



## Features

- Ultra-tight tolerance
- Wide resistance range
- RoHS compliant\*
- Four package sizes available

## Applications

- Current sense
- Precision circuits
- Printers
- Automation equipment
- Navigation equipment

# CRT-ST Series - Thin Film Precision Chip Resistors

## Electrical Characteristics

Characteristic	Model CRT0402-ST	Model CRT0603-ST	Model CRT0805-ST	Model CRT1206-ST
Power Rating @ 70 °C	1/16 watt	1/10 watt	1/8 watt	1/4 watt
Operating Temperature Range	-55 to +155 °C			
Derated to Zero Load at	+155 °C			
Maximum Working Voltage	50 V	75 V	150 V	200 V
Maximum Overload Voltage	100 V	150 V	300 V	400 V
Resistance Range (E-96 + E-24 Values)	(See Value - TCR Table on Page 2)			
Temperature Coefficient of Resistance (TCR)	25 to 50 PPM/°C (See Value - TCR Table on Page 2)			

NOTE: TCR code assigned as "X", see "How to Order".

## Performance Characteristics

Test	Test Method	Test Limits ΔR
Temperature Coefficient of Resistance (TCR)	MIL-STD-202 Method 304	As specified
Short Time Overload	JIS-C-5201-1 5.5 RCWV*2.5 or max. overload voltage; whichever is lower, for 5 seconds	≤±0.2 %
Insulation Resistance	MIL-STD-202 Method 302 Apply 100 Vdc for 1 minute	>10 GΩ
Endurance	MIL-STD-202 Method 108A 70 ±2 °C, RCWV for 1,000 hours with 1.5 hours "ON" and 0.5 hours "OFF"	≤±0.5 %
Damp Heat with Load	MIL-STD-202 Method 103B 40 ±2 °C, 90~95 % R.H., RCWV for 1,000 hours with 1.5 hours "ON" and 0.5 hours "OFF"	≤±0.5 %
Bending Strength	JIS-C-5201-1 56.1.4 Bending Amplitude 3 mm for 10 seconds	≤±0.1 %
Solderability	MIL-STD-202 Method 208H 245 ±5 °C for 3 seconds	95 % min. coverage
Resistance to Solder Heat	MIL-STD-202 Method 210E 260 ±5 °C for 10 seconds	≤±0.1 %
Thermal Shock	MIL-STD-202 Method 107G -55 °C to 150 °C, 100 cycles	≤±0.2 %
Low Temperature Operation	JIS-C-5201-1 7.1 1 hour, -65 °C, followed by 45 minutes of RCWV	≤±0.5 %

RCWV (Rated Continuous Working Voltage) =  $\sqrt{P \cdot R}$  or Max. Operating Voltage, whichever is lower.

## Environmental Characteristics

Moisture Sensitivity Level..... 1  
ESD Classification (HBM) ..... N/A

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\*RoHS Directive 2015/863, Mar 31, 2015 and Annex. Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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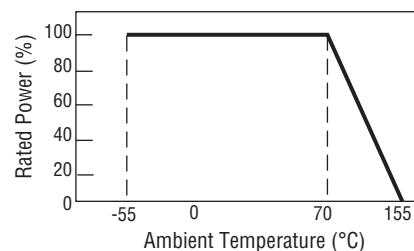
# CRT-ST Series - Thin Film Precision Chip Resistors

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## Value - TCR Table

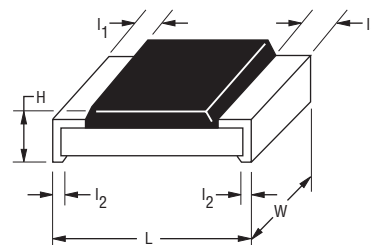
Model	TCR		Resistance Tolerance (Code)			
	(PPM/°C)	(Code)	±0.1 % (B)	±0.25 % (C)	±0.5 % (D)	±1 % (F)
CRT0402-ST	±25	(Y)	4.7 Ω to 255K Ω			
	±50	(Z)				
CRT0603-ST	±25	(Y)	1 Ω to 1M Ω			
	±50	(Z)				
CRT0805-ST	±25	(Y)	1 Ω to 2M Ω			
	±50	(Z)				
CRT1206-ST	±25	(Y)	1 Ω to 2.49M Ω			
	±50	(Z)				

