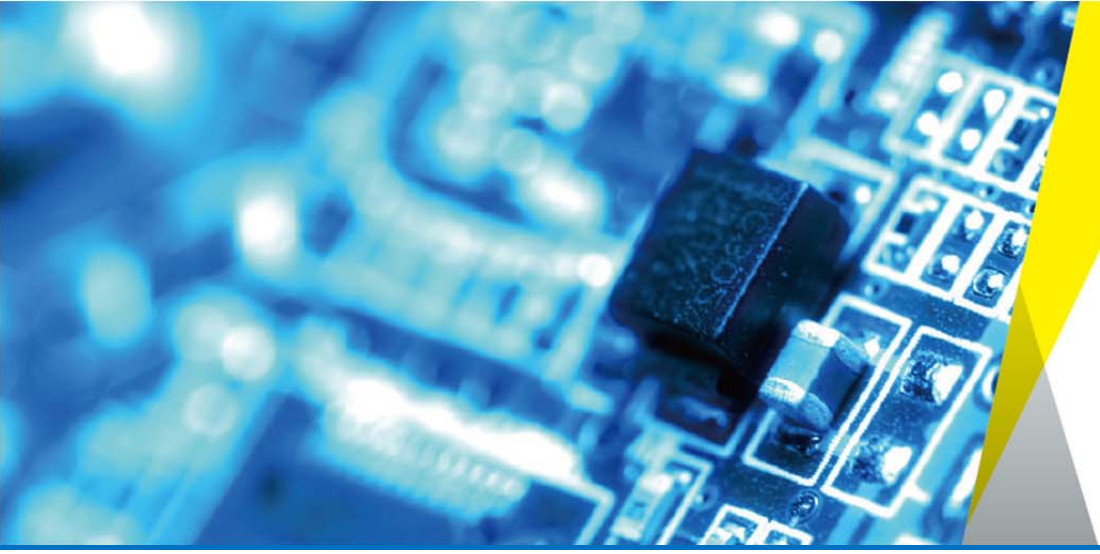

DATASHEET

Product Name	**Metal Glaze Film Voltage Divider Resistors**
Part Name	**MGRD 50W Series**
File No.	**DIP-SP-070**

Uniroyal Electronics Global Co., Ltd.

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	Aeon Technology Corporation
	Royal Electronic Factory (Thailand) Co., Ltd.
	Royal Technology (Thailand) Co., Ltd.

1. Scope

1.1 This specification for approve relates Metal Glaze Film Voltage Divider Resistors manufactured by UNI-ROYAL.
1.2 Non-inductive design, excellent characteristics at high frequency.
1.3 Be applicable for mutual inductor of electric system .
1.4 Compliant with RoHS directive.
1.5 Halogen free requirement.

