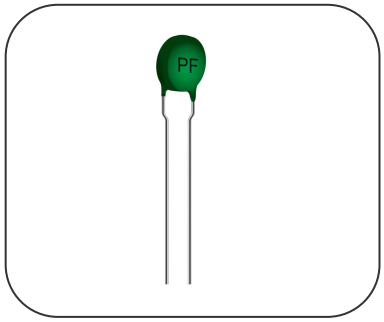
Ceramic PTC Thermistor: PPL Lead-Free Series For Overload Protection

■ Features



1. No intentional use of lead compounds
2. Lead concentration in the homogenous materials lower than 0.1%
3. RoHS compliant
4. Voltage rating: 270V_{ac}
5. Resistance range: 10Ω~120Ω
6. Stable over a long time
7. Operating temperature range: 0 ~ +85°C (V=Vmax)
   -25 ~ +125°C (V=0)

■ Recommended Applications

1. Home appliance
2. Electrical equipment (Electrical machinery, transformer, and electric meter)
3. Server Power

■ Part Number Code

P	P	L	0	7	6	5	0	M	A	2	B	7	Y	0			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Product Code

PP	THINKING Ceramic PTC Thermistor PP Series

Series

L	Leaded Type

Dimensions

07	Φ7mm
12	Φ12mm

Resistance (R_{25})

100	10Ω
650	65Ω
121	120Ω

Tolerance of R_{25}

M	±20%
H	±25%
N	±30%
T	±40%
P	±50%
S	+35%~-15%
Q	+30%~-20%
Y	Special

Curie Temperature

A2	120℃

Max. Voltage

270V

Packaging

Y	Bulk
X	Ammo Box Pitch 12.7mm
V	Ammo Box Pitch 15mm
W	Tape & Reel Pitch 12.7mm
U	Tape & Reel Pitch 15mm

Application

Overload protection

Lead-Free Control Code

Y

Internal Control Code

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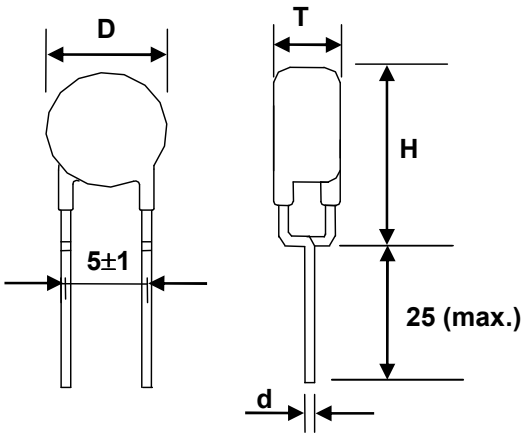
■ Dimensions



(Unit: mm)

