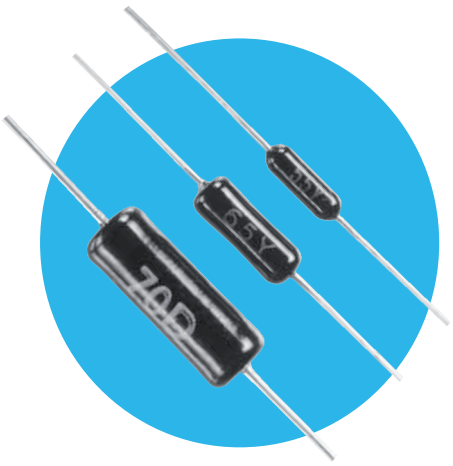
Resistors

Precision Metal Film Resistors



RC series

- CECC released products with low TCRs over a wide resistance range
- Resistance tolerance down to 0.05%
- Express delivery available
- Low noise and negligible voltage coefficient
- Screened parts available for critical applications
- Temperature Coefficient of Resistance down to 5 ppm/°C
- Options for RoHS compliant and Lead bearing wire finishes

All Pb-free parts comply with EU Directive 2011/65/EU (RoHS2)

Electrical Data

		RC55	RC65	RC70	Notes
Commercial					
Power rating at 70°C	watts	0.25	0.5	1.0	
Resistance range	ohm	1R to 4M	1R to 4M	1R 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
Resistance tolerance	%	0.05(W), 0.1(B), 0.25.(C), 0.5(D) & 1(F)			restrictions

CECC 40101-004 Requirements		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
Resistance tolerance (code)	%	0.05(W), 0.1(B), 0.25.(C), 0.5(D) & 1(F)					restrictions

CECC 40101-804 Requirements		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(Y), 25(D), 50(C), 100(Z)				See resistance
Resistance tolerance (code)	%	0.05(W), 0.1(B), 0.25.(C), 0.5(D) & 1(F)				restrictions

These tables indicate the CECC specification requirements, and these are met or exceeded by the corresponding RC series products.

Standard values		E24, E96 preferred			Any value
Thermal impedance	°C/watt	110	70	60	to order
Ambient temperature range	°C	-55 to +155			

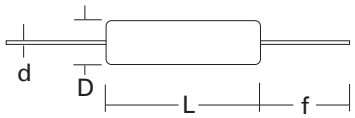
General Note

TT Electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

Physical Data

Dimensions (mm) & Weight (g)

Type	L max	D max	f min[1]	d nom	PCB mounting centres	Min. Bend Radius	Wt. 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



Note 1 - dimension relates only to bulk packed product.

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 Solder coated 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.

Performance 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	50% at 125°C & Zero at 155°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	55/125/56	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.

Table of Resistance Restrictions

TCR ppm/°C	Tolerance								
	RC55			RC65			RC70		
	0.05%	0.1 - 0.25%	0.5%[3] - 1%[3]	0.05%	0.1 - 0.25%	0.5%[3] - 1%[3]	0.05%	0.1 - 0.25%	0.5%[3] - 1%[3]
5[1]	10R to 500K	10R to 500K	1R to 500K	10R to 500K	10R to 500K	1R to 500K	10R to 750K	10R to 750K	10R to 750K
10	10R to 1M	10R to 1M	1R to 1M	10R to 1M	10R to 1M	1R to 1M	10R to 1M	10R to 1M	1R to 1M
15	10R to 1M	2R49 to 1M	1R to 1M	10R to 1M	5R to 1M	1R to 1M	10R to 1M	10R to 2M	1R to 2M
25	10R to 1M	2R49 to 2M	1R to 2M	10R to 1M	5R to 2M	1R to 2M	10R to 1M	10R to 5M	1R to 5M
50[2]	10R to 1M	2R49 to 2M	1R to 4M	10R to 1M	5R to 2M	1R to 4M	10R to 1M	5R to 10M	1R to 10M
100[2]	10R to 1M	1R to 2M	1R to 4M	10R to 1M	1R to 2M	1R to 4M	10R to 1M	1R to 10M	1R to 10M

Note1:

1. Based on sampling. 100% screened product is available.
2. For maximum availability, where the ohmic value permits, 25ppm/°C is preferred to 50 or 100ppm/°C.
3. For maximum availability, where the ohmic value permits, 0.25% is preferred to 0.5% or 1%

Application Notes

Matched Sets and Networks

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

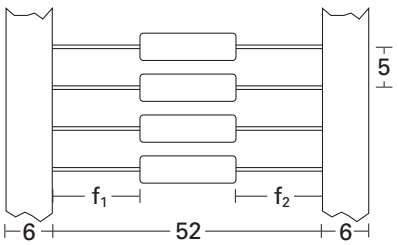
Resistors can be supplied matched for tolerance and TCR down to ±0.02% and ±2ppm/°C, either as separate resistors or pre-assembled and encapsulated within a plastic box.

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

A low inductance version is available in the range 5R0 to 1K0 at 1% tolerance. For low inductance version add suffix N.

Packaging

RC55 and RC65 standard packing is in tape, as shown below, whilst RC70 is bulk packed. Taped resistors on reel or loose packed components can also be supplied by special request.



Body location $f_1 - f_2 \leq 1.4$ mm

Ordering Procedure

This product has two valid part numbers:

European (Welwyn) Part Number: RC55V-31K6BI (RC55 with TCR ±5ppm/°C at 31.6 kilohms ±0.1%, Pb-free)

R	C	5	5	V	-	3	1	K	6	B	I	
1				2		3				4	5	

1 Type	2 TCR (ppm/°C)	3 Value	4 Tolerance	5 Finish, Screening & Packing		
RC55	V = ±5	E24 = 3/4 characters E96 = 4/5 characters R = ohms K = kilohms M = megohms	W = ±0.05%	I	Pb-free (RoHS)	
RC65	T = ±10		B = ±0.1%	SC	Pb-free with screened TCR (5ppm only)	
RC70	Y = ±15		C = ±0.25%	PB	Sn(95)Pb(5) finish	
	D = ±25		D = ±0.5%	HL	Sn(60)Pb(40) high lead finish	
	C = ±50		F = ±1%	All above in Standard Packing		
	Z = ±100			RC55, 65	Ammo	Up to 1000/box
				RC70	Bulk	250/box

For CECC released product state on order the CECC number and style. Example: RC55Y-31K6BI CECC40101-004 JY

For CECC 40101-804 the TCR codes T and E relate to 15 and 25ppm/°C and are coded in the MPN as Y and D respectively
Example: RC65Y-31K6BI CECC 40101-804BT

USA (IRC) Part Number: RC55LFV3162BA (RC55 with TCR ±5ppm/°C at 31.6 kilohms ±0.1%, Pb-free)

R	C	5	5	L	F	V	3	1	6	2	B	A
1				2		3	4				5	6

1 Type	2 Termination	3 TCR (ppm/°C)	4 Value	5 Tolerance	6 Packing		
RC55	Omit for Sn(95)Pb(5)	V = ±5	3 digits + multiplier	A = ±0.05%	A	RC55, RC65	Ammo, up to 1000/box
RC65		T = ±10	R = ohms for values <100 ohms	B = ±0.1%			
RC70	LF = Pb-free	Y = ±15		C = ±0.25%	B	RC70	Bulk 250/box
		D = ±25		D = ±0.5%			
		C = ±50		F = ±1%			
		Z = ±100					