




SPECIFICATION SHEET

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|---|---|-------------------------------|
| SPECIFICATION SHEET NO. | R0412- CRCP06FB39KS01 | |
| DATE | Apr. 12, 2024 | |
| REVISION | A1 | Updated With Most Recent Data |
| DESCRIPTION AND MAIN PARAMETRICS | <p>High power Chip Resistors, 1206 (3216 Metric), CP06 Series, Dimension L3.10*W1.60*H0.55mm, 2 Terminations, Tolerance: $\pm 1.0\%$, Resistance 39K ohm, Dissipation Max. 1/2W @ 70°C, Temperature Coefficient Rate (TCR) Max. $\pm 100\text{ppm}/^\circ\text{C}$ Operating Temp. Range -55° C ~+155° C Package in Tape/Reel, 5,000pcs/Reel RoHS/RoHS III compliant and HF</p> | |
| CUSTOMER | | |
| CUSTOMER PART NO. | | |
| CROSS REF. PART NO. | | |
| ORIGINAL MFG/PART NO. | Aillen/CP06FB39K | |
| PART CODE | CRCP06FB39KS01 | |

| | | | |
|-------------------------|---|--|---|
| VENDOR APPROVE | | | |
| Issued/Checked/Approved |  |  |  |
| DATE: Apr. 12, 2024 | | | |

| | |
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| CUSTOMER APPROVE | |
| | |
| DATE: | |

4/12/2024

HIGH POWER CHIP RESISTORS CP06 SERIES

DESCRIPTION

The resistors are constructed in a high grade ceramic body (aluminum oxide). Internal metal electrodes are added at each end and connected by a resistive paste that is applied to the top surface of the substrate. The composition of the paste is adjusted to give the approximate resistance required and the value is trimmed to within tolerance by laser cutting of this resistive layer. The resistive layer is covered with a protective coat. Finally, the two external end terminations are added. For ease of soldering the outer layer of these end terminations is a Tin (lead free) alloy.

MAIN FEATURE

- High power rating and compact size
- High reliability and stability
- Reduced size of final equipment
- RoHS compliant and Lead free products
- Flame Retardant



APPLICATION

- Power supply / PDA
- Digital meter / PC
- Automotives / Battery charger
- DC-DC power converter

HOW TO ORDER

- Please indicate part code OR custom parameters code and send us your RFQ by E-mail

HIGH POWER CHIP RESISTORS CP06 SERIES

PART CODE GUIDE

RFQ

[Request For Quotation](#)

| CODE | NAME | KEY SPECIFICATION OPTION |
|------|--|--|
| CRCP | Product code | High power Chip Resistors |
| 06 | Size Code | 0402 (1005): L1.00*W0.50mm; 0603 (1608): L1.60*W0.80mm; 0805 (2012): L2.00*W1.25mm; 1206 (3216) : L3.10*W1.60mm; 1210 (3225:) L3.20*W2.60mm; 2512 (6432): L6.30*W3.10mm; |
| F | Resistance Range Tolerance Code | P: Jumper; B: +/-0.1%; D: +/-0.5%; F: +/-1%; J: +/-5% |
| B | Package Code | A: 4Kpcs/7" Reel; B:5kpcs/7" Reel; C:10kpcs/7" Reel; M:15kpcs/7" Reel; D:10kpcs/10" Reel; E:20kpcs/10" Reel |
| 39K | Resistance value code | 0R: 0ohm; R75: 0.75ohm; 10R: 10ohm; 20R: 20ohm; 51R: 51ohm; 240R: 240ohm; 390R: 390ohm; 1K:1Kohm; 10K: 10Kohm; 10K5: 10.5Kohm; 13K7: 13.7Kohm; 39K: 39Kohm; 100K: 100Kohm; 118K: 118Kohm; 1M: 1.0Mohm; 1M2: 1.2Mohm |
| S01 | Internal control code, | Custom letter A~Z, a-z or digits (0-9) |

HIGH POWER CHIP RESISTORS CP06 SERIES

DIMENSION (Unit: mm)