## Derating Curve



## Chip Dimensions

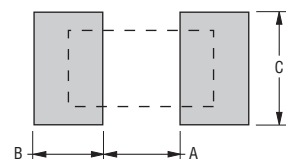
Dim.	Model CRT0402-ST	Model CRT0603-ST	Model CRT0805-ST	Model CRT1206-ST
L	$\frac{1.00 \pm 0.05}{(0.040 \pm 0.002)}$	$\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$	$\frac{2.00 \pm 0.15}{(0.079 \pm 0.006)}$	$\frac{3.10 \pm 0.15}{(0.122 \pm 0.006)}$
W	$\frac{0.50 \pm 0.05}{(0.020 \pm 0.002)}$	$\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$	$\frac{1.25 \pm 0.15}{(0.049 \pm 0.006)}$	$\frac{1.55 \pm 0.15}{(0.061 \pm 0.006)}$
H	$\frac{0.30 \pm 0.10}{(0.012 \pm 0.004)}$	$\frac{0.45 \pm 0.10}{(0.018 \pm 0.004)}$	$\frac{0.50 \pm 0.10}{(0.020 \pm 0.004)}$	$\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$
l <sub>1</sub>	$\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.42 \pm 0.20}{(0.017 \pm 0.008)}$
l <sub>2</sub>	$\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$	$\frac{0.35 \pm 0.25}{(0.014 \pm 0.010)}$



DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Recommended Land Pattern

Dimension	Model CRT0402-ST	Model CRT0603-ST	Model CRT0805-ST	Model CRT1206-ST
A	$\frac{0.50}{(0.020)}$	$\frac{0.80}{(0.031)}$	$\frac{1.00}{(0.039)}$	$\frac{2.00}{(0.079)}$
B	$\frac{0.50}{(0.020)}$	$\frac{1.00}{(0.039)}$	$\frac{1.00}{(0.039)}$	$\frac{1.15}{(0.045)}$
C	$\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$	$\frac{0.90 \pm 0.20}{(0.035 \pm 0.008)}$	$\frac{1.35 \pm 0.20}{(0.053 \pm 0.008)}$	$\frac{1.70 \pm 0.20}{(0.067 \pm 0.008)}$



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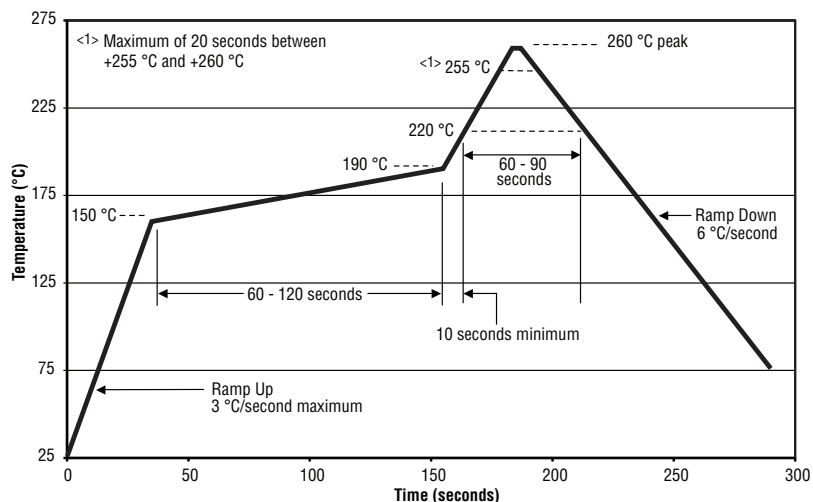
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# CRT-ST Series - Thin Film Precision Chip Resistors

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## Soldering Profile



## How to Order

**CRT 0603 - C Y - 1003 E ST**

Model \_\_\_\_\_  
(CRT = Thin Film Precision Chip Resistor)

Size \_\_\_\_\_  
• 0402 • 0603 • 0805 • 1206

Resistance Tolerance \_\_\_\_\_  
F = ±1 % D = ±0.5 % C = ±0.25 % B = ±0.1 %

TCR (PPM/°C) \_\_\_\_\_  
Z = ±50 Y = ±25

Resistance Value \_\_\_\_\_  
<100 ohms: "R" represents decimal point  
(example: 24R3 = 24.3 ohms)  
≥100 ohms: First three digits are significant, fourth digit represents number of zeroes to follow  
(example: 8252 = 82.5K ohms)

