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.

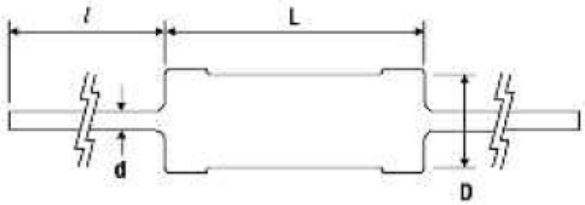
Characteristics – Electrical

		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[1] (V)		400	500	700	1000	1000
Max Intermittent Overload Voltage[2](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				

[1]Maximum Overload Voltage is 2.5 times rated voltage up to the specified voltage for 5 seconds.

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

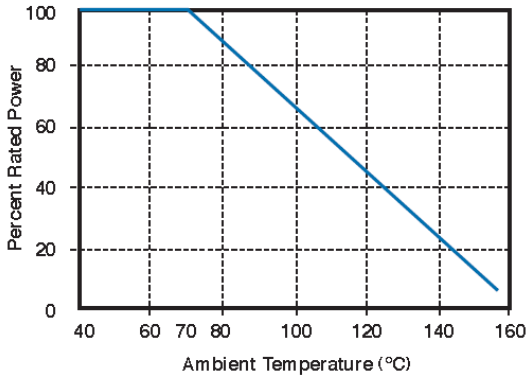
Dimensions



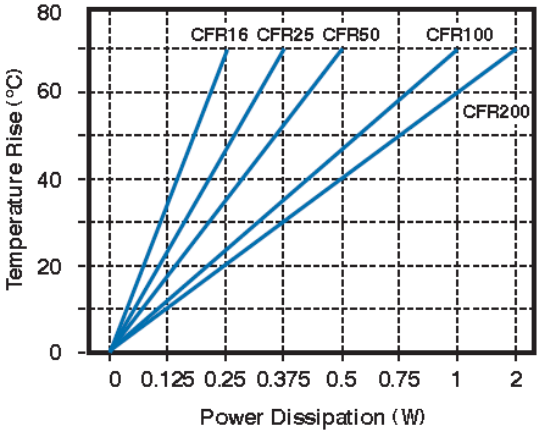
Type	L[1]max.	D Max.	D ±0.05	l ±3
CFR16	3.5	1.85	0.45	28
CFR25	6.8	2.5	0.54	28
CFR50	9.0	3.0	0.54	28
CFR100	12.0	5.0	0.70	25
CFR200	16.0	5.5	0.70	28

[1]Length is measured in accordance with IEC 294

Derating curve

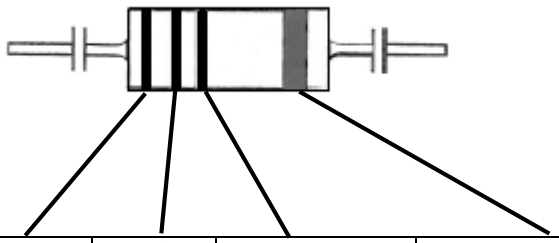


Surface Temperature vs Load



Marking

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



Color	1st Figure	2nd 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 ±(5% +0.1Ω)**
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 ±(1% +0.05Ω)**
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 25 – 0.33W 50 – 0.50W 100 – 1.00W 200 – 2.00W	G – 2% J – 5%	1Ω - 1R0 1KΩ (1,000Ω) - 1K0 100KΩ(100,000Ω) – 100K 1MΩ(1,000,000Ω) – 1M0