2. Part No. System

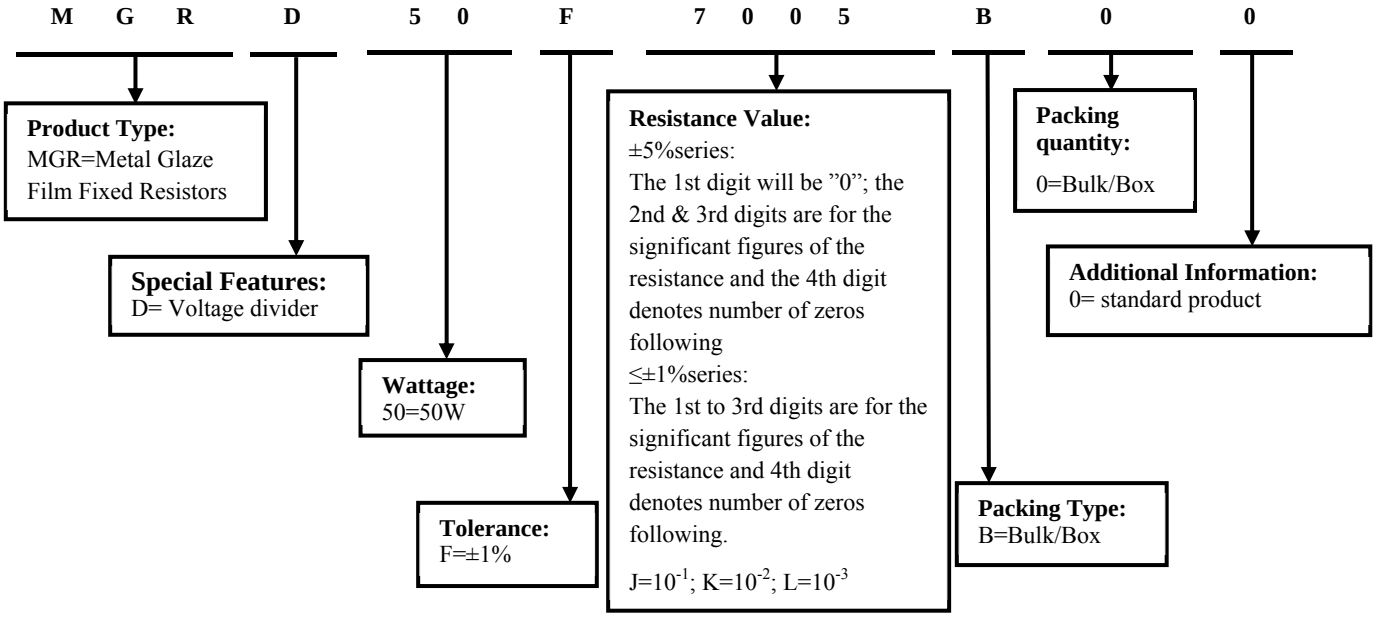
The standard Part No. includes 14 digits with the following explanation:
2.1 1st to 3rd digits are to indicate the product type and 4th digit is the special feature.
Example: MGRD= Metal Glaze Film Voltage Divider Resistors
2.2 5th~6th digits:

Wattage	70
Normal Size	70W

2.3 The 7th digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resistance Tolerance.
F=±1% G=±2% J=±5% K= ±10%
2.4 The 8th to 11th digits is to denote the Resistance Value.
2.4.1 For the standard resistance values of E-24 series, the 8th digit is "0",the 9th & 10th digits are to denote the significant figures of the resistance and the 11th digit is the number of zeros following;
For the standard resistance values of E-96 series, the 8th digit to the 10th digits is to denote the significant figures of the resistance and the 11th digit is the 11th digit is the zeros following.
2.4.2 The following number s and the letter codes are to be used to indicate the number of zeros in the 11th digit:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6 J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4}
2.4.3 The 12th, 13th & 14th digits.The 12th digit is to denote the Packaging Type with the following codes:
B=Bulk/Box
2.5 The 12th, 13th & 14th digits.
2.5.1The 12th digit is to denote the Packaging Type with the following codes:
B=Bulk/Box
2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with "0"for the Cement products with "Bulk/Box" packing requirements.
2.5.3 For some items, the 14th digit alone can use to denote special features of additional information with the following codes or standard product .
Example: 0= standard product

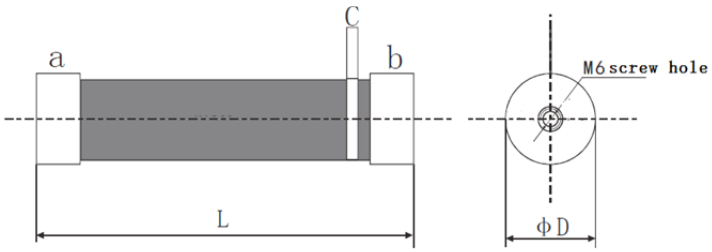
3. Ordering Procedure

(Example: MGRD 50W ±1% 70MΩ B/B)



