



UNI-ROYAL
厚聲集團

DATA SHEET

Product Name Chip Resistors Shunt

Part Name RS12/RS20/RS30 Series

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1. Scope

- 1.1 This data sheet is the characteristics of Chip Resistors Shunt manufactured by UNI-ROYAL.
- 1.2 The resistor is manufactured by highly quality-controlled process and guaranteed high reliability, it meets RoHS & Halogen-Free requirement.
- 1.3 Current sensor for power hybrid applications
- 1.4 Frequency converters
- 1.5 Power modules
- 1.6 Communication system
- 1.7 Automatic control power supply
- 1.8 High current applications for the automotive market
- 1.9 AEC-Q200 qualified

2. Part No. System

Part No. includes 14 codes shown as below:

2.1 1st~4th codes: Part name. E.g.: RS12, RS20, RS30

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 equal or lower 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 E-24 series, the 8th code is zero, 9th~10th codes are the significant figures of resistance value, and the 11th code is the power of ten.

2.4.2 If value belongs to standard value of E-96 series, the 8th~10th codes are the significant figures of resistance value, and the 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.: B = Bulk / Box T=Tape/Reel

2.5.2 13th code: Standard Packing Quantity.

4=4,000pcs

5=5,000pcs

B=2500 pcs

C=10,000pcs

D=20,000pcs

E=15,000pcs

Chip Product: BD=B/B-20000pcs

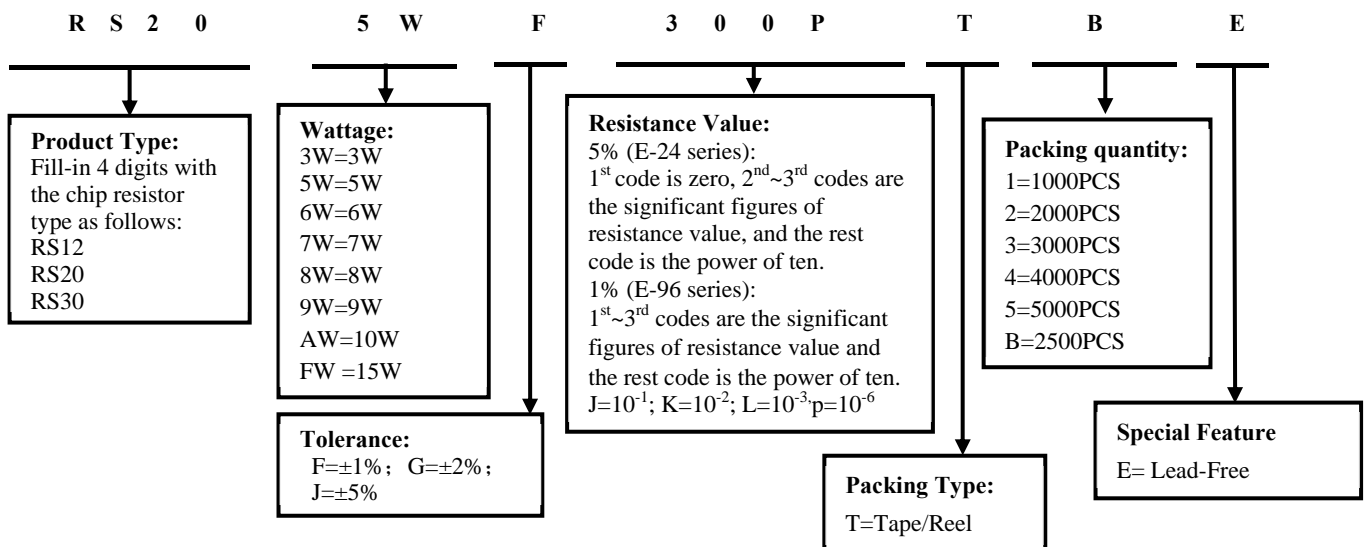
TC=T/R-10000pcs

2.5.3 14th code: Special features.

