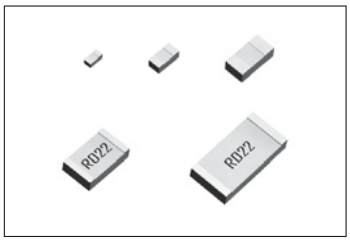
# Thick Film Low Ohmic Chip Resistors for Current Detection

**UCR Series** Datasheet

## ●Features

1) Very-low ohmic resistance from 11mΩ is in lineup by thick-film resistive element.
2) Resistive element is located at bottom side, which reduces the resistance shift during mounting process.
3) ROHM's unique structure achieved improvement of heat.
4) ROHM resistors have obtained ISO9001 / ISO / TS16949 certification.
5) Corresponds to AEC-Q200. But UCR006 is prereparing.
   UCR03 (under 100mΩ or less) are unsupprted.




## ●Products List

| Part No. | Size (mm) | Size (inch) | Rated Power (70°C) (W) | Resistance Tolerance (%) | Temperature Coefficient (ppm / °C) | Resistance Range | Series | Operating Temperature Range (°C) |
|---|---|---|---|---|---|---|---|---|
| **UCR006** | 0603 | 0201 | 0.1 | J(±5%) F(±1%) | 0 to 300 | 0.1Ω to 0.91Ω | E24 | –55 to +155 |
| **UCR01** | 1005 | 0402 | 0.125 | J(±5%) F(±1%) | 0 to 300 | 0.068Ω to 0.091Ω | | |
| | | | | | 0 to 250 | 0.1Ω to 0.2Ω | | |
| | | | | | 0 to 200 | 0.22Ω to 0.91Ω | | |
| **UCR03** | 1608 | 0603 | 0.25 | J(±5%) F(±1%) | 0 to 250 | 0.020Ω to 0.047Ω | | |
| | | | | | 0 to 200 | 0.051Ω to 0.091Ω | | |
| | | | | | 0 to 150 | 0.1Ω to 0.2Ω | | |
| | | | 0.2 | J(±5%) F(±1%) | 0 to 150 | 0.22Ω to 0.91Ω | | |
| **UCR10** | 2012 | 0805 | 0.33 | J(±5%) | 250 ± 200 | 0.011Ω to 0.018Ω | | |
| | | | | | 0 to 250 | 0.020Ω to 0.047Ω | | |
| | | | | | 0 to 150 | 0.051Ω to 0.1Ω | | |
| | | | | F(±1%) | 0 to 250 | 0.020Ω to 0.047Ω | | |
| | | | | | 0 to 150 | 0.051Ω to 0.1Ω | | |
| **UCR18** | 3216 | 1206 | 0.5 | J(±5%) F(±1%) | 0 to 350 | 0.011Ω to 0.018Ω | | |
| | | | | | 0 to 200 | 0.020Ω to 0.039Ω | | |
| | | | | | 0 to 150 | 0.043Ω to 0.1Ω | | |

∗Design and specifications are subject to change without notice.
Carefully check the specification sheet supplied with the product before using or ordering it.

## ●Part Number Description

**U C R** — **Part No.**
**UCR** (Thick Film Low Ohmic Chip Resistors)

**1 0** — **Size** (mm [inch])
006 (0603 [0201])
01 (1005 [0402])
03 (1608 [0603])
10 (2012 [0805])
18 (3216 [1206])

**E V H** — **Packaging Specifications Code**

| Part No. | Code | Packaging specifications | Quantity / Reel |
|---|---|---|---|
| **UCR006** | YVP | Paper tape (4mm Pitch) | 15,000 |
| **UCR01** | MVP | Paper tape (2mm Pitch) | 10,000 |
| **UCR03** | EWP (20 to 47mΩ) | Paper tape (4mm Pitch) | 5,000 |
| | EVP (51 to 910mΩ) | | |
| **UCR10** | EVH | Paper tape (4mm Pitch) | 5,000 |
| **UCR18** | EVH | Paper tape (4mm Pitch) | 5,000 |

