



ACR Series Thick Film Chip Resistors Product Specification

Document No.	IE-SP-010
Released Date	2021/07/08
Page No.	1

1 Scope:

- 1.1 This specification is applicable to lead free and halogen free of RoHS directive for RTT series thick film chip resistors
- 1.2 The product is for general electronic purpose.

2 Explanation Of Part Numbers:

(EX)



Type	Size	Packaging	Nominal Resistance		Resistance Tolerance
RTT series Thick Film Chip Resistors	0201	T:Taping Type	2%	EX. 10Ω=100 4.7Ω=4R7 JUMPER=000	B =± 0.1% D=± 0.5% F=± 1% G=± 2% J=± 5%
	0402		5% (3-Digit)		
	0603		0.1%	EX. 10.2Ω=10R2 10KΩ=1002 JUMPER=0000	
	0805		0.5%		
	1206		1%		
	1210		(4-Digit)		
	1812				
	2010				
	2512				

IE			QA		Remark	Issue Dep.DATA Center.
Written	Checked	Approved	Signing			
朱翠平	汪晓伟	马建	仝红霞		IT'S NOT UNDER CONTROL FOR PDF FILE PLS NOTE THE VERSION STATED..	Series No. 60
					Do not copy without permission	



ACR Series Thick Film Chip Resistors Product Specification

Document No.

IE-SP-010

Released Date

2021/07/08

Page No.

2

3 General Specifications:

Type	Rated Power at 70°C	Max. Working Voltage	Max. Overload Voltage	T.C.R (ppm/°C)	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%)
ACR (0201)	1/20 W	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					
ACR (0402)	1/16 W	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					
ACR (0603)	1/10 W	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					
ACR (0805)	1/8 W	150V	300V	±100	100Ω ≤ R ≤ 1.5MΩ	10Ω ≤ R ≤ 10MΩ	10Ω ≤ R ≤ 27MΩ	10Ω ≤ R ≤ 27MΩ	2A	2.5A	50mΩ MAX.	20mΩ MAX.
				±200	-----	1Ω ≤ R < 10Ω	1Ω ≤ R < 10Ω					
ACR (1206)	1/4 W	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					
ACR (1210)	1/2 W	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				
ACR (1812)	3/4 W	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				
ACR (2010)	3/4 W	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				
ACR (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°C ~ +155°C (0201: -55°C ~ +125°C)								

3.1 Power Derating Curve:

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

Remark

IT'S NOT UNDER CONTROL FOR PDF FILE
PLS NOTE THE VERSION STATED..

Do not copy without permission

Issue Dep. DATA Center.

Series No. **60**

3.2 Voltage Rating :

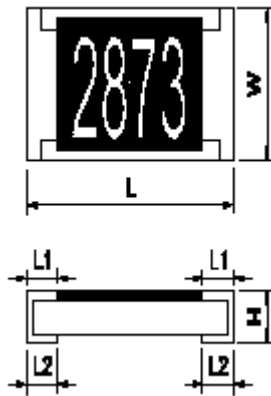
Rated Voltage: The resistor shall have a DC continuous working voltage or a rms. AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined from the following

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

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

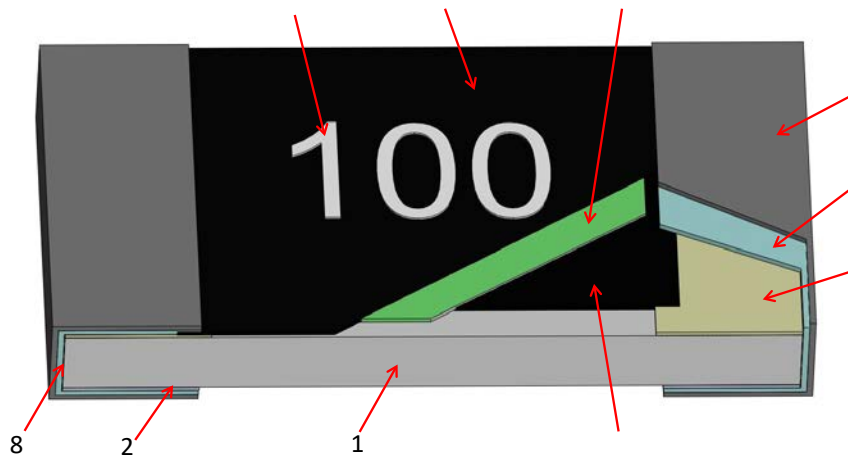
4 Dimensions:

