

## SMD 0402, Glass Protected NTC Thermistors



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### FEATURES

- TCR ranging from -6.5 %/K at -40 °C to -2 %/K at 150 °C
- Tolerance on  $R_{25}$  down to 1 %
- Suitable for wave or reflow soldering
- NiSn terminations
- Fully glass coated and protected
- cULus recognized, file E148885 (UL category XGPU2 / XGPU8)
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### LINKS TO ADDITIONAL RESOURCES



QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	4.7K to 470K	Ω
Tolerance on $R_{25}$ -value	± 1; ± 2; ± 3; ± 5	%
$B_{25/85}$ -value	3490 to 4075	K
Tolerance on $B_{25/85}$ -value	± 3	%
Maximum dissipation at 25 °C	70	mW
Thermal time constant $\tau$	≈ 5	s
Dissipation factor D	≈ 2.0	mW/K
Operating temperature range at zero power	-40 to +150	°C
Weight	≈ 1.2	mg

### APPLICATIONS

- Temperature sensing, protection and compensation in automotive, industrial, telecom and consumer applications. Examples are:
  - Battery chargers
  - Power supplies
  - Office equipment
  - LCD compensation
  - In-car entertainment

### DESCRIPTION

Size 0402 (M1005) glass protected SMD chip thermistor with negative temperature coefficient (TCR) and matte tin (Sn) plated terminations. The device has no marking.

### PACKAGING

Available in 8 mm punched paper tape on reel package of 10 000 units.

### DESIGN-IN SUPPORT

For complete curve computation, please visit: [www.vishay.com/thermistors/ntc-rt-calculator/](http://www.vishay.com/thermistors/ntc-rt-calculator/)

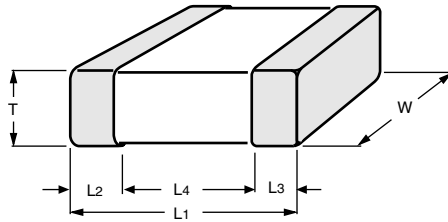
### AGENCY APPROVALS

Agency approval documents, please see: [www.vishay.com/ppg?29003&documents](http://www.vishay.com/ppg?29003&documents)

ELECTRICAL DATA AND ORDERING INFORMATION				
$R_{25}$ (Ω)	$R_{25}$ -TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$ -TOL. (± %)	SAP MATERIAL AND ORDERING NUMBER ... (1)
4700	3, 5	3595	3	NTCS0402E3472*MT
10 000	1, 2, 3, 5	3490	3	NTCS0402E3103*L1T (2)
10 000	3, 5	3950	3	NTCS0402E3103*HT
15 000	3, 5	3965	3	NTCS0402E3153*HT
22 000	3, 5	3590	3	NTCS0402E3223*MT
33 000	3, 5	3670	3	NTCS0402E3333*MT
47 000	1, 2, 3, 5	4075	3	NTCS0402E3473*XT
68 000	3, 5	3910	3	NTCS0402E3683*HT
100 000	1, 2, 3, 5	3950	3	NTCS0402E3104*HT
470 000	3, 5	3807	3	NTCS0402E3474*HT (3)

### Notes

- (1) Replace \* in SAP by J for ± 5 %, H for ± 3 %, G for ± 2 %, F for ± 1 % tolerance on  $R_{25}$
- (2) The digit 1 at the end of this part number NTCS0402E3103\*L1T differentiates it from the legacy P/N
- (3) This P/N is not UL recognized