**J** — **Resistance Tolerance**
F ( ±1% )
J ( ±5% )

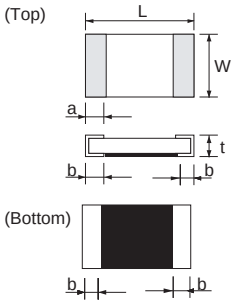
**L** — **Special part code**
S : 0.011 to 0.091Ω
L : 0.1Ω to

**R 1 0** — **Nominal Resistance**
Resistance code, 3 or 4 digits.

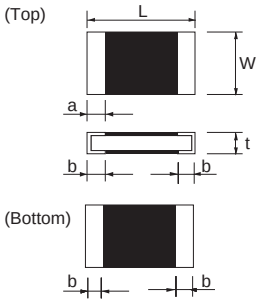
| Resistance tolerance + Special code | Resistance code |
|---|---|
| **FS,FL,JS** : | 4 digits |
| **JL** : | 3 digits |

## ●Chip Resistor Dimensions and Markings

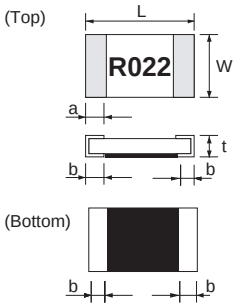
■ **UCR006/01**
■ **UCR03** (50mΩ ≦ R ≦ 910mΩ)




■ **UCR03** (20mΩ ≦ R < 50mΩ)




■ **UCR10 / 18**

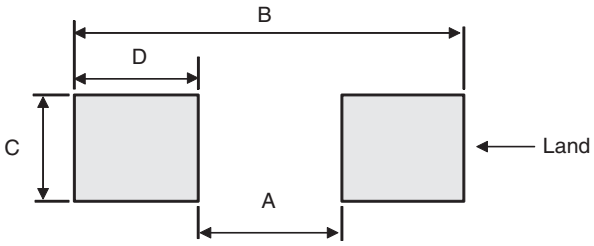



<Marking method>
There are three or four digits used for the calculation number according to IEC code and “R”is used for the decimal point.
Ex.) 4digits……0.1Ω=R100
3digits……0.1Ω=R10

(Unit : mm)

| Part No. | (mm) | (inch) | L | W | t | a | b | Marking existence |
|---|---|---|---|---|---|---|---|---|
| **UCR006** | 0603 | 0201 | 0.62±0.05 | 0.32±0.05 | 0.24±0.05 | 0.18±0.1 | 0.22±0.1 | No |
| **UCR01** | 1005 | 0402 | 1.0±0.1 | 0.55±0.1 | 0.37±0.05 | 0.28±0.1 | 0.34±0.1 | No |
| **UCR03** | 1608 | 0603 | 1.6±0.1 | 0.87±0.1 | 0.5±0.1 | 0.45±0.2 | 0.45±0.2 | No |
| **UCR10** | 2012 | 0805 | 2.0±0.1 | 1.25±0.1 | 0.55±0.1 | 0.24±0.2 | 0.5±0.2 | Yes |
| **UCR18** | 3216 | 1206 | 3.2±0.15 | 1.6±0.15 | 0.55±0.1 | 0.3±0.2 | 0.9±0.25 | Yes |

## ●Land pattern Example



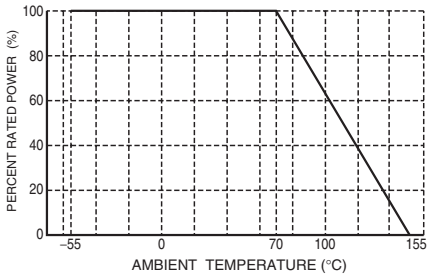

(Unit : mm)

| Dimensions / Part No. | A | B | C | D |
|---|---|---|---|---|
| **UCR006** | 0.3 | 1.2 | 0.5 | 0.45 |
| **UCR01** | 0.5 | 1.8 | 0.5 | 0.65 |
| **UCR03** | 0.5 | 2.5 | 0.9 | 1.0 |
| **UCR10** | 0.8 | 3.4 | 1.3 | 1.3 |
| **UCR18** | 1.4 | 4.0 | 1.8 | 1.3 |

