

## Type CFR Series

### Key Features

Low Cost –  
High Reliability

High power to  
size ratio

5 power  
ratings –  
0.25W ~ 2W

### Applications

Audio

Communications

Measurement

Computing



The resistive element comprises a thin film of carbon, deposited onto a high thermal conductivity ceramic core. Metal end caps are force fitted to the element prior to spiralling to value. Tinned copper lead wires are welded to the end caps and the components are then coated. One coat of phenolic resin is followed by three coats of epoxy resin. All resistors are tested for value and tolerance.

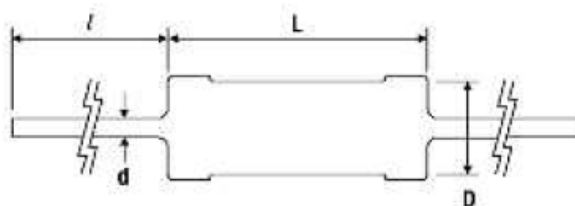
### Characteristics – Electrical

|                                                    |          | CFR16      | CFR25 | CFR50 | CFR100 | CFR200 |
|----------------------------------------------------|----------|------------|-------|-------|--------|--------|
| Rated power @ 70°C (W)                             |          | 0.25       | 0.33  | 0.5   | 1      | 2      |
| Resistance Range Ω                                 | Min      | 1R0        | 1R0   | 1R0   | 1R0    | 1R0    |
|                                                    | Max      | 4M7        | 10M   | 10M   | 10M    | 10M    |
| Tolerance (%)                                      |          | 2 5        |       |       |        |        |
| Code Letter                                        |          | G J        |       |       |        |        |
| T.C.R. (PPM/°C)                                    | ≤10R     | ±350       |       |       |        |        |
|                                                    | 11R-99K  | 0 ~ -450   |       |       |        |        |
|                                                    | 100K-1M0 | 0 ~ -700   |       |       |        |        |
|                                                    | ≥1M1     | 0 ~ -1500  |       |       |        |        |
| Selection Series                                   |          | E24        |       |       |        |        |
| Limiting Element Voltage (V)                       |          | 200        | 250   | 350   | 500    | 500    |
| Max. Overload Voltage <sup>1</sup> (V)             |          | 400        | 500   | 700   | 1000   | 1000   |
| Max Intermittent Overload Voltage <sup>2</sup> (V) |          | 500        | 700   | 750   | 750    | 750    |
| Operating temperature range                        |          | -55 ~ +155 |       |       |        |        |
| Climatic Category                                  |          | 55/155/56  |       |       |        |        |
| Dielectric strength (V)                            |          | 400        | 500   | 700   | 1000   | 1000   |
| Insulation Resistance (MΩ) Min.                    |          | 10000      |       |       |        |        |

<sup>1</sup>Maximum Overload Voltage is 2.5 times rated voltage up to the specified voltage for 5 seconds.

<sup>2</sup>Maximum Intermittent Overload Voltage is 4 times rated voltage up to the specified voltage for 1 second ON and 25 seconds OFF. >100R ONLY

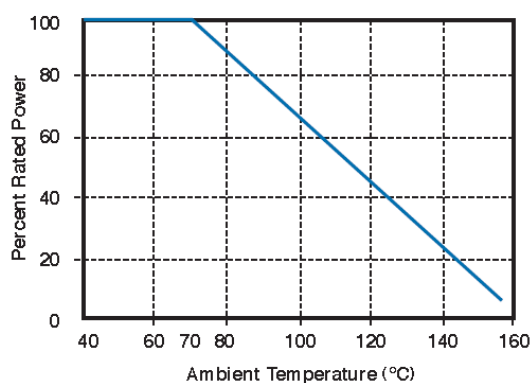
## Dimensions



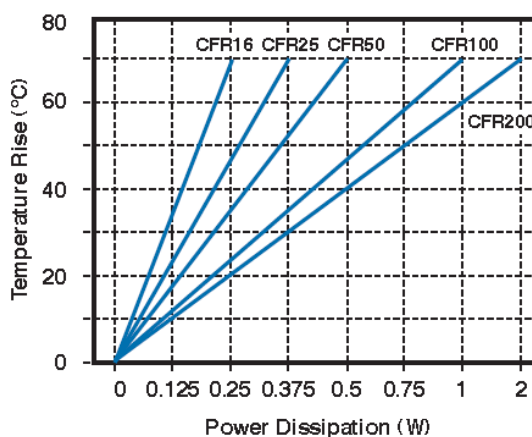
| Type   | L <sup>1</sup> max. | D Max. | D ±0.05 | l ±3 |
|--------|---------------------|--------|---------|------|
| CFR16  | 3.5                 | 1.85   | 0.45    | 28   |
| CFR25  | 6.8                 | 2.5    | 0.54    | 28   |
| CFR50  | 9.0                 | 3.0    | 0.54    | 28   |
| CFR100 | 12.0                | 5.0    | 0.70    | 25   |
| CFR200 | 16.0                | 5.5    | 0.70    | 28   |

