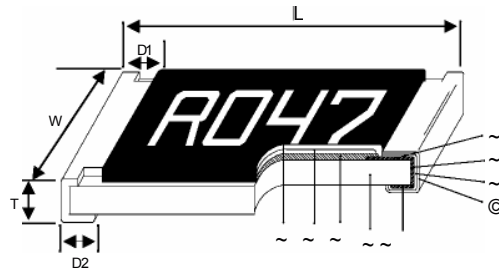
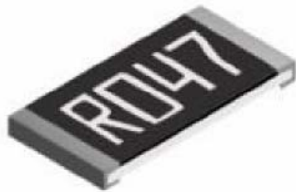


## Current Sensing Thick Film Chip Resistor - RS Series

### Construction



Ⓜ Alumina Substrate	Ⓜ Edge Electrode (NiCr)	Ⓜ Resistor Layer (RuO <sub>2</sub> /Ag)
~ Bottom Electrode (Ag-Pd)	Ⓜ Barrier Layer (Ni)	Ⓜ Primary Overcoat (Glass)
~ Top Electrode (Ag)	~ External Electrode (Sn)	~ Secondary Overcoat (Epoxy)

### Features

- Low inductance
- Highly reliable multilayer electrode construction—
- Higher component and equipment reliability —
- Reduced size of final equipment reliability

### Applications

- Power Management Applications
- Switching Power Supply
- Over Current Protection in Audio Application —
- Voltage Regulation Module (VRM)
  - DC-DC Converter, Battery Pack, Charger, Adaptor
- Automotive Engine Control
- Disk Driver
- Portable Devices (PDA, Cell Phone)

### Dimensions

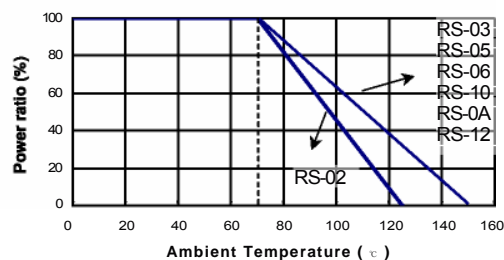
Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
RS-02	0402	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.20±0.10	0.620
RS-03	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	2.042
RS-05	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
RS-06	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947
RS-10	1210	3.20±0.20	2.60±0.15	0.55±0.10	0.50±0.25	0.50±0.20	15.959
RS-0A	2010	5.00±0.20	2.50±0.15	0.55±0.10	0.60±0.25	0.50±0.20	24.241
RS-12	2512	6.35±0.20	3.20±0.15	0.55±0.10	0.60±0.25	0.50±0.20	39.448

### Part Numbering

Product Type	Dimensions (L×W)	Resistance Tolerance	Function Code	Packaging Code	Resistance
RS-	03	F	L	7	- 0R047
02: 0402	03: 0603	F: ±1%	L: Standard	4: 7" Reel 4Kpcs	- 0R047:
5: 0805	6: 1206	J: ±5%	P: High Power	6: 7" Reel 10Kpcs	0.047C) - - -
10: 1210	0A: 2010			7: 7" Reel 5Kpcs	.. to fill up 6 spaces
12: 2512				9: 10" Reel 8Kpcs	
				A: 10" Reel 10Kpcs	
				B: 10" Reel 20Kpcs	
				C: 13" Reel 40Kpcs	

### Derating



## Standard Electrical Specifications

Item Type	Power Rating at 70 C	Operating Temp. Range	Resistance Range (mD)		TCR (PPM/C)
			±1%	±5%	
RS-02 (0402)	1/16W	-55..+125 C	50 - 99	.800	
			100 - 499		.500
			500 - 976		.200
RS-03 (0603)	1/10W	-55..+155 C	20 - 47	.1200	
			50 - 99		.800
			100 - 499		.500
			500 - 976		.200
RS-05 (0805)	1/8W	-55..+155 C	10 - 18	.1500	
RS-06 (1206)	1/4W		20 - 47		.1200
			50 - 99		.800
RS-10 (1210)	1/3W	-55..+155 C	100 - 499	.500	
RS-0A (2010)	3/4W		500 - 976		.200
RS-12 (2512)	1W		10 - 18		.1500
			20 - 47		
			50 - 99	.800	
			100 - 499	.200	
			500 - 976	.200	

Operating Voltage= $\sqrt{P \cdot R}$

Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$

## High Power Rating Electrical Specifications

Item Type	Power Rating at 70 C	Operating Temp. Range	Resistance Range (mD)		TCR (PPM/C)
			±1%	±5%	
RS-02 (0402)	1/10W	-55..+125 C	50 - 99	.800	
			100 - 499		.500
			500 - 976		.200
RS-03 (0603)	1/8W	-55..+155 C	20 - 47	.1200	
			50 - 99		.800
			100 - 499		.500
			500 - 976		.200
RS-05 (0805)	1/4W	-55..+155 C	10 - 18	.1500	
RS-06 (1206)	1/3W		20 - 47		.1200
			50 - 99		.800
RS-10 (1210)	1/2W	-55..+155 C	100 - 499	.500	
RS-0A (2010)	1W		500 - 976		.200
RS-12 (2512)	2W		10 - 18		.1500
			20 - 47		
			50 - 99	.800	
			100 - 499	.200	
			500 - 976	.200	

