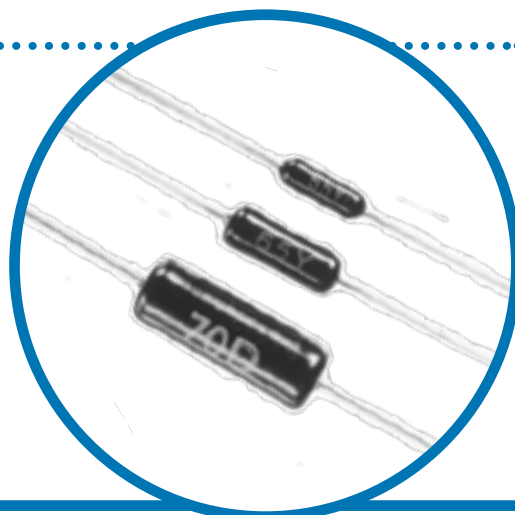


# Precision Metal Film Resistor

## RC Series

- Resistance tolerance down to  $\pm 0.05\%$
- Low noise and negligible voltage coefficient
- CECC released product with low TCRs over a wide resistance range
- 100% tin plated (Pb-free, RoHS compliant) leads



## Electrical Data

|                           |        | RC55                                      | RC65     | RC70        | Notes                       |
|---------------------------|--------|-------------------------------------------|----------|-------------|-----------------------------|
| Commercial                |        |                                           |          |             |                             |
| Power Rating At 70°C      | Watts  | 0.25                                      | 0.5      | 1.0         |                             |
| Resistance Range          | Ohms   | 1R to 4M                                  | 1R to 4M | 10R0 to 10M |                             |
| Limiting Element Voltage  | Volts  | 350                                       | 350      | 500         |                             |
| Isolation Voltage         | Volts  | 500                                       | 500      | 700         |                             |
| TCR (20 to +70°C) & codes | ppm/°C | 5(V), 10(T), 15(Y), 25(D), 50(C) & 100(Z) |          |             | See resistance restrictions |
| Resistance Tolerance      | %      | 0.05(W), 0.1(B), 0.25(C), 0.5(D) & 1 (F)  |          |             |                             |

| Approved CECC 40101-004     |        | H                                       | J        | K        | K         | L         |                             |
|-----------------------------|--------|-----------------------------------------|----------|----------|-----------|-----------|-----------------------------|
| Power Rating At 70°C        | Watts  | 0.063                                   | 0.125    | 0.25     | 0.25      | 0.5       |                             |
| Resistance Range            | Ohms   | 1R to 1M                                | 1R to 1M | 1R to 1M | 10R to 1M | 10R to 1M |                             |
| Limiting Element Voltage    | Volts  | 200                                     | 200      | 250      | 250       | 350       |                             |
| Isolation Voltage           | Volts  | 280                                     | 280      | 350      | 350       | 500       |                             |
| TCR & Codes                 | ppm/°C | 15(Y), 25(D), 50(C) & 100(Z)            |          |          |           |           | See resistance restrictions |
| Resistance Tolerance (code) | %      | 0.05(W), 0.1(B), 0.25(C), 0.5(D) & 1(F) |          |          |           |           |                             |

| Approved CECC 40101-804     |        | A                                       | B        | B         | C         |                             |
|-----------------------------|--------|-----------------------------------------|----------|-----------|-----------|-----------------------------|
| Power Rating At 70°C        | Watts  | 0.125                                   | 0.25     | 0.25      | 0.5       |                             |
| Resistance Range            | Ohms   | 1R to 1M                                | 1R to 1M | 10R to 1M | 10R to 1M |                             |
| Limiting Element Voltage    | Volts  | 200                                     | 250      | 250       | 350       |                             |
| Isolation Voltage           | Volts  | 280                                     | 350      | 350       | 500       |                             |
| TCR & Codes                 | ppm/°C | 15(T), 25(E) & 50(C)                    |          |           |           | See resistance restrictions |
| Resistance Tolerance (code) | %      | 0.05(W), 0.1(B), 0.25(C), 0.5(D) & 1(F) |          |           |           |                             |

| <b>Standard Values</b>    |         | E24, E96 Preferred |    |    | Any value to order |
|---------------------------|---------|--------------------|----|----|--------------------|
| Thermal Impedance         | °C/Watt | 110                | 70 | 60 |                    |
| Ambient Temperature Range | °C      | -55 to +155        |    |    |                    |