Unit:mm



Dimension		L	W	H	L1	L2
Type	Size Code					
ACR	0201	0.60±0.03	0.30±0.03	0.23±0.03	0.10±0.05	0.15±0.05
ACR	0402	1.00±0.10	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10
ACR	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.15	0.30±0.15
ACR	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.35±0.15
ACR	1206	3.05±0.10	1.55±0.10	0.50±0.10	0.45±0.20	0.35±0.15
ACR	1812	4.40±0.20	3.15±0.20	0.47±0.20	0.60±0.20	0.60±0.20
ACR	1210	3.05±0.10	2.55±0.10	0.55±0.10	0.50±0.20	0.50±0.20
ACR	2010	5.00±0.20	2.50±0.20	0.55±0.10	0.60±0.20	0.60±0.20
ACR	2512	6.30±0.20	3.20±0.20	0.55±0.10	0.60±0.20	0.60±0.20

5 Structure Graph:



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

Remark

IT'S NOT UNDER CONTROL FOR PDF FILE
PLS NOTE THE VERSION STATED..

Issue Dep. DATA Center.

Do not copy without permission

Series No. **60**



ACR Series Thick Film Chip Resistors Product Specification

Document No.

IE-SP-010

Released Date

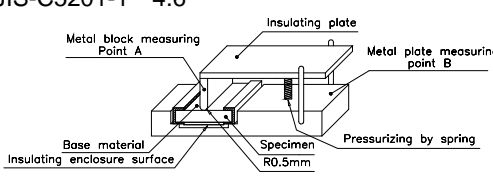
2021/07/08

Page No.

4

6 Reliability Test:

6.1 Electrical Performance Test

Item	Conditions	Specifications																															
		Resistors	Jumper																														
Temperature Coefficient of Resistance	$TCR \text{ (ppm / } ^\circ\text{C)} = \frac{R2 - R1}{R1 (T2 - T1)} \times 10^6$ R1: Resistance at room temperature R2: Resistance at -55°C or +125°C T1: Room temperature T2: Temperature -55°C or +125°C 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) Refer to JIS-C5201-1 4.13	0.1%、0.5%、1%:ΔR%=±1.0% 2%、5%:ΔR%=±2.0%	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 	≥ 10 ⁹ Ω																															
Dielectric Withstand Voltage	Put the resistor in the fixture, add VAC (see SPEC below) in +, - terminal for. ACR0805,1206,1210,1812,2010 2512 apply 500 VAC 1 minute. ACR0201,0402 0603 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°C 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 <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Type</th> <th>ACR (0201)</th> <th>ACR (0402)</th> <th>ACR (0603)</th> <th>ACR (0805)</th> <th>ACR (1206)</th> <th>ACR (1210)</th> <th>ACR (1812)</th> <th>ACR (2010)</th> <th>ACR (2512)</th> </tr> </thead> <tbody> <tr> <td>±5%</td> <td>1.25A</td> <td>2.5A</td> <td>2.5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> </tr> <tr> <td>±1%</td> <td>1.25A</td> <td>3.75A</td> <td>5A</td> <td>6.25A</td> <td>8.75A</td> <td>10A</td> <td>12.5A</td> <td>12.5A</td> <td>17.5A</td> </tr> </tbody> </table> Refer to JIS-C5201-1 4.13	Type	ACR (0201)	ACR (0402)	ACR (0603)	ACR (0805)	ACR (1206)	ACR (1210)	ACR (1812)	ACR (2010)	ACR (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	ΔR%=±5.0%	Refer to item 3. general specifications
Type	ACR (0201)	ACR (0402)	ACR (0603)	ACR (0805)	ACR (1206)	ACR (1210)	ACR (1812)	ACR (2010)	ACR (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																								

Remark

IT'S NOT UNDER CONTROL FOR PDF FILE
PLS NOTE THE VERSION STATED..

Issue Dep. DATA Center.

