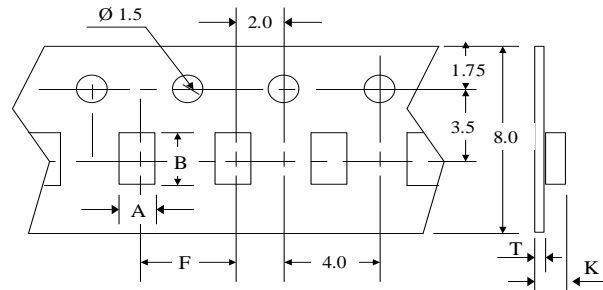
**Packing Quantity**

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



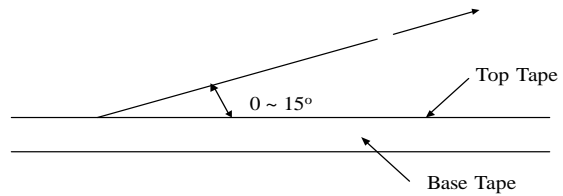
**Dimensions (unit: m/m)**

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**

