

DATASHEET

Product Name **Metal Glaze Film Fixed Resistors**

Part Name **RC06 1/4W Series**

File No. **DIP-SP-068**

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1. Scope

- 1.1 This datasheet for approve relates Metal Glaze Film Fixed Resistors manufactured by UNI-ROYAL.
- 1.2 Small size and light weigh;
- 1.3 Lighting application
- 1.4 Too low/high ohmic value can be supplied case to case basis
- 1.5 Compliant with RoHS directive.
- 1.6 Halogen free requirement.

2. Part No. System

The standard Part No. includes 14 digits with the following explanation:

- 2.1 Coated type, the 1st to 4th digits are to indicate the product type and 4th digit is the special feature.

Example: RC06= Special Metal Glaze film (non-flame)

- 2.2 5th~6th digits:

- 2.2.1 This is to indicate the wattage or power rating. To dieting the size and the numbers,

The following codes are used; and please refer to the following chart for detail:

Wattage	1/4
Normal Size	W4

- 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= $\pm 1\%$ J= $\pm 5\%$

- 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;

- 2.4.2 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.

- 2.4.3 The following number s and the letter codes are to be used to indicate the number of zeros in the 11th digit:

0=10⁰ 1=10¹ 2=10² 3=10³ 4=10⁴ 5=10⁵ 6=10⁶ 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

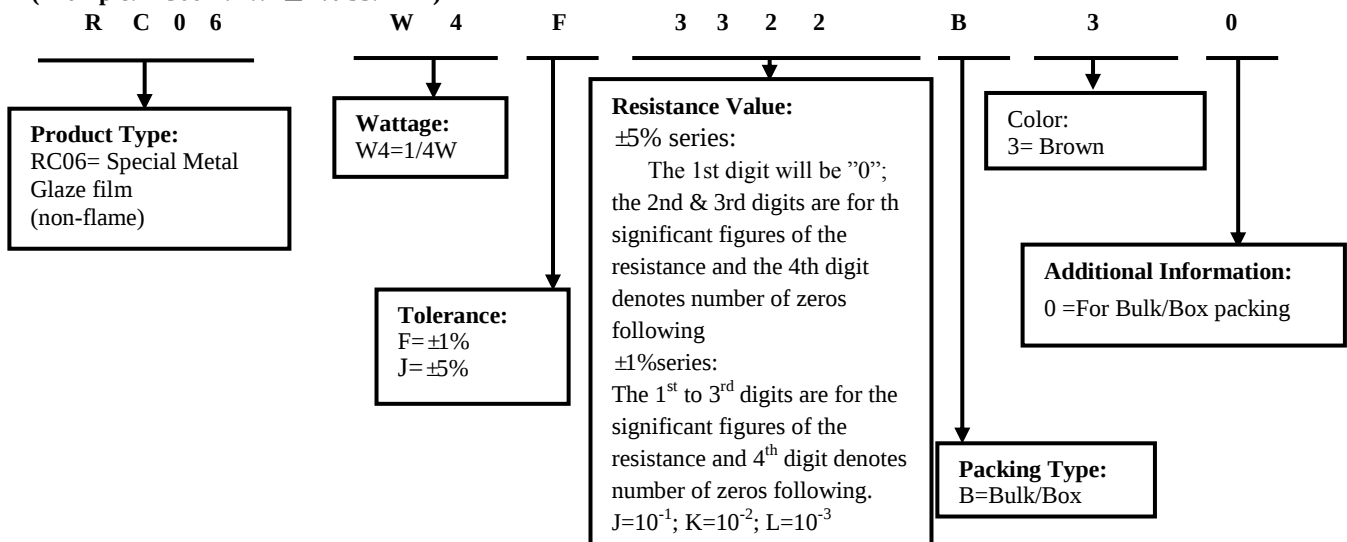
- 2.4.4 The 13th digit is normally to indicate the color: 3= Brown

- 2.4.5 For some items, the 14th digit alone can use to denote special features of additional information with the following codes:

0 =For Bulk/Box packing

3. Ordering Procedure

(Example: RC06 1/4W $\pm 1\%$ 33.2K Ω)



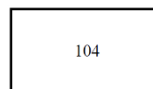
4. Marking

4.1 $\pm 5\%$ tolerance products (E-24 series):

3 codes.

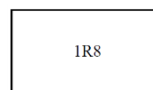
1st~2nd codes are the significant figures of resistance value,

and the rest code is the power of ten.



104 → 100K Ω

For ohmic values below 10 Ω , letter "R" is for decimal point.



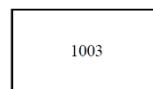
1R8 → 1.8 Ω

4.2 $\pm 1\%$ tolerance products (E-96 series):

4 codes.

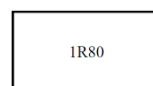
1st~3rd codes are the significant figures of resistance value,

and the rest code is the power of ten.



1003 → 100K Ω

For ohmic values below 100 Ω , letter "R" is for decimal point.



