

Surface Mount Chip Resistors

Token has introduced precision surface-mount resistor networks, chip array, and flip-chips.

► Preview

Token has introduced precision surface-mount resistor networks, chip array, and flip-chips. Those no-lead packages are optimized to meet new automotive industry requirements for temperature and humidity, while offering high repeatability and stable performance for industrial, telecommunication, and consumer electronics.

Suitable for processing on automatic SMD assembly systems, those new devices are RoHS-compliant and compatible with lead (Pb)-free and tin/lead (Sn/Pb) reflow and vapor-phase soldering processes.



Flip Chip Resistor FCR Series:

- The resistor flip chip configurations (FCR Series) are available in industry standard EIA0603, EIA0805, and EIA1206.
- Power Rating 1/10W, 1/8W, and 1/4W are available in max. voltage 100V, 300V, and 300V respectively.
- Resistance tolerance is tight to F($\pm 1\%$), J($\pm 5\%$) with resistance range 1 Ω to 10M Ω .

Resistor Chip Array RCA Series:

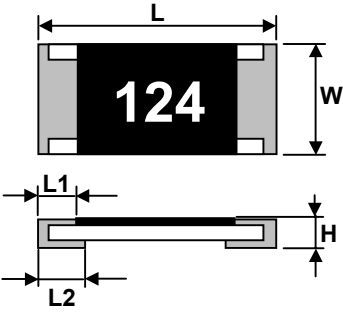
- Its small 1.6mm by 3.2mm package enables the design of high-density circuits.
- The resistor chip array (RCA Series) offers a low cost when compared to using four high-precision resistors.
- The devices feature precision ratio tolerances to F($\pm 1\%$), G($\pm 2\%$), and J($\pm 5\%$) are available with resistance range 10 Ω to 1M Ω .

Resistor Networks RCN Series:

- The (RCN) resistor networks offer a resistance range from 10 Ω to 1M Ω at operating temperature range -55 $^{\circ}\text{C}$ ~+125 $^{\circ}\text{C}$.
- All devices offer power ratings of 1/16W at +70 $^{\circ}\text{C}$ per resistor, custom configurations of the devices are available.

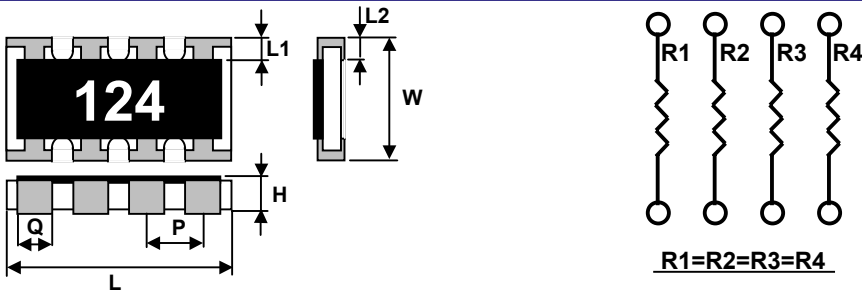
Full line products meet RoHS compliant. Detailed specifications, both mechanical and electrical, please contact our sales representative for more information.

▶ FCR Series Dimensions (Unit: mm)



| Dimensions Type | L | W | H | L1 | L2 |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| FCR 03 | 1.60 ± 0.10 | 0.80 ± 0.10 | 0.45 ± 0.10 | 0.30 ± 0.20 | 0.30 ± 0.20 |
| FCR 05 | 2.00 ± 0.15 | 1.25 ± 0.15 | 0.50 ± 0.10 | 0.40 ± 0.20 | 0.35 ± 0.15 |
| FCR 06 | 3.10 ± 0.15 | 1.55 ± 0.15 | 0.55 ± 0.10 | 0.50 ± 0.25 | 0.50 ± 0.25 |

