Resistor Kit
CFR 1/4 W 5% (2.5 × 6.8)

multicomp PRO

RoHS Compliant

Specifications:

Kit No : 1171087 E12 Series = 85 values
Quantity : 100 pieces per value
Total Quantity : 8,500 pieces

Ratings:

Ratings shall be shown in the table 1.

Type	CR
Rated Power	0.25W at 70°C
Max. Working Voltage	250V
Max. Overload Voltage	500V
Dielectric Withstanding Voltage	500V
Rated Ambient Temp.	70°C
Operating Temp.Range.	-55°C to +155°C
Resistance Tolerance	± 5%
Resistance Range	1Ω to 10MΩ

Table 1

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 figure 1.

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 curresponding to the power rating , as determined from the following formula :

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

Were : 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.

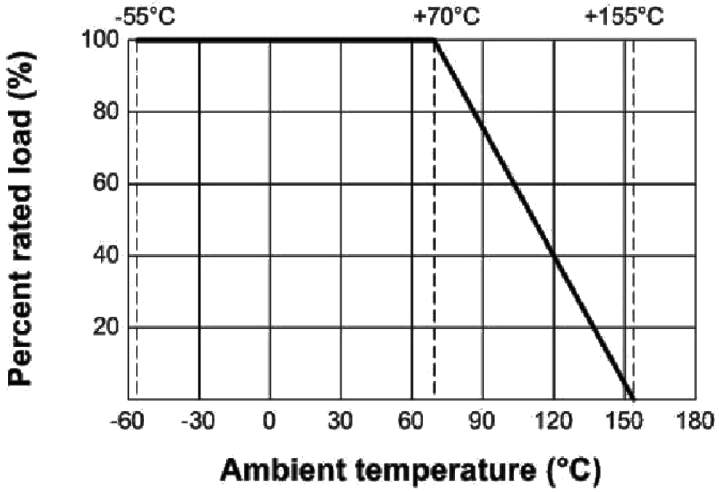
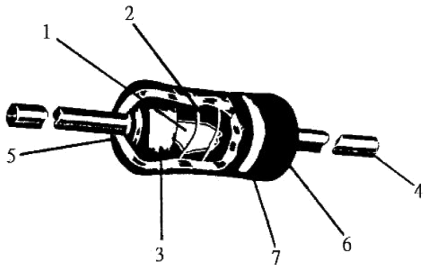


Figure 1

Nominal Resistance :

Effective figures of nominal resistance shall be in accordance with E-12 series, and resistance tolerance shall be shown by table 1.

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 epoxy resin (Colour: Beige)
7	Color Code	Epoxy Resin

Coated Type Kit Resistors (CFR)

Characteristics:

<table>
<tr><th>Characteristics</th><th colspan="2">Limits</th><th>Test Methods
(JIS C 5201-1)</th></tr>
<tr><td>DC. resistance</td><td colspan="2">Must be within the specified tolerance.</td><td>The limit of error of measuring apparatus shall not exceed allowable range or 5% of resistance tolerance (Sub-clause 4.5)</td></tr>
<tr><td>Insulation resistance</td><td colspan="2">Insulation resistance is 10,000MΩ Min</td><td>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.
(Sub-clause 4.6)</td></tr>
<tr><td>Dielectric withstanding voltage</td><td colspan="2">No evidence of flashover mechanical damage, arcing or insulation break down</td><td>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 table 1. for 60 +10/-0 secs.
(Sub-clause 4.7)</td></tr>
<tr><td>Temperature coefficient</td><td>Resis.Range</td><td>T.C.R. (PPM/°C)</td><td rowspan="2">Natural resistance change per temp. degree centigrade.

$\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6$ (PPM/°C)

R_1: Resistance value at room temperature (t_1)
R_2: Resistance value at room temp.plus 100°C (t_2)
(Sub-clause 4.8)</td></tr>
<tr><td>≦10Ω
11Ω
99K
100K 1M
1.1M
10M</td><td>0 ±350
0 -450
0 -700
0 -1,500</td></tr>
<tr><td>Short time overload</td><td colspan="2">Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage</td><td>Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.
(Sub-clause 4.13)</td></tr>
<tr><td>Terminal strength</td><td colspan="2">No evidence of mechanical damage.</td><td>Direct load :
Resistance to a 2.5 kgs direct load for 10 secs. 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. (Sub-clause 4.16)</td></tr>
</table>

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Characteristics:

