CARBON FILM FIXED RESISTORS

Features

- Automatically insertable
- High quality performance
- Non - Flame type available
- Cost effective and commonly used
- Too low or too high values can be supplied on a case to case basis

Ordering Procedure: (Ex.: CFR 1/4W, +/-5%, 10KΩ, T/B-5000)

C	F	R	0	W	4	J	0	1	0	3	A	5	0

Resistor Type:
CFR = Carbon Film Fixed Resistors

Special Feature:
0 = Standard Product
F = Non-Flame
I = Non-Inductive

Wattage:
Normal size: W8=1/8W, W6=1/6W, W4=1/4W, W2=1/2W, 1W=1W, 2W=2W, 3W=3W

Small size: S4=1/4W-S, S3=1/3W-S, S2=1/2W-S, 1S=1W-S, 2S=2W-S, 3S=3W-S

Extra small size: U2=1/2W-SS

Tolerance:
F = ±1%, G = ±2%, J = ±5%, K = ±10%

Resistance Value:
- E-24 series: the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th indicate the number of zeros: "J" ~ 0.1, "K" ~ 0.01
  Ex.: 4.7Ω ~ 47J, 4.7KΩ ~ 472
- E-96 series: the 1st to 3rd digits are for the significant figures of the resistance and the 4th digit denotes the number of zeros.
  Ex.: 1.33KΩ = 1331

Packing Type:
A = Tape / Box
T = Tape / Reel
B = Bulk / Box
P = Tape / Box of PT-26 product

Packing Qty:
1 = 1,000 pcs, 2 = 2,000 pcs,
4 = 4,000 pcs, 5 = 5,000 pcs,
A = 500 pcs, B = 2,500 pcs,
0 = for Bulk / Box packing

Additional Information:
P = Panasert type
1 = Avisert type
2 = Avisert type 2
3 = Avisert type 3
0 = PT-52mm, NIL for PT-26
8 = PT-58mm
9 = PT-64mm
7 = Lead wire (H) 38mm

** More explanation on part no, please see details on pages 79-80.*

Performance Specifications

Temperature coefficient	±350PPM/°C for ≤ 10Ω ±450PPM/°C for 11Ω ~ 99KΩ 0 ~ -700PPM/°C for 100KΩ ~ 1MΩ 0 ~ -1500PPM/°C for 1.1MΩ ~ 10MΩ
Short time overload	ΔR/R ≤ ±(1.0% + 0.05Ω), with no evidence of mechanical damage.
Insulation resistance	Min. 10,000 Mega Ohm
Dielectric withstanding voltage	No evidence of flashover, mechanical damage, arcing or insulation breakdown.
Terminal strength	No evidence of mechanical damage.
Resistance to soldering heat	ΔR/R ≤ ±(1.0% + 0.05Ω), with no evidence of mechanical damage.
Solderability	Min. 95% coverage.
Resistance to solvent	No deterioration of protective coating and markings.
Temperature cycling	ΔR/R ≤ ±(1.0% + 0.05Ω), with no evidence of mechanical damage.
Load life in humidity	Normal type: ΔR/R ±3% for <100KΩ, ±5% for ≥ 100KΩ Non-Flame type: ΔR/R ±5% for <100KΩ, ±10% for ≥ 100KΩ
Load life	Normal type: ΔR/R ±2% for <56KΩ, ±3% for ≥ 56KΩ Non-Flame type: ΔR/R ±5% for <100KΩ, ±10% for ≥ 100KΩ

**More details, please see pages 77-78.*

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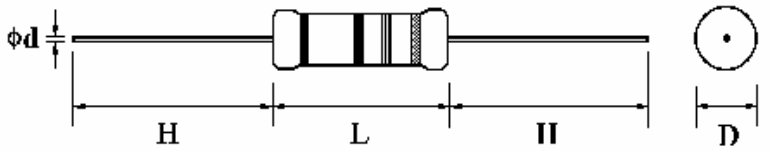
Dimension (mm)



