RALEC

ISO9001/QS9000
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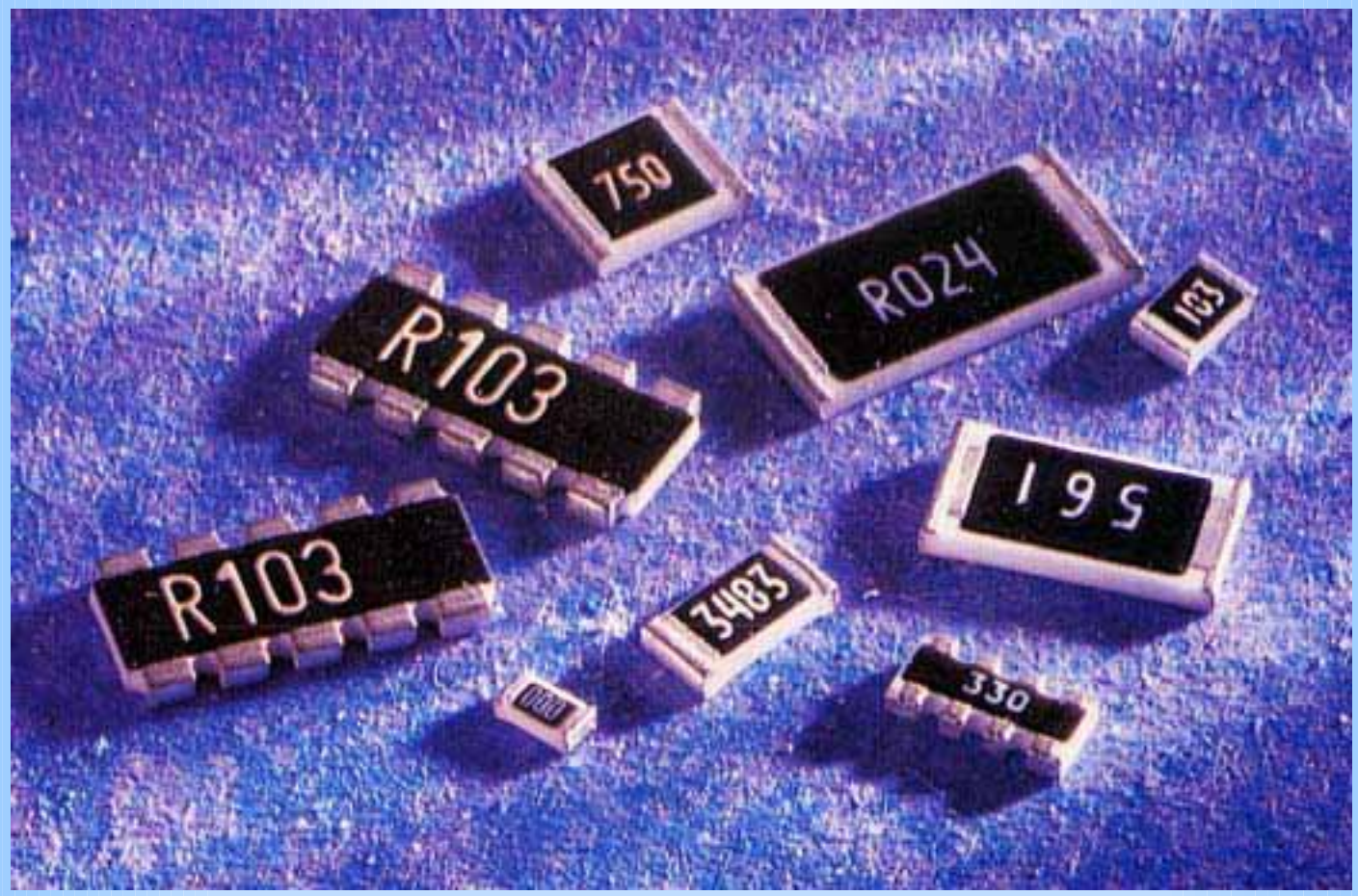
Quality,Service,Innovation

RESISTOR COMPONENTS



RALEC ELECTRONIC CORPORATION

http://www.ralec.com **2004 February**

INDEX

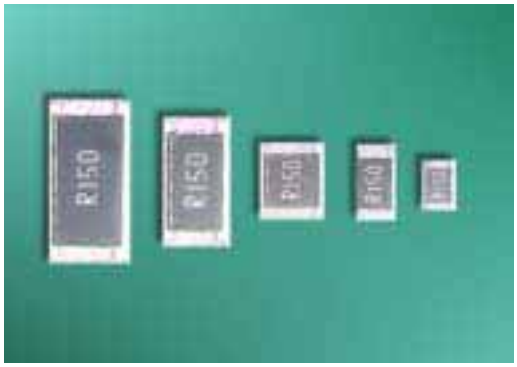
Resistors

Laboratory Kits

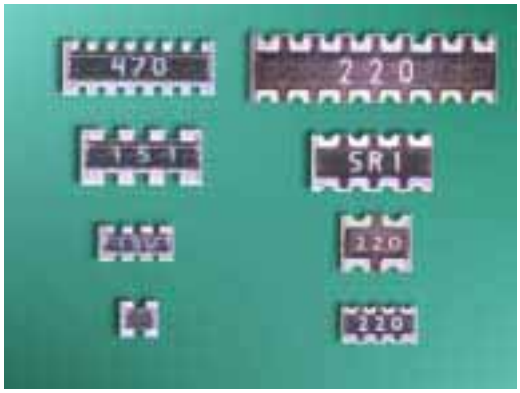
Ralec’ s Product

- **Thick Film Chip Resistors**

- **Thick Film Low-Ohmic Chip Resistors**



- **Thick Film Chip Resistors Array**



- **Thick Film Chip Resistors Network**

GLOSSARY

- **Rated Power**
  The maximum value of power which can be continuously loaded to a resistor at a rated ambient temperature. Please confirm beforehand that there is such a case in a network resistor that rated power per package as well as per element is specified.

- **Rated Voltage**
  The maximum value of D.C. voltage or A.C. voltage (commercial frequency effective value) capable of being applied continuously to a resistor at the rated ambient temperature.

- **Maximum Working Voltage**
  The maximum value of D.C. voltage or A.C. voltage (commercial frequency effective value) capable of being applied continuously to a resistor or a resistor element. However, the maximum value of the applicable voltage is the rated voltage at the critical resistance value or lower.

- **Maximum Overload Voltage**
  The maximum value of voltage capable of being applied to a resistor for five seconds in the overload test. (JIS-C5201-1 4.13). Typically the applied voltage in the short time overload test shall be 2.5 times larger than the rated voltage. However, it shall not exceed the maximum overload voltage.

- **Rated Ambient temperature**
  The maximum ambient temperature at which a resistor is capable of being used continuously with the prescribed rated load (power). The rated ambient temperature refers to the temperature around the resistor inside the equipment, not to the air-temperature outside the equipment.

- **Derating Curve**
  The curve that expresses the relation between the ambient temperature and the maximum value of continuously loadable power at its temperature, which is generally expressed in percentage.

Thick Film Chip Resistors

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

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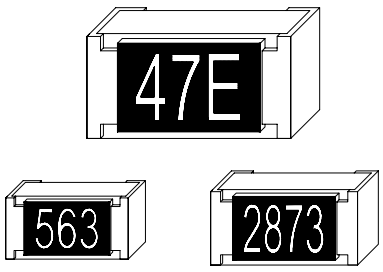
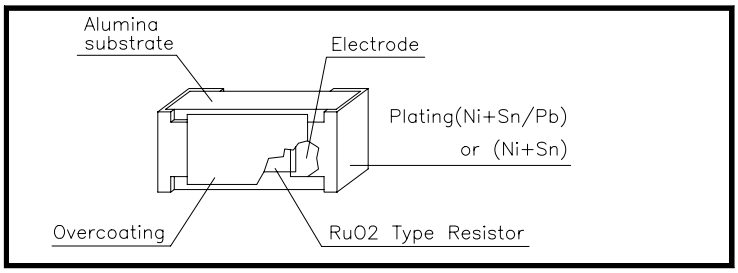


■ Construction



■ 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 electrial equipment, PDA, Digital Camera....
4.Battery changer, DC-DC power converter
5.Automotive

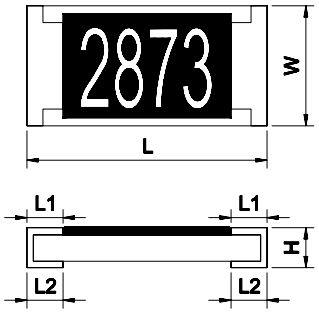
■ Explanation of Part Numbers

(EX) **RCT 03 101 J TP**

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

■ Dimensions

Unit:mm

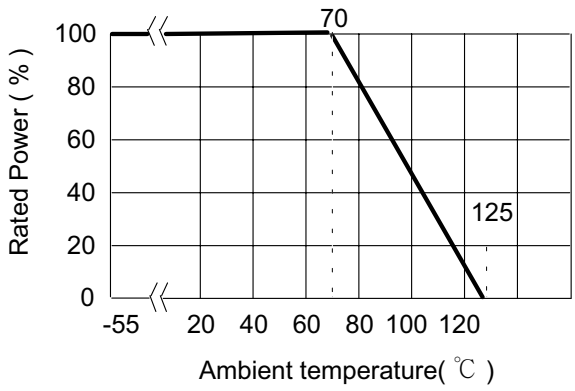


Type \ Dimensions	L	W	H	L1	L2
RCT01 (0201)	0.60± 0.03	0.30± 0.03	0.23± 0.03	0.12± 0.05	0.15± 0.05
RCT&RTT02 (0402)	1.00± 0.10	0.50± 0.05	0.30± 0.05	0.20± 0.10	0.25± 0.10
RCT&RTT03 (0603)	1.55± 0.10	0.80 $^{+0.15}_{-0.05}$	0.45± 0.10	0.30± 0.15	0.30± 0.15
RCT&RTT05 (0805)	2.00± 0.10	1.25± 0.10	0.50± 0.10	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