Image for reference

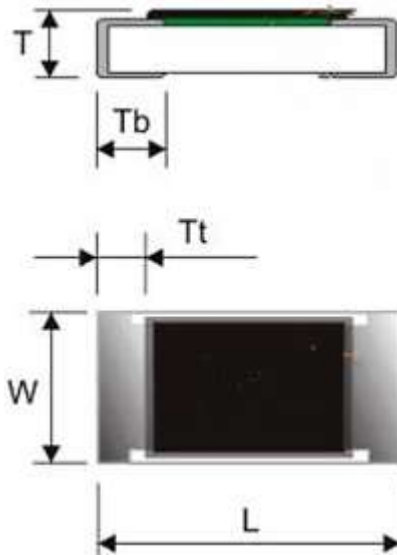


General Marking:

3-digits or 4-digits marking

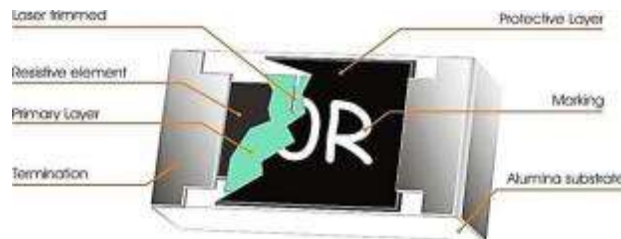
*Each resistor is marked with a three or four digits code on the protective coating to designate the nominal resistance value

CP06 series

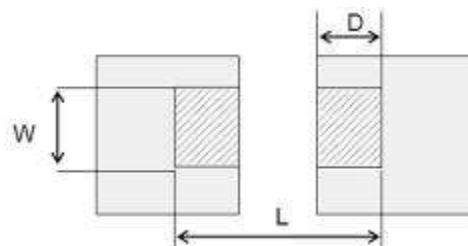


| Item | Dimension |
|------|-----------|
| L | 3.10±0.15 |
| W | 1.60±0.15 |
| T | 0.55±0.10 |
| T b | 0.50±0.25 |
| T t | 0.50±0.25 |

Resistors Construction For Reference



Recommended Solder Pad



| Item | Dimension |
|------|-----------|
| W | 2.0~2.4 |
| L | 4.4~5.0 |
| D | 1.2~1.8 |

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HIGH POWER CHIP RESISTORS CP06
GENERAL ELECTRONICAL CHARACTERISTICS

| Item | | Unit | Symbol | Characteristic | Condition |
|------------------------|-----------------|--------|--------|-------------------------------------|-------------|
| Product Name | | | CRCP | High power Chip Resistors | |
| Size | | | 06 | CP06 Series, L3.10*W1.60*H0.55mm | |
| Resistance Range | | Ω | | 39K | |
| Resistance Tolerance | | % | F | +/-1 | |
| TCR | 0.02 ~ 0.043Ω | ppm/°C | | ≤±1000 | |
| | 0.047 ~ 0.0976Ω | | | ≤±200 | |
| | 0.1 ~ 0.43Ω | | | ≤±100 | |
| | 0.47 ~ 0.976Ω | | | ≤±100 | |
| | 1 ~ 10Ω | | | ≤±200 | |
| | ≥10Ω | | | ≤±100 | |
| Max. Dissipation | | W | | 1/2 | @ Tamb=70°C |
| Operating Temperature | | °C | | -55 ~+155 | |
| Max. Operation Voltage | | V | | 200 | @DC or RMS |
| Max. Overload Voltage | | V | | 400 | @DC or RMS |

Note

- 1) This is the maximum voltage that may be continuously supplied to the resistor element, see "IEC publication 60115-8"
- 2) Max. Operation Voltage : So called RCWV (Rated Continuous Working Voltage) is determined by

$$RCWV = \sqrt{\text{Rated Power} \times \text{Resistance Value}}$$
or Max. RCWV listed above, whichever is lower.
- 3) Test condition for jumper (0 Ω)

| Item | Unit | Symbol | Characteristic | Condition |
|-----------------------|------|--------|----------------|-----------|
| Power Rating At 70°C | W | | 1/2 | |
| Max. Resistance | mΩ | | 20 | |
| Rated Current | A | | 5.0 | |
| Peak Current | A | | 12.5 | |
| Operating Temperature | °C | | -55 ~+155 | |

PRODUCT CHARACTERIZATION

Standard values of nominal resistance are taken from the E24 & E96 series for resistors with a tolerance of $\pm 0.1\%$, $\pm 0.5\%$, $\pm 1\%$ & $\pm 5\%$. The values of the E24/E96 series are in accordance with "IEC publication 60063"