Do not copy without permission

Series No. **60**



ACR Series Thick Film Chip Resistors Product Specification

Document No.	IE-SP-010
Released Date	2021/07/08
Page No.	5

6.2 Mechanical Performance Test

Item	Conditions	Specifications							
		Resistors	Jumper						
Terminal Strength	Test 1 : The resistor mounted on the board applied 5N pushing force on the sample rear for 10 sec. (ACR0201:3N) 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 : ACR0201 \geq 3N Other Type \geq 5N							
Resistance to Solvent	The tested resistor be immersed into isopropyl alcohol of 20~25°C 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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Type</td> <td style="width: 25%;">ACR0201</td> <td style="width: 50%;">Other</td> </tr> <tr> <td>$\Delta R\%$</td> <td>$\Delta R\% = \pm 1.0\%$</td> <td>$\Delta R\% = \pm 0.5\%$</td> </tr> </table>	Type	ACR0201	Other	$\Delta R\%$	$\Delta R\% = \pm 1.0\%$	$\Delta R\% = \pm 0.5\%$	Refer to item 3. general specifications
Type	ACR0201	Other							
$\Delta R\%$	$\Delta R\% = \pm 1.0\%$	$\Delta R\% = \pm 0.5\%$							
Solderability	Preconditioning Put the tested resistor in the apparatus of PCT, at a temperature of 105°C, humidity of 100% RH, and pressure of 1.22x10 ⁵ 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°C 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°C 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°C 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°C 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 $\Delta R\% = \pm 1.0\%$ 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 $\Delta R\% = \pm 1.0\%$	Refer to item 3. general specifications						

Remark	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> IT'S NOT UNDER CONTROL FOR PDF FILE PLS NOTE THE VERSION STATED.. </div>	Issue Dep. DATA Center.
	Do not copy without permission	Series No. 60



RTT Series Thick Film Chip Resistors Product Specification

Document No.

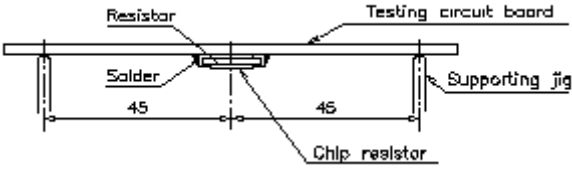
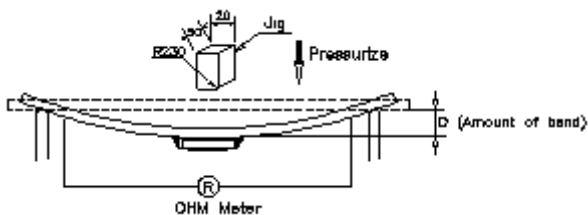
IE-SP-010

Released Date

2021/07/08

Page No.

6

Item	Conditions	Specifications	
		Resistors	Jumper
Joint Strength of Solder	<p>◎Bending Strength Solder tested resistor on to PC board add force in the middle down, and under load measured its resistance variance rate. D:ACR0402,0602 0805=5mm ACR0201、1206 1210=3mm ACR1812 2010、2512=2mm</p>   <p>Refer to JIS-C5201-1 4.33</p>	$\Delta R\% = \pm 1.0\%$	Refer to item 3. general specifications

Remark

IT'S NOT UNDER CONTROL FOR PDF FILE
PLS NOTE THE VERSION STATED..

Issue Dep. DATA Center.

Do not copy without permission

Series No. **60**



ACR Series Thick Film Chip Resistors Product Specification

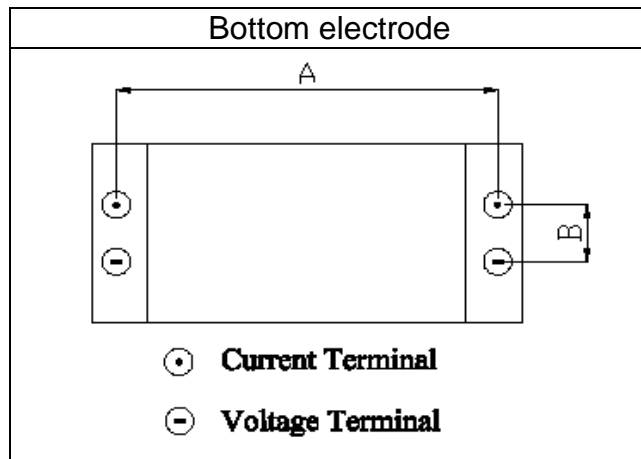
Document No.	IE-SP-010
Released Date	2021/07/08
Page No.	7