■ 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		
RCT01	1/20W	25V	50V	±250	------	------	10Ω~1MΩ	------	10Ω~1MΩ	0.5A	100mΩ MAX
RCT RTT 02	1/16W	50V	100V	+500 −200	------	------	1Ω~9.9Ω	1Ω~9.9Ω	1Ω~9.9Ω	1A	50mΩ MAX
				±200	------	100Ω~990Ω	10Ω~990Ω	10Ω~990Ω	10Ω~990Ω		
				±300	------	1K~1MΩ	1K~4M7Ω	1K~4M7Ω	1K~10MΩ		
RCT RTT 03	1/10W	50V	100V	±100	100Ω~1MΩ	100Ω~1MΩ	33Ω~1MΩ	------	------	1A	50mΩ MAX
				±200	------	10Ω~99Ω	10Ω~32Ω 1.1M~10MΩ	10Ω~10MΩ	10Ω~10MΩ		
				±400	------	------	1Ω~9.9Ω	1Ω~9.9Ω	1Ω~9.9Ω 11MΩ-26MΩ		
RCT RTT 05	1/8W	150V	300V	±100	100Ω~1MΩ	100Ω~1MΩ	33Ω~1MΩ	------	------	2A	50mΩ MAX
				±200	------	------	10Ω~32Ω 1.1M~10M	10Ω~10MΩ	10Ω~10MΩ		
				±400	------	------	1Ω~9.9Ω	1Ω~9.9Ω	1Ω~9.9Ω 11MΩ-26MΩ		
RCT RTT 06	1/4W	200V	400V	±100	100Ω~1MΩ	100Ω~1MΩ	33Ω~1MΩ	------	------	2A	50mΩ MAX
				±200	------	------	10Ω~32Ω 1.1M~10MΩ	10Ω~10MΩ	10Ω~10MΩ		
				±400	------	------	1Ω~9.9Ω	1Ω~9.9Ω	1Ω~9.9Ω 11MΩ-26MΩ		
RCT RTT 12	1/3W	200V	400V	±100	100Ω~ 1MΩ	100Ω~ 1MΩ	33Ω~1MΩ	------	------	2A	50mΩ MAX
				±200	------	------	10Ω~32Ω 1.1M~10M	10Ω~10M	10Ω~20MΩ		
				±400	------	------	1Ω~9.9Ω	1Ω~9.9Ω	1Ω~9.9Ω		
RCT RTT 20	3/4W	200V	400V	±100	------	------	10Ω~1MΩ	------	------	2A	50mΩ MAX
				±200	------	------	------	10Ω~1MΩ	10Ω~1MΩ		
				±400	------	------	------	------	1Ω~9.9Ω		
RCT RTT 25	1W	200V	400V	±100	------	------	10Ω~1MΩ	------	------	2A	50mΩ MAX
				±200	------	------	------	10Ω~1MΩ	10Ω~10MΩ		
				±400	------	------	------	------	1Ω~9.9Ω		
Operating Temperature Range					−55℃ ~ +125℃						

■ Power Derating Curve



■ Marking

FOR E-24&E-96

◎2%,5% 3 digits indication
first 2 digits are significant figures
3rd digit is multiplier($10^{\times}$)
EX. Marking --> 563
$56 \times 10^3 = 56000\Omega = 56K\Omega$

◎1% 4 digits indication
first 3 digits are significant figures
4th digit is multiplier($10^{\times}$)
EX. Marking --> 3922
$392 \times 10^2 = 39200\Omega = 39.2K\Omega$

FOR RCT03 1%(E-96)

◎3 digit indication
first 2 digits are significant for E-96 Part marking scheme.
3rd digit is multiplier:

$Y=10^{-2}$	$X=10^{-1}$	$A=10^0$	$B=10^1$
$C=10^2$	$D=10^3$	$E=10^4$	$F=10^5$

Type RCT01,02:No marking Code

Thick Film Low-Ohmic Chip Resistors

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

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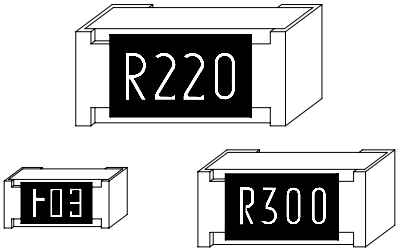
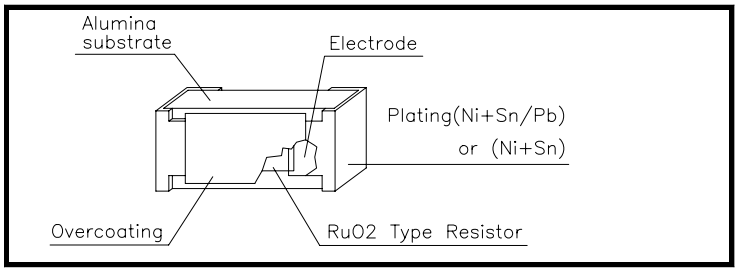


■ Construction



■ Feature

1.Small size and light weight
2.High reliability and stability
3.Lower assembly cost
4.Suitable for reflow and flow soldering

■ Application

1.NB / MB / Monitor(For power management)
2.Mobile phone, Telecom....
3.Digital meter, PDAs....
4.Battery changer, DC-DC power converter, Power supply....
5.Automotive

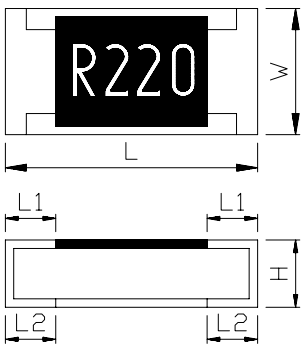
■ Explanation of Part Numbers

(EX) **RCT 03 R330 J TP**

Type	Size	Nominal Resistance		Resistance Tolerance	Packaging	
Thick Film Chip Resistors	03(0603)	3 – Digit	E24 Series EX 330mΩ=R33 40mΩ=R04	F=± 1%	TP	4 mm Pitch Paper(Taping) 5000 pcs
RCT:Sn/Pb Process RTT:Sn(Tin) Process	05(0805)	4 – Digit	E24,E96 Series EX 330mΩ=R330 40mΩ=R040	G=± 2%	P2	4 mm Pitch Paper(Taping) 10000 pcs
	06(1206)			J=± 5%	P3	4 mm Pitch Paper(Taping) 15000 pcs
	12(1210)				P4	4 mm Pitch Paper(Taping) 20000 pcs
	20(2010)				TE	4 mm Pitch Emboss(Taping) 4000 pcs
	25(2512)					

■ Dimensions

Unit:mm

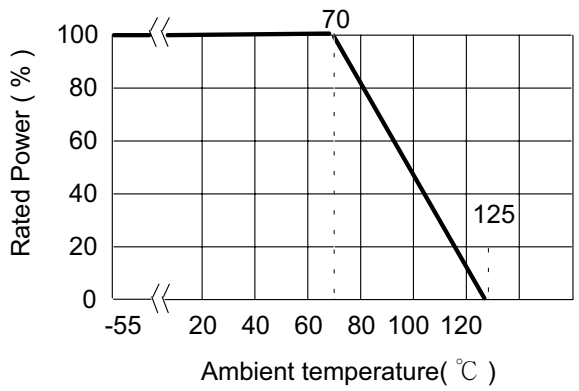


Type \ Dimensions	L	W	H	L1	L2
RCT&RTT03 (0603)	1.55± 0.10	0.80+0.10 -0.05	0.45± 0.10	0.30± 0.15	0.30± 0.15
RCT&RTT05 (0805)	2.00± 0.10	1.25± 0.10	0.50± 0.10	0.35± 0.20	0.35± 0.15
RCT&RTT06 (1206)	3.05± 0.10	1.55± 0.10	0.55+0.10 -0.05	0.45± 0.20	0.35± 0.15
RCT&RTT12 (1210)	3.05± 0.10	2.55± 0.10	0.55± 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

■ Standard electrical specifications

Type	Rated Power at 70℃	Max. Working Current	Max. Overload Current	T.C.R. (ppm/℃)	Resistance Range	
					F(±1%) E-24、E-96	G(±2%)、J(±5%) E-24
RCT&RTT03	1/10W	1.41A	3.52A	±600	50 ~ 99 mΩ	50 ~ 99 mΩ
				±300	100 ~ 199 mΩ	100 ~ 199 mΩ
				±600	200 ~ 499 mΩ	200 ~ 499 mΩ
				±400	500 ~ 976 mΩ	500 ~ 910 mΩ
RCT&RTT05	1/8W	1.94A	4.85A	±800	33 ~ 49 mΩ	33 ~ 49 mΩ
				±600	50 ~ 99 mΩ	50 ~ 99 mΩ
				±300	100 ~ 199 mΩ	100 ~ 199 mΩ
				±500	200 ~ 499 mΩ	200 ~ 499 mΩ
				±400	500 ~ 976 mΩ	500 ~ 910 mΩ
RCT&RTT06	1/3W	3.65A	9.12A	±1000	25 ~ 49 mΩ	25 ~ 49 mΩ
				±600	50 ~ 99 mΩ	50 ~ 99 mΩ
				±300	100 ~ 199 mΩ	100 ~ 199 mΩ
				±500	200 ~ 499 mΩ	200 ~ 499 mΩ
				±400	500 ~ 976 mΩ	500 ~ 910 mΩ
RCT&RTT12	1/3W	3.65A	9.12A	±700	25 ~ 49 mΩ Ω	25 ~ 49 mΩ
				±400	50 ~ 99 mΩ	50 ~ 99 mΩ
				±200	100 ~ 199 mΩ	100 ~ 199 mΩ
				±400	200 ~ 499 mΩ	200 ~ 499 mΩ
				±300	500 ~ 976 mΩ	500 ~ 910 mΩ
RCT&RTT20	1/2W	4.47A	11.17A	±900	25 ~ 49 mΩ	25 ~ 49 mΩ
				±500	50 ~ 99 mΩ	50 ~ 99 mΩ
				±300	100 ~ 199 mΩ	100 ~ 199 mΩ
				±500	200 ~ 499 mΩ	200 ~ 499 mΩ
				±400	500 ~ 976 mΩ	500 ~ 910 mΩ
RCT&RTT25	1W	6.32A	15.80A	±900	25 ~ 49 mΩ	25 ~ 49 mΩ
				±500	50 ~ 99 mΩ	50 ~ 99 mΩ
				±300	100 ~ 199 mΩ	100 ~ 199 mΩ
				±500	200 ~ 499 mΩ	200 ~ 499 mΩ
				±400	500 ~ 976 mΩ	500 ~ 910 mΩ
Operating Temperature Range				−55℃ ~ +125℃		

