

**METAL GLAZE FILM FIXED RESISTORS
(FLAME PROOF, HIGH OHMIC & HIGH VOLTAGE)**

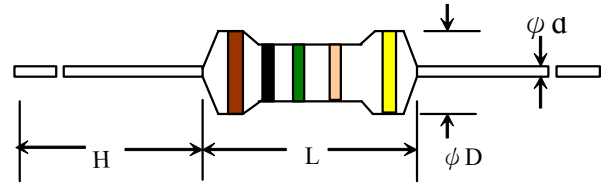


GMFHV

GMFHV-1/4, 1/2, 1S, 1W, 1

Product

A metal glaze film is deposited on a high grade ceramic body, the resistors are coated with a pink lacquer, the 5th color band is yellow for tolerance 5% to represent high voltage resistors.



Dimensions

Dimensions: mm				
Style	L	D	H	d
GMFHV-1/4	6.3 ± 0.5	2.4 ± 0.2	28 ± 2.0	0.55 ± 0.05
GMFHV-1/2	9.0 ± 0.5	3.3 ± 0.3	26 ± 2.0	0.55 ± 0.05
GMFHV-1S				
GMFHV-1W	11.5 ± 1.0	4.5 ± 0.5	35 ± 2.0	0.80 ± 0.05
GMFHV-1	15.5 ± 1.0	5.0 ± 0.5	33 ± 2.0	0.80 ± 0.05

Electrical Characteristics

Style	GMFHV-1/4	GMFHV-1/2	GMFHV-1S	GMFHV-1W	GMFHV-1
Power Rating at 70°C	1/4W	1/2W	1W	1W	1W
Maximum Working Voltage (DC)	1600V	3500V		5000V	10000V
Maximum Overload Voltage (DC)	3000V	7000V		10000V	20000V
Dielectric Withstanding Voltage	500V	700V			
Resistance Range	100K ~ 68MΩ for E24 & E96 Series Value				
Operating Temperature Range	-55°C to +155°C				
Temperature Coefficient	±200ppm/°C				

Part Numbering System

GMFHV — 1/4 1% 100K TR 26

Type	Rated Power		Resistance Tolerance	E24 & E96 Series Value Nominal Resistance		Packaging		Tape Width	
	Code	Wattage		Code	Description	Code	Description	Code	Description
GMFHV	1/4	1/4W	1% 5%	100K	100K Ohms	B	Bulk	Nil	52.4mm (Standard)
	1/2	1/2W		120K	120K Ohms	TB	Tape & Box	26	26mm
	1S	1W	1M21	1.21Meg Ohms	TR	Tape & Reel	73	73mm	
	1W	1W	68M	68Meg Ohms					
	1	1W							

Environmental Characteristics

1 -Short Time Over Load Test:

At 2.5 times of the rated voltage applied for 5 seconds, the resistor should be free from defects after the resistor is released from load for about 30 minutes.

$$\text{Short Time Overload Voltage} = 2.5 * \sqrt{\text{Power Rating} \times \text{Resistance Value}}$$

The change of the resistance value should be within $\pm 1\% + 0.05\Omega$

2 -Dielectric Withstanding Voltage:

The resistor is placed on the metal V Block. Apply a Table I dielectric withstanding between the terminals connected together with the block for about 60 seconds.

The resistor shall be able to withstand without breakdown or flashover.

3 -Temperature Coefficient Test:

Test of resistors above room temperature $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (Testing Temperature 115°C to 130°C) at the constant temperature silicon plate for over 5 minutes. Then measure the resistance value.

The Temperature Coefficient is calculated by the following equation and its value should be within the range of requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

R = Resistance value under the testing temperature

R_0 = Resistance value at the room temperature

t = The testing temperature

t_0 = Room Temperature

4 -Insulation Resistance:

Apply test terminal on lead and resistor body.

The test resistance should be high than 10,000M ohm.

5 - Solderability

Immerse the specimen into the solder pot at $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for ± 0.5 seconds.

At least 95% solder coverage on the termination.

6 - Resistance to Solvent:

The specimen into the appropriate solvent of IPA condition of ultrasonic machine for 1 minutes.

The specimen is no deterioration of coatings and color code.

7 -Terminal Strength:

Direct Load - Resistors shall be held by one terminal and the load shall be gradually applied in the direction of the longitudinal axis of the resistor until the applied load reached 5 pounds.

The load shall be held for 10 seconds. The load of weight shall be $\geq 2.5\text{kg}$ (24.5N).

8 -Pulse Overload

Apply 4 times of rated voltage to the specimen at the 1 second on and 25 seconds off cycle, subjected to voltage application cycles specified in 10,000 time.

The change of the resistance value shall be within $\pm 1\% + 0.05\Omega$

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9 -Load Life in Humidity:

Place the specimen in a test chamber at 40°C and 93% relative humidity. Apply the rated voltage to the specimen at the 1.5 hours on and 0.5 hour off cycle. The total length of test is 1,000 hours.

The change of the resistance value shall be within $\pm 5.0\% + 0.05\Omega$

10 -Load Life Test

Placed in the constant temperature chamber of $70 \pm 3^\circ\text{C}$ the resistor shall be connected to the lead wire at the point of 25mm. Length with each terminal, the resistors shall be arranged not much effected mutually by the temperature of the resistors and the excessive ventilation shall not be performed, for 90 minutes on and 30 minutes off under this condition the rated DC voltage is applied continuously for 1000+48/-0 hours then left at no-load for 1 hour, measured at this time the resistance value.

