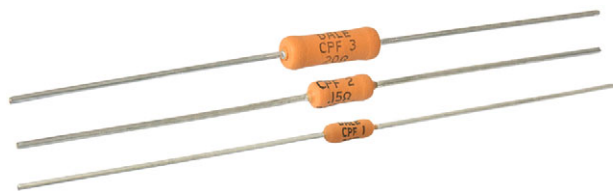


# Metal Film Resistors, Axial, Industrial Power, Precision, Flameproof



## FEATURES

- High power rating, small size
- Flameproof, high temperature silicone coating
- Special filming and coating processes
- Excellent high frequency characteristics
- Low noise
- Low voltage coefficient
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS\***  
Available

## Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

| STANDARD ELECTRICAL SPECIFICATIONS |                  |                                             |                                                       |                              |                         |                                                              |
|------------------------------------|------------------|---------------------------------------------|-------------------------------------------------------|------------------------------|-------------------------|--------------------------------------------------------------|
| GLOBAL MODEL                       | HISTORICAL MODEL | MAXIMUM WORKING VOLTAGE <sup>(1)</sup><br>V | POWER RATING<br>$P_{70\text{ }^{\circ}\text{C}}$<br>W | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$   | TEMPERATURE COEFFICIENT<br>$\pm \text{ppm}/^{\circ}\text{C}$ |
| CPF1                               | CPF-1            | 250                                         | 1                                                     | 5 to 150K                    | 0.1, 0.25, 0.5, 1       | 25                                                           |
|                                    |                  |                                             |                                                       | 5 to 150K                    | 0.1, 0.25, 0.5, 1, 2, 5 | 50                                                           |
|                                    |                  |                                             |                                                       | 1 to 150K                    | 0.5, 1, 2, 5            | 100                                                          |
|                                    |                  |                                             |                                                       | 0.5 to 150K                  | 1, 2, 5                 | 150                                                          |
|                                    |                  |                                             |                                                       | 0.5 to 150K                  | 1                       | 200                                                          |
|                                    |                  |                                             |                                                       | 0.2 to 150K                  | 2, 5                    | 200                                                          |
|                                    |                  |                                             |                                                       | 0.1 to 150K                  | 2, 5                    | 300                                                          |
| CPF2                               | CPF-2            | 350                                         | 2                                                     | 5 to 150K                    | 0.1, 0.25, 0.5, 1       | 25                                                           |
|                                    |                  |                                             |                                                       | 5 to 150K                    | 0.1, 0.25, 0.5, 1, 2, 5 | 50                                                           |
|                                    |                  |                                             |                                                       | 1 to 150K                    | 0.5, 1, 2, 5            | 100                                                          |
|                                    |                  |                                             |                                                       | 0.5 to 150K                  | 1, 2, 5                 | 150                                                          |
|                                    |                  |                                             |                                                       | 0.5 to 150K                  | 1                       | 200                                                          |
|                                    |                  |                                             |                                                       | 0.2 to 150K                  | 2, 5                    | 200                                                          |
|                                    |                  |                                             |                                                       | 0.1 to 150K                  | 2, 5                    | 300                                                          |
| CPF3                               | CPF-3            | 500                                         | 3                                                     | 8 to 150K                    | 0.1, 0.25, 0.5, 1       | 25                                                           |
|                                    |                  |                                             |                                                       | 8 to 150K                    | 0.1, 0.25, 0.5, 1, 2, 5 | 50                                                           |
|                                    |                  |                                             |                                                       | 1 to 150K                    | 0.5, 1, 2, 5            | 100                                                          |
|                                    |                  |                                             |                                                       | 1 to 150K                    | 1, 2, 5                 | 150                                                          |
|                                    |                  |                                             |                                                       | 1 to 150K                    | 1                       | 200                                                          |
|                                    |                  |                                             |                                                       | 0.2 to 150K                  | 2, 5                    | 200                                                          |
|                                    |                  |                                             |                                                       | 0.1 to 150K                  | 2, 5                    | 300                                                          |