■ Power Derating Curve

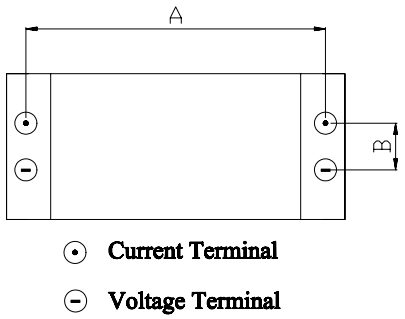


■ Marking

FOR RCT05、06、12、20、25
◎1%、2%、5% (E24、E96)
4 digits indication
later 3 digits are significant figures
first digit is multiplier
EX.Marking --> R330
330 × 10^{-3} = 0.33Ω = 330mΩ

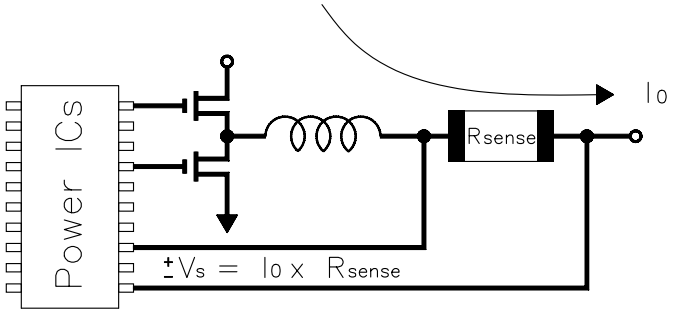
FOR RCT03
◎1%、2%、 5%(E-24)
3 digits indication
later 2 digits are significant figures
first digit is multiplier
EX.Marking --> R33
33 × 10^{-2} = 0.33Ω = 330mΩ
Marking --> 033
33 × 10^{-3} = 0.033Ω = 33mΩ

■ Measurement Point For Low-Ohmic Chip Resistors



TYPE \ DIM	A	B
RCT&RTT03	1.35± 0.05	0.35 ± 0.05
RCT&RTT05	1.80 ± 0.05	0.35 ± 0.05
RCT&RTT06	2.90 ± 0.05	0.35 ± 0.05
RCT&RTT12	2.90 ± 0.05	0.35 ± 0.05
RCT&RTT20	4.50 ± 0.05	1.15 ± 0.05
RCT&RTT25	5.90 ± 0.05	1.60 ± 0.05

■ Function For Low-Ohmic Chip Resistors



Selection of R sense:
On general case, the feedback voltage is set around 100 mV.

$100\ mV = I_o \times R\ sense$

where I_o means the maximum average output current.

■ Standard Resistance Values

For 2%,5%(E-24)

10	11	12	13	15
16	18	20	22	24
27	30	33	36	39
43	47	51	56	62
68	75	82	91	

For 1%(E-96)

100	102	105	107	110	113	115	118	121	124	127	130
133	137	140	143	147	150	154	158	162	165	169	174
178	182	187	191	196	200	205	210	215	221	226	232
237	243	249	255	261	267	274	280	287	294	301	309
316	324	332	340	348	357	365	374	383	392	402	412
422	432	442	453	464	475	487	499	511	523	536	549
562	576	590	604	619	634	649	665	681	698	715	732
750	768	787	806	825	845	866	887	909	931	953	976

■ Alternate Marking Method

For RCT03 1%(E-96)

Code	R Value	Code	R Value	Code	R Value	Code	R Value	Code	R Value	Code	R Value	Code	R Value	Code	R Value
1	100	13	133	25	178	37	237	49	316	61	422	73	562	85	750
2	102	14	137	26	182	38	243	50	324	62	432	74	576	86	768
3	105	15	140	27	187	39	249	51	332	63	442	75	590	87	787
4	107	16	143	28	191	40	255	52	340	64	453	76	604	88	806
5	110	17	147	29	196	41	261	53	348	65	464	77	619	89	825
6	113	18	150	30	200	42	267	54	357	66	475	78	634	90	845
7	115	19	154	31	205	43	274	55	365	67	487	79	649	91	866
8	118	20	158	32	210	44	280	56	374	68	499	80	665	92	887
9	121	21	162	33	215	45	287	57	383	69	511	81	681	93	909
10	124	22	165	34	221	46	294	58	392	70	523	82	698	94	931
11	127	23	169	35	226	47	301	59	402	71	536	83	715	95	953
12	130	24	174	36	232	48	309	60	412	72	549	84	732	96	976

■ Reliability Test

Item	Specification			Test Method
	R:≧1Ω		R:＜1Ω	
	0.5%、1%	2%、5%	1%、 2%、5%	
Temperature Coefficient of Resistance	Within the specification of TCR			JIS-C5202-5.2 $TCR\ (ppm/℃) = \frac{(R2-R1)}{R1\ (T2-T1)} \times 10$ R1: Resistance at room temperature R2: Resistance at -55℃ or +125℃ T1: Room temperature T2:Temperature -55℃ or +125℃
Short Time Overload	± (1.0%+0.05Ω)	± (2.0%+0.10Ω)	± (2.0%+0.001Ω)	JIS-C5202-5.5 Apply 2.5 times rated voltage or Max. Overload Voltage for 5 seconds.
	RCT01 : ± (2.0%+0.10Ω)			
Insulation Resistance	≧10^9Ω			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	± (5.0%+0.10Ω)		± (5.0%+0.001Ω)	JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle. (RCT01 N/A)
Bending Strength	± (1.0%+0.05Ω)		± (1.0%+0.001Ω)	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	± (0.5%+0.05Ω)		± (1.0%+0.001Ω)	JIS-C5202-6.9 Immersed into ispropyl alcohol of 23 ~ 25℃ for 60 seconds.
Resistance to Soldering Heat	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	± (1.0%+0.001Ω)	JIS-C5202-6.10 Immerse for 10 sec. in solder at 260± 5℃.
	RCT01 : ± (2.0%+0.10Ω)			
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	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	± (1.0%+0.001Ω)	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	± (1.0%+0.05Ω)	± (2.0%+0.10Ω)	± (1.0%+0.001Ω)	JIS-C5202-7.2 96 Hrs at 125℃
	RCT01 : ± (5.0%+0.10Ω)			
Temperature Cycling	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	± (1.0%+0.001Ω)	JIS-C5202-7.4 Cycle between -55℃ and +125℃ 30 minute for 5 cycles.
	RCT01 : ± (5.0%+0.10Ω)			
Loading Life in Moisture	± (0.5%+0.05Ω)	± (2.0%+0.10Ω)	± (2.0%+0.001Ω)	JIS-C5202-7.9 40± 2℃,90~95 %RH 1000Hrs at RCWV, 1.5Hrs ON, 0.5Hrs OFF.
	RCT01 : ± (5.0%+0.10Ω)			
Load Life	± (1.0%+0.05Ω)	± (3.0%+0.10Ω)	± (2.0%+0.001Ω)	JIS-C5202-7.10 70℃, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF.
	RCT01 : ± (5.0%+0.10Ω)			
Low Temperature Operation	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	± (1.0%+0.001Ω)	MIL-R-5532D 4.7.4 1 Hrs, -55℃ ,Followed by 45 minutes of RCWV. (RCT01 N/A)

RCWV=Rated Continuous Working Voltage

■ Reliability Test

Item	Specification			Test Method
	R:≧1Ω		R:＜1Ω	
	0.5%、1%	2%、5%	1%、 2%、5%	
Temperature Coefficient of Resistance	Within the specification of TCR			JIS-C5202-5.2 TCR (ppm/℃) = $\frac{(R2-R1)}{R1\ (T2-T1)} \times 10$ R1: Resistance at room temperature R2: Resistance at -55℃ or +125℃ T1: Room temperature T2:Temperature -55℃ or +125℃
Short Time Overload	± (1.0%+0.05Ω)	± (2.0%+0.10Ω)	± (2.0%+0.001Ω)	JIS-C5202-5.5 Apply 2.5 times rated voltage or Max. Overload Voltage for 5 seconds.
Insulation Resistance	≧10^9Ω			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%+0.10Ω)		± (5.0%+0.001Ω)	JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle.
Core Body Strength	± (1.0%+0.05Ω)		± (1.0%+0.001Ω)	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%+0.05Ω)		± (1.0%+0.001Ω)	JIS-C5202-6.9 Immersed into ispropyl alcohol of 23 ~ 25℃ for 60 seconds.
Resistance to Soldering Heat	± (1.0%+0.05Ω)		± (1.0%+0.001Ω)	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%+0.05Ω)		± (1.0%+0.001Ω)	By SONY SS-00254-7, JIS-C5202-6.1.4
	Average change ratio of robustness after temperature cycle :50% or less			
Leaching Test	Coverage≧95%			By SONY SS-00254-9
Vibration	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	± (1.0%+0.001Ω)	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%+0.05Ω)	± (2.0%+0.10Ω)	± (1.0%+0.001Ω)	JIS-C5202-7.2 96 Hrs at 125℃
Temperature Cycling	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	± (1.0%+0.001Ω)	JIS-C5202-7.4 Cycle between -55℃ and +125℃ 30 minute for 5 cycles.
Loading Life in Moisture	± (0.5%+0.05Ω)	± (2.0%+0.10Ω)	± (2.0%+0.001Ω)	JIS-C5202-7.9 40± 2℃,90~95 %RH ,1000Hrs at RCWV, 1.5Hrs ON, 0.5Hrs OFF.
Load Life	± (1.0%+0.05Ω)	± (3.0%+0.10Ω)	± (2.0%+0.001Ω)	JIS-C5202-7.10 70℃, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Low Temperature Operation	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	± (1.0%+0.001Ω)	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

Thick Film Chip Resistors Array : Concave Termination

RCA&RTA 02-4C, 03-2C, 03-4C, 03-8C

RALEC

■ Feature

1.High reliability and stability.
2.Less solder bridge.
3.Efficiency, space and cost saving.
4.Strong body and terminations strength.
5.Higher self-alignment effect in reflow-soldering process.
6.Excellence performance in surface mounting assembly.

