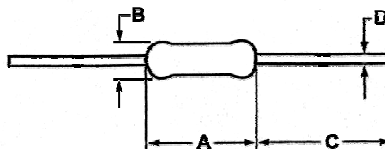


- Features:
- General purpose resistor ideal for commercial/industrial applications
  - Flame retardant coatings standard
  - Flameproof version available as CFF
  - Panasert available on selected sizes; contact factory
  - Auto sequencing/insertion compatible
  - CFM (mini) ideal choice when size constraints apply
  - Cut and formed product is available on select sizes; contact factory
  - Standard lead wire for CF/CFM is copper plated steel, with 100% tin over plate
  - 100% tin plate on copper wire is available as type CFQ/CFQM
  - RoHS compliant / lead-free



| Electrical Specifications |                             |                             |                          |                                 |                                                                                                                                                                                                                                                                                                                                                                                                         |                               |         |
|---------------------------|-----------------------------|-----------------------------|--------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------|
| Type / Code               | Power Rating (Watts) @ 70°C | Maximum Working Voltage (1) | Maximum Overload Voltage | Dielectric Withstanding Voltage | Resistance Temperature Coefficient per Ohmic Range                                                                                                                                                                                                                                                                                                                                                      | Ohmic Range (Ω) and Tolerance |         |
|                           |                             |                             |                          |                                 |                                                                                                                                                                                                                                                                                                                                                                                                         | 2%                            | 5%      |
| CF18                      | 0.125W                      | 250V                        | 500V                     | 350V                            | $<10\Omega = \pm 400\text{ppm}/^\circ\text{C}$<br>$10\Omega \text{ to } 9.99\text{K}\Omega = 0 \sim -400\text{ppm}/^\circ\text{C}$<br>$10\text{K}\Omega \text{ to } 99\text{K}\Omega = 0 \sim -500\text{ppm}/^\circ\text{C}$<br>$100\text{K}\Omega \text{ to } 999\text{K}\Omega = 0 \sim -850\text{ppm}/^\circ\text{C}$<br>$1\text{M}\Omega \text{ and above} = 0 \sim -1500\text{ppm}/^\circ\text{C}$ | 10 - 1M                       | 1 - 22M |
| CF14                      | 0.25W                       | 350V                        | 600V                     | 350V                            |                                                                                                                                                                                                                                                                                                                                                                                                         | 1 - 1M                        | 1 - 22M |
| CF12                      | 0.5W                        | 350V                        | 700V                     | 600V                            |                                                                                                                                                                                                                                                                                                                                                                                                         | 10 - 1M                       | 1 - 22M |
| CF1                       | 1W                          | 500V                        | 1,000V                   | 600V                            |                                                                                                                                                                                                                                                                                                                                                                                                         | 1 - 1M                        | 1 - 10M |
| CF2                       | 2W                          | 500V                        | 1,000V                   | 600V                            |                                                                                                                                                                                                                                                                                                                                                                                                         | 10 - 1M                       | 1 - 10M |
| CFM14                     | 0.25W                       | 250V                        | 500V                     | 350V                            |                                                                                                                                                                                                                                                                                                                                                                                                         | 10 - 1M                       | 1 - 10M |
| CFM12                     | 0.5W                        | 350V                        | 600V                     | 350V                            |                                                                                                                                                                                                                                                                                                                                                                                                         | 10 - 1M                       | 1 - 10M |
| CFM1                      | 1W                          | 600V                        | 1,000V                   | 600V                            |                                                                                                                                                                                                                                                                                                                                                                                                         | 10 - 1M                       | 1 - 10M |

(1) Lesser of  $\sqrt{\text{PR}}$  or maximum working voltage.

