

### Features:

- Available to EN140101 & IECQ-CECC40101 release
- Resistance tolerance down to 0.05%
- Wide resistance range
- Low noise and negligible voltage coefficient
- Screened parts available for critical applications
- Temperature coefficient of resistance down to 5ppm/°C
- Options for Pb-free and Pb-bearing wire finishes



All Pb-free parts comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

## Electrical Data

Commercial		RC55	RC65	RC70
Power rating @70°C	W	0.4	0.5	1
Resistance range	ohms	1R0 – 4M0		1R0 – 10M
Limiting element voltage	V	350	500	
Isolation voltage	V	500	750	700
TCR (20 - 70°C) <sup>1</sup>	ppm/°C	5, 10, 15, 25, 50, 100		
Resistance tolerance <sup>1</sup>	%	0.05, 0.1, 0.25, 0.5, 1		
Standard values <sup>2</sup>		E24 & E96 preferred		
Thermal impedance	°C/W	110	70	60
Ambient temperature range	°C	-55 to 155		

Note 1: See table of resistance restrictions.

Note 2: Non-standard values may be requested.

The requirements of the following standards are met or exceeded by the corresponding RC series products above.

EN140101-806 Requirements		B	C
Power rating @70°C	W	0.4	0.5
Qualified resistance range	ohms	56R – 820K	56R – 1M0
Limiting element voltage	V	300	500
Isolation voltage	V	500	750
TCR <sup>1</sup>	ppm/°C	10, 15, 25, 50	
Resistance tolerance	%	0.1, 0.25, 0.5, 1	

IECQ-CECC 40101-004 Requirements		H	J	K	L
Power rating @70°C	W	0.063	0.125	0.25	0.5
Qualified resistance range	ohms	1R0 – 1M0		10R – 1M0	
Limiting element voltage	V	200	250		350
Isolation voltage	V	280	350		500
TCR <sup>1</sup>	ppm/°C	15, 25, 50, 100			
Resistance tolerance	%	0.05, 0.1, 0.25, 0.5, 1			

IECQ-CECC 40101-804 Requirements		A	B	C
Power rating @70°C	W	0.125	0.25	0.5
Qualified resistance range	ohms	1R0 – 1M0		10R – 1M0
Limiting element voltage	V	200	250	350
Isolation voltage	V	280	350	500
TCR <sup>1</sup>	ppm/°C	15, 25, 50		
Resistance tolerance	%	0.1, 0.25, 0.5, 1		

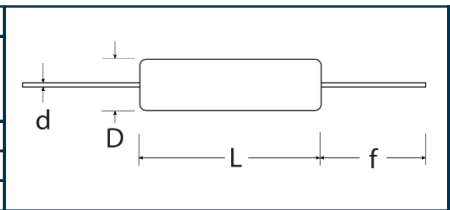
Note 1: In these standards TCRs are not specified for values <5R0, and for values ≥5R0 and <10R the TCR limit is 2 x the stated figure.

### 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 in mm and weight in g							
Type	L max	D max	f min <sup>1</sup>	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	3.7	30	0.6	12.7	0.6	0.4
RC70	15.5	5.5	30	0.8	18.4	1.2	1.15



Note 1: Dimension relates only to bulk packed products

### Construction

A metal film is deposited onto a high quality ceramic rod. Nickel-plated steel caps are force fitted to the rod 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.

### Marking

Type reference, TCR code, resistance value and tolerance code are legend marked. The resistance values conform to IEC 62.

### Terminations

- Material** Copper wire with Sn or SnPb finish.
- 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.

### Solvent Resistance

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

### Performance Data

		EN140101-806 Requirements	IECQ-CECC 40101-004 Requirements	IECQ-CECC 40101-804 Requirements	Actual Performance	
					Maximum <sup>1,2</sup>	Typical
Load at full rated power: $P_r$ for 1000 hours at 70°C	$\pm\Delta R\%$	Not specified			0.3	0.1
Load at EN140101 & IECQ-CECC40101 ratings: 1000 hours at 70°C	$\pm\Delta R\%$	0.25 <sup>3</sup>	0.5 <sup>3</sup>	0.5 <sup>3</sup>	0.3	0.05
Dry heat: No load, 1000 hours at 155°C	$\pm\Delta R\%$	0.25 <sup>3</sup>	0.5 <sup>3</sup>	0.5 <sup>3</sup>	1	0.15
Shelf life test: 12 months at room temperature	$\pm\Delta R\%$	Not specified			0.1	0.03
Derating from rated power at 70°C		Zero @125°C	Zero @155°C	50% @125°C	50% @125°C, zero @155°C	
Short term overload: Lesser of 6.25x $P_r$ or 2.5xLEV for 5s	$\pm\Delta R\%$	0.5 <sup>2</sup>	0.1 <sup>2</sup>	0.1 <sup>3</sup>	0.1	0.02
Climatic	$\pm\Delta R\%$	0.25 <sup>3</sup>	0.5 <sup>3</sup>	0.5 <sup>3</sup>	0.3	0.1
Climatic category		55/125/56	55/155/56	55/125/56	55/155/56	
Long term damp heat	$\pm\Delta R\%$	0.25 <sup>3</sup>	0.5 <sup>3</sup>	0.5 <sup>3</sup>	0.5	0.1
Temperature rapid change	$\pm\Delta R\%$	0.05 <sup>2</sup>	0.1 <sup>2</sup>	0.1 <sup>2</sup>	0.2	0.05
Resistance to solder heat	$\pm\Delta R\%$	0.05 <sup>2</sup>	0.1 <sup>2</sup>	0.1 <sup>2</sup>	0.06	0.03
Vibration	$\pm\Delta R\%$	0.05 <sup>2</sup>	0.1 <sup>2</sup>	0.1 <sup>2</sup>	0.06	0.02
Bump	$\pm\Delta R\%$	Not specified			0.06	0.02
Noise in a decade of frequency	$\mu V/V$	<0.5	Not specified		1	0.1
Voltage coefficient of resistance	ppm/V	Not specified				<1

Note 1: All values within the qualified resistance range meet EN140101 and IECQ-CECC40101 requirements.