Normal Size

Part No.	Style	Power Rating at 70°C	Dimension (mm)				Max. Working Voltage	Max. Overload Voltage	Dielectric With-standing Voltage	Resistance Range
			D Max.	L Max.	H ± 3	d ± 0.05				
CFR0W8	CFR-125	1/8W (0.125W)	1.85	3.5	28	0.45	200 V	400 V	400 V	1Ω~1MΩ
CFR0W4	CFR-25	1/4W (0.25W)	2.5	6.8	28	0.54 (1)	250 V	500 V	500 V	1Ω~10MΩ
CFR0W2	CFR-50	1/2W (0.5W)	3.5	10.0	28	0.54	350 V	700 V	700 V	1Ω~10MΩ
CFR01W	CFR-100	1W	5.5	16.0	28	0.70	500 V	1,000 V	1,000 V	1Ω~10MΩ
CFR02W	CFR-200	2W	6.5	17.5	28	0.75	500 V	1,000 V	1,000 V	1Ω~10MΩ

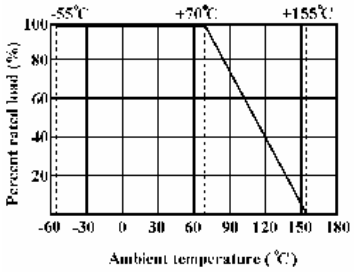
Small Size

Part No.	Style	Power Rating at 70°C	Dimension (mm)				Max. Working Voltage	Max. Overload Voltage	Dielectric With-standing Voltage	Resistance Range
			D Max.	L Max.	H ± 3	d ± 0.05				
CFR0S4	CFR-25-S	1/4W (0.25W)	1.85	3.5	28	0.45	200 V	400 V	400 V	1Ω~1MΩ
CFRFU2	CFR-50-SS	1/2W (0.5W)	2.5	6.8	28	0.54 (1)	250 V	500 V	250 V	1Ω~10MΩ
CFR0S2	CFR-50-S	1/2W (0.5W)	3.0	9.0	28	0.54	350 V	700 V	700 V	1Ω~10MΩ
CFR01S	CFR-100-S	1W	5.0	12.0	28	0.70	500 V	1,000 V	1,000 V	1Ω~10MΩ
CFR02S	CFR-200-S	2W	5.5	16.5	28	0.70	500 V	1,000 V	1,000 V	1Ω~10MΩ
CFR03S	CFR-300-S	3W	6.5	17.5	28	0.75	500 V	1,000 V	1,000 V	1Ω~10MΩ

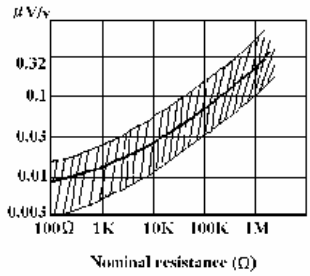
Note:

- Standard E-24 series values in ±5% tolerance
- Standard beige base color; Light brown base color for CFR01S, CFR02S & CFR03S
- Standard grayish-green base color (Non-flammable coating) for CFRFU2
- (1) Lead diameter of CFR0W4 & CFRFU2 can be provided in 0.50mm, 0.54mm & 0.60mm
- For any special inquiry which includes too low or high ohmic values are available on a case to case basis

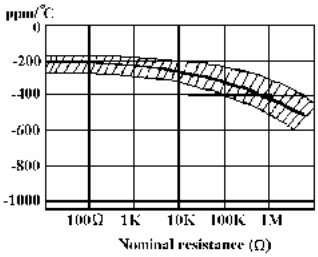
Derating Curve



Current Noise



Temp. Coefficient



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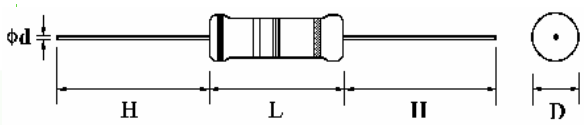
(1) Copper Plated Steel Lead Wire Type

