

Coated Type Kit Resistors



**RoHS
Compliant**

General Specifications:



Ratings

Rated Power at 70°C	: 0.5W
Max. Working Voltage	: 350V
Max. Overload Voltage	: 700V
Dielectric Withstanding Voltage	: 700V
Rated Ambient Temperature	: 70°C
Operating Temp. Range	: -55°C to +155°C
Resistance Tolerance	: ±5%
Resistance Range	: 1Ω to 10MΩ

Power Rating:

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 70°C. For temperature in excess of 70°C, the load shall be derated as shown in the below figure.

Voltage rating:

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial line frequency and waveform corresponding to the power rating, as determined from the following formula:

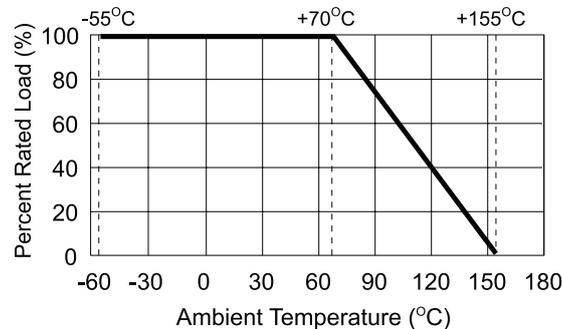
$$RCWV = \sqrt{P \times R}$$

Where : RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

P = Power Rating (watt)

R = Nominal Resistance (ohm)

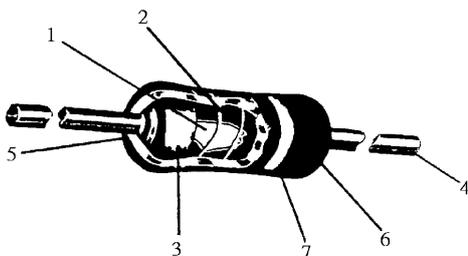
In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.



Nominal resistance:

Nominal resistance shall be in accordance with E-24 series and resistance tolerance shall be ±5%

Construction



No.	Name	Material
1	Basic Body	Rod Type Ceramics
2	Resistance Film	Carbon Film
3	End Cap	Steel (Tin plated iron surface)
4	Lead Wire	Annealed copper wire coated with tin
5	Joint	By welding
6	Coating	Insulated resin (Colour : Beige)
7	Colour Code	Epoxy Resin



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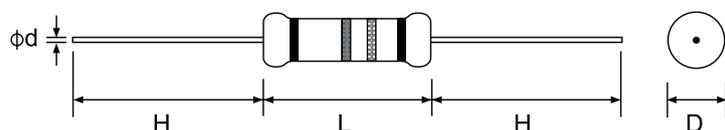
Characteristics