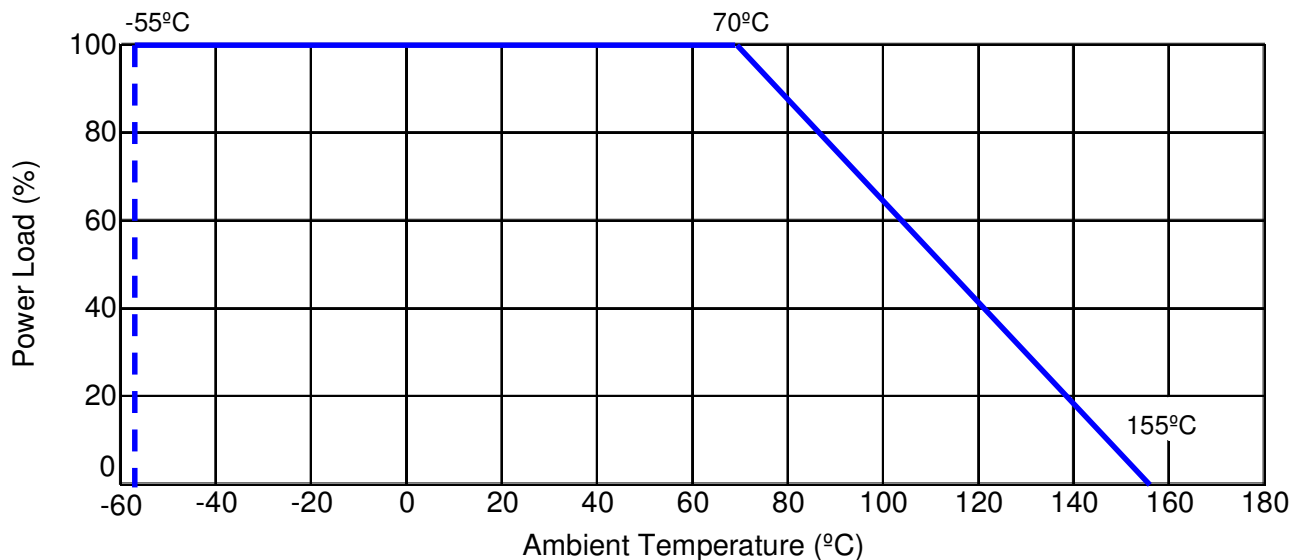


| Mechanical Specifications |                  |                    |                        |                    |        |
|---------------------------|------------------|--------------------|------------------------|--------------------|--------|
| Type / Code               | A<br>Body Length | B<br>Body Diameter | C<br>Lead Length(Bulk) | D<br>Lead Diameter | Unit   |
| CF18                      | 0.130 ± 0.012    | 0.067 ± 0.012      | 1.102 ± 0.118          | 0.018 ± 0.003      | inches |
|                           | 3.30 ± 0.30      | 1.70 ± 0.30        | 28.00 ± 3.00           | 0.45 ± 0.08        | mm     |
| CF14                      | 0.256 ± 0.020    | 0.091 ± 0.012      | 1.102 ± 0.118          | 0.022 ± 0.003      | inches |
|                           | 6.50 ± 0.50      | 2.30 ± 0.30        | 28.00 ± 3.00           | 0.55 ± 0.08        | mm     |
| CF12                      | 0.335 ± 0.039    | 0.106 ± 0.020      | 1.181 ± 0.118          | 0.022 ± 0.002      | inches |
|                           | 8.50 ± 1.00      | 2.70 ± 0.50        | 30.00 ± 3.00           | 0.56 ± 0.05        | mm     |
| CF1                       | 0.433 ± 0.039    | 0.177 ± 0.020      | 1.181 ± 0.118          | 0.028 ± 0.004      | inches |
|                           | 11.00 ± 1.00     | 4.50 ± 0.50        | 30.00 ± 3.00           | 0.70 ± 0.10        | mm     |
| CF2                       | 0.591 ± 0.039    | 0.197 ± 0.020      | 1.339 ± 0.157          | 0.031 ± 0.004      | inches |
|                           | 15.00 ± 1.00     | 5.00 ± 0.50        | 34.00 ± 4.00           | 0.80 ± 0.10        | mm     |
| CFM14                     | 0.130 ± 0.012    | 0.067 ± 0.012      | 1.102 ± 0.118          | 0.018 ± 0.003      | inches |
|                           | 3.30 ± 0.30      | 1.70 ± 0.30        | 28.00 ± 3.00           | 0.45 ± 0.08        | mm     |
| CFM12                     | 0.256 ± 0.039    | 0.091 ± 0.012      | 1.102 ± 0.118          | 0.022 ± 0.003      | inches |
|                           | 6.50 ± 1.00      | 2.30 ± 0.30        | 28.00 ± 3.00           | 0.55 ± 0.08        | mm     |
| CFM1                      | 0.354 ± 0.020    | 0.138 ± 0.020      | 1.102 ± 0.118          | 0.024 ± 0.002      | inches |
|                           | 9.00 ± 0.50      | 3.50 ± 0.50        | 28.00 ± 3.00           | 0.60 ± 0.05        | mm     |

| Performance Characteristics     |                        |              |
|---------------------------------|------------------------|--------------|
| Test                            | Standard / Method      | Test Results |
| Short Time Overload             | EIA-RS-172-B 3.2.6     | $\pm 0.5\%$  |
| Resistance to Solder Heat       | MIL-STD 202 Method 210 | $\pm 0.5\%$  |
| Dielectric Withstanding Voltage | JIS C 5202 5.6         | $\pm 0.5\%$  |
| Load Life                       | MIL-STD 202 Method 108 | $\pm 1\%$    |
| Terminal Strength               | MIL-STD 202 Method 211 | $\pm 0.2\%$  |
| Moisture Resistance             | MIL-STD 202 Method 106 | $\pm 0.5\%$  |

