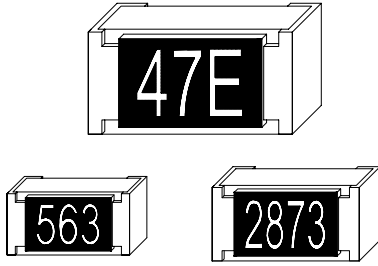
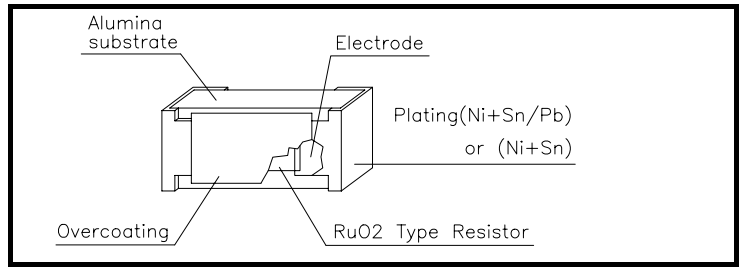


Thick Film Chip Resistors

RCT&RTT 01,02,03,05,06,12,20,25



Construction



Feature

- 1.Small size and light weight.
- 2.High reliability and stability.
- 3.Lower assembly cost.

Application

- 1.Computer application, NB, MB, add-on card harddisk....
- 2.Mobile phone, Telecom....
- 3.Consumer electrical equipment, PDA, Digital Camera....
- 4.Battery changer, DC-DC power converter
- 5.Automotive

Explanation of Part Numbers

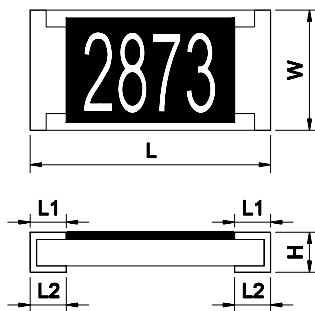
(EX) RCT 03 101 J TP

Type	Size	Nominal Resistance		Resistance Tolerance	Packaging	
Thick Film Chip Resistors	01(0201)	Resistors	3 - Digit	E24 Series EX 2.2 =2R2 100 =101	D=± 0.5% F=± 1% G=± 2% J=± 5%	TH 2 mm Pitch Paper(Taping) 10000 pcs
	02(0402)		4 - Digit	E96 Series EX 10.2 =10R2 10K =1002		TP 4 mm Pitch Paper(Taping) 5000 pcs
RCT:Sn/Pb Process	03(0603)	Jumper	000			P2 4 mm Pitch Paper(Taping) 10000 pcs
RTT:Sn (Tin) Process	05(0805)					P3 4 mm Pitch Paper(Taping) 15000 pcs
	06(1206)					P4 4 mm Pitch Paper(Taping) 20000 pcs
	12(1210)					TE 4 mm Pitch Emboss(Taping) 4000 pcs
	20(2010)					BA Bulk Case
	25(2512)					

Dimensions

Unit:mm

Type	Dimensions					
	L	W	H	L1	L2	
RCT01 (0201)	0.60± 0.03	0.30± 0.03	0.23± 0.03	0.12± 0.05	0.15± 0.05	
RCT&RTT02 (0402)	1.00± 0.10	0.50± 0.05	0.30± 0.05	0.20± 0.10	0.25± 0.10	
RCT&RTT03 (0603)	1.55± 0.10	0.80 ^{+0.15} _{-0.05}	0.45± 0.10	0.30± 0.15	0.30± 0.15	
RCT&RTT05 (0805)	2.00± 0.10	1.25± 0.10	0.50± 0.10	0.35± 0.20	0.35± 0.15	
RCT&RTT06 (1206)	3.05± 0.10	1.55± 0.10	0.55 ^{+0.10} _{-0.05}	0.45± 0.20	0.35± 0.15	
RCT&RTT12 (1210)	3.05± 0.10	2.55± 0.10	0.55± 0.10	0.50± 0.20	0.50± 0.20	
RCT&RTT20 (2010)	5.00± 0.20	2.50± 0.20	0.55± 0.10	0.60± 0.20	0.60± 0.20	
RCT&RTT25 (2512)	6.30± 0.20	3.20± 0.20	0.55± 0.10	0.60± 0.20	0.60± 0.20	



