# WELLCOMP TECHNOLOGY CO., LTD

# APPROVAL SHEET

| | |
|---|---|
| **Model Name** | **Chip Current Sensing Resistor** |
| **Part Number** | **WCCS Series** |
| **Customer Name** | |
| **Customer P/N** | |
| **Issued Date** | |

| Customer | | Maker | | |
|---|---|---|---|---|
| Approved | Checked | Inspector | Checked | Prepared |
| | | | | |


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# WCCS Series

**Thin Film Current Sensing Resistor**

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Version: A04

## Features

◆Chip size from 0402 to 2512
◆Resistance Value from 47mΩ to 910mΩ
◆Lead free, RoHS compliant for global applications and halogen free

## Application

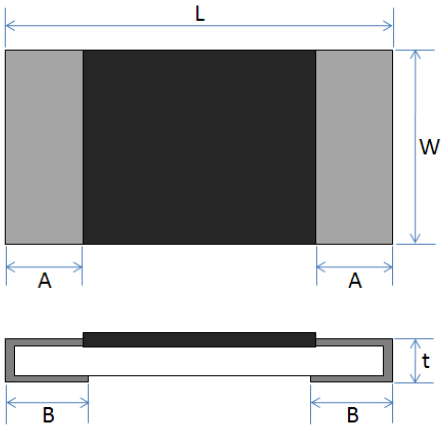
◆Mobile electronic equipment-Cellular phone, NB Tablet PC, GPS, DSC, HDD
◆DC-DC converter, Adapter, Battery pack and charger
◆Switching power supply
◆Voltage Regulation module
◆Power management applications

## Part Numbering System

| WCCS | 1206 | R100 | F | T | x |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |

(1) Series Code
(2) Size (EIA): Length x Width
(3) Resistance: R002=2mΩ, R010=10mΩ
(4) Tolerance: D=+/-0.5%, F=+/-1%, G=+/-2%, J=+/-5%
(5) Packaging: T- Embossed paper tape, 7" reel
E-Embossed plastic tape, 7” reel
(6) Factory Code

## Dimension




| Type | Dimensions | | | | |
|---|---|---|---|---|---|
| (inch size) | L | W | t | A | B |
| 0402 | 1.00±0.10 | 0.50±0.05 | 0.35±0.05 | 0.20±0.10 | 0.25±0.10 |
| 0603 | 1.55±0.10 | 0.80±0.10 | 0.45±0.10 | 0.30±0.20 | 0.35±0.20 |
| 0805 | 2.10±0.15 | 1.30±0.15 | 0.65±0.15 | 0.40±0.20 | 0.35±0.20 |
| 1206-S Type | 3.10±0.20 | 1.65±0.10 | 0.65±0.15 | 0.50±0.30 | 0.40±0.20 |
| 1206-L Type | | | | 0.8±0.30 | |
| 2512-S Type | 6.45±0.20 | 3.25±0.10 | 0.80±0.15 | 0.60±0.30 | 0.50±0.25 |
| 2512-L Type | | | | 1.8±0.30 | |

*Remark: R≧100mΩ is S Type
R<100mΩ is L Type

## Electrical Specification

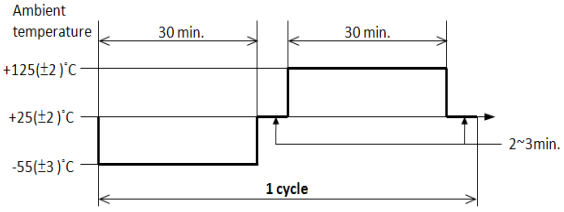
| Type | Power Rating | Operation Temp. Range | Resistance Range(mΩ) | | | TCR (PPM/℃) |
|---|---|---|---|---|---|---|
| | | | 1% | 2% | 5% | |
| 0402 | 1/16W | -55~+155℃ | 100-499 | | | ±500 |
| 0603 | 1/10W | | 500-976 | | | ±200 |
| 0805 | 1/8W | -55~+155℃ | 50-99 | | | ±800 |
| 1206 | 1/4W | | 100-499 | | | ±500 |
| 2512 | 1W | | 500-976 | | | ±200 |

Note:

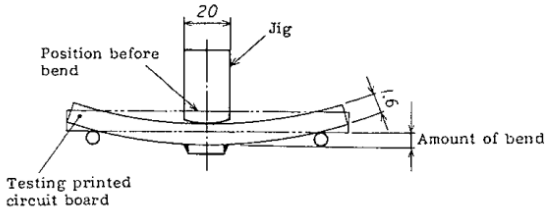
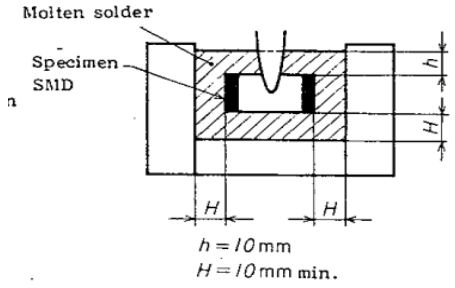
(1) Non-Standard resistance values available

## Performances

### Environmental Performance

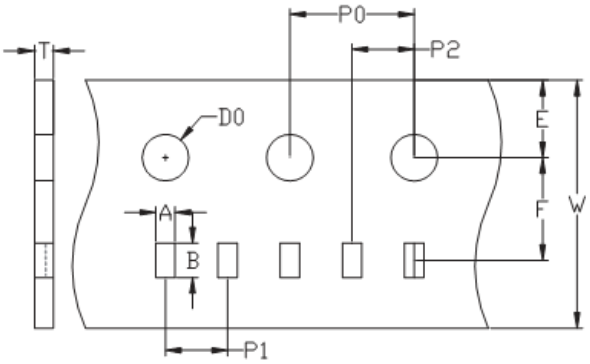
| No. | Item | Test Condition | Specification | |
|---|---|---|---|---|
| | | | 1%, 2% | 5% |
| 1 | Short Time Overload | 5X rated power for 5 sec. (JIS-C5202-5.5) | ±(1%+0.05Ω) | ±(2%+0.05Ω) |
| 2 | Temperature Coefficient of Resistance (T.C.R.) | +25°C /+125°C. (JIS-C5202-5.2) $TCR\ (\text{ppm/℃}) = \frac{\Delta R}{R \times \Delta t} \times 10^6$ | Refer to Electrical Specification | |
| 3 | Damp Heat with Load | The specimens shall be placed in a chamber and subjected to a relative humidity of 90~95% percent and a temperature of 40° ±2°C for the period of 1000 hrs. (MIL-STD-202, Method 103) | ±(2%+0.05Ω) | ±(3%+0.05Ω) |
| 4 | High Temperature Exposure | The ship (mounted on board) is exposed in the heat chamber 125±3℃ for 1000 hrs. (JIS-C5202-7.2) | ±(1%+0.05Ω) | ±(1.5%+0.05Ω) |
| 5 | Load Life | Apply rated power at 70±2°C for 1000 hours with 1.5 hours ON and 0.5 hour OFF. (JIS-C5202-7.10) | ±(2%+0.05Ω) | ±(3%+0.05Ω) |
| 6 | Rapid change of temperature | The chip (mounted on board) is exposed, -55±3°C (30min.)/+125±2°C (30min.) for 5 cycles. The following conditions as the following figure. (JIS-C5202-7.4)   | ±(0.5%+0.05Ω) | ±(1%+0.05Ω) |

## Function Performance

| No. | Item | Test Condition | Specification | |
|---|---|---|---|---|
| | | | 1%, 2% | 5% |
| 1 | Bending Strength | Mount the chip to test substrate. Apply pressure in direction of arrow unit band width reaches 3mm(+0.2/-0mm) illustrated in the figure below and hold for 10±1 sec. (JIS-C5202-6.1)<br>Unit: mm<br>  | ±(1%+0.05Ω) | |
| 5 | Solvent Resistance | The chip is completed immersion of the specimens in the isopropyl alcohol for 3 *+5, -0) min., 25°C ±5°C. (MIL-STD-202, Method 215) | Verify marking permanency. (Nor required for laser etched parts or parts with no marking) | |
| 6 | Resistance to solder Heat | The specimen chip shall be immersed into the flux specified in the solder bath 260±5°C for 10±1 sec. (MIL-STD-202, Method 210) | ±(0.5%+0.05Ω) | ±(1%+0.05Ω) |
| 7 | Solderability | The specimen chip shall be immersed into the flux specified in the solder bath 235±5°C for 2±0.5 sec. It shall be immersed to a point 10mm from its root. (Sn96.5/Ag3.0/Cu0.5) (JIS-C5 202-6.11)<br>  | Solder shall be covered 95% or more of the electrode area. | |