Characteristics	Limits	Test Methods (JIS C 5201-1)										
DC resistance	Must be within the specified tolerance	The limit of error of measuring apparatus shall not exceed allowable range or 5% of resistance tolerance										
Insulation resistance	Insulation resistance is 10,000MΩ Min.	Resistors shall be clamped in the trough of a 90° metallic V-block or foil method use a metal foil shall be wrapped closely around the body of the resistor. After that shall be tested at DC potential respectively specified in the above list for 60 +10/-0 secs.										
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	Resistors shall be clamped in the trough of a 90° metallic V-block or foil method use a metal foil shall be wrapped closely around the body of the resistor. After that shall be tested at AC potential respectively specified in the ratings specification, for 60 +10/-0 secs.										
Temperature coefficient	<table border="1"> <thead> <tr> <th>Resistance Range</th> <th>TCR (PPM/°C)</th> </tr> </thead> <tbody> <tr> <td>≤10Ω</td> <td>0 ±350</td> </tr> <tr> <td>11Ω 99kΩ</td> <td>0 -450</td> </tr> <tr> <td>100k 1M</td> <td>0 -700</td> </tr> <tr> <td>1.1M 10M</td> <td>0 -1500</td> </tr> </tbody> </table>	Resistance Range	TCR (PPM/°C)	≤10Ω	0 ±350	11Ω 99kΩ	0 -450	100k 1M	0 -700	1.1M 10M	0 -1500	Natural resistance change per temperature degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ R1: Resistance value at room temperature (t1) R2: Resistance value at room temperature plus 100°C (t2)
	Resistance Range	TCR (PPM/°C)										
	≤10Ω	0 ±350										
	11Ω 99kΩ	0 -450										
100k 1M	0 -700											
1.1M 10M	0 -1500											
Short time overload	Resistance change rate is ±(1% + 0.05Ω) max. with no evidence of mechanical damage	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds										
Terminal strength	No evidence of mechanical damage	Direct load: Resistance to a 2.5 kgs direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads. Twist test: Terminal leads shall be bent through 90° at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations										
Solderability	95% coverage minimum	The area covered with a new, smooth clean, shiny and continuous surface free from concentrated pinholes. Test temperature of solder : 245°C ±3°C Dwell time in solder : 2 to 3 seconds										
Soldering temperature reference	Electrical characteristics shall be satisfied. Without distinct deformation in appearance. (95 % coverage Min.)	The leads immersed into solder bath to 3.2 to 4.8mm from the body. Permanent resistance change shall be checked. Wave soldering condition: (2 cycles Max.) Pre-heat : 100 ~ 120°C, 30 ± 5 sec. Suggestion solder temp. : 235 ~ 255°C, 10 sec. (Max.) Peak temp. : 260°C Hand soldering condition: Hand Soldering bit temp. : 380 ±10°C Dwell time in solder : 3 +1/-0 sec.										
Resistance to soldering heat	Resistance change rate is ±(1% + 0.05Ω) Max. with no evidence of mechanical damage.	Permanent resistance change when leads immersed to 3.2mm to 4.8mm from the body in 350°C ±10°C solder for 3 ±0.5 seconds										

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Characteristics	Limits	Test Methods (JIS C 5201-1)															
Temperature cycling	Resistance change rate is $\pm(1\% + 0.05\Omega)$ max. with no evidence of mechanical damage	Resistance change after continuous 5 cycles for duty shown below: <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C $\pm 3^\circ\text{C}$</td> <td>30 minutes</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>10 to 15 minutes</td> </tr> <tr> <td>3</td> <td>+155°C $\pm 2^\circ\text{C}$</td> <td>30 minutes</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>10 to 15 minutes</td> </tr> </tbody> </table>	Step	Temperature	Time	1	-55°C $\pm 3^\circ\text{C}$	30 minutes	2	Room temperature	10 to 15 minutes	3	+155°C $\pm 2^\circ\text{C}$	30 minutes	4	Room temperature	10 to 15 minutes
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3	+155°C $\pm 2^\circ\text{C}$	30 minutes															
4	Room temperature	10 to 15 minutes															
Vibration	Resistance change rate is $\pm(1\% + 0.05\Omega)$ Max.	55Hz, 3 planes 2hrs each Total amplitude = 1.5mm															
Load life in humidity	<table border="1"> <thead> <tr> <th>Resistance value</th> <th>$\Delta R/R$</th> </tr> </thead> <tbody> <tr> <td>Normal Type <100kΩ</td> <td>$\pm 3\%$</td> </tr> <tr> <td>>=100kΩ</td> <td>$\pm 5\%$</td> </tr> </tbody> </table>	Resistance value	$\Delta R/R$	Normal Type <100k Ω	$\pm 3\%$	>=100k Ω	$\pm 5\%$	Resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "ON", 0.5 hour "OFF") in a humidity test chamber controlled at 40°C $\pm 2^\circ\text{C}$ and 90% to 95% relative humidity									
Resistance value	$\Delta R/R$																
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Resistance value	$\Delta R/R$																
Normal Type <56k Ω	$\pm 2\%$																
>=56k Ω	$\pm 3\%$																
Resistance to solvent	No deterioration of protective coatings and markings	Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic															

