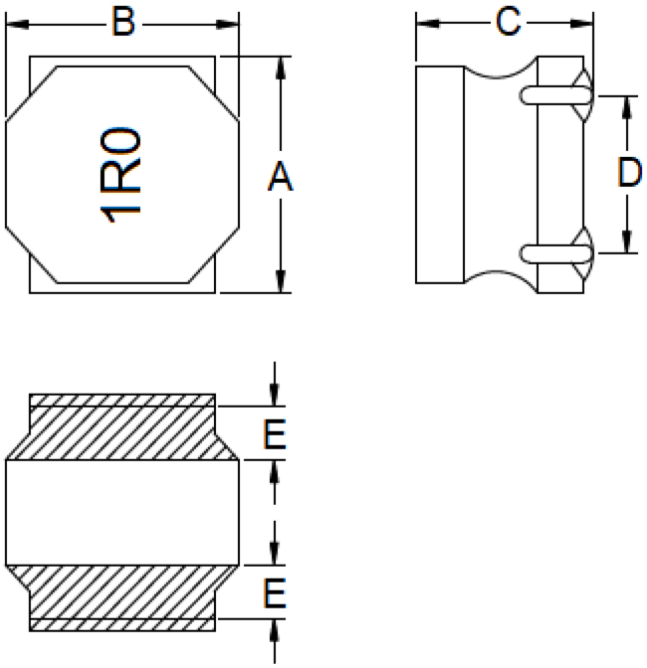
1. Part No. Expression

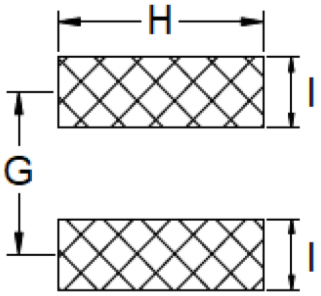
P N S Q 6 0 4 5 1 R 0 Y W F

(a) (b) (c) (d) (e) (f)

(a)	Series Code	(d)	Tolerance Code
(b)	Dimension Code	(e)	Special Code
(c)	Inductance Code	(f)	Packaging Code

2. Configuration & Dimensions (Unit: mm)





Recommended PCB Layout

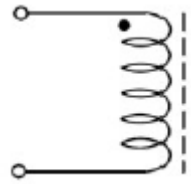
Note: 1. The above PCB layout reference only.

2. Recommend solder paste thickness at 0.12 mm and above.

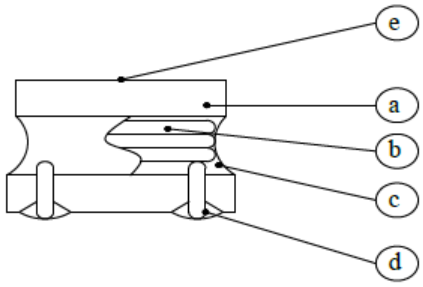
3. Marking: Inductance Code

A	B	C	D	E	G	H	I
6.00±0.20	6.00±0.20	4.50 Max	4.00±0.20	1.35±0.20	4.70 Ref	5.70 Ref	1.60 Ref

3. Schematic



4. Material List



(a) Core
(b) Wire (180°C)
(c) Adhesive
(d) Terminal
(e) Ink

5. General Specifications

(a) Reliability test for this part meets AEC-Q200 standard.
(b) Operating Temp.: -40°C to +125°C (including self-temperature rise)
(c) Storage Temp.: -40°C to +125°C (on board)
(d) All test data referenced to 25°C ambient.
(e) Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT of 40°C.
(f) Saturation Current (Isat) will cause inductance L0 to drop 30% Max.
(g) Rated Current: The lower value of Isat and Irms.
(h) Storage Condition (Component in its packaging)
    i) Temperature: Less than 40°C
    ii) Humidity: Less than 60% RH

NOTE: Specifications subject to change without notice. Please check our website for latest information.