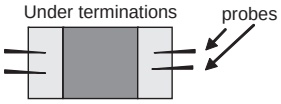
## ●Derating Curve

When the ambient temperature exceeds 70°C, power dissipation must be adjusted according to the derating curves below.

■ UCR006 / 01 / 03 / 10 / 18




## ●Characteristics (UCR01 / 03 / 10 / 18 )

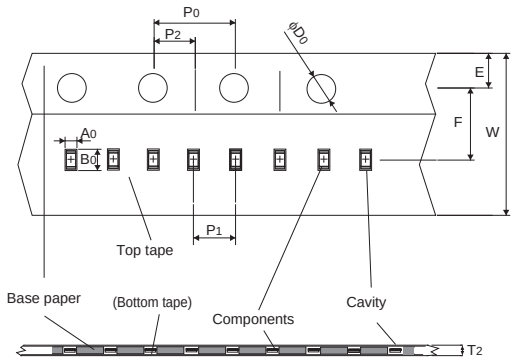
| Test Items | Guaranteed Value<br>Resistor Type | Test Conditions |
|---|---|---|
| Resistance | See P.1 | 20°C<br>Measuring method : Measure under terminations by 4 probes.<br>  |
| Variation of resistance with temperature | See P.1 | Measurement : +20 / –55 / +20 / +125°C |
| Overload | ± (2.0%+0.005Ω) | Rated voltage (current) ×2.5, 2s |
| Solderability | A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage. | Rosin·Ethanol : 25% (Weight)<br>Soldering condition : 235±5°C<br>Duration of immersion : 2.0±0.5s |
| Resistance to soldering heat | ± (1.0%+0.005Ω)<br>No remarkable abnormality on the appearance. | Soldering condition : 260±5°C<br>Duration of immersion : 10±1s |
| Rapid change of temperature | ± (1.0%+0.005Ω) | Test temp. : –55°C to +125°C 5cycle |
| Damp heat, steady state | ± (3.0%+0.005Ω) | 40°C, 93%RH (Relative Humidity)<br>Test time : 1,000h to 1,048h |
| Endurance at 70°C | ± (3.0%+0.005Ω) | 70°C<br>Rated voltage (current)<br>1.5h : ON – 0.5h : OFF<br>Test time : 1,000h to 1,048h |
| Endurance | ± (3.0%+0.005Ω) | 155°C<br>Test time : 1,000h to 1,048h |
| Resistance to solvent | ± (0.5%+0.005Ω) | 23±5°C, Immersion cleaning, 5±0.5min<br>Solvent : 2–propanol |
| Bend strength of the end face plating | Without mechanical damage such as breaks. | – |

∗Please contact us for guarantee of the test conditions other than those described above.

Compliance Standard(s) : IEC60115–8
JISC 5201–8

## ●Tape Dimensions

■ Paper Tape

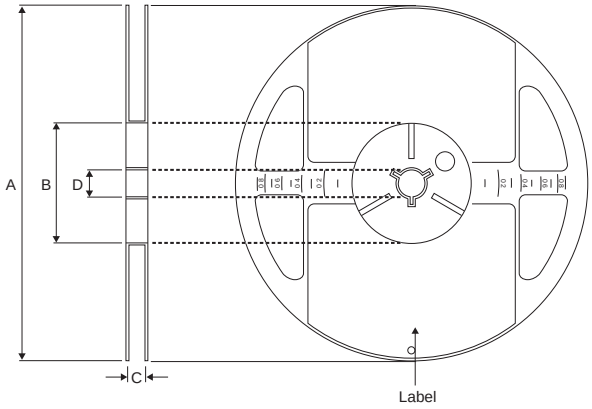



(Unit : mm)

