

# Metal Film Resistors, Industrial Power, Precision, Flameproof



## FEATURES

- High power rating, small size
- Flameproof, high temperature coating
- Special filming and coating processes
- Excellent high frequency characteristics
- Low noise
- Low voltage coefficient
- Material categorization:

For definitions of compliance please see **RoHS\***  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
COMPLIANT

## Note

\* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

## STANDARD ELECTRICAL SPECIFICATIONS

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

## Note

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

## 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/ $^{\circ}\text{C}$ |

## TECHNICAL SPECIFICATIONS

| PARAMETER                                  | UNIT               | CPF1                                              | CPF2 | CPF3 |
|--------------------------------------------|--------------------|---------------------------------------------------|------|------|
| Rated Dissipation at 70 $^{\circ}\text{C}$ | W                  | 1                                                 | 2    | 3    |
| Limiting Element Voltage <sup>(2)</sup>    | V $\cong$          | 250                                               | 350  | 500  |
| Insulation Voltage                         | V <sub>eff</sub>   | 900                                               | 900  | 900  |
| 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>(2)</sup> Rated voltage  $\sqrt{P \times R}$

## GLOBAL PART NUMBER INFORMATION

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

| 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 | E14 = Lead (Pb)-free, bulk<br>E36 = Lead(Pb)-free, T/R (full)<br>EE6 = Lead (Pb)-free, T/R (1000 pieces)<br>B14 = Tin/lead, bulk<br>R36 = Tin/lead, T/R (full)<br>RE6 = Tin/lead, T/R (1000 pieces) | Blank = Standard (Dash Number) (Up to 3 digits) From 1 to 999 as applicable |

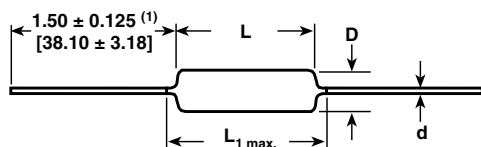
Historical Part Number example: CPF-15620FT-1 R36 (will continue to be accepted)

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

## Note

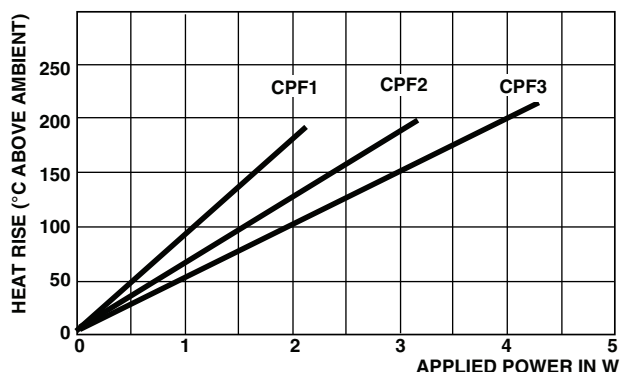
- For additional information on packaging, refer to the Through-Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544)).

## DIMENSIONS



### Notes

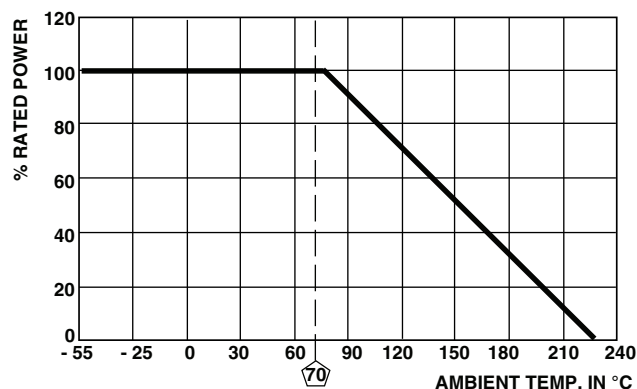
- (1) Lead length for product in bulk pack. For product supplied in tape and reel, the actual lead length would be based on the body size, tape spacing and lead trim.
- Surface temperatures were taken with an infrared pyrometer in + 25 °C still air. Resistors were supported by their leads in test clips at a point 0.500" (12.70 mm) out from the resistor body ends.



## THERMAL RESISTANCE

| 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 |

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



## DERATING

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

## MARKING

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