



ISO9001 & ISO14001 & TS16949 CHILISIN ELECTRONICS CORP.

Form No.: QF-1274
Edition: 2

RoHS & Halogen Free & REACH Compliance.

SPECIFICATION FOR APPROVAL

Customer : _____

Customer P/N: _____

Drawing No : _____

Quantity : **0** Pcs. Date : _____

Chilisin P/N : **BCRC Series**

| SPECIFICATION ACCEPTED BY: | |
|----------------------------|--|
| COMPONENT ENGINEER | |
| ELECTRICAL ENGINEER | |
| MECHANICAL ENGINEER | |
| APPROVED | |
| REJECTED | |

奇力新電子股份有限公司
 Chilisin Electronics Corp
 No. 29, Alley 301, Tehhsin Rd.,
 Hukou, Hsinchu 303, Taiwan
 TEL : +886-3- 599-2646
 FAX : +886-3- 599-9176
 E-mail : sales@chilisin.com
 http : //www.chilisin.com

東莞奇力新電子(東莞廠)有限公司
 Chilisin Electronics (Dongguan) Co., Ltd.
 No. 78, Puxing Rd., Yuliangwei Administration
 Area, Qingxi Town, Dongguan City,
 Guangdong, China
 TEL : +86-769-8773-0251~3
 FAX : +86-769-8773-0232
 E-mail : cect@chilisin.com

奇力新電子(越南廠)有限公司
 Chilisin Electronics (Vietnam) Limited
 No 143 - 145, Road No 10, VSIP Hai Phong,
 Lap Le Commune, Thuy Nguyen Dist,
 Haiphong City, Vietnam
 Tel : 84-316 255 688 Fax : 84-316 255
 689

奇力新電子(湖南廠)有限公司
 HuNan Chilisin Electronics Technology Co., Ltd
 No. 8, Shaziao Liangshuijing Town, Yuanling
 County, Huaihua City, Hunan Province 419601,
 China
 Tel : 86-745-867-5882
 E-mail : cect@chilisin.com

Drawn by
Desmond.Wu

Checked by
Cf.Hsieh

Approved by
Wl.Liu



BCRC Jumper Specification

1 Scope:

This specification is applicable to lead free and halogen free for zero milli-ohm resistor (Jumper) series metal alloy product only.

2 Part Numbering:

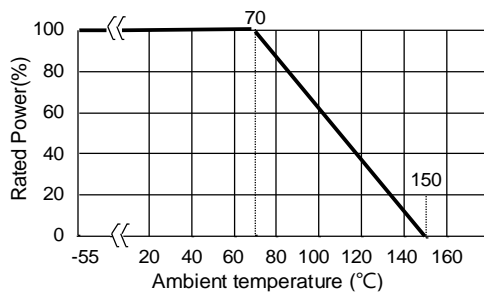
| | | | | | | | | | | | | | | | | | |
|---|----------|----------|----------|----------------------|----------|-------------------------|----------|----------|----------|------------------------|---------------------------|----------|----------|----------|------------------|----------|----------|
| B | C | R | C | 0 | 0 | 0 | 6 | 0 | 3 | C | R | 0 | 0 | 0 | J | P | J |
| Series | | | | Internal Code | | Dimension (inch) | | | | Rated Power (W) | Nominal Resistance | | | | Tolerance | | |
| BCRC: Metal Alloy Low resistance Resistor | | | | | | 0603 | | | | G = 0.25W | R000JP = Below 0.30 mΩ | | | | J = ± 5% | | |
| | | | | | | 0805 | | | | C = 0.5 W | R000JP = Below 0.20 mΩ | | | | | | |
| | | | | | | 1206 | | | | 1 = 1 W | | | | | | | |
| | | | | | | 2512 | | | | 2 = 2 W | | | | | | | |
| | | | | | | | | | | 3 = 3 W | | | | | | | |

3 SPECIFICATIONS:

| Type | Max. Rating Power | Max. Loading Current | Resistance (mΩ) | Operating Temperature Range |
|------|-------------------|----------------------|-----------------|-----------------------------|
| 0603 | 0.25 W | 28.9 A | < 0.30 | -55~+150°C |
| 0805 | 0.5 W | 50.0 A | < 0.20 | |
| 1206 | 0.5W | 50.0 A | < 0.20 | |
| | 1 W | 70.7 A | < 0.20 | |
| 2512 | 2 W | 100.0 A | < 0.20 | |
| | 3 W | 122.5 A | < 0.20 | |