■ Application

1.Computer application, NB, MB, add-on card, harddisk....
2.Mobile phone, Telecom....
3.Consumer electrial equipment, PDAs, Digital Camcorder....

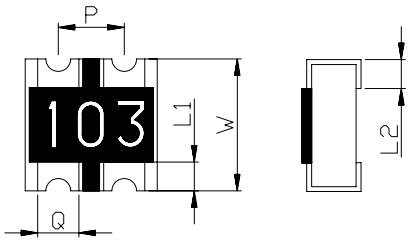
■ Explanation of Part Numbers

(EX) RCA 03 — 4 C 101 J TP

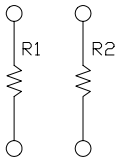
Type	Size	Number of Circuits	Terminal Type	Nominal Resistance			Resistance Tolerance	Packaging	
Chip Resistors Array RCA:Sn/Pb Process RTA:Sn(Tin) Process	02(0402) 03(0603)	2:2 circuits 4:4 circuits 8:8 circuits	C:Concave	Resistors	3-Digit	E24 Series EX 10Ω=100 100Ω=101	F=± 1% G=± 2% J=± 5%	TP	4 mm Pitch Paper (Taping) 5000 pcs
					4-Digit	E96 Series EX 10.2Ω=10R2 10KΩ=1002		P2	4 mm Pitch Paper (Taping) 10000 pcs
				Jumper		000		P3	4 mm Pitch Paper (Taping) 15000 pcs
								P4	4 mm Pitch Paper (Taping) 20000 pcs

■ Dimensions

RCA&RTA 03-2C

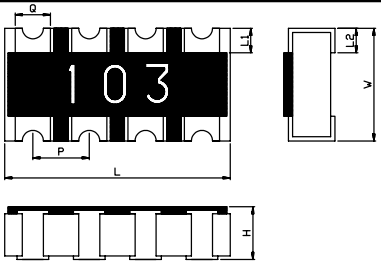


Circuits

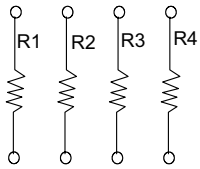


R1=R2

RCA&RTA 02-4C, 03-4C

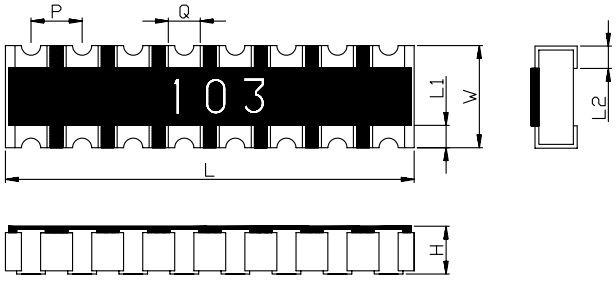


Circuits

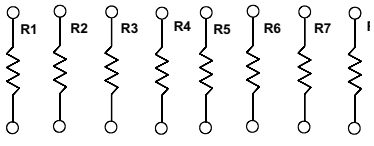


R1=R2=R3=R4

RCA&RTA 03-8C



Circuits



R1 = R2= R3 = R4 = R5 = R6 = R7 = R8

Unit:mm

Type \ Dimensions	L	W	H	L1	L2	P	Q
RCA&RTA02-4C (0402)	2.00± 0.10	1.00± 0.10	0.40± 0.10	0.15± 0.10	0.25± 0.10	(0.50)	0.30± 0.10
RCA&RTA03-2C (0603)	1.60±0.15	1.60±0.15	0.55±0.10	0.30±0.15	0.40±0.15	(0.80)	0.50±0.10
RCA&RTA03-4C (0603)	3.20±0.15	1.60±0.15	0.55±0.10	0.35±0.15	0.45±0.15	(0.80)	0.50±0.10
RCA&RTA03-8C (0603)	6.40±0.20	1.60±0.20	0.55±0.10	0.30±0.15	0.40±0.15	(0.80)	0.50±0.10

■ Standard electrical specifications

Type	Rated Power at 70℃	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/℃)	Resistance Range		Number of Terminals	Number of Resistors	Jumper Rated Current	Jumper Resistance Value	Operating Temperature Range
					F(± 1%) E-96	G(± 2%) J(± 5%) E-24					
RCA&RTA02-4C (0402)	$\frac{1}{16}$W	25V	50V	±200	1Ω~1MΩ	1Ω~1MΩ	8	4	1A	50mΩ MAX	−55℃ | +125℃
RCA&RTA03-2C (0603)	$\frac{1}{16}$W	50V	100V	±200	1Ω~1MΩ	1Ω~10MΩ	4	2	1A	50mΩ MAX	
RCA&RTA03-4C (0603)	$\frac{1}{16}$W	50V	100V	±200	1Ω~1MΩ	1Ω~10MΩ	8	4	1A	50mΩ MAX	
RCA&RTA03-8C (0603)	$\frac{1}{16}$W	50V	100V	±200	1Ω~1MΩ	1Ω~10MΩ	16	8	1A	50mΩ MAX	

Thick Film Chip Resistors Array : Convex Termination

RCA&RTA 02-2D, 02-4D, 02-8D, 03-2D, 03-4D

RALEC

■ Feature

1.High reliability and stability
2.Efficiency, space and cost saving.

■ Application

1.Computer application, NB, MB, add-on card, harddisk....
2.Mobile phone, Telecom....
3.Consumer electrial equipment, PDAs, Digital Camcorder....

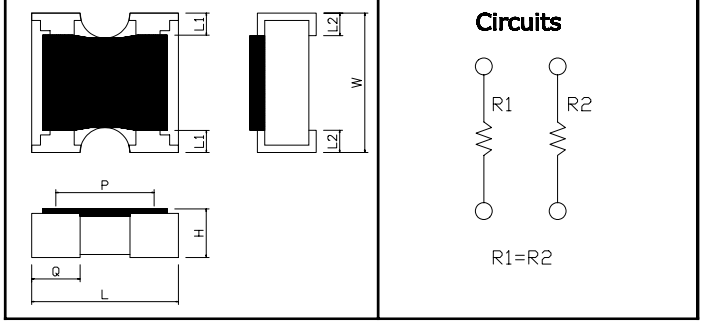
■ Explanation of Part Numbers

(EX) RCA 03 — 4 D 101 J TP

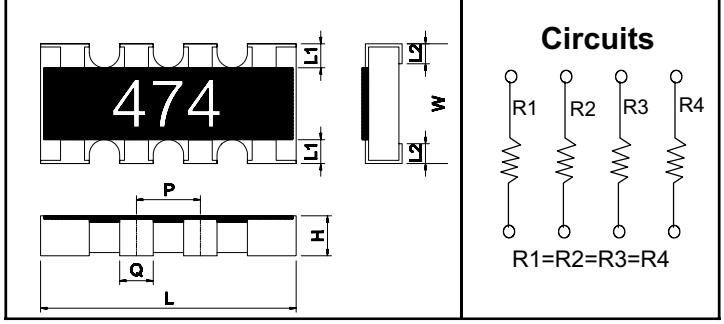
Type	Size	Number of Circuits	Terminal Type	Nominal Resistance			Resistance Tolerance	Packaging	
Chip Resistors Array RCA:Sn/Pb Process RTA:Sn(Tin) Process	02(0402) 03(0603)	2: 2 circuits 4: 4 circuits 8: 8 circuits	D:Convex	Resistors	3-Digit	E24 Series EX 10Ω=100 100Ω=101	F=± 1% G=± 2% J=± 5%	TP	4 mm Pitch Paper (Taping) 5000 pcs
					4-Digit	E96 Series EX 10.2Ω=10R2 10KΩ=1002		P2	4 mm Pitch Paper (Taping) 10000 pcs
				Jumper		000		P3	4 mm Pitch Paper (Taping) 15000 pcs
								P4	4 mm Pitch Paper (Taping) 20000 pcs