5. Dimension

5.1 Dimension

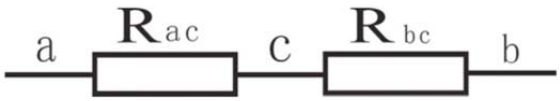


Type	Dimension(mm)	
	L	ΦD
MGRD 50W	152±2	27±2

5.2 Range

Type	Power	Tolerance	Temperature Coefficient	Limit surge voltage	Max Working Voltage	Dielectric Withstanding Voltage	Surge Withstanding Voltage	Resistance Range
MGRD	50W	±1% ±5%	±200PPM/℃	13.2kV	26.4kV	1000V	18.7V	50M~80M

6. Circuit structure

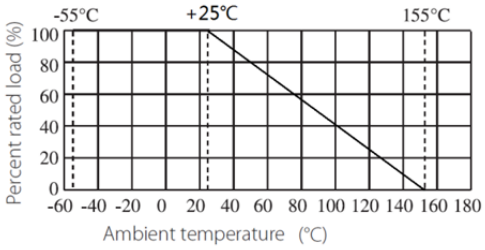


Total resistance value at both ends: Rab=Rac+Rbc
Voltage division ratio: Rab：Rbc

7. Derating Curve

Resistors shall have a power rating based on continuous load operation at an ambient temperature from -55℃ to 25℃. For temperature in excess of 25℃, the load shall be derate as shown in figure 1

Figure1



6.1 Voltage rating:

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

Where: RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (VOLT.)
P = power rating (WATT.) R= nominal resistance (OHM)
In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.
The overload voltage is 2.5 times RCWV or Max. Overload voltage whichever is less.

8. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Load life	ΔR/R ≤ ±(3%+0.1Ω),with no evidence of mechanical damage	4.25.1 Permanent Resistance change after 1000 hours operating at RCWV or Max.Working Voltage whichever less with duty cycle of 1.5 hours “ON”， 0.5 hour “OFF” at 70±2℃ ambient.
Temperature Coefficient	±200PPM/℃	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6$ (PPM/℃) R_1: Resistance Value at room temperature (t_1) R_2: Resistance value at room temperature +100℃ (t_2) Test pattern: Room temperature (t_1), Room temperature +100℃ (t_2)
Short-time overload	ΔR/R ≤ ±(3%+0.1Ω),with no evidence of mechanical damage	4.13Permanent resistance change after the application of a potential of 2.5 times RCWV or Max.Overload Votage whichever less for 5 seconds.
Dielectric withstanding voltage	With no evidence of flashover, mechanical damage, arcing or insulation breakdown	4.7 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 60-70 seconds.for cement fixed resistors the testing voltage is 1000V.
Rapid change of temperature	ΔR/R ≤ ±(3%+0.1Ω),with no evidence of mechanical damage	4.19 30 min at -55 °C and 30 min at 125°C; 100 cycles.
Terminal strength	No evidence of mechanical damage	4.16 Direct load: Resistance to a 20N direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads.
Biased Humidity	ΔR/R ≤ ±(3%+0.1Ω),with no evidence of mechanical damage	AEC-Q200 TEST 7 MIL-STD-202 Method 103 1000 hours 85℃,85%RH. Note: Specified conditions: 10% of operating power. Measurement at 24±2 hours after test conclusion.
Solderability	Coverage must be over 95%.	4.17 The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Temperature of solder:245±3°C; Dwell time in solder: 2~3 seconds.

9. Note

9.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35℃ under humidity between 25 to 75%RH.

Even under storage conditions recommended above, solder ability of products will be degraded stored over 1 year old.

9.2. Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.

9.3. Storage conditions as below are inappropriate:

a. Stored in high electrostatic environment

b. Stored in direct sunshine, rain, snow or condensation.

c. Exposed to sea wind or corrosive gases, such as Cl_2, H_2S, NH_3, SO_2, NO_2, etc.

10. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~4	Jul.24, 2023	Haiyan Chen	Yuhua Xu