1 Scope:

1.1 This specification is applicable to lead and halogen free RTT series thick film chip resistors.

1.2 Lead free products mean lead free termination meets RoHS requirement. Pb contained in glass material of resistor element are exempted by RoHS directive.

1.3 The product is for general purpose.

1.4 The available AEC-Q200 report also can provide by customer request.

2 Explanation Of Part Numbers:

(EX)

RTT 02 100 J TH

Type	Size	Nominal Resistance		Resistance Tolerance	Packaging (Refer to IE-SP-055)
Thick Film Chip Resistors	01(0201) 02(0402) 03(0603) 05(0805) 06(1206) 12(1210) 18(1812) 20(2010) 25(2512)	3-Digit	EX. 10Ω=100 4.7Ω=4R7 JUMPER=000	B =± 0.1% D=± 0.5% F=± 1% G=± 2% J=± 5%	Q1：1 mm Pitch Carrier Tape 20000 pcs QE：1 mm Pitch Carrier Tape 150000 pcs TH：2 mm Pitch Carrier Tape 10000 pcs H0：2 mm Pitch Carrier Tape 15000 pcs H1：2 mm Pitch Carrier Tape 20000 pcs H2：2 mm Pitch Carrier Tape 20000 pcs H3：2 mm Pitch Carrier Tape 30000 pcs H4：2 mm Pitch Carrier Tape 40000 pcs H5：2 mm Pitch Carrier Tape 50000 pcs H6：2 mm Pitch Carrier Tape 60000 pcs TP：4 mm Pitch Carrier Tape 5000 pcs P2：4 mm Pitch Carrier Tape 10000 pcs P3：4 mm Pitch Carrier Tape 15000 pcs P4：4 mm Pitch Carrier Tape 20000 pcs TE：4 mm Pitch Carrier Tape 4000 pcs E6：8 mm Pitch Carrier Tape 2000 pcs BA：散裝(盒裝)BA：Bulk Case
		4-Digit	EX. 10.2Ω=10R2 10KΩ=1002 JUMPER=0000		

3 General Specifications:

3.1 Resistance Range: ≧1Ω & 0Ω

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-24、E-96	D(±0.5%) E-24、E-96	F(±1%) E-24、E-96	G(±2%)、J(±5%) E-24	J (±5%)	F (±1%)	J (±5%)	F (±1%)
RTT01 (0201)	1/20W	25V	50V	-200 +400	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω	1Ω≦R＜10Ω	0.5A	0.5A	50mΩ MAX.	35mΩ MAX.
				±200	47Ω≦R≦1MΩ	10Ω≦R≦10MΩ	10Ω≦R≦10MΩ	10Ω≦R≦10MΩ				
RTT02 (0402)	1/16W	50V	100V	±100	100Ω≦R≦1MΩ	10Ω≦R≦1MΩ	10Ω≦R≦22MΩ	10Ω≦R≦22MΩ	1A	1.5A	50mΩ MAX.	20mΩ MAX.
				±200	------	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
RTT03 (0603)	1/10W	75V	150V	±100	100Ω≦R≦1MΩ	10Ω≦R≦1MΩ	10Ω≦R≦22MΩ	10Ω≦R≦22MΩ	1A	2A	50mΩ MAX.	20mΩ MAX.
				±200	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
RTT05 (0805)	1/8W	150V	300V	±100	100Ω≦R≦1MΩ	10Ω≦R≦10MΩ	10Ω≦R≦27MΩ	10Ω≦R≦27MΩ	2A	2.5A	50mΩ MAX.	20mΩ MAX.
				±200	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
RTT06 (1206)	1/4W	200V	400V	±100	10Ω≦R≦1MΩ	10Ω≦R≦10MΩ	10Ω≦R≦27MΩ	10Ω≦R≦27MΩ	2A	3.5A	50mΩ MAX.	20mΩ MAX.
				±200	3Ω≦R＜10Ω	1Ω≦R＜10Ω	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
RTT12 (1210)	1/2W	200V	400V	±100	100Ω≦R≦1MΩ	10Ω≦R≦10MΩ	10Ω≦R≦27MΩ	10Ω≦R≦27MΩ	2A	4A	50mΩ MAX.	20mΩ MAX.
				±200	------	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
RTT18 (1812)	3/4W	200V	400V	±100	100Ω≦R≦1MΩ	10Ω≦R≦10MΩ	10Ω≦R≦20MΩ	10Ω≦R≦20MΩ	2A	5A	50mΩ MAX.	20mΩ MAX.
				±200	------	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
RTT20 (2010)	3/4W	200V	400V	±100	100Ω≦R≦1MΩ	10Ω≦R≦10MΩ	10Ω≦R≦20MΩ	10Ω≦R≦20MΩ	2A	5A	50mΩ MAX.	20mΩ MAX.
				±200	------	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
RTT25 (2512)	1W	200V	400V	±100	100Ω≦R≦1MΩ	10Ω≦R≦10MΩ	10Ω≦R≦20MΩ	10Ω≦R≦20MΩ	2A	7A	50mΩ MAX.	20mΩ MAX.
				±200	------	------	1Ω≦R＜10Ω	1Ω≦R＜10Ω				
Operating Temperature Range				－55℃ ~ ＋155℃ (0201:－55℃ ~ ＋125℃)								