■ Electrical Characteristics

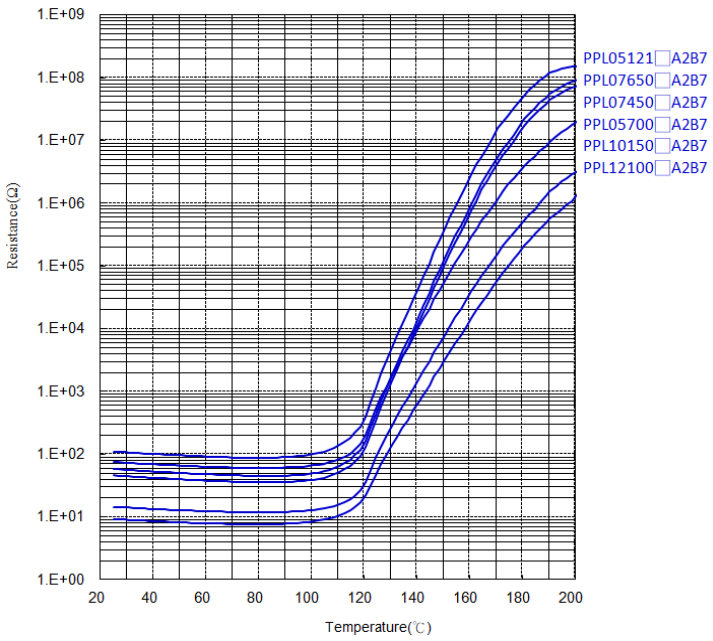
PPL Series

270Vac/120℃

Part No.	Curie Temperature	Zero-power Resistance at 25℃	Non-operating Current at 25℃	Trip Current at 25℃	Max. Voltage	Rated Voltage	Max. Current	Dimensions			
	Tc (℃)	R_{25} (Ω)	I_N (mA)	I_T (mA)	V_{max}(V_{ac})	V_R(V_{ac})	I_{max}(A)	$D_{max.}$ (mm)	T_{max} (mm)	d±0.02 (mm)	H_{max} (mm)
PPL05700□A2B7	120typ	70	65	130	270	230	0.4	4.5-6.5	2.5-5	0.6	10
PPL05121□A2B7		120	50	100	270	230	0.4	4.5-6.5	2.5-5	0.6	10
PPL07450□A2B7		45	90	180	270	230	1.0	7.0-9.0	2.5-5	0.6	12.5
PPL07650□A2B7		65	80	120	270	230	1.0	7.0-9.0	2.5-5	0.6	12.5
PPL10150□A2B7		15	170	260	270	230	1.5	9.0-11.	2.5-5	0.6	14.5
PPL12100□A2B7		10	220	330	270	230	2.2	10.5-13	2.5-5	0.6	17.5

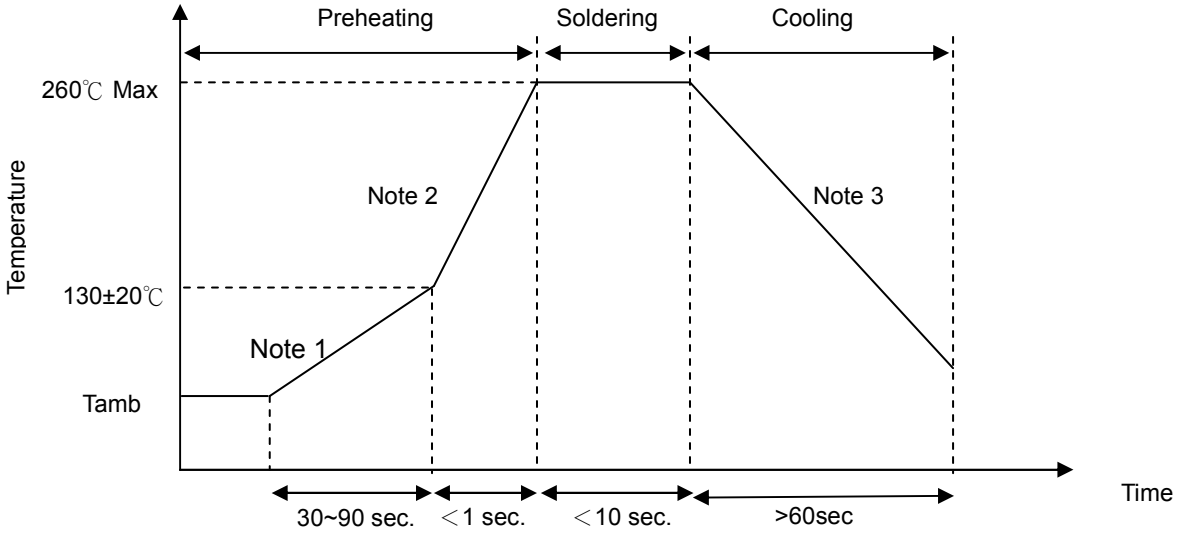
Note: □ is tolerance of R_{25}

■ R-T Characteristic Curve (Typical)



■ Soldering Recommendation

● Wave Flow Soldering Profile



Note:

1. 1~3℃/sec.
2. Approx. 200℃/sec
3. 5℃/sec. (Max)

