



Flameproof & Flameproof Fusible Metal Film Resistors

Features:

- Flame retardant coating
- Availability of very low or very high ohmic values can be supplied on a case to case basis.
- Ideal circuit opening controller, disconnecting units from overload rating specified.

Explanation of Part Numbers:

FMF	25	C	1001	F	T	XX
1	2	3	4	5	6	7

1 Style:

FMF - Flameproof Fusible Metal Film Resistors

FPM - Flameproof Metal Film Resistors

2 Wattage:

08 = 1/8 watt 50 = 1/2 watt 200 = 2 watt
 25 = 1/4 watt 100 = 1 watt

3 Temperature Coefficient:

T = ± 15 ppm C = ± 50 ppm (Std)
 E = ± 25 ppm D = ± 100 ppm

4 Nominal Resistance Value:

E24 Series (5% Tolerance)

The first two digits are significant figures of resistance and the third digit denotes the number of zeros (decimal point is expressed by the letter "R").

i.e. 102 = 1k 1R2 = 1.2

E96 Series (1% Tolerance)

The first three digits are significant figures of resistance and the fourth digit denotes the number of zeros.

i.e. 1001 = 1k 10R0 = 10

5 Tolerance:

A = ± 0.5% D = ± .5% J = ±5%
 B = ± .1% F = ± 1%
 C = ± .25% G = ± 2%

6 Packaging:

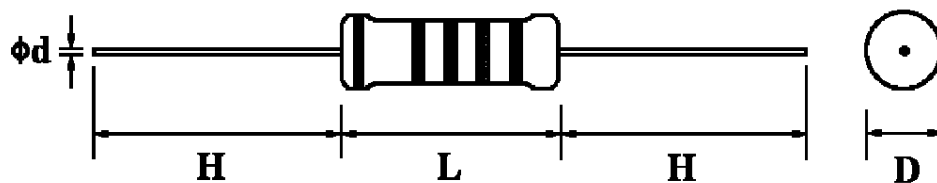
T = Tape & Reel B = Bulk
 TB = Tape & Box A = Ammo

7 Lead Forming:

PN = Panasert Type PA1 = Avisert Type 1
 PA2 = Avisert Type 2 PA3 = Avisert Type 3

* For all other requests, please consult factory

Dimension & Rating





Flameproof Fusible Metal Film Resistors

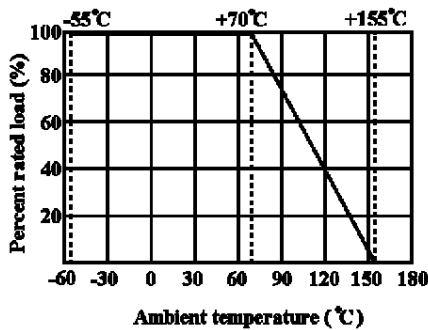
Style	Power Rating at 70°C	D Max.	L Max.	H±3	d ^{+0.02} _{-0.05}	Resistance Range	Dielectric Withstanding Voltage
FMF 25	1/4W (0.25W)	2.5	6.8	28	0.6	0.22 ~ 10K	300V
FMF 50	1/2W (0.5W)	3.0	9.0	28	0.6	0.22 ~ 10K	350V
FMF 100	1W	4.0	10.0	28	0.7	0.3 ~ 10K	350V
FMF 200	2W	5.0	12.0	28	0.7	0.3 ~ 10K	600V

* Part numbering system on Page K44.

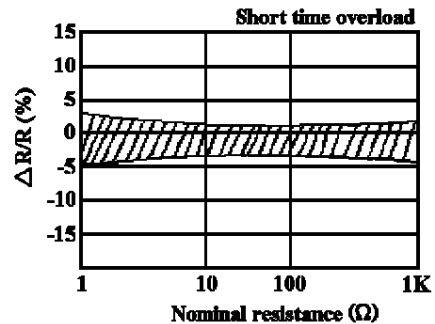
Fusing Characteristics

Resistance Range	Magnification of Power Rating	Fusing Time (Maximum Time)
0.22 ~ 0.99	32	60 Seconds
1 ~ 10K	16	60 Seconds
	20	40 Seconds
	24	30 Seconds
	28	20 Seconds
	32	15 Seconds

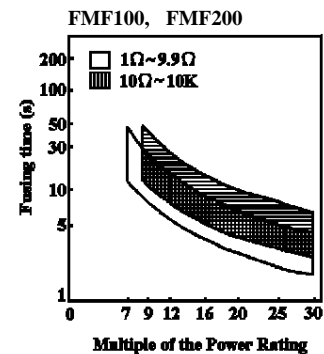
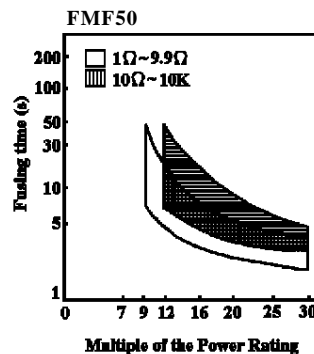
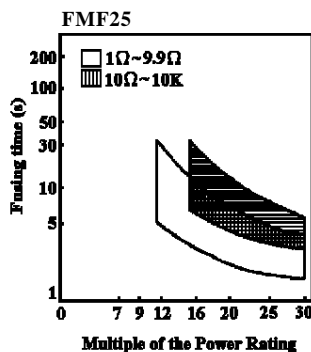
Derating Curve



Overload Curve



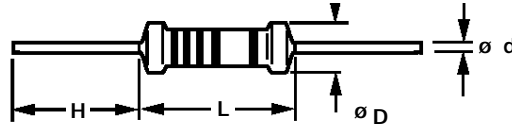
Fusing Characteristics Chart



Flameproof Metal Film Resistors



FPM series is a group of nonflammable, high performance metal film fixed resistors. By applying selected flame-overload burning-resisting resin on our regular metal film fixed resistors, they improved the safeness of various kinds of electronic devices and instruments and have excellent electrical performance.