6. Electrical Characteristics

Part Number	Inductance (μH) @0A	Test Frequency	SRF (MHz) Typ	DCR (Ω) ±30%	Isat (A) Max	Irms (A) Max	Marking
PNSQ60451R0YWF	1.0±30%	1V/100KHz	110	0.014	8.5	4.2	1R0
PNSQ60451R2YWF	1.2±30%	1V/100KHz	100	0.016	8.0	4.0	1R2
PNSQ60451R3YWF	1.3±30%	1V/100KHz	95	0.016	8.0	4.0	1R3
PNSQ60451R5YWF	1.5±30%	1V/100KHz	65	0.018	7.0	3.7	1R5
PNSQ60451R8YWF	1.8±30%	1V/100KHz	60	0.018	7.0	3.7	1R8
PNSQ60452R0YWF	2.0±30%	1V/100KHz	52	0.021	6.0	3.5	2R0
PNSQ60452R2YWF	2.2±30%	1V/100KHz	52	0.021	6.0	3.5	2R2
PNSQ60452R3YWF	2.3±30%	1V/100KHz	52	0.021	6.0	3.5	2R3
PNSQ60453R0YWF	3.0±30%	1V/100KHz	35	0.024	5.0	3.2	3R0
PNSQ60453R3YWF	3.3±30%	1V/100KHz	32	0.024	5.0	3.2	3R3
PNSQ60453R6MWF	3.6±20%	1V/100KHz	28	0.028	4.4	3.1	3R6
PNSQ60454R5MWF	4.5±20%	1V/100KHz	25	0.031	4.0	3.0	4R5
PNSQ60454R7MWF	4.7±20%	1V/100KHz	24	0.031	4.0	3.0	4R7
PNSQ60455R6MWF	5.6±20%	1V/100KHz	23	0.036	3.9	2.9	5R6
PNSQ60456R3MWF	6.3±20%	1V/100KHz	15	0.038	3.8	2.8	6R3
PNSQ60456R8MWF	6.8±20%	1V/100KHz	14	0.038	3.8	2.8	6R8
PNSQ6045100MWF	10.0±20%	1V/100KHz	12	0.047	3.0	2.5	100
PNSQ6045150MWF	15.0±20%	1V/100KHz	10	0.077	2.3	1.9	150
PNSQ6045220MWF	22.0±20%	1V/100KHz	7	0.115	1.9	1.5	220
PNSQ6045330MWF	33.0±20%	1V/100KHz	6	0.145	1.5	1.4	330
PNSQ6045470MWF	47.0±20%	1V/100KHz	5	0.220	1.3	1.1	470

Note: Tolerance M= ±20%, Y=±30%

NOTE: Specifications subject to change without notice. Please check our website for latest information.

Part Number	Inductance (μH) @0A	Test Frequency	SRF (MHz) Typ	DCR (Ω) ±30%	Isat (A) Max	Irms (A) Max	Marking
PNSQ6045560MWF	56.0±20%	1V/100KHz	4.5	0.310	1.1	1.0	560
PNSQ6045680MWF	68.0±20%	1V/100KHz	4	0.330	1.0	0.90	680
PNSQ6045820MWF	82.0±20%	1V/100KHz	3.9	0.460	0.90	0.80	820
PNSQ6045101MWF	100.0±20%	1V/100KHz	3	0.500	0.80	0.70	101
PNSQ6045121MWF	120.0±20%	1V/100KHz	3	0.620	0.75	0.70	121
PNSQ6045151MWF	150.0±20%	1V/100KHz	2.8	0.800	0.70	0.65	151
PNSQ6045181MWF	180.0±20%	1V/100KHz	2.6	0.930	0.65	0.60	181
PNSQ6045221MWF	220.0±20%	1V/100KHz	2.4	1.200	0.60	0.50	221
PNSQ6045331MWF	330.0±20%	1V/100KHz	2.2	1.800	0.50	0.40	331
PNSQ6045471MWF	470.0±20%	1V/100KHz	2.0	2.000	0.40	0.35	471

Note: Tolerance M= ±20%, Y=±30%

7. Soldering Specification

Mildly activated rosin fluxes are preferred. Our terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

7-1. IR Soldering Reflow

Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020F).