6.3 Environmental Test

Item	Conditions	Specifications									
		Resistors	Jumper								
Resistance to Dry Heat	Put tested resistor in chamber under temperature $155\pm 5^{\circ}\text{C}$ for 1000 +48/-0 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate.(ACR0201 for $125\pm 3^{\circ}\text{C}$) Refer to JIS-C5201-1 4.25	0.1%、0.5%、1%: $\Delta R\%=\pm 1.0\%$ 2%、5%: $\Delta R\%=\pm 2.0\%$	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. <table border="1" style="margin: 10px auto; width: 60%;"> <thead> <tr> <th colspan="2">Testing Condition</th> </tr> </thead> <tbody> <tr> <td>Lowest Temperature</td> <td>$-55\pm 5^{\circ}\text{C}$</td> </tr> <tr> <td>Highest Temperature</td> <td>$125\pm 5^{\circ}\text{C}$</td> </tr> <tr> <td>Temperature-retaining time</td> <td>15 minutes each</td> </tr> </tbody> </table> Refer to MIL-STD 202 Method 107	Testing Condition		Lowest Temperature	$-55\pm 5^{\circ}\text{C}$	Highest Temperature	$125\pm 5^{\circ}\text{C}$	Temperature-retaining time	15 minutes each	0.1%、0.5%、1%: $\Delta R\%=\pm 0.5\%$ 2%、5%: $\Delta R\%=\pm 1.0\%$	Refer to item 3. general specifications
Testing Condition											
Lowest Temperature	$-55\pm 5^{\circ}\text{C}$										
Highest Temperature	$125\pm 5^{\circ}\text{C}$										
Temperature-retaining time	15 minutes each										
Loading Life in Moisture	Put the tested resistor in the chamber under temperature $40\pm 2^{\circ}\text{C}$, 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	<table border="1" style="width: 100%;"> <thead> <tr> <th>Type</th> <th>ACR01</th> <th>Other</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Range</td> <td>1%: $\Delta R\%=\pm 1.0\%$</td> <td>0.1%、0.5%、1%: $\Delta R\%=\pm 0.5\%$</td> </tr> <tr> <td>5%: $\Delta R\%=\pm 3.0\%$</td> <td>2%、5%: $\Delta R\%=\pm 2.0\%$</td> </tr> </tbody> </table>	Type	ACR01	Other	Range	1%: $\Delta R\%=\pm 1.0\%$	0.1%、0.5%、1%: $\Delta R\%=\pm 0.5\%$	5%: $\Delta R\%=\pm 3.0\%$	2%、5%: $\Delta R\%=\pm 2.0\%$	Refer to item 3. general specifications
Type	ACR01	Other									
Range	1%: $\Delta R\%=\pm 1.0\%$	0.1%、0.5%、1%: $\Delta R\%=\pm 0.5\%$									
	5%: $\Delta R\%=\pm 3.0\%$	2%、5%: $\Delta R\%=\pm 2.0\%$									
	Load Life	Put the tested resistor in chamber under temperature $70\pm 2^{\circ}\text{C}$ 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	<table border="1" style="width: 100%;"> <thead> <tr> <th>Type</th> <th>ACR01</th> <th>Other</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Range</td> <td>1%: $\Delta R\%=\pm 1.0\%$</td> <td>0.1%、0.5%、1%: $\Delta R\%=\pm 0.5\%$</td> </tr> <tr> <td>5%: $\Delta R\%=\pm 3.0\%$</td> <td>2%、5%: $\Delta R\%=\pm 2.0\%$</td> </tr> </tbody> </table>	Type	ACR01	Other	Range	1%: $\Delta R\%=\pm 1.0\%$	0.1%、0.5%、1%: $\Delta R\%=\pm 0.5\%$	5%: $\Delta R\%=\pm 3.0\%$	2%、5%: $\Delta R\%=\pm 2.0\%$
Type	ACR01	Other									
Range	1%: $\Delta R\%=\pm 1.0\%$	0.1%、0.5%、1%: $\Delta R\%=\pm 0.5\%$									
	5%: $\Delta R\%=\pm 3.0\%$	2%、5%: $\Delta R\%=\pm 2.0\%$									

7 Measurement Point:

DIM	Unit : mm	
	A	B
ACR0201	0.44 ± 0.05	0.22 ± 0.05
ACR0402	0.80 ± 0.05	0.24 ± 0.05
ACR0603	1.35 ± 0.05	0.35 ± 0.05
ACR0805	1.80 ± 0.05	0.35 ± 0.05
ACR1206	2.90 ± 0.05	0.35 ± 0.05
ACR1210	2.90 ± 0.05	0.35 ± 0.05
ACR1812	3.70 ± 0.05	0.60 ± 0.05
ACR2010	4.50 ± 0.05	1.15 ± 0.05
ACR2512	5.90 ± 0.05	1.60 ± 0.05



Remark	IT'S NOT UNDER CONTROL FOR PDF FILE PLS NOTE THE VERSION STATED..	Issue Dep. DATA Center.
	Do not copy without permission	Series No. 60



ACR Series Thick Film Chip Resistors Product Specification

Document No.