3.1 Power Derating Curve: Operating Temperature Range: - 55 ~+150 °C

For resistors operated in ambient temperatures 70°C, power rating shall be derated in accordance with the curve below:



3.2 Rating Current:

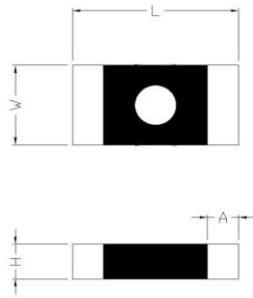
The following equation may be used to determine the DC (Direct Current) or AC (Alternating Current) currents (RMS, root mean square value) of normal rated power. However, if the result value exceeds the highest current of regulated standards, the highest normal rated power is to be used.

- a. I: Rating Current.(A)
- b. P: Rating Power.(W)
- c. R: Resistance.(Ω)

$$I = \sqrt{P/R}$$

BCRC Jumper Specification

4 Physical Dimensions:



| Type | Rated Power | Resistance Range (mΩ) | Dimensions - in inches (millimeters) | | | |
|------|-------------|-----------------------|--------------------------------------|----------|-----------|-----------|
| | | | L | W | H | A |
| 0603 | 0.25W | < 0.3 | 1.60±0.1 | 0.80±0.1 | 0.35±0.15 | 0.30±0.15 |
| 0805 | 0.5 W | < 0.2 | 2.03±0.2 | 1.27±0.2 | 0.35±0.15 | 0.40±0.15 |
| 1206 | 0.5 W | < 0.2 | 3.05±0.2 | 1.52±0.2 | 0.50±0.2 | 0.70±0.2 |
| | 1.0 W | | | | | |
| 2512 | 2.0 W | < 0.2 | 6.35±0.2 | 3.05±0.2 | 0.60±0.2 | 1.40±0.2 |
| | 3.0 W | | 6.35±0.2 | 3.05±0.2 | 0.60±0.2 | 1.40±0.2 |



BCRC Jumper Specification

5 Reliability Performance

5.1 Electrical Performance

| No | Item | Conditions of Test | Test Limits | | | | | | | | | | | | | | | |
|-------|---------------------------------|--|---------------------------------------|-----------|------------------|------|------|---------|------|-----|---------|------|-----|------|-----|------|-----|--|
| 5-1-1 | Short Time Overload | <p>Applied Overload for 5 seconds and release the load for about 30 minutes, then measure its resistance variance rate. (Overload condition refer to below):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Type</th> <th>Power (W)</th> <th># of rated power</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>0.25</td> <td>4 times</td> </tr> <tr> <td>0805</td> <td>0.5</td> <td rowspan="4">4 times</td> </tr> <tr> <td>1206</td> <td>0.5</td> </tr> <tr> <td>2512</td> <td>1.0</td> </tr> <tr> <td>2512</td> <td>3.0</td> </tr> </tbody> </table> <p>Refer to JIS C 5201-1 4.13</p> | Type | Power (W) | # of rated power | 0603 | 0.25 | 4 times | 0805 | 0.5 | 4 times | 1206 | 0.5 | 2512 | 1.0 | 2512 | 3.0 | $\leq 0.2 \text{ m}\Omega$ $\leq 0.3 \text{ m}\Omega$ No evidence of mechanical damage |
| Type | Power (W) | # of rated power | | | | | | | | | | | | | | | | |
| 0603 | 0.25 | 4 times | | | | | | | | | | | | | | | | |
| 0805 | 0.5 | 4 times | | | | | | | | | | | | | | | | |
| 1206 | 0.5 | | | | | | | | | | | | | | | | | |
| 2512 | 1.0 | | | | | | | | | | | | | | | | | |
| 2512 | 3.0 | | | | | | | | | | | | | | | | | |
| 5-1-2 | Insulation Resistance | <p>Put the resistor in the fixture, add 100 VDC in +, - terminal for 60secs then measured the insulation resistance between electrodes and insulating enclosure or between electrodes and base material.</p> <p>Refer to JIS-C5201-1 4.6</p> | $\geq 10^9 \Omega$ | | | | | | | | | | | | | | | |
| 1-1-4 | Dielectric Withstanding Voltage | <p>Applied 500VAC for 1 minute, and Limit surge current 50 mA (max.)</p> <p>Refer to JIS-C5201-1 4.7</p> | No short or burned on the appearance. | | | | | | | | | | | | | | | |

