



Metal Glaze Film Fixed Resistors

Performance Specification

Temperature Coefficient	≤ ±200PPM/°C
Short Time Overload	±(1.0% + 0.05Ω)Max, with no evidence of mechanical damage.
Insulation Resistance	Min. 10,000 Mega Ohm
Dielectric Withstanding Voltage	No evidence of flashover, mechanical damage, arcing or insulation breakdwown.
Pulse Overload	±(2.0% + 0.05Ω)Max, with no evidence of mechanical damage.
Terminal Strength	No evidence of mechanical damage.
Resistance to Soldering Heat	±(1.0% + 0.05Ω)Max, with no evidence of mechanical damage.
Solderability	Min. 95% coverage.
Resistance to Solvent	No deterioration of protective coating and markings.
Temperature Cycling	±(1.0% + 0.05Ω)Max, with no evidence of mechanical damage.
Humidity (Steady State)	±(2.0% + 0.05Ω)Max, with no evidence of mechanical damage.
Load Life in Humidity	±(5.0% + 0.05Ω)Max, with no evidence of mechanical damage.
Load Life	±(5.0% + 0.05Ω)Max, with no evidence of mechanical damage.
Surge Withstanding Voltage	±(20.0% + 0.05Ω)Max, with no evidence of mechanical damage.

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

M G R F 1 W J 0 4 7 4 A 1 0

Type:
MGR = Metal Glaze Film

Feature:
0 = UL epoxy for 1/4W only
F = UL Non-Flame for 1/2W, 1W, 2W

Wattage:
Normal:
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)

Small:
S2 = 1/2WS
1S = 1WS
2S = 2WS
3S = 3WS

Extra small:
U2 = 1/2WSS
1U = 1WSS
2U = 2WSS
3U = 3WSS

Tolerance:
F = ±1%
G = ±2%
J = ±5%

Resistance Value:

- E-24 series:
1st digit is "0"
2nd & 3rd digits are the significant figures of the resistance
4th indicates the number of zeros:
"J" ~ 0.1, "K" ~ 0.01
Ex.: 4.7Ω ~ 47J, 4.7KΩ ~ 472

- E-96 series:
1st to 3rd digits are the significant figures of the resistance and the 4th digit indicates the number of zeros.
Ex.: 1.33KΩ = 1331

Packing Type:
A = Tape/Box
T = Tape/Reel
B = Bulk/Box
P = Tape/Box of PT-26mm

Packing Qty:
1 = 1,000 pcs.
4 = 4,000 pcs.
5 = 5,000 pcs.
A = 500 pcs.
B = 2,500 pcs.
0 = Bulk/Box

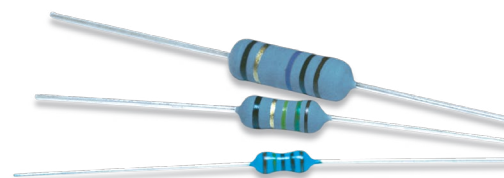
Additional Information:
0 = PT-52mm,
Standard lead wire for Bulk/Box
8 = PT-58mm
9 = PT-64mm



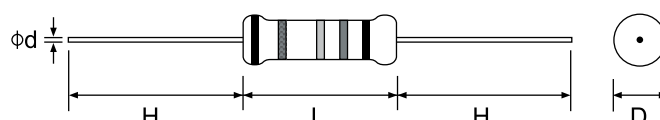
Metal Glaze Film Fixed Resistors

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)
(For 1/2W: 1M ~ 100M, 1W and 2W: 100K ~ 100M)
- Recognized by UL 1676 for 1/2W, 1W and 2W normal size resistance value 960K ~ 12M



Standard : 2% ,5% ,10% -- E-24 series
1% -- E-96 series



Part No.	Style	Power Rating at 70°C	Dimension (mm)					Std Packing Qty
			D Max	L Max	d±0.05	H±3	PT	
Normal Size								
MGR0W4	MGR 25	1/4W (0.25W)	2.7	7.0	0.60	28	52	4,000
MGRFW2	MGR 50	1/2W (0.50W)	3.8	10.0	0.60	28	52	1,000
MGRF1W	MGR 100	1W	5.2	13.0	0.75	25	52	1,000
MGRF2W	MGR 200	2W	6.0	17.0	0.75	28	64	500
Small Size / Ultra Small Size								
MGR0U2	MGR-50-SS	1/2W	2.7	7.0	0.60	28	52	4,000
MGRFS2	MGR-50-S	1/2W	3.3	9.5	0.60	28	52	1,000
MGRF1U	MGR-100-SS	1W	4.0	10.0	0.60	28	52	1,000
MGRF1S	MGR-100-S	1W	4.7	11.0	0.70	28	52	1,000
MGRF2U	MGR-200-SS	2W	4.7	13.0	0.75	28	52	1,000
MGRF2S	MGR-200-S	2W	5.2	13.0	0.75	28	52	1,000
MGRF3U	MGR-300-SS	3W	5.2	13.0	0.75	28	52	1,000
MGRF3S	MGR-300-S	3W	6.0	17.0	0.75	28	64	500

