MFR – Electronic Components Pvt. Ltd.

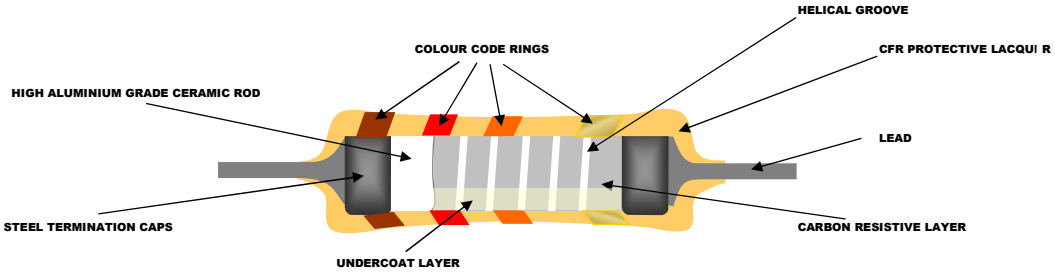
CARBON FILM RESISTORS

Series : CF / CFS

Features:

- Economical as Produced on automated mass production.
- Superior quality raw materials to ensure stability & reliability.
- Available in T52 tape packing.
- **RoHS** Compliant directive 2002/95/EC
- Lead (Pb)-free solder contacts.
- Low cost & miniature size

Construction :

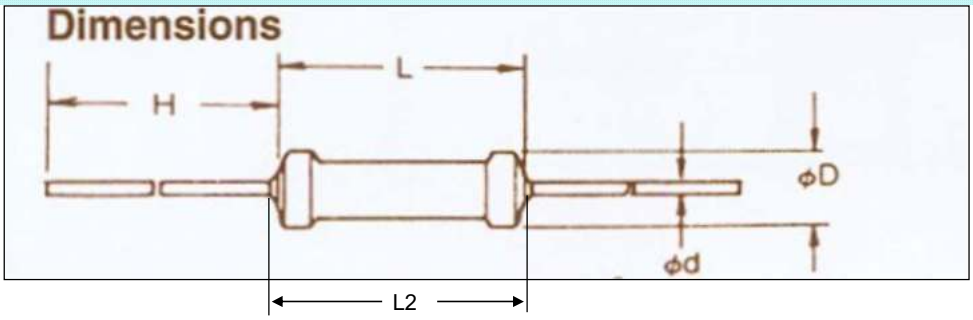


Technical specification:

DESCRIPTION	GENERAL SERIES			MINITURE SERIES		
	CF50	CF100	CF200	CFS100	CFS200	CFS300
Resistance range*	±5% 10Ω ~ 1MΩ					
Resistance tolerance	±5%, E24 series					
Temperature coefficient	Refer graph of Temperature Coefficient					
Maximum dissipation @ 70°C	0.5W	1W	2W	1W	2W	3W
Maximum permissible voltage	350V	500V	500V	500V	500V	500V
Climatic category	55/155/56					
Stability, R max.						
Load	△ R±(5% +0.05Ω)					
Climatic test	△ R±(5% +0.05Ω)					
Soldering	△ R±(1.0% +0.05Ω)					
Short time overload	△ R±(1.0% +0.05Ω)					

***Note :** Value other than resistance range are available on request

Dimensions :



Physical Data:

1.0 GENERAL SERIES SPECIFICATION :

TYPE	WATT. @ 70°C	TOL.	TCR PPM/°C	DIMENSIONS (mm) L	L2	D	d ± 0.05	H	RESISTANCE RANGE	MAX WORKING VOLTAGE	OVERLOAD VOLTAGE
CF50	0.5W	±5%		9.5 ±1	12.0 MAX.	3.5 ±0.5	0.6	25 min	10Ω ~ 1MΩ	350V	700V
CF100	1W	±5%		12 ±1	14.0 MAX.	4.5 ±0.5	0.8	24 min	10Ω ~ 1MΩ	500V	1000V
CF200	2W	±5%		16 ±1	18.0 MAX.	5.5 ±0.5	0.8	25 min	10Ω ~ 1MΩ	500V	1000V

Note : Working voltage is $\sqrt{P \times R}$ where P is power & R is resistance in Ohms

2.0 MINITURE SERIES SPECIFICATION :

TYPE	WATT. @ 70°C	TOL.	TCR PPM/°C	DIMENSIONS (mm) L	L2	D	d ± 0.05	H	RESISTANCE RANGE	MAX WORKING VOLTAGE	OVERLOAD VOLTAGE
CFS100	1W	±5%		9.5 ±1	12.0 MAX.	3.5 ±0.5	0.6	25 min	10Ω ~ 1MΩ	500V	1000V
CFS200	2W	±5%		12 ±1	14.0 MAX.	4.5 ±0.5	0.78	24 min	10Ω ~ 1MΩ	500V	1000V
CFS300	3W	±5%		16 ±1	18.0 MAX.	5.5 ±0.5	0.78	25 min	10Ω ~ 1MΩ	500V	1000V

Note : Working voltage is $\sqrt{P \times R}$ where P is power & R is resistance in Ohms

Marking:

The CF & CFS series / type, the nominal resistance & tolerance are marked on the resistor body using four or five coloured bands in accordance with IEC publication 60062 "color codes for fixed resistors"

Material Specifications:

Element : Carbon film

Core : Fire cleaned high purity ceramic

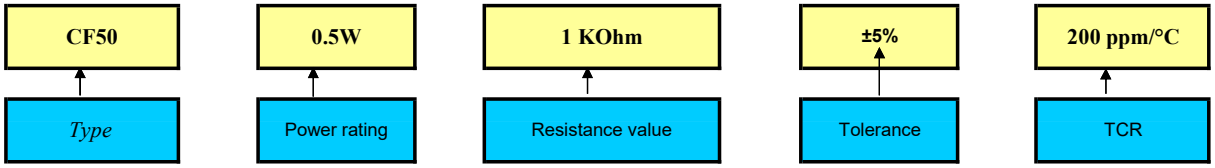
End caps : Steel caps

Coating : CFR protective lacquer

Standard Terminals : Solderable - tinplated copper

Part Numbering Information:

Part Number : Type number, power rating, resistance value, tolerance, tcr.