7-2. Iron Reflow

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended (Figure 2).

Note:

(a) Preheat circuit and products to 150°C.

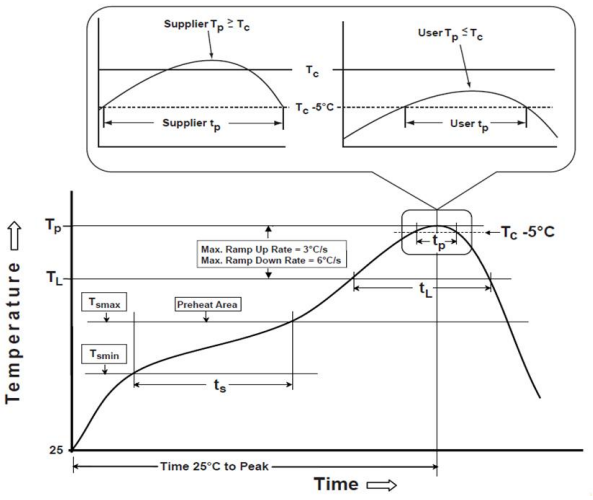
(b) 350°C tip temperature (Max.)

(c) Never contact the ceramic with the iron tip

(d) 1.0mm tip diameter (Max.)

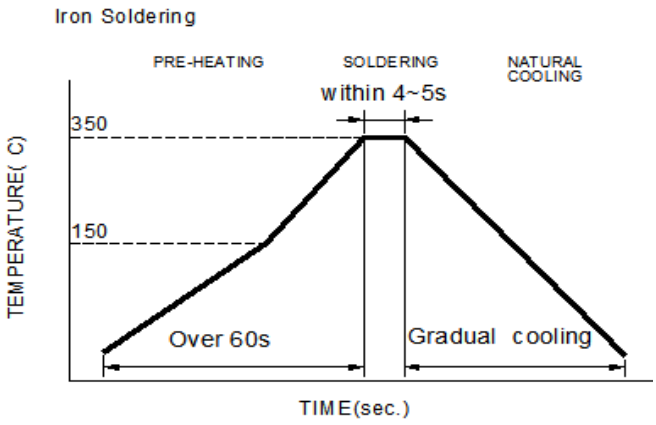
(e) Use a 20 watt soldering iron with tip diameter of 1.0mm

(f) Limit soldering time to 4~5 sec.



Reflow times: 3 times Max

Figure 1: IR Soldering Reflow



Iron Soldering times：1 times max

Figure 2: Iron soldering temperature profiles

NOTE: Specifications subject to change without notice. Please check our website for latest information.

Table (1.1) Reflow Profiles

Profile Type:	Pb-Free Assembly
Preheat -Temperature Min (T_{smin}) -Temperature Max (T_{smax}) -Time (t_s) from (T_{smin} to T_{smax})	 150°C 200°C 60-120seconds
Ramp-up rate ($T_L$to T_p)	3°C /second max.
Liquids temperature (T_L) Time (t_L) maintained above T_L	217°C 60-150 seconds
Classification temperature (T_c)	See Table (1.2)
Time (t_p) at Tc- 5°C (Tp should be equal to or less than Tc.)	< 30 seconds
Ramp-down rate (T_p to T_L)	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

Tp: maximum peak package body temperature, **Tc**: the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc.**

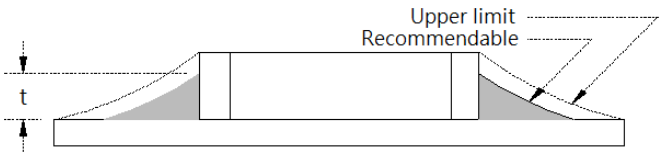
Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

	Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020F.

