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**SPECIFICATION FOR APPROVAL**

CUSTOMER	Blume-Newmatik-IVRA
CERTIFIED	
MODEL/TYPE	TPM2S471P105
PART NO.	TPM2S471P105R (RoHS+HF)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	Feb. 01, 2024
REV. NO.	
REV. DATE	

FOR CUSTOMER APPROVAL	CHECKED BY
	<i>Shu Ling Fu</i>
	APPROVED BY
	<i>Chun Chu Tu</i>





REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT



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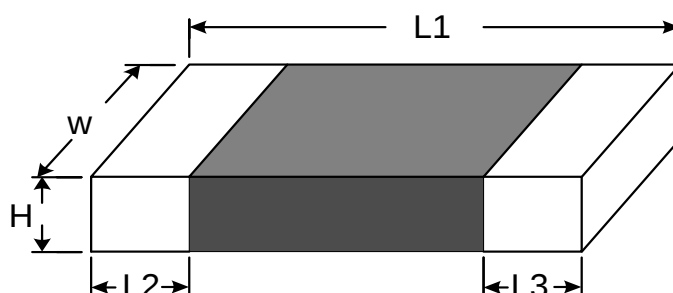
Part Number Code

Example :

TPM **2** **S** **471** **P** **105** **R**
 (1) (2) (3) (4) (5) (6) (7)

No.	Item	Digit	Specification
(1)	Product Type	TPM	Thinking CPTC thermistor TPM type
(2)	Size (EIA)	2	0805
(3)	Type Series	S	Sensing series
(4)	Zero Power Resistance at 25°C	471	$47 \times 10^1 = 470\Omega$
(5)	Tolerance of R ₂₅	P	± 50%
(6)	Sensing Temperature	105	Ts=105°C
(7)	Packaging	R	Reel

Structure and Dimensions



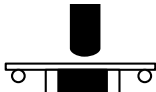
(unit : mm)

L1	W	H max.	L2 and L3
2.00±0.20	1.25±0.20	1.00	0.45±0.25

Electrical Characteristics

Part No.	Sensing Temperature @ 4.7KΩ	Zero Power Resistance at 25°C	Max. Voltage	Operating Temperature Range
	Ts (°C)	R ₂₅ (Ω)	Vmax. (V _{DC})	(°C)
TPM2S471P105R	105±5	470±50%	32	-25 ~ +120