1R80 → 1.8 Ω

4.1 Label:

Label shall be marked with following items:

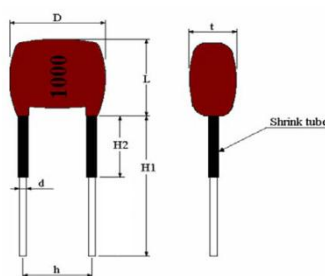
- (1) Type and style
- (2) Nominal resistance
- (3) Resistance tolerance
- (4) Quantity
- (5) Lot number
- (6) PPM

Example:

METAL GLAZE FILM FIXED RESISTORS	
WATT: 1/4W	VAL: 33.2K Ω
Q'TY:	TOL: 1%
LOT:	PPM:

5. Dimension & Ratings

5.1 Dimension



Type	Dimension(mm)						
	D ± 1	L ± 1	H1 ± 1.5	H2 ± 1	h ± 1	d ± 0.05	t ± 1
RC06	5.5	6	13.5	4.5	3.5	0.68	3.5

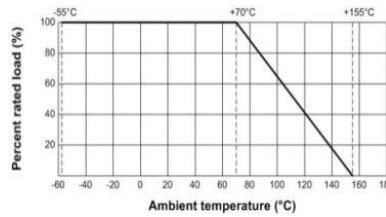
5.2 Ratings

Type	Power Rating	Tolerance	Resistance Range	Max Working Voltage	Max Overload Voltage	Dielectric Withstanding Voltage	Standard Color	Operating Temperature
RC06	1/4W	$\pm 1\%$	10 Ω ~1M Ω	200V	400V	500V	Brown	-55 ~ +155 $^{\circ}\text{C}$
		$\pm 5\%$	1 Ω ~10M Ω					
		Jumper	<50m Ω					

6. Derating Curve

Resistors shall have a power rating based on continuous load operation at an ambient temperature from -55°C to 70°C. For temperature in excess of 70°C, 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:

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

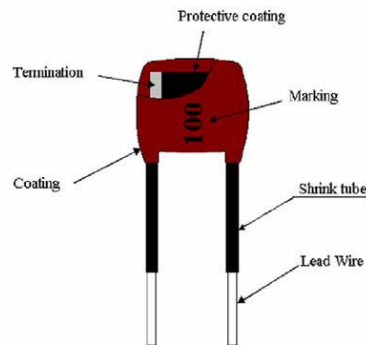
Where: RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (VOLT.)

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.

7. Structure



8. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature coefficient	$1\Omega \sim 10\Omega : \pm 400 \text{ PPM}/^\circ\text{C}$ $10.1\Omega \sim 100\Omega : \pm 200 \text{ PPM}/^\circ\text{C}$ $101\Omega \sim 10\text{M}\Omega : \pm 100 \text{ PPM}/^\circ\text{C}$	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C)}$ R_1 : Resistance Value at room temperature (t_1) ; R_2 : Resistance at test temperature (t_2) t_1 : +25 °C or specified room temperature t_2 : Test temperature (+ 125°C)
Short time overload	$\pm 1\% : \pm (1.0\% + 0.1\Omega) \text{ Max.}$ $\pm 5\% : \pm (2.0\% + 0.1\Omega) \text{ Max.}$	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV or Max.Overload Votage whichever less for 5 seconds.
Solderability	95 % coverage Min.	4.17 Test temperature of solder : $245 \pm 3 \text{ }^\circ\text{C}$; Dwell time in solder : 2 ~ 3 seconds
Soldering Heat	Resistance change rate is: $\pm (1.0\% + 0.05\Omega) \text{ Max.}$	4.18 Dip the resistor into a solder bath having a temperature of $260 \text{ }^\circ\text{C} \pm 3 \text{ }^\circ\text{C}$ and hold it for 10 ± 1 seconds.
Rapid change of temperature	Resistance change rate is: $\pm 1\% : \pm (0.5\% + 0.1\Omega) \text{ Max.}$ $\pm 5\% : \pm (1.0\% + 0.1\Omega) \text{ Max.}$	4.19 30 min at -55 °C and 30 min at 155 °C; 100 cycles.

Insulation resistance	1,000 MΩ or more	4.6 Apply 500VDC between protective coating and termination for 1 min, then measure.
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	4.7 Apply 500VAC between protective coating and termination for 1 minute.
Load life in humidity	Resistance change rate is: ± 1% : ± (1.0% + 0.1Ω) Max. ± 5% : ± (3.0% + 0.1Ω) Max.	7.9 Resistance change after 1000 hours (1.5hours“ON”, 0.5hours“OFF”) at RCWV or Max.Working Voltage whichever less in a humidity test chamber controlled at 40±2 °C and 90~95% RH.
Load Life	Resistance change rate is: ± 1% : ± (1.0% + 0.1Ω) Max. ± 5% : ± (3.0% + 0.1Ω) Max.	4.25.1Permanent 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°C ambient.

9. Note

- 9.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35 °C 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:
- Stored in high electrostatic environment
 - Stored in direct sunshine, rain, snow or condensation.
 - Exposed to sea wind or corrosive gases, such as Cl₂, H₂S, NH₃, SO₂, NO₂, etc.

10. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~5	May.26, 2023	Haiyan Chen	Yuhua Xu

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