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

3. Ordering Procedure

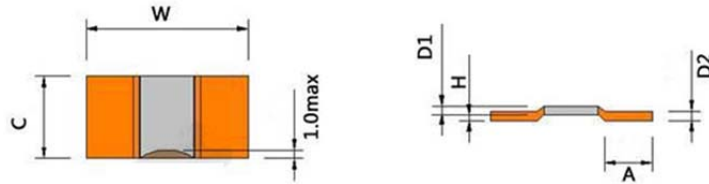
(Example: RS20 5W ±1% 0.3mΩ T/R-2500)



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.

eg: R0003 1% \rightarrow 0.3m Ω 1%

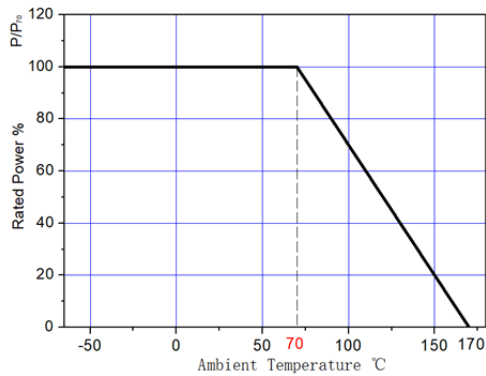
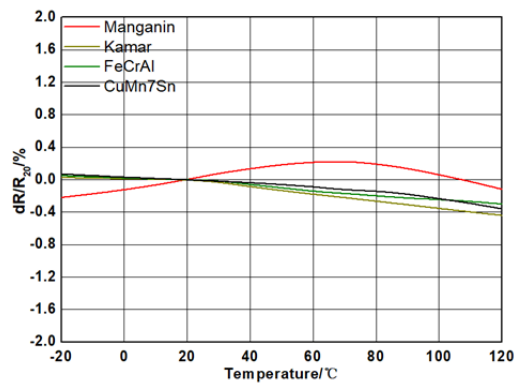
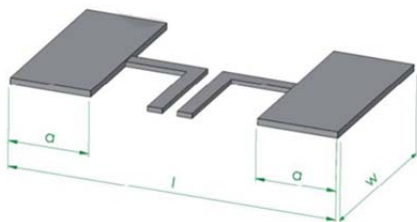
5. Dimension (Unit: mm)

Type	W	A	C	H
RS12	6.3 \pm 0.2	1.2 \pm 0.2	3.1 \pm 0.3	0.5 \pm 0.1
RS20	10 \pm 0.2	2.2 \pm 0.2	5.1 \pm 0.4	0.5 \pm 0.1
RS30	15 \pm 0.3	4.2 \pm 0.3	7.6 \pm 0.4	0.5 \pm 0.1

Type	Resistance (m Ω)	D1	D2	Material
RS12	0.2	1.40	1.40	CuMn7Sn
	0.3	1.50	1.50	Manganin
	0.5	0.88	0.88	
	1	0.50	0.50	
	2	0.65	0.65	Kamar
	3	0.43	0.43	
	4	0.3	0.3	
	2	0.7	0.7	FeCrAl
	3	0.47	0.47	
	4	0.35	0.35	
5	0.28	0.28		
RS20	0.2	1.29	1.29	CuMn7Sn
	0.2	1.66	1.66	Manganin
	0.3	1.37	1.37	
	0.5	0.83	0.83	
	1	0.40	0.40	
	1	1.16	1.16	Kama
	2	0.56	0.56	
	3	0.37	0.37	
	4	0.28	0.28	
	1	1.28	1.28	FeCrAl
2	0.64	0.64		
3	0.43	0.43		
4	0.32	0.32		
RS30	0.1	2.0	2.0	CuMn7Sn
	0.2	1.50	1.50	Manganin
	0.4	0.75	0.75	
	0.5	0.60	0.60	
	0.75	0.41	0.41	
	1	0.86	0.86	Kamar
	2	0.40	0.40	
	3	0.29	0.29	
	1	0.96	0.96	FeCrAl
	2	0.48	0.48	
3	0.32	0.32		