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3.2 Resistance Range: ＜1Ω

Type	Rated Power at 70℃	Max. Rated Current	Max. Overload Current	T.C.R (ppm / ℃)	Resistance Range F(±1%)、G(±2%)、J((±5%) E-24、E-96
RTT02 (0402)	1/16W	1.58A	3.95A	±1500	25 mΩ≦R＜37 mΩ
				±1200	37 mΩ≦R＜60 mΩ
				±600	60 mΩ≦R＜200 mΩ
				±300	200 mΩ≦R＜400 mΩ
				±250	400 mΩ≦R＜600 mΩ
				±200	600 mΩ≦R＜1000 mΩ
RTT03 (0603)	1/10W	3.16A	7.91A	±1500	10 mΩ≦R＜37 mΩ
				±1200	37 mΩ≦R＜60 mΩ
				±600	60 mΩ≦R＜100 mΩ
				±300	100 mΩ≦R＜200 mΩ
				±600	200 mΩ≦R＜500 mΩ
				±400	500 mΩ≦R＜1000 mΩ
RTT05 (0805)	1/8W	3.53A	8.82A	±1500	10 mΩ≦R＜19 mΩ
				±1200	19 mΩ≦R＜33 mΩ
				±800	33 mΩ≦R＜50 mΩ
				±600	50 mΩ≦R＜100 mΩ
				±200	100 mΩ≦R＜1000 mΩ
RTT06 (1206)	1/3W	5.77A	14.42A	±1500	10 mΩ≦R＜19 mΩ
				±1200	19 mΩ≦R＜25 mΩ
				±1000	25 mΩ≦R＜50 mΩ
				±600	50 mΩ≦R＜100 mΩ
				±200	100 mΩ≦R＜1000 mΩ
RTT12 (1210)	1/2W	7.07A	17.67A	±1500	10 mΩ≦R＜19 mΩ
				±1000	19 mΩ≦R＜25 mΩ
				±700	25 mΩ≦R＜50 mΩ
				±400	50 mΩ≦R＜100 mΩ
				±200	100 mΩ≦R＜1000 mΩ
RTT18 (1812)	3/4W	8.66A	21.65A	±1500	10 mΩ≦R＜19 mΩ
				±1200	19 mΩ≦R＜25 mΩ
				±900	25 mΩ≦R＜50 mΩ
				±500	50 mΩ≦R＜100 mΩ
				±200	100 mΩ≦R＜1000 mΩ
				±200	100 mΩ≦R＜1000 mΩ
RTT20 (2010)	3/4W	8.66A	21.65A	±1500	10 mΩ≦R＜19 mΩ
				±1200	19 mΩ≦R＜25 mΩ
				±900	25 mΩ≦R＜50 mΩ
				±500	50 mΩ≦R＜100 mΩ
				±200	100 mΩ≦R＜1000 mΩ
RTT25 (2512)	1 W	10A	25A	±1500	10 mΩ≦R＜19 mΩ
				±1200	19 mΩ≦R＜25 mΩ
				±900	25 mΩ≦R＜50 mΩ
				±500	50 mΩ≦R＜100 mΩ
				±200	100 mΩ≦R＜1000 mΩ
Operating Temperature Range				－55℃ ~ ＋155℃	

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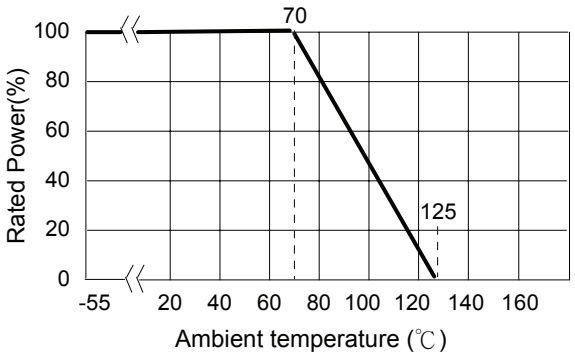
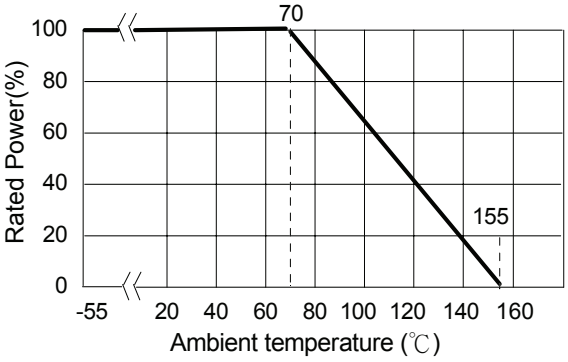
3.3 Power Derating Curve:

Type	RTT01 (0201)	Other
Operating Temperature Range	－55℃ ~ ＋125℃	－55℃ ~ ＋155℃
Explain	For resistors operated in ambient temperatures above 70℃, power rating shall be derated in accordance with figure below.	For resistors operated in ambient temperatures above 70℃, power rating shall be derated in accordance with figure below.
Figure		

3.4 Voltage Rating or Current Rating

3.4.1Resistance Range:≧1Ω

Rated Voltage: The resistor shall have a DC continuous working voltage or a rms. AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined from the following

$E = \sqrt{R \times P}$

E= Rated voltage (v)
P= Power rating (w)
R= Nominal resistance(Ω)

3.4.2Range:＜1Ω

Rated Current: The resistor shall have a DC continuous working current or a rms. AC continuous working current at commercial-line frequency and wave form corresponding to the power rating, as determined from the following:

$I = \sqrt{P/R}$

I= Rated current (A)
P= Power rating (w)
R= Nominal resistance(Ω)

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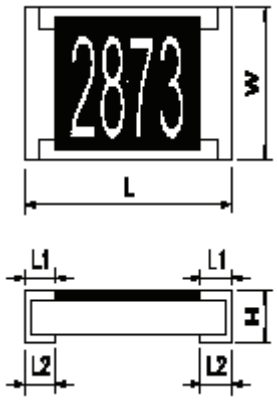
4 Dimensions:

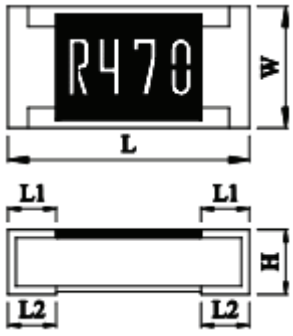
4.1 Resistance Range: ≧1Ω & 0Ω



Unit:mm

Type \ Dimension / Size Code	L	W	H	L1	L2
RTT01 / 0201	0.60±0.03	0.30±0.03	0.23±0.03	0.10±0.05	0.15±0.05
RTT02 / 0402	1.00±0.10	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10
RTT03 / 0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.15	0.30±0.15
RTT05 / 0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.35±0.15
RTT06 / 1206	3.05±0.10	1.55±0.10	0.50±0.10	0.45±0.20	0.35±0.15
RTT12 / 1210	3.05±0.10	2.55±0.10	0.55±0.10	0.50±0.20	0.50±0.20
RTT18 / 1812	4.40±0.20	3.15±0.20	0.47±0.20	0.60±0.20	0.60±0.20
RTT20 / 2010	5.00±0.20	2.50±0.20	0.55±0.10	0.60±0.20	0.60±0.20
RTT25 / 2512	6.30±0.20	3.20±0.20	0.55±0.10	0.60±0.20	0.60±0.20

4.2 Resistance Range: ＜1Ω



Unit:mm

Type \ Dimension / Size Code	L	W	H	L1	L2
RTT02 / 0402	1.00±0.10	0.50±0.05	0.30±0.10	0.25±0.10	0.20±0.15
RTT03 / 0603	1.60±0.10	0.80±0.10	0.45±0.10	0.25±0.15	0.35±0.15
RTT05 / 0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.35±0.20
RTT06 / 1206	3.05±0.10	1.55±0.10	0.50±0.10	0.45±0.20	0.55±0.25
RTT12 / 1210	3.05±0.10	2.55±0.10	0.55±0.10	0.50±0.20	0.50±0.20
RTT18 / 1812	4.40±0.20	3.15±0.20	0.47±0.20	0.60±0.20	0.60±0.20
RTT20 / 2010	5.00±0.20	2.50±0.20	0.60±0.10	0.65±0.20	0.65±0.20
RTT25 / 2512	6.30±0.20	3.20±0.20	0.60±0.10	0.65±0.20	0.65±0.20