5-2.Mechanical /Constructional Performance

| No | Item | Conditions of Test | Test Limits |
|-------|---------------------------|---|--|
| 5-2-1 | Resistance to Solder Heat | <p>The tested resistor be immersed 25 mm/sec into molten solder of $260 \pm 5^\circ\text{C}$ for 10 ± 1secs. Then the resistor is left in the room for 1 hour, and measured its resistance variance rate.</p> <p>Refer to JIS-C5201-1 4.18</p> | $\leq 0.2 \text{ m}\Omega$ $\leq 0.3 \text{ m}\Omega$ No evidence of mechanical damage |
| 5-2-2 | Solderability | <p>Add flux into tested resistors, immersion into solder bath in temperature $245 \pm 5^\circ\text{C}$ for 3 ± 0.5secs.</p> <p>Refer to JIS-C5201-1 4.17</p> | Solder coverage over 95% |
| 5-2-3 | Vibration | <p>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 : 1.5mm This motion shall be applied for a period of 4 hours in each 3 mutually perpendicular directions (a total of 12hrs)</p> <p>Refer to JIS-C5201-1 4.22</p> | $\leq 0.2 \text{ m}\Omega$ $\leq 0.3 \text{ m}\Omega$ No evidence of mechanical damage |
| 5-2-4 | Resistance to solvent | <p>The tested resistor be immersed into isopropyl alcohol of $20\text{--}25^\circ\text{C}$ for 60secs, then the resistor is left in the room for 48 hrs. Refer to JIS-C5201-1 4.29</p> | $\leq 0.2 \text{ m}\Omega$ $\leq 0.3 \text{ m}\Omega$ No evidence of mechanical damage |



BCRC Jumper Specification

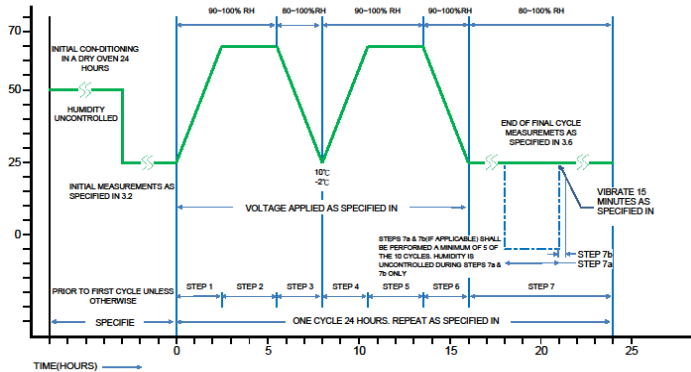
5-3.Environmental Performance

| No | Item | Conditions of Test | Test Limits | | | | | | |
|----------------------------------|--|---|---|--|---------------------------------|--|----------------------------------|--|---|
| 5-3-1 | Low Temperature Exposure (Storage) | Put the tested resistor in chamber under temperature $-55\pm 2^{\circ}\text{C}$ for 1,000 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate. Refer to JIS-C5201-1 4.23.4 | $\leq 0.2\text{ m}\Omega$ $\leq 0.3\text{m}\Omega$ No evidence of mechanical damage | | | | | | |
| 5-3-2 | High Temperature Exposure (Storage) | Put tested resistor in chamber under temperature $150\pm 5^{\circ}\text{C}$ for 1,000 hours. Then leaving the tested resistor in room temperature for 60 minutes , and measure its resistance variance rate. Refer to JIS-C5201-1 4.23.2 | $\leq 0.2\text{ m}\Omega$ $\leq 0.3\text{m}\Omega$ No evidence of mechanical damage | | | | | | |
| 5-3-3 | Temperature Cycling (Rapid Temperature Change) | Put the tested resistor in the chamber under the temperature cycling which shown in the following table shall be repeated 1,000 times consecutively. Then leaving the tested resistor in the room temperature for 60 minutes, and measure its resistance variance rate. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">Testing Condition[Ⓐ]</th> </tr> </thead> <tbody> <tr> <td>Lowest Temperature[Ⓐ]</td> <td>$-55\ +0/-10^{\circ}\text{C}$ [Ⓐ]</td> </tr> <tr> <td>Highest Temperature[Ⓐ]</td> <td>$150\ +10/-0^{\circ}\text{C}$ [Ⓐ]</td> </tr> </tbody> </table> Refer to JIS-C5201-1 4.19 | Testing Condition [Ⓐ] | | Lowest Temperature [Ⓐ] | $-55\ +0/-10^{\circ}\text{C}$ [Ⓐ] | Highest Temperature [Ⓐ] | $150\ +10/-0^{\circ}\text{C}$ [Ⓐ] | $\leq 0.2\text{ m}\Omega$ $\leq 0.3\text{m}\Omega$ No evidence of mechanical damage |
| Testing Condition [Ⓐ] | | | | | | | | | |
| Lowest Temperature [Ⓐ] | $-55\ +0/-10^{\circ}\text{C}$ [Ⓐ] | | | | | | | | |
| Highest Temperature [Ⓐ] | $150\ +10/-0^{\circ}\text{C}$ [Ⓐ] | | | | | | | | |
| 5-3-4 | Moisture Resistance (Climatic Sequence) | Put the tested resistor in chamber and subject to 10 cycles of damp heat and without power. Each one of which consists of the steps 1 to 7 (Figure 1). Then leaving the tested resistor in room temperature for 24 hr, and measure its resistance variance rate. Refer to MIL-STD 202 Method 106 | $\leq 0.2\text{ m}\Omega$ $\leq 0.3\text{m}\Omega$ No evidence of mechanical damage | | | | | | |
| 5-3-5 | Bias Humidity | Put the tested resistor in chamber under $85\pm 5^{\circ}\text{C}$ and $85\pm 5\%\text{RH}$ with 10% bias and load the rated current for 90 minutes on, 30 minutes off, total 1,000 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 | $\leq 0.2\text{ m}\Omega$ $\leq 0.3\text{m}\Omega$ No evidence of mechanical damage | | | | | | |