DERATING

The power that the resistor can dissipate depends on the operating temperature; see Fig.1

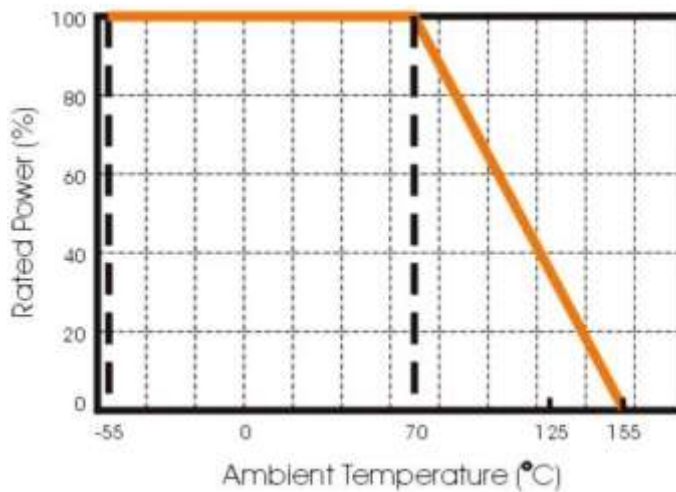


Fig 1 Maximum dissipation in percentage of rated power as a function of the ambient temperature

MOUNTING

Due to their rectangular shapes and small tolerances, Surface Mountable Resistors are suitable for handling by automatic placement systems. Chip placement can be on ceramic substrates and printed-circuit boards (PCBs). Electrical connection to the circuit is by individual soldering condition. The end terminations guarantee a reliable contact.

REFLOW SOLDERING CONDITION

The robust construction of chip resistors allows them to be completely immersed in a solder bath of 260 °C for 10 seconds. Therefore, it is possible to mount Surface Mount Resistors on one side of a PCB and other discrete components on the reverse (mixed PCBs). Surface Mount Resistors are tested for solderability at 235 °C during 2 seconds. The test condition for no leaching is 260°C for 30 seconds. Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2.

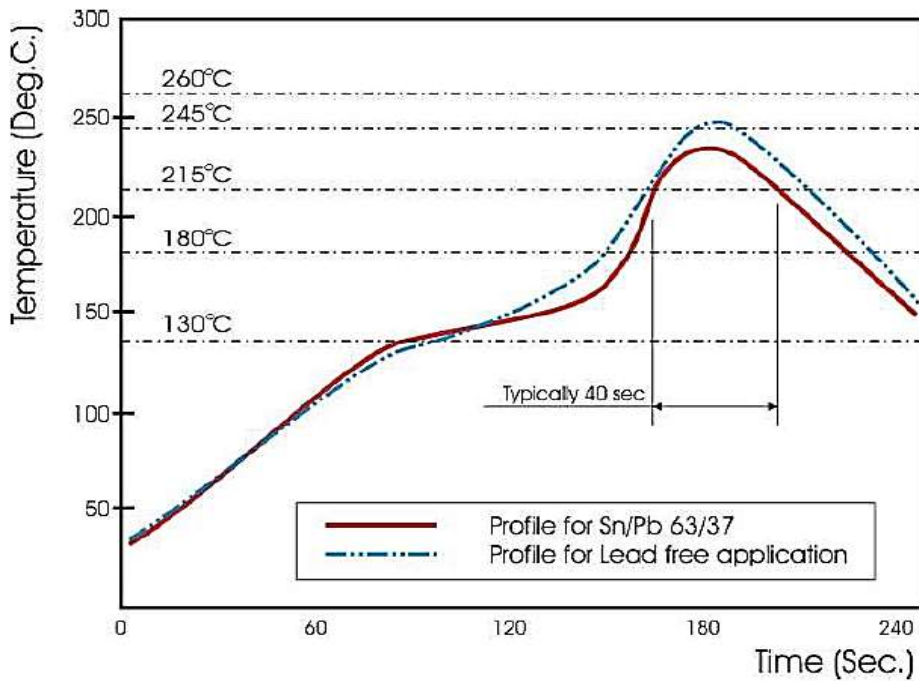


Fig 2. Infrared soldering profile for Chip Resistors

HIGH POWER CHIP RESISTORS CP06
TEST AND REQUIREMENT (JIS C 5201-1 : 1998)