Examples: **PART NO. : CF50, 0.5W, 1 KOhm, ±5%, 200ppm/°C**

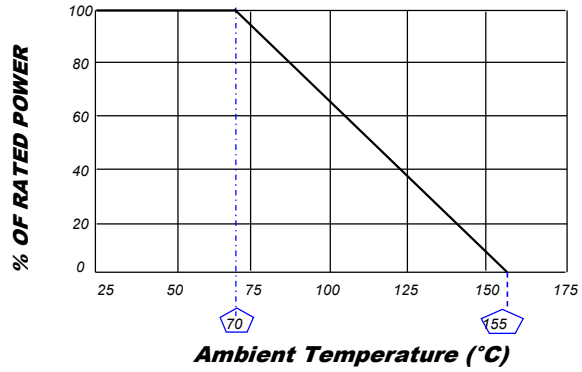
Packing Information:

TYPE	Pcs Per Poly Bag/ Blue box	Pcs Per Brown Box	Pcs Per Real
CF50 / CFS100	1,000	2,500	2500
CF100 / CFS200	500	1,500	1500
CF200 / CFS300	---	1,000	---

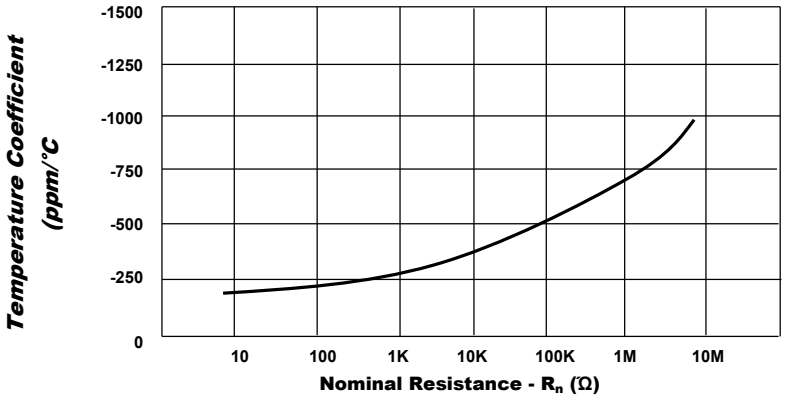
Performance Data (Procedure & Requirements):

TEST	PROCEDURE	REQUIREMENTS
Robustness Of Termination		
1. Tensile Test	Load 10 N for 10 sec.	No visual damage
2. Bend Test	Load 5 N 90° , 180°, 90°	No visual damage
3. Torsion Test	3 X 360° in opposite directions	No visual damage △R/R max.: ±(0.50% +0.05 Ω)
Solderability Test	16 hrs steam or 16 hrs. at 155°C 2 sec. ±0.5 sec. in solder at 235° ±5°C Using flux	>95% coverage covered (good tinning) & no damage
Resistance To Soldering Heat	at 350°C for 3 sec., 2.5mm from the body	△R/R max.: ±(1.0% +0.05 Ω)
Temperature Cycling	30 minutes at -55°C & 30 minutes at 150°C Total 5 number of cycles.	No visual damage △R/R max.: ±(1.0% +0.05 Ω)
Dry Heat Test	16 hrs at 150°C	△R/R max.: ±(5.0% +0.05 Ω)
Cold Test	2 hrs at -55°C	△R/R max.: ±(1.0% +0.05 Ω)
Short Time Overload	6.25 X Power nominal for 5 sec.ON & 45 sec. OFF; 10 Cycles @ 25°C. Voltage not more than 2 X limiting voltage.	△R/R max.: ±(1.0 +0.05 Ω)
Endurance @ 70°C	2000 hrs. load with Pn (power nominal) 1.5 hr. ON & 0.5 hr. OFF	No visual damage △R/R max.: ±(5.0% +0.05 Ω)
Endurance @ Upper Category Temperature	1000 hrs. at 150°C with no load	No visual damage △R/R max.: ±(5.0% +0.05 Ω)
Temperature Rise Test	Horizontally mounted, loaded with Pn	Hot spot temperature less than maximum body temperature
Damp Heat Steady State	56 days, 40°C; 90 to 95% Rh; dissipation ≤ 0.01Pn	No visual damage △R/R max.: ±(5.0% +0.05 Ω)
Temperature Coefficient	At 25/-55/25 °C & 25/150/25 °C	Within specified limits
Insulation Resistance	V- Block method for 1 minute duration At 500 V dc	> 10^3 MΩ
Voltage Proof Test	V- Block method for 1 minute duration At 500 V	No flash over or break down should observed

Derating Curve:



Temperature coeffecient :



Current noise :