



UNI-ROYAL
厚聲集團

DATA SHEET

Product Name Chip Resistors Shunt

Part Name RS Series

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Uniroyal Electronics Global Co.,Ltd Xiamen Branch
Kunshan Foss Electronic material Co., Ltd.
Royal Electronic Factory (thailand) co., ltd

Brands *RoyalOhm* *UniOhm*



1. Scope

- 1.1 This specification for approve relates to the Chip Resistors Shunt manufactured by UNI-ROYAL.
- 1.2 Electron beam welding structure, stable performance
- 1.3 Comply with ROHS standard
- 1.4 Very low resistance

2. Part No. System

Part No. includes 14 codes shown as below:

2.1 1st~4th codes: Part name. E.g.: RS12 RS21 RS31 RS26

2.2 5th~6th codes: Power rating.

E.g.: W=Normal Size		"1~G" = "1~16"									
Wattage	1/32	3/4	1/2	1/3	1/4	1/8	1/10	1/16	1/20	1	
Normal Size	WH	07	W2	W3	W4	W8	WA	WG	WM	1W	

If power rating is lower or equal than 1 watt, 5th code would be "W" and 6th code would be a number or letter.

E.g.: WA=1/10W W4=1/4W

2.3 7th code: Tolerance. E.g.: D=±0.5% F=±1% G=±2% J=±5% K= ±10%

2.4 8th~11th codes: Resistance Value.

2.4.1 If value belongs to standard value of ≥5% series, 8th code would be zero, 9th~10th codes are significant figures of the resistance and 11th code is the power of ten.

2.4.2 If value belongs to standard value of ≤2% series, 8th~10th codes are significant figures of the resistance, and 11th code is the power of ten.

2.4.3 11th codes listed as following:

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

2.5 12th~14th codes.

2.5.1 12th code: Packaging Type. E.g.: C=Bulk T=Tape/Reel

2.5.2 13th code: Standard Packing Quantity.

4=4000pcs 5=5000pcs C=10000pcs D=20000pcs E=15000pcs

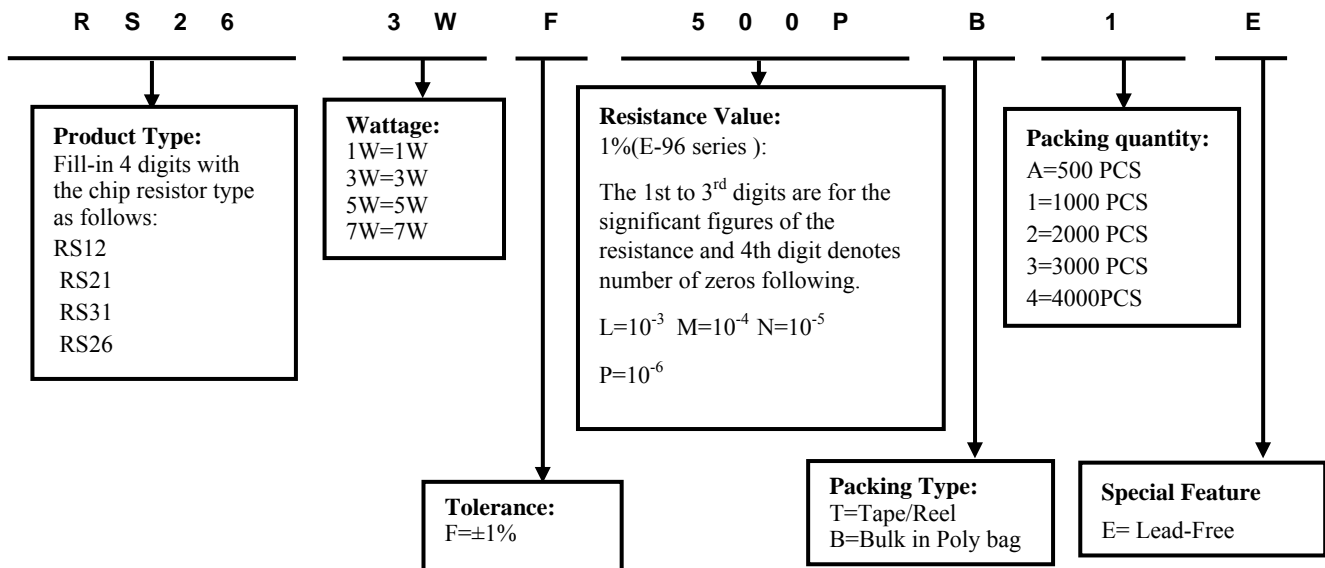
Chip Product: BD=B/B-20000pcs TC=T/R-10000pcs

2.5.3 14th code: Special features.

E = Environmental Protection, Lead Free, or Standard type.

3. Ordering Procedure

(Example: RS26 3W ±1% 0.0005 Ω B-1000)



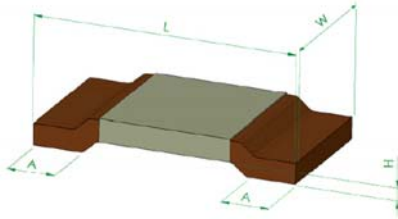
4. Marking

When the resistance value is lower than 1 ohm, the first digit of marking will be symbolized as "R" which represent as a decimal point.