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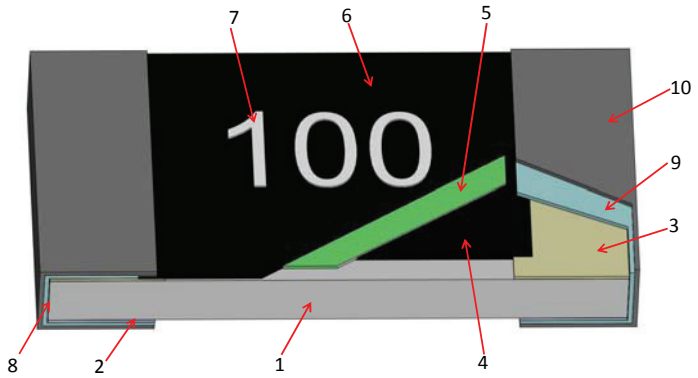
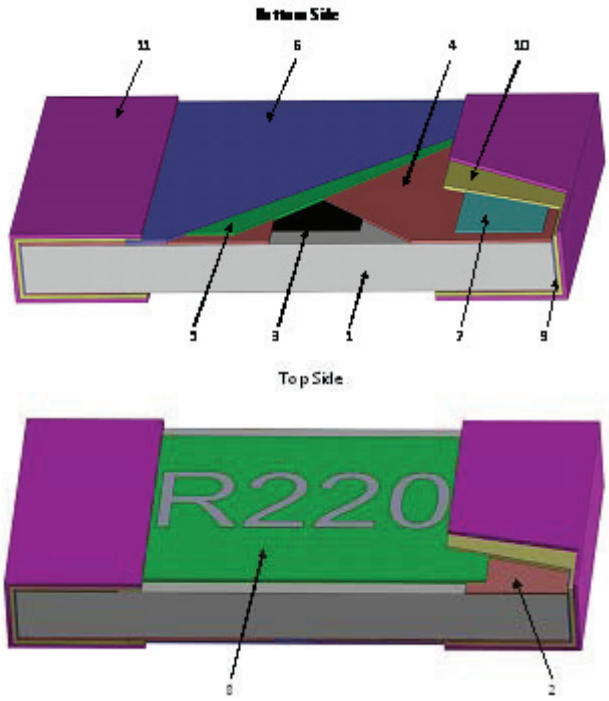
5 Structure Graph:

5.1 Resistance Range: ≧1Ω & 0 Ω



1	Ceramic substrate	6	2nd Protective coating
2	Bottom inner electrode	7	Marking
3	Top inner electrode	8	Terminal inner electrode
4	Resistive layer	9	Ni plating
5	1st Protective coating	10	Sn plating

5.2 Resistance Range: ＜1Ω



1	Ceramic substrate	7	2nd Bottom inner electrode
2	Top inner electrode	8	G2 layer + Marking
3	Resistive layer	9	Terminal inner electrode
4	1st Bottom inner electrode	10	Ni plating
5	1st Protective coating	11	Sn plating
6	2nd Protective coating		

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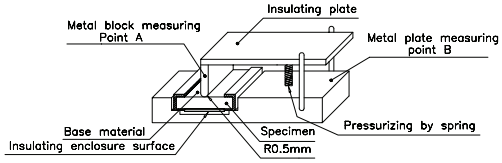
6 Reliability Test:

6.1 Electrical Performance Test

Item	Conditions	Specifications	
		Resistors	Jumper
Temperature Coefficient of Resistance	$TCR(ppm/℃) = \frac{(R2-R1)}{R1(T2-T1)} \times 10^6$ R1: Resistance at room temperature R2: Resistance at -55℃ or +125℃ T1: Room temperature T2: Temperature -55℃ or +125℃ Refer to JIS-C5201-1 4.8	Refer to item 3. general specifications	NA
Short Time Overload	Applied 2.5 times rated voltage for 5 seconds and release the load for about 30 minutes, then measure its resistance variance rate. (Rated voltage refer to item 3. general specifications) Jumper : Applied Maximum overload current Refer to JIS-C5201-1 4.13	1.Resistance Range:≧1Ω 0.1%、0.5%、1%:±(1.0%+0.05Ω) 2%、5%:±(2.0%+0.10Ω) 2.Resistance Range:<1Ω 1%、2%、5%:±(2.0%+0.001Ω) No evidence of mechanical damage. No short or burned on the appearance.	Refer to item 3. general specifications
Insulation Resistance	Put the resistor in the fixture, add 100 VDC in + ,- terminal for 60 sec then measured the insulation resistance between electrodes and insulating enclosure or between electrodes and base material. Refer to JIS-C5201-1 4.6	$\geqq 10^9\Omega$	
Dielectric Withstand Voltage	Put the resistor in the fixture, add VAC (see SPEC below) in +,- terminal for. RTT05、06、12、18、20、25 apply 500 VAC 1 minute. RTT01、02、03 apply 300 VAC 1 minute. Refer to JIS-C5201-1 4.7	No short or burned on the appearance.	
Intermittent Overload	Put the tested resistor in chamber under temperature 25±2℃ and load 2.5 times rated DC voltage for 1 sec on, 25 sec off, 10000^{+400}_{0} test cycles, then it be left at no-load for 1 hour , then measure its resistance variance rate. Jumper : Applied Maximum overload current Refer to JIS-C5201-1 4.13	1.Resistance Range:≧1Ω ±(5.0%+0.10Ω) 2.Resistance Range:<1Ω ±(5.0%+0.001Ω) No evidence of mechanical damage. No short or burned on the appearance.	Refer to item 3. general specifications
Noise Level	Refer to JIS-C5201-1 4.12		NA