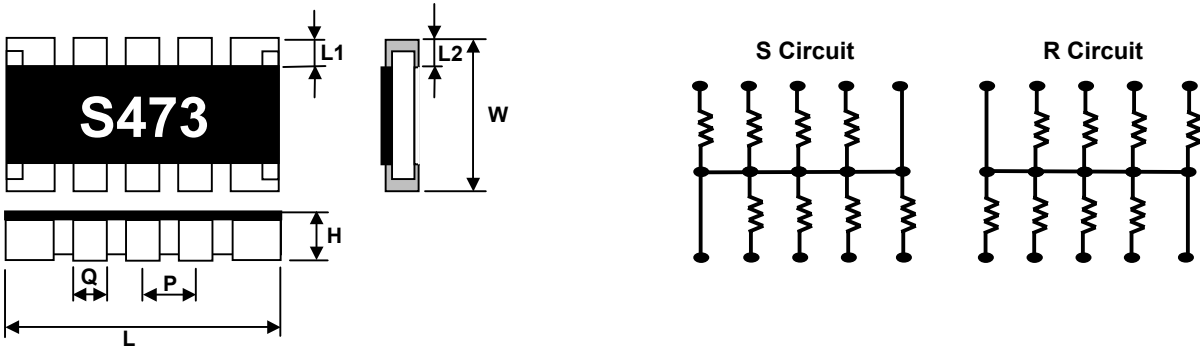
▶ FCR Series Dimensions (Unit: mm)



| Type | L | W | H | L1 | L2 | P | Q |
|-----------------|---------------|----------------|---------------|-----------------|---------|---------------|---------------|
| RCA03-4D (0603) | 3.2 ± 0.2 | 1.6 ± 0.15 | 0.5 ± 0.1 | 0.30 ± 0.15 | 0.35Max | 0.8 ± 0.1 | 0.5 ± 0.1 |

$R1=R2=R3=R4$

▶ FCR Series Dimensions (Unit: mm)



| Type | L | W | H | L1 | L2 | P | Q |
|------------------------|---------------|---------------|----------------|---------------|---------------|----------------|---------------|
| RCN06-10R RCN06-10S | 6.4 ± 0.2 | 3.1 ± 0.2 | 0.55 ± 0.1 | 0.5 ± 0.3 | 0.5 ± 0.2 | 1.27 ± 0.1 | 0.8 ± 0.2 |

▶ FCR Series Electrical Specifications

| Type | Power Rating at 70°C | Max. RCWV | Max. Overload Voltage | Resistance Tolerance(%) | Resistance Range (Ω) | | Standard Resistance Values |
|--------|----------------------|-----------|-----------------------|-------------------------|----------------------|------|----------------------------|
| | | | | | Min. | Max. | |
| FCR 03 | 1/10W | 50V | 100V | ± 1% (F) | 10Ω | 1MΩ | E-96 |
| | | | | ± 5% (J) | 1Ω | 10MΩ | E-24 |
| FCR 05 | 1/8W | 150V | 300V | ± 1% (F) | 10Ω | 1MΩ | E-96 |
| | | | | ± 5% (J) | 1Ω | 10MΩ | E-24 |
| FCR 06 | 1/4W | 200V | 300V | ± 1% (F) | 10Ω | 1MΩ | E-96 |
| | | | | ± 5% (J) | 1Ω | 10MΩ | E-24 |

▶ RCA Series Electrical 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 | Operating Temperature Range |
|-----------------|---------------------|----------------------|-----------------------|-----------------|------------------|--------------------|----------------------|-------------------------|-----------------------------|
| | | | | | F(±1%) E-96 | G(±2%) J(±5%) E-24 | | | |
| RCA03-4D (0603) | 0.063 | 50V | 100V | ± 200 | 100Ω~470KΩ | 10Ω~1MΩ | 1A | 50mΩ MAX | -55°C~+125°C |

▶ RCN Series Electrical Specifications

| Type | Rated Power at 70°C | Max. Working Voltage | Max. Overload Voltage | T.C.R. (ppm/°C) | Resistance Range | Number of Terminals | Number of Elements | Operating Temperature Range |
|------------------------|---------------------|----------------------|-----------------------|-----------------|------------------|---------------------|--------------------|-----------------------------|
| | | | | | J (±5%) E-12 | | | |
| RCN06-10R RCN06-10S | 1/16W | 50V | 100V | ±200 | 10Ω~1MΩ | 10 | 8 | -55°C~+125°C |

