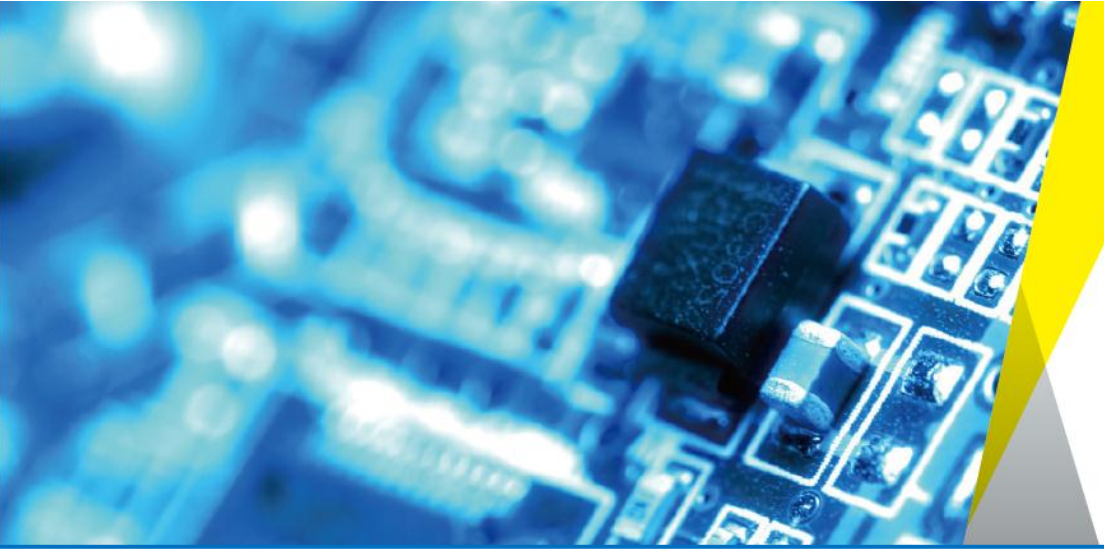

DATASHEET

Product Name	**General Metal Film MELF Resistors**
Part Name	**G24、G27 Series**
File No.	**DIP-SP-107**

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

1. Scope

1.1 This specification for approve relates General Metal Film MELF Resistors manufactured by UNI-ROYAL.
1.2 SMD enabled structure
1.3Excellent solderability termination
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 Coated type, the 1st to 3rd digits are to indicate the product type.

Example: G27= General Metal Film MELF Resistors;

2.2 4th~5th digits:

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:

W=Normal Size;

Wattage	1/4	1/3	1/2
Normal Size	W4	W3	W2

2.3 The 6th 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% B=±0.1% C=±0.25% D=±0.5%

2.4 The 7th digit is to denote the Resistance Temperature Coefficient

2.5 The 8th to 11th digits is to denote the Resistance Value.

2.5.1 For the standard resistance values of E-24 series in 2% & 5% tolerance, 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

2.5.2 For the standard resistance values of E-96 series in ≤1% tolerance, the 8th digit to the 10th digits are to denote the significant figures of the resistance and the 11th digit is the number of zeros following

2.5.2 The following numbers and the letter codes are to be used to indicate the number of zeros in the 11th digit:

$0=10^0$ $1=10^1$ $2=10^2$ $3=10^3$ $4=10^4$ $5=10^5$ $6=10^6$ $J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$ $M=10^{-4}$

2.5.3 The 12th, 13th , & 14th digits.

The 12th digit is to denote the Packaging Type with the following codes:

T=Tape/Reel

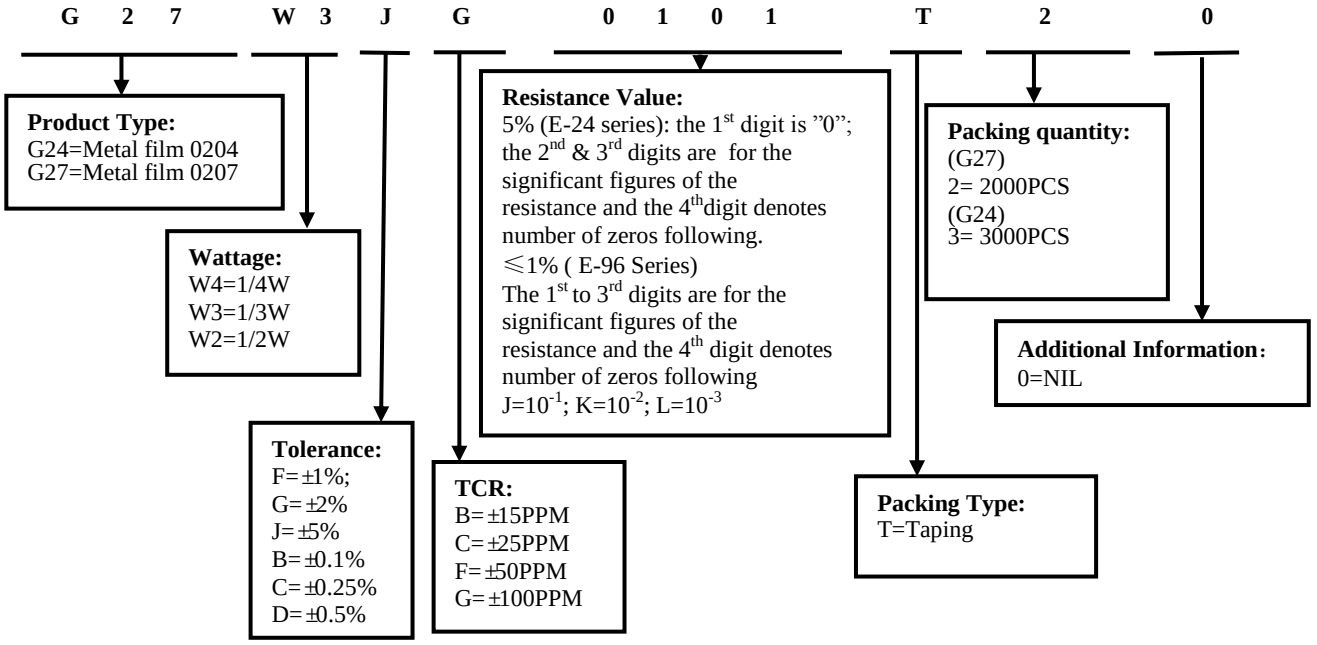
2.6 The 13th digit is normally to indicate the Packing Quantity of Tape/Box & Tape/Reel packaging types. The following letter code is to be used for some packing quantities:

2=2000pcs 3=3000pcs

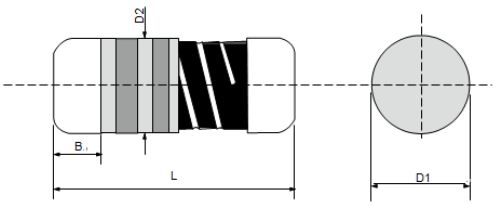
2.7 For some items, the 14th digit alone can use to denote special features of additional information with the following codes: 0=NIL

3. Ordering Procedure

(Example: G27 1/3W ±5% 100Ω 100PPM/℃ T/R-2000)



3. Dimension



Type	Dimension（mm）			
	L	D1	D2	B
G24	3.52±0.15	1.35±0.1	D1+0.02/-0.15	0.6 Min.
G27	5.90±0.20	2.20±0.1	D1+0.02/-0.2	1.0 Min.

4. Electrical Specifications

4.1 Ratings

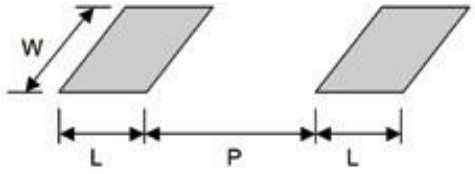
Type	Power Rating	Resistance Tolerance	Resistance Range	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Insulation resistance（MΩ）
G24	1/4W	±1%, ±2%, ±5%	0.51Ω~10MΩ	200V	400V	200V	$>10^4$
		±0.5%	1Ω~1MΩ			300V	
		±0.25%	22Ω~1MΩ				
		±0.1%	43Ω~1MΩ				
G27	1/3W	±1%, ±2%, ±5%	0.51Ω~10MΩ	300V	500V	500V	
	1/2W						
	1/2W	±0.5%	10Ω~1MΩ				
		±0.25%	15Ω~1MΩ				
		±0.1%	33Ω~1MΩ				

4.2 Temperature Coefficient

Temperature Coefficient (PPM/℃)	Resistance Tolerance	Resistance Range	
		G24	G27
±15, ±25, ±50, ±100	±1%, ±2%	0.51Ω~10MΩ	0.51Ω~10MΩ
±100	±5%	0.51Ω~10MΩ	0.51Ω~10MΩ
±5	±0.5%	100Ω~10KΩ	75Ω~15KΩ
	±0.25%		
	±0.1%		
±10, ±15	±0.5%	1Ω~330KΩ	10Ω~680KΩ
	±0.25%	22Ω~330KΩ	15Ω~510KΩ
	±0.1%	43Ω~330KΩ	33Ω~510KΩ
±25	±0.5%	1Ω~750KΩ	10Ω~1MΩ
	±0.25%	22Ω~510KΩ	15Ω~1MΩ
	±0.1%	43Ω~510KΩ	33Ω~1MΩ
±50	±0.5%	10Ω~1MΩ	10Ω~1MΩ
	±0.25%	22Ω~510KΩ	15Ω~1MΩ
	±0.1%	43Ω~510KΩ	33Ω~1MΩ

*Not application to all resistance values, Please check with us regarding the PPM of specific resistance values.