● Recommended Reworking Conditions with Soldering Iron

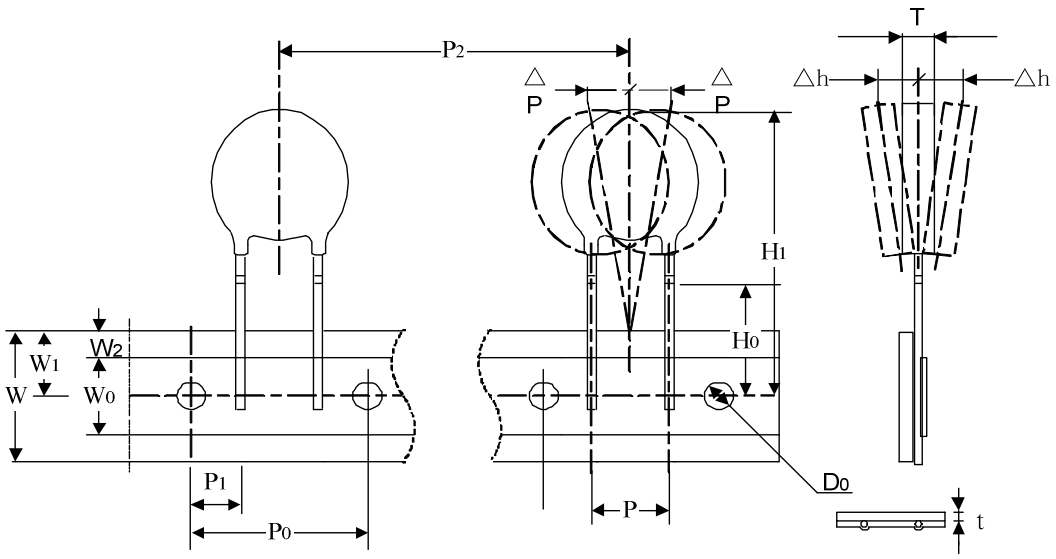
Item	Conditions
Temperature of Soldering Iron-tip	360℃ (max.)
Soldering Time	3 sec (max.)
Distance from Thermistor	2 mm (min.)

■ Reliability Test

<table>
<tr><th>Item</th><th>Standard</th><th>Test conditions and methods</th><th>Specifications</th></tr>
<tr><td>Robustness of Terminations</td><td>IEC 60738-1</td><td>Gradually apply the specified force and keep the unit fixed for 10±1 sec.
Terminal diameter (mm) / Force T(N)
0.35<d≦0.5 : 5.0
0.5<d≦0.8 : 10.0
0.8<d≦1.25 : 20.0</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Solderability</td><td>IEC 60738-1</td><td>245±3 ℃, 2±0.5 sec</td><td>At least 95% of terminal electrode is covered by new solder</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>IEC 60738-1</td><td>260±3 ℃, 10±1 sec</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Vibration</td><td>IEC 60738-1</td><td>Frequency range: 10~55Hz
Amplitude: 0.75mm or 98m/s^2
Direction: 3 mutually perpendicular directions
Duration: 6hrs(3x2 hrs)</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Shock</td><td>IEC 60738-1</td><td>Wave: half-sine
⊿V: 1.0m/s
Acceleration: 50 m/s^2
Pulse time: 30ms</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Rapid Change of Temperature</td><td>IEC 60738-1</td><td>The thermal shock conditions shown below shall be repeated 5 cycles.
<table>
<tr><th>Step</th><th>Temperature (℃)</th><th>Period (minutes)</th></tr>
<tr><td>1</td><td>-40 ± 5</td><td>30 ± 3</td></tr>
<tr><td>2</td><td>Room temperature</td><td>5 ± 3</td></tr>
<tr><td>3</td><td>85 ± 5</td><td>30 ± 3</td></tr>
<tr><td>4</td><td>Room temperature</td><td>5 ± 3</td></tr>
</table></td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Climatic Sequence</td><td>IEC 60738-1</td><td>Dry heat: 125 ℃ for 16 hrs
Damp heat first cycle: 40℃, 95% R.H, cycle time: 24 hrs
Cold: -40℃ for 2 hrs
Damp heat (cyclic), remaining cycles: 5 cycles
Test according to IEC60068-2-30</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Damp Heat, Steady State</td><td>IEC 60738-1</td><td>40±2℃, 90~95%RH,1000±2hrs</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Endurance at Maximum Operating Temperature and Maximum Voltage</td><td>IEC 60738-1</td><td>UCT=85℃, Vmax, It≦I≦Imax, 1000±2hrs</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
<tr><td>Endurance at Maximum Voltage</td><td>IEC60738-1</td><td>25±5℃, Vmax, It≦I≦ Imax
1min. on and 5min. Off ×100cycles</td><td>｜△R25/R25｜≦20%
No visible damage</td></tr>
</table>

