

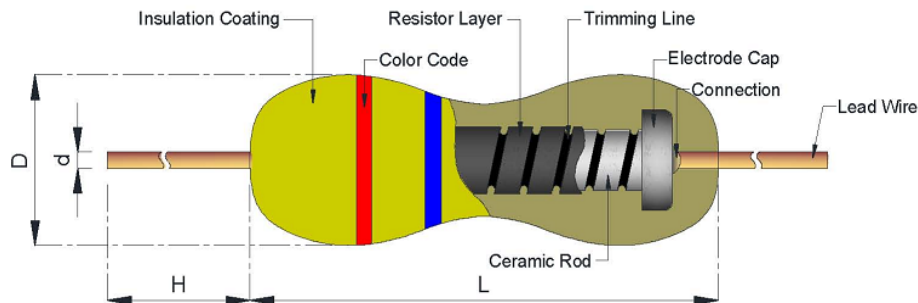
## CF series Carbon Film Fixed Resistors

### ◆ Purpose

- » Excellent Long Term Stability
- » Wide Resistance Range  $0\Omega$ ~ $22M\Omega$
- » Power Ratings

### ◆ Power Ratings Dimensions

- » Standard Type: 1/8W ~ 3W
- » Miniature Type: 1/4Ws ~ 3Ws



Type		Dimension				
Standard	Miniature	L		D	H	d
CF12 (1/8W) CF16 (1/6W)	CFS25 (1/4WS)	3.3	+0.4 -0.2	$1.8 \pm 0.3$	$29 \pm 2.0$	$0.45 \pm 0.05$
CF12 (1/8W)	CFS25 (1/4WS)	3.3	+0.7 -0.2 -0.2	$1.8 \pm 0.3$	$29 \pm 2.0$	$0.45 \pm 0.05$
CF25 (1/4W)	CFS50 (1/2WS)	$6.3 \pm 0.5$		$2.3 \pm 0.3$	$28 \pm 2.0$	$0.55 \pm 0.05$
CF33 (1/3W)	---	$8.5 \pm 0.5$		$2.7 \pm 0.5$	$27 \pm 2.0$	$0.55 \pm 0.05$
CF50 (1/2W)	CFS100 (1WS)	$9.0 \pm 0.5$		$3.2 \pm 0.5$	$26 \pm 2.0$	$0.55 \pm 0.05$
CF100 (1W)	CFS200 (2WS)	$11.5 \pm 0.5$		$4.5 \pm 0.5$	$35 \pm 2.0$	$0.8 \pm 0.05$
CF200 (2W)	CFS300 (3WS)	$15.5 \pm 1.0$		$5.0 \pm 0.5$	$32 \pm 2.0$	$0.8 \pm 0.05$
CF300 (3W)	---	$17.0 \pm 1.0$		$6.0 \pm 0.5$	$35 \pm 2.0$	$0.8 \pm 0.05$



◆ How To Order

CF	12	J	2K3	T
Type	Watt	Tolerance	R value	Packing
CF	1/8W = 12	J = ± 5%	2.3K = 2K3	T = Taping Box
CFS	1/6W = 16	G = ± 2%	10KΩ = 10K	B = Bulk
	1/4W = 25			R = Taping Reel
	1/3W = 33			M = M Lead Form
	1/2W = 50			MB = MB Lead Form
	1W = 100			MK = MK Lead Form
	2W = 200			F = F Lead Form
	3W = 300			FC = FC Lead Form
				FCK = FCK Lead Form
				FK = FK Lead Form
				FKK = FKK Lead Form
				PANA = PANA Lead Form (Only for 1/8W & 1/4W)



### ◆ Electrical Characteristics

#### » Standard Size

Power rating at 70°C	1/8W, 1/6W	1/4W	1/3W	1/2W	1W	2W	3W
Body Size	3.3 x 1.8	6.3 x 2.3	8.5 x 2.7	9 x 3.2	11.5 x 4.5	15.5 x 5	17 x 6
Operating Temp. Range	- 55°C ~ +155°C						
Max. Working Voltage	150V	250V	280V	350V	450V	500V	500V
Max. Overload Voltage	300V	500V	500V	700V	1000V	1000V	1000V
Dielectric withstanding voltage	300V	500V	500V	700V	1000V	1000V	1000V
Value Range ±5%	1Ω~ 22MΩ , E24 Series						