Type / Jumper	RTT01 (0201)	RTT02 (0402)	RTT03 (0603)	RTT05 (0805)	RTT06 (1206)	RTT12 (1210)	RTT18 (1812)	RTT20 (2010)	RTT25 (2512)
±5%	1.25A	2.5A	2.5A	5A	5A	5A	5A	5A	5A
±1%	1.25A	3.75A	5A	6.25A	8.75A	10A	12.5A	12.5A	17.5A

Resistance	Noise
R ＜100Ω	≦ -10db (0.32 uV/V)
100Ω ≦R ＜1KΩ	≦ 0db (1.0 uV/V)
1KΩ ≦R ＜10KΩ	≦ 10db (3.2 uV/V)
10KΩ ≦R ＜100KΩ	≦ 15db (5.6 uV/V)
100KΩ ≦R ＜1MΩ	≦ 20db (10 uV/V)
1MΩ ≦R	≦ 30db (32 uV/V)

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6.2 Mechanical Performance Test

Item	Conditions	Specifications	
		Resistors	Jumper
Core Body Strength	Applied R0.5 test probe at its central part then pushing 10N｛1.02 Kgf｝ force on the sample for 10 sec. 1.RTT02、RTT03：probe R0.2 2.RTT05、06、12、18、20、25：probe R0.5 Refer to JIS-C5201-1 4.15	1.Resistance Range:≧1Ω ±(1.0%+0.05Ω) 2.Resistance Range:<1Ω ±(1.0%+0.001Ω)	Refer to item 3. general specifications
		No evidence of mechanical damage. No side conductive peeling off	
Terminal Strength	Test 1 : The resistor mounted on the board applied 5N pushing force on the sample rear for 10 sec. (RTT01:3N) Test 2 : The resistor mounted on the board slowly add force on the sample rear until the sample termination is breakdown. Refer to JIS-C5201-1 4.16	Test 1 : No evidence of mechanical damage. Test 2 : RTT01≧3N Other Type≧5N	
Resistance to Solvent	The tested resistor be immersed into isopropyl alcohol of 20~25℃ for 5 minutes, then the resistor is left in the room for 48 hrs, and measured its resistance variance rate. Refer to JIS-C5201-1 4.29	1.Resistance Range:≧1Ω Type / RTT01 / Other △R% / ±(1.0%+0.05Ω) / ±(0.5%+0.05Ω) 2.Resistance Range:<1Ω ±(1.0%+0.001Ω)	Refer to item 3. general specifications
		No evidence of mechanical damage. No G2 overcoating and Sn layer by leaching.	
Solderability	Preconditioning Put the tested resistor in the apparatus of PCT, at a temperature of 105℃, humidity of 100% RH, and pressure of 1.22×105 Pa for a duration of 4 hours. Then after left the tested resistor in room temperature for 2 hours or more. Test method: The resistor be immersed into solder pot in temperature 235±5℃ for 2 sec, then the resistor is left as placed under microscope to observed its solder area. Refer to JIS-C5201-1 4.17	Solder coverage over 95%	
Resistance to Soldering Heat	◎Test method 1 (Solder pot test): The tested resistor be immersed into molten solder of 260+5/-0℃ for 10 seconds. Then the resistor is left in the room for 1 hour. ◎Test method 2 (Solder pot test): The tested resistor be immersed into molten solder of 260+5/-0℃ for 30 seconds. Then the resistor is left as placed under microscope to observe its solder area. ◎Test method 3 (Electric iron test): Preheating temperature : 350±10℃ Electric iron preheating time : 3+1/-0 sec Preheating the electric iron on electrode termination, as after that step placed the iron over 60 min. and measured its resistance variance rate. Refer to JIS-C5201-1 4.18	Test item 1: (1).Variance rate on resistance 1.Resistance Range:≧1Ω △R%=±(1.0%+0.05Ω) 2.Resistance Range:<1Ω △R%=±(1.0%+0.001Ω) (2).No evidence of electrode damage. No side conductive peeling off. Test item 2: (1).Solder coverage over 95%. (2).The underlying material (such as ceramic) shall not be visible at the crest corner area of the electrode. Test item 3: (1).Variance rate on resistance 1.Resistance Range:≧1Ω △R%=±(1.0%+0.05Ω) 2.Resistance Range:<1Ω △R%=±(1.0%+0.001Ω) (2).No evidence of electrode damage. No side conductive peeling off.。	Refer to item 3. general specifications