Environmental Characteristics

| Item | Specification | Test Method |
|--|---|---|
| DC Resistance | J: $\pm 5\%$, F: $\pm 1\%$ | JIS C 5202 5.1 |
| Temperature Coefficient of Resistance(TCR) | J: $\pm 200\text{ppm}/^\circ\text{C}$ F: $\pm 100\text{ppm}/^\circ\text{C}$ | JIS C 5202 5.2 / IEC 115-1 4.8.4.2; T1 T2 Test emperature: $25^\circ\text{C} \rightarrow -55^\circ\text{C}$ $25^\circ\text{C} \rightarrow -55^\circ\text{C}$ |
| Short Time Overload | J: $\Delta R \leq \pm (2\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$ | JIS C 5202 5.5 / IEC 115-1 4.13; 2.5xRated voltage (Max. Overload Voltage) for 5 sec. measure resistance after 30 minutes |
| Resistance to Solder Heat | J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$ No mechanical damage | JIS C 5202 6.4 / IEC 115-1 4.18; With $260 \pm 5^\circ\text{C}$ for 10 ± 1 sec. |
| Solderability | Over 95% of termination must be covered with solder | JIS C 5202 7.4 / IEC 115-1 4.17; After immersing flux, dip in the $235 \pm 5^\circ\text{C}$ molten solderbath for 2 ± 0.5 sec. |
| Temperature Cycle | J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$ No mechanical damage | JIS C 5202 7.4 / IEC 115-1 4.19; Repeat 5 cycles as follow; $-55^\circ\text{C}(30\text{minutes}) + 25^\circ\text{C}(10\sim 15\text{minutes})$ $+125^\circ\text{C}(30\text{minutes}) + 25^\circ\text{C}(10\sim 15\text{minutes})$ |
| Terminal Strength | $\Delta R \leq \pm (0.5\% + 0.05\Omega)$ No mechanical damage | JIS C 5202 6.1; 500g for 10 seconds |
| Load Life | J: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$ | JIS C 5202 7.10 / IEC 115-1 4.25.1; Permanent resistance change after 1000+48/-0 hours (1.5 hours ON, 0.5hour OFF) at RCWV or Max. Keep the element at $70 \pm 3^\circ\text{C}$ ambient |
| Load Life Humidity | J: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$ | JIS C 5202 7.9 / IEC 115-1 4.24.2; Maintain the temperature of the element at $40 \pm 2^\circ\text{C}$ and 90~95% RH with the rated voltage applied. Cycle ON for 1.5hours and Off for 0.5 hour for 1000+48/-0 hours. After one hour, measure the resistance value. |
| Intermittent Overload | $\Delta R \leq \pm (5\% + 0.1\Omega)$ No mechanical damage | JIS C 5202 5.8; 2.5xRated Voltage(Max.OverloadVoltage), 1secON, 25sec OFF, test 10,000 cycles |

Marking



3 digit marking
for E24(J)
100~10 Ω
122~1.2K Ω
473~47K Ω
105~1M Ω



4 digit marking
for E96(F)
22R1~22.1 Ω
1020~102 Ω
1542~15.4K Ω

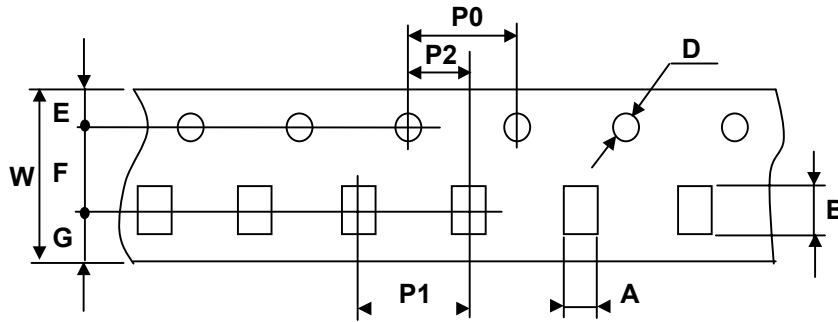


3 digit marking
for E96(F)
02C
 $102 \times 10^2 = 10.2\text{K}\Omega$



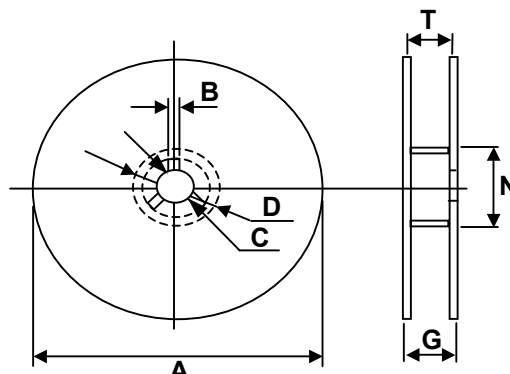
15E
 $140 \times 10^4 = 1.4\text{M}\Omega$