6. Range

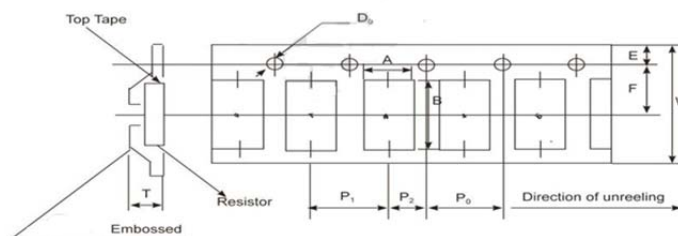
Type	Power	Tolerance	Resistance Range	Operating Temperature
RS12	3W~6W	±1%、±2%、±5%	0.2 mΩ~5mΩ	-55℃~170℃
RS20	5W~9W		0.2 mΩ~4mΩ	
RS30	7W~15W		0.1 mΩ~3 mΩ	

7. Derating Curve8. TCR Derating9. Recommended Solder Pad Layout(Unit: mm)

Type	L	w	a
RS12	7	3.4	1.8
RS20	11	6.2	2.7
RS30	16	8.75	5.2

10. Performance Specification

Items	Reference	Limits	Additional Requirements
Temperature Cycling	JESD22 Method JA-104	±0.5%	1000 Cycles(-55°C to+125°C) Measurement at 24±2hours after test conclusion
Short Time Overload	MIL-STD-202 Method 301	±0.5%	5 times rated power for 5 s Measurement at 24±2hours after test conclusion
High Temperature Exposure	MIL-STD-202 Method 108	±0.5%	1000hrs. @T=125°C.Unpowered. Measurement at 24±2hours after test conclusion
Biased Humidity	MIL-STD-202 Method 103	±0.5%	1000hrs 85°C/85%RH · Note: Specif ied conditions: 10% of operating power. Measurement at 24±2hours after test conclusion
Operational Life	MIL-STD-202 Method 108	±0.5%	Condition D Steady State TA=125°C at rated power. Measurement at 24±2hours after test conclusion
Solderability	J-STD-002C	95% Coverage Min	245°C±5°C, 5s±0.5s/-0
Vibration	MIL-STD-202 Method 204	±0.5%	5 g's for 20 min, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB .031" thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz. Measurement at 24±2hours after test conclusion
Resistance to Soldering Heat	MIL-STD-202 Method 210	±0.5%	260°C±5°C · 10s±1s Measurement at 24±2hours after test conclusion

11. Packing

Unit: mm

Type	A	B	W	E	F	P0	P1	P2	D0	T	Quantity (EA)
RS12	4.3	7.6	16	1.55	7.5	4	7.7	7.7	1.50	1.7	1000
RS20	6	11	24	1.55	11.2	4	12	12	1.50	2.0	2500
RS30	8.6	16	24	1.55	10.8	4	12	12	1.50	2.4	2000



12. Note

- 12.1. UNI-ROYAL recommend the storage condition temperature: $20 \pm 2^{\circ}\text{C}$, humidity : $65 \pm 5\%$.
 (Put condition for individual product).Even under UNI-ROYAL recommended storage condition, solderability of products over 1 year old.
 (Put condition for each product) may be degraded.
- 12.2. 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.
- 12.3. Product performance and soldered connections may deteriorate if the products are stored in the following places:
- Storage in high Electrostatic.
 - Storage in direct sunshine 、rain and snow or condensation.
 - Where the products are exposed to sea winds or corrosive gases, including Cl_2 , H_2S , NH_3 , SO_2 , NO_2 .

13. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~6	Apr.20,2020	Song Nie	Yuhua Xu

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