

### Datasheet

RS Pro RS Series Thick Film Surface Mount Resistor 0603 Case 1.5kΩ ±5% 0.1W ±200ppm/°C RS Stock No: 713-4153



## **Product Details**

RS Pro 0603 thick film surface mount resistor with  $\pm 5\%$  tolerance, provides 1.5 k $\Omega$  resistance and is power rated at 0.1 W. The temperature coefficient of resistance is  $\pm 200$  ppm/°C. Applications include telecommunication equipment, radio and tape recorders, TV tuners, video cameras, watches, pocket calculators, automotive industry, computers, instruments, medical and military equipment.

## **Features and Benefits**

- Small size and lightweight
- Highly reliable multilayer electrode construction
- Compatible with all soldering process



## **Specifications:**

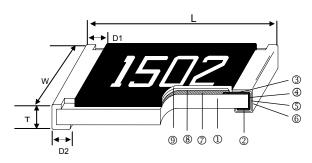
Case Style	Ruthenium Oxide
Depth	0.8 mm
Dimensions	1.6 x 0.8 x 0.45 mm
Height	0.45 mm
Length	1.6 mm
Maximum Operating Temperature	+155°C
Maximum Temperature Coefficient	+200 ppm/°C
Minimum Operating Temperature	-55°C
Minimum Temperature Coefficient	-200 ppm/°C
Package/Case	0603
Power Rating	0.1 W
Resistance	1.5 kΩ
Technology	Thick Film
Temperature Coefficient	±200 ppm/°C
Termination Style	Solder Pad
Tolerance	±5%
Maximum Overload Voltage	150 V
Maximum Operating Voltage	75 V
Tape Width	8 mm



# **Thick Film Chip Resistor 5% - RS Series**

0201/0402/0603/0805/1206

#### Construction

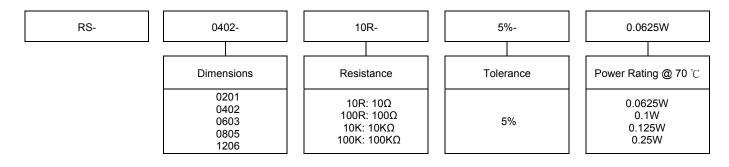


② Bottom Electrode (Ag) ⑤ Barrier Layer (Ni) ⑧ Primary Overcoat (Glass)   ③ Top Electrode (Ag-Pd) ⑥ External Electrode (Sn) ⑨ Secondary Overcoat (Epox	(	1	Alumina Substrate	4	Edge Electrode (NiCr)	0	Resistor Layer (RuO <sub>2</sub> /Ag)
3 Top Electrode (Ag-Pd) 6 External Electrode (Sn) 9 Secondary Overcoat (Epox	1	2	Bottom Electrode (Ag)	5	Barrier Layer (Ni)	8	Primary Overcoat (Glass)
	(	3	Top Electrode (Ag-Pd)	6	External Electrode (Sn)	9	Secondary Overcoat (Epoxy)

#### Dimensions

■Dimensio	ons						Unit: mm
Туре	Size (Inch)	L	w	т	D1	D2	Weight (g) (1000pcs)
RS-0201	0201	0.60±0.03	0.30±0.03	0.23±0.03	0.15±0.05	0.15±0.05	0.150
RS-0402	0402	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.20±0.10	0.620
RS-0603	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	2.042
RS-0805	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
RS-1206	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947

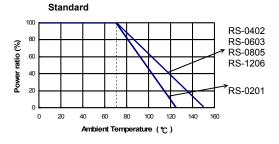
#### Part Numbering



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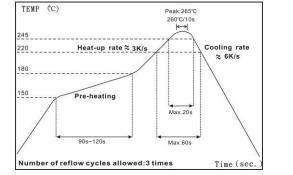
#### Derating Curve

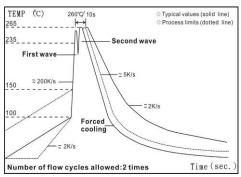


#### Standard Electrical Specifications

ltem	Power Rating at 70°C Jumper	Operating Temp. Range	Max. Operating	Max. Overload	Resistance Range	TCR (PPM/°C)
Туре	Rated Current	Voltage Voltage		±5%	, ,	
RS-0201	1/20W	-55 ~ +155°C	25V	50V	1Ω – 9.76ΜΩ	±200
Jumper	1A	-55 ~ +155 C	230	500	0Ω (<50mΩ)	-
RS-0402	1/16W	EE	50V	100V	1Ω – 9.76ΜΩ	±200
Jumper	1A	-55 ~ +155°C	50 V	1000	0Ω (<50mΩ)	-
RS-0603	1/10W	-55 ~ +155°C	75V	150V	1Ω – 9.76ΜΩ	±200
Jumper	1A	-55~+155°C	750	1500	0Ω (<50mΩ)	-
RS-0805	1/8W	-55 ~ +155°C	150V	300V	1Ω – 9.76ΜΩ	±200
Jumper	2A	-55~+155 C	1500	3000	0Ω (<50mΩ)	-
RS-1206	1/4W	EE	200V	400V	1Ω – 9.76ΜΩ	±200
Jumper	2A	-55 ~ +155°C	2000	4007	0Ω (<50mΩ)	-