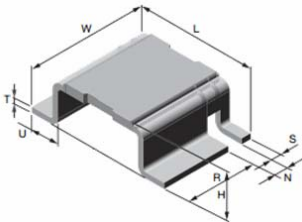
5. Dimension

RS12, RS21, RS31



Type	Dimension(mm)			
	L	W	H	A
RS12(2512)	6.30±0.20	3.10±0.30	0.50±0.10	1.20±0.20
RS21(3921)	10.00±0.20	5.10±0.40	0.50±0.10	2.20±0.20
RS31(5931)	15.00±0.30	7.60±0.40	0.50±0.10	4.20±0.30

PS26

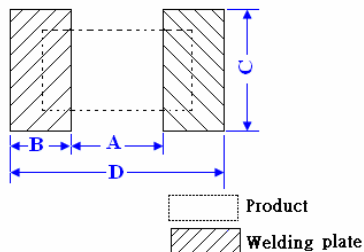


Type	Dimension(mm)							
	L	W	H	R	S	T	U	N
RS26(4026)	10.1±0.20	6.6+0.5/-0.2	3.0±0.20	5.2±0.20	0.7±0.10	0.4±0.10	2.0±0.10	1.0±0.15

6. Resistance Range

Type	Power Rating at 70°C	Resistance Range ±1%	T.C.R
RS12	3W	0.2~1mΩ	±50PPM/°C
RS21	5W	0.2~1mΩ	±50PPM/°C
RS31	7W	0.2~1 mΩ	±50PPM/°C
RS26	3W	0.5mΩ	±100PPM/°C

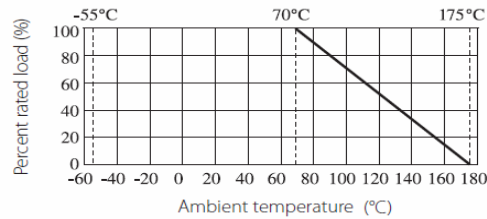
7. Recommend the size of welding plate



Type	Dimension(mm)			
	A	B	C	D
RS06(1206)	1.40±0.10	1.90±0.10	1.80±0.10	5.20±0.10
RS12(2512)	2.20±0.10	3.40±0.10	4.00±0.10	9.00±0.10
RS21(3921)	5.21±0.10	3.94±0.10	5.84±0.10	13.08±0.10
RS31(5931)	7.40±0.10	5.60±0.10	8.40±0.10	18.60±0.10

8. Derating Curve

Resistors shall have a power rating based on continuous load operation at an ambient temperature from -55°C to 175°C. The load power will decline when the environment temperature increase. The relationship of power and Temperature is shown in figure as below.



8.1 Current rating:

Resistors shall have one current specifications:

1. Rated direct-current (DA) continuous working voltage;
2. Or at approximate single-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage

We can calculate the Voltage from the following formula:

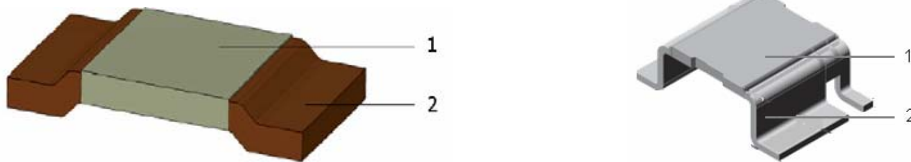
Remark:

RCWV=Rate continuous working voltage (Volt).

P=Power Rating (WATT) R=Nominal Resistance (Ohm)

I=SQRT(P/R)

9. Structure



1	Alloy
2	Terminal (Cu)

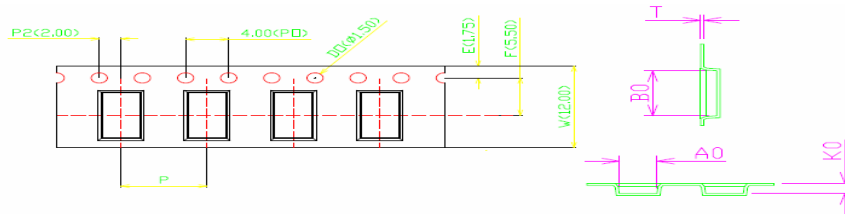
10. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	Refer to item 6.0	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ R ₁ : Resistance Value at room temperature (t ₁) ; R ₂ : Resistance at test temperature (Upper limit temperature or Lower limit temperature) t ₁ : +25°C or specified room temperature t ₂ : Upper limit temperature or Lower limit temperature test temperature
Short-time overload	1%	±(1.0%+0.0005Ω)
	5%	±(2.0%+0.0005Ω)
High Temperature Exposure	±(1.0%+0.0005Ω)	4.23.2 Upper limit temperature , for 1000H.
Low Temperature Storage	±(1.0%+0.0005Ω)	4.23.4 Lower limit temperature , for 1000H