■ Packaging

● Taping Specification



● Parameter List of Kinked Lead

Index	Parameter	Nominal dimensions		Tolerance
P	Lead spacing	5	5	±1
P_0	Sprocket hole pitch	12.7	15	±0.3
P_1	Ordinate to adjacent component lead	3.85	5	±1
P_2	Device pitch	12.7	15	±1
H_0	Abscissa to plane (kinked lead)	16	16	±0.5
H_1	Abscissa to top	27 (for PPL05 series) 29 (for PPL07 series) 32 (for PPL10 series) 34 (for PPL12 series)		
W	Carrier tape width	18	18	±1
W_0	Hold-down tape width	12	12	±1.5
W_1	Sprocket hole position	9	9	±1
W_2	Top distance between tape edges	3	3	Max.
△P	Body tape plane deviation	1	1	Max.
△h	Body lateral deviation	2	2	Max.
D_0	Sprocket hole diameter	4	4	±0.2
t	Tape thickness	0.6	0.6	±0.2

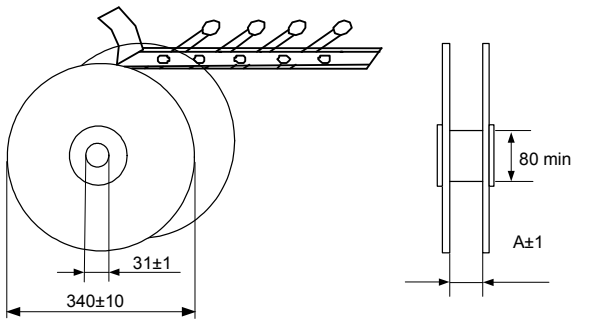
■ Quantity

● Bulk Packing

Disc Size (mm)	Quantity (pcs / bag)
Φ≦10	200
10<Φ<20	100

● Reel Packing

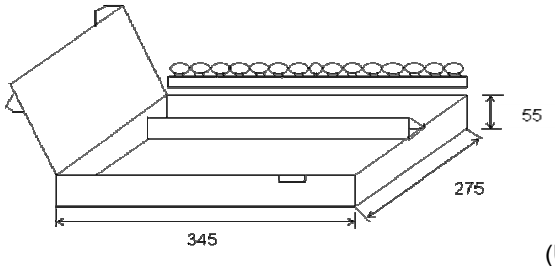
Disc Size (mm)	Rated Voltage (V_R)	Quantity (pcs/reel)
Φ≦07	V_R≦270V_{ac}	1,500
07＜Φ≦11	V_R≦270V_{ac}	1,000
Φ12	V_R≦270V_{ac}	750



(Unit: mm)

● Ammo Packing

Disc Size(mm)	Rated Voltage (V_R)	Quantity (pcs/box)
Φ≦06	V_R≦270V_{ac}	1,500
07≦Φ≦12	V_R≦270V_{ac}	1000



(Unit: mm)

■ Warehouse Storage Conditions of Products

● Storage Conditions:

1. Storage Temperature: -10℃~ +40℃
2. Relative Humidity: ≦75%RH
3. Keep away from corrosive atmosphere and sunlight.

● Period of Storage: 1 year

■ Usage

Please keep products away from the conditions mentioned below to avoid their characteristic deterioration and failure.

1. Corrosive gas or deoxidizing gas (Cl_2, H_2S, NH_3, SOx, NOx etc.)
2. Place in a vacuum or put pressure
3. Salt water, oil, solvent, and chemical liquid
4. Flammable gas
5. Place in splashed water, or high humidity and dewing place
6. Other places similar to any conditions mentioned above