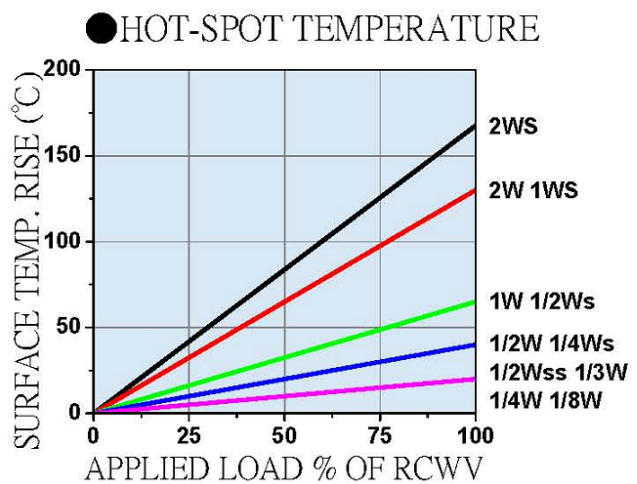
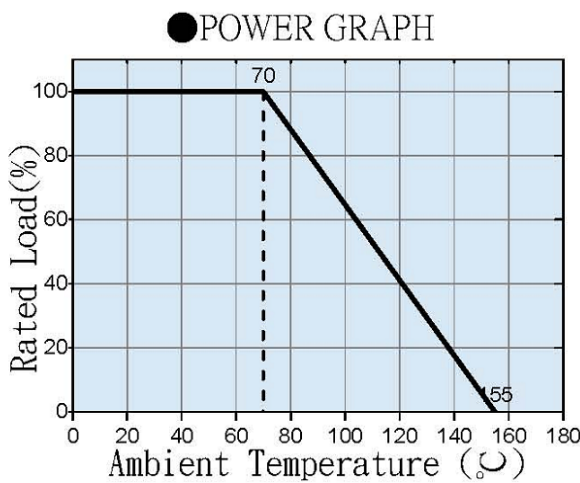
Rated continuous Working Voltage (RCWV) =  $\sqrt{\text{POWER. RATING} * \text{RESISTANCE. VALUE}}$

#### » Miniature

Power rating at 70°C	1/4WS	1/2WSS	1/2WS	1WS	2WS	3WS
Body Size	3.3 x 1.8	3.3 x 1.8	6.3 x 2.3	9 x 3.2	11.5 x 4.5	15.5 x 5
Operating Temp. Range	- 55°C ~ +155°C					
Max. Working Voltage	200V	280V	300V	400V	500V	500V
Max. Overload Voltage	400V	500V	500V	800V	1000V	1000V
Dielectric withstanding voltage	400V	400V	500V	800V	1000V	1000V
Value Range ±5%	1Ω~ 22MΩ , E24 Series					

Value Range for standard resistance, below or over this resistance on request.

Rated continuous Working Voltage (RCWV) =  $\sqrt{\text{POWER. RATING} * \text{RESISTANCE. VALUE}}$





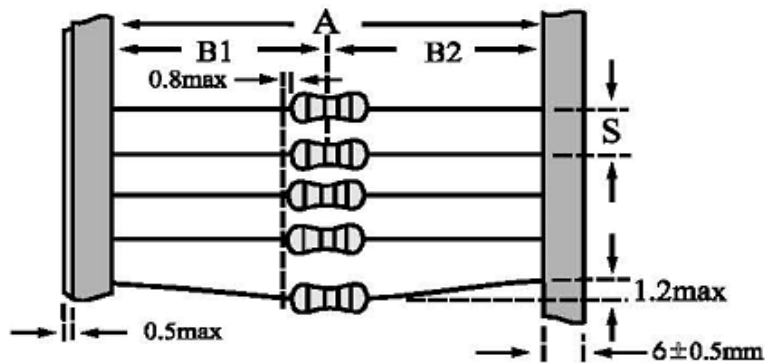
## ◆ Temperature Coefficient (T.C.R.)