The change of the resistance value shall be within $\pm 5.0\% + 0.05\Omega$.

There shall be no remarkable change in the appearance and the color code shall be legible after the test.

11 -Temperature Cycling Test

The temperature cycle shown in the following table shall be repeated 5 times consecutively. The measurement of the resistance value is done before the first cycle and after ending the fifth cycle, leaving in the room temperature for about 1 hour.

Temperature Cycling Conditions:

Step	Temperature(°C)	Time (minute)
1	-55 ± 3	30
2	25 ± 3	2 ~ 3
3	155 ± 3	30
4	25 ± 3	2 ~ 3

The change of the resistance value shall be within $\pm 1.0\% + 0.05\Omega$.

After the test the resistor shall be free from the electrical or mechanical damage.

12 -Resistance to Soldering Heat:

The terminal lead shall be dipped into the solder pot at 350°C for 10 seconds.

The change of the resistance value shall be within $\pm 1.0\% + 0.05\Omega$

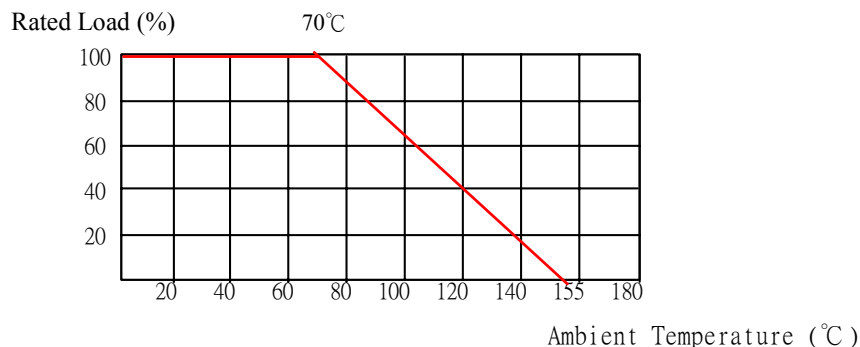
13 -Overload Flame Retardant:

At 4 times of the rated voltage (if the voltage exceeds the maximum load voltage, the maximum load voltage will be used as the rated voltage) applied for 1 minute.

$$\text{Overload Test Voltage} = 4 * \sqrt{\text{Power Rating} * \text{Resistance Value}}$$

The resistor shall be able to no evidence of flaming arcing.

Derating Curve

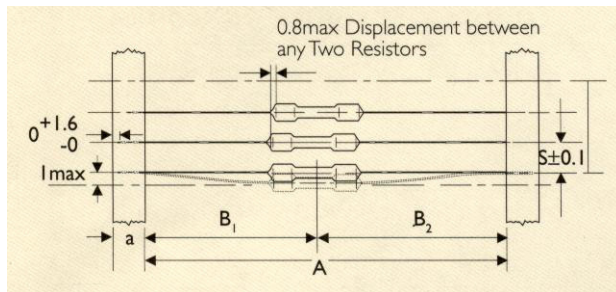


Band-Code



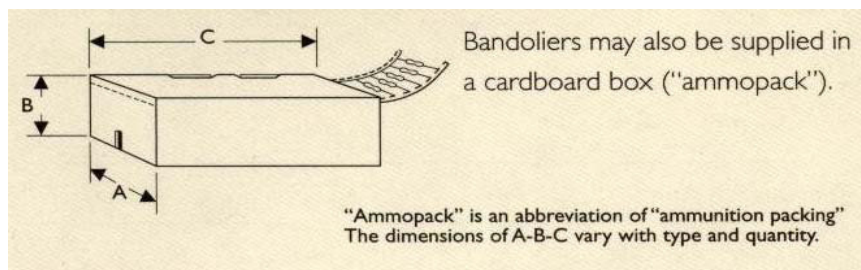
COLOR	1ST BAND	2ND BAND	MULTIPLIER	TOLERANCE
BLACK	0	0	1Ω	
BROWN	1	1	10Ω	± 1 % (F)
RED	2	2	100Ω	
ORANGE	3	3	1KΩ	
YELLOW	4	4	10KΩ	GMFHV 5%
GREEN	5	5	100KΩ	
BLUE	6	6	1MΩ	
VIOLET	7	7	10MΩ	
Gold	8	8		± 5 % (J)
Silver	9	9		

Packing Methods



Style	Dimensions: mm				
	a	A	B1-B2	S (spacing)	T (max. deviation of spacing)
GMFHV-1/4	6 ± 0.5	52.4 ± 1.0	1.2	5	1 mm per 10 spacing 0.5mm per 5 spacing
GMFHV-1/2		26.0 ± 1.0	1.0		
GMFHV-1S	6 ± 0.5	26.0 ± 1.0	1.0	5	
GMFHV-1W	6 ± 0.5	73.0 ± 1.5	1.5	5	
		52.4 ± 1.0	1.2		
GMFHV-1	6 ± 0.5	73.0 ± 1.5	1.5	5	

Tape On Box Packing



Style	Dimensions: mm			
	W(A)	H(B)	L(C)	Qty per Box
GMFHV-1/4	75	55	255	2,000
GMFHV-1/2				2,000
GMFHV-1S				2,000
GMFHV-1W	103	78	260	1,000
GMFHV-1	90	74	260	500