Reliability

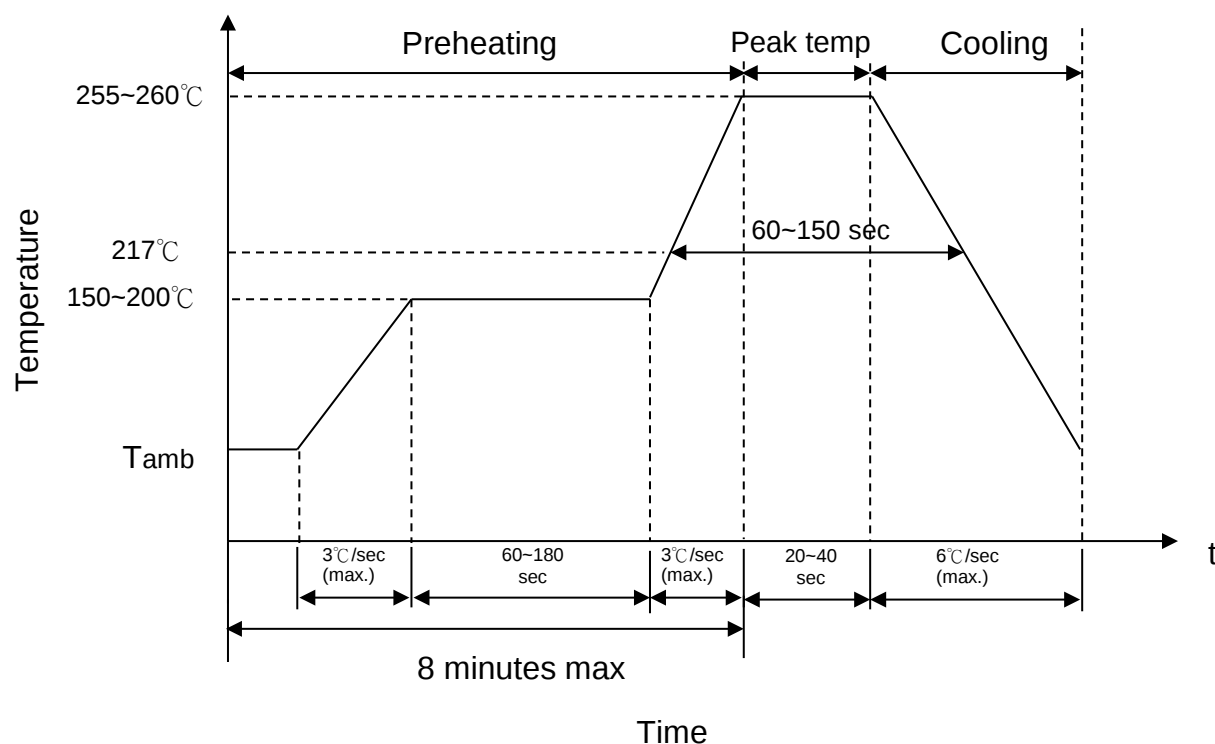
Item	Standard	Test conditions / Methods	Specifications															
Bending Strength	IEC60068-2-21	Warp : 2mm ; Speed < 0.5mm/sec. Duration : 10 sec on PCB. 	No visible damage ΔR ₂₅ /R ₂₅ ≤ 10 %															
Damp Heat, Steady State	IEC 60068-2-78	40 ± 2 °C , 90 ~ 95% RH , 1000± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
High Temp. Storage	IEC 60068-2-2	T _U ± 5 °C , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Low Temp. Storage	IEC 60068-2-1	T _L ± 3 °C , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Rapid Change of Temperature	IEC 60068-2-14	The conditions shown below shall be repeated 5 cycles on PCB <table><tr><th>Step</th><th>Temperature (°C)</th><th>Period (minutes)</th></tr><tr><td>1</td><td>-25± 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>150± 5</td><td>30 ± 3</td></tr><tr><td>4</td><td>Room temperature</td><td>5 ± 3</td></tr></table>	Step	Temperature (°C)	Period (minutes)	1	-25± 5	30 ± 3	2	Room temperature	5 ± 3	3	150± 5	30 ± 3	4	Room temperature	5 ± 3	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %
Step	Temperature (°C)	Period (minutes)																
1	-25± 5	30 ± 3																
2	Room temperature	5 ± 3																
3	150± 5	30 ± 3																
4	Room temperature	5 ± 3																
High Temp. Load	IEC 60738-1 7.24.3	85 ± 5 °C , Vmax. , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Climatic Sequence	IEC 60738-1 7.22	a. T _U x 16 hrs b. 1st cycle : 40 °C 95 %RH x 24 hrs c. T _L x 2 hrs d. 5 cycles : 40°C 95% RH x 24 hrs / Cycle	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Solderability	IEC 60068-2-58	245 ± 5 °C , 3 ± 0.3 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC 60068-2-58	8.1.2.2 Solder reflow method Preheating: 150~180°C ,60~120 secs. Peak temp.: 245~255°C ,≤20 secs. (reflow)	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															

Note: T_L = Minimum operating temperature ($^\circ \text{C}$)

T_U = Maximum operating temperature ($^\circ \text{C}$)

Soldering Recommendation

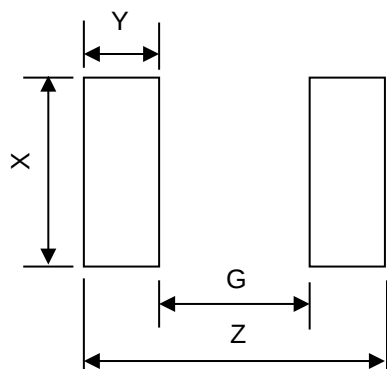
■ IR-Reflow Soldering Profile



■ Recommended Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Diameter of Soldering Iron-tip	φ 3mm (max.)
Caution: Not to touch the component surface with soldering iron directly to prevent component damage.	

