

Carbon Film Resistors

CFR Series

Normal & Miniature Style



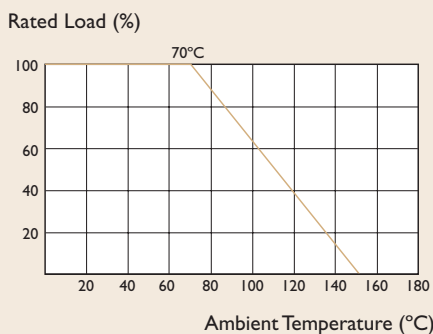
INTRODUCTION

Billions of products are already in use worldwide in all types of applications—from process control instrumentation to telephone receivers and FM radio to color television. The secret is in a proprietary production system and baking by a uniquely designed and automated production technique. Years of experience in making raw materials and production machinery prove the unique quality and high reliability of these products. The meet-or far exceed—such specifications as EIA RS196A, JIS-C-6402 and IEC-115. The resistors are coated with layers of tan color lacquer.

FEATURES

- Industry's Lowest Cost
- Delivery From Stock in Bulk, Taped and Strip Pack
- Exceptional Long-Term Stability
- Exceeds Carbon Comp MIL-R-111 Performance
- Resistance Tolerance: $\pm 2\%$, $\pm 5\%$
- Variety of Packaging—Bulk, Strip Pack, 26mm and 52mm Tape and Reel, Cut and Formed, or Radial Panaset/Avisert

DERATING CURVE



HOTSPOT TEMPERATURE

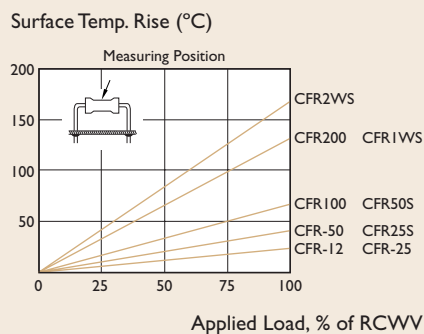
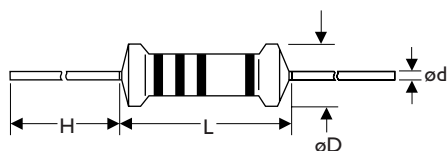


TABLE I TEMPERATURE COEFFICIENT

| STYLE | Max. Value of Temp. Coefficient ppm/°C | | |
|--|--|-------------|------------|
| | under 100KΩ | 100KΩ ~ 1MΩ | 1MΩ ~ 10MΩ |
| CFR100, CFR200, CFR2WS | ± 350 | -500 | -1500 |
| CFR-12, CFR-25, CFR-50, CFR25S, CFR50S, CFR1WS | +350 | -700 | -1500 |
| CFR2WS | -500 | | |

DIMENSIONS



Unit : mm

| STYLE | | DIMENSION | | | |
|--------|-----------|----------------|---------------|--------------|----------------|
| Normal | Miniature | L | øD | H | ød |
| CFR-12 | CFR25S | 3.4 \pm 0.3 | 1.9 \pm 0.2 | 28 \pm 2.0 | 0.5 \pm 0.05 |
| CFR-25 | CFR50S | 6.3 \pm 0.5 | 2.4 \pm 0.2 | 28 \pm 2.0 | 0.6 \pm 0.05 |
| CFR-50 | CFR1WS | 9.0 \pm 0.5 | 3.3 \pm 0.3 | 26 \pm 2.0 | 0.6 \pm 0.05 |
| CFR100 | CFR2WS | 11.5 \pm 1.0 | 4.5 \pm 0.5 | 35 \pm 2.0 | 0.8 \pm 0.05 |
| CFR200 | — | 15.5 \pm 1.0 | 5.0 \pm 0.5 | 33 \pm 2.0 | 0.8 \pm 0.05 |



Note :

ELECTRICAL CHARACTERISTICS

| STYLE | CFR-12 | CFR25S | CFR-25 | CFR50S | CFR-50 | CFR1WS | CFR100 | CFR2WS | CFR200 |
|-----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Power Rating at 70°C | 1/6W | 1/4W | | 1/2W | | 1W | | 2W | |
| Operating Temp. Range | -55°C to +155°C | | | | | | | | |
| Maximum Working Voltage | 150V | 200V | 250V | 300V | 350V | 400V | 500V | 500V | 500V |
| Maximum Overload Voltage | 300V | 400V | 500V | 600V | 700V | 800V | 1000V | 1000V | 1000V |
| Dielectric Withstanding Voltage | 300V | 400V | 500V | 500V | 500V | 700V | 1000V | 1000V | 1000V |
| Value Range ±2%, ±5% | 1Ω~10MΩ | | | | | | | | |
| Temperature Coefficient (by Type) | see TABLE I | | | | | | | | |

* Standard resistance is 1Ω~10MΩ, below or over this resistance on request.

ENVIRONMENTAL CHARACTERISTICS

| PERFORMANCE TEST | TEST METHOD | | APPRAISE |
|---------------------------------------|--|--|---|
| Short Time Overload | JIS-C-5202 5.5 | 2.5 Times RCWV for 5 Seconds | ±(0.75%+0.05Ω) |
| Dielectric Withstanding Voltage | JIS-C-5202 5.7 | in V-Block for 60 Seconds | by Type |
| Temperature Coefficient of Resistance | JIS-C-5202 5.2 | -55°C to +155°C | by Type |
| Insulation Resistance | JIS-C-5202 5.6 | in V-Block | >1000MΩ |
| Solderability | JIS-C-5202 6.5 | 235°C for 5±0.5 Seconds | 95% Min. Coverage |
| Resistance to Solvent | JIS-C-5202 6.9 | IPA for 1 Min. with Ultrasonic | No Deterioration of Coatings and Markings |
| Terminal Strength | Direct Load for 10 Sec. in The Direction of The Terminal Leads | | ≥2.5kg (24.5N) |
| Pulse Overload | JIS-C-5202 5.8 | 4 Times RCWV 10000 Cycles (1 Sec. on , 25 Sec. off) | ±(1%+0.05Ω) |
| Load Life in Humidity | JIS-C-5202 7.9 | 40±2°C, 90~95% RH at RCWV for 1000 Hrs. (1.5 Hrs. on , 0.5 Hrs. off) | ±(3%+0.05Ω) |
| Load Life | JIS-C-5202 7.10 | 70°C at RCWV for 1000 Hrs. (1.5 Hrs. on , 0.5 Hrs. off) | ±(3%+0.05Ω) |
| Temperature Cycling | JIS-C-5202 7.4 | -55°C → Room Temp. → +155°C → Room Temp. for 5 Cycles | ±(1%+0.05Ω) |
| Resistance to Soldering Heat | JIS-C-5202 6.4 | 350°C±10°C for 3±0.5 Seconds | ±(1%+0.05Ω) |

* Rated Continuous Working Voltage (RCWV)= $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$