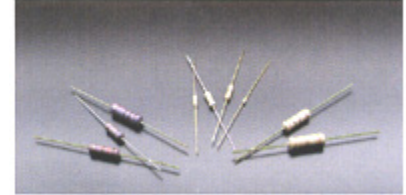


CARBON FILM FIXED RESISTOR

Features

- Automatically insertable
- High quality performance
- Non - Flame type available
- Cost effective and commonly used
- Too low or too high 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
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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 following;
"J" ~ 0.1, "K" ~ 0.01
Ex.: 4.7Ω ~ 47J, 4.7KΩ ~ 472
- E-96 series: the 1st to 3rd digits are significant figures of resistance and the fourth one denotes number of zeros following:
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, 3 = 3,000 pcs,
4 = 4,000 pcs, 5 = 5,000 pcs,
A = 500 pcs, B = 2,500 pcs,
0 = for Bulk/Box packing

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

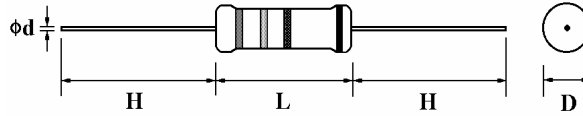
Additional Information:

- P = Panasert type
- 1 = Avisert type 1
- 2 = Avisert type 2
- 3 = Avisert type 3
- 0 = PT-52mm
- 8 = PT-58mm
- 9 = PT-64mm
- 7 = Lead wire (H) 38mm

* For complete details, please see Page 69.

CARBON FILM FIXED RESISTOR

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 +0.02 - 0.05				
CFR0W8	CFR-12	1/8W(0.125W)	1.85	3.5	28	0.5	200 V	400 V	400 V	1Ω ~ 1MΩ
CFR0W4	CFR-25	1/4W(0.25W)	2.5	6.8	28	0.6	250 V	500 V	500 V	1Ω ~ 10MΩ
CFR0W2	CFR-50	1/2W(0.5W)	3.5	10.0	28	0.6	350 V	700 V	700 V	1Ω ~ 10MΩ
CFR01W	CFR-100	1W	5.5	16.0	28	0.8	500 V	1000 V	1000 V	1Ω ~ 10MΩ
CFR02W	CFR-200	2W	6.5	17.5	28	0.8	500 V	1000 V	1000 V	1Ω ~ 10MΩ

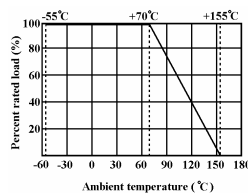
Small Size

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 +0.02 - 0.05				
CFR0S4	CFR-25-S	1/4W(0.25W)	1.85	3.5	28	0.5	200 V	400 V	400 V	1Ω ~ 1MΩ
CFR0S2	CFR-50-S	1/2W(0.5W)	3.0	9.0	28	0.6	350 V	700 V	700 V	1Ω ~ 10MΩ
CFRFU2	CFR-50-SS	1/2W(0.5W)	2.5	6.8	28	0.6	250 V	500 V	250 V	1Ω ~ 10MΩ
CFR01S	CFR-100-S	1W	5.0	12.0	28	0.8	500 V	1000 V	1000 V	1Ω ~ 10MΩ
CFR02S	CFR-200-S	2W	5.5	16.0	28	0.8	500 V	1000 V	1000 V	1Ω ~ 10MΩ
CFR03S	CFR-300-S	3W	6.5	17.5	28	0.8	500 V	1000 V	1000 V	1Ω ~ 10MΩ

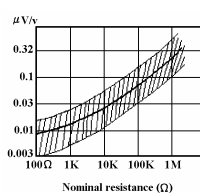
Note:

- 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 (CFR-50-SS)
- For any special inquiry which including too low or high ohmic values is available on a case to case basis

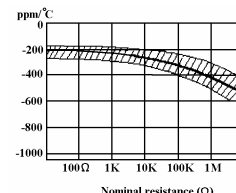
Derating Curve



Current Noise

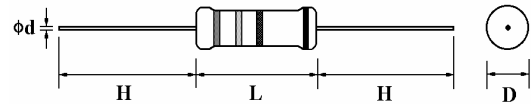


Temp. Coefficient



CARBON FILM FIXED RESISTOR

(1) Copper Plated Steel Lead Wire Type



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

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

* Cutting type resistors are produced without lead-wire and without coating

* Cap plated: 1. Tin-plated 2. Nickel-plated

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
 COT=Cutting type (Tin-Plated Cap)
 CON=Cutting type (Nickel Plated Cap)
 CT0=Tin Copper Plated Steel Lead Wire, H=28mm
 CTL=Tin Copper Plated Steel Lead Wire, H=38mm

Wattage:

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

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

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 following:
 "J" ~ 0.1, "K" ~ 0.01
 Ex.: 4.7Ω ~ 47J, 4.7K Ω ~ 472

Packing Type:

A = Tape/Box
 T = Tape/Reel
 B = Bulk/Box
 "B" (B/B) is the only available packing for Cutting type

Tolerance:

G = ±2%,
 J = ±5%,
 K = ±10%

Special Feature:

0 = Standard Product
 F = Non-Flame
 I = Non-Inductive

Additional Information:

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

Packing Qty:

1 = 1,000 pcs, 2 = 2,000 pcs, 3 = 3,000 pcs,
 4 = 4,000 pcs, 5 = 5,000 pcs,
 A = 500 pcs, B = 2,500 pcs, 0 = for Bulk/Box packing