▶ Tape Specifications (Unit: mm)



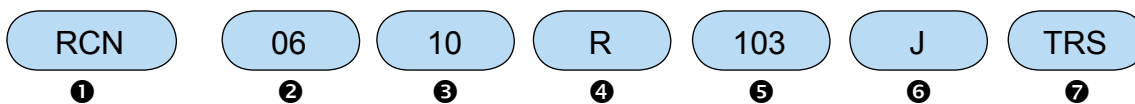
| Codes | A | B | W | F | E | P1 | P2 | P0 | D | G |
|-------|--------------------|--------------------|---------|-----------|-----------|---------|-----------|---------|---------------|------|
| FCR03 | 1.10±0.20 | 1.90±0.20 | 8.0±0.3 | 3.50±0.05 | 1.75±0.10 | 4.0±0.1 | 2.00±0.05 | 4.0±0.1 | 1.5±0.1 -0 | 2.75 |
| FCR05 | 1.65±0.20 | 2.45±0.20 | 8.0±0.3 | 3.50±0.05 | 1.75±0.10 | 4.0±0.1 | 2.00±0.05 | 4.0±0.1 | 1.5±0.1 -0 | 2.75 |
| FCR06 | 2.00±0.10 -0.15 | 3.57±0.10 -0.15 | 8.0±0.3 | 3.50±0.05 | 1.75±0.10 | 4.0±0.1 | 2.00±0.05 | 4.0±0.1 | 1.5±0.1 -0 | 2.75 |

▶ Tape Specifications (Unit: mm)



| Symbol | A | B | C | D | G | N | T |
|-----------|-----------|----------|------------|---------|-----------|------------|-----------|
| Dimension | 178 ± 2.0 | 20 ± 0.5 | 13.0 ± 0.5 | 20 min. | 100 ± 1.5 | 80.0 ± 0.5 | 14.9 max. |

▶ How to Order



- ❶ Type: SMD Network
- ❷ Size: 06 (6.40×3.10mm)
- ❸ Number of Terminals: 10
- ❹ Circuit Structure: R Circuit, S Circuit
- ❺ Nominal Resistance

| Code | Resistance Tolerance |
|---------|--------------------------------------|
| 3-Digit | E12 Series EX 10Ω=100 100Ω=101 |

- ❻ Resistance Tolerance (%)

| Code | Resistance Tolerance |
|------|----------------------|
| J | ±5% |

- ❼ Package

| Code | Package |
|------|-------------|
| TR | Taping Reel |
| P | Bulk |

How to Order

FCR

①

03

②

100

③

J

④

TR

⑤

① Part Number: FCR

② Size

| Code | Size (mm) |
|------|-----------|
| 03 | 1.60×0.80 |
| 05 | 2.00×1.25 |
| 06 | 3.10×1.55 |

③ Nominal Resistance

| Code | Nominal Resistance | |
|--------------|--------------------|--|
| SMD Elements | 3-Digit | E24 Series EX 10Ω=100 47Ω=470 |
| | 4-Digit | E96 Series EX 10.2Ω=10R2 10KΩ=1002 |
| Jumper | | 000 |

④ Resistance Tolerance

| Code | Resistance Tolerance |
|------|----------------------|
| F | ±1% |
| J | ±5% |

⑤ Package

| Code | Package |
|------|-------------|
| TR | Taping Reel |
| P | Bulk |

How to Order

RCA

①

03

②

4

③

D

④

101

⑤

J

⑥

TR

⑦

① Part Number: RCA

② Size: 03 (3.20×1.60mm)

③ Number of circuits: 4 (4 circuits)

④ Electrode Structure: D (protruding electrode)

⑤ Nominal Resistance

| Code | Nominal Resistance | |
|--------------|--------------------|--|
| SMD Elements | 3-Digit | E24 Series EX 10Ω=100 47Ω=470 |
| | 4-Digit | E96 Series EX 10.2Ω=10R2 10KΩ=1002 |
| Jumper | | 000 |

⑥ Resistance Tolerance

| Code | Resistance Tolerance |
|------|----------------------|
| F | ±1% |
| G | ±2% |
| J | ±5% |

⑦ Package

| Code | Package |
|------|-------------|
| TR | Taping Reel |
| P | Bulk |

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