■ Dimensions

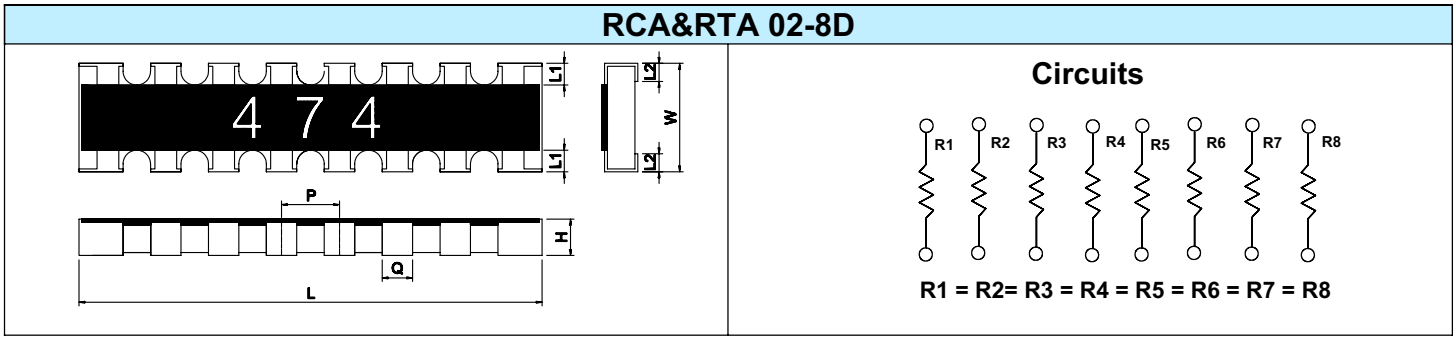
RCA&RTA 02-2D, 03-2D



RCA&RTA 02-4D, 03-4D



RCA&RTA 02-8D



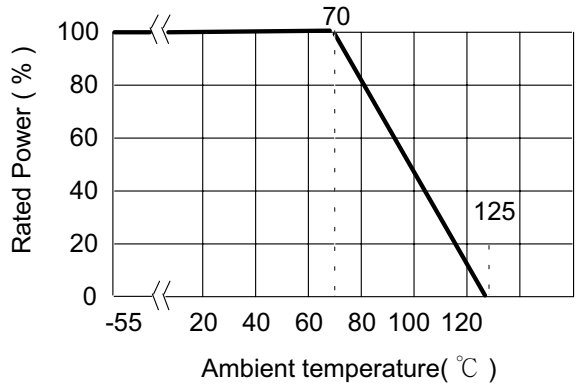
Unit:mm

Type \ Dimensions	L	W	H	L1	L2	P	Q
RCA&RTA02-2D (0402)	1.00± 0.10	1.00± 0.10	0.30± 0.05	0.15± 0.10	0.25± 0.10	(0.67)	0.33± 0.10
RCA&RTA02-4D (0402)	2.00± 0.10	1.00± 0.10	0.40± 0.10	0.20± 0.10	0.25± 0.10	(0.50)	0.30± 0.10
RCA&RTA02-8D (0402)	4.00±0.20	1.60±0.10	0.55±0.10	0.30±0.15	0.30±0.10	(0.50)	0.25±0.10
RCA&RTA03-2D (0603)	1.60± 0.15	1.60± 0.15	0.45± 0.10	0.30± 0.15	0.30± 0.15	(0.80)	0.60± 0.10
RCA&RTA03-4D (0603)	3.20± 0.20	1.60± 0.15	0.50± 0.10	0.30± 0.15	0.30± 0.15	(0.80)	0.50± 0.10

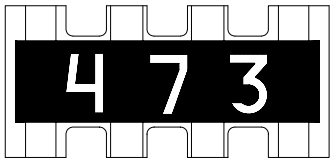
■ Standard electrical specifications

Type	Rated Power at 70℃	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/℃)	Resistance Range		Number of Terminals	Number of Resistors	Jumper Rated Current	Jumper Resistance Value	Operating Temperature Range
					F(± 1%) E-96	G(± 2%) J(± 5%) E-24					
RCA&RTA02-2D (0402)	1/16W	25V	50V	±250	-----	10Ω~1MΩ	4	2	1A	50mΩ MAX	−55℃ | +125℃
RCA&RTA02-4D (0402)	1/16W	25V	50V	±200	----	10Ω~1MΩ	8	4	1A	50mΩ MAX	
RCA&RTA02-8D (0402)	1/16W	25V	50V	±200	----	10Ω~1MΩ	16	8	1A	50mΩ MAX	
RCA&RTA03-2D (0603)	1/16W	50V	100V	±200	----	1Ω~10MΩ	4	2	1A	50mΩ MAX	
RCA&RTA03-4D (0603)	1/16W	50V	100V	±200	1Ω~10MΩ	1Ω~10MΩ	8	4	1A	50mΩ MAX	

■ Power Derating Curve



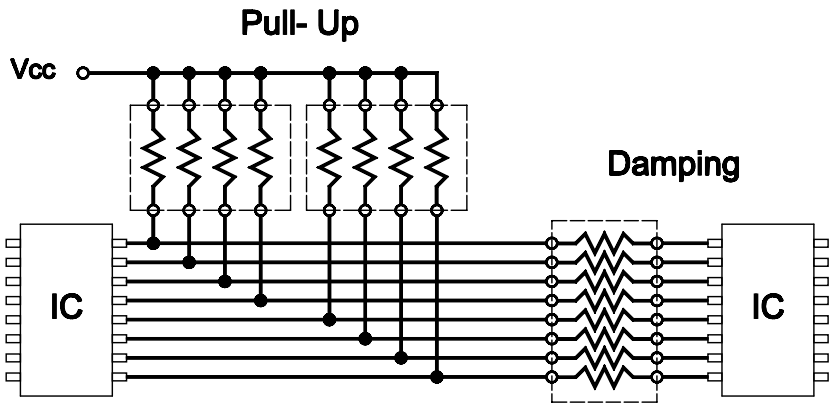
■ Marking



FOR E-24&E-96
◎ 2%,5% 3 digit indication
first 2 digits are significant figures
3rd digit is multiplier($10^{\times}$)
EX. Marking --> 473
$47 \times 10^3 = 47000\Omega = 47K\Omega$
◎1% 4 digit indication
first 3 digits are significant figures
4th digit is multiplier($10^{\times}$)
EX. Marking --> 3922
$392 \times 10^2 = 39200\Omega = 39.2K\Omega$

Type 02-2D:No marking Code

■ Typical Application



■ Reliability Test

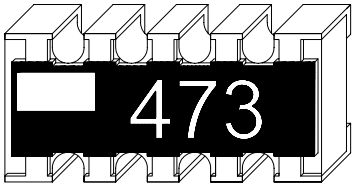
Item	Specification		Test Method
	0.5%、1%	2%、5%	
Temperature Coefficient of Resistance	Within the specification of TCR		JIS-C5202-5.2 $TCR\ (ppm/℃) = \frac{(R2-R1)}{R1\ (T2-T1)} \times 10$ R1: Resistance at room temperature R2: Resistance at -55℃ or +125℃ T1: Room temperature T2:Temperature -55℃ or +125℃
Short Time Overload	± (1.0%+0.05Ω)	± (2.0%+0.10Ω)	JIS-C5202-5.5 Apply rated voltage 2.5 times for 5 seconds.
Insulation Resistance	≧10^9Ω		JIS-C5202-5.6 Put the resistor in the fixture, add 100 VDC in +,- termination for 60 seconds then measured the insulation resistance.
Dilectric Withstand Voltage	No short or burned on the appearance		JIS-C5202-5.7 Put the resistor in the fixture, add 300 VDC in +,- termination for 60 seconds.
Intermittent Overload	± (5.0%+0.10Ω)		JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle
Bending Strength	± (1.0%+0.05Ω)		JIS-C5202-6.1.4 5mm deflection in either direction.
Resistance to Solvent	± (0.5%+0.05Ω)		JIS-C5202-6.9 Immersed into ispropyl alcohol of 23 ~ 25℃ for 60 seconds.
Resistance to Soldering Heat	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	JIS-C5202-6.10 Immerse for 10 sec. in solder at 260± 5℃.
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℃.
Resistance to dry heat	± (1.0%+0.05Ω)	± (2.0%+0.10Ω)	JIS-C5202-7.2 96 Hrs at 125℃
Temperature Cycling	± (1.0%+0.05Ω)		JIS-C5202-7.4 Cycle between -55℃ and +125℃ for 5 cycles
Loading Life in Moisture	± (2.0%+0.10Ω)	± (3.0%+0.10Ω)	JIS-C5202-7.9 40℃, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Load Life	± (2.0%+0.10Ω)	± (3.0%+0.10Ω)	JIS-C5202-7.10 70℃, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Low Temperature Operation	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	MIL-R-5532D 4.7.4 1 Hrs, -55℃ ,Followed by 45 Minutes of RCWV.

RCWV=Rated Continuous Working Voltage

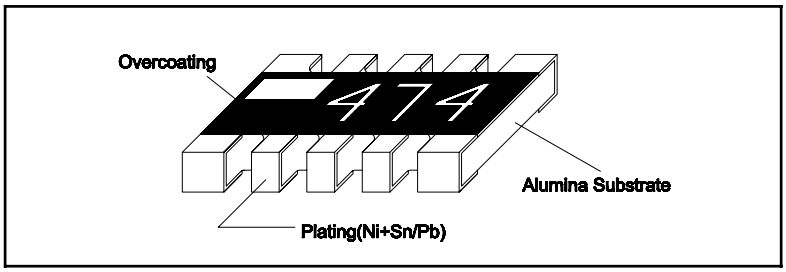
■ Reliability Test

Item	Specification		Test Method
	1%	2%、5%	
Temperature Coefficient of Resistance	Within the specification of TCR		JIS-C5202-5.2 TCR (ppm/℃) = $\frac{(R2-R1)}{R1\ (T2-T1)} \times 10$ R1: Resistance at room temperature R2: Resistance at -55℃ or +125℃ T1: Room temperature T2:Temperature -55℃ or +125℃
Short Time Overload	± (1.0%+0.05Ω)	± (2.0%+0.10Ω)	JIS-C5202-5.5 Apply rated voltage 2.5 times for 5 seconds.
Insulation Resistance	≧10^9Ω		JIS-C5202-5.6 Put the resistor in the fixture, add 100 VDC in +,- termination for 60 seconds then measured the insulation resistance.
Dilectric Withstand Voltage	No short or burned on the appearance		JIS-C5202-5.7 Put the resistor in the fixture, add 300 VDC in +,- termination for 60 seconds.
Intermittent Overload	± (5.0%+0.10Ω)		JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle
Resistance to Solvent	± (0.5%+0.05Ω)		JIS-C5202-6.9 Immersed into ispropyl alcohol of 23 ~ 25℃ for 60 seconds.
Resistance to Soldering Heat	± (1.0%+0.05Ω)		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%+0.05Ω) Average change ratio of robustness after temperature cycle:50% or less		By SONY SS-00254-7, JIS-C5202-6.1.4
Leaching Test	Coverage≧95%		By SONY SS-00254-9
Resistance to dry heat	± (1.0%+0.05Ω)	± (2.0%+0.10Ω)	JIS-C5202-7.2 96 Hrs at 125℃
Temperature Cycling	± (1.0%+0.05Ω)		JIS-C5202-7.4 Cycle between -55℃ and +125℃ for 5 cycles
Loading Life in Moisture	± (2.0%+0.10Ω)	± (3.0%+0.10Ω)	JIS-C5202-7.9 40℃,90~95%RH ,1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Load Life	± (2.0%+0.10Ω)	± (3.0%+0.10Ω)	JIS-C5202-7.10 70℃, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Low Temperature Operation	± (0.5%+0.05Ω)	± (1.0%+0.05Ω)	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



■ Construction



■Feature

1.High reliability and stability
2.Efficiency, space and cost saving.

