

**RoHS
Compliant**



Ratings:

| | |
|---------------------------------|-----------------|
| 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 | ±1% |
| Resistance Range | 10Ω to 1MΩ |

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

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:

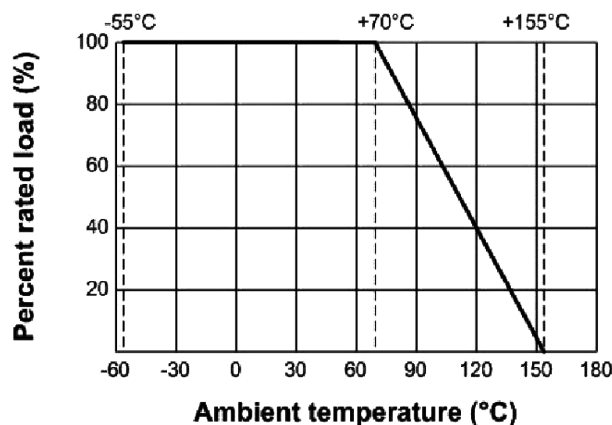
$$RCWV = \sqrt{P \times R}$$

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)

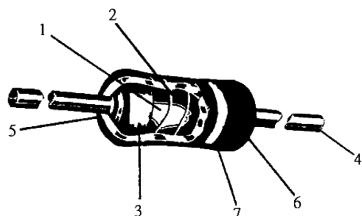
In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value



Nominal resistance :

Effective figures of nominal resistance shall be in accordance with E-24 series

Construction:



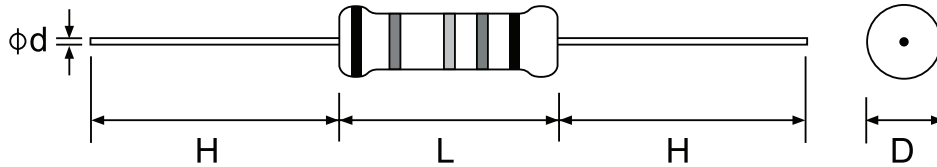
| No. | Name | Material |
|-----|-----------------|---|
| 1 | Basic Body | Rod Type Ceramics |
| 2 | Resistance Film | Metal Film |
| 3 | End Cap | Steel (Tin plated iron surface) |
| 4 | Lead Wire | Annealed copper wire coated with tin |
| 5 | Joint | By Welding |
| 6 | Coating | Insulated epoxy resin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

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 1% 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 table 1. for 60 +10/-0 secs. |
| Temperature Coefficient | Within the temperature coefficient specified below : ±50 PPM/°C Max | 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) |
| Short Time Overload | Resistance change rate is ±(0.5% +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 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 |

| Characteristics | Limits | Test Methods (JIS C 5201-1) | | | | | | | | | | | | | | | |
|---------------------------------|--|--|------|-------------|------|---|-------------|--------|---|------------|--------------|---|--------------|--------|---|------------|---------------|
| Solderability | 95 % coverage Min. | 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 ~ 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. <u>Wave soldering condition: (2 cycles Max.)</u> Pre-heat : 100 ~ 120°C, 30 ±5 sec. Suggestion solder temp.: 235 ~ 255°C, 10 sec.(Max.) Peak temp.: 260°C <u>Hand soldering condition:</u> 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 3.2 to 4.8mm from the body in 350°C ±10°C solder for 3 ± 0.5seconds | | | | | | | | | | | | | | | |
| Temperature Cycling | Resistance change rate is ±(1% +0.05Ω) 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 ± 3°C</td> <td>30mins</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10 to 15mins</td> </tr> <tr> <td>3</td> <td>+155°C ± 2°C</td> <td>30mins</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10 to 15 mins</td> </tr> </tbody> </table> | Step | Temperature | Time | 1 | -55°C ± 3°C | 30mins | 2 | Room temp. | 10 to 15mins | 3 | +155°C ± 2°C | 30mins | 4 | Room temp. | 10 to 15 mins |
| Step | Temperature | Time | | | | | | | | | | | | | | | |
| 1 | -55°C ± 3°C | 30mins | | | | | | | | | | | | | | | |
| 2 | Room temp. | 10 to 15mins | | | | | | | | | | | | | | | |
| 3 | +155°C ± 2°C | 30mins | | | | | | | | | | | | | | | |
| 4 | Room temp. | 10 to 15 mins | | | | | | | | | | | | | | | |
| Vibration | Resistance change rate is ±(1% + 0.05Ω) Max. | 55Hz, 3 planes 2hrs each, Total amplitude = 1.5mm | | | | | | | | | | | | | | | |
| Load life in Humidity | Resistance value Normal type | Δ R/R ±1.5% | | | | | | | | | | | | | | | |
| Load Life | Resistance value Normal type | Δ R/R ±1.5% | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | |
| Pulse overload | Resistance change rate is ±(1% + 0.05Ω) Max. with no evidence of mechanical damage | Resistance change after 10,000 cycles (1 sec. "on", 25 secs. "off") at 4 times RCWV | | | | | | | | | | | | | | | |

