



## 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

# 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)

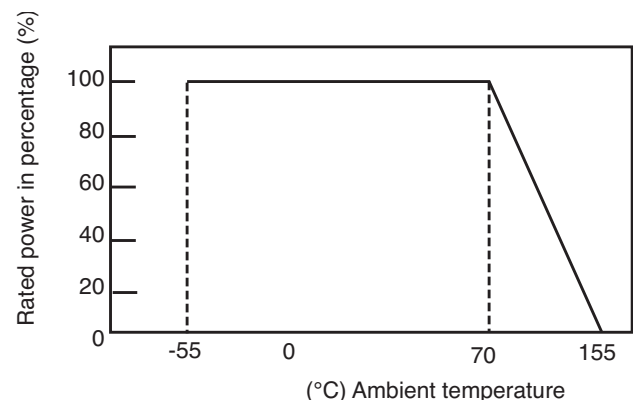
Packaging \_\_\_\_\_

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.

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# 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> | $\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$ | $\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$ | $\frac{0.40 \pm 0.25}{(0.016 \pm 0.010)}$ | $\frac{0.35 \pm 0.25}{(0.020 \pm 0.014)}$ |



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

## 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         | $\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$ | $\frac{0.90 \pm 0.20}{(0.035 \pm 0.008)}$ | $\frac{1.35 \pm 0.20}{(0.053 \pm 0.008)}$ | $\frac{1.70 \pm 0.20}{(0.067 \pm 0.008)}$ |



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

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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;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- 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.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

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

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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