<table>
<tr><th>Characteristics</th><th>Limits</th><th>Test Methods
(JIS C 5201-1)</th></tr>
<tr><td>Solderability</td><td>95 % coverage Min.</td><td>The area covered with a new , smooth clean , shiny and continuous surface free from concentrated pinholes.
Test temp. of solder : 245°C ±3°C
Dwell time in solder : 2 to 3 seconds
(Sub-clause 4.17)</td></tr>
<tr><td>Soldering temp. reference</td><td>Electrical characteristics shall be satisfied. Without distinct deformation in appearance.
(95 % coverage Min.)</td><td>The leads immersed into solder bath to 3.2mm to 4.8mm from the body. Permanent resistance change shall be checked.
Wave soldering condition: (2 cycles Max.)
Pre-heat: 100°C to 120°C, 30 ±5 sec.
Suggestion solder temp.: 235°C to 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.</td></tr>
<tr><td>Resistance to soldering heat</td><td>Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage.</td><td>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
(Sub-clause 4.18)</td></tr>
<tr><td>Temperature cycling</td><td>Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage.</td><td>Resistance change after continuous 5 cycles for duty shown below:
<table>
<tr><th>Step</th><th>Temperature</th><th>Time</th></tr>
<tr><td>1</td><td>-55°C ±3°C</td><td>30 mins</td></tr>
<tr><td>2</td><td>Room temp.</td><td>10 to15 mins</td></tr>
<tr><td>3</td><td>+155°C ±2°C</td><td>30 mins</td></tr>
<tr><td>4</td><td>Room temp.</td><td>10 to 15 mins</td></tr>
</table>
(Sub-clause 4.19)</td></tr>
<tr><td>Vibration</td><td>Resistance change rate is ± (1% + 0.05Ω) Max.</td><td>55Hz, 3 planes 2hrs each
Total amplitude = 1.5mm
(Sub-clause 4.22)</td></tr>
<tr><td>in humidity</td><td>
<table>
<tr><th colspan="2">Resistance value</th><th>ΔR/R</th></tr>
<tr><td rowspan="2">Normal Type</td><td><100kΩ</td><td>±3%</td></tr>
<tr><td>≧100kΩ</td><td>±5%</td></tr>
</table>
</td><td>Resistance change after 1,000 hours Load life operating at RCWV with duty cycle of
(1.5 hours “on”, 0.5 hour “off”) in a humidity test chamber controlled at 40°C ±2°C and 90 to 95 % relative humidity
(Sub-clause 4.24.2.1)</td></tr>
</table>

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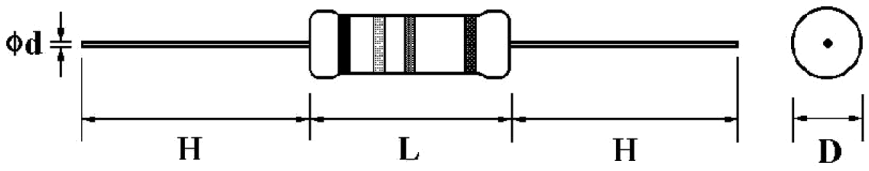
Coated Type Kit Resistors (CFR)

Characteristics:

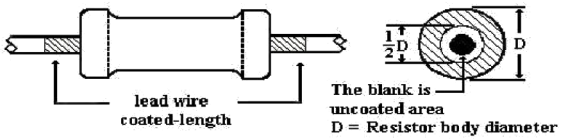
Characteristics	Limits	Test Methods (JIS C 5201-1)
Load life	Resistance value: Normal Type <56kΩ ΔR/R ±2%; Normal Type ≧56kΩ ΔR/R ±3%	Permanent resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours “on”, 0.5 hour “off”) at 70°C ±2°C ambient (Sub-clause 4.25.1)
Resistance to solvent	No deterioration of protective coatings and markings	Specimens shall be immersed in a bath of richroethane completely for 3 minutes with ultrasonic

Dimension:



Type	Power Rating	D (Max.)	L (Max.)	d ±0.05	H ±3
CR	1/4W	2.5mm	6.8mm	0.54mm	28mm

Painting method:
Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover. The extent should be within 1/2 of the are angle.



