Power Inductor – *PNS4012T Series*

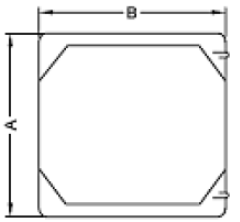
1. Part No. Expression

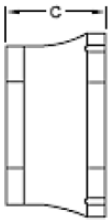
P N S 4 0 1 2 T 1 R 0 Y F

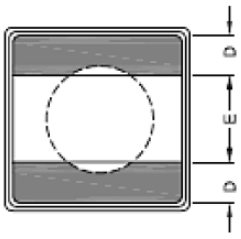
(a) (b) (c) (d) (e)(f)

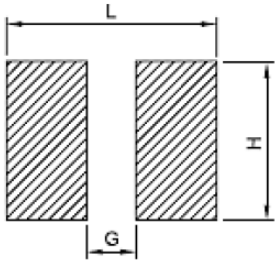
(a)	Series Code	(d)	Inductance Code
(b)	Dimension Code	(e)	Tolerance Code
(c)	Material Code	(f)	Packaging Code

2. Configuration & Dimensions (Unit: mm)





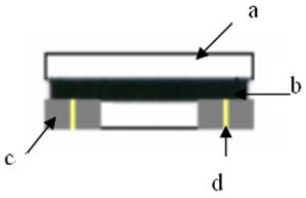




Recommended PCB Layout

A	B	C	D	E	L	G	H
4.0±0.2	4.0±0.2	1.2 Max	1.2 Ref	1.6 Ref	4.2 Ref	1.2 Ref	4.2 Ref

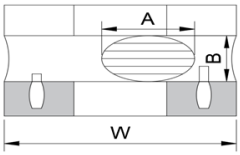
3. Material List



a) Core
b) Glue
c) Terminal
d) Wire

Void appearance tolerance Limit

Size of voids occurring to coating resin is specified below.



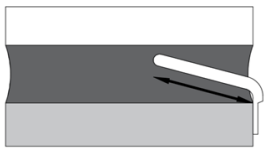
Exposed wire tolerance limit of coating resin part on product side.

Size of exposed wire occurring to coating resin is specified below.

1. Width direction（dimension a）: Acceptable when a≦w/2.
2. Length direction（dimension b）: Dimension b is not specified.
3. The total area of exposed wire occurring to each sides is not greater than 50% of coating resin area, and is acceptable.

External appearance criterion for exposed wire

Exposed winding wire at the secondary side is regarded as qualified product.



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

4. General Specification

(a) Operating Temperature: -40°C to +125°C (Including self - temperature rise)

(b) Storage Temperature: -40°C to +125°C (on board)

(c) Saturation Current (Isat) will cause L0 to drop approximately 30%.

(d) Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT of 40°C.

(e) Rated DC current: The lower value of Irms and Isat.

(f) Storage condition (component in its packaging)

i) Temperature: Less than +40°C

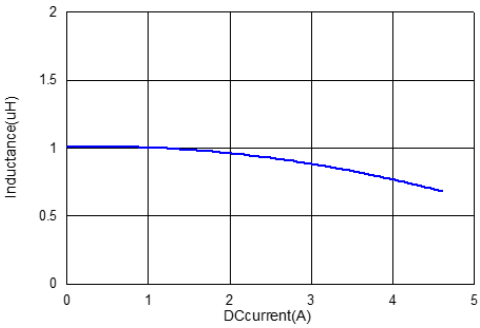
ii) Humidity: Less than 60% RH

5. Electrical Characteristics

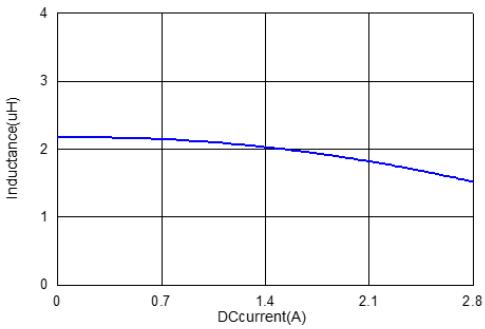
Part Number	Inductance (µH)	Tolerance (%)	Test Frequency	DCR (Ω) ±20%	Isat (A) Typ	Isat (A) Max	Irms (A) Typ	Irms (A) Max
PNS4012T1R0YF	1.0	±30%	1V/100kHz	0.042	3.30	2.80	2.50	2.20
PNS4012T2R2MF	2.2	±20%	1V/100kHz	0.060	1.95	1.65	2.20	1.90
PNS4012T3R3MF	3.3	±20%	1V/100kHz	0.070	1.60	1.40	1.90	1.70
PNS4012T4R7MF	4.7	±20%	1V/100kHz	0.095	1.40	1.20	1.70	1.50
PNS4012T6R8MF	6.8	±20%	1V/100kHz	0.125	1.10	0.90	1.50	1.30
PNS4012T100MF	10	±20%	1V/100kHz	0.180	1.00	0.80	1.30	1.10
PNS4012T150MF	15	±20%	1V/100kHz	0.260	0.80	0.65	0.95	0.75
PNS4012T220MF	22	±20%	1V/100kHz	0.400	0.60	0.50	0.72	0.62