| TEST | PROCEDURE / TEST METHOD | REQUIREMENT |
|---|---|--|
| Temperature Coefficient of Resistance(T.C.R) Clause 4.8 | Natural resistance change per change in degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/}^\circ\text{C)}$ t1 : 20°C+5°C-1°C R1 : Resistance at reference temperature R2: Resistance at test temperature | Refer to quick reference data for T.C.R specification |
| Short time overload (S.T.O.L) Clause 4.13 | 5.0× Rated power or Max. Overload Voltage for 5 sec. Measure resistance after 30 minutes.. | Δ R/R max. J: ≤ ±(2%+0.1Ω) B,D, F: ≤ ±(1%+0.05Ω) |
| Resistance to soldering heat(R.S.H) Clause 4.18 | Un-mounted chips completely immersed for 10±1second in a SAC solder bath at 260°C±5°C | Δ R/R max. J: ≤ ±(1%+0.1Ω) B,D, F: ≤ ±(0.5%+0.05Ω) No visible damage |
| Solderability Clause 4.17 | Un-mounted chips completely immersed for 2±0.5 second in a SAC solder bath at 235°C±5°C | Good tinning (>95% covered) No visible damage |
| Clause 4.18 Leach Test | Un-mounted chips completely immersed for 60±1second in a solder bath at 260°C±5°C | Ditto |
| Temperature cycling Clause 4.19 | 30 minutes at -55°C±3°C, 2~3 minutes at 20°C+5°C-1°C, 30 minutes at +155°C±3°C, 2~3 minutes at 20°C+5°C-1°C, total 5 continuous cycles | Δ R/R max. J ≤ ±(1%+0.1Ω) B,D,F ≤ ±(0.5%+0.05Ω) No visible damage |
| Damp Heat (Load life in humidity) Clause 4.24 | 1000 +48/-0 hours, loaded with RCWV or Vmax in humidity chamber controller at 40°C±2°C and 90~95% relative humidity, 1.5hours on and 0.5 hours off | Δ R/R max. J ≤ ±(3%+0.1Ω) B,D,F ≤ ±(1%+0.05Ω) No visible damage |
| Load life (endurance) JISC5201-1: 1998 Clause 4.25 | 1000 +48/-0 hours, loaded with RCWV or Vmax in chamber controller 70±2°C, 1.5 hours on and 0.5 Hours off | Δ R/R max. J ≤ ±(3%+0.1Ω) B,D,F ≤ ±(1%+0.05Ω) No visible damage |
| Bending strength Clause 4.33 | Resistors mounted on a 90mm glass epoxy resin PCB(FR4); bending : 2 mm(2512;2010) 3mm(1206), once for 10 seconds | Δ R/R max. J ≤ ±(1%+0.1Ω) B,D,F ≤ ±(0.5%+0.05Ω) No visible damage |

HiGH POWER CHIP RESISTORS CP06 SERIES

TEST AND REQUIREMENT (JIS C 5201-1 : 1998)

| TEST | PROCEDURE / TEST METHOD | REQUIREMENT |
|--|--|---|
| Adhesion Clause 4.32 | Pressurizing force: 5N, Test time: 10±1sec. | No remarkable damage or removal of the terminations |
| Insulation Resistance Clause 4.6 | Apply the maximum overload voltage (DC) for 1minute | $R \geq 10G\Omega$ |
| Dielectric Withstand Voltage Clause 4.7 | Apply the maximum overload voltage (AC) for 1 minute | No breakdown or flashover |