Type		Max. Value of Temp. Coefficient ppm/°C		
		Under 100KΩ	100KΩ ~ 1MΩ	1MΩ ~ 4M7Ω
CF	1W. 2W. 2WS. 3WS. 3W	± 350ppm	-0ppm -500ppm	-0ppm -1000ppm
	1/6W. 1/4W. 1/4WS 1/2W. 1/2WS. 1WS	+350ppm -500ppm	-0ppm -700ppm	-0ppm -1500ppm

## ◆ Environmental Characteristics

Performance Test	Test Method	Appraise
Short time overload	JIS-C-5202 5.5 2.5 times RCWV for 5 seconds	±(0.75%+0.05Ω)
Temperature Coefficient (T.C.R)	Resistance value at room Temperature and room Temperature+100°C	page
Dielectric Withstanding Voltage	JIS-C5202 5.7 In V-Block for 60 seconds	By Type
Pulse Overload	JIS-C5202 5.8 4 times RCWV for 10000 cycles (1sec.on , 25secs.off)	±(1%+0.05Ω)
Insulation Resistance	JIS-C5202 5.6 In V-Block	> 10000MΩ
Load Life	JIS-C5202 7.10 70°C at RCWV for 1000hrs. (1.5hrs. on , 0.5hrs.off)	±(3%+0.05Ω)
Load Life in Humidity	JIS-C5202 7.9 40±2°C 90~95%RH at RCWV for 1000hrs. (1.5hrs. on , 0.5hrs.off)	Less than 100KΩ±3% 100KΩ or more±5%
Solder Ability	JIS-C5202 6.5 260±5°C for 2±0.5 seconds	95% min. coverage
Resistance to Solvent	JIS-C5202 6.9 Trichroethance for 1 min. with ultrasonic	No deterioration of coatings and markings
Terminal Strength	Direct load for 10 sec. In the direction off the terminal leads.	Tensile: ≥2.5kg

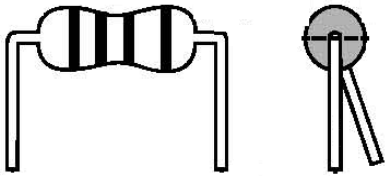
◆ **Packing Methods** Bandoleer for Axial leads



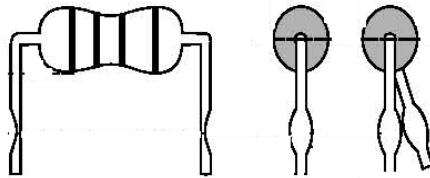
Type	Dimensions (mm)				
	A		B1-B2	S (spacing)	Max. deviation of spacing
1/8W 1/6W 1/4WS 0.4W (0204)	52	+1	1.2	5	1 mm per 10 spacing
		-0			
	26	+1	1		
		-0			
1/4W 1/2WS 0.6W(0207) 1WSS	52	+1	1.2		
		-0			
	26	+1	1		
		-0			
1/3W	52	+1	1.2	5	
	52	+1	1.2	5	
		-0			
1W 2WS 3WSS	52	+1	1.5	5	
		-0			
	73	+1	1.5		
		-0			
2W 3WS 4WSS	52	+1	1.5	10	
		-0			
	73	+1	1.5		
		-0			
3W 5WS	52	+1	1.5	10	
		-0			
	73	+1	1.5		
		-0			
5W 7WS	88	+1	1.5	10	
		-0			

◆ Lead Forming

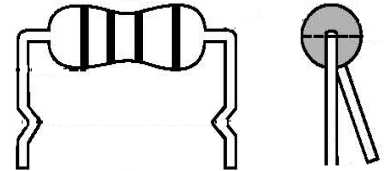
M Lead Form



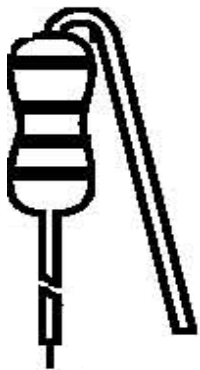
MB Lead Form



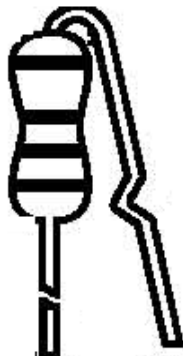
MK Lead Form



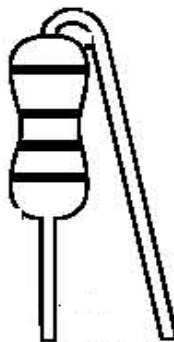
F Lead Form



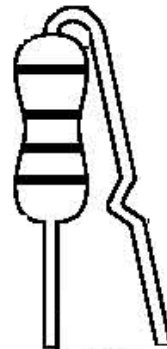
FK Lead Form



FC Lead Form



FCK Lead Form



FKK Lead Form