5. Soldering pad size recommended

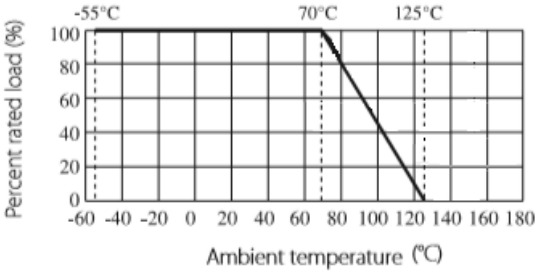


Unit: mm

Type	Soldering Mode	L(Min.)	P	W(Min.)
G24	Reflow	1.3	1.6 ±0.1	1.6
	Wave	1.5	1.5 ±0.1	1.8
G27	Reflow	2.0	3.0 ±0.1	3.0
	Wave	2.5	3.0 ±0.1	3.0

For better heat dissipation / lower heat resistance, increase W & L

6. Derating Curve



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:

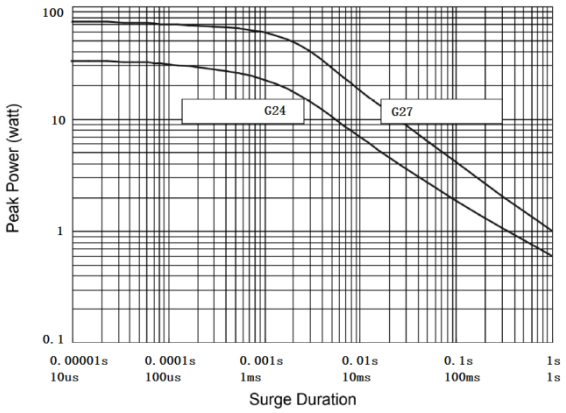
$$RCWV = \sqrt{P \times R}$$

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

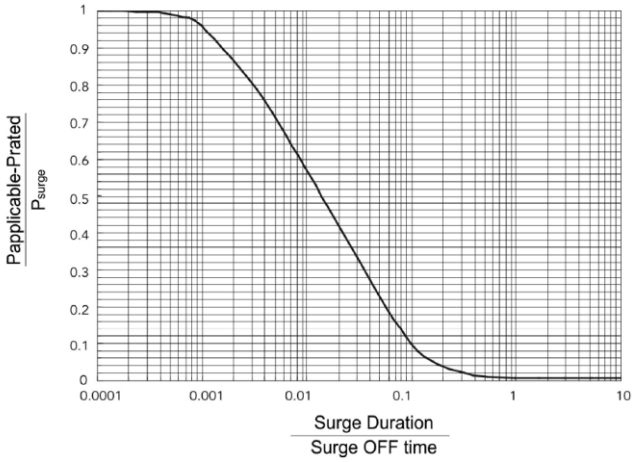
P = power rating (WATT.)

R= nominal resistance (OHM)

7. Single surge performance



8. Surge power derating curve



Notes:

Single surge performance graph is good for non repetitive applications operating in an ambient temperature of 70℃ or less.

For temperatures above 70℃, the graph power must be derated further linearly down to zero at 125℃.

To determine applicable surge power in continuous-surge applications:

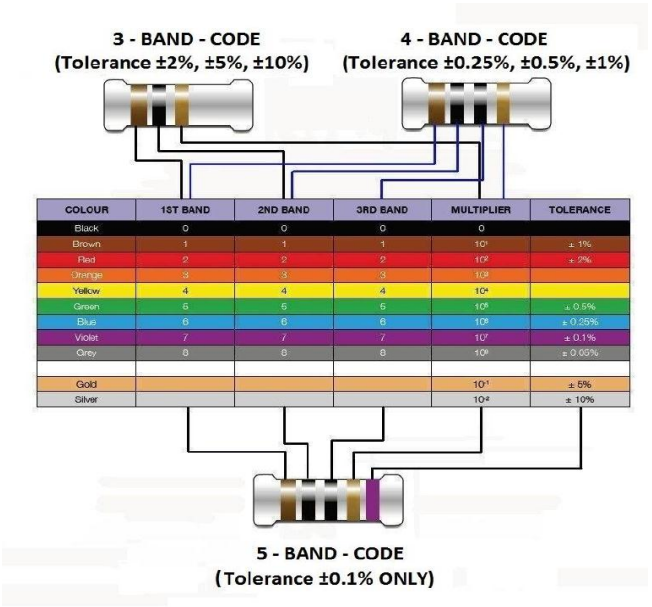
1. Identify allowable duration and peak power P_{surge} of single surge;
2. Determine ratio of surge duration/surge OFF time in application;
3. Calculate $P_{applicable}$ backwardly according to Y-axis of surge power Derating curve.