■Application

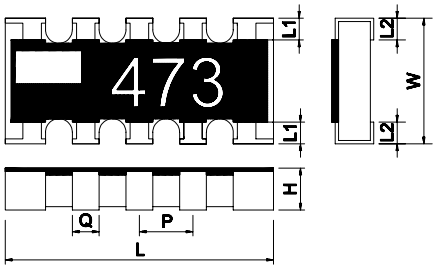
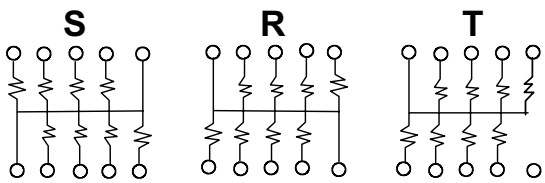
1.Computer application, NB, MB....

■ Explanation of Part Numbers

RCN 02 – 10 T 103 J TP

Type	Size	Number of Terminals	Circuit	Nominal Resistance	Resistance Tolerance	Packaging
Chip Resistors Network RCN:Sn/Pb Process RTN:Sn(Tin) Process	02	10	(see below)	3–Digit E12 Series EX 10Ω=100 1KΩ=102	J=± 5%	TP 4 mm Pitch Paper (Taping) 5000 pcs P2 4 mm Pitch Paper (Taping) 10000 pcs P3 4 mm Pitch Paper (Taping) 15000 pcs P4 4 mm Pitch Paper (Taping) 20000 pcs

■ Dimensions

RCN02-10T	Circuit
	

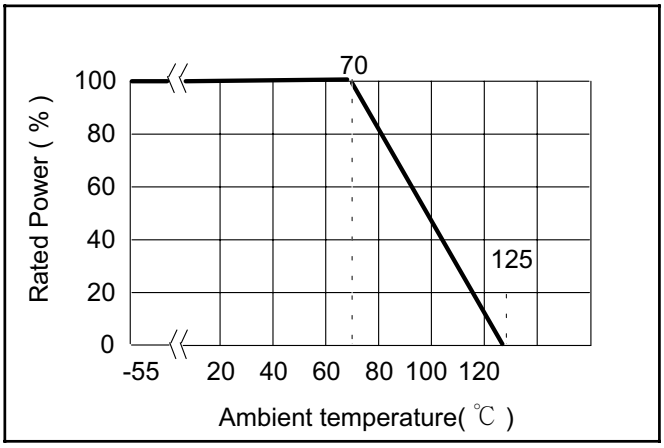
Unit: mm

Type \ Dimensions	L	W	H	L1	L2	P	Q
RCN&RTN02-10T RCN&RTN02-10R RCN&RTN02-10S	3.20± 0.20	1.60± 0.15	0.55± 0.10	0.30± 0.15	0.30± 0.15	0.64± 0.10	0.32± 0.10

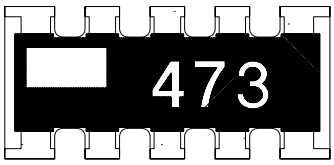
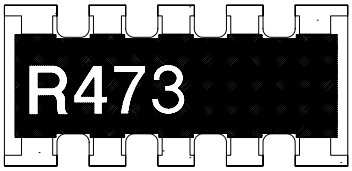
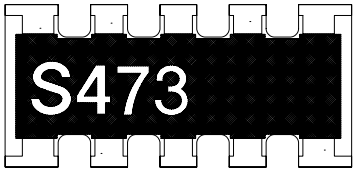
■ Standard electrical specifications

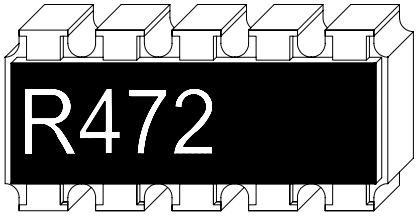
Type	Rated Power at 70℃	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/℃)	Resistance J(± 5%) E-12	Number of Terminals	Number of Resistors	Operating Temperature Range
RCN&RTN02-10T	$\frac{1}{16}W$	25V	50V	± 200	33Ω～1MΩ	10	8	−55℃～+125℃
RCN&RTN02-10R RCN&RTN02-10S					56Ω～1MΩ			

■ Power Derating Curve

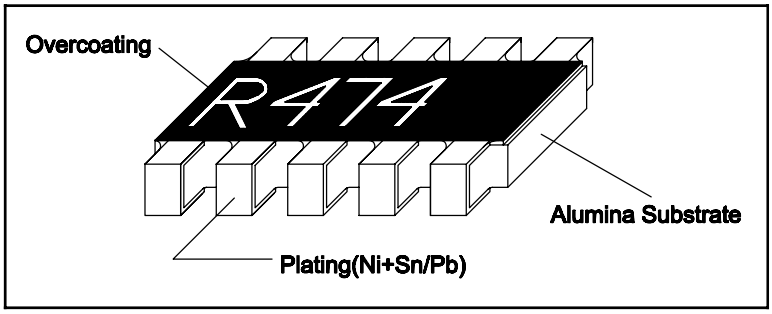


■Marking

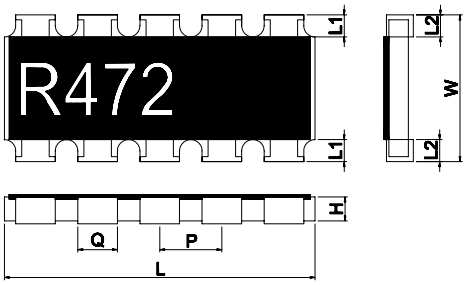
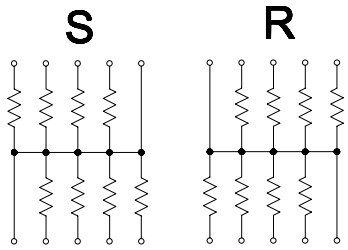
RCN&RTN02-10T	RCN&RTN02-10R	RCN&RTN02-10S
		
First Code : Circuit type T tyoe : Symbol ■ R type : Symbol R S type : Symbol S	The later three digits : Resistance code FOR E-12 ◎ 2%,5% 3 digit indication first 2 digits are significant figures 3rd digit is multiplier(10^{x}) EX.Marking --> 473 $47 \times 10^{3} = 47000\Omega = 47K\Omega$	



■ Construction



■ Dimensions

RCN&RTN 06-10R/S	Circuit
	

Unit: mm

Type \ Dimensions	L	W	H	L1	L2	P	Q
RCN&RTN06-10R RCN&RTN06-10S	6.40± 0.20	3.10± 0.20	0.55± 0.10	0.50± 0.20	0.50± 0.20	1.27± 0.10	0.80± 0.10

■ Ratings

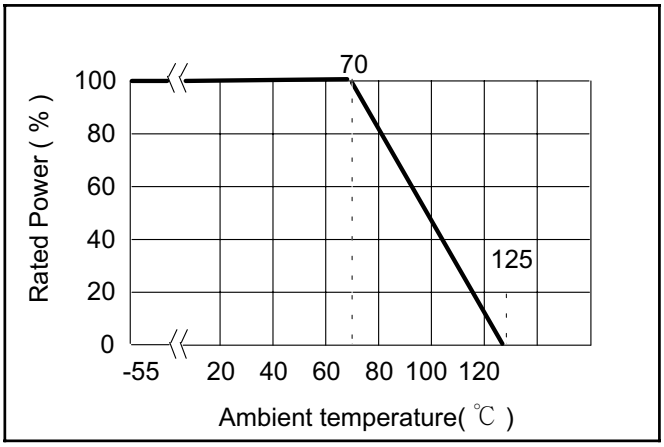
Type	Rated Power at 70℃	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/℃)	Resistance J(± 5%) E-12	Number of Terminals	Number of Resistors	Operating Temperature Range
RCN&RTN06-10R RCN&RTN06-10S	$\frac{1}{16}W$	50V	100V	± 200	10Ω～1MΩ	10	8	－55℃～＋125℃

■ Explanation of Part Numbers

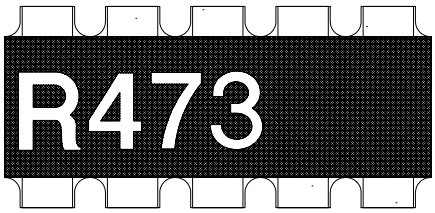
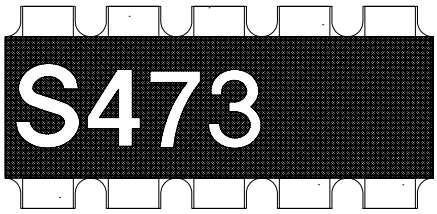
RCN 06 _ 10 R 103 J TE

Type	Size	Number of Terminals	Circuit	Nominal Resistance	Resistance Tolerance	Packaging
Chip Resistors Network RCN:Sn/Pb Process RTN:Sn(Tin) Process	06	10	(see above)	3—Digit E12 Series EX 10Ω＝100 1KΩ＝102	J＝± 5%	TE: 4 mm Pitch Emboss (Taping) 4000 pcs

