



## Features

- Resistance value as low as 0.001 ohm
- High power density
- Inductance less than 5 nH
- RoHS compliant\*

## Applications

- Power supplies
- Stepper motor drives

## CRF Series - High Power Current Sense Chip Resistor

### Electrical Characteristics

| Rating                      | CRF0805              | CRF1206                                                                           | CRF2512                                          |
|-----------------------------|----------------------|-----------------------------------------------------------------------------------|--------------------------------------------------|
| Power Rating @ 70 °C        | 0.5 W                | 1 W                                                                               | (0.001 to 0.010 Ω) 2 W<br>(0.011 to 0.050 Ω) 1 W |
| Operating Temperature Range | -55 °C to +170 °C    |                                                                                   |                                                  |
| Derated to Zero Load at     | +170 °C              |                                                                                   |                                                  |
| Maximum Working Voltage     | $(P \times R)^{1/2}$ |                                                                                   |                                                  |
| Resistance                  | 0.005 ~ 0.020 Ω      | 0.001 ~ 0.030 Ω                                                                   | 0.001 ~ 0.050 Ω                                  |
| Resistance Tolerance        | 1 %, ±5 %            |                                                                                   |                                                  |
| Temperature Coefficient     | ±100 PPM/°C          | (0.001 Ω) ±275 PPM/°C<br>(0.002 to 0.010 Ω) ±100 PPM/°C<br>(>0.010 Ω) ± 75 PPM/°C |                                                  |

### Performance Characteristics

| Test                      | Conditions                                                               | Specification                          |                                        |         |
|---------------------------|--------------------------------------------------------------------------|----------------------------------------|----------------------------------------|---------|
|                           |                                                                          | CRF0805                                | CRF1206                                | CRF2512 |
| Thermal Shock             | -55 °C to +150 °C,<br>300 Cycles, 15 minutes                             | $\Delta R \pm(1 \% + 0.0005 \Omega)$   | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |
| Short Time Overload       | 5 X Rated Power for 5 seconds                                            | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |
| Low Temperature Storage   | -55 °C for 1000 hours                                                    | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |
| High Temperature Exposure | 1000 hours @ + 170 °C                                                    | $\Delta R \pm(1 \% + 0.0005 \Omega)$   | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |
| Bias Humidity             | + 85 °C, 85 % RH,<br>10 % Bias, 1000 hours                               | N/A                                    | $\Delta R \pm(1 \% + 0.0005 \Omega)$   |         |
| Mechanical Shock          | 100 g for 6 milliseconds,<br>5 pulses                                    | N/A                                    | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |
| Vibration                 | Frequency varied 10-2000 KHz<br>in one minute, 3 directions,<br>12 hours | N/A                                    | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |
| Load Life                 | 1000 hours at rated power at<br>+70 °C, 1.5 hours on, 0.5 hours<br>off   | $\Delta R \pm(1 \% + 0.0005 \Omega)$   | $\Delta R \pm(1 \% + 0.0005 \Omega)$   |         |
| Resistance to Solder Heat | +260 °C, 10-12 second dwell,<br>25 mm/second emergence                   | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |
| Moisture Resistance       | MIL-STD-202 Method 106, 0 %<br>power (7a and 7b not required)            | $\Delta R \pm(1 \% + 0.0005 \Omega)$   | $\Delta R \pm(0.5 \% + 0.0005 \Omega)$ |         |

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

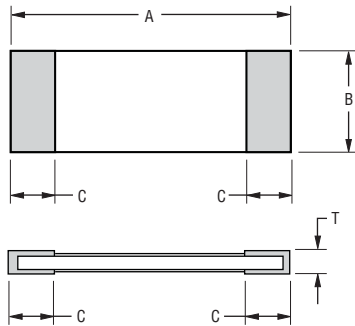
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# CRF Series - High Power Current Sense Chip Resistor

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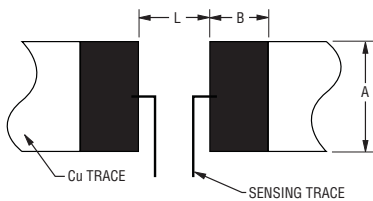
## Product Dimensions



| Dim. | CRF0805                            | CRF1206                             | CRF2512                            |
|------|------------------------------------|-------------------------------------|------------------------------------|
| A    | $2.0 \pm 0.10$<br>(0.079 ± 0.004)  | $3.20 \pm 0.20$<br>(0.126 ± 0.008)  | $6.40 \pm 0.20$<br>(0.252 ± 0.008) |
| B    | $1.25 \pm 0.10$<br>(0.049 ± 0.004) | $1.65 \pm 0.20$<br>(0.064 ± 0.008)  | $3.20 \pm 0.20$<br>(0.126 ± 0.008) |
| C    | $0.40 \pm 0.20$<br>(0.016 ± 0.008) | $0.50 \pm 0.30$<br>(0.0197 ± 0.012) | $0.95 \pm 0.30$<br>(0.037 ± 0.012) |
| T    | $0.60 \pm 0.20$<br>(0.024 ± 0.008) | $0.60 \pm 0.20$<br>(0.024 ± 0.008)  | $0.60 \pm 0.20$<br>(0.024 ± 0.008) |