Recommended Soldering Pad Dimensions



Size (EIA)	0805
Z	3.4 mm
G	1.0 mm
X	1.4 mm
Y	1.2 mm

RoHS Compliant Declaration

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

Restriction of Weapon and Military End-Use

Thinking has established and implemented the fundamental policy on no of our product should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or goods or systems specially designed or intended for military end-use or utilization by military end-users.

Warehouse Storage Conditions of Products

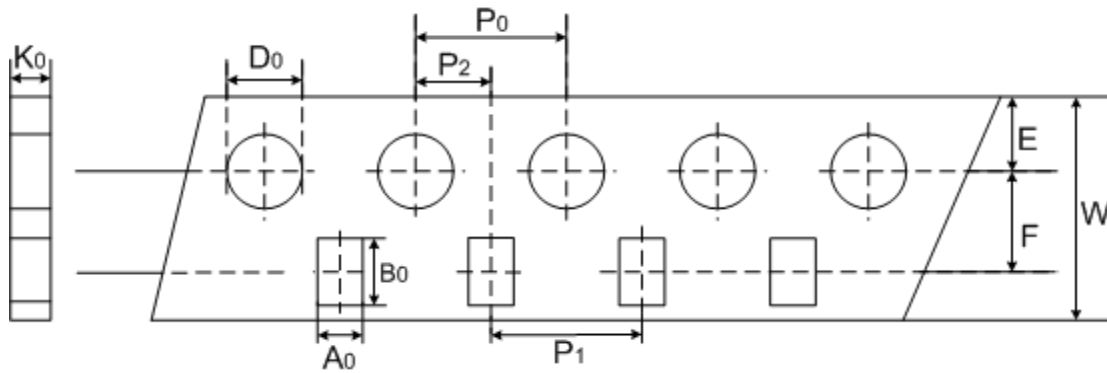
(I) Storage Conditions :

- 1.Storage Temperature : -10°C ~+40°C
- 2.Relative Humidity : $\leq 75\%RH$
- 3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

Packaging

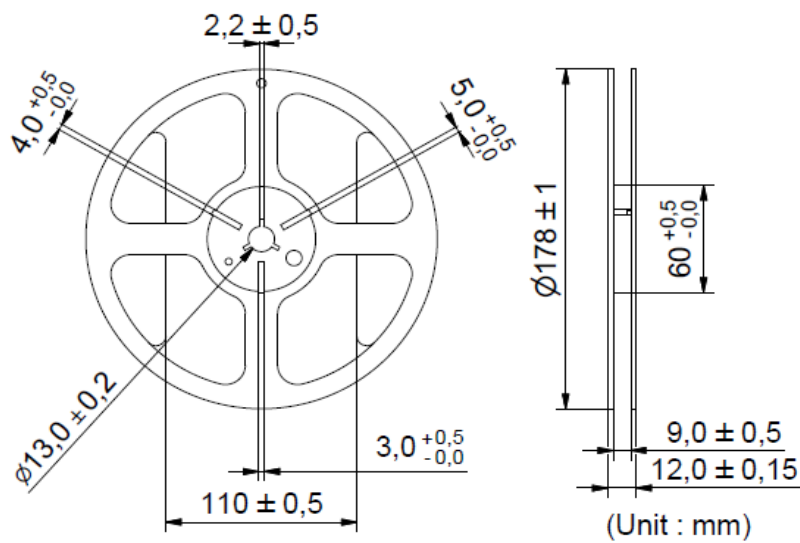
■ Taping specification (0805 Series)



(Unit : mm)

Index	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	K ₀
Size	±0.2	±0.2	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1
0805	1.5	2.3	8	1.75	3.5	4	2	4	1.55	1

■ Quantity (3500 pcs / reel)



(Unit : mm)

Safety Approvals (Certified Model/Type : TPM2S471P105)



* UL 1434 / cUL recognized (File # E138827)



* TUV recognized (File # R 50133294)

Certificates

- (1) IATF 16949 certificate
- (2) ISO 9001 certificate
- (3) QC 080000 certificate

Test Report

- (1) RoHS test report
- (2) Halogen-free test report



R-T Characteristic Curve