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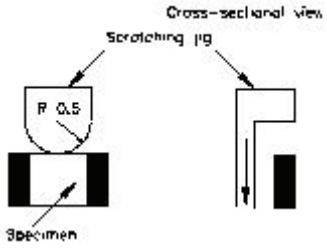
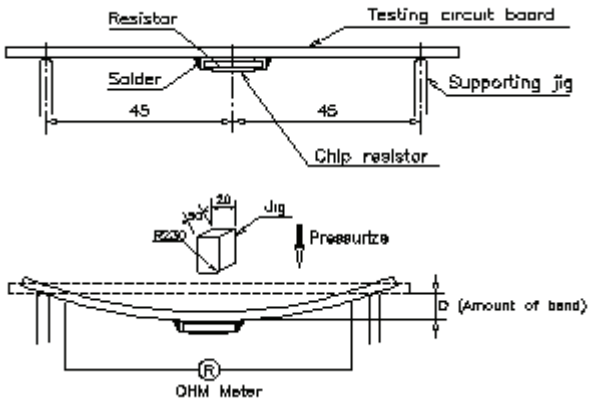
Item	Conditions	Specifications	
		Resistors	Jumper
Joint Strength of Solder	Preconditioning Put tested resistor in the apparatus of PCT, at a temperature of 105℃, humidity of 100% RH, and pressure of 1.22×105 Pa for a duration of 4 hours. Then after left the specimen in a temperature for 2 hours or more. Test method: ◎Test item 1 (Adhesion): A static load using a R0.5 (0201:R0.1) scratch tool shall be applied on the core of the component and in the direction of the arrow and held for 10 seconds and under load measured its resistance variance rate. Load:1.RTT01=5N 2.RTT02=10N 3.Other type=20N  Refer to JIS-C5201-1 4.32 ◎Test item 2 (Bending Strength): Solder tested resistor on to PC board add force in the middle down, and under load measured its resistance variance rate. D:RTT02、03、05=5mm RTT01、06、12=3mm RTT18、20、25=2mm  Refer to JIS-C5201-1 4.33	Test item 1: (1).Variance rate on resistance 1.Resistance Range:≧1Ω △R%=±(1.0%+0.05Ω) 2.Resistance Range:<1Ω △R%=±(1.0%+0.001Ω) (2).No evidence of mechanical damage. No terminal peeling off. Test item 2: (1).Variance rate on resistance 1.Resistance Range:≧1Ω △R%=±(1.0%+0.05Ω) 2.Resistance Range:<1Ω △R%=±(1.0%+0.001Ω) (2).No evidence of mechanical damage. No terminal peeling off and core body cracked.	Refer to item 3. general specifications
Vibration	The resistor shall be mounted by its terminal leads to the supporting terminals on the solid table. The entire frequency range: from 10 Hz to 55 Hz and return to 10 Hz, shall be transferred in 1 min. 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) Refer to JIS-C5201-1 4.22	1.Resistance Range : ≧1 Ω 0.1%、0.5%、1%:±(0.5%+0.05Ω) 2%、5%:±(1.0%+0.05Ω) 2.Resistance Range : <1 Ω 1%、2%、5%:±(1.0%+0.001Ω) No evidence of mechanical damage..	Refer to item 3. general specifications

