



# THINKING ELECTRONIC INDUSTRIAL CO., LTD.

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## SPECIFICATION FOR APPROVAL

CUSTOMER	_____
CERTIFIED	_____
MODEL/TYPE	_____
PART NO.	PPL03222MA0B2YGU (RoHS)
APPLICATION	_____
CUSTOMER P/N	_____
ISSUE DATE	Jul.04.2019
REV. NO.	1.1
REV. DATE	Jul.29.2019

<b>FOR CUSTOMER APPROVAL</b>	<b>CHECKED BY</b>
	<i>Haili Gong</i>
	<b>APPROVED BY</b>
	<i>Huaifang Zhang</i>





**REVISED RECORD SHEET**

REV. NO	REV. DATE	REVISED CONTENT



<b>INDEX</b>	<b>Page</b>
■ Part Number Code	1
■ Structure and Dimensions	2
■ Electrical Characteristics	2
■ Reliability	3
■ Soldering Recommendation	4
■ RoHS Compliant Declaration	5
■ Warehouse Storage Conditions of Products	5
■ Certificates	6



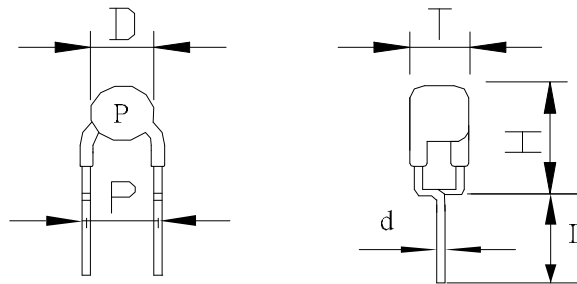
Part Number Code

Example :

**PP**    **L**    **03**    **222**    **M**    **A0**    **B2**    **Y**    **GU**  
(1)    (2)    (3)    (4)    (5)    (6)    (7)    (8)    (9)

No.	Item	Digit	Specification
(1)	Product Type	PP	Thinking overload protection PP type
(2)	Type Series	L	Lead type
(3)	Body Size	03	φ3 mm
(4)	Resistance( $R_{25}$ )	222	$22 \times 10^2 \Omega = 2200 \Omega$
(5)	Tolerance of $R_{25}$	M	± 20 %
(6)	Curie Temperature	A0	Refer to "Optional Suffix"
(7)	Rated Voltage	B2	220V
(8)	Packaging	Y	RoHS compliance & Bulk
(9)	Optional Suffix	GU	Silicone Coating Refer to " Structure and Dimensions" and " Electrical Characteristics" on page 2.

## Structure and Dimensions



( unit : mm )

Item.	D	T	H	d	L	P
max	4.5	4.5	8.5	0.52	3.5	6.0
min	3.0	3.5	---	0.48	2.5	4.0

## Electrical Characteristics

Part No.	Curie Temperature	Zero-power Resistance at 25+/-2°C	Max. Current
	Tc(°C)	R <sub>25</sub> (Ω)	I <sub>max</sub> (A)
PPL03222MA0B2YGU	100±10°C	2200±20%	0.2

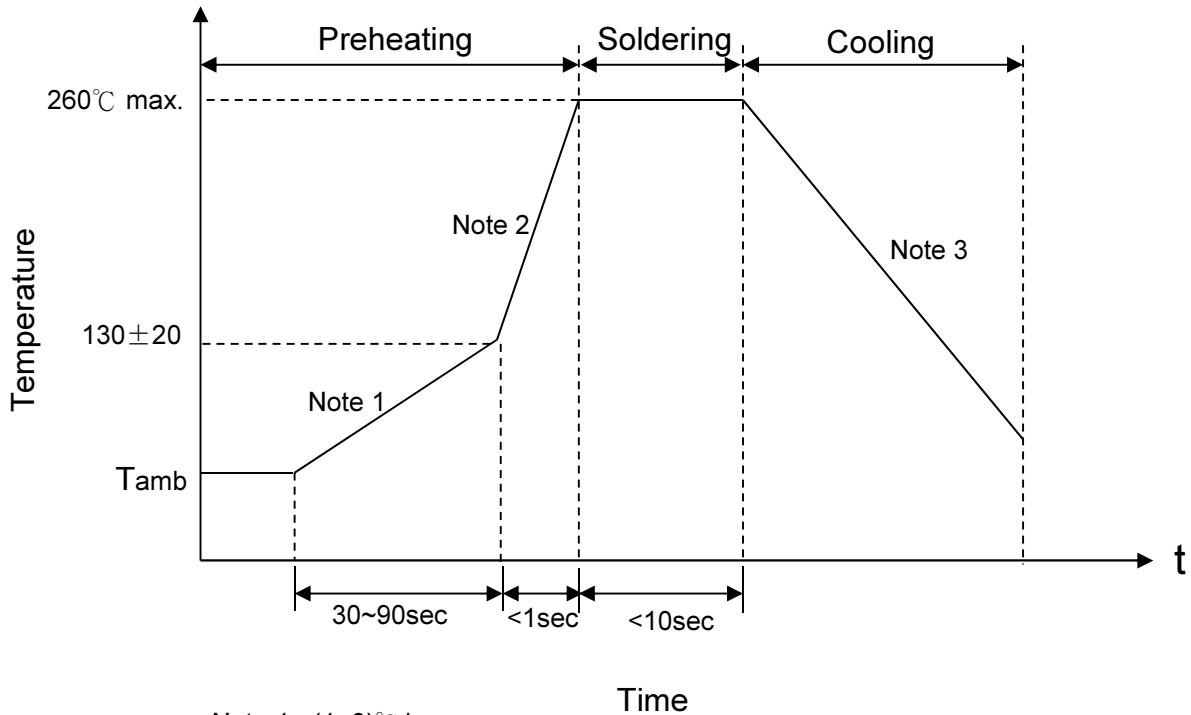
Part No.	Max. Voltage	Rated Voltage	Operating Temperature Range (V=V <sub>max</sub> )	Operating Temperature Range (V=0)
	V <sub>max</sub> (Vac)	V <sub>r</sub> (Vac)	(°C)	(°C)
PPL03222MA0B2YGU	270	220	0~60	-25~+125