■ Power Derating Curve



■Marking

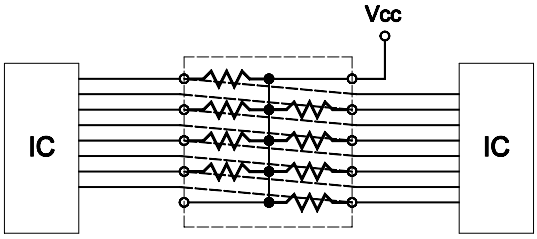
RCN&RTN06-10R	RCN&RTN06-10S
	
First Code : Circuit type R type : Symbol R S type : Symbol S	The later three digits : Resistance code FOR E-12 ◎ 2%,5% 3 digit indication first 2 digits are significant figures 3rd digit is multiplier(10^{x}) EX.Marking --> 473 $47 \times 10^{3} = 47000\Omega = 47K\Omega$

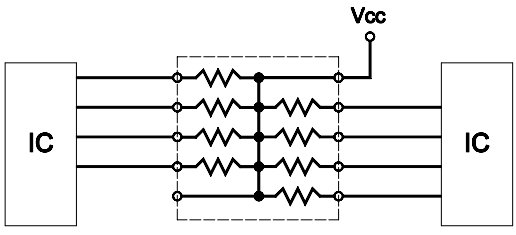
■ Reliability Test

Item	Specification 2%、5%	Test Method
Temperature Coefficient of Resistance	Within the specification of TCR	JIS-C5202-5.2 TCR (ppm/℃) = $\frac{(R2-R1)}{R1\ (T2-T1)} \times 10$ R1: Resistance at room temperature R2: Resistance at -55℃ or +125℃ T1: Room temperature T2:Temperature -55℃ or +125℃
Short Time Overload	± (2.0%+0.10Ω)	JIS-C5202-5.5 Apply rated voltage 2.5 times for 5 seconds.
Insulation Resistance	≧10^9Ω	JIS-C5202-5.6 Put the resistor in the fixture, add 100 VDC in +,- termination for 60 seconds then measured the insulation resistance.
Dilectric Withstand Voltage	No short or burned on the appearance	JIS-C5202-5.7 Put the resistor in the fixture, add 300 VDC in +,- termination for 60 seconds.
Intermittent Overload	± (5.0%+0.10Ω)	JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle
Bending Strength	± (1.0%+0.05Ω)	JIS-C5202-6.1.4 5mm deflection in either direction.
Resistance to Solvent	± (0.5%+0.05Ω)	JIS-C5202-6.9 Immersed into ispropyl alcohol of 23 ~ 25℃ for 60 seconds.
Resistance to Soldering Heat	± (1.0%+0.05Ω)	JIS-C5202-6.10 Immerse for 10 sec. in solder at 260± 5℃.
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℃.
Resistance to dry heat	± (2.0%+0.10Ω)	JIS-C5202-7.2 96 Hrs at 125℃
Temperature Cycling	± (1.0%+0.05Ω)	JIS-C5202-7.4 Cycle between -55℃ and +125℃ for 5 cycles
Loading Life in Moisture	± (2.0%+0.10Ω)	JIS-C5202-7.9 40℃,90~95%RH, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Load Life	± (3.0%+0.10Ω)	JIS-C5202-7.10 70℃, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Low Temperature Operation	± (1.0%+0.05Ω)	MIL-R-5532D 4.7.4 1 Hrs, -55℃ ,Followed by 45 Minutes of RCWV.

RCWV=Rated Continuous Working Voltage

■ Typical Application



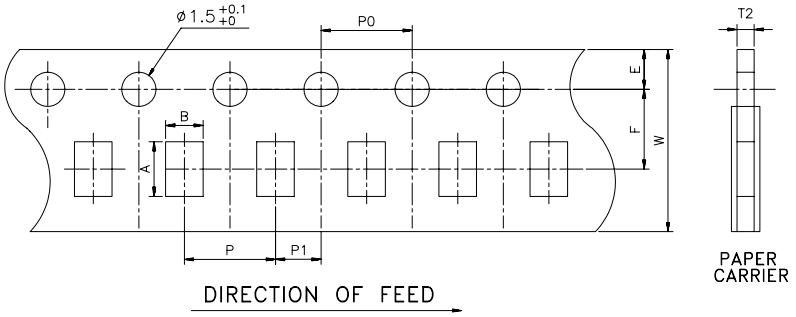


■ Reliability Test

Item	Specification 2%、5%	Test Method
Temperature Coefficient of Resistance	Within the specification of TCR	JIS-C5202-5.2 TCR (ppm/℃) $= \frac{(R2-R1)}{R1\ (T2-T1)} \times 10$ R1: Resistance at room temperature R2: Resistance at -55℃ or +125℃ T1: Room temperature T2:Temperature -55℃ or +125℃
Short Time Overload	± (2.0%+0.10Ω)	JIS-C5202-5.5 Apply rated voltage 2.5 times for 5 seconds.
Insulation Resistance	≧10^9Ω	JIS-C5202-5.6 Put the resistor in the fixture, add 100 VDC in +,- termination for 60 seconds then measured the insulation resistance.
Dilectric Withstand Voltage	No short or burned on the appearance	JIS-C5202-5.7 Put the resistor in the fixture, add 300 VDC in +,- termination for 60 seconds.
Intermittent Overload	± (5.0%+0.10Ω)	JIS-C5202-5.8 Apply rated voltage 2.5 times, 1sec ON, 25sec OFF, 10000 test cycle
Resistance to Solvent	± (0.5%+0.05Ω)	JIS-C5202-6.9 Immersed into ispropyl alcohol of 23 ~ 25℃ for 60 seconds.
Resistance to Soldering Heat	± (1.0%+0.05Ω)	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%+0.05Ω) Average change ratio of robustness after temperature cycle:50% or less	By SONY SS-00254-7, JIS-C5202-6.1.4
Leaching Test	Coverage≧95%	By SONY SS-00254-9
Resistance to dry heat	± (2.0%+0.10Ω)	JIS-C5202-7.2 96 Hrs at 125℃
Temperature Cycling	± (1.0%+0.05Ω)	JIS-C5202-7.4 Cycle between -55℃ and +125℃ for 5 cycles
Loading Life in Moisture	± (3.0%+0.10Ω)	JIS-C5202-7.9 40℃,90~95%RH ,1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Load Life	± (3.0%+0.10Ω)	JIS-C5202-7.10 70℃, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Low Temperature Operation	± (1.0%+0.05Ω)	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

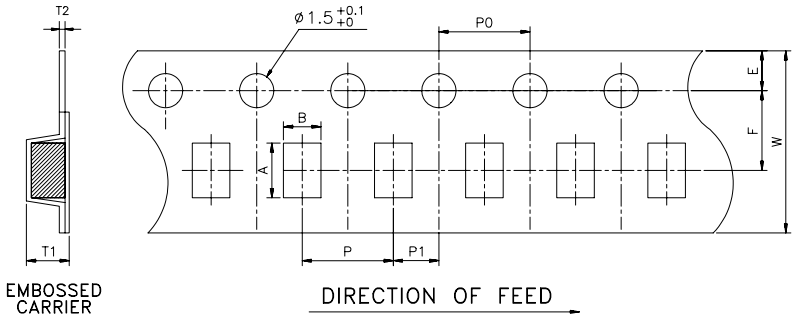
■ Paper Tape Specifications for RCT, RCA, RCN / RTT, RTA, RTN Series



RCT / RTT Series									Unit: mm
TYPE	A	B	W	E	F	T2	P	P0	P1
RCT01	0.68± 0.05	0.38± 0.05	8.0± 0.30	1.75± 0.10	3.5± 0.05	0.42± 0.05	2.0± 0.05	4.0± 0.10	1.0± 0.05
RCT02	1.15± 0.05	0.65± 0.05	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.45± 0.05	2.0± 0.10	4.0± 0.05	2.0± 0.05
RCT03	1.70± 0.10	1.00+0.1/-0.05	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.60± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCT05	2.30± 0.10	1.55± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCT06	3.50± 0.20	1.90± 0.20	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCT12	3.50± 0.20	2.80± 0.20	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05

RCA&RCN / RTA&RTN Series									Unit: mm
TYPE	A	B	W	E	F	T2	P	P0	P1
RCA02-2D	1.20± 0.10	1.20± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.43± 0.10	2.0± 0.10	4.0± 0.05	2.0± 0.05
RCA02-4D	2.20± 0.10	1.20± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.60± 0.10	2.0± 0.10	4.0± 0.05	2.0± 0.05
RCA02-4C	2.20± 0.10	1.20± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.60± 0.10	2.0± 0.10	4.0± 0.05	2.0± 0.05
RCA02-8D	4.30± 0.20	1.90± 0.10	12.0± 0.20	1.75± 0.10	5.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCA03-2D	1.90± 0.10	1.90± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.60± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCA03-2C	1.90± 0.10	1.90± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCA03-4D	3.45± 0.10	1.90± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCA03-4C	3.45± 0.10	1.90± 0.10	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCA03-8C	6.90± 0.20	2.00± 0.20	12.0± 0.20	1.75± 0.10	5.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCN02-10T/R/S	3.50± 0.20	1.90± 0.20	8.0± 0.20	1.75± 0.10	3.5± 0.05	0.75± 0.10	4.0± 0.10	4.0± 0.05	2.0± 0.05

■ Emboss Plastic Tape Specifications for RCT, RCN / RTT, RTN Series

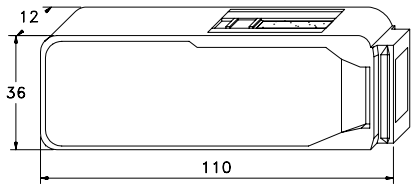


RCT&RCN / RTT&RTN Series										Unit: mm
TYPE	A	B	W	E	F	T1	T2	P	P0	P1
RCT 20	5.50± 0.20	2.80± 0.20	12.0± 0.20	1.75± 0.10	5.5± 0.05	0.85± 0.15	0.23± 0.15	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCT 25	6.70± 0.20	3.40± 0.20	12.0± 0.20	1.75± 0.10	5.5± 0.05	0.85± 0.15	0.23± 0.15	4.0± 0.10	4.0± 0.05	2.0± 0.05
RCN06-10R/S	6.70± 0.20	3.40± 0.20	12.0± 0.20	1.75± 0.10	5.5± 0.10	0.85± 0.15	0.23± 0.15	4.0± 0.10	4.0± 0.10	2.0± 0.10