Packaging \_\_\_\_\_  
G = Paper tape (10K pcs.) on 7 " plastic reel (CRT0402-ST)  
E = Paper tape (5K pcs.) on 7 " plastic reel (CRT0603-ST, CRT0805-ST, CRT1206-ST)

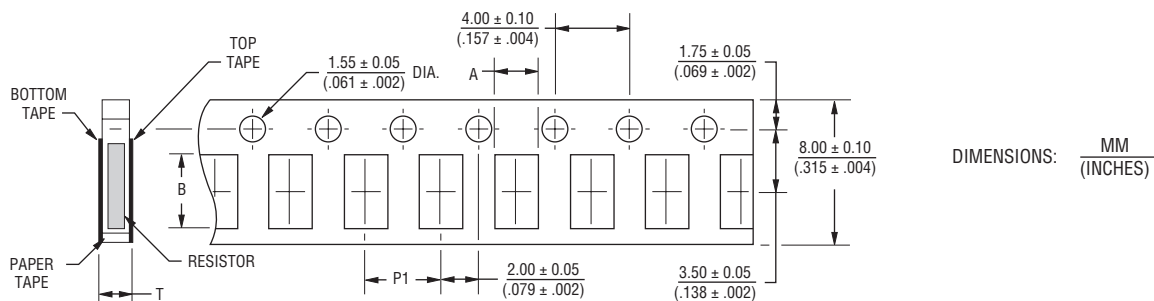
Termination \_\_\_\_\_  
ST = Tin-plated (RoHS compliant)

# CRT-ST Series - Thin Film Precision Chip Resistors

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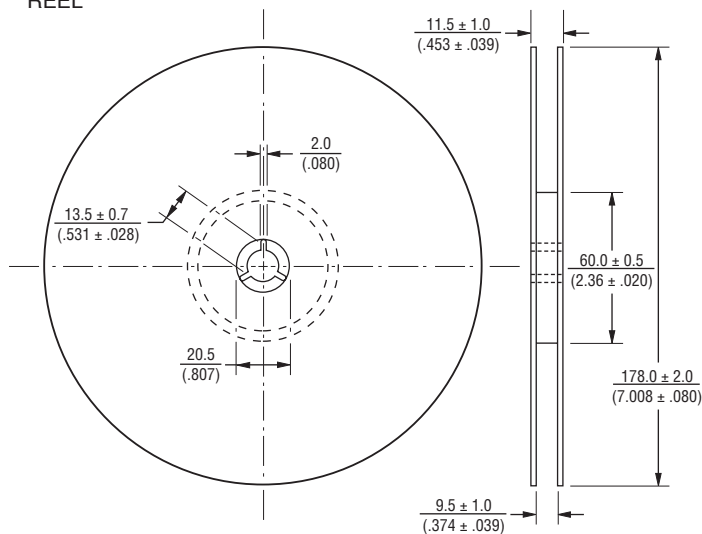
## Packaging Dimensions

### TAPE



Dimension	Model CRT0402-ST	Model CRT0603-ST	Model CRT0805-ST	Model CRT1206-ST
A	$\frac{0.70 \pm 0.05}{(0.028 \pm 0.002)}$	$\frac{1.10 \pm 0.05}{(0.043 \pm 0.002)}$	$\frac{1.60 \pm 0.05}{(0.063 \pm 0.002)}$	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$
B	$\frac{1.16 \pm 0.05}{(0.046 \pm 0.002)}$	$\frac{1.90 \pm 0.05}{(0.075 \pm 0.002)}$	$\frac{2.37 \pm 0.05}{(0.093 \pm 0.002)}$	$\frac{3.55 \pm 0.05}{(0.140 \pm 0.002)}$
P1	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
T	$\frac{0.40 \pm 0.03}{(0.016 \pm 0.001)}$	$\frac{0.60 \pm 0.03}{(0.024 \pm 0.001)}$	$\frac{0.75 \pm 0.05}{(0.030 \pm 0.002)}$	$\frac{0.75 \pm 0.05}{(0.030 \pm 0.002)}$

### REEL



Model CRT0402-ST Series: 10,000 pcs./reel  
 Model CRT0603-ST, CRT0805-ST, CRT1206-ST Series: 5,000 pcs./reel

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