

Thick Film Chip Resistor (RC Series) (0Ω, 1Ω - 1GΩ)



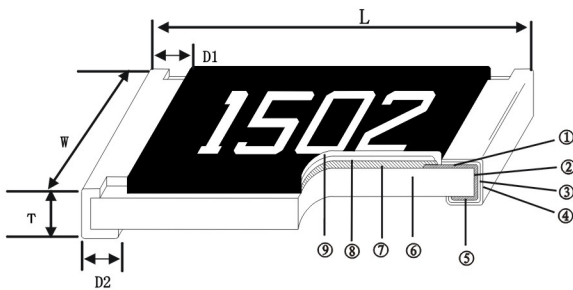
Scope

- This specification applies to all sizes of rectangular-type fixed chip resistors with Ruthenium-base as material.

Features

- Small size and light weight
- Highly reliable multi-layer electrode construction
- Compatible with all soldering process

Construction



Applications

- Telecommunication Equipments
- Radio and Tape Recorders, TV Tuners
- Digital Cameras, Watches, Pocket Calculators
- Computers, Instruments
- Medical and Military Equipment

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)

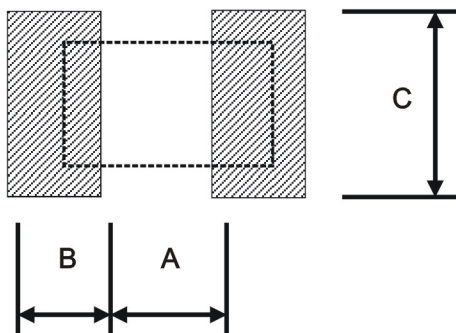
Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)	Weight (g) (1000pcs)
RC01005	01005	0.40 ± 0.02	0.20 ± 0.02	0.13 ± 0.02	0.10 ± 0.03	0.10 ± 0.03	0.037
RC0201	0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.15 ± 0.05	0.15 ± 0.05	0.150
RC0402	0402	1.00 ± 0.05	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.20 ± 0.10	0.620
RC0603	0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.30 ± 0.20	0.30 ± 0.20	2.042
RC0805	0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.40 ± 0.20	4.368
RC1206	1206	3.10 ± 0.10	1.55 ± 0.10	0.55 ± 0.10	0.50 ± 0.25	0.50 ± 0.25	8.947
RC1210	1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.50 ± 0.25	0.50 ± 0.25	15.959
RC2010	2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.60 ± 0.25	0.60 ± 0.25	24.241
RC2512	2512	6.35 ± 0.10	3.10 ± 0.15	0.55 ± 0.10	0.60 ± 0.25	0.50 ± 0.25	39.448

Part Numbering

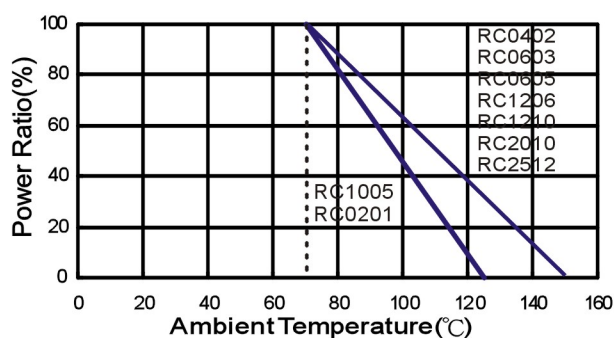
RC	0603	T	R	-	07	100R	L
Product Type	Size	Resistance Tolerance	Packaging Type	Temperature Coefficient of resistance	Taping Reel	Resistance	Marking Code
	0201 0402 0603 0805 1206 1210 2010 2512	F: $\pm 1\%$ J: $\pm 5\%$	R: Paper/PE taping reel K: Embossed taping reel	-: Base on spec	07: 7 inch dia. reel 10: 10 inch dia reel 13: 13 inch dia. Reel 7W: 7 inch Dia. Reel and 2 x standard power type. 7H: 7 inch Dia Reel Ultra High Power	1R: 1Ω 4R7: 4.7Ω 1K: $1K\Omega$ 1M: $1M\Omega$	Latter L is system default code for order only.