## Tape Packaging Specifications

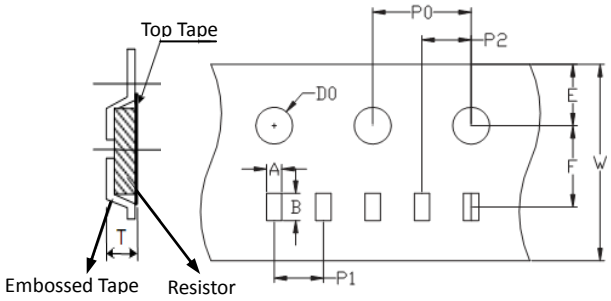
◆Paper Tape Specifications




Unit:mm

| Type | Carrier Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | E | F | W | P0 | P1 | P2 | D0 | T |
| 0402 | 0.7±0.05 | 1.2±0.05 | 1.75±0.1 | 3.5±0.05 | 8.0±0.2 | 4.0±0.1 | 2.0±0.1 | 2.0±0.05 | 1.55±0.05 | 0.45±0.1 |
| 0603 | 1.1±0.1 | 1.9±0.1 | 1.75±0.1 | 3.5±0.05 | 8.0±0.2 | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 1.55±0.05 | 0.64±0.1 |
| 0805 | 1.6±0.1 | 2.4±0.1 | 1.75±0.1 | 3.5±0.05 | 8.0±0.2 | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 1.55±0.05 | 0.97±0.1 |
| 1206 | 2.0±0.1 | 3.6±0.1 | 1.75±0.1 | 3.5±0.05 | 8.0±0.2 | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 1.55±0.05 | 0.97±0.1 |

◆Embossed Plastic Tape Specifications




Unit:mm

| Type | Carrier Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | E | F | W | P0 | P1 | P2 | D0 | T |
| 2512 | 3.5±0.1 | 6.8±0.1 | 1.75±0.1 | 5.5±0.05 | 12.0±0.2 | 4.0±0.05 | 4.0±0.1 | 2.0±0.05 | 1.5±0.1 | 1.0±0.2 |

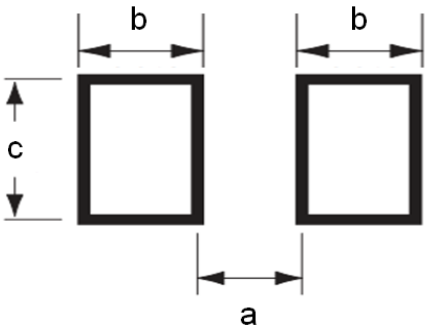
## Packaging

| Size EIA (EIAJ) | 0402 | 0603/0805/1206 | 2512 |
|---|---|---|---|
| Standard Packing Quantity (pcs /reel) | 10,000 | 5,000 | 4,000 |

## Storage Conditions

Temperature：5~35℃, Humidity：40~75%

## Recommended Solder Pad Layout



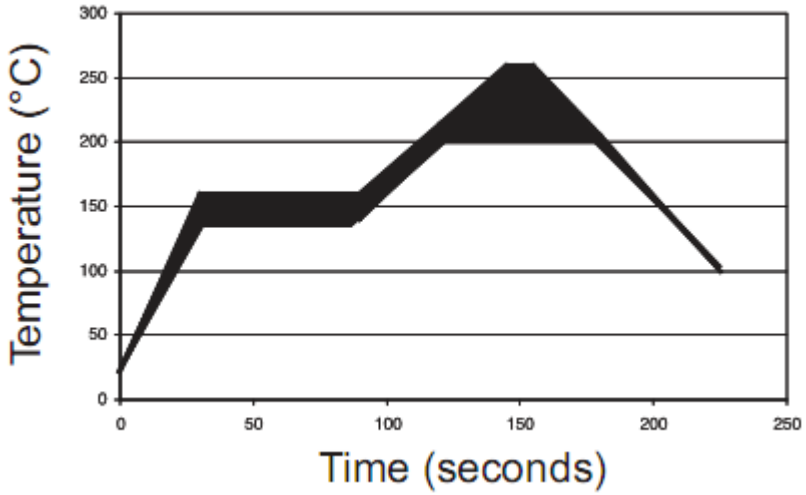

| Type | Pad Layout Dimension (mm) | | |
|---|---|---|---|
| | a | b | c |
| 0402 | 0.60 | 0.50 | 0.60 |
| 0603 | 0.90 | 0.70 | 1.00 |
| 0805 | 1.20 | 1.20 | 1.40 |
| 1206 | 2.20 | 1.30 | 1.80 |
| 2512 | 3.80 | 2.10 | 3.40 |

## Soldering Recommendations

◆ Peak reflow temperatures and durations：
- IR Reflow Peak = 260℃ max for 30 sec
- Wave Solder = 260℃ max for 10 sec

◆ Compatible with lead and lead-free solder reflow processes

◆ Recommended IR Reflow Profile：




## ECN

Engineering Change Notice：The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.