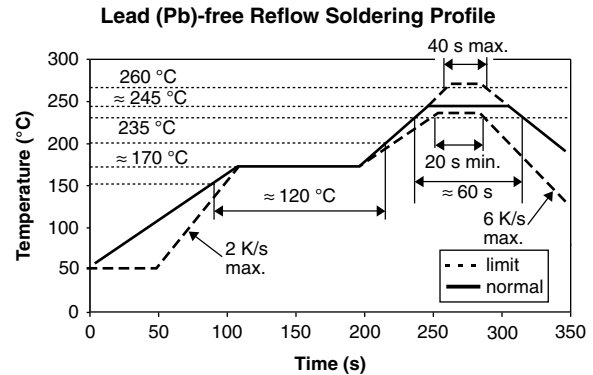
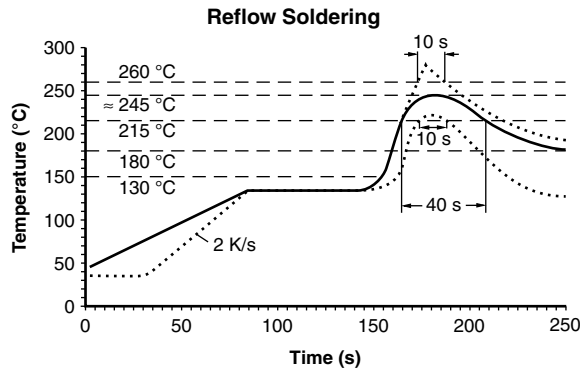
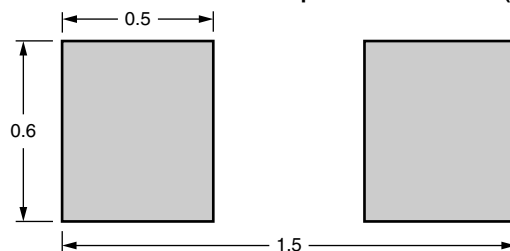
**DIMENSIONS** in millimeters


L <sub>1</sub>	W	T	L <sub>2</sub> AND L <sub>3</sub> MIN.	L <sub>4</sub> MIN.
1.0 ± 0.15	0.5 ± 0.15	0.5 ± 0.15	0.1	0.3

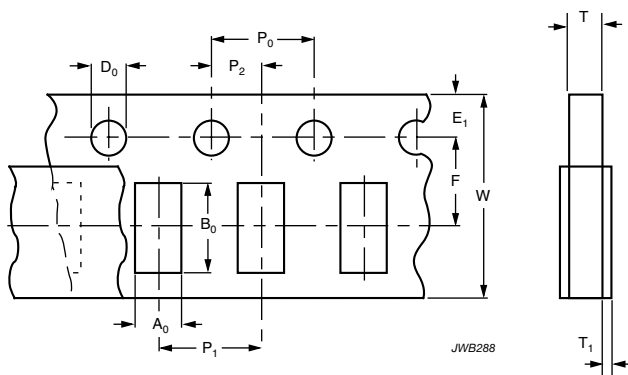
**SOLDERING CONDITIONS**

This SMD thermistor is only suitable for wave or reflow soldering, in accordance with JEDEC® J-STD-020. The maximum temperature of 260 °C during 40 s should not be exceeded.

Typical examples of a soldering processes that will provide reliable joints without damage, are shown below.


**Recommended solder land pattern dimensions (mm)**

**PACKAGING**
**TAPE SPECIFICATIONS**

All tape specifications are in accordance with IEC 60286-3. Basic dimensions are given below. Carrier tape material is paper.



<b>DIMENSIONS OF PAPER TAPE</b> in millimeters	
PARAMETER	DIMENSION
A <sub>0</sub> <sup>(1)</sup>	0.65 ± 0.1
B <sub>0</sub> <sup>(1)</sup>	1.15 ± 0.1
W	8.0 ± 0.2
E <sub>1</sub>	1.75 ± 0.1
F	3.5 ± 0.05
D <sub>0</sub>	1.55 ± 0.05
P <sub>0</sub> <sup>(2)</sup>	4.0 ± 0.1
P <sub>1</sub>	4.0 ± 0.1
P <sub>2</sub>	2.0 ± 0.05
T tape thickness max.	0.8
T <sub>1</sub> cover tape thickness max.	0.1

**Notes**

- (1) Measured 0.3 mm above base pocket
- (2) P<sub>0</sub> pitch cumulative error over any 10 pitches ± 0.2 mm



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