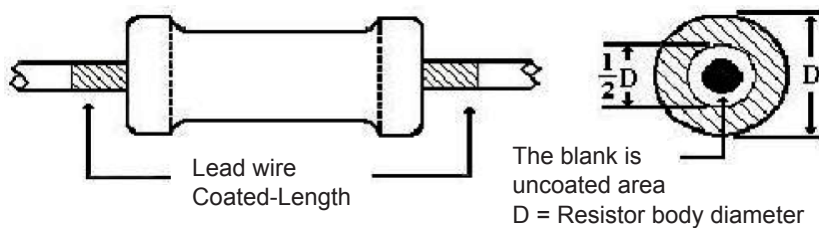
Dimension:



| Type | Power Rating | Dimension | | | |
|------|--------------|-----------|--------|-----------|--------------|
| | | D Max. | L Max. | H ± 3 | d ± 0.05 |
| MF | 1/4W | 2.5mm | 6.8mm | 28mm | 0.54mm |

Painting method:

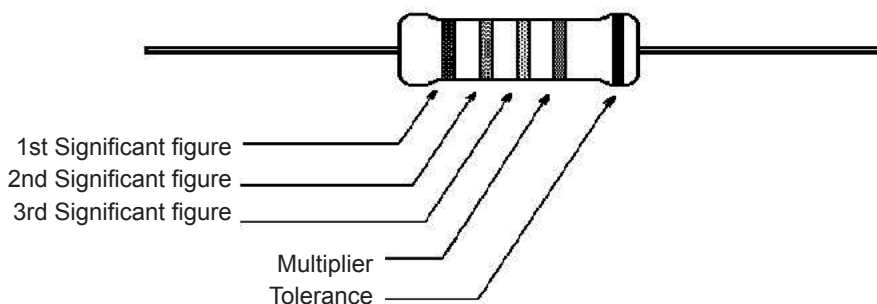
Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover. The extent should be within 1/2 of the arc angle.



Marking:

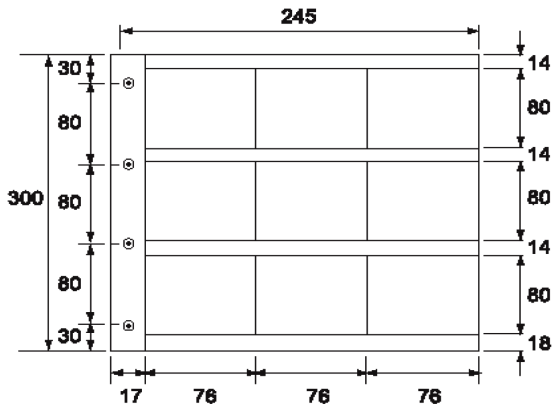
Resistor:

Resistors shall be marked with colour coding colours shall be in accordance with JIS C 0802

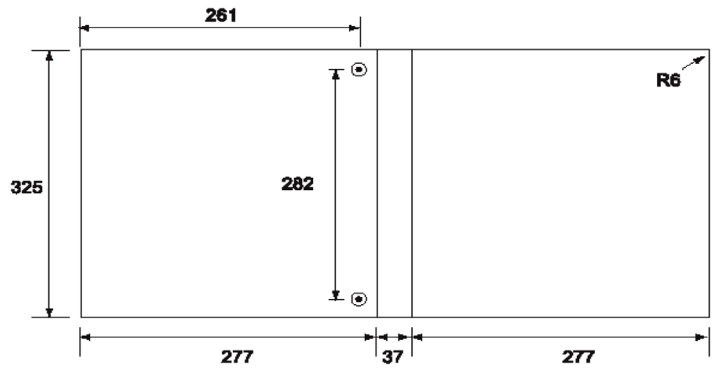


Kit resistors:

Insert for Chip Kit



Album for Chip Kit:



Dimensions : Millimetres

Chip Kit Resistors:

Product : MF 1/4W 1% 50ppm (2.5x6.8)
 E12 Series : (121 Values)
 Quantity : 100pcs per value
 Total Qty : 12,100pcs.

| NO. | Value |
|-----|-------|
| 1 | 10R |
| 2 | 11R |
| 3 | 12R |
| 4 | 13R |
| 5 | 15R |
| 6 | 16R |
| 7 | 18R |
| 8 | 20R |
| 9 | 22R |
| 10 | 24R |
| 11 | 27R |
| 12 | 30R |
| 13 | 33R |
| 14 | 36R |
| 15 | 39R |
| 16 | 43R |
| 17 | 47R |
| 18 | 51R |
| 19 | 56R |

| NO. | Value |
|-----|-------|
| 20 | 62R |
| 21 | 68R |
| 22 | 75R |
| 23 | 82R |
| 24 | 91R |
| 25 | 100R |
| 26 | 110R |
| 27 | 120R |
| 28 | 130R |
| 29 | 150R |
| 30 | 160R |
| 31 | 180R |
| 32 | 200R |
| 33 | 220R |
| 34 | 240R |
| 35 | 270R |
| 36 | 300R |
| 37 | 330R |
| 38 | 360R |