#### Soldering Condition





#### IR Reflow Soldering

Wave Soldering (Flow Soldering)

- (1) Time of IR reflow soldering at maximum temperature point 260°C: 10s
- (2) Time of wave soldering at maximum temperature point 260°C: 10s
  - (3) Time of soldering iron at maximum temperature point 410°C: 5s

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#### Environmental Characteristics

Item	Requ	irement	Test Method						
Item	±5%	Jumper	Test Method						
Temperature Coefficient of	As Spec.		JIS-C-5201-1 4.8 IEC-60115-1 4.8						
Resistance (T.C.R.)			-55°C~+125/+155°C, 25°C is the reference temperature						
		.50 . 0	JIS-C-5201-1 4.13 IEC-60115-1 4.13						
Short Time Overload	±(2.0%+0.05Ω)	<50mΩ	RCWV*2.5 or Max. overload voltage for 5 seconds, 2 seconds for high power series						
Insulation Resistance	≥10G		JIS-C-5201-1 4.6 IEC-60115-1 4.6						
			Max. overload voltage for 1 minute						
Faduration		<100mΩ	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1						
Endurance	±(3.0%+0.10Ω)	< 1001102	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON and 0.5 hrs "OFF"						
			JIS-C-5201-1 4.24						
Damp Heat with Load	±(3.0%+0.10Ω)	<100mΩ	40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"						
Dry Heat	±(1.5%+0.10Ω)	<50mΩ	JIS-C-5201-1 4.23 IEC-60115-1 2.23.2						
2.9.1000			at +125/+155°C for 1000 hrs						
			JIS-C-5201-1 4.33 IEC-60115-1 4.33						
Bending Strength	±(1.0%+0.05Ω)	<50mΩ	Bending once for 5 seconds						
			2010, 2512 sizes: 2mm Other sizes: 3mm						
Solderability	95% min. coverag	e	JIS-C-5201-1 4.17 IEC-60115-1 4.17						
			245±5°C for 3 seconds						
Resistance to Soldering Heat	±(1.0%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.18 IEC-60115-1 4.18						
<b>j</b>	_(,		260±5°C for 10 seconds						
Voltage Proof	No breakdown or	flashover	JIS-C-5201-1 4.7 IEC-60115-1 4.7						
0			1.42 times RCWV (RMS) for 1 minute						
Leaching	Individual leaching	•	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1						
5	Total leaching are	a 10%	260±5°C for 30 seconds						
Rapid Change of Temperature	±(1.0%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.18 IEC-60115-1 4.18						
	_(,)		-55°C to +125/+155°C, 5 cycles						

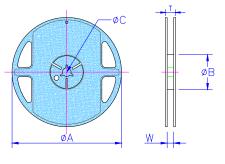
■ Storage Temperature: 25±3°C; Humidity < 80%RH

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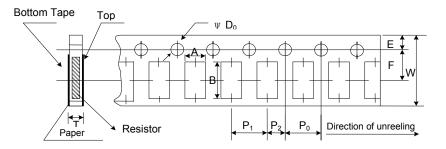
#### Packaging

Reel Specifications & Packaging Quantity



								Unit: mm
Туре	Packaging Quantity	Tape Width	Reel Diameter	ΦΑ	ФВ	ФС	w	т
RS-0201 RS-0402			7 inch	178.5±1.5	60 <sup>+1/-0</sup>	13.0±0.2	9.0±0.5	12.5±0.5
RS-0402	Paper	8mm	10 inch	254±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
RS-0805 RS-1206			13 inch	330±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5

#### Paper Tape Specifications



										Unit: mm
Туре	Α	В	w	E	F	Po	P <sub>1</sub>	P <sub>2</sub>	ΦD₀	т
RS-0201	0.38±0.05	0.68±0.05	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.50+0.1,-0	0.42±0.1
RS-0402	0.65±0.10	1.15±0.1	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.50+0.1,-0	0.45±0.1
RS-0603	1.10±0.10	1.90±0.1	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.70±0.1
RS-0805	1.60±0.10	2.40±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1
RS-1206	1.90±0.10	3.50±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1

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#### Marking

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Unit: mm

No Marking for 0201 and 0402

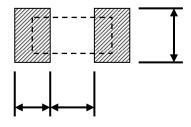
Jumper for all: Letter "0"

5% for 0603/0805/1206: 3 digits marking in E24

**Example:** 101=100 $\Omega$  102=1K $\Omega$  (1<sup>st</sup> and 2<sup>nd</sup> are E24 code and 3<sup>rd</sup> code is multiplier)

	E24 code	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91
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#### Recommend Land Pattern



Туре	Α	В	C
RS-0201	0.30	0.25	0.30
RS-0402	0.50	0.45	0.60
RS-0603	0.90	0.60	0.90
RS-0805	1.20	0.70	1.30
RS-1206	2.00	0.90	1.60

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