Note 2: Apply an ohmic addition of R01.

Note 3: Apply an ohmic addition of R05.

### Table of Resistance Restrictions

TCR ppm/°C	Tolerance %								
	RC55			RC65			RC70		
	0.05	0.1 - 0.25	0.5 <sup>3</sup> - 1 <sup>3</sup>	0.05	0.1 - 0.25	0.5 <sup>3</sup> - 1 <sup>3</sup>	0.05	0.1 - 0.25	0.5 <sup>3</sup> - 1 <sup>3</sup>
5 <sup>1</sup>	10R to 500K		1R0 to 500K	10R to 500K		1R0 to 500K	10R to 750K		
10	10R to 1M0	10R to 1M0	1R0 to 1M0	10R to 1M0	10R to 1M0	1R0 to 1M0	10R to 1M0	10R to 1M0	1R0 to 1M0
15					5R0 to 1M0			10R to 2M0	1R0 to 2M0
25		10R to 2M0	1R0 to 2M0		5R0 to 2M0	1R0 to 2M0		10R to 5M0	1R0 to 5M0
50 <sup>2</sup>					1R0 to 4M0	1R0 to 4M0		5R0 to 10M	1R0 to 10M
100 <sup>2</sup>					1R0 to 2M0			1R0 to 10M	

Note 1: Based on sampling. 100% screened product is available.

Note 2: For maximum availability, where the ohmic value permits, 25ppm/°C is preferred to 50 or 100ppm/°C.

Note 3: For maximum availability, where the ohmic value permits, 0.25% is preferred to 0.5 or 1%.

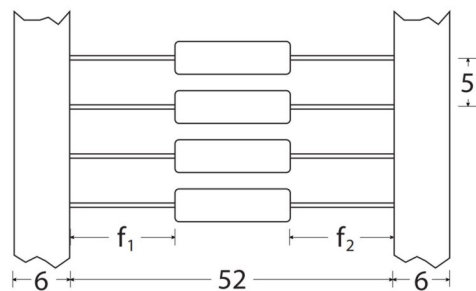
## Application Notes

### Matched Sets

TT Electronics has many years' experience in the supply of matched sets of precision resistors. Resistors can be supplied matched for tolerance and TCR down to ±0.02% and ±2ppm/°C.

### 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  $\pm 5\text{ppm}/^\circ\text{C}$  at 31.6 kilohms  $\pm 0.1\%$ , Pb-free)

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

1	2	3	4	5		
Type	TCR (ppm/°C)	Value	Tolerance	Finish, Screening & Packing		
RC55	V = $\pm 5$	E24 = 3/4 characters	W = $\pm 0.05\%$	I	Pb-free (RoHS)	
RC65	T = $\pm 10$	E96 = 3/4 characters	B = $\pm 0.1\%$	SC	Pb-free with screened TCR (5ppm only)	
RC70	Y = $\pm 15$	R = ohms	C = $\pm 0.25\%$	PB	Sn(95)Pb(5) finish	
	D = $\pm 25$	K = kilohms	D = $\pm 0.5\%$	HL	Sn(60)Pb(40) high lead finish	
	C = $\pm 50$	M = megohms	F = $\pm 1\%$	All above in Standard Packing		
	Z = $\pm 100$				RC55	Ammo
				RC65		Up to 2500/box
				RC70	Bulk	250/box

Note: For product released to EN140101 or CECC40101, follow the MPN with text indicating the relevant release and style. For CECC40101-004 the style includes a TCR code which is the same as that used in the MPN. Note that this additional text does not form part of our MPN.

Examples: **RC55Y-31K6BI** EN140101-806 B  
**RC55Y-31K6BI** CECC40101-004 JY

For CECC 40101-804 the TCR codes T and E are used in the style for 15 and 25ppm/°C, coded in the MPN as Y and D respectively. Also an additional suffix -804 is added after, or in the case of Pb-free, instead of, the Finish, Screening & Packing code.

Examples: **RC65Y-31K6B-804** CECC 40101-804 BT  
**RC55D-31K6BPB-804** CECC 40101-804 AE

**USA (IRC) Part Number: RC55LFV3162BA** (RC55 with TCR  $\pm 5\text{ppm}/^\circ\text{C}$  at 31.6 kilohms  $\pm 0.1\%$ , Pb-free)

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

1	2	3	4	5	6		
Type	Termination	TCR (ppm/°C)	Value	Tolerance	Packing		
RC55	Omit for	V = $\pm 5$	3 digits + multiplier	A = $\pm 0.05\%$	A	RC55	Ammo, up to 5000/box
RC65	Sn(95)Pb(5)	T = $\pm 10$	R = ohms for values	B = $\pm 0.1\%$		RC65	Ammo, up to 2500/box
RC70	LF = Pb-free	Y = $\pm 15$	<100 ohms	C = $\pm 0.25\%$	B	RC70	Bulk, 250/box
		D = $\pm 25$		D = $\pm 0.5\%$			
		C = $\pm 50$		F = $\pm 1\%$			
		Z = $\pm 100$					