

Datasheet

RS Pro RS Series Thick Film Surface Mount Resistor 0402

Case 210 Ω $\pm$ 1% 0.063W $\pm$ 100ppm/ $^{\circ}$ C

RS Stock No: 716-8636



Product Details

RS Pro 0402 thick film surface mount resistor with $\pm$ 1% tolerance, provides 210 Ω resistance and is power rated at 0.0625 W. The temperature coefficient of resistance is $\pm$ 100 ppm/ $^{\circ}$ 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

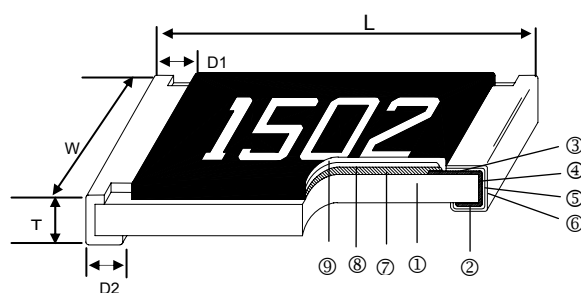
Specifications:

Case Style	Ruthenium Oxide
Depth	0.5 mm
Dimensions	1 x 0.5 x 0.35 mm
Height	0.35 mm
Length	1 mm
Maximum Operating Temperature	+155°C
Maximum Temperature Coefficient	+100 ppm/°C
Minimum Operating Temperature	-55°C
Minimum Temperature Coefficient	-100 ppm/°C
Package/Case	0402
Power Rating	0.0625 W
Resistance	210 Ω
Technology	Thick Film
Temperature Coefficient	±100 ppm/°C
Termination Style	Solder Pad
Tolerance	±1%
Maximum Overload Voltage	100 V
Maximum Operating Voltage	50 V
Tape Width	8 mm

Thick Film Chip Resistor 1% - RS Series

0201/0402/0603/0805/1206

Construction



① Alumina Substrate	④ Edge Electrode (NiCr)	⑦ Resistor Layer (RuO ₂ /Ag)
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

Unit: mm

Type	Size (Inch)	L	W	T	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

RS-	0402-	10R-	1%-	0.0625W
	Dimensions	Resistance	Tolerance	Power Rating @ 70 °C
	0201 0402 0603 0805 1206	10R: 10Ω 100R: 100Ω 10K: 10KΩ 100K: 100KΩ	1%	0.0625W 0.1W 0.125W 0.25W

■Derating Curve



■Standard Electrical Specifications

Item Type	Power Rating at 70°C Jumper Rated Current	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range	TCR (PPM/°C)
					±1%	
RS-0201	1/20W	-55 ~ +155°C	25V	50V	10Ω – 910KΩ	±200
RS-0402	1/16W	-55 ~ +155°C	50V	100V	10Ω – 910KΩ	±100
RS-0603	1/10W	-55 ~ +155°C	75V	150V	10Ω – 910KΩ	±100
RS-0805	1/8W	-55 ~ +155°C	150V	300V	10Ω – 910KΩ	±100
RS-1206	1/4W	-55 ~ +155°C	200V	400V	10Ω – 910KΩ	±100

■Soldering Condition



IR Reflow 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



Wave Soldering (Flow Soldering)

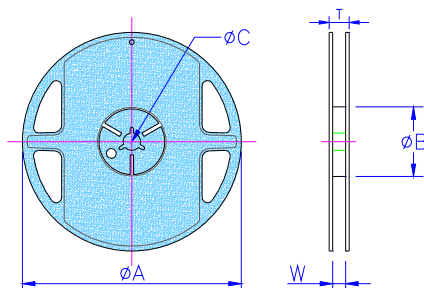
■ Environmental Characteristics

Item	Requirement	Test Method
	±1%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	JIS-C-5201-1 4.8 IEC-60115-1 4.8 -55°C~+125/+155°C, 25°C is the reference temperature
Short Time Overload	±(1.0%+0.05Ω)	JIS-C-5201-1 4.13 IEC-60115-1 4.13 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
Endurance	±(2.0%+0.10Ω)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	±(2.0%+0.10Ω)	JIS-C-5201-1 4.24 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	±(1.0%+0.05Ω)	JIS-C-5201-1 4.23 IEC-60115-1 2.23.2 at +125/+155°C for 1000 hrs
Bending Strength	±(1.0%+0.05Ω)	JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 5 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm
Solderability	95% min. coverage	JIS-C-5201-1 4.17 IEC-60115-1 4.17 245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5%+0.05Ω)	JIS-C-5201-1 4.18 IEC-60115-1 4.18 260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover	JIS-C-5201-1 4.7 IEC-60115-1 4.7 1.42 times RCWV (RMS) for 1 minute
Leaching	Individual leaching area □ 5% Total leaching area □ 10%	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260±5°C for 30 seconds
Rapid Change of Temperature	±(0.5%+0.05Ω)	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

■Packaging

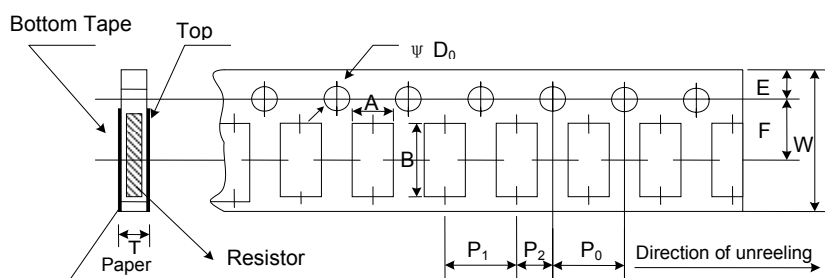
Reel Specifications & Packaging Quantity



Unit: mm

Type	Packaging Quantity	Tape Width	Reel Diameter	ΦA	ΦB	ΦC	W	T
RS-0201 RS-0402	Paper	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
			10 inch	254±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
RS-0603 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

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
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

■Marking

No Marking for 0201 and 0402

1% for 0805/1206: 4 digits marking

Example:

Resistance	100Ω	2.2KΩ	10KΩ	49.9KΩ	100KΩ
Marking	1000	2201	1002	4992	1003

1% for 0603: 3 digits marking in E96



3 digits marking for Example: 14C=13K7Ω 13C=13K3Ω
68B=4K99Ω 68X=49.9Ω

Marking Table

Code	E96		Code	E96		Code	E96		Code	E96		
01	100		25	178		49	316		73	562		
02	102		26	182		50	324		74	576		
03	105		27	187		51	332		75	590		
04	107		28	191		52	340		76	604		
05	110		29	196		53	348		77	619		
06	113		30	200		54	357		78	634		
07	115		31	205		55	365		79	649		
08	118		32	210		56	374		80	665		
09	121		33	215		57	383		81	681		
10	124		34	221		58	392		82	698		
11	127		35	226		59	402		83	715		
12	130		36	232		60	412		84	732		
13	133		37	237		61	422		85	750		
14	137		38	243		62	432		86	768		
15	140		39	249		63	442		87	787		
16	143		40	255		64	453		88	806		
17	147		41	261		65	464		89	825		
18	150		42	267		66	475		90	845		
19	154		43	274		67	487		91	866		
20	158		44	280		68	499		92	887		
21	162		45	287		69	511		93	909		
22	165		46	294		70	523		94	931		
23	169		47	301		71	536		95	953		
24	174		48	309		72	549		96	976		
Code	A		B	C	D	E	F	G	X	Y		
Multiplier	10 ⁰		10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁻¹	10 ⁻²		

■Recommend Land Pattern



Unit: mm

Type	A	B	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