Recommend Land Pattern

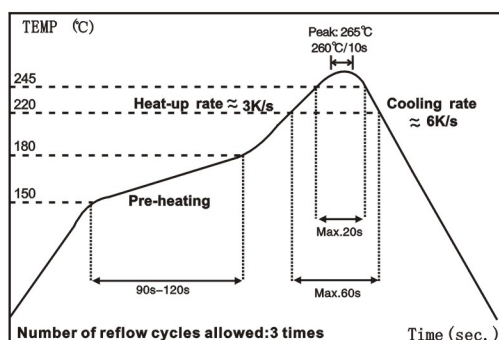


Type	A (mm)	B (mm)	C (mm)
RC01005	0.14	0.18	0.25
RC0201	0.30	0.25	0.30
RC0402	0.50	0.45	0.60
RC0603	0.90	0.60	0.90
RC0805	1.20	0.70	1.30
RC1206	2.00	0.90	1.60
RC1210	2.00	0.90	2.80
RC2010	3.80	0.90	2.80
RC2512	3.80	1.60	3.50

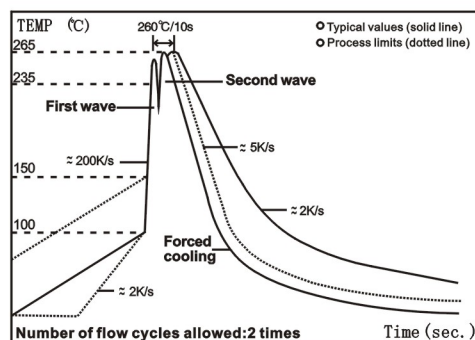
Derating Curve



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

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%	±5%	
RC01005	1/32W	-55 ~ +125°C	15V	30V	10Ω - 1MΩ		±300
	Jumper 0.5A				0Ω (<50mΩ)		-
RC0201	1/20W	-55 ~ +125°C	25V	50V	1Ω - 10MΩ		±200
	Jumper 1A				0Ω (<50mΩ)		-
RC0402	1/16W	-55 ~ +155°C	50V	100V	1Ω - 9.76Ω 10Ω - 1MΩ 10.2MΩ - 20MΩ 20.5MΩ - 100MΩ		±200 ±100 ±200 ±400
	Jumper 1A				0Ω (<50mΩ)		-
RC0603	1/10W	-55 ~ +155°C	75V	150V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 20MΩ 20.5MΩ - 100MΩ		±200 ±100 ±200 ±400
	Jumper 1A				0Ω (<50mΩ)		-
RC0805	1/8W	-55 ~ +155°C	150V	300V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 20MΩ 20.5MΩ - 100MΩ		±200 ±100 ±200 ±400
RC1206	Jumper 2A		200V	400V	0Ω (<50mΩ)		-
	Jumper 2A				0Ω (<50mΩ)		-
RC1210	1/3W	-55 ~ +155°C	200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 20MΩ 20.5MΩ - 39MΩ		±200 ±100 ±200 ±400
	Jumper 2.5A				0Ω (<50mΩ)		-
RC2010	3/4W	-55 ~ +155°C	200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 20MΩ 20.5MΩ - 100MΩ		±200 ±100 ±200 ±400
	Jumper 3.5A				0Ω (<50mΩ)		-
RC2512	1W	-55 ~ +155°C	250V	500V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 20MΩ 20.5MΩ - 100MΩ		±200 ±100 ±200 ±400
	Jumper 4A				0Ω (<50mΩ)		-

■ High Power & Ultra High Power Rating Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range		TCR (PPM/°C)
					±1%	±5%	
RC0402	1/8W	-55 ~ +155°C	50V	100V	1Ω - 9.76Ω 10Ω - 1MΩ		±200 ±100
RC0603	1/4W		75V	150V			
RC0805	1/3W		150V	300V			
RC1206	1/3 *1/2W		200V	400V			
RC1210	1/2 *3/4W		200V	400V			
RC2010	1W		200V	400V			
RC2512	2W		250V	500V			

*: Ultra High Power

Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.

Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.

■ High Ohmic Chip Resistor

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range	TCR (PPM/°C)
					± 5%	
RC0805	1/8W	-55 ~ +155°C	150V	300V	110MΩ ~ 500MΩ	± 500
					510MΩ ~1GΩ	± 1000
RC1206	1/4W		200V	400V	110MΩ ~ 500MΩ	± 500
					510MΩ ~1GΩ	± 1000

Environmental Characteristics

Item	Requirement			Test Method
	±1% and Below	±5%	Jumper	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.			JIS-C-5201-1 4.8 IEC-60115-1 4.8 -55°C~+125°C, 25°C is the reference temperature
Short Time Overload	±(1.0%+0.05Ω)	±(2.0%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 or Max. overload voltage whichever is lower 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	±(1.0%+0.10Ω)	±(2.0%+0.10Ω)	<100mΩ	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	±(1.0%+0.10Ω)	±(2.0%+0.10Ω)	<100mΩ	JIS-C-5201-1 4.24 40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Dry Heat	±(1.0%+0.05Ω)	±(1.5%+0.10Ω)	<50mΩ	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)	±(1.0%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 5 seconds 2010 2512 size:2mm Other size: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)	±(1.0%+0.05Ω)	<50mΩ	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)	±(1.0%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.18 IEC-60115-1 4.18 -55°C to +125/+155°C, 5 cycles

RCWV(Rated continuous working voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

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