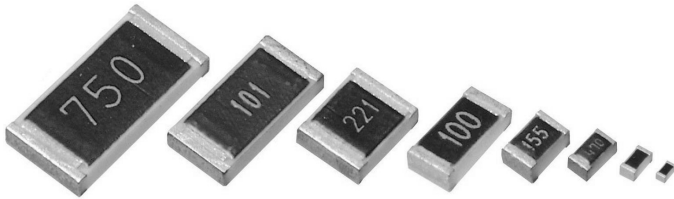




ELECTRO-MECHANICS

Thick Film Chip Resistors.

Rectangular type – General purpose



■ FEATURES

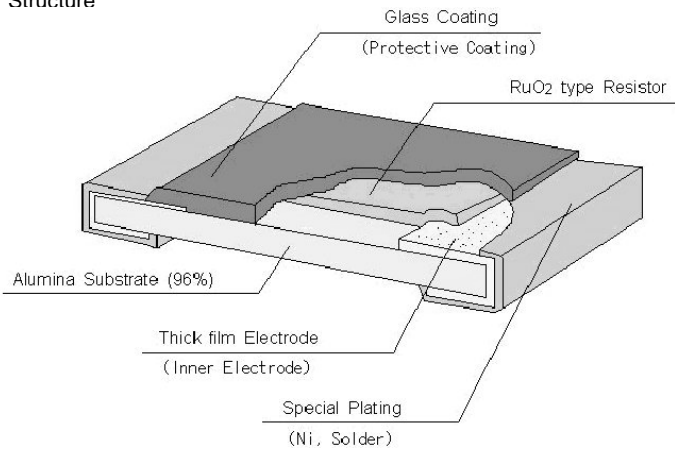
- Very small, thin, and light weight.
- Both flow and reflow soldering are applicable.
- Owing to the reduced lead inductance, the high frequency characteristic is excellent.
- Suitable size and packaging for surface mount assembly.

■ APPLICATION

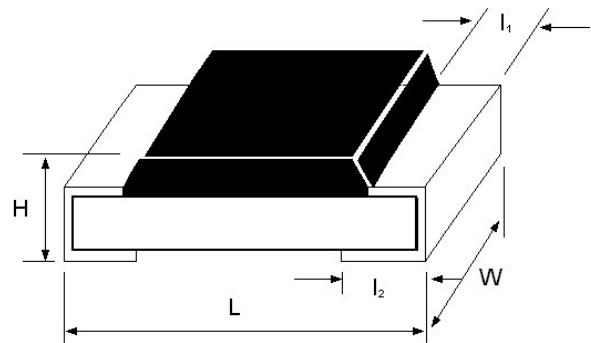
- General purpose
- Home Appliances
(DVD, Digital TV, CAMCODER, VTR, Digital Camera, Audio, Tunner)
- For Computers & Communications
(Notebook, Memory Module, Mobile, Network Equipment, etc)

■ STRUCTURE AND DIMENSIONS

• Structure



• Dimensions



(UNIT : mm)

TYPE	inch	Power (W)	L	W	H	I ₁	I ₂	Unit Weight
RC0603	0201	1/20	0.60±0.03	0.30±0.03	0.23±0.05	0.15±0.05	0.15±0.05	0.16mg
RC1005	0402	1/16	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	0.6mg
RC1608	0603	1/10	1.60±0.10	0.80±0.15	0.45±0.10	0.30±0.20	0.35±0.20	2.1mg
RC2012	0805	1/8	2.00±0.20	1.25±0.15	0.50±0.10	0.40±0.20	0.35±0.20	4.9mg
RC3216	1206	1/4	3.20±0.20	1.60±0.15	0.55±0.10	0.45±0.20	0.40±0.20	9.5mg
RC3225	1210	1/4	3.20±0.20	2.55±0.20	0.55±0.10	0.45±0.20	0.40±0.20	16mg
RC5025	2010	1/2	5.00±0.15	2.50±0.15	0.55±0.15	0.60±0.20	0.60±0.20	26mg
RC6432	2512	1	6.30±0.15	3.20±0.15	0.55±0.15	0.60±0.20	0.60±0.20	41mg

The new product will be available on the market from the second quarter of year 2002.

■ PARTS NUMBERING SYSTEM

- The part number system shall be in the following format

RC	2012	J	100	CS
Code Designation	Dimension & Size Code	Tolerance	Resistance Value	Packaging Code
RC : Chip Resistor	0603 : 0.6×0.3(mm)——0201(inch) 1005 : 1.0×0.5(mm)——0402(inch) 1608 : 1.6×0.8(mm)——0603(inch) 2012 : 2.0×1.2(mm)——0805(inch) 3216 : 3.2×1.6(mm)——1206(inch) 3225 : 3.2×2.5(mm)——1210(inch) 5025 : 5.0×2.5(mm)——2010(inch) 6432 : 6.4×3.2(mm)——2512(inch)	G : ± 2% J : ± 5% K : ±10% × Jumper : 'J'	3 or 4 digits coding system (IEC coding system) 3digits (E-24 series) 4digits (E-48 series)	GS: Bulk Packaging CS: Tape Packaging 7" ES: Tape Packaging 10" FS: Tape Packaging 13" AS: Tape Packaging 13"

Thick Film Chip Resistors.