Thick Film Chip Resistors

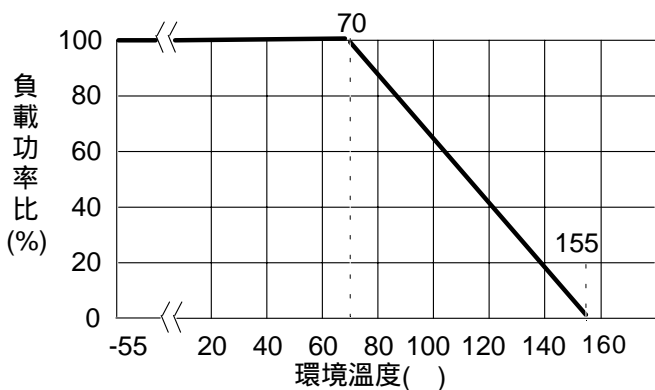
RCT&RTT 01,02,03,05,06,12,20,25

RALEC

Standard electrical specifications

Type	Rated Power at 70	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/)	Resistance Range					Jumper Rated Current	Jumper Resistance Value
					B(± 0.1%) E-96	D(± 0.5%) E-96	F(± 1%) E-96	G(± 2%) E-24	J(± 5%) E-24		
RCT RTT 1	$\frac{1}{20}$ W	25V	50V	± 250	-----	-----	10 ~1M	-----	10 ~1M	0.5A	100m MAX
RCT RTT 02	$\frac{1}{16}$ W	50V	100V	+500 -200	-----	-----	1 ~9.9	1 ~9.9	1 ~9.9	1A	50m MAX
				± 200	-----	100 ~990	10 ~990	10 ~990			
				± 300	-----	1K~1M	1K~4M7	1K~4M7	1K~10M		
RCT RTT 03	$\frac{1}{10}$ W	50V	100V	± 100	100 ~1M	100 ~1M	33 ~1M	-----	-----	1A	50m MAX
				± 200	-----	10 ~99	10 ~32 1.1M~10M	10 ~10M	10 ~10M		
				± 400	-----	-----	1 ~9.9	1 ~9.9	1 ~9.9 11M ~26M		
RCT RTT 05	$\frac{1}{8}$ W	150V	300V	± 100	100 ~1M	100 ~1M	33 ~1M	-----	-----	2A	50m MAX
				± 200	-----	-----	10 ~32 1.1M~10M	10 ~10M	10 ~10M		
				± 400	-----	-----	1 ~9.9	1 ~9.9	1 ~9.9 11M ~26M		
RCT RTT 06	$\frac{1}{4}$ W	200V	400V	± 100	100 ~1M	100 ~1M	33 ~1M	-----	-----	2A	50m MAX
				± 200	-----	-----	10 ~32 1.1M~10M	10 ~10M	10 ~10M		
				± 400	-----	-----	1 ~9.9	1 ~9.9	1 ~9.9 11M ~26M		
RCT RTT 12	$\frac{1}{3}$ W	200V	400V	± 100	100 ~1M	100 ~1M	33 ~1M	-----	-----	2A	50m MAX
				± 200	-----	-----	10 ~32 1.1M~10M	10 ~10M	10 ~20M		
				± 400	-----	-----	1 ~9.9	1 ~9.9	1 ~9.9		
RCT RTT 20	$\frac{3}{4}$ W	200V	400V	± 100	-----	-----	10 ~1M	-----	-----	2A	50m MAX
				± 200	-----	-----	-----	10 ~1M	10 ~1M		
				± 400	-----	-----	-----	-----	1 ~9.9		
RCT RTT 25	1W	200V	400V	± 100	-----	-----	10 ~1M	-----	-----	2A	50m MAX
				± 200	-----	-----	-----	10 ~1M	10 ~10M		
				± 400	-----	-----	-----	-----	1 ~9.9		
Operating Temperature Range					- 55 ~ + 155						

Power Derating Curve



Marking



FOR E-24&E-96

2%,5% 3 digits indication

first 2 digits are significant figures

3rd digit is multiplier(10^x)

EX. Marking --> 563

$$56 \times 10^3 = 56000 = 56K$$

1% 4 digits indication

first 3 digits are significant figures

4th digit is multiplier(10^x)

EX. Marking --> 3922

$$392 \times 10^2 = 39200 = 39.2K$$

FOR RCT03 1%(E-96)

3 digit indication

first 2 digits are significant for E-96 Part marking scheme.

