

# METAL GLAZE FILM FIXED RESISTORS

## Features

- Small in dimension and broad range in high resistance
- Metal glaze resistor elements provide high stable performance against environmental conditions and overload
- Excellent in absorption of electric shock (Pulse, Surge voltage)
- Approved to IEC 60065 safety requirements (VDE),  
Recognized by UL1676 (File #E245052)



**Ordering Procedure: (Ex.: MGR 1W, +/-5%, 470KΩ, T/B-1000, Non - Flame)**

<b>M</b>	<b>G</b>	<b>R</b>	<b>F</b>	<b>1</b>	<b>W</b>	<b>J</b>	<b>0</b>	<b>4</b>	<b>7</b>	<b>4</b>	<b>A</b>	<b>1</b>	<b>8</b>				
<b>Resistor Type:</b> MGR = Metal Glaze Film Fixed Resistors			<b>Special Feature:</b> 0 = UL Epoxy for 1/4W Only F = UL Non-Flame for 1/2W, 1W, 2W			<b>Wattage:</b> W4 = 1/4W (UL Epoxy Paint) Only W2 = 1/2W (UL Non-Flame Paint), 1W = 1W (UL Non-Flame Paint), 2W = 2W (UL Non-Flame Paint)			<b>Resistance Value:</b> <ul style="list-style-type: none"> <li>• E-24 series: the 1<sup>st</sup> digit is "0", the 2<sup>nd</sup> &amp; 3<sup>rd</sup> digits are for the significant figures of the resistance and the 4<sup>th</sup> indicate the number of zeros. "J" ~ 0.1, "K" ~ 0.01  <b>Ex.</b> 4.7Ω ~ 47J, 4.7KΩ ~ 472</li> <li>• E-96 series: The 1<sup>st</sup> to 3<sup>rd</sup> digits are significant figures of resistance and the 4<sup>th</sup> one denotes number of zeros.  <b>Ex.</b> 1.33 KΩ = 1331</li> </ul>			<b>Tolerance:</b> F = ±1%, G = ±2%, J = ±5%			<b>Packing Type:</b> A = Tape/Box T = Tape/Reel B = Bulk/Box P = Tape/Box of PT-26 product		
<b>Packing Qty:</b> 1 = 1,000 PCS    2 = 2,000 PCS 4 = 4,000 PCS    5 = 5,000 PCS A = 500 PCS    B = 2,500 PCS 0 = for Bulk/Box packing																	

\* More explanation on part no, please see details on pages 79-80.

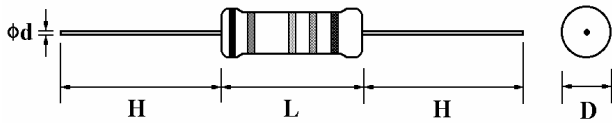
## Performance Specifications

<b>Temperature coefficient</b>	≤ ±200PPM/°C	<b>Additional Information:</b> 0 = PT-52 mm, NIL for PT-26 8 = PT-58 mm 9 = PT-64 mm
<b>Short-time overload</b>	ΔR/R ≤ ±(1.0% + 0.05Ω), with no evidence of mechanical damage.	
<b>Dielectric withstanding voltage</b>	No evidence of flashover, mechanical damage, arcing or insulation breakdown.	
<b>Pulse overload</b>	ΔR/R ≤ ±(2.0% + 0.05Ω), with no evidence of mechanical damage.	
<b>Terminal strength</b>	No evidence of mechanical damage.	
<b>Resistance to soldering heat</b>	ΔR/R ≤ ±(1.0% + 0.05Ω), with no evidence of mechanical damage.	
<b>Solderability</b>	Min. 95% coverage	
<b>Resistance to solvent</b>	No deterioration of protective coating and markings.	
<b>Temperature cycling</b>	ΔR/R ≤ ±(1.0% + 0.05Ω), with no evidence of mechanical damage.	
<b>Load life in humidity</b>	ΔR/R ≤ ±(5.0% + 0.05Ω), with no evidence of mechanical damage.	
<b>Load life</b>	ΔR/R ≤ ±(5.0% + 0.05Ω), with no evidence of mechanical damage.	
<b>Surge withstanding voltage</b>	ΔR/R ≤ ±(20.0% + 0.05Ω), with no evidence of mechanical damage.	

\*More details, please see pages 77-78.