Metal Glaze Film Fixed Resistors

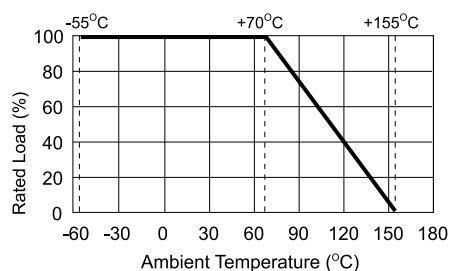
Surge Characteristics

Part No.	Style	Max Working Voltage	Max Overload Voltage	Dielectric Withstanding Voltage	Surge Withstanding Voltage	Resistance Range
Normal Size						
MGR0W4	MGR 25	1,600V	2,000V	700V	100K Ω ~100M Ω : 3,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 100M Ω
MGRFW2	MGR 50	3,500V	4,000V	700V	100K Ω ~360K Ω : 5,000V 361K Ω ~1M Ω : 7,000V 1.1M Ω ~100M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 100M Ω
MGRF1W	MGR 100	3,500V	4,000V	1,000V	100K Ω ~100M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 100M Ω
MGRF2W	MGR 200	3,500V	4,000V	1,000V	100K Ω ~100M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 100M Ω
Small Size / Ultra Small Size						
MGR0U2	MGR-50-SS	500V	700V	500V	100K Ω ~1M Ω : 3,000V 1.1M Ω ~6.2M Ω : 4,000V $\geq \sim 6.8$ M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω
MGRFS2	MGR-50-S	500V	700V	500V		$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω
MGRF1U	MGR-100-SS	700V	1,000V	700V	100K Ω ~1M Ω : 4,000V 1.1M Ω ~6.2M Ω : 5,000V $\geq \sim 6.8$ M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω
MGRF1S	MGR-100-S	700V	1,000V	700V		$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω
MGRF2U	MGR-200-SS	1,000V	1,400V	700V	100K Ω ~1M Ω : 5,000V 1.1M Ω ~6.2M Ω : 6,000V $\geq \sim 6.8$ M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω
MGRF2S	MGR-200-S	1,000V	1,400V	700V		$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω
MGRF3U	MGR-300-SS	1,000V	1,400V	700V	100K Ω ~1M Ω : 5,000V 1.1M Ω ~6.2M Ω : 6,000V $\geq \sim 6.8$ M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω
MGRF3S	MGR-300-S	1,000V	1,400V	700V	100K Ω ~1M Ω : 8,000V 1.1M Ω ~6.2M Ω : 9,000V $\geq \sim 6.8$ M Ω : 10,000V	$\pm 1\%$: 100K Ω ~ 1M Ω $\pm 5\%$: 1K Ω ~ 33M Ω $\pm 10\%$: 1K Ω ~ 33M Ω

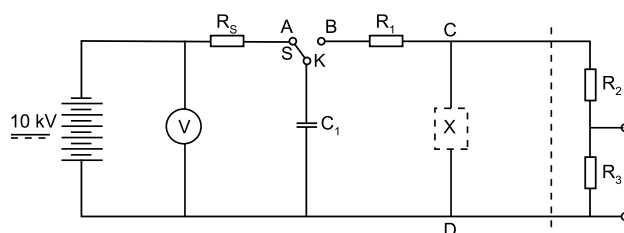
Surge Withstanding Voltage: IEC 60065

- Discharge test: 3KV ~ <10KV, 0.01 μ F capacitor discharge pulse, 10 times (1 pulse: 2.5 sec "ON", 2.5 sec "OFF")
- Discharge test: ≥ 10 KV, 0.001 μ F (1nF) capacitor discharge pulse, 50 times (1 pulse: 2.5 sec "ON", 2.5 sec "OFF")

Derating Curve



Surge Test - Test Circuit



Note: C1 = 0.01 μ F <10,000V C1 = 0.001 μ F (1nF) $\geq 10,000$ V
 $R_1 = 1$ K Ω $R_2 = 100$ M Ω $R_3 = 0.1$ M Ω $R_3 = 15$ M Ω