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6.3 Environmental Test

Item	Conditions	Specifications	
		Resistors	Jumper
Resistance to Dry Heat	Put tested resistor in chamber under temperature 155±5℃ for 1000 +48/-0 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate.(RTT01 for 125±3℃) Refer to JIS-C5201-1 4.25	1.Resistance Range:≧1Ω 0.1%、0.5%、1%:±(1.0%+0.05Ω) 2%、5%:±(2.0%+0.10Ω) 2.Resistance Range:<1Ω 1%、2%、5%:±(1.0%+0.001Ω) No evidence of mechanical damage. No short or burned on the appearance.	Refer to item 3. general specifications
Thermal Shock	Put the tested resistor in the chamber under the Thermal Shock which shown in the following table shall be repeated 300 times consecutively. Then leaving the tested resistor in the room temperature for 1 hours, and measure its resistance variance rate. Testing Condition: Lowest Temperature -55±5℃; Highest Temperature 125±5℃; Temperature-retaining time 15 minutes each Refer to MIL-STD 202 Method 107	1.Resistance Range:≧1Ω 0.1%、0.5%、1%:±(0.5%+0.05Ω) 2%、5%:±(1.0%+0.05Ω) 2.Resistance Range:<1Ω 1%、2%、5%:±(1.0%+0.001Ω) No evidence of mechanical damage. No short or burned on the appearance.	Refer to item 3. general specifications
Loading Life in Moisture	Put the tested resistor in the chamber under temperature 40±2℃, relative humidity 90~95% and load the rated voltage for 90 minutes on, 30 minutes off, total 1000 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate. Refer to JIS-C5201-1 4.24	1.Resistance Range:≧1Ω Type / RTT01 / Other Range: 1%: ±(1.0%+0.05Ω) 5%: ±(3.0%+0.1Ω) / 0.1%、0.5%、1%: ±(0.5%+0.05Ω) 2%、5%: ±(2.0%+0.10Ω) 2.Resistance Range:<1Ω 1%、2%、5%:±(2.0%+0.001Ω) No evidence of mechanical damage. No short or burned on the appearance.	Refer to item 3. general specifications
Load Life	Put the tested resistor in chamber under temperature 70±2℃ and load the rated voltage for 90 minutes on, 30 minutes off, total 1000 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate. Refer to JIS-C5201-1 4.25	1.Resistance Range:≧1Ω Type / RTT01 / Other Range: 1%: ±(1.0%+0.05Ω) 5%: ±(3.0%+0.1Ω) / 0.1%、0.5%、1%: ±(0.5%+0.05Ω) 2%、5%: ±(2.0%+0.10Ω) 2.Resistance Range:<1Ω 1%、2%、5%:±(2.0%+0.001Ω) No evidence of mechanical damage. No short or burned on the appearance.	Refer to item 3. general specifications
Low Temperature Operation	Put the tested resistor in the chamber at room temperature 25℃.Decreasing the temperature to -55℃ and keep the temperature at -55℃ for 1 hour. Then load the rated voltage for 45 minutes on, and 15 minutes off. Then leaving the tested resistor in room temperature for 8±1 hours, and measure its resistance variance rate. Refer to MIL-R-55342D 4.7.4	1.Resistance Range:≧1Ω 0.1%、0.5%、1%:±(0.5%+0.05Ω) 2%、5%:±(1.0%+0.05Ω) 2.Resistance Range:<1Ω 1%、2%、5%:±(1.0%+0.001Ω) No evidence of mechanical damage. No short or burned on the appearance.	Refer to item 3. general specifications
Whisker Test	◎Test item (Thermal Shock test): Testing Condition: Minimum storage temperature -55+0/-10℃; Maximum storage temperature 85+10/-0℃; Temperature-retaining time 10 min.; Number of temperature cycles 1,500 ◎Inspection: Inspect for whisker formation on specimens that underwent the acceleration test specified in subciause 4.2, with a magnifier (stereo microscope) of about 40 or higher magnification. If judgment is hard in this method, use a scanning electron microscope (SEM) of about 1,000 or higher magnification. By JESD Standard NO.22A121 class 2.	Max. 50 μm	

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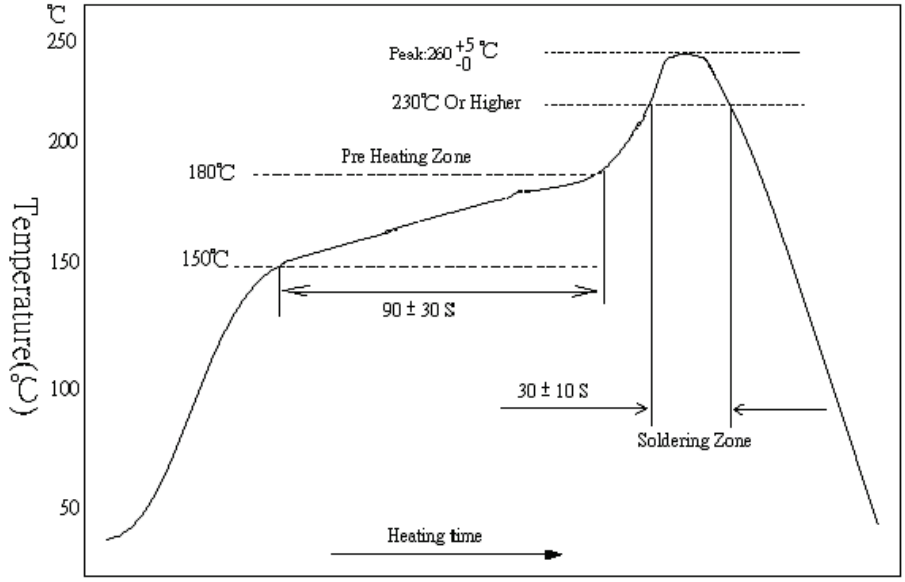
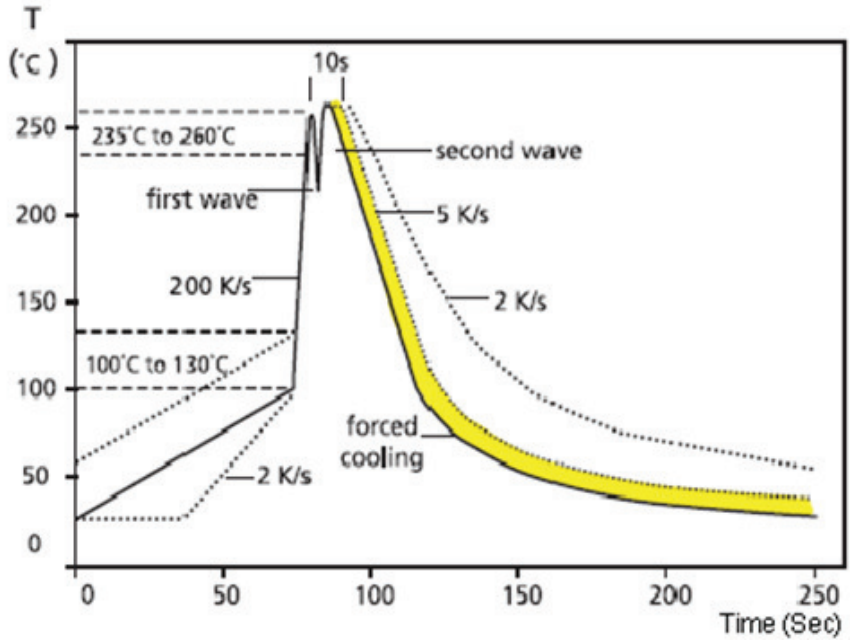
7 Recommend Soldering Method:

7.1 Lead Free Reflow Soldering Profile



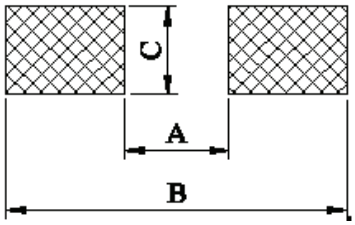
Remark: The peak temperature of soldering heat is 260 +5/-0 ℃ for 10 seconds

7.2 Lead Free Double-Wave Soldering Profile.(This applies to 0603 size inclusive above products)



7.3 Soldering Iron: temperature 350℃±10℃ , dwell time shall be less than 3 sec.

8 Recommend Land Pattern Design (For Reflow Soldering)



Unit:mm

DIM / TYPE	A	B	C
RTT01	0.3	1.0	0.4
RTT02	0.5	1.5	0.6
RTT03	0.8	2.1	0.9
RTT05	1.2	3.0	1.3
RTT06	2.2	4.2	1.6
RTT12	2.2	4.2	2.8
RTT18	3.1	5.9	3.0
RTT20	3.5	6.1	2.8
RTT25	3.8	8.0	3.5

9 Plating Thickness:

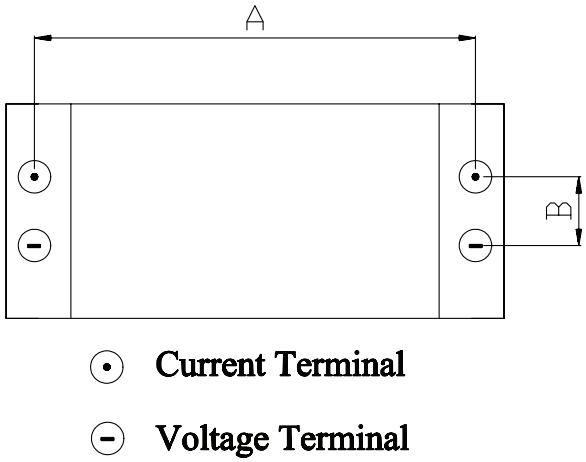
9.1 Ni:≧2 μm

9.2 Sn(Tin):≧3 μm

9.3 Sn(Tin):Matte Sn

10 Measurement Point:

Bottom electrode



Unit : mm

DIM / TYPE	A	B
RTT01	0.44±0.05	0.22 ±0.05
RTT02	0.80±0.05	0.24 ±0.05
RTT03	1.35±0.05	0.35 ±0.05
RTT05	1.80 ±0.05	0.35 ±0.05
RTT06	2.90 ±0.05	0.35 ±0.05
RTT12	2.90 ±0.05	0.35 ±0.05
RTT18	3.90±0.05	1.55±0.05
RTT20	4.50 ±0.05	1.15 ±0.05
RTT25	5.90 ±0.05	1.60 ±0.05

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11 Stock period:

11.1 The temperature condition must be controlled at 25±5℃, the R.H. must be controlled at 60±15%. The stock can maintain quality level in two years.

12 The carton packaged for electronic-information products is made by the symbol as follows: (For china)

	
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13 Attachments:

13.1 Document Revise Record (QA-QR-027)

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