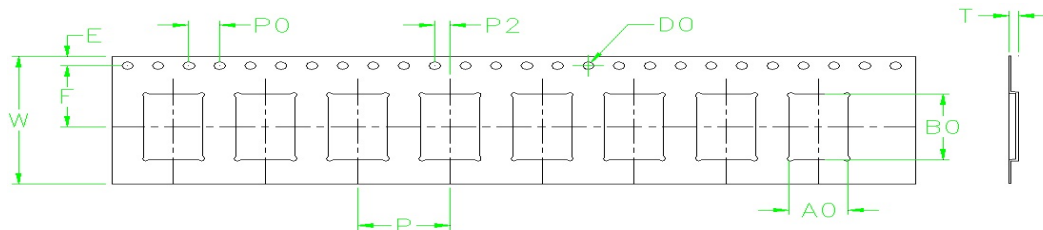
Solderability	Coverage must be over 95%.	4.17 The surface of solder must be new, smooth, clean, shiny and continuous, and without concentrated pinholes. The solder's temperature must be within $245 \pm 3^\circ\text{C}$. Hold in hot solder 2~3 seconds.
Soldering heat	$\pm(1\%+0.0005\Omega)$	4.18 Dip the resistor into a solder bath having a temperature of $260^\circ\text{C} \pm 5^\circ\text{C}$ and hold it for 10 ± 1 seconds.
Load life	1% $\pm(1\%+0.0005\Omega)$	7.9 Resistance change after 1,000 hours (1.5 hours "ON", 0.5 hour "OFF") at RCWV in a humidity chamber controlled at $40^\circ\text{C} \pm 2^\circ\text{C}$ and 90 to 95% relative humidity.
	5% $\pm(3\%+0.0004\Omega)$	
Rapid change of temperature	$\pm(1\%+0.0005\Omega)$	4.19 30 min at lower limit temperature and 30 min at upper limit temperature, 100 cycles.
Leaching	No visible damage	J-STD-002 test D Lead free solder, 260°C , 30 seconds immersion time

10. Packing of Surface Mount Resistors

10.1 Dimension of Paper Taping : (Unit: mm)

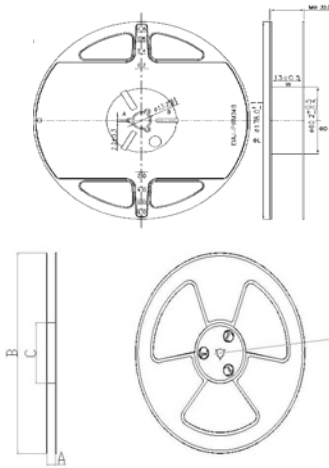


TYPE	A0 ±	B0 ±	K0 ±	P ±	D0	E	F	W	T	P0 ±	P2 ±
RS12	0.10	0.10	0.10	0.10	+0.10 -0	± 0.10	± 0.10	± 0.30	± 0.05	0.10	0.10



TYPE	W ± 0.3	A0 ± 0.1	B0 ± 0.1	P ± 0.1	F ± 0.1	E ± 0.1	D0 ± 0.1	P0 ± 0.1	P2 ± 0.1	T ± 0.05
RS21	24.0	5.40	11.5	8.0	11.5	1.75	1.5	4.0	2.0	0.3
RS31	24.0	8.00	16.00	8.0	11.5	1.75	1.5	4.0	2.0	0.3

10.2 Dimension of Embossed



TYPE	TAPING	Qty/Reel	A±0.3	B + 0.3/-0.2	ΦD±0.5	ΦL±1	W±0.5
RS12	Emboss Plastic Tape	2000pcs	2.2	13.2	60.2	178.0	13.0

TYPE	TAPING	Qty/Reel	A±1.0	B±2.0	C±1.0	D±0.2
RS21	Embossed	1000pcs	25.4	330.0	100.0	13.0
RS31	Embossed	1000pcs	25.4	330.0	100.0	13.0

11. Note

11.1 UNI-ROYAL recommends the storage condition as below:

11.1.1 Temperature: 15°C~35°C.

11.1.2 Humidity :25%~75%.

11.1.3 Those condition recommended are for individual product.

11.1.4 Even under recommended condition,products' solderability will degrade if store more than 1 year.

11.2 Please hold the cartones in correct direction signed on cartons' side during storage and delivery, or else ,it will lead the products abnormal to use.

11.3 Resistors' performance and solderability will fail if stored in the following condition:

- a. High electrostatic environment.
- b. Direct sunlight,rain,snow,and so on.
- c. Hold in sea wind or corrosive gases long time,including Cl₂, H₂S₃ NH₃, SO₂, NO₂.

12. Record

Version	Description of amendment	Page	Date	Amended by	Checked by
1	First issue of this specification	1~6	Mar.20, 2018	Chen Haiyan	Chen Nana
2	1.Resistance Range 2.Modify the Performance Specification	3 4~5	Feb.16, 2019	Chen Haiyan	Xu Yuhua

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