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

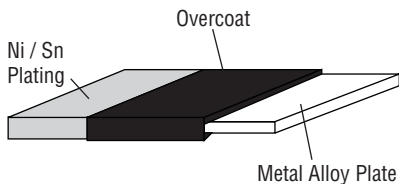
## Recommended Solder Pad Layout



| Dim. | CRF0805                | CRF1206               |                       | CRF2512               |                       |
|------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|      | 0.005 ~ 0.020 Ω        | 0.001 Ω               | 0.002 ~ 0.030 Ω       | 0.001 ~ 0.003 Ω       | 0.004 ~ 0.050 Ω       |
| A    | $\frac{1.4}{(0.055)}$  | $\frac{1.8}{(0.070)}$ | $\frac{1.8}{(0.070)}$ | $\frac{4.0}{(0.157)}$ | $\frac{4.0}{(0.157)}$ |
| B    | $\frac{1.15}{(0.045)}$ | $\frac{2.3}{(0.090)}$ | $\frac{1.7}{(0.066)}$ | $\frac{3.1}{(0.122)}$ | $\frac{2.1}{(0.083)}$ |
| L    | $\frac{1.2}{(0.047)}$  | $\frac{1.0}{(0.039)}$ | $\frac{1.6}{(0.062)}$ | $\frac{1.3}{(0.051)}$ | $\frac{4.1}{(0.161)}$ |

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

## Construction



## Resistance Value Tables

### CRF0805

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R005 | 0.005   | R010 | 0.010   |
| R009 | 0.009   | R020 | 0.020   |

### CRF1206

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R001 | 0.001   | R010 | 0.010   |
| R002 | 0.002   | R012 | 0.012   |
| R004 | 0.004   | R014 | 0.014   |
| R005 | 0.005   | R015 | 0.015   |
| R006 | 0.006   | R020 | 0.020   |
| R007 | 0.007   | R022 | 0.022   |
| R008 | 0.008   | R025 | 0.025   |
| R009 | 0.009   | R030 | 0.030   |

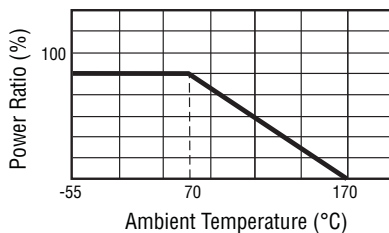
### CRF2512 (1W)

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R011 | 0.011   | R030 | 0.030   |
| R012 | 0.012   | R033 | 0.033   |
| R015 | 0.015   | R035 | 0.035   |
| R018 | 0.018   | R040 | 0.040   |
| R020 | 0.020   | R050 | 0.050   |
| R025 | 0.025   |      |         |

### CRF2512 (2W)

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R001 | 0.001   | R006 | 0.006   |
| R002 | 0.002   | R007 | 0.007   |
| R003 | 0.003   | R008 | 0.008   |
| R004 | 0.004   | R010 | 0.010   |
| R005 | 0.005   |      |         |

## Derating Curve



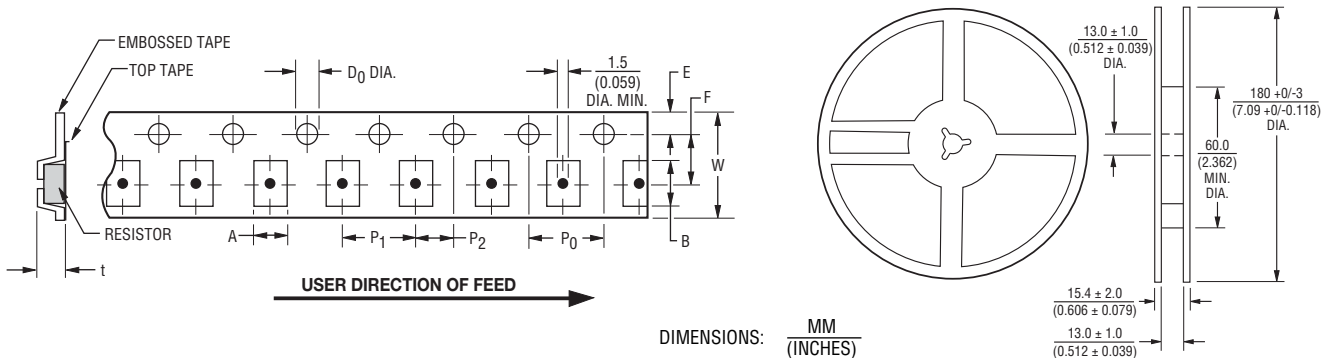
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## Packaging Dimensions (Conforms to EIA RS-481A)



