



## Features

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

## Applications

- Current sense
- Precision circuits
- Medical equipment\*\*
- Printers
- Automation equipment
- Navigation equipment

**BOURNS®**

# CRT Series - Thin Film Precision Chip Resistors

## Electrical Characteristics

Characteristic	Model CRT0402	Model CRT0603	Model CRT0805	Model CRT1206
Power Rating @ 70 °C	1/16 watt	1/16 watt	1/10 watt	1/8 watt
Operating Temperature Range	-55 to +155 °C			
Derated to Zero Load at	+155 °C			
Maximum Working Voltage	25 V	50 V	100 V	150 V
Maximum Overload Voltage	50 V	100 V	200 V	300 V
Resistance Range (E-96 + E-24 Values)	(See Standard Values Table)			
Temperature Coefficient of Resistance (TCR)	5 to 50 PPM/°C (See Value - TCR Table on Pages 2 & 3)			

## Environmental Characteristics

Specification	Test (MIL STD 202)	Limit ( $\Delta R$ ) (Tol. $\leq 0.05\%$ )	Limit ( $\Delta R$ ) (Tol. $> 0.05\%$ )
Short Time Overload	2.5 x Max. Operating Voltage for 5 seconds	$\pm 0.05\%$	$\pm 0.2\%$
Load Life	1000 Hours at Rated Power	$\pm 0.05\%$	$\pm 0.5\%$
Humidity (Steady State)	Method 103B	$\pm 0.05\%$	$\pm 0.3\%$
Thermal Shock	Method 107	$\pm 0.05\%$	$\pm 0.3\%$
Solderability	Method 208H		
Resistance to Soldering Heat	Method 210E	$\pm 0.05\%$	$\pm 0.2\%$

## How to Order

### CRT 0603 - C V - 1003 E LF

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

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

Resistance Tolerance \_\_\_\_\_  
 F =  $\pm 1\%$     B =  $\pm 0.1\%$   
 D =  $\pm 0.5\%$     A =  $\pm 0.05\%$   
 C =  $\pm 0.25\%$     P =  $\pm 0.01\%$

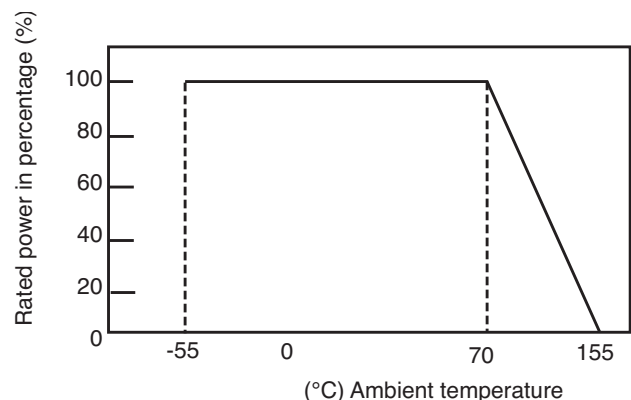
TCR (PPM/°C) \_\_\_\_\_  
 Z =  $\pm 50$     W =  $\pm 10$   
 Y =  $\pm 25$     V =  $\pm 5$   
 X =  $\pm 15$

Resistance Value \_\_\_\_\_  
 <100 ohms: "R" represents decimal point  
 (example: 24R3 = 24.3 ohms)  
 $\geq 100$  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)  
 E = Paper tape (5K pcs.) on 7" plastic reel (CRT0603, CRT0805,  
 CRT1206)

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

## Derating Curve



\* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

\*\*Bourns® products have not been specifically designed and tested for FDA Class III applications and their use in such applications is neither recommended nor supported. Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# CRT Series - Thin Film Precision Chip Resistors