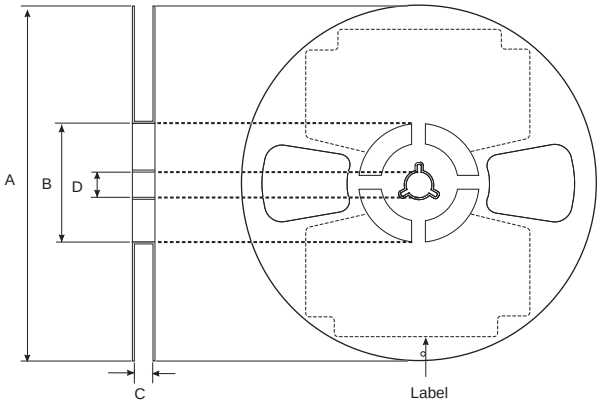
| Part No. | W | F | E | A0 | B0 |
|---|---|---|---|---|---|
| **UCR006** | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 0.39±0.1 | 0.7±0.1 |
| **UCR01** | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 0.7±0.1 | 1.2±0.1 |
| **UCR03** | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 1.1±0.1 | 1.9±0.1 |
| **UCR10** | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | $1.65^{+0.2}_{-0.1}$ | $2.4^{+0.2}_{-0.1}$ |
| **UCR18** | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | $1.95^{+0.1}_{-0.05}$ | $3.5^{+0.15}_{-0.05}$ |

| Part No. | D0 | P0 | P1 | P2 | T2 |
|---|---|---|---|---|---|
| **UCR006** | $\phi 1.5^{+0.1}_{0}$ | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | Max0.46 |
| **UCR01** | $\phi 1.5^{+0.1}_{0}$ | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | Max 1.1 |
| **UCR03** | $\phi 1.5^{+0.1}_{0}$ | 4.0±0.1 | 4.0±0.05 | 2.0±0.05 | Max 1.1 |
| **UCR10** | $\phi 1.5^{+0.1}_{0}$ | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |
| **UCR18** | $\phi 1.5^{+0.1}_{0}$ | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |

## ●Reel Dimensions




ACCORDING TO EIAJ ET-7200B




ACCORDING TO EIAJ ET-7200B (RRV)

(Unit : mm)

| Part No. | A | B | C | D |
|---|---|---|---|---|
| **UCR006** | $\phi 180^{0}_{-1.5}$ | $\phi 60^{+1.0}_{0}$ | $9^{+1.0}_{0}$ | φ13±0.2 |
| **UCR01** | | | | |
| **UCR03** | | | | |
| **UCR10** | | | | |
| **UCR18** | | | | |

## Notes

1) The information contained herein is subject to change without notice.

2) Before you use our Products, please contact our sales representative and verify the latest specifications :

3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. ROHM shall have no responsibility for any damages arising out of the use of our Poducts beyond the rating specified by ROHM.

4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

5) The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM or any other parties. ROHM shall have no responsibility whatsoever for any dispute arising out of the use of such technical information.

6) The Products are intended for use in general electronic equipment (i.e. AV/OA devices, communication, consumer systems, gaming/entertainment sets) as well as the applications indicated in this document.

7) The Products specified in this document are not designed to be radiation tolerant.

8) For use of our Products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a ROHM representative : transportation equipment (i.e. cars, ships, trains), primary communication equipment, traffic lights, fire/crime prevention, safety equipment, medical systems, servers, solar cells, and power transmission systems.

9) Do not use our Products in applications requiring extremely high reliability, such as aerospace equipment, nuclear power control systems, and submarine repeaters.

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