Operating Voltage= $\sqrt{P \cdot R}$

Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$

## Environmental Characteristics

Item	Requirement		Test Method
	.1%	.5%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		-55C~+1 25/+ 155C, 25C is the reference temperature
Short Time Overload	$\pm(1.0\%+0.05C)$	$\pm(2.0\%+0.05C)$	RCWV*2.5 or Max. overload voltage for 5 seconds, 2 seconds for high power series
Insulation Resistance	$\pm 1$ 0G		Max. overload voltage for 1 minute
Endurance	$\pm(2.0\%+0.1$ 0C))	$\pm(3.0\%+0.1$ 0C))	70.2C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	$\pm(2.0\%+0.1$ 0C))	$\pm(3.0\%+0.1$ 0C))	40.2C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Dry Heat	$\pm(1.0\%+0.05C)$	$\pm(1.5\%+0.1$ 0C))	at +1 25/+1 55C for 1000 hrs
Bending Strength	$\pm(1.0\%+0.05C)$	$\pm(1.0\%+0.05C)$	Bending once for 5 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm
Solderability	95% min. coverage		245.5 C for 3 seconds
Resistance to Soldering Heat	$\pm(0.5\%+0.05C)$	$\pm(1.0\%+0.05C)$	260.5 C for 10 seconds
Voltage Proof	No breakdown or flashover		1.42 times RCWV (RMS) for 1 minute
Leaching	Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$		260.5 C for 30 seconds
Rapid Change of Temperature	$\pm(0.5\%+0.05C)$	$\pm(1.0\%+0.05C)$	-55C to +1 25/+1 55C, 5 cycles

- Reference Standards: IEC 60115-1, 60068-2-58; JIS-C 5201 -1
- Storage Temperature: 25 $\pm$ 3 °C; Humidity < 80%RH

## Marking for 0603

Codes	Type
1R0	1.000C)
R10	0.100C)
R01	0.010C)
101	0.101C)
035	0.035C)

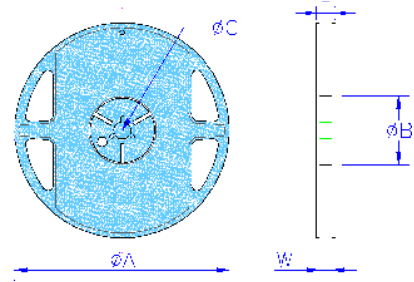
non-E24 / E96 series product is with no marking

## Packaging

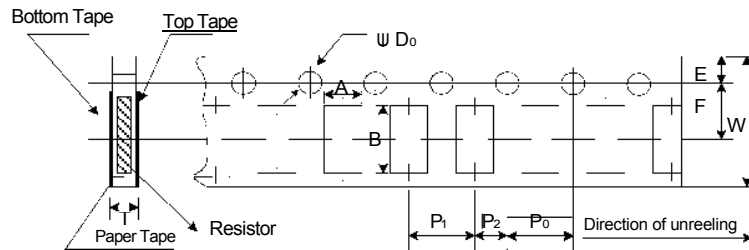
Reel Specifications & Packaging Quantity

Unit: mm

Type	Packaging Quantity	Tape width	Reel Diameter	ØA	ØB	ØC	W	T	
RS-02	Paper	10K	8mm	7 inch	178.5±1.5	13.0±0.2	9.0±0.5	12.5±0.5	
RS-03		20K							
RS-05		40K		10 inch	254±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
RS-06		5K							
RS-10	10K	13 inch	330±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5		
RS-0A	Embossed	4K	12mm	7 inch	178.5±1.5	13.0±0.5	13.0±0.5	15.5±0.5	
RS-12		8K		10 inch	250±1	13.0±0.5	12.5±0.5	16.5±0.5	



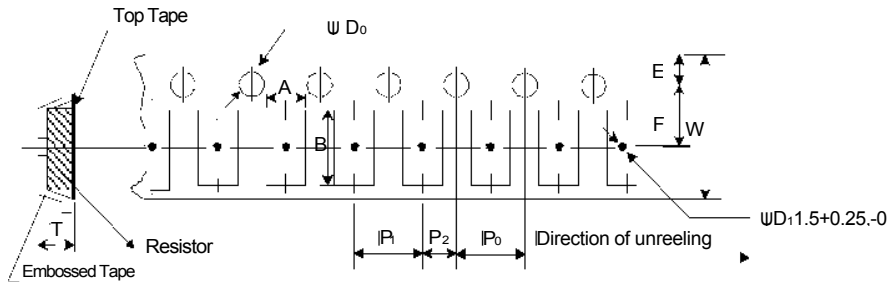
### Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	ØD <sub>0</sub>	T
RS-02	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-03	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-05	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-06	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
RS-10	2.80±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

### Embossed Plastic Tape Specifications

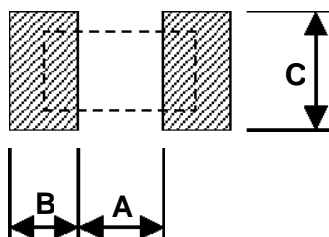


Unit: mm

Type	A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	ØD <sub>0</sub>	T
RS-0A	2.8±0.20	5.5±0.20	12.0±0.3	1.75±0.1	5.5±0.05	4.00±0.10	4.00±0.1	2.00±0.05	1.50+0.1,-0	1.2 <sup>±0</sup>
RS-12	3.5±0.20	6.7±0.20	12.0±0.3	1.75±0.1	5.5±0.05	4.00±0.10	4.00±0.1	2.00±0.05	1.50+0.1,-0	1.2 <sup>±0</sup>

## Recommend Land Pattern

Unit: mm



Type	A	B	C
RS-02	0.50	0.45	0.60
RS-03	0.90	0.60	0.90
RS-05	1.20	0.70	1.30
RS-06	2.00	0.90	1.60
RS-10	2.00	0.90	2.80
RS-0A	3.80	0.90	2.80
RS-12	3.80	1.60	3.50