# BOURNS®

Value - TCR Table

Part Number	TR Range (Ohms)	TR Tolerance	TCR (PPM/°C)
CRT0402-AV	49.9 to 5K	0.05 %	5
CRT0402-AW	49.9 to 12K	0.05 %	10
CRT0402-AX	49.9 to 12K	0.05 %	15
CRT0402-AY	49.9 to 12K	0.05 %	25
CRT0402-AZ	49.9 to 12K	0.05 %	50
CRT0402-BV	49.9 to 5K	0.10 %	5
CRT0402-BW	49.9 to 12K	0.10 %	10
CRT0402-BX	49.9 to 70K	0.10 %	15
CRT0402-BY	10 to 205K	0.10 %	25
CRT0402-BZ	10 to 205K	0.10 %	50
CRT0402-CV	49.9 to 5K	0.25 %	5
CRT0402-CW	49.9 to 12K	0.25 %	10
CRT0402-CX	49.9 to 70K	0.25 %	15
CRT0402-CY	10 to 205K	0.25 %	25
CRT0402-CZ	10 to 205K	0.25 %	50
CRT0402-DV	49.9 to 5K	0.50 %	5
CRT0402-DW	49.9 to 12K	0.50 %	10
CRT0402-DX	49.9 to 70K	0.50 %	15
CRT0402-DY	10 to 205K	0.50 %	25
CRT0402-DZ	1 to 205K	0.50 %	50
CRT0402-FV	49.9 to 5K	1.00 %	5
CRT0402-FW	49.9 to 12K	1.00 %	10
CRT0402-FX	49.9 to 70K	1.00 %	15
CRT0402-FY	10 to 205K	1.00 %	25
CRT0402-FZ	1 to 205K	1.00 %	50
CRT0402-PV	49.9 to 5K	0.01 %	5
CRT0402-PW	49.9 to 12K	0.01 %	10
CRT0402-PX	49.9 to 12K	0.01 %	15
CRT0402-PY	49.9 to 12K	0.01 %	25
CRT0402-PZ	49.9 to 12K	0.01 %	50
CRT0603-AV	24.9 to 15K	0.05 %	5
CRT0603-AW	4.7 to 332K	0.05 %	10
CRT0603-AX	4.7 to 332K	0.05 %	15
CRT0603-AY	4.7 to 332K	0.05 %	25
CRT0603-AZ	4.7 to 332K	0.05 %	50
CRT0603-BV	24.9 to 15K	0.10 %	5
CRT0603-BW	4.7 to 33K	0.10 %	10
CRT0603-BX	4.7 to 33K	0.10 %	15
CRT0603-BY	4.7 to 1 meg	0.10 %	25
CRT0603-BZ	4.7 to 1 meg	0.10 %	50
CRT0603-CV	24.9 to 15K	0.25 %	5
CRT0603-CW	4.7 to 33K	0.25 %	10
CRT0603-CX	4.7 to 33K	0.25 %	15
CRT0603-CY	2 to 1 meg	0.25 %	25
CRT0603-CZ	1 to 1 meg	0.25 %	50
CRT0603-DV	24.9 to 15K	0.50 %	5
CRT0603-DW	4.7 to 33K	0.50 %	10
CRT0603-DX	4.7 to 33K	0.50 %	15
CRT0603-DY	2 to 1 meg	0.50 %	25
CRT0603-DZ	1 to 1 meg	0.50 %	50
CRT0603-FV	24.9 to 15K	1.00 %	5
CRT0603-FW	4.7 to 33K	1.00 %	10

Part Number	TR Range (Ohms)	TR Tolerance	TCR (PPM/°C)
CRT0603-FX	4.7 to 33K	1.00 %	15
CRT0603-FY	2 to 1 meg	1.00 %	25
CRT0603-FZ	1 to 1 meg	1.00 %	50
CRT0603-PV	24.9 to 15K	0.01 %	5
CRT0603-PW	24.9 to 100K	0.01 %	10
CRT0603-PX	24.9 to 100K	0.01 %	15
CRT0603-PY	24.9 to 100K	0.01 %	25
CRT0603-PZ	24.9 to 100K	0.01 %	50
CRT0805-AV	24.9 to 30K	0.05 %	5
CRT0805-AW	4.7 to 511K	0.05 %	10
CRT0805-AX	4.7 to 511K	0.05 %	15
CRT0805-AY	4.7 to 511K	0.05 %	25
CRT0805-AZ	4.7 to 511K	0.05 %	50
CRT0805-BV	24.9 to 30K	0.10 %	5
CRT0805-BW	4.7 to 511K	0.10 %	10
CRT0805-BX	4.7 to 511K	0.10 %	15
CRT0805-BY	4.7 to 2 meg	0.10 %	25
CRT0805-BZ	4.7 to 2 meg	0.10 %	50
CRT0805-CV	24.9 to 30K	0.25 %	5
CRT0805-CW	4.7 to 511K	0.25 %	10
CRT0805-CX	4.7 to 511K	0.25 %	15
CRT0805-CY	1 to 2 meg	0.25 %	25
CRT0805-CZ	1 to 2 meg	0.25 %	50
CRT0805-DV	24.9 to 30K	0.50 %	5
CRT0805-DW	4.7 to 511K	0.50 %	10
CRT0805-DX	4.7 to 511K	0.50 %	15
CRT0805-DY	1 to 2 meg	0.50 %	25
CRT0805-DZ	1 to 2 meg	0.50 %	50
CRT0805-FV	24.9 to 30K	1.00 %	5
CRT0805-FW	4.7 to 511K	1.00 %	10
CRT0805-FX	4.7 to 511K	1.00 %	15
CRT0805-FY	1 to 2 meg	1.00 %	25
CRT0805-FZ	1 to 2 meg	1.00 %	50
CRT0805-PV	24.9 to 30K	0.01 %	5
CRT0805-PW	24.9 to 200K	0.01 %	10
CRT0805-PX	24.9 to 200K	0.01 %	15
CRT0805-PY	24.9 to 200K	0.01 %	25
CRT0805-PZ	24.9 to 20K	0.01 %	50
CRT1206-AV	24.9 to 50K	0.05 %	5
CRT1206-AW	4.7 to 1 meg	0.05 %	10
CRT1206-AX	4.7 to 1 meg	0.05 %	15
CRT1206-AY	4.7 to 1 meg	0.05 %	25
CRT1206-AZ	4.7 to 1 meg	0.05 %	50
CRT1206-BV	24.9 to 50K	0.10 %	5
CRT1206-BW	4.7 to 1 meg	0.10 %	10
CRT1206-BX	4.7 to 1 meg	0.10 %	15
CRT1206-BY	4.7 to 2.5 meg	0.10 %	25
CRT1206-BZ	4.7 to 2.5 meg	0.10 %	50
CRT1206-CV	24.9 to 50 K	0.25 %	5
CRT1206-CW	4.7 to 1 meg	0.25 %	10
CRT1206-CX	4.7 to 1 meg	0.25 %	15
CRT1206-CY	1 to 2.5 meg	0.25 %	25