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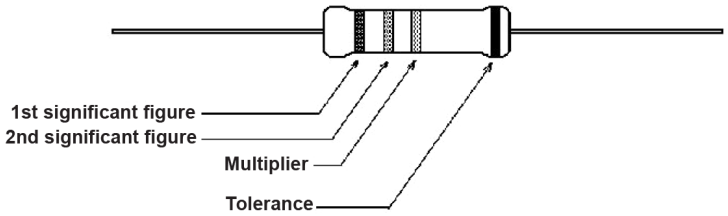
Marking:

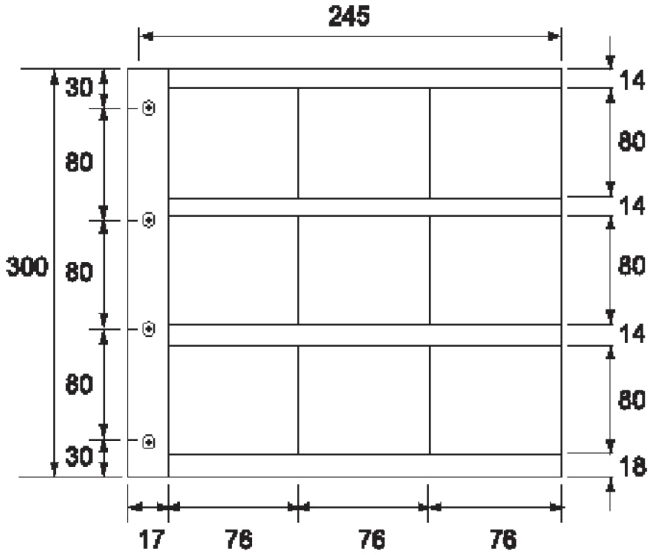
Resistor:

Resistors shall be marked with color coding
colors shall be in accordance with JIS C 0802



Kit Resistors:

Insert for Coated Kit



Dimensions : Millimetres

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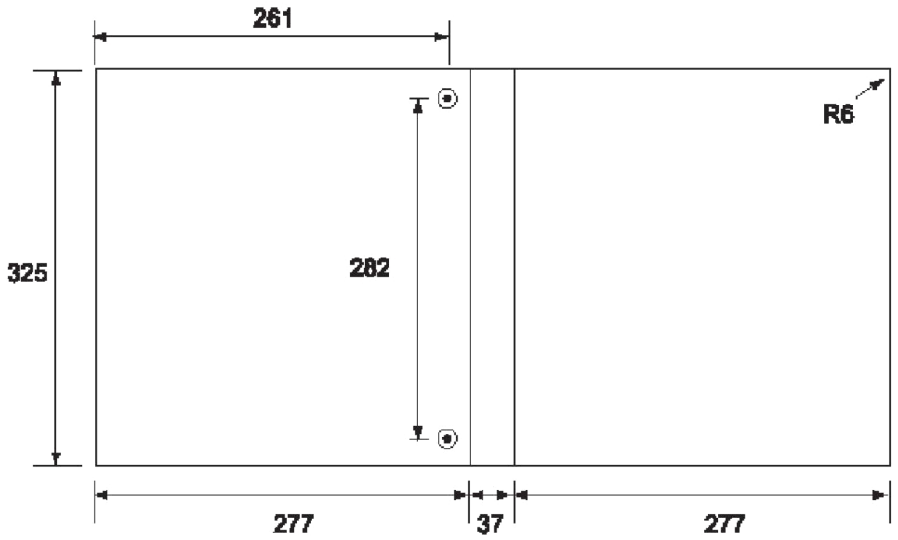
Album for Coated Kit:



Dimensions : Millimetres

****Due to shipping processes, the resistors and inserts may not be in order****

Environment Related Substance:

This product complies to EU RoHS directive, EU PAHs directive, EU PFOS directive and Halogen free.

Ozone layer depleting substances.

Ozone depleting substances are not used in our manufacturing process of this product.

This product is not manufactured using Chloro fluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs),

Hydrobromofluorocarbons (HBFCs) or other ozone depleting substances in any phase of the manufacturing process.

Storage Condition:

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of 25°C ± 5°C and a relative humidity of 60%RH ± 10%RH

Even within the above guarantee periods, do not store these products in the following conditions.

Otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials

(e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as Cl2, H2S, NH3, SO2, or NO2
2. In direct sunlight

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Farnell in One Resistor Kit:

Item	O / C	Value	Part Number
1	9339094	1R	MCF 0.25W 1R
2	9339159	1R2	MCF 0.25W 1R2
3	9339213	1R5	MCF 0.25W 1R5
4	9339272	1R8	MCF 0.25W 1R8
5	9339337	2R2	MCF 0.25W 2R2
6	9339396	2R7	MCF 0.25W 2R7
7	9339450	3R3	MCF 0.25W 3R3
8	9339515	3R9	MCF 0.25W 3R9
9	9339574	4R7	MCF 0.25W 4R7
10	9339639	5R6	MCF 0.25W 5R6
11	9339698	6R8	MCF 0.25W 6R8
12	9339752	8R2	MCF 0.25W 8R2
13	9339035	10R	MCF 0.25W 10R
14	9339108	12R	MCF 0.25W 12R
15	9339167	15R	MCF 0.25W 15R
16	9339221	18R	MCF 0.25W 18R
17	9339280	22R	MCF 0.25W 22R
18	9339345	27R	MCF 0.25W 27R
19	9339400	33R	MCF 0.25W 33R
20	9339469	39R	MCF 0.25W 39R
21	9339523	47R	MCF 0.25W 47R
22	9339582	56R	MCF 0.25W 56R
23	9339647	68R	MCF 0.25W 68R
24	9339701	82R	MCF 0.25W 82R
25	9339043	100R	MCF 0.25W 100R
26	9339116	120R	MCF 0.25W 120R
27	9339175	150R	MCF 0.25W 150R
28	9339230	180R	MCF 0.25W 180R
29	9339299	220R	MCF 0.25W 220R
30	9339353	270R	MCF 0.25W 270R
31	9339418	330R	MCF 0.25W 330R
32	9339477	390R	MCF 0.25W 390R
33	9339531	470R	MCF 0.25W 470R
34	9339590	560R	MCF 0.25W 560R
35	9339655	680R	MCF 0.25W 680R

Item	O / C	Value	Part Number
36	9339710	820R	MCF 0.25W 820R
37	9339051	1K	MCF 0.25W 1K
38	9339124	1K2	MCF 0.25W 1K2
39	9339183	1K5	MCF 0.25W 1K5
40	9339248	1K8	MCF 0.25W 1K8
41	9339302	2K2	MCF 0.25W 2K2
42	9339361	2K7	MCF 0.25W 2K7
43	9339426	3K3	MCF 0.25W 3K3
44	9339485	3K9	MCF 0.25W 3K9
45	9339540	4K7	MCF 0.25W 4K7
46	9339604	5K6	MCF 0.25W 5K6
47	9339663	6K8	MCF 0.25W 6K8
48	9339728	8K2	MCF 0.25W 8K2
49	9339060	10K	MCF 0.25W 10K
50	9339132	12K	MCF 0.25W 12K
51	9339191	15K	MCF 0.25W 15K
52	9339256	18K	MCF 0.25W 18K
53	9339310	22K	MCF 0.25W 22K
54	9339370	27K	MCF 0.25W 27K
55	9339434	33K	MCF 0.25W 33K
56	9339493	39K	MCF 0.25W 39K
57	9339558	47K	MCF 0.25W 47K
58	9339612	56K	MCF 0.25W 56K
59	9339671	68K	MCF 0.25W 68K
60	9339736	82K	MCF 0.25W 82K
61	9339078	100K	MCF 0.25W 100K
62	9339140	120K	MCF 0.25W 120K
63	9339205	150K	MCF 0.25W 150K
64	9339264	180K	MCF 0.25W 180K
65	9339329	220K	MCF 0.25W 220K
66	9339388	270K	MCF 0.25W 270K
67	9339442	330K	MCF 0.25W 330K
68	9339507	390K	MCF 0.25W 390K
69	9339566	470K	MCF 0.25W 470K
70	9339620	560K	MCF 0.25W 560K

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Farnell in One Resistor Kit:

Item	O / C	Value	Part Number
71	9339680	680K	MCF 0.25W 680K
72	9339744	820K	MCF 0.25W 820K
73	9339086	1M	MCF 0.25W 1M
74	1186236	1M2	MCF 0.25W 1M2
75	1186237	1M5	MCF 0.25W 1M5
76	1186238	1M8	MCF 0.25W 1M8
77	1186239	2M2	MCF 0.25W 2M2
78	1186240	2M7	MCF 0.25W 2M7
79	1186241	3M3	MCF 0.25W 3M3
80	1186242	3M9	MCF 0.25W 3M9
81	1186244	4M7	MCF 0.25W 4M7
82	1186245	5M6	MCF 0.25W 5M6
83	1186246	6M8	MCF 0.25W 6M8
84	1186247	8M2	MCF 0.25W 8M2
85	1186248	10M	MCF 0.25W 10M

Part Number Table

Description	Part Number
Resistor Kit, 0.25W, 5%, E12	CFR0W4JE012KIL