9. Performance Specification

Characteristics	Test Conditions	Limits	
Short Time Overload	**IEC 60115-1 4.13** 5 seconds， 2.5times rated voltage (not over max. overload voltage)	≤332KΩ	±(0.25%+0.01Ω)
		>332KΩ	±(0.5%+0.01Ω)
Load Life	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hour OFF, at (70±2)℃	≤332KΩ	±(0.75%+0.01Ω)
		>332KΩ	±(1.0%+0.01Ω)
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load (not over max. working voltage) at (40±2)℃ and (93±3)% relative humidity	≤332KΩ	±(1.0%+0.01Ω)
		>332KΩ	±(2.0%+0.01Ω)
Load Life In Humidity (accelerated mode)	**IEC 60115-1 4.37** 1,000 hours at 85℃ and 85% relative humidity with 0.1times rated voltage (not over 100V)	＜10KΩ	±(1.0%+0.01Ω)
		10K≤R≤332KΩ	±(2.5%+0.01Ω)
		>332KΩ	±(3.5%+0.01Ω)
Periodic Electric Overload	**IEC 60115-1 4.39** 3.9 times rated voltage (not over max. overload voltage) with 0.1s ON, 2.5s OFF for 1,000 cycles	±(0.5%+0.01Ω)	
Resistance To Soldering Heat	**IEC 60115-1 4.18.2** Dip the resistor into a solder bath measured (260±5)℃ and hold it for a 10±1 seconds	±(0.5%+0.01Ω)	
Thermal Endurance	**IEC 60115-1 4.25.3** 1,000 hours without load	85℃	±(0.5%+0.01Ω)
		125℃	±(1.0%+0.01Ω)
Thermal Shock	**IEC 60115-1 4.19** -55℃ 30minutes, +125℃ 30minutes	5 cycles	±(0.25%+0.01Ω)
		1,000 cycles	±(1.0%+0.01Ω)
Single pulse high voltage overload	**IEC 60115-1 4.27** • 5 pulses of 1.2/50μs at 10 times rated voltage (not over 400V for G24; not over 500V for G27) with interval of 12 sec. • 10 pulses of 10/700μs at 10 times rated voltage (not over 400V for G24; not over 500V for G27) with interval of 60 sec.	±(0.5%+0.01Ω)	
Electrostatic discharge (Human body model)	**IEC 60115-1 4.38** 3 positive & 3 negative discharges with 2KV for G24 or 4KV for G27 (For continuous surge application please see Surge Performance paragraph)	±(0.5%+0.01Ω)	

Climatic test	**IEC 60115-1 4.23** 4.23.2 - dry heat: 16 hours 125℃ 4.23.3 - damp heat: 24 hours 55℃ with 95% relative humidity 4.23.4 - cold: 2 hours -55℃ 4.23.5 - negative air pressure: 2 hour 8.5KPa at (25±10)℃ 4.23.6 - damp heat cyclic: 5 days 55℃ with 95% relative humidity 4.23.7 - DC load: rated voltage at -55℃ and 125℃ each 1 Min.	±(1.0%+0.01Ω)
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (235±3)℃/(2±0.2) seconds with flux applied	95% min. coverage
Vibration	**IEC 60115-1 4.22** 6 hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	±(0.25%+0.01Ω)
Bending test	**IEC 60115-1 4.33** Pressing depth 2mm, 3 times	±(0.25%+0.01Ω)
Flammability	**IEC 60115-1 4.35** Needle flame test 10s	No burning after 30s

10. Standard Color Code



11. Note

11.1 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.

11.2 Store / transport cartons in the correct direction, which is indicated on a carton as a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.

11.3 Product performance and soldered connections may deteriorate if the products are stored in the following places:

a. Storage in high Electrostatic.

b. Storage in direct sunshine、rain and snow or condensation.

c. Where the products are exposed to sea winds or corrosive gases, including Cl_2, H_2S,NH_3, SO_2, NO_2.

12. Record

Version	Description of amendment	Page	Date	Amended by	Checked by
1	First issue of this specification	1~6	Jun.17, 2024	Song Nie	Haiyan Chen
2	Add the 0.1% ,0.25%, 0.5%	1~6	Jul.30, 2024	Haiyan Chen	Yuhua Xu
3	Modify the resistance value range	3	Aug.01,2025	Haiyan Chen	Yuhua Xu