



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 breakdown.
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 NonFlame Paint)
1W = 1W (UL NonFlame Paint)
2W = 2W (UL NonFlame Paint)

Small:
S2 = 1/2W-S (UL NonFlame Paint)
1S = 1W-S (UL NonFlame Paint)
2S = 2W-S (UL NonFlame Paint)
3S = 3W-S (UL NonFlame Paint)

Extra small:
U2 = 1/2W-SS (UL NonFlame Paint)
1U = 1W-SS (UL NonFlame Paint)
2U = 2W-SS (UL NonFlame Paint)
3U = 3W-SS (UL NonFlame Paint)

Tolerance:
F = ± 1%
G = ± 2%
J = ± 5%

Resistance Value:

- E-24 series:
1st digit is "0"
2nd & 3rd digits are 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 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

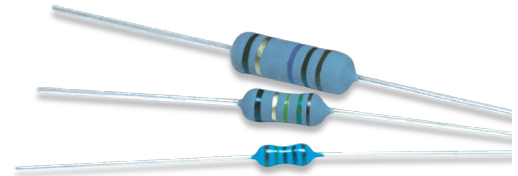
Packing Qty:
1 = 1,000 pcs.
4 = 4,000 pcs.
5 = 5,000 pcs.
A = 500 pcs.
B = 2,500 pcs.
0 = Bulk/Box

Additional Information:
0 = PT-52mm, PT-26mm,
Standard lead wire for Bulk/Box
8 = PT-58mm
9 = PT-64mm

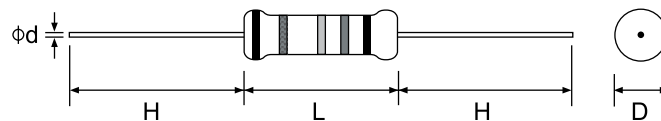
Metal Glaze Film Fixed Resistors

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 UL1676 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

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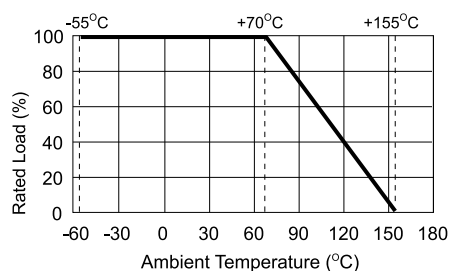
Surge Characteristics

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	100KΩ~100MΩ: 3,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 100MΩ
MGRFW2	MGR 50	3,500V	4,000V	700V	100KΩ~360KΩ: 5,000V 361KΩ~1MΩ: 7,000V 1.1MΩ~100MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 100MΩ
MGRF1W	MGR 100	3,500V	4,000V	1,000V	100KΩ~100MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 100MΩ
MGRF2W	MGR 200	3,500V	4,000V	1,000V	100KΩ~100MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 100MΩ
Small Size / Ultra Small Size						
MGRFU2	MGR-50-SS	500V	700V	500V	100KΩ~1MΩ: 3,000V 1.1MΩ~6.2MΩ: 4,000V ≥~6.8MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ
MGRFS2	MGR-50-S	500V	700V	500V		±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ
MGRF1U	MGR-100-SS	700V	1,000V	700V	100KΩ~1MΩ: 4,000V 1.1MΩ~6.2MΩ: 5,000V ≥~6.8MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ
MGRF1S	MGR-100-S	700V	1,000V	700V		±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ
MGRF2U	MGR-200-SS	1,000V	1,400V	700V	100KΩ~1MΩ: 5,000V 1.1MΩ~6.2MΩ: 6,000V ≥~6.8MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ
MGRF2S	MGR-200-S	1,000V	1,400V	700V		±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ
MGRF3U	MGR-300-SS	1,000V	1,400V	700V	100KΩ~1MΩ: 5,000V 1.1MΩ~6.2MΩ: 6,000V ≥~6.8MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ
MGRF3S	MGR-300-S	1,000V	1,400V	700V	100KΩ~1MΩ: 8,000V 1.1MΩ~6.2MΩ: 9,000V ≥~6.8MΩ: 10,000V	±1%: 100KΩ ~ 1MΩ ±5%: 1KΩ ~ 33MΩ ±10%: 1KΩ ~ 33MΩ

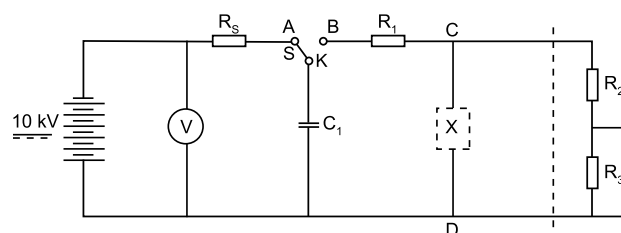
Surge Withstanding Voltage: IEC 60065

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

Derating Curve



Surge Test - Test Circuit



Note: C1 = 0.01μF <10,000V C1 = 0.001μF (1nF) ≥10,000V
R₁ = 1KΩ R₂ = 100MΩ R₃ = 0.1MΩ R₃ = 15MΩ