| Packing       | Model   | A                              | B                             | W                              | F                             | E                              | P1                            | P2                            | P0                            | D0                             | t                              |
|---------------|---------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
| Paper Tape    | CRF0805 | 1.6 ± 0.15<br>(0.063 ± 0.006)  | 2.4 ± 0.20<br>(0.094 ± 0.008) | 8.0 ± 0.20<br>(0.315 ± 0.008)  | 3.5 ± 0.05<br>(0.138 ± 0.002) | 1.75 ± 0.10<br>(0.069 ± 0.004) | 4.0 ± 0.10<br>(0.157 ± 0.004) | 2.0 ± 0.1<br>(0.079 ± 0.004)  | 4.0 ± 0.1<br>(0.157 ± 0.004)  | 1.5+0.1/-0<br>(0.059+0.004/-0) | 0.84 ± 0.10<br>(0.033 ± 0.004) |
| Paper Tape    | CRF1206 | 2.0 ± 0.15<br>(0.079 ± 0.006)  | 3.6 ± 0.20<br>(0.142 ± 0.008) | 8.0 ± 0.20<br>(0.315 ± 0.008)  | 3.5 ± 0.05<br>(0.138 ± 0.002) | 1.75 ± 0.10<br>(0.069 ± 0.004) | 4.0 ± 0.10<br>(0.157 ± 0.004) | 2.0 ± 0.05<br>(0.079 ± 0.002) | 4.0 ± 0.05<br>(0.157 ± 0.002) | 1.5+0.1/-0<br>(0.059+0.004/-0) | 0.85 ± 0.15<br>(0.033 ± 0.006) |
| Embossed Tape | CRF2512 | 3.60 ± 0.20<br>(0.142 ± 0.008) | 6.9 ± 0.20<br>(0.272 ± 0.008) | 12.0 ± 0.20<br>(0.472 ± 0.008) | 5.5 ± 0.05<br>(0.217 ± 0.002) | 1.75 ± 0.10<br>(0.069 ± 0.004) | 4.0 ± 0.10<br>(0.157 ± 0.004) | 2.0 ± 0.05<br>(0.079 ± 0.002) | 2.0 ± 0.05<br>(0.079 ± 0.002) | 1.5+0.1/-0<br>(0.059+0.004/-0) | 0.85 ± 0.15<br>(0.033 ± 0.006) |

## How to Order

**CRF 0805 - F X - R020 E LF**

Model \_\_\_\_\_  
(CRF = Precision Chip Resistor)

Size \_\_\_\_\_  
0805 = 0805 Size  
1206 = 1206 Size  
2512 = 2512 Size

Resistance Tolerance \_\_\_\_\_  
• F = ±1 %  
• J = ±5 %

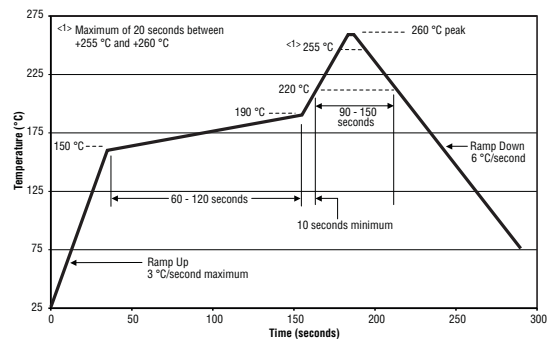
TCR (PPM/°C) \_\_\_\_\_  
• Z = ± 75 PPM/°C (>0.010 ohm)  
• X = ±100 PPM/°C (0.002 ohm ~ 0.010 ohm & Model CRF0805 only)  
• V = ±275 PPM/°C (0.001 ohm)

Resistance Value \_\_\_\_\_  
"R" (decimal point) followed by three significant digits  
(example: R020 = 0.020 ohm)

Packaging \_\_\_\_\_  
• E = 5,000 pcs./180 mm (7-inch) reel (CRF0805 & CRF1206)  
or 4,000 pcs./180 mm (7-inch) reel (CRF2512)

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

## Soldering Profile



REV. 09/13

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## Данный компонент на территории Российской Федерации

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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

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На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9