IE-SP-010

Released Date

2021/07/08

Page No.

8

8 Plating Thickness:

8.1 Ni: $\geq 2 \mu\text{m}$

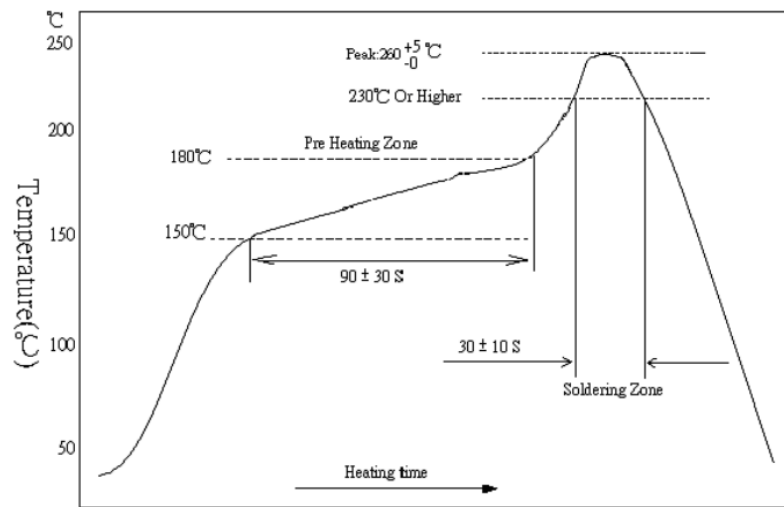
8.2 Sn(Tin): $\geq 3 \mu\text{m}$

8.3 Sn(Tin): Matte Sn

9 Technical application notes: (This is for recommendation, please customer perform adjustment according to actual application)

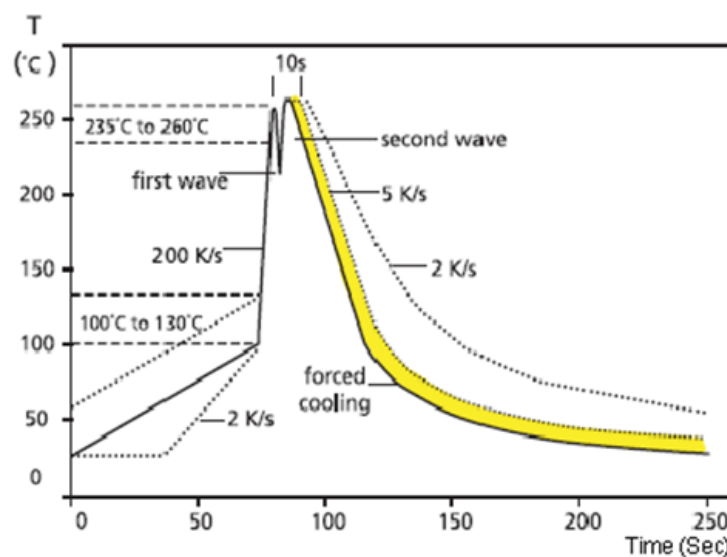
9.1 Recommend Soldering Method:

9.1.1 Lead Free IR Reflow Soldering Profile (MEET J-STD-020D)



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

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



9.1.3 Soldering Iron: temperature 350°C ±10°C , dwell time shall be less than 3 sec

Remark

IT'S NOT UNDER CONTROL FOR PDF FILE
PLS NOTE THE VERSION STATED..

Issue Dep. DATA Center.

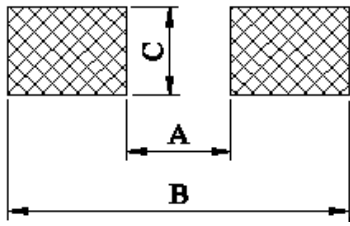
Do not copy without permission

Series No. **60**

9.2 Recommend Land Pattern Design (For Reflow Soldering)

When a component is soldered, the resistance after soldering changes slightly depending on the size of the soldering area and the amount of soldering. When designing a circuit, it is necessary to consider the effect of a decrease or increase in its resistance.