Reliability

Item	Standard	Test conditions / Methods	Specifications															
Robustness of Terminations	IEC 60738-1	Gradually apply the specified force and keep the unit fixed for $10 \pm 1$ sec.  <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Terminal diameter (mm)</td> <td style="text-align: center;">Force T(N)</td> </tr> <tr> <td style="text-align: center;"><math>0.35 &lt; d \leq 0.5</math></td> <td style="text-align: center;">5.0</td> </tr> <tr> <td style="text-align: center;"><math>0.5 &lt; d \leq 0.8</math></td> <td style="text-align: center;">10.0</td> </tr> <tr> <td style="text-align: center;"><math>0.8 &lt; d \leq 1.25</math></td> <td style="text-align: center;">20.0</td> </tr> </table>	Terminal diameter (mm)	Force T(N)	$0.35 < d \leq 0.5$	5.0	$0.5 < d \leq 0.8$	10.0	$0.8 < d \leq 1.25$	20.0	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage							
Terminal diameter (mm)	Force T(N)																	
$0.35 < d \leq 0.5$	5.0																	
$0.5 < d \leq 0.8$	10.0																	
$0.8 < d \leq 1.25$	20.0																	
Solderability	IEC 60738-1	$245 \pm 3$ °C , $2 \pm 0.5$ sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC 60738-1	$260 \pm 3$ °C , $10 \pm 1$ sec	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage															
Vibration	IEC 60738-1	Frequency range: 10~55Hz Amplitude: 0.75mm or $98\text{m/S}^2$ Direction: 3 mutually perpendicular directions Duration : 6HRS(3x2HRS)	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage															
Shock	IEC 60738-1	Wave: half-sine $\Delta V$ : 1.0m/s Acceleration: $50\text{m/s}^2$ Pulse time: 30ms	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage															
Rapid Change of Temperature	IEC 60738-1	The thermal shock conditions shown below shall be repeated 5 cycles <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature(°C)</th> <th>Period(minutes)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;"><math>-40 \pm 5</math></td> <td style="text-align: center;"><math>30 \pm 3</math></td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Room temperature</td> <td style="text-align: center;"><math>5 \pm 3</math></td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;"><math>85 \pm 5</math></td> <td style="text-align: center;"><math>30 \pm 3</math></td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Room temperature</td> <td style="text-align: center;"><math>5 \pm 3</math></td> </tr> </tbody> </table>	Step	Temperature(°C)	Period(minutes)	1	$-40 \pm 5$	$30 \pm 3$	2	Room temperature	$5 \pm 3$	3	$85 \pm 5$	$30 \pm 3$	4	Room temperature	$5 \pm 3$	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage
Step	Temperature(°C)	Period(minutes)																
1	$-40 \pm 5$	$30 \pm 3$																
2	Room temperature	$5 \pm 3$																
3	$85 \pm 5$	$30 \pm 3$																
4	Room temperature	$5 \pm 3$																
Climatic Sequence	IEC 60738-1	Dry heat: $125$ °C for 16 hrs Damp heat first cycle: $40$ °C , 95% R.H , cycle time: 24 hrs Cold: $-40$ °C for 2 hrs Damp heat (cyclic), remaining cycles: 5 cycles Test according to IEC60068-2-30	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage															
Damp Heat, Steady State	IEC 60738-1	$40 \pm 2$ °C , 90~95%RH, $1000 \pm 2$ hrs	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage															
Endurance at Maximum Operating Temperature and Maximum Voltage	IEC 60738-1	UCT= $60$ °C , VR, $I_t \leq I \leq I_{max}$ , $1000 \pm 2$ hrs	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage															
Endurance at Maximum Voltage	IEC 60738-1	$25 \pm 5$ °C , VR, $I_t \leq I \leq I_{max}$ 1min. on and 5min. Off $\times 100$ cycles	$ \Delta R_{25}/R_{25}  \leq 20\%$ No visible damage															

## Soldering Recommendation

### ■ Wave Soldering Profile



- Note 1 : (1~3)°C/sec  
 Note 2 : Approx. 200°/sec  
 Note 3 : 5°/sec Max

### ■ Recommended Reworking Conditions with Soldering Iron

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

### RoHS Compliant Declaration

We hereby declare that the components delivered to your company are compliant with RoHS directive 2015/863/EU.

### Warehouse Storage Conditions of Products

(I) Storage Conditions :

- 1.Storage Temperature :  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- 2.Relative Humidity :  $\leq 75\% \text{RH}$
- 3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year





Certificates

- (1) IATF 16949 certificate
- (2) ISO 9001 certificate

Test Report

- (1) RoHS test report

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[PTGL10ARR27M1B51A0](#) [P5005C090S500H](#) [YQD120N0025](#) [PTGL12AS4R7K6B51B0](#) [PTGL12AR100M6C01B0](#)  
[PTGL07AS2R7K2B51A0](#) [PTGL07AS1R8K2B51B0](#) [PTGL13AR0R8H2B71B0](#)