Copper Plated Wire (CP)/Tin Plated Copper Wire (CT)



Part No.	Style	Power Rating at 70°C	Dimension (mm)				Max. Working Voltage	Max. Overload Voltage	Resistance Range
			D Max.	L Max.	d ± 0.02	H ± 3			
CPxxW8/CTxxW8	CP/CT-12	1/8W (0.125W)	1.85	3.5	0.5	28	200 V	400 V	1Ω ~ 1MΩ
CPxxW4/CTxxW4	CP/CT-25	1/4W (0.25W)	2.5	6.8	0.5	28/38	250 V	500 V	1Ω ~ 10MΩ
CPxxS3/CTxxS3	CP/CT-33-S	1/3W (0.33W)	2.5	6.8	0.5	28/38	300 V	600 V	1Ω ~ 10MΩ
CPxxW3/CTxxW3	CP/CT-33	1/3W (0.33W)	3.0	9.0	0.5	28	300 V	600 V	1Ω ~ 10MΩ
CPxxS2/CTxxS2	CP/CT-50-S	1/2W (0.5W)	3.0	9.0	0.5	28	350 V	700 V	1Ω ~ 10MΩ

(2) Cutting (CO) Type

Part No.	Dimension (mm)	Power Rating at 70°C	Dimension (mm)		Resistance Range
			D	L	
CO...W8	CO-12	0.125W	1.6 +0.10 - 0.00	3.2 ±0.1	1Ω ~ 10MΩ
CO...W4	CO-25	0.25W	2.1 +0.09 - 0.00	5.6 +0.10 - 0.20	1Ω ~ 10MΩ
CO...W4...A	CO-25-A	0.25W	2.1 +0.09 - 0.00	5.9 +0.10 - 0.15	1Ω ~ 10MΩ
CO...W4...B	CO-25-B	0.25W	2.1 +0.09 - 0.01	6.4 +0.10 - 0.15	1Ω ~ 10MΩ

* Cutting type resistors are produced without lead-wire and without coating * Cap plated: 1. Tin-plated (Royal std), 2. Nickel-plated (Special request)

Ordering Procedure: (Ex.: CP0 1/4W, +/-5%, 10Ω, T/B-5000

C	P	0	0	W	4	J	0	1	0	0	A	5	0

Resistor Type:
CP0 = Copper Plated Steel Lead Wire, H=28mm
CPL = Copper Plated Steel Lead Wire, H=38mm
CT0 = Tin Plated Copper Steel Lead Wire, H=28mm
CTL = Tin Plated Copper Steel Lead Wire, H=38mm
COT = Cutting Type (Tin-Plated Cap)
CON = Cutting Type (Nickel-Plated Cap)

Special Feature:
0 = Standard Product
F = Non-Flame
I = Non-Inductive

Wattage:
Normal size:
W8 = 1/8W
W4 = 1/4W
W3 = 1/3W

Small size:
S2 = 1/2W-S
S3 = 1/3W-S

Tolerance:
G = ±2%
J = ±5%
K = ±10%

Resistance Value:
E-24 series: the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th indicate the number of zeros.
"J" ~ 0.1, "K" ~ 0.01
Ex. 4.7Ω ~ 47J, 4.7KΩ ~ 472

Packing Type:
A = Tape / Box
T = Tape / Reel
B = Bulk / Box

Packing Qty:
1 = 1,000 pcs, 2 = 2,000 pcs, 5 = 5,000 pcs,
A = 500 pcs, B = 2,500 pcs, 0 = for Bulk / Box packing

Additional Information:
0 = For CP/CT type,
A = Cutting type (CO-25-A)
B = Cutting type (CO-25-B)

** More explanation on part no, please see details on pages 79-80.*

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