Unit:mm



DIM TYPE	A	B	C
ACR0201	0.3	1.0	0.4
ACR0402	0.5	1.5	0.6
ACR0603	0.8	2.1	0.9
ACR0805	1.2	3.0	1.3
ACR1206	2.2	4.2	1.6
ACR1210	2.2	4.2	2.8
ACR1812	3.1	5.9	3.0
ACR2010	3.5	6.1	2.8
ACR2512	3.8	8.0	3.5

9.3 Environment Precautions:

This specification product is for general electronic use, ABCQ will not be responsible for any damage, cost or loss caused by using this specification product in any special environment. If other applications need to confirm with ABCQ.

If consumer intends to use our Company product in special environment or condition (including but not limited to those mentioned below), then will need to make individual recognition of product features and reliability accordingly.

- (a) Used in high temperature and humidity environment;
- (b) Exposed to sea breeze or other corrosive gas, such as Cl₂、H₂S、NH₃、SO₂ and NO₂;
- (c) Used in non-verified liquids including water, oil, chemical and organic solvents;
- (d) Using non-verified resin or other coating material to seal or coat our Company product;
- (e) After soldering, it is necessary to use water-soluble detergents to clean residual solder fluxes, even though no-clean fluxes are recommended.

9.4 Momentary Overload Precautions:

The product might be out of function when momentary overloaded. Please make sure to avoid momentary overloading while using and preserving.

Remark	IT'S NOT UNDER CONTROL FOR PDF FILE PLS NOTE THE VERSION STATED..	Issue Dep. DATA Center.
	Do not copy without permission	Series No. 60



ACR Series Thick Film Chip Resistors Product Specification

Document No.

IE-SP-010

Released Date

2021/07/08

Page No.

10

9.5 Operation and Processing Precautions:

- (a) Avoid damage to the edge of resistor and protective layer caused by mechanical stress.
- (b) Handle with care when printing circuit board (PCB) is divided or fixed on support body, because bending of printing circuit board (PCB) mounting will make mechanical stress for resistors.
- (c) Make sure the power rating is under the limit when using the resistor. When power rating is over the limit, the resistor will be overloaded. There might be machinery damage due to the climbing temperature.
- (d) If the resistor will be exposed under massive impact load (shock wave) in a short period of time, the working environment must be set up well before use.
- (e) Please make evaluation and confirmation when the product is well used in your company and have a through consideration of it's fail-safe design to ensure the system safety.

10 Stock period:

10.1 The temperature condition must be controlled at $25\pm 5^{\circ}\text{C}$, the R.H. must be controlled at $60\pm 15\%$. The stock can maintain quality level in two years.

10.2 Please avoid the mentioned harsh environment below when storing to ensure product performance and its' weldability. Places exposed to sea breeze or other corrosive gas, such as Cl_2 、 H_2S 、 NH_3 、 SO_2 and NO_2 .

10.3 When the product is moved and stored, please ensure the correct orientation of the box. Do not drop or squeeze the box. Otherwise, the electrode or the body of the product may be damaged.

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

Marking for control of pollution cause by electronic-information products	Marking for package recovery

Remark

IT'S NOT UNDER CONTROL FOR PDF FILE
PLS NOTE THE VERSION STATED..

Issue Dep. DATA Center.

Do not copy without permission

Series No. **60**



ACR Series Thick Film Chip Resistors Product Specification

Document No.	IE-SP-010
Released Date	2021/07/08
Page No.	11

Legal disclaimer

ABCO, its distributors and agents (collectively, "ABCO"), hereby disclaims any and all liabilities for any errors, inaccuracies or incompleteness contained in any product related information, including but not limited to product specifications, datasheets, pictures and/or graphics. ABCO may make changes, modifications and/or improvements to product related information at any time and without notice.

ABCO makes no representation, warranty, and/or guarantee about the fitness of its products for any particular purpose or the continuing production of any of its products. To the maximum extent permitted by law, ABCO disclaims (i) any and all liability arising out of the application or use of any ABCO product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for a particular purpose, non-infringement and merchantability.

ABCO defined this product is for general electrical use, not design for any application for automotive electrical ,life-saving or life support equipment, or any application which may inflict casualties if ABCO product failure occurred. When consumer is using or selling products of ABCO without having discussion with the sales representatives and specifically stated the applicability mentioned above in a written form, then the client need to take a full responsibility and agree to protect ABCO from punishment and damage.

Information provided here is intended to indicate product specifications only. ABCO reserves all the rights for revising this content without further notification, as long as products are unchanged. Any product change will be announced by ECN.

Remark	IT'S NOT UNDER CONTROL FOR PDF FILE PLS NOTE THE VERSION STATED..	Issue Dep. DATA Center.
	Do not copy without permission	Series No. 60