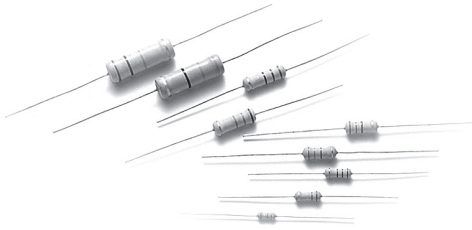


## Metal Oxide Film Resistors

# Flame-Proof Type

## Normal & Miniature Style [ RSF Series ]



### INTRODUCTION

The RSF Series Metal Oxide Film Flame-Proof Resistors offer excellent performance in applications where stability and uniformity of characteristics are desired. The normal style & 'RSF-WV' style of RSF series are coated with layers of gray flame-proof lacquer; and the miniature style are coated with layers of pink colors flame-proof lacquer.

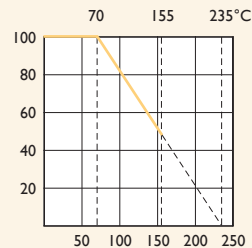
### FEATURES

|  |                            |
|--|----------------------------|
| Power Rating                           | 1/4W, 1/2W, 1W, 2W, 3W, 5W |
| Resistance Tolerance                   | ±2%, ±5%                   |
| T.C.R.                                 | ±300ppm/°C                 |
| Flameproof Multi-layer Coating Meets   | UL-94V-0                   |
| Flameproof Feature Meets Overload Test | UL-1412                    |

### DERATING CURVE

For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with the curve below.

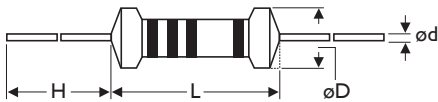
Rated Load (%)



Ambient Temperature (°C)

### DIMENSIONS

Unit: mm



| STYLE  |           | DIMENSION |         |        |           |
|--------|-----------|-----------|---------|--------|-----------|
| Normal | Miniature | L         | øD      | H      | ød        |
| RSF-25 | RSF50S    | 6.3±0.5   | 2.4±0.2 | 28±2.0 | 0.55±0.05 |
| RSF-50 | RSF1WS    | 9.0±0.5   | 3.3±0.3 | 26±2.0 | 0.55±0.05 |
| RSF100 | RSF2WS    | 11.5±1.0  | 4.5±0.5 | 35±2.0 | 0.8±0.05  |
| RSF200 | RSF3WS    | 15.5±1.0  | 5.0±0.5 | 33±2.0 | 0.8±0.05  |
| RSF3WM | RSF5SS    | 17.5±1.0  | 6.5±1.0 | 32±2.0 | 0.8±0.05  |
| RSF300 | RSF5WS    | 24.5±1.0  | 8.5±1.0 | 38±2.0 | 0.8±0.05  |
| RSF500 | -         | 24.5±1.0  | 8.5±1.0 | 38±2.0 | 0.8±0.05  |

Note: RSF1WS (for MB Type) ød = 0.8±0.05mm

## ELECTRICAL CHARACTERISTICS

### NORMAL STYLE

| STYLE                       | RSF-25                          | RSF-50 | RSF100 | RSF200 | RSF3WM | RSF300 | RSF500 |
|-----------------------------|---------------------------------|--------|--------|--------|--------|--------|--------|
| Power Rating at 70°C        | 1/4W                            | 1/2W   | 1W     | 2W     | 3W     |        | 5W     |
| Maximum Working Voltage     | 200V                            | 250V   | 350V   |        | 450V   | 500V   | 750V   |
| Maximum Overload Voltage    | 300V                            | 400V   | 600V   |        | 700V   | 800V   | 1,000V |
| Voltage Proof on Insulation | 250V                            | 350V   | 500V   |        |        |        |        |
| Resistance Range            | 1Ω - 1MΩ & for E24 series value |        |        |        |        |        |        |
| Operating Temp. Range       | -55°C to +155°C                 |        |        |        |        |        |        |
| Temperature Coefficient     | ±300ppm/°C                      |        |        |        |        |        |        |

### MINIATURE STYLE

| STYLE                       | RSF50S                          | RSFIWS | RSF2WS | RSF3WS | RSF5SS | RSF5WS |
|-----------------------------|---------------------------------|--------|--------|--------|--------|--------|
| Power Rating at 70°C        | 1/2W                            |        | 2W     | 3W     | 5W     | 5W     |
| Maximum Working Voltage     | 250V                            | 300V   | 350V   | 350V   | 500V   | 700V   |
| Maximum Overload Voltage    | 400V                            |        | 600V   |        | 800V   | 900V   |
| Voltage Proof on Insulation | 350V                            | 400V   | 500V   |        |        |        |
| Resistance Range            | 1Ω - 1MΩ & for E24 series value |        |        |        |        |        |
| Operating Temp. Range       | -55°C to +155°C                 |        |        |        |        |        |
| Temperature Coefficient     | ±300ppm/°C                      |        |        |        |        |        |

Note: Special value is available on request

## ENVIRONMENTAL CHARACTERISTICS

| PERFORMANCE TEST              | TEST METHOD   | APPRAISE  |
|-------------------------------|---|---|
| Short Time Overload           | IEC 60115-1 4.13<br>2.5 times RCWV for 5 sec.<br>(Not more than maximum Overload Voltage)             | ±1.0%+0.05Ω for normal style<br>±2.0%+0.05Ω for miniature style |
| Voltage Proof on Insulation   | IEC 60115-1 4.7<br>In V-Block for 60 sec., test voltage as above table                                | No Breakdown  |
| Temperature Coefficient       | IEC 60115-1 4.8<br>Between -55°C to +155°C  | By type   |
| Insulation Resistance         | IEC 60115-1 4.6<br>in V-block for 60 Sec.   | >1,000MΩ  |
| Solderability                 | IEC 60115-1 4.17<br>245±5°C for 3±0.5 Sec.  | 95% Min. coverage   |
| Solvent Resistance of Marking | IEC 60115-1 4.30<br>IPA for 5±0.5 Min. with ultrasonic  | No deterioration of coatings and markings                       |
| Robustness of Terminations    | IEC 60115-1 4.16<br>Direct load for 10 Sec. in the direction of the terminal leads                    | ≥2.5kg (24.5N)  |
| Periodic-pulse Overload       | IEC 60115-1 4.39<br>4 times RCWV 10,000 cycles (1 Sec. on, 25 Sec. off)                               | ±2.0%+0.05Ω   |
| Damp Heat Steady State        | IEC 60115-1 4.24<br>40±2°C, 90-95% RH for 56 days, loaded with 0.1 times RCWV                         | ±5.0%+0.05Ω   |
| Endurance at 70°C             | IEC 60115-1 4.25<br>70±2°C at RCWV (or Umax., Whichever less) for 1,000 Hr.<br>(1.5Hr.on, 0.5Hr. Off) | ±5.0%+0.05Ω   |
| Temperature Cycling           | IEC 60115-1 4.19<br>-55°C ⇄ Room Temp. ⇄ +155°C ⇄ Room Temp. (5 cycles)                               | ±1.0%+0.05Ω   |
| Resistance to Soldering Heat  | IEC 60115-1 4.18<br>260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body                  | ±1.0%+0.05Ω   |
| Accidental Overload Test      | IEC 60115-1 4.26<br>4 times RCWV for 1 Min.   | No evidence of flaming or arcing                                |

Note: Rated Continuous Working Voltage (RCWV) =  $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$  or Max. working voltage listed above, whichever less.

Revision: 2020

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