Rectangular type – General purpose

■ SPECIFICATION

TYPE	Power Rating(W)	Working Voltage(MAX)	Overload Voltage(MAX)	TCR (ppm/°C)	Resistance Range (Ω)			Rated Ambient Temperature	Rated Working Temperature
					G(±2%) E-48	J(±5%) E-24	K(±10%) E-12		
RC0603	1/20	25(V)	50(V)	0 ≤ R ≤ 10Ω ±300ppm	-	10Ω-1MΩ	10Ω-1MΩ	70°C	-55°C ~ +125°C
RC1005	1/16	50(V)	100(V)		10Ω-1MΩ	1Ω-10MΩ	1Ω-10MΩ		
RC1608	1/10			1Ω-10MΩ	1Ω-10MΩ	1Ω-10MΩ			
RC2012	1/8	150(V)	300(V)	10Ω ≤ R ≤ 1MΩ ±200ppm	1Ω-10MΩ	1Ω-10MΩ	1Ω-10MΩ		-55°C ~ +155°C
RC3216	1/4	200(V)	400(V)		1Ω-10MΩ	1Ω-10MΩ	1Ω-10MΩ		
RC3225	1/4			1Ω-10MΩ	1Ω-10MΩ	1Ω-10MΩ			
RC5025	1/2			1Ω-10MΩ	1Ω-10MΩ	1Ω-10MΩ			
RC6432	1			1Ω-10MΩ	1Ω-10MΩ	1Ω-10MΩ			
				1MΩ ≤ R ≤ 10MΩ ±300ppm					-55°C ~ +125°C

• Rated voltage (V) = $\sqrt{\text{Rated power (W)} \times \text{Normal resistance value (R)}}$

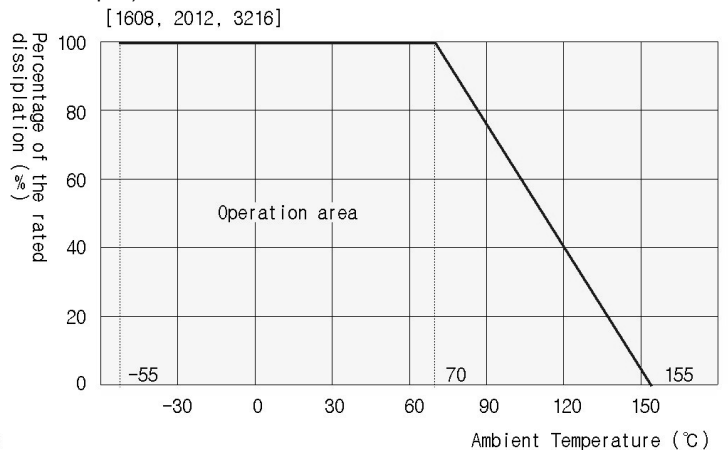
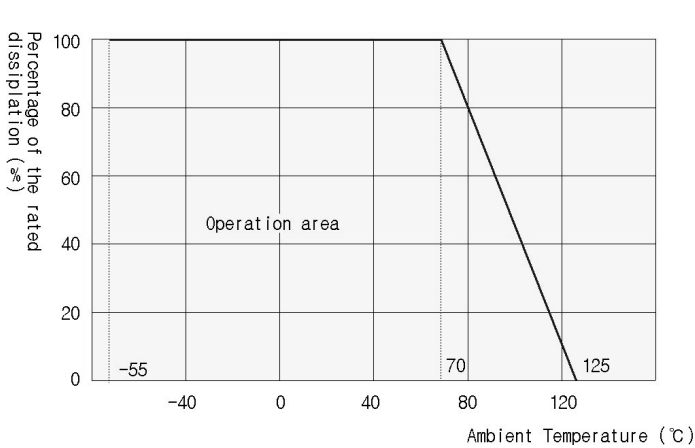
Rated voltage should be lower than (MAX) working voltage.

■ POWER DERATING CURVE

The rated power is the maximum continuous loading power at 70°C ambient temperature.

For ambient temperature above 70°C, the loading power follows the below power derating curve.

(The load current shall be derated according to Derating curve in case of the 'Jumper')



■ JUMPER RESISTORS

TYPE	Resistance	Current Rating	Rated Ambient Temperature	Rated Working Temperature
RC0603	50mΩ .MAX	0.5(A)	70°C	-55°C ~ +125°C
RC1005				
RC1608		1.0(A)		-55°C ~ +155°C
RC2012				
RC3216		2.0(A)		-55°C ~ +125°C
RC3225				
RC5025				
RC6432				

■ MARKING

• 3 digits indication (E-24,E-12 series)	• 4 digits indication (E-48 series)
<ul style="list-style-type: none"> - Left 2 digits represent significant figures. - Last 1 digit represents exponential number of 10. - Example : 103 Left 2 digits : 10 Last 1 digit : 3 $103 = 10 \times 10^3 \Omega$ $= 10000 \Omega = 10k\Omega$ 	<ul style="list-style-type: none"> - Left 3 digits represent significant figures. - Last 1 digit represents exponential number of 10. - Example : 1002 Left 3 digits : 100 Last 1 digit : 2 $1002 = 100 \times 10^2 \Omega$ $= 10000 \Omega = 10k\Omega$
<ul style="list-style-type: none"> • Jumper chip is printed as 000 • 0603, 1005 type : No marking. 	