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### Dimension (mm)



- 5 color code band for  $\pm 5\%$  tolerance and last band Black color for identification
- Standard 5 color code band for  $\pm 1\%$  tolerance
- [MGR0W4 using UL Epoxy paint](#)
- [MGRFW2, MGRF1W, MGR2W using Non-flame paint](#)

Part No.	Style	Power Rating at 70°C	Dimension (mm)			
			D Max.	L Max.	d $\pm 0.05$	H $\pm 3$
MGR0W4	MGR-25	1/4W(0.25W)	2.7	7.0	0.60	28

Part No.	Style	Power Rating at 70°C	Dimension (mm)			
			D Max.	L Max.	d $\pm 0.05$	H $\pm 3$
MGRFW2	MGR-50	1/2W(0.5 W)	3.8	10.0	0.60	28
MGRF1W	MGR-100	1W	5.2	13.0	0.75	25
MGRF2W	MGR-200	2W	6.0	17.0	0.75	28

### Power Rating

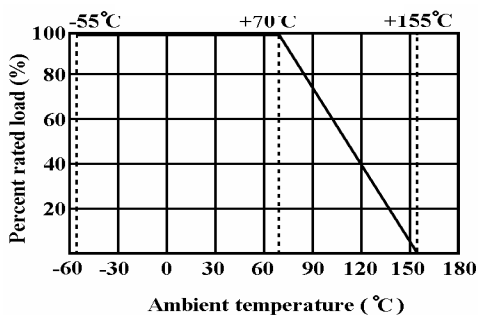
Style	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Surge Withstanding Voltage	Resistance Range
MGR-25	1,600 V	2,000 V	700 V	100K $\Omega$ ~ 33M $\Omega$ : 3,000 V	$\pm 1\%$ : 100K $\Omega$ ~ 1M $\Omega$ $\pm 5\%$ : 1K $\Omega$ ~ 33M $\Omega$

Style	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Surge Withstanding Voltage	Resistance Range
MGR-50	3,500 V	4,000 V	700 V	100K $\Omega$ ~ 360K $\Omega$ : 5,000 V 361K $\Omega$ ~ 1M $\Omega$ : 7,000 V 1.1M $\Omega$ ~ 33M $\Omega$ : 10,000 V	$\pm 1\%$ : 100K $\Omega$ ~ 1M $\Omega$ $\pm 5\%$ : 1K $\Omega$ ~ 33M $\Omega$
MGR-100	3,500 V	4,000 V	1,000 V	100K $\Omega$ ~ 33M $\Omega$ : 10,000 V	$\pm 1\%$ : 100K $\Omega$ ~ 1M $\Omega$ $\pm 5\%$ : 1K $\Omega$ ~ 33M $\Omega$
MGR-200	3,500 V	4,000 V	1,000 V	100K $\Omega$ ~ 33M $\Omega$ : 10,000 V	$\pm 1\%$ : 100K $\Omega$ ~ 1M $\Omega$ $\pm 5\%$ : 1K $\Omega$ ~ 33M $\Omega$

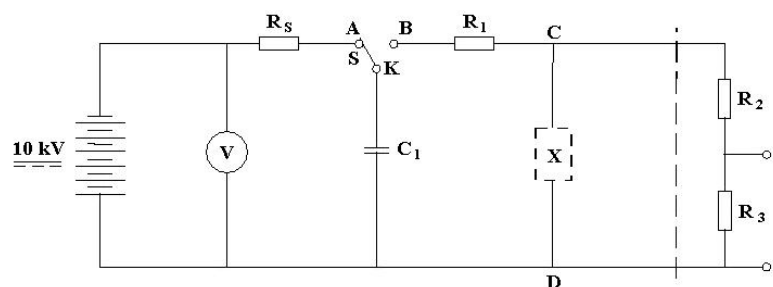
#### Surge withstanding voltage: IEC 60065

1. Discharge test: 3kV ~ <10kV, 0.01 $\mu$ F capacitor discharge pulse, 10 times (1pulse: 2.5 second "ON", 2.5 second "OFF")
2. Discharge test:  $\geq 10$ kV, 0.001 $\mu$ F (1nF) capacitor discharge pulse, 50 times (1pulse: 2.5 second "ON", 2.5 second "OFF")

#### Derating Curve



#### Surge Test – Test Circuit



Note:  $C_1 = 0.01\mu\text{F} < 10,000\text{V}$      $C_1 = 1\text{nF} (0.001\mu\text{F}) \geq 10,000\text{V}$   
 $R_1 = 1\text{k}\Omega$      $R_2 = 100\text{M}\Omega$      $R_3 = 0.1\text{M}\Omega$      $R_s = 15\text{M}\Omega$