3rd digit is multiplier:

$$Y=10^{-2} \quad X=10^{-1} \quad A=10^0 \quad B=10^1$$

$$C=10^2 \quad D=10^3 \quad E=10^4 \quad F=10^5$$

Type RCT01,02:No marking Code

Thick Film Chip Resistors

RCT 01,02,03,05,06,12,20,25

RALEC

■ Reliability Test

Item	Specification			Test Method
	R: 1		R: < 1	
	0.5%、 1%	2%、 5%	1%、 2%、 5%	
Temperature Coefficient of Resistance	Within the specification of TCR			JIS-C5202-5.2 $TCR \text{ (ppm/ } ^\circ\text{C)} = \frac{(R2 - R1)}{R1 (T2 - T1)} \times 10$ R1: Resistance at room temperature R2: Resistance at -55 or +155 T1: Room temperature T2: Temperature -55 or +155 (RCT01 at 125)
Short Time Overload	$\pm (1.0\% + 0.05)$	$\pm (2.0\% + 0.10)$	$\pm (2.0\% + 0.001)$	JIS-C5202-5.5 Apply 2.5 times rated voltage or Max. Overload Voltage for 5 seconds.
	RCT01 : $\pm (2.0\% + 0.10)$			
Insulation Resistance	10 ⁹			JIS-C5202-5.6 Put the resistor in the fixture, add 100 VDC in +,- terminal for 60 seconds then measured the insulation resistance. (RCT01 N/A)
Dielectric Withstand Voltage	No short or burned on the appearance			JIS-C5202-5.7 Apply 500VAC for 1min.(RCT02,03 300VAC). (RCT01 N/A)
Intermittent Overload	$\pm (5.0\% + 0.10)$	$\pm (5.0\% + 0.001)$		JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle. (RCT01 N/A)
Bending Strength	$\pm (1.0\% + 0.05)$	$\pm (1.0\% + 0.001)$		JIS-C5202-6.1.4 RCT02 ,03 ,05=5 mm ; RCT01,06,12,=3 mm ; RCT20,25=2 mm deflection in either direction.
Terminal Strength	No evidence of mechanical damage			JIS-C5202-6.1.4 Apply 5N pushing force for 10sec. (RCT01 N/A)
Resistance to Solvent	$\pm (0.5\% + 0.05)$	$\pm (1.0\% + 0.001)$		JIS-C5202-6.9 Immersed into isopropyl alcohol of 23 ~ 25 for 60 seconds.
Resistance to Soldering Heat	$\pm (0.5\% + 0.05)$	$\pm (1.0\% + 0.05)$	$\pm (1.0\% + 0.001)$	JIS-C5202-6.10 Immerse for 10 sec. in solder at 260± 5 .
	RCT01 : $\pm (2.0\% + 0.10)$			
Solderability	Coverage 95%			JIS-C5202-6.11 Immerse for 3 sec. in solder at 230± 3 .
Steam aging	Coverage 95%			JIS-C5202-6.11.4 Put the resistor in the vessel of temperature 100 relative humidity 100% for 4 hrs then Immerse for 3 sec. in solder at 230± 3 . (RCT01 N/A)
Vibration	$\pm (0.5\% + 0.05)$	$\pm (1.0\% + 0.05)$	$\pm (1.0\% + 0.001)$	JIS-C5202-6.3 Frequency range:10 Hz to 55Hz to 10Hz/1min. Amplitude:1.5 mm This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (a total of 6 hrs). (RCT01 N/A)
Resistance to dry heat	$\pm (1.0\% + 0.05)$	$\pm (2.0\% + 0.10)$	$\pm (1.0\% + 0.001)$	JIS-C5202-7.2 96 Hrs at 155 (RCT01 at 125)
	RCT01 : $\pm (5.0\% + 0.10)$			
Temperature Cycling	$\pm (0.5\% + 0.05)$	$\pm (1.0\% + 0.05)$	$\pm (1.0\% + 0.001)$	JIS-C5202-7.4 Cycle between -55 and +155 30 minute for 5 cycles. (RCT01 at 125)
	RCT01 : $\pm (5.0\% + 0.10)$			
Loading Life in Moisture	$\pm (0.5\% + 0.05)$	$\pm (2.0\% + 0.10)$	$\pm (2.0\% + 0.001)$	JIS-C5202-7.9 40± 2 ,90~95 %RH 1000Hrs at RCWV, 1.5Hrs ON, 0.5Hrs OFF.
	RCT01 : $\pm (5.0\% + 0.10)$			
Load Life	$\pm (1.0\% + 0.05)$	$\pm (3.0\% + 0.10)$	$\pm (2.0\% + 0.001)$	JIS-C5202-7.10 70 , 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF.
	RCT01 : $\pm (5.0\% + 0.10)$			
Low Temperature Operation	$\pm (0.5\% + 0.05)$	$\pm (1.0\% + 0.05)$	$\pm (1.0\% + 0.001)$	MIL-R-5532D 4.7.4 1 Hrs, -55 , Followed by 45 minutes of RCWV. (RCT01 N/A)

