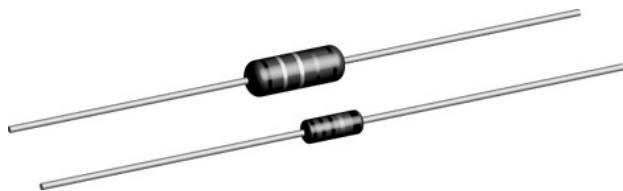


## Metal Film Resistors, Industrial, $\pm 1\%$ Tolerance



### FEATURES

- Power Ratings: 1/4, 1/2, 3/4 and 1 W at + 70 °C
- $\pm 100$  ppm/°C temperature coefficient
- Superior electrical performance
- Flame retardant epoxy conformal coating
- Standard 5 band color code marking for ease of identification after mounting
- Tape and reel packaging for automatic insertion (52.4 mm inside tape spacing per EIA-296-E)
- Lead (Pb)-free version is RoHS compliant



**RoHS\***  
COMPLIANT

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING<br>$P_{70\text{ }^{\circ}\text{C}}$<br>W | LIMITING ELEMENT<br>VOLTAGE MAX.<br>$V_{\Xi}$ | TEMPERATURE<br>COEFFICIENT<br>ppm/°C | TOLERANCE<br>% | RESISTANCE<br>RANGE<br>$\Omega$ | E-SERIES |
|--------------|------------------|-------------------------------------------------------|-----------------------------------------------|--------------------------------------|----------------|---------------------------------|----------|
| CCF55        | CCF-55           | 0.25/0.5                                              | 250                                           | $\pm 100$                            | $\pm 1$        | 10R - 3.01M                     | 96       |
| CCF60        | CCF-60           | 0.50/0.75/1.0                                         | 500                                           | $\pm 100$                            | $\pm 1$        | 10R - 1M                        | 96       |

### TECHNICAL SPECIFICATIONS

| PARAMETER                     | UNIT             | CCF55          | CCF60          |
|-------------------------------|------------------|----------------|----------------|
| Rated Dissipation at 70 °C    | W                | 0.25/0.5       | 0.5/0.75/1.0   |
| Maximum Working Voltage       | $V_{\Xi}$        | $\leq 250$     | $\leq 500$     |
| Insulation Voltage (1 min)    | $V_{\text{eff}}$ | 500            | 500            |
| Dielectric Strength           | $V_{\text{AC}}$  | 450            | 450            |
| Insulation Resistance         | $\Omega$         | $\geq 10^{11}$ | $\geq 10^{11}$ |
| Operating Temperature Range   | °C               | - 65/+ 165     | - 65/+ 165     |
| Terminal Strength (pull test) | lb               | 2              | 2              |
| Weight                        | g                | 0.35 max       | 0.75 max       |

### GLOBAL PART NUMBER INFORMATION

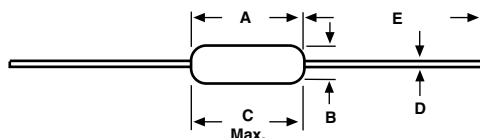
New Global Part Numbering: CCF55301RFKR36 (preferred part numbering format)

| GLOBAL MODEL   | RESISTANCE VALUE                                                                                                   | TOLERANCE CODE | TEMPERATURE COEFFICIENT | PACKAGING                                                                                                                                                    | SPECIAL                                                                                |
|----------------|--------------------------------------------------------------------------------------------------------------------|----------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| CCF55<br>CCF60 | R = Decimal<br>K = Thousand<br>M = Million<br>10R0 = 10 $\Omega$<br>680K = 680 k $\Omega$<br>1M00 = 1.0 M $\Omega$ | F = $\pm 1\%$  | K = 100 ppm             | E36 = Lead (Pb)-free,<br>CCF55 = T/R (5000 pieces)<br>CCF60 = T/R (2500 pieces)<br>R36 = Tin/Lead,<br>CCF55 = T/R (5000 pieces)<br>CCF60 = T/R (2500 pieces) | Blank = Standard<br>(Dash Number)<br>(up to 3 digits)<br>From 1 - 999<br>as applicable |

Historical Part Number example: CCF-553010F (will continue to be accepted)

|                  |                  |                |           |
|------------------|------------------|----------------|-----------|
| CCF-55           | 3010             | F              | R36       |
| HISTORICAL MODEL | RESISTANCE VALUE | TOLERANCE CODE | PACKAGING |