## Note

<sup>(1)</sup> Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less

**GLOBAL PART NUMBER INFORMATION**

New Global Part Numbering: CPF1562R00FKR36 (preferred part numbering format)

|                      |   |   |                                                                                                            |   |   |                                                                                                           |   |   |                                                                                      |   |   |                                                                                                                                                                                                          |   |   |                                                                             |  |  |
|----------------------|---|---|------------------------------------------------------------------------------------------------------------|---|---|-----------------------------------------------------------------------------------------------------------|---|---|--------------------------------------------------------------------------------------|---|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|-----------------------------------------------------------------------------|--|--|
| C                    | P | F | 1                                                                                                          | 5 | 6 | 2                                                                                                         | R | 0 | 0                                                                                    | F | K | R                                                                                                                                                                                                        | 3 | 6 |                                                                             |  |  |
| GLOBAL MODEL         |   |   | RESISTANCE VALUE                                                                                           |   |   | TOLERANCE CODE                                                                                            |   |   | TEMPERATURE COEFFICIENT                                                              |   |   | PACKAGING                                                                                                                                                                                                |   |   | SPECIAL                                                                     |  |  |
| CPF1<br>CPF2<br>CPF3 |   |   | R = $\Omega$<br>K = k $\Omega$<br>R10000 = 0.1 $\Omega$<br>10R000 = 10 $\Omega$<br>150K00 = 150 k $\Omega$ |   |   | B = $\pm 0.1\%$<br>C = $\pm 0.25\%$<br>D = $\pm 0.5\%$<br>F = $\pm 1\%$<br>G = $\pm 2\%$<br>J = $\pm 5\%$ |   |   | E = 25 ppm<br>H = 50 ppm<br>K = 100 ppm<br>L = 150 ppm<br>N = 200 ppm<br>M = 300 ppm |   |   | E14 = lead (Pb)-free, bulk<br>E36 = lead (Pb)-free, T/R (full)<br>EE6 = lead (Pb)-free, T/R (1000 pcs)<br><br>B14 = tin / lead, bulk<br>R36 = tin / lead, T/R (full)<br>RE6 = tin / lead, T/R (1000 pcs) |   |   | Blank = standard (dash number) (up to 3 digits) From 1 to 999 as applicable |  |  |

Historical Part Number Example: CPF-15620FT-1 R36 (will continue to be accepted)

|                  |                  |                |                   |           |
|------------------|------------------|----------------|-------------------|-----------|
| CPF-1            | 5620             | F              | T-1               | R36       |
| HISTORICAL MODEL | RESISTANCE VALUE | TOLERANCE CODE | TEMP. COEFFICIENT | PACKAGING |

**Note**

- For additional information on packaging, refer to the Through-Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544))

**TEMPERATURE COEFFICIENT CODES**

| GLOBAL TC CODE | HISTORICAL TC CODE | TEMPERATURE COEFFICIENT     |
|----------------|--------------------|-----------------------------|
| E              | T-9                | 25 ppm/ $^{\circ}\text{C}$  |
| H              | T-2                | 50 ppm/ $^{\circ}\text{C}$  |
| K              | T-1                | 100 ppm/ $^{\circ}\text{C}$ |
| L              | T-0                | 150 ppm/ $^{\circ}\text{C}$ |
| N              | T-00               | 200 ppm/ $^{\circ}\text{C}$ |
| M              | M                  | 300 ppm/ $^{\circ}\text{C}$ |

**TECHNICAL SPECIFICATIONS**

| PARAMETER                                  | UNIT               | CPF1                                             | CPF2 | CPF3 |
|--------------------------------------------|--------------------|--------------------------------------------------|------|------|
| Rated Dissipation at 70 $^{\circ}\text{C}$ | W                  | 1                                                | 2    | 3    |
| Limiting Element Voltage <sup>(1)</sup>    | V $\equiv$         | 250                                              | 350  | 500  |
| Dielectric Withstanding Voltage            | V <sub>eff</sub>   | 500                                              | 700  | 800  |
| Thermal Resistance                         | K/W                | 85                                               | 60   | 50   |
| Insulation Resistance                      | $\Omega$           | 10 <sup>10</sup>                                 |      |      |
| Category Temperature Range                 | $^{\circ}\text{C}$ | -65 $^{\circ}\text{C}$ / +230 $^{\circ}\text{C}$ |      |      |

**Note**

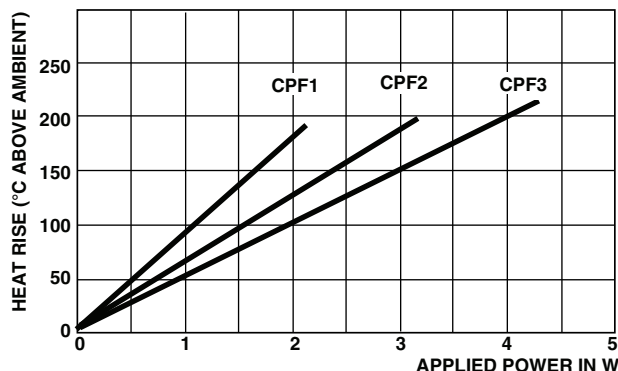
- <sup>(1)</sup> Rated voltage  $\sqrt{P \times R}$