### General Note

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## Physical Data

| Dimensions (mm) & Weight (g) |          |          |          |          |                            |                       |            |
|------------------------------|----------|----------|----------|----------|----------------------------|-----------------------|------------|
| Type                         | L<br>Max | D<br>Max | F<br>Min | D<br>Nom | PCB<br>Mounting<br>Centers | Min<br>Bend<br>Radius | Wt.<br>Nom |
| RC55                         | 7.2      | 2.5      | 30       | 0.6      | 10.2                       | 0.6                   | 0.24       |
| RC65                         | 10.0     | 3.7      | 30       | 0.6      | 12.7                       | 0.6                   | 0.40       |
| RC70                         | 15.5     | 5.5      | 30       | 0.8      | 18.4                       | 1.2                   | 1.15       |



## Construction

A metal film is deposited onto a high quality ceramic former. Nickel-plated steel caps are force fitted to the former and termination wires are welded to the caps.

The resistor is adjusted to value by a helical cut in the film and the body is protected with a specially formulated epoxy coating.

## Terminations

**Material** 100% tin plated over copper wire

**Strength** The terminations meet the requirements of IEC 68.2.21.

**Solderability** The terminations meet the requirements of IEC 115-1, Clause 4.17.3.2.

## Marking

Type reference, TCR code, resistance value and tolerance code.

The resistance values conform to IEC 62.

## Solvent Resistance

The body protection and marking are resistant to all normal industrial cleaning solvents suitable for printed circuits.

## Environmental Data

|                                               |       | CECC 40101-004 | CECC 40101-804 | *Actual Performance |         |
|-----------------------------------------------|-------|----------------|----------------|---------------------|---------|
|                                               |       | Requirements   | Requirements   | Maximum             | Typical |
| Load At Commercial Rating: 1000 Hours At 70°C | ΔR%   | ---            | ---            | 0.3                 | 0.1     |
| Load At CECC Rating: 1000 Hours At 70°C       | ΔR%   | 0.5            | 0.5            | 0.3                 | 0.05    |
| Dry Heat: 1000 Hours at 155°C                 | ΔR%   | 0.5            | 0.5            | **1.0               | 0.15    |
| Shelf Life: 12 Months at Room Temperature     | ΔR%   | Not specified  | Not specified  | 0.1                 | 0.03    |
| Derating From Rated Power At 70°C             |       | Zero at 155°C  | 50% at 125°C   | ---                 | ---     |
| Short Term Overload                           | ΔR%   | 0.1            | 0.1            | 0.1                 | 0.02    |
| Climatic                                      | ΔR%   | 0.5            | 0.5            | 0.3                 | 0.1     |
| Climatic Category                             |       | 55/155/56      | 55/155/56      | 55/155/56           | ---     |
| Long Term Damp Heat                           | ΔR%   | 0.5            | 0.5            | 0.5                 | 0.1     |
| Temperature Rapid Change                      | ΔR%   | 0.1            | 0.1            | **0.2               | 0.05    |
| Resistance To Solder Heat                     | ΔR%   | 0.1            | 0.1            | 0.06                | 0.03    |
| Vibration and Bump                            | ΔR%   | 0.1            | 0.1            | 0.06                | 0.02    |
| Noise (in a decade of frequency)              | μV/V  | Not specified  | Not specified  | 1.0                 | 0.1     |
| Voltage Coefficient Of Resistance             | ppm/V | Not specified  | Not specified  | ---                 | <1      |

**Note:** \*An 0.01 ohm addition to be added to the performance claims of all resistors <10R.  
\*\* All products within the specified approved range meet CECC requirements.

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## Table of Resistance Restrictions