Operating Temperature Range: -55°C to +155°C

### Power Derating Curve:



## How to Order

| 1        | 2        | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10       |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>C</b> | <b>F</b> | <b>1</b> | <b>2</b> | <b>J</b> | <b>T</b> | <b>1</b> | <b>0</b> | <b>0</b> | <b>K</b> |

| Product Series | Size                                   | Power Rating | Tolerance | Code | Description   | Size                                             | Quantity | Resistance Value                                                      |
|----------------|----------------------------------------|--------------|-----------|------|---------------|--------------------------------------------------|----------|-----------------------------------------------------------------------|
| CF             | Standard                               | 18 0.125W    | Code Tol  | B    | Bulk          | CF18, CFM14, CF14, CFM12<br>CF12, CFM1, CF1, CF2 | 1,000    | Four characters with<br>the multiplier used as<br>the decimal holder. |
| CFF            | Flameproof                             | 14 0.25W     | G 2%      |      |               |                                                  |          |                                                                       |
| CFM            | Mini                                   | 12 0.5W      | J 5%      |      |               |                                                  |          |                                                                       |
| PCF            | Panasert CF14                          | 1 1W         |           |      |               |                                                  |          |                                                                       |
| PCFM           | Panasert CF12                          | 2 2W         |           |      |               |                                                  |          |                                                                       |
| CFQ            | Tin plating on copper wire             |              |           | T    | Tape and Reel | CF18, CFM14, CF14,<br>CFM12, CF12, PCF14, PCFM12 | 5,000    | 10 ohm = 10R0<br>10.2 Kohm = 10K2<br>1 Mohm = 1M00                    |
| CFQM           | Tin plating (mini)                     |              |           |      |               | CFM1                                             | 2,500    |                                                                       |
|                |                                        |              |           |      |               | CF1                                              | 2,000    |                                                                       |
|                |                                        |              |           |      |               | CF2                                              | 1,000    |                                                                       |
| PCFQ           | Tin plating on copper wire<br>Panasert |              |           | A    | Ammo          | CF18, CFM14, CF14, CFM12                         | 5,000    |                                                                       |
|                |                                        |              |           |      |               | CF12, CFM1, PCF14, PCFM12                        | 2,000    |                                                                       |
|                |                                        |              |           |      |               | CF1, CF2                                         | 1,000    |                                                                       |

Legacy Part Number (before January 3, 2011):

| SEI Type  | Code       | Nominal Resistance | Tolerance | Packaging |
|-----------|------------|--------------------|-----------|-----------|
| <b>CF</b> | <b>1/2</b> | <b>100K</b>        | <b>5%</b> | <b>R</b>  |

| Code | Description                            | Code | Wattage | Tolerance |
|------|----------------------------------------|------|---------|-----------|
| CF   | Standard                               | 1/8  | 0.125W  | 2%        |
| CFF  | Flameproof                             | 1/4  | 0.25W   | 5%        |
| CFM  | Mini                                   | 1/2  | 0.5W    |           |
| PCF  | Panasert CF 1/4                        | 1    | 1W      |           |
| PCFM | Panasert CF 1/2                        | 2    | 2W      |           |
| CFQ  | Tin plating on copper wire             |      |         |           |
| CFQM | Tin plating (mini)                     |      |         |           |
| PCFQ | Tin plating on copper wire<br>Panasert |      |         |           |

| Code →    | A     | R           | T                        |
|-----------|-------|-------------|--------------------------|
| SEI Types | Bulk  | Tape & Reel | Tape & Box<br>(Ammo Box) |
| CF 1/8    |       |             |                          |
| CFM 1/4   | 1,000 | 5,000       | 5,000                    |
| CF 1/4    |       |             |                          |
| CFM 1/2   |       |             |                          |
| CF 1/2    | 1,000 | 5,000       | 2,000                    |
| CFM 1     | 1,000 | 2,500       | 2,000                    |
| CF 1      | 1,000 | 2,000       | 1,000                    |
| CF 2      | 1,000 | 1,000       | 1,000                    |
| PCF 1/4   |       |             |                          |
| PCFM 1/2  | N/A   | 5,000       | 2,000                    |