■ Packaging Quantities

TYPE	Taping Package(pcs/reel)					
	Paper Tape					Plastic Tape
	2mm Pitch	4mm Pitch				4mm Pitch
	TH	TP	P2	P3	P4	TE
RCT01	10,000	-------	-------	-------	-------	-------
RCT02	10,000	-------	-------	-------	-------	-------
RCT03	-------	5,000	10,000	15,000	20,000	-------
RCT05	-------	5,000	10,000	15,000	20,000	-------
RCT06	-------	5,000	10,000	15,000	20,000	-------
RCT12	-------	5,000	10,000	15,000	20,000	-------
RCT20	-------	-------	-------	-------	-------	4,000
RCT25	-------	-------	-------	-------	-------	4,000
RCA02-2D	10,000	-------	-------	-------	-------	-------
RCA02-4D	10,000	-------	-------	-------	-------	-------
RCA02-4C	10,000	-------	-------	-------	-------	-------
RCA02-8D	-------	5,000	10,000	15,000	20,000	-------
RCA03-2D	-------	5,000	10,000	15,000	20,000	-------
RCA03-4D	-------	5,000	10,000	15,000	20,000	-------
RCA03-4C	-------	5,000	10,000	15,000	20,000	-------
RCA03-8C	-------	5,000	10,000	15,000	20,000	-------
RCN02-10T	-------	5,000	10,000	-------	-------	-------
RCN02-10R	-------	5,000	10,000	-------	-------	-------
RCN02-10S	-------	5,000	10,000	-------	-------	-------
RCN06-10R	-------	-------	-------	-------	-------	4,000
RCN06-10S	-------	-------	-------	-------	-------	4,000
Reel diameter	7”	7”	10”	13”	13”	7”

■ Bulk Case



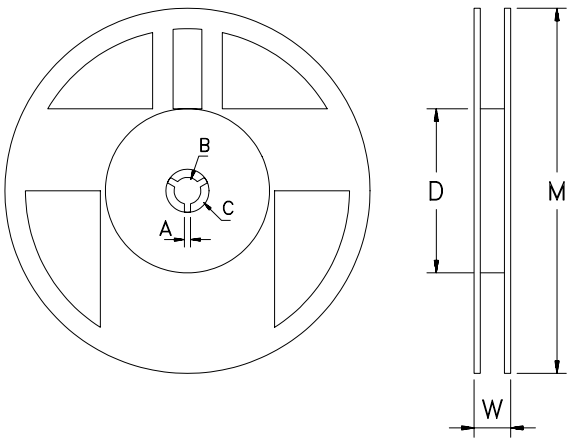
TYPE	Bulk Case(pcs./case)
RCT02	50,000
RCT03	25,000
RCT05	10,000
RCT06	5,000

Remark:

1.Typical taping type:TH、TP、TE

2. Other taping type are upon customer’s request

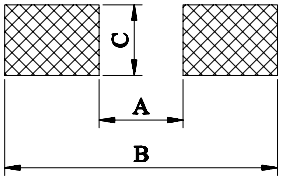
■ Reel Specification



Reel / Tape	W	M	A	B	C	D
7” reel for 8mm tape	12.5± 1.5	178± 2.0	2.0± 0.5	13.5± 0.5	21.0± 0.5	60.0± 2.0
7” reel for 12mm tape	16.5± 1.5	178± 2.0	2.0± 0.5	13.5± 0.5	21.0± 0.5	80.0± 2.0
10” reel for 8mm tape	14.0± 1.5	254± 2.0	2.0± 0.5	13.5± 0.5	21.0± 0.5	100.0± 2.0
13” reel for 8mm tape	14.0± 1.5	330± 2.0	2.0± 0.5	13.5± 0.5	21.0± 0.5	100.0± 2.0

Unit: mm

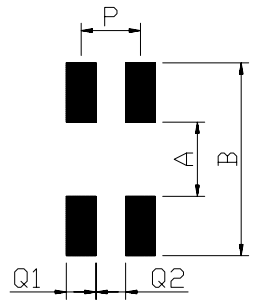
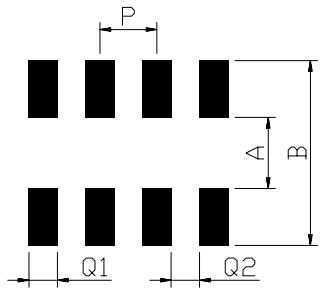
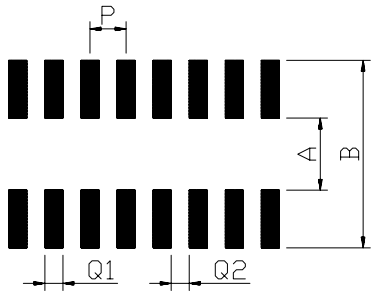
■ Recommand Land Pattern Design for RCT/RTT Series



TYPE \ DIM	A	B	C
01	0.36	1.00	0.40
02	0.50	1.60	0.50
03	0.80	2.50	0.80
05	1.00	3.50	1.20
06	2.00	4.50	1.50
12	2.00	5.00	2.50
20	3.50	7.50	2.50
25	4.00	9.00	3.00

Unit:mm

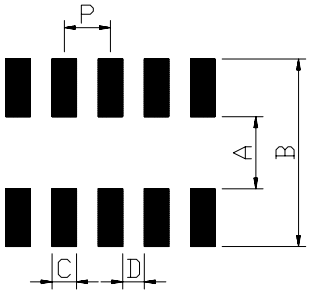
■ Recommand Land Pattern Design for RCA/RTA Series

02-2D 03-2D、03-2C	02-4D、02-4C 03-4D、03-4C	02-8D、03-8C
		

TYPE \ DIM	A	B	P	Q1	Q2
02-2D	0.50	2.00	0.67	0.33	0.34
02-4D、02-4C	0.50	2.00	0.50	0.28	0.22
03-2D、03-2C 03-4D、03-4C 03-8C	1.00	2.60	0.80	0.40	0.40
02-8D	1.00	2.60	0.50	0.25	0.25

Unit:mm

■ Recommand Land Pattern Design for RCN/RTN Series



TYPE \ DIM	A	B	C	D	P
02-10T/R/S	2.6	1.0	0.34	0.34	0.64
06-10R/S	4.2	2.0	0.80	0.47	1.27

Unit:mm

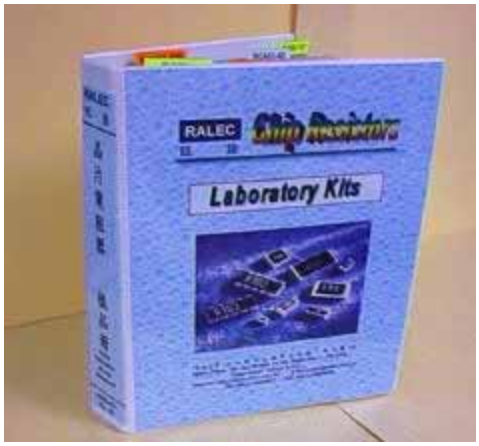
Surface Mount Resistors
Laboratory Kits

FEATURES

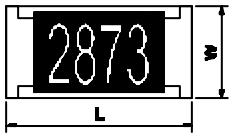
- ●Portable, extractable sample lists
- ●E-24、E96 series values in sample lists.
- ●14 series values per page.
- ●Each value individually packaged & labeled

PACKAGING

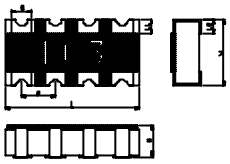
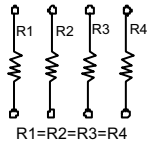
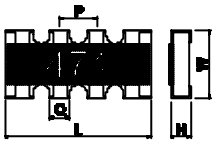
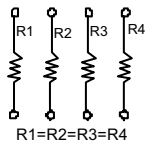
- ●50 pieces per value
- ●sample lists: 1Ω~10MΩ for E24 Series
  10Ω~1MΩ for E96 Series
- ●34 pages per list



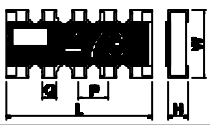
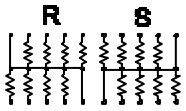
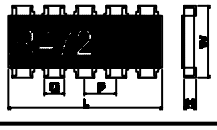
◎ Thick Film Chip Resistors

Series	Part NO.	Rated Power at 70℃	Case Size Dimension (mm) Appearance	L	W	H	Max. Working Voltage	Max. Overload Voltage	Jumper Resistance Value
LAB	RCT03	1/10W		1.60	0.80	0.45	50V	100V	50mΩ MAX
LAB	RCT05	1/8W		2.00	1.25	0.50	150V	300V	50mΩ MAX
LAB	RCT06	1/4W		3.10	1.55	0.55	200V	400V	50mΩ MAX

◎ Thick Film Chip Array

Series	Part NO.	Rated Power at 70℃	Case Size Dimension (mm) Appearance	L	W	H	P	Q	Max. Working Voltage	Max. Overload Voltage	Number of terminal	Numberof resistor	Jumper Resistance Value	Circuit
LAB	RCA03-4C	1/10W		3.20	1.60	0.55	0.80	0.50	50V	100V	8	4	50mΩ MAX	 R1=R2=R3=R4
LAB	RCA03-4D	1/10W		3.20	1.60	0.50	0.80	0.50	50V	100V	8	4	50mΩ MAX	 R1=R2=R3=R4

◎ Thick Film Chip Network

Series	Part NO.	Rated Power at 70℃	Case Size Dimension (mm) Appearance	L	W	H	P	Q	Max. Working Voltage	Max. Overload	Number of Terminal	Number of Resistor	Circuit
LAB	RCN02-10R/S/T	1/16 W		3.20	1.60	0.55	0.64	0.32	25V	50V	10	8	 R S T
LAB	RCN06-10R/S	1/16 W		6.40	3.10	0.55	1.27	0.80	50V	100V	10	8	