5-4 Operational Life Endurance

| No | Item | Conditions of Test | Test Limits |
|-------|-----------|---|---|
| 5-4-1 | Load Life | Put the tested resistor in chamber under temperature $70\pm 2^{\circ}\text{C}$ and load the rated current 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 | $\leq 0.2\text{ m}\Omega$ $\leq 0.3\text{m}\Omega$ No evidence of mechanical damage |

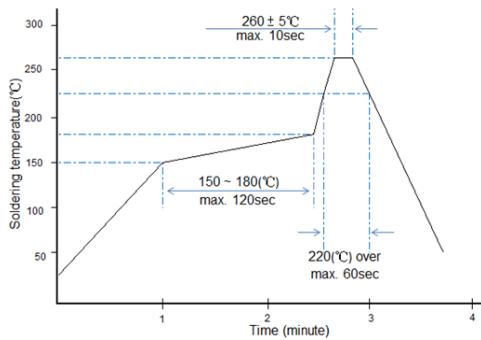
BCRC Jumper Specification



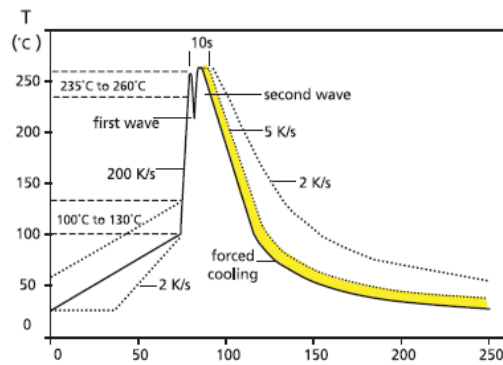
6 Recommend Soldering Conditions

Surface-mount components are tested for solderability at a temperature of 260 °C for 5 seconds.

Typical examples of soldering processes that provide reliable joints without any damage are given in below:



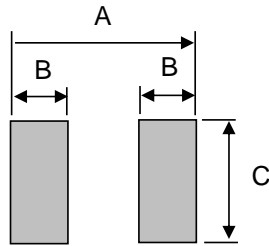
Recommended IR Reflow Soldering Profile



Recommended double-wave Soldering Profile
Typical values (solid line)
Process limits (dotted line)

BCRC Jumper Specification

7 Recommend Land Pattern:



| TYPE | Dimensions (mm) | | |
|------|-----------------|-----|-----|
| | A | B | C |
| 0603 | 2.6 | 0.9 | 0.9 |
| 0805 | 3.4 | 1.3 | 1.3 |
| 1206 | 4 | 1.5 | 1.8 |
| 2512 | 7.6 | 2.6 | 3.8 |

8 Packaging Quantity:

| Type | Tape Width | Packaging Quantity (pcs/reel) |
|------|------------|---------------------------------|
| | | 4 mm Pitch |
| 0603 | 8 mm | 5,000 pcs |
| 0805 | 8 mm | 5,000 pcs |
| 1206 | 8 mm | 4,000 pcs |
| 2512 | 12 mm | 4,000 pcs |