<sup>1</sup>Length is measured in accordance with IEC 294

## Derating curve

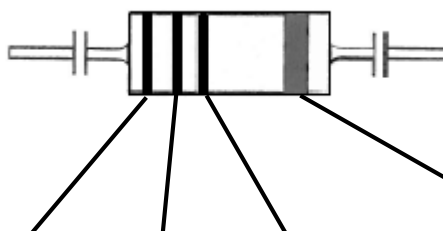


## Surface Temperature vs Load



## Marking

Resistors are marked with a four colour band code in accordance with IEC 62 on a beige base colour



| Color  | 1 <sup>st</sup><br>Figure | 2 <sup>nd</sup><br>Figure | Multiplier    | Tolerance |         |
|--------|---------------------------|---------------------------|---------------|-----------|---------|
|        |                           |                           |               | Letter    | Percent |
| Black  | 0                         | 0                         | 1             |           |         |
| Brown  | 1                         | 1                         | 10            | F         | ±1%     |
| Red    | 2                         | 2                         | 100           | G         | ±2%     |
| Orange | 3                         | 3                         | 1,000         |           |         |
| Yellow | 4                         | 4                         | 10,000        |           |         |
| Green  | 5                         | 5                         | 100,000       | D         | ±0.5%   |
| Blue   | 6                         | 6                         | 1,000,000     | C         | ±0.25%  |
| Violet | 7                         | 7                         | 10,000,000    | B         | ±0.1%   |
| Grey   | 8                         | 8                         | 100,000,000   |           |         |
| White  | 9                         | 9                         | 1,000,000,000 |           |         |
| Gold   |                           |                           | 0.1           | J         | ±5%     |
| Silver |                           |                           | 0.01          | K         | ±10%    |
| None   |                           |                           |               | M         | ±20%    |

## Mounting

The resistors are suitable for processing on automatic insertion equipment and cutting and bending machines.

## Packaging

Carbon film resistors are normally supplied taped in 'ammo' boxes. Other styles may be supplied on request. All tape specifications are in accordance with IEC 286-1.

| Type   | Box Quantity | Std. Tape Spacing | Component Spacing |
|--------|--------------|-------------------|-------------------|
| CFR16  | 5000         | 52                | 5                 |
| CFR25  | 4000         | 52                | 5                 |
| CFR50  | 3000         | 52                | 5                 |
| CFR100 | 1000         | 52                | 10                |
| CFR200 | 1000         | 64                | 10                |

## Performance Characteristics

Ref QC 400 000 and QC 400 100

| Test Ref  | Long term tests $\pm(5\% +0.1\Omega)$   |
|-----------|-----------------------------------------|
| 4.23      | Climatic Sequence                       |
| 4.24      | Damp heat, steady state                 |
| 4.25.1    | Endurance @ 70°C                        |
| 4.25.3    | Endurance @ 155°C                       |
| Test Ref. | Short term Tests $\pm(1\% +0.05\Omega)$ |
| 4.13      | Overload                                |
| 4.16      | Robustness of terminations              |
| 4.18      | Resistance to soldering heat            |
| 4.19      | Rapid change of temperature             |
| 4.22      | Vibration                               |

## How To Order

| CFR                        | 16          | J         | 100R                   |
|----------------------------|-------------|-----------|------------------------|
| Common Part                | Size        | Tolerance | Value                  |
| CFR – Carbon Film Resistor | 16 – 0.25W  | G – 2%    | 1Ω - 1R0               |
|                            | 25 – 0.33W  |           | 1KΩ (1,000Ω) - 1K0     |
|                            | 50 – 0.50W  | J – 5%    | 100KΩ(100,000Ω) – 100K |
|                            | 100 – 1.00W |           | 1MΩ(1,000,000Ω) – 1M0  |
|                            | 200 – 2.00W |           |                        |

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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