| NO. | Value |
|-----|-------|
| 39 | 390R |
| 40 | 430R |
| 41 | 470R |
| 42 | 510R |
| 43 | 560R |
| 44 | 620R |
| 45 | 680R |
| 46 | 750R |
| 47 | 820R |
| 48 | 910R |
| 49 | 1K |
| 50 | 1K1 |
| 51 | 1K2 |
| 52 | 1K3 |
| 53 | 1K5 |
| 54 | 1K6 |
| 55 | 1K8 |
| 56 | 2K |
| 57 | 2K2 |

| NO. | Value |
|-----|-------|
| 58 | 2K4 |
| 59 | 2K7 |
| 60 | 3K |
| 61 | 3K3 |
| 62 | 3K6 |
| 63 | 3K9 |
| 64 | 4K3 |
| 65 | 4K7 |
| 66 | 5K1 |
| 67 | 5K6 |
| 68 | 6K2 |
| 69 | 6K8 |
| 70 | 7K5 |
| 71 | 8K2 |
| 72 | 9K1 |
| 73 | 10K |
| 74 | 11K |
| 75 | 12K |
| 76 | 13K |

Metal Film Resistor Kit

multicomp PRO

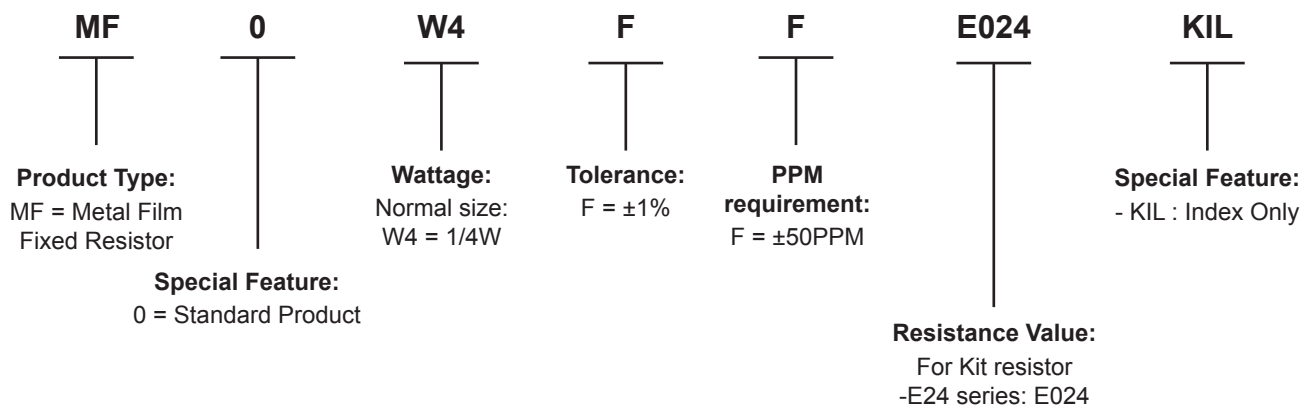
| NO. | Value |
|-----|-------|
| 77 | 15K |
| 78 | 16K |
| 79 | 18K |
| 80 | 20K |
| 81 | 22K |
| 82 | 24K |
| 83 | 27K |
| 84 | 30K |
| 85 | 33K |
| 86 | 36K |
| 87 | 39K |
| 88 | 43K |
| 89 | 47K |

| NO. | Value |
|-----|-------|
| 90 | 51K |
| 91 | 56K |
| 92 | 62K |
| 93 | 68K |
| 94 | 75K |
| 95 | 82K |
| 96 | 91K |
| 97 | 100K |
| 98 | 110K |
| 99 | 120K |
| 100 | 130K |
| 101 | 150K |
| 102 | 160K |

| NO. | Value |
|-----|-------|
| 103 | 180K |
| 104 | 200K |
| 105 | 220K |
| 106 | 240K |
| 107 | 270K |
| 108 | 300K |
| 109 | 330K |
| 110 | 360K |
| 111 | 390K |
| 112 | 430K |
| 113 | 470K |
| 114 | 510K |
| 115 | 560K |

| NO. | Value |
|-----|-------|
| 116 | 620K |
| 117 | 680K |
| 118 | 750K |
| 119 | 820K |
| 120 | 910K |
| 121 | 1M |

Explanation of Part Number



Part Number Table

| Description | Part Number |
|--------------------------------|----------------|
| Resistor, Kit, 0.25W, 1%, E-24 | MF0W4FFE024KIL |

Important Notice : This data sheet and its contents (the "Information") belong to the members of the AVNET group of companies (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp Pro is the registered trademark of Premier Farnell Limited 2019.

Newark.com/multicomp-pro
Farnell.com/multicomp-pro
Element14.com/multicomp-pro

multicomp PRO