6. Characteristics Curves

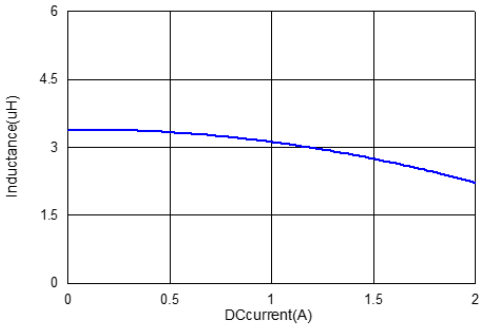
PNS4012T1R0YF



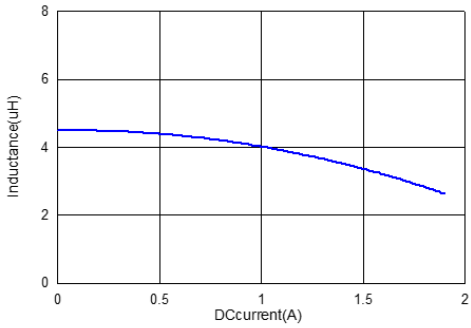
PNS4012T2R2MF



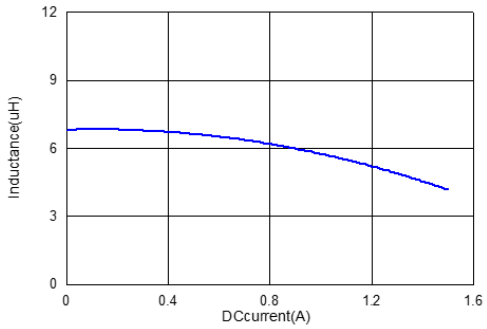
PNS4012T3R3MF



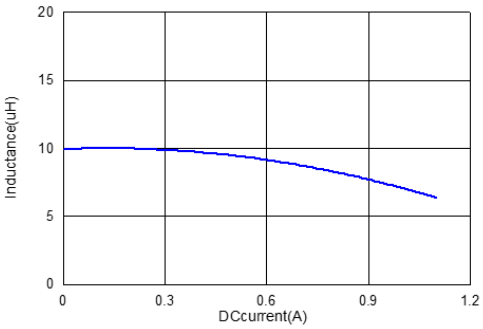
PNS4012T4R7MF



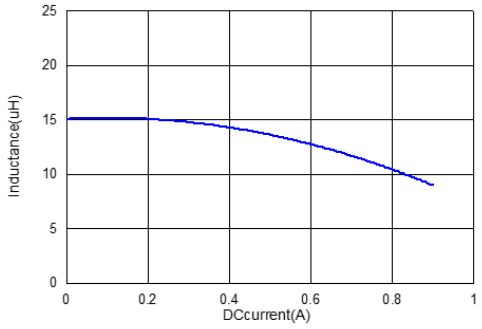
PNS4012T6R8MF



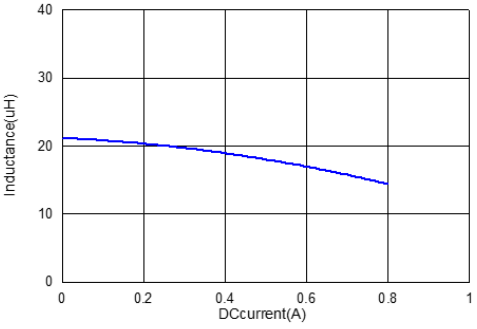
PNS4012T100MF



PNS4012T150MF



PNS4012T220MF



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7. Soldering and Mounting

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-020E).

7-2 Iron Soldering (Figure 2)

Products attachment with 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.

Note:

a) Preheat circuit and products to 150°C.

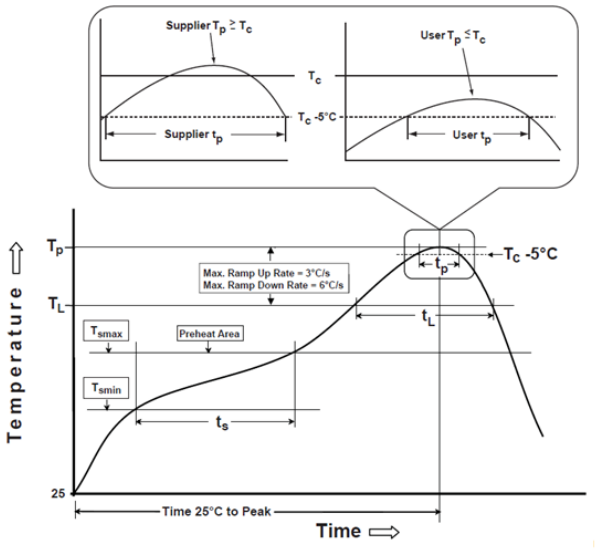
b) 355°C tip temperature (Max.)

c) Never contact the ceramic with the iron tip.

d) 1.0mm tip diameter (Max.)