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# CRT Series - Thin Film Precision Chip Resistors

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## Value - TCR Table (Continued)

Part Number	TR Range (Ohms)	TR Tolerance	TCR (PPM/°C)
CRT1206-CZ	1 to 2.5 meg	0.25 %	50
CRT1206-DV	24.9 to 50K	0.50 %	5
CRT1206-DW	4.7 to 1 meg	0.50 %	10
CRT1206-DX	4.7 to 1 meg	0.50 %	15
CRT1206-DY	1 to 2.5 meg	0.50 %	25
CRT1206-DZ	1 to 2.5 meg	0.50 %	50
CRT1206-FV	24.9 to 50K	1.00 %	5
CRT1206-FW	4.7 to 1 meg	1.00 %	10
CRT1206-FX	4.7 to 1 meg	1.00 %	15
CRT1206-FY	1 to 2.5 meg	1.00 %	25
CRT1206-FZ	1 to 2.5 meg	1.00 %	50
CRT1206-PV	24.9 to 50K	0.01 %	5
CRT1206-PW	24.9 to 500K	0.01 %	10
CRT1206-PX	24.9 to 500K	0.01 %	15
CRT1206-PY	24.9 to 500K	0.01 %	25
CRT1206-PZ	24.9 to 500K	0.01 %	50

## Soldering Profile



## Chip Dimensions

Dimension	Model CRT0402	Model CRT0603	Model CRT0805	Model CRT1206
L	$\frac{1.00 \pm 0.10}{(0.040 \pm 0.004)}$	$\frac{1.55 \pm 0.10}{(0.061 \pm 0.004)}$	$\frac{2.00 \pm 0.15}{(0.079 \pm 0.006)}$	$\frac{3.05 \pm 0.15}{(0.120 \pm 0.006)}$
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	$\frac{0.30 \pm 0.05}{(0.012 \pm 0.002)}$	$\frac{0.45 \pm 0.15}{(0.018 \pm 0.006)}$	$\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$	$\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$
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>	$\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.40 \pm 0.25}{(0.016 \pm 0.010)}$	$\frac{0.35 \pm 0.25}{(0.020 \pm 0.014)}$



## Recommended Land Pattern

Dimension	Model CRT0402	Model CRT0603	Model CRT0805	Model CRT1206
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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# CRT Series - Thin Film Precision Chip Resistors

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## Packaging Dimensions - Tape

Dimension	Model CRT0402	Model CRT0603	Model CRT0805	Model CRT1206
A	$\frac{1.16 \pm 0.05}{(0.046 \pm 0.002)}$	$\frac{1.90 \pm 0.05}{(0.075 \pm 0.002)}$	$\frac{2.37 \pm 0.05}{(0.094 \pm 0.002)}$	$\frac{3.55 \pm 0.05}{(0.140 \pm 0.002)}$
B	$\frac{0.70 \pm 0.05}{(0.028 \pm 0.002)}$	$\frac{1.10 \pm 0.05}{(0.043 \pm 0.002)}$	$\frac{1.60 \pm 0.05}{(0.063 \pm 0.002)}$	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$
C	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$



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Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

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«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,  
кабельные сборки и микроволновые компоненты:

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