RCWV=Rated Continuous Working Voltage

Thick Film Chip Resistors

RTT 01,02,03,05,06,12,20,25 (Lead-Free)

RALEC

■ Reliability Test

Item	Specification			Test Method
	R: 1		R: < 1	
	0.5%、 1%	2%、 5%	1%、 2%、 5%	
Temperature Coefficient of Resistance	Within the specification of TCR			JIS-C5202-5.2 $TCR \text{ (ppm/ } ^\circ\text{C)} = \frac{(R_2 - R_1)}{R_1 (T_2 - T_1)} \times 10^6$ R1: Resistance at room temperature R2: Resistance at -55 or +155 T1: Room temperature T2: Temperature -55 or +155 (RTT01 at 125)
Short Time Overload	± (1.0% + 0.05)	± (2.0% + 0.10)	± (2.0% + 0.001)	JIS-C5202-5.5 Apply 2.5 times rated voltage or Max. Overload Voltage for 5 seconds.
Insulation Resistance	10 ⁹			JIS-C5202-5.6 Put the resistor in the fixture, add 100 VDC in +,- terminal for 60 seconds then measured the insulation resistance.
Dielectric Withstand Voltage	No short or burned on the appearance			JIS-C5202-5.7 Apply 500VAC for 1min.(RCT02,03 300VAC).
Intermittent Overload	± (5.0% + 0.10)		± (5.0% + 0.001)	JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle.
Core Body Strength	± (1.0% + 0.05)		± (1.0% + 0.001)	JIS-C5202-6.1.4 Applied R0.5 test probe at its central part then pushing 1Kgf force on the sample for 10 sec.
Terminal Strength	No evidence of mechanical damage			JIS-C5202-6.1.4 Apply 5N pushing force for 10sec.
Resistance to Solvent	± (0.5% + 0.05)		± (1.0% + 0.001)	JIS-C5202-6.9 Immersed into isopropyl alcohol of 23 ~ 25 for 60 seconds.
Resistance to Soldering Heat	± (1.0% + 0.05)		± (1.0% + 0.001)	By SONY SS-00254-5, JIS-C5202-6.10
Solderability	Coverage 95%			By SONY SS-00254-2, JIS-C5202-6.11
Joint strength of solder	± (1.0% + 0.05)		± (1.0% + 0.001)	By SONY SS-00254-7, JIS-C5202-6.1.4
	After application of temperature cycle, adhesion or bending load should be 50% or more of initial strength.			
Leaching Test	Coverage 95%			By SONY SS-00254-9
Vibration	± (0.5% + 0.05)	± (1.0% + 0.05)	± (1.0% + 0.001)	JIS-C5202-6.3 Frequency range:10 Hz to 55Hz to 10Hz/1min. Amplitude:1.5 mm This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (a total of 6 hrs).
Resistance to dry heat	± (1.0% + 0.05)	± (2.0% + 0.10)	± (1.0% + 0.001)	JIS-C5202-7.2 96 Hrs at 155 .(RTT01 at 125)
Temperature Cycling	± (0.5% + 0.05)	± (1.0% + 0.05)	± (1.0% + 0.001)	JIS-C5202-7.4 Cycle between -55 and +155 30 minute for 5 cycles. (RTT01 at 125)
Loading Life in Moisture	± (0.5% + 0.05)	± (2.0% + 0.10)	± (2.0% + 0.001)	JIS-C5202-7.9 40± 2 ,90~95 %RH ,1000Hrs at RCWV, 1.5Hrs ON, 0.5Hrs OFF.
Load Life	± (1.0% + 0.05)	± (3.0% + 0.10)	± (2.0% + 0.001)	JIS-C5202-7.10 70 , 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Low Temperature Operation	± (0.5% + 0.05)	± (1.0% + 0.05)	± (1.0% + 0.001)	MIL-R-5532D 4.7.4 1 Hrs, -55 , Followed by 45 minutes of RCWV.
Whisker Test	Max 50 μm			By SONY SS-00254-8, JIS-C5202

RCWV=Rated Continuous Working Voltage