General Specifications

Style	Power Rating (W)		Dimension (mm)				Max Working Voltage		Max Overload Voltage		Resistor Range
	70°C	125°C	L	øD	H(MIN)	ød	70°C	125°C	70°C	125°C	
FPM08	0.125W	0.05W	3.7 ± 0.4	1.5 ± 0.2	27	0.46 ± 0.02	200	150	400	300	10 ~ 1M
FPM25	0.25W	0.1W	6.5 ± 0.5	2.3 ± 0.2	27	0.58 ± 0.02	250	200	500	400	10 ~ 1M
FPM50	0.5W	0.125W	9.0 ± 1	3.5 ± 0.5	27	0.65 ± 0.02	350	250	700	500	10 ~ 1M
FPM100	1W	.25W	12 ± 1.0	4.5 ± 0.5	27	0.80 ± 0.03	500	300	1000	600	10 ~ 1M
FPM200	2W	0.5W	16 ± 1.0	5.5 ± 0.5	27	0.80 ± 0.03	500	350	1000	700	10 ~ 1M

* Part numbering system on Page K44.

Characteristics

Requirements	Characteristics	Test Method
Non-Combustibility	<p>Flame Resistance</p> <p>Will not burn continuously for more than 5 seconds.</p> <p>Overload Burning Resistance</p> <p>Will not fume under the overload of less than 5 times of rated power.</p> <p>The volume of fumes emitted under the overload of more than 5 times of rated power is less than that of stilled fumes emitted by one cigarette.</p> <p>During the test the flame height will not exceed 3mm and the burning does not continue for more than 3 seconds</p>	<p>MIL-STD-202 Method 111</p> <p>JIS C 5202 7.12</p> <p>EIAJ-RC 2658 5. 1</p>



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Performance Specifications

Characteristics	Test Methods	Limits	
Temperature coefficient JIS - C - 5202 5.2	Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1 (t_2 - t_1)} \times 10^6 \text{ (PPM / } ^\circ\text{C)}$ R ₁ : Resistance value at room temperature (t ₁) R ₂ : Resistance value at room temp. plus 100 °C (t ₂)	± 350 PPM / °C	
Dielectric withstanding voltage JIS - C - 5202 5.7	Resistors shall be clamped in the trough of a 90° metallic V- block and shall be tested at AC potential respectively specified in the above list for 60+10/-0seconds.	No evidence of flashover, mechanical damage, arcing or insulation break down.	
Temperature cycling JIS - C - 5202 7.4	Resistance change after continuous five cycles for duty cycle specified below:		
	Step	Temperature	Time
	1	-55°C ± 3°C	30 minutes
	2	Room temp	10-15 minutes
	3	+ 155°C ± 2°C	30 minutes
4	Room temp	10-15 minutes	
Resistance change rate is ± (2% + 0.05). No evidence of mechanical damage			
Short - time overload JIS - C - 5202 5.5	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.	Resistance change rate is ± (5% + 0.05) No evidence of mechanical damage	
Load life in humidity JIS - C - 5202 7.9	Resistance change after 1000 hours (1.5 hours "on" 0.5 hour "off") at RCWV in a humidity chamber controlled at 40°C±2°C and 90 to 95% relative humidity.	Resistance change rate is ± (5% + 0.05) No evidence of mechanical damage	
Load life JIS - C - 5202 7.10	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.	Resistance change rate is ± (5% + 0.05) No evidence of mechanical damage	
Terminal strength JIS - C - 5202 6.1	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 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.	No evidence of mechanical damage	
Resistance to soldering heat JIS - C - 5202 6.4	Permanent resistance change when leads immersed to 3.2 mm to 4.8 mm from the body in 350°C ±10°C solder for 3 ±0.5 seconds	Resistance change rate is ± (1% + 0.05) No evidence of mechanical damage	
Solderability JIS - C - 5202 6.5	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. of solder : 235°C ± 5°C Dwell time in solder : 3 + 0.5 / - 0 seconds	95% coverage Min.	
Flame retardant JIS - C - 5202 7.12	The burner is placed remote from resistor ignited and adjusted to produce a blue flame 38mm in height and a top of flame 127mm above the top of the burner tube. Resistor is supported from its lead at 45° from the horizontal to that the lower end of resistor is the top of blue flame. The test flame is placed to remain for 15 seconds and removed for 15 seconds. The operation is to be repeated until resistor has been subjected to 5 application of test flame.	Do not have any specimens which burn with flaming combustion after each application of the test flame.	

*RCWV = Rated Continuous Working Voltage = $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$