7-3. Soldering Volume

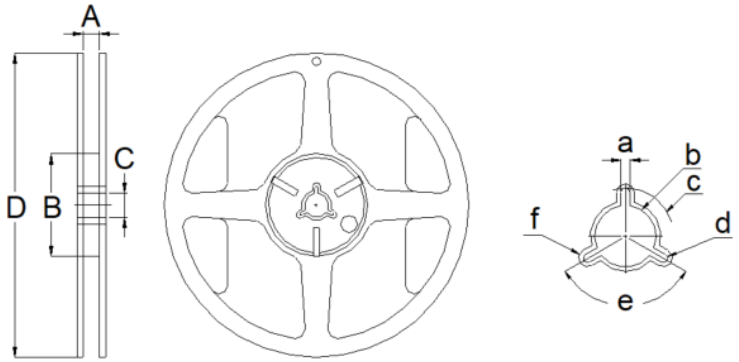
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceeded as shown in the Figure below. Minimum fillet height = soldering thickness + 25% product height.



NOTE: Specifications subject to change without notice. Please check our website for latest information.

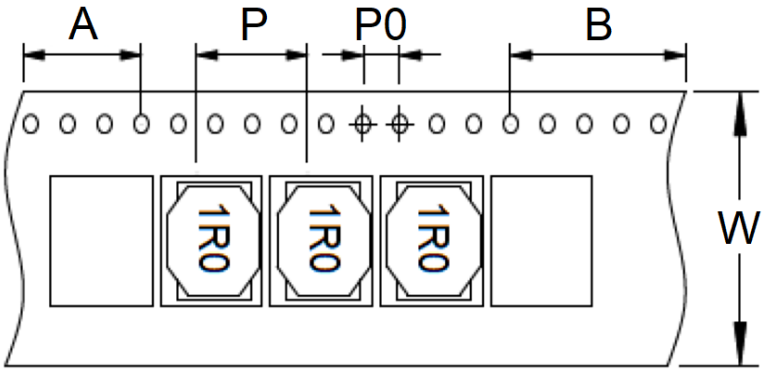
8. Packaging Information

8-1. Reel Dimension (Unit: mm)



Type	A	B	C	D	a
	16.4 Ref	100.0 Ref	13.5 Ref	330.0 Ref	2.0 Ref
7”x8mm	b	c	d	e	f
	13.5 Ref	R10.5	R0.5	120°	R1.9

8-2. Tape Dimension (Unit: mm)



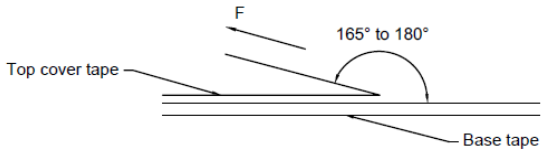
A	P	P0	B	W
200	12	4	400	16

NOTE: Specifications subject to change without notice. Please check our website for latest information.

8-3. Packaging Quantity (Unit: Pcs)

Chip/ Reel	1,000
Carton	6,000

8-4. Tearing Off Force



The force for tearing off cover tape is according to the follow table, in the arrow direction under the following conditions.
(Referenced ANSI/EIA-481-D-2008 of 4.11 standard)

Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed (mm/min)
5~35	45~85	860~1060	300±10

Tape Size	8 mm	12 to 56 mm	72 mm or Wider
Tearing Off Force (grams)	10~100	10~130	10~150

Application Notice

1. Storage Conditions

To maintain the solderability of terminal electrodes:

(a) Products meet IPC/JEDEC J-STD-020F standard-MSL, level 1.

(b) Recommended products should be used within 12 months from the time of delivery.

(c) The packaging material should be kept where no chlorine or sulfur exists in the air.

2. Transportation

(a) Products should be handled with care to avoid damage or contamination from perspiration and skin oils.

(b) Vacuum pick up is strongly recommended for individual components.

(c) Bulk handling should ensure that abrasion and mechanical shock are minimized.