| TCR<br>ppm/°C | Tolerance  |             |           |            |             |           |            |             |           |
|---------------|------------|-------------|-----------|------------|-------------|-----------|------------|-------------|-----------|
|               | RC55       |             |           | RC65       |             |           | RC70       |             |           |
|               | 0.05%      | 0.1 - 0.25% | 0.5 - 1%  | 0.05%      | 0.1 - 0.25% | 0.5 - 1%  | 0.05%      | 0.1 - 0.25% | 0.5 - 1%  |
| 5             | 10 to 500K | 10 to 500K  | 1 to 500K | 10 to 500K | 10 to 500K  | 1 to 500K | 10 to 750K | 10 to 750K  | 1 to 750K |
| 10            | 10 to 1M   | 10 to 1M    | 1 to 1M   | 10 to 1M   | 10 to 1M    | 1 to 1M   | 10 to 1M   | 10 to 1M    | 1 to 1M   |
| 15            | 10 to 1M   | 5 to 1M     | 1 to 1M   | 10 to 1M   | 5 to 1M     | 1 to 1M   | 10 to 1M   | 10 to 2M    | 1 to 2M   |
| 25            | 10 to 1M   | 5 to 2M     | 1 to 2M   | 10 to 1M   | 5 to 2M     | 1 to 2M   | 10 to 1M   | 10 to 5M    | 1 to 5M   |
| 50            | 10 to 1M   | 5 to 2M     | 1 to 4M   | 10 to 1M   | 5 to 2M     | 1 to 4M   | 10 to 1M   | 5 to 10M    | 1 to 10M  |
| 100           | 10 to 1M   | 1 to 2M     | 1 to 4M   | 10 to 1M   | 1 to 2M     | 1 to 4M   | 10 to 1M   | 1 to 10M    | 1 to 10M  |

## Application Notes

### Matched Sets and Networks

TT Electronics has many years experience in the supply of matched set of precision resistors.

Resistors can be supplied matched for tolerance and TCR down to  $\pm 0.02\%$  and  $\pm 2$  ppm/°C, either as separate resistors or pre-assembled and encapsulated within a plastic box.

The individual resistors within a set or module can be manufactured with a tolerance of  $\pm 0.05\%$  and TCR of  $\pm 5$  ppm/°C.

A low inductance version is available at 1% tolerance. For low inductive version add suffix N.

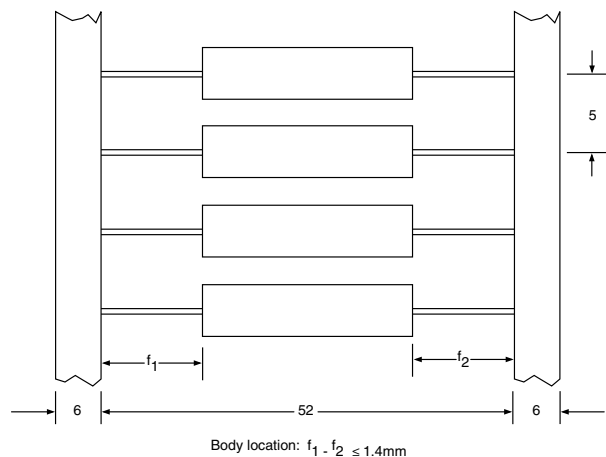
## Ordering Data

|                  |                                                                                                          |   |        |   |     |   |   |
|------------------|----------------------------------------------------------------------------------------------------------|---|--------|---|-----|---|---|
| Prefix           | RC                                                                                                       | - | RC55LF | C | 6K8 | B | B |
| Type             | RC55LF, RC65LF, RC70LF                                                                                   |   |        |   |     |   |   |
| TCR Code         | V = $\pm 5$ ppm/°C, T = $\pm 10$ ppm/°C, Y = $\pm 15$ ppm/°C<br>D = $\pm 25$ ppm/°C, C = $\pm 50$ ppm/°C |   |        |   |     |   |   |
| Resistance Value | Ex: 6K8 = 6.8K $\Omega$                                                                                  |   |        |   |     |   |   |
| Tolerance        | F = $\pm 1\%$ , D = $\pm 0.5\%$ , C = $\pm 0.25\%$ , B = $\pm 0.1\%$ , A = $\pm 0.05\%$                  |   |        |   |     |   |   |
| Packaging        | A = Ammo Pack; B = Bulk; T = Tape and Reel                                                               |   |        |   |     |   |   |

For additional information or to discuss your specific requirements, please contact our Applications Team using the contact details below.

## Packaging

The standard method of packaging RC55 resistors is taped in ammo packs. Taped resistors on reel or loose packed components can also be supplied by special request. The standard packaging for RC65 and RC70 resistors is loose in boxes. By special request the RC65 components can also be supplied taped on reel or in ammo pack. In the case of tape packed components the usable lead length is reduced by the width of the tape.



## Standard Quantities Per Package

| Type       | RC55 | RC65 | RC70 |
|------------|------|------|------|
| Small box  | 250  | 125  | 25   |
| Large box  | 1000 | 500  | 250  |
| Reel       | 5000 | 2500 | -    |
| Large ammo | 1000 | 1000 | -    |

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