**DIMENSIONS**

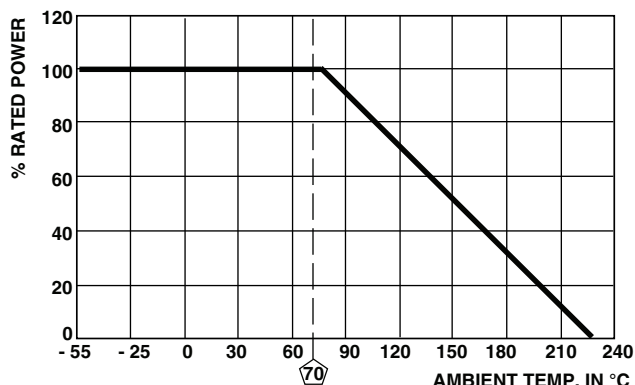
**Note**

- <sup>(1)</sup> Lead length for product in bulk pack. For product supplied in tape and reel, the actual lead length would be based on the body size, tape spacing and lead trim

| GLOBAL MODEL | DIMENSIONS in inches (millimeters)      |                                         |                     |                                        |
|--------------|-----------------------------------------|-----------------------------------------|---------------------|----------------------------------------|
|              | L                                       | D                                       | L <sub>1</sub> max. | d                                      |
| CPF1         | 0.240 $\pm$ 0.020<br>(6.10 $\pm$ 0.51)  | 0.090 $\pm$ 0.008<br>(2.29 $\pm$ 0.20)  | 0.310<br>(7.87)     | 0.025 $\pm$ 0.002<br>(0.64 $\pm$ 0.05) |
| CPF2         | 0.344 $\pm$ 0.031<br>(8.74 $\pm$ 0.79)  | 0.145 $\pm$ 0.015<br>(3.68 $\pm$ 0.38)  | 0.425<br>(10.80)    | 0.032 $\pm$ 0.002<br>(0.81 $\pm$ 0.05) |
| CPF3         | 0.555 $\pm$ 0.041<br>(14.10 $\pm$ 1.04) | 0.180 $\pm$ 0.015<br>(4.57 $\pm$ 0.381) | 0.650<br>(16.51)    | 0.032 $\pm$ 0.002<br>(0.81 $\pm$ 0.05) |

**THERMAL RESISTANCE****Note**

- Surface temperatures were taken with an infrared pyrometer in +25 °C still air. Resistors were supported by their leads in test clips at a point 0.500" (12.70 mm) out from the resistor body ends

**DERATING****MATERIAL SPECIFICATIONS**

|             |                                                                                                |
|-------------|------------------------------------------------------------------------------------------------|
| Element     | Proprietary nickel-chrome alloy                                                                |
| Core        | Cleaned high purity ceramic                                                                    |
| Coating     | Special high temperature conformal coat                                                        |
| Termination | Standard lead material is solder-coated<br>Solderable and weldable per<br>MIL-STD-1276, type C |

**MECHANICAL SPECIFICATIONS**

|                   |                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------|
| Terminal Strength | 2 pound pull test                                                                             |
| Solderability     | Continuous satisfactory coverage when<br>tested in accordance with MIL-STD-202,<br>method 208 |

**MARKING**

Temperature Coefficient: T00 = 200 ppm, T0 = 150 ppm, T1 = 100 ppm, T2 = 50 ppm, T9 = 25 ppm, M = 300 ppm

CPF1, CPF2, CPF3: (5 lines)

|         |                     |
|---------|---------------------|
| DALE    | Manufacturer's name |
| CPF-1   | Style and size      |
| 49.9 kΩ | Value               |
| 1 % T2  | Tolerance and TC    |
| 1208    | 4-digit date code   |

**PERFORMANCE**

| TEST                            | MAX. ΔR (TYPICAL TEST LOTS) |
|---------------------------------|-----------------------------|
| Thermal Shock                   | ± 1.0 %                     |
| Short Time Overload             | ± 0.5 %                     |
| Low Temperature Operation       | ± 0.5 %                     |
| Moisture Resistance             | ± 1.5 %                     |
| Resistance to Soldering Heat    | ± 0.5 %                     |
| Shock                           | ± 0.5 %                     |
| Vibration                       | ± 0.5 %                     |
| Terminal Strength               | ± 0.5 %                     |
| Dielectric Withstanding Voltage | ± 0.5 %                     |
| Life                            | ± 2.0 %                     |



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