\* Pb containing terminations are not RoHS compliant, exemptions may apply

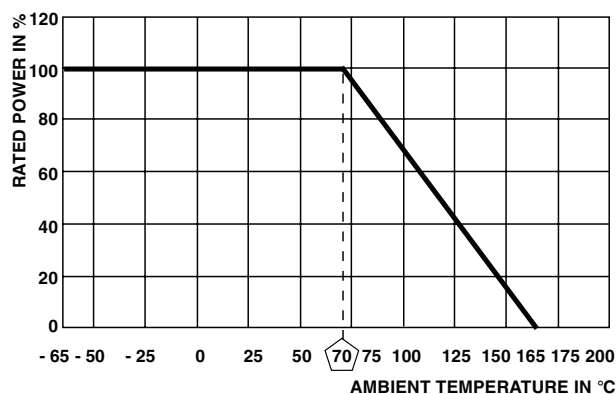
**DIMENSIONS** in inches [millimeters]


| GLOBAL MODEL  | A                                      | B                                      | C (Max.)           | D                                      | E                                       |
|---------------|----------------------------------------|----------------------------------------|--------------------|----------------------------------------|-----------------------------------------|
| CCF55 (Sn/Pb) | $0.245 \pm 0.020$<br>[6.22 $\pm$ 0.51] | $0.090 \pm 0.008$<br>[2.29 $\pm$ 0.20] | $0.265$<br>[6.73]  | $0.025 \pm 0.002$<br>[0.64 $\pm$ 0.05] | $1.100 \pm 0.040$<br>[27.94 $\pm$ 1.02] |
| CCF55 (Sn)    | $0.245 \pm 0.020$<br>[6.22 $\pm$ 0.51] | $0.090 \pm 0.008$<br>[2.29 $\pm$ 0.20] | $0.265$<br>[6.73]  | $0.023 \pm 0.002$<br>[0.60 $\pm$ 0.05] | $1.100 \pm 0.040$<br>[27.94 $\pm$ 1.02] |
| CCF60         | $0.344 \pm 0.031$<br>[8.74 $\pm$ 0.79] | $0.139 \pm 0.009$<br>[3.53 $\pm$ 0.23] | $0.400$<br>[10.16] | $0.025 \pm 0.002$<br>[0.64 $\pm$ 0.05] | $1.000 \pm 0.040$<br>[25.40 $\pm$ 1.02] |

**RESISTANCE VALUES**

Vishay Dale Models CCF55 and CCF60 are available in the standard 96 resistance values per decade. Values are obtained from the following decade table by multiplying by powers of 10. As an example: 30.1 can represent 30.1  $\Omega$ , 301  $\Omega$ , 3.01 k $\Omega$ , 30.1 k $\Omega$  or 301 k $\Omega$ .

|      |      |      |      |      |      |
|------|------|------|------|------|------|
| 10.0 | 14.7 | 21.5 | 31.6 | 46.4 | 68.1 |
| 10.2 | 15.0 | 22.1 | 32.4 | 47.5 | 69.8 |
| 10.5 | 15.4 | 22.6 | 33.2 | 48.7 | 71.5 |
| 10.7 | 15.8 | 23.2 | 34.0 | 49.9 | 73.2 |
| 11.0 | 16.2 | 23.7 | 34.8 | 51.1 | 75.0 |
| 11.3 | 16.5 | 24.3 | 35.7 | 52.3 | 76.8 |
| 11.5 | 16.9 | 24.9 | 36.5 | 53.6 | 78.7 |
| 11.8 | 17.4 | 25.5 | 37.4 | 54.9 | 80.6 |
| 12.1 | 17.8 | 26.1 | 38.3 | 56.2 | 82.5 |
| 12.4 | 18.2 | 26.7 | 39.2 | 57.6 | 84.5 |
| 12.7 | 18.7 | 27.4 | 40.2 | 59.0 | 86.6 |
| 13.0 | 19.1 | 28.0 | 41.2 | 60.4 | 88.7 |
| 13.3 | 19.6 | 28.7 | 42.2 | 61.9 | 90.9 |
| 13.7 | 20.0 | 29.4 | 43.2 | 63.4 | 93.1 |
| 14.0 | 20.5 | 30.1 | 44.2 | 64.9 | 95.3 |
| 14.3 | 21.0 | 30.9 | 45.3 | 66.5 | 97.6 |


**DERATING**
**MARKING**

- Color band

**PERFORMANCE**

| POWER RATING at + 70 °C         |                    |                    |
|---------------------------------|--------------------|--------------------|
| CCF55                           | 1/4 W              | 1/2 W              |
| CCF60                           | 1/2 W              | 3/4 W and 1 W      |
| TEST <sup>(1)</sup>             | MAXIMUM $\Delta R$ | MAXIMUM $\Delta R$ |
| Thermal Shock                   | $\pm 0.5\%$        | -                  |
| Short Time Overload             | $\pm 0.5\%$        | -                  |
| Low Temperature Operation       | $\pm 0.5\%$        | -                  |
| Moisture Resistance             | $\pm 1.5\%$        | -                  |
| Resistance to Soldering Heat    | $\pm 0.5\%$        | -                  |
| Shock/Bump                      | $\pm 0.5\%$        | -                  |
| Vibration                       | $\pm 0.5\%$        | -                  |
| Life                            | $\pm 0.5\%$        | $\pm 1.0\%$        |
| Terminal Strength               | $\pm 0.2\%$        | -                  |
| Dielectric Withstanding Voltage | $\pm 0.5\%$        | -                  |

**Note:**
<sup>(1)</sup> Test Methods per MIL-STD-202G/IEC 60115/DIN EN140000 (as applicable).



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