■ CHARACTERISTICS PERFORMANCE

• Electrical Characteristic

Item	Requirements Specification		Test Methods	
	Resistor	Jumper	Resistor	Jumper
Direct Current Resistance	Within the regulated resistance tolerance.		JIS C 5202 (5.1) Voltage apply within 5 sec.	
Temperature Characteristic	$1\Omega \leq R < 10\Omega$: +300 ppm/°C -200 ppm/°C $10\Omega \leq R < 1M\Omega$: ±200 ppm/°C $1M\Omega \leq R < 10M\Omega$: ±300 ppm/°C	50mΩ max.	Test Temperature(°C) 20 → -55 → 20 → 125 → 20 T.C.R(ppm/°C)=(R-R ₂₀ /R ₂₀ ×1/(T/T ₂₀)×10 ⁶ × T=Test Temperature, T ₂₀ =20°C R=Resistance at T, R ₂₀ =Resistance at T ₂₀	
Short-time Overload	ΔR	Less than ±(1%+0.1Ω)of the initial value.	50mΩ max.	Apply 2.5 times rated voltage for 5 sec. Wait 30 minutes at room temperature. Measure the resistance value.
	Visual	No evidence of mechanical damage.		
Intermittent Overload	ΔR	Less than ±(3%+0.1Ω)of the initial value.	50mΩ max.	2.5 times of rated voltage. 1 second ON, 25 second OFF. 10,000cycles.
	Visual	No evidence of mechanical damage.		
Dielectric Withstanding Voltage	No evidence of mechanical damage.		Apply voltage for 1 minute. 0603,1005,1608 : 100V Others : 500V	
Insulation Resistance	Over 1,000MΩ			

• Mechanical Characteristic

Item	Requirements Specification		Test Methods	
	Resistor	Jumper	Resistor	Jumper
Solderability	Coverage : ≥95% each termination.		Rosin Flux : Rosin 25%, Methanol 75% Solder Temp. : 235± 5°C Dipping time : 2± 0.5sec.	
Bending Test	ΔR	Less than ±(0.5%+0.05Ω)of initial value.	50mΩ max.	After soldering resistor on the PCB, 3mm of bending shall be applied for 10 sec.
	Visual	No evidence of mechanical damage.		
Terminal Strength	0603,1005,1608 : Over 0.3kg Others : Over 0.5kg		Pull direction fixed 0.4 lead.	
Resis. to Soldering H.	ΔR	Less than ±(1%+0.05Ω)of initial value.	50mΩ max.	Immerse in molten solder at 260°C for 10±1sec. Preheat and soldering Procedure.
	Visual	No evidence of mechanical damage.		
Anti-Vibration Test	ΔR	Less than ±(1%+0.1Ω)of initial value.	50mΩ max.	2 hours each in X,Y, and Z axis(total 6 hours) 10 to 55 Hz sweep in 1 minute at 1.5mm amplitude.
	Visual	No evidence of mechanical damage.		

• Environmental Characteristic

Item	Requirements Specification		Test Methods	
	Resistor	Jumper	Resistor	Jumper
Temperature Cycle	ΔR	Less than ±(1%+0.1Ω)of initial value.	50mΩ max.	Test Temperature(°C) : -55 → 20 → 125 → 20 Test Time (minute) : 30 → 15 → 30 → 15
	Visual	No evidence of mechanical damage.		
Load Life	ΔR	Less than ±(3%+0.1Ω)of initial value.	50mΩ max.	Test Voltage : rated voltage Temp : 70 ± 3°C Time : 1,000 ⁺⁴⁸ hours (90min ; ON, 30min ; OFF)
	Visual	No evidence of mechanical damage.		
Low Temp. Exposure	ΔR	Less than ±(3%+0.1Ω)of initial value.	50mΩ max.	Dwell in -55°C chamber without loading for 1,000 ⁺⁴⁸ hours. Stabilize for 60 minute at room temperature. Measure value.
	Visual	No evidence of mechanical damage.		
High Temp. Exposure	ΔR	Less than ±(3%+0.1Ω)of initial value.	50mΩ max.	Dwell in 125°C chamber without loading for 1,000 ⁺⁴⁸ hours. Stabilize for 60 minute at room temperature. Measure value.
	Visual	No evidence of mechanical damage.		
Moisture Resistance	ΔR	Less than ±(3%+0.1Ω)of initial value.	50mΩ max.	Test voltage : rated voltage Test Temp. : 40±2°C Time : 1,000 ⁺⁴⁸ hours (90min:ON,30min:OFF) Humidity : 90~95% RH Stabilize for 1hrs & Measure.
	Visual	No evidence of mechanical damage.		