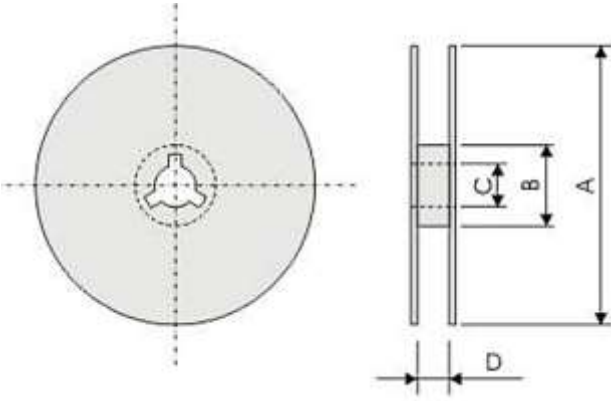
STORAGE AND HANDLING CONDITIONS

1. Products are recommended to be used up within two years since operation date as ensured shelf life. Check solderability in case shelf life extension is needed.
2. To store products with following condition: Temperature : 5 to 40°C Humidity: 20 to 70% relative humidity
3. Don't store products in a corrosive environment such as sulfide, chloride gas, or acid. It may cause oxidization of electrode, which easily be resulted in poor soldering b.To store products on the shelf and avoid exposure to moisture. Don't expose products to excessive shock, vibration, direct sunlight and so on.

HIGH POWER CHIP RESISTORS CP06

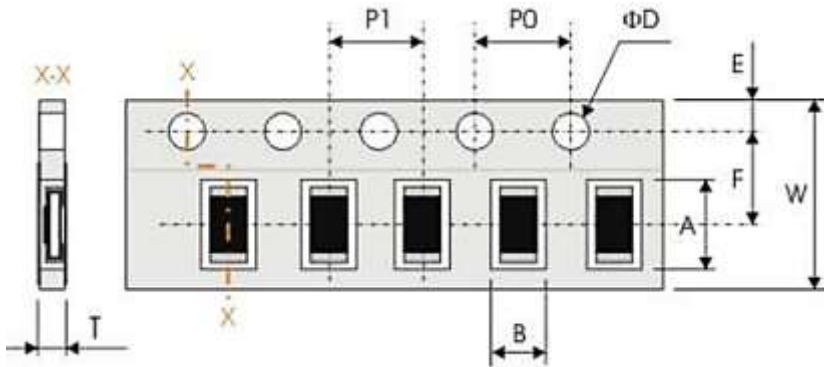
REEL DIMENSION (Unit: mm)

7": 5,000Ppcs/Reel



| Code | Dimension 7" | Dimension 10" | Dimension 13" |
|------|--------------|---------------|---------------|
| A | 178.0+/-2.0 | 254.0+/-2.0 | 330.0+/-2.0 |
| B | 60.0 +/-1.0 | 100 +/-1.0 | 100+/-1.0 |
| C | 13.0+/-0.20 | 13.0+/-0.20 | 13.0+/-0.20 |
| D | 9.0±0.5 | 9.0±0.5 | 9.0±0.5 |

TAPE DIMENSION (Unit: mm)



| Code | Dimension |
|------|-----------|
| A | 3.60±0.20 |
| B | 2.00±0.20 |
| W | 8.00±0.30 |
| F | 3.50±0.20 |
| E | 1.75±0.10 |
| P 1 | 4.00±0.10 |
| P0 | 4.00±0.10 |
| ΦD | 1.50±0.10 |
| T | 1.0 Max. |

TAPING QUANTITY AND TAPE MATERIAL

| Tape | Paper Tape | | | | | | Embossed Tape | Bulk Cassette |
|-----------|------------|-------|-------|------------|-----|-----|---------------|---------------|
| | 4 mm Pitch | | | 2 mm Pitch | | | 4 mm Pitch | |
| Reel Size | 7" | 10" | 13" | 7" | 10" | 13" | 7" | |
| CP06 | 5000 | 10000 | 20000 | - | - | - | - | 5000 |

PERFORMANCE OF TAPING

Strength of Carrier Tape and Top Cover Tape

Carrier Tape: When a tensile force 1.02kgf is applied in the direction of unreeling the tape, the tape shall withstand this force. Top cover Tape: When a tensile force 1.02kgf is applied to the tape, the tape shall withstand this force.

Peel Force of Top Cover Tape

Unless otherwise specified, the peel force of top cover tape shall be 10.2 to 71.4 g f when the top cover tape is pulled at a speed of 300mm/min with the angle between the taped during peel and the direction of unreeling maintained at 165 to 180° as illustrated in Fig.



HIGH POWER CHIP RESISTORS CP06

ROHS COMPLIANCE

- The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained can be obtained at Download Center.

REACH COMPLIANCE

- REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained can be obtained at Download Center.

IMPORTANT NOTES AND DISCLAIMER

1. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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