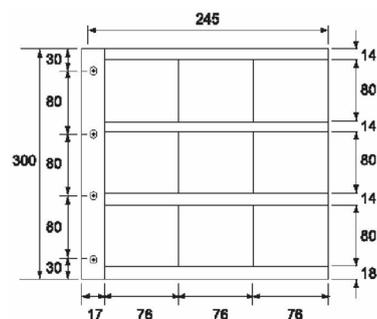
Dimension



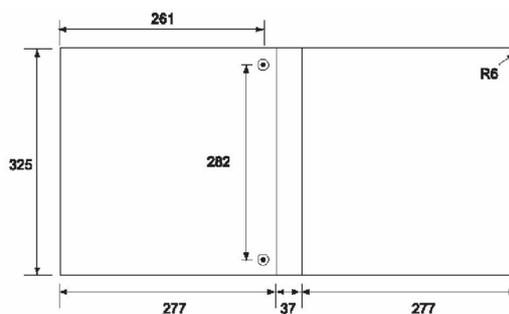
Part Number	Power Rating	Dimension (mm)			
		D Max.	L Max.	d ± 0.05	H ± 3
CFR0S2JE006KIL	1/2 W-S	3mm	9mm	0.54mm	28mm

Dimension of Kit Resistors

Insert for Coated Kit



Album for Coated Kit



Dimensions : Millimetres

Coated Type Kit Resistors

This E6 Series has 37 Values (Part Numbers)

There are listed below:

Description	Part Number
Resistor, 500mW 5% 10R	MCF 0.5W 10R
Resistor, 500mW 5% 15R	MCF 0.5W 15R
Resistor, 500mW 5% 22R	MCF 0.5W 22R
Resistor, 500mW 5% 33R	MCF 0.5W 33R
Resistor, 500mW 5% 47R	MCF 0.5W 47R
Resistor, 500mW 5% 68R	MCF 0.5W 68R
Resistor, 500mW 5% 100R	MCF 0.5W 100R
Resistor, 500mW 5% 150R	MCF 0.5W 150R
Resistor, 500mW 5% 220R	MCF 0.5W 220R
Resistor, 500mW 5% 330R	MCF 0.5W 330R
Resistor, 500mW 5% 470R	MCF 0.5W 470R
Resistor, 500mW 5% 680R	MCF 0.5W 680R
Resistor, 500mW, 5% 1K	MCF 0.5W 1K
Resistor, 500mW 5% 1K5	MCF 0.5W 1K5
Resistor, 500mW, 5% 2.2K	MCF 0.5W 2K2
Resistor, 500mW 5% 3K3	MCF 0.5W 3K3
Resistor, 500mW 5% 4K7	MCF 0.5W 4K7
Resistor, 500mW 5% 6K8	MCF 0.5W 6K8
Resistor, 500mW, 5% 10K	MCF 0.5W 10K

Description	Part Number
Resistor, 500mW 5% 15K	MCF 0.5W 15K
Resistor, 500mW 5% 22K	MCF 0.5W 22K
Resistor, 500mW 5% 33K	MCF 0.5W 33K
Resistor, 500mW 5% 47K	MCF 0.5W 47K
Resistor, 500mW 5% 68K	MCF 0.5W 68K
Resistor, 500mW 5% 100K	MCF 0.5W 100K
Resistor, 500mW 5% 150K	MCF 0.5W 150K
Resistor, 500mW 5% 220K	MCF 0.5W 220K
Resistor, 500mW 5% 330K	MCF 0.5W 330K
Resistor, 500mW 5% 470K	MCF 0.5W 470K
Resistor, 500mW 5% 680K	MCF 0.5W 680K
Resistor, 500mW 5% 1M	MCF 0.5W 1M
Resistor, 500mW 5% 1M5	MCF 0.5W 1M5
Resistor, 500mW 5% 2M2	MCF 0.5W 2M2
Resistor, 500mW 5% 3M3	MCF 0.5W 3M3
Resistor, 500mW 5% 4M7	MCF 0.5W 4M7
Resistor, 500mW 5% 6M8	MCF 0.5W 6M8
Resistor, 500mW 5% 10M	MCF 0.5W 10M

Part Number Table

Description	Part Number
Axial Resistor Kit, 100-Pieces each, 37 Values	CFR0S2JE006KIL

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