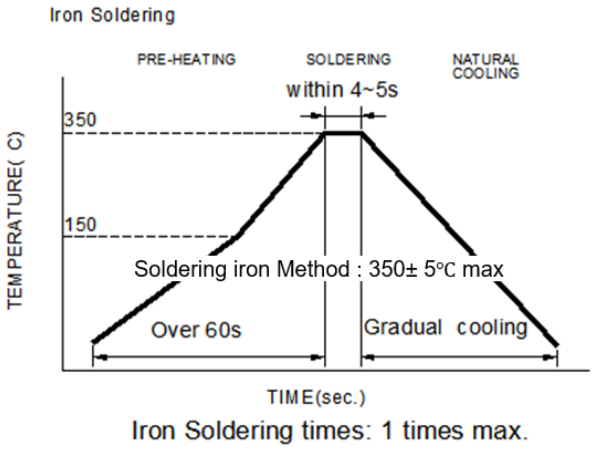
e) Use a 20 watt soldering iron with tip diameter of 1.0mm.

f) Limit soldering time to 4~5 secs.



Reflow times: 3 times max

Figure 1: IR Soldering Reflow



Iron Soldering times: 1 times max.

Figure 2: Iron soldering temperature profiles

Table1.1: 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.
Liquidus 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.**

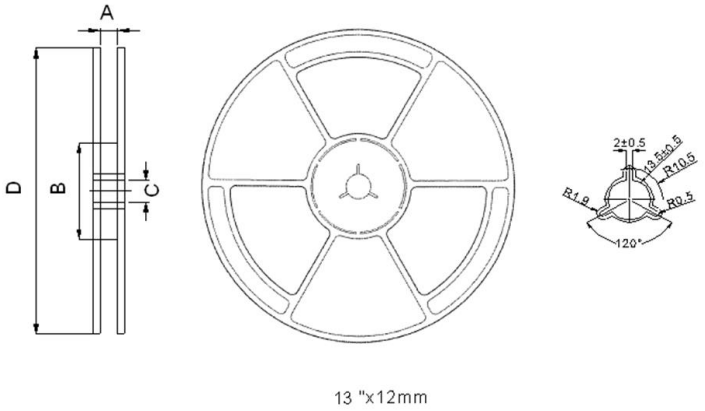
Table 1.2: Package Thickness/Volume and Classification Temperature (Tc)

	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-020E.

8. Packaging Information

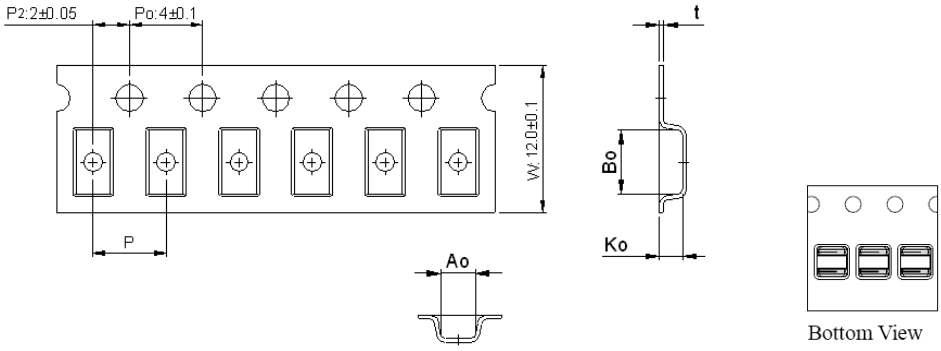
8-1 Reel Dimension



13 "x12mm

Type	A(mm)	B(mm)	C(mm)	D(mm)
13”x12mm	12±1.5	100±0.5	13.2±0.5	330±0.5

8-2 Tape Dimension (Unit: mm)

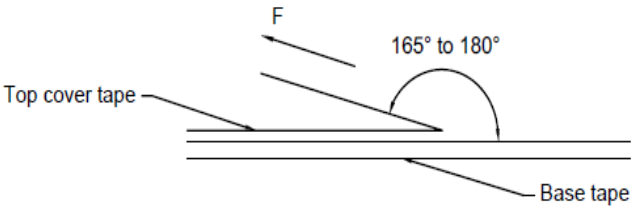


Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
4.35±0.1	4.50±0.1	1.55±0.1	8.0±0.10	0.25±0.05

8-3 Packaging Quantity

Chip / Reel	4,500

8-4 Tearing Off Force



The force for tearing off cover tape is 10 to 130 grams 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%

Application Notice

1. Storage Conditions

To maintain the solderability of terminal electrodes:

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

b) 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.