

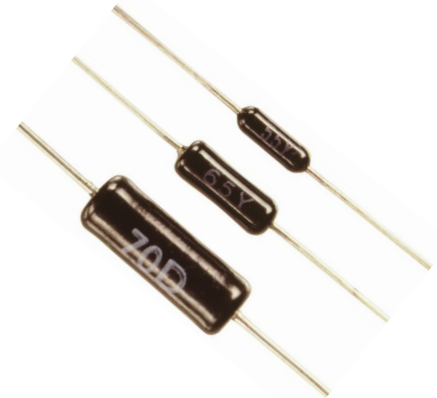
Precision Metal Film Resistors



RC Series

OBSOLETE

(RC70 ONLY)



Features:

- RC55 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

RC Actual Data		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) ¹	ppm/°C	5, 10, 15, 25, 50, 100		
Resistance tolerance ¹	%	0.05, 0.1, 0.25, 0.5, 1		
Standard values ²		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		
Required power rating @70°C	W	0.4		
Qualified resistance range	ohms	56R – 820K		
Required limiting element voltage	V	300		
Required isolation voltage	V	500		
Required TCR ¹	ppm/°C	10, 15, 25, 50		
Required resistance tolerance	%	0.1, 0.25, 0.5, 1		

IECQ-CECC 40101-004 Requirements		H	J	K
Required power rating @70°C	W	0.063	0.125	0.25
Qualified resistance range	ohms	1R0 – 1M0		
Required limiting element voltage	V	200	250	
Required isolation voltage	V	280	350	
Required TCR ¹	ppm/°C	15, 25, 50, 100		
Required resistance tolerance	%	0.05, 0.1, 0.25, 0.5, 1		

IECQ-CECC 40101-804 Requirements		A	B
Required power rating @70°C	W	0.125	0.25
Qualified resistance range	ohms	1R0 – 1M0	
Required limiting element voltage	V	200	250
Required isolation voltage	V	280	350
Required TCR ¹	ppm/°C	15, 25, 50	
Required 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

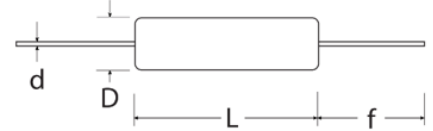
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BI Technologies IRC Welwyn

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Physical Data

Dimensions in mm and weight in g							
Type	L max ¹	D max	f min ²	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: Coating may extend up to 2mm along each lead.

Note 2: 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 60062.

Terminations

Terminations are copper wire with Sn or SnPb finish. They meet the strength requirements of IEC 60115-1 clause 9.5 and the solderability requirements of IEC 60115-1 clause 11.1.

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 ^{1,2}	Typical
Load at full rated power: P _r for 1000 hours at 70°C	±ΔR%	Not specified			0.3	0.1
Load at EN140101 & IECQ-CECC40101 ratings: 1000 hours at 70°C	±ΔR%	0.25 ³	0.5 ³	0.5 ³	0.3	0.05
Dry heat: No load, 1000 hours at 155°C	±ΔR%	0.25 ³	0.5 ³	0.5 ³	1	0.15
Shelf-life test: 12 months at room temperature	±ΔR%	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 6.25xP _r or 2.5xLEV for 5s	±ΔR%	0.5 ²	0.1 ²	0.1 ³	0.1	0.02
Climatic	±ΔR%	0.25 ³	0.5 ³	0.5 ³	0.3	0.1
Climatic category		55/125/56	55/155/56	55/125/56	55/155/56	
Long term damp heat	±ΔR%	0.25 ³	0.5 ³	0.5 ³	0.5	0.1
Temperature rapid change	±ΔR%	0.05 ²	0.1 ²	0.1 ²	0.2	0.05
Resistance to solder heat	±ΔR%	0.05 ²	0.1 ²	0.1 ²	0.06	0.03
Vibration	±ΔR%	0.05 ²	0.1 ²	0.1 ²	0.06	0.02
Bump	±ΔR%	Not specified			0.06	0.02
Noise in a decade of frequency	μV/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.

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Temperature Derating

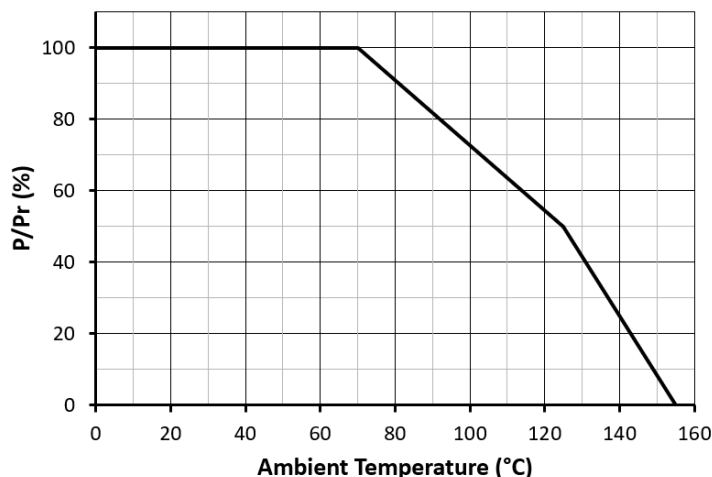


Table of Resistance Restrictions

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		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		1R0 to 2M0	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 ²			1R0 to 4M0		1R0 to 2M0	1R0 to 4M0		5R0 to 10M	1R0 to 10M
100 ²					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%.

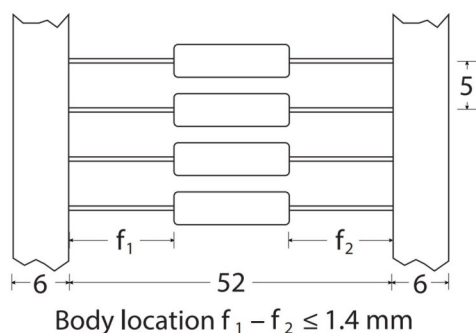
Application Notes

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.



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Ordering Procedure

Global Part Number Example: 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 = ± 5	E24 = 3/4 characters	W = $\pm 0.05\%$	I	Pb-free (RoHS)	
RC65	T = ± 10	E96 = 3/4 characters	B = $\pm 0.1\%$	SC	Pb-free with screened TCR (5ppm only)	
RC70	Y = ± 15	R = ohms	C = $\pm 0.25\%$	PB	Sn(95)Pb(5) finish	
	D = ± 25	K = kilohms	D = $\pm 0.5\%$	HL	Sn(60)Pb(40) high lead finish	
	C = ± 50	M = megohms	F = $\pm 1\%$	All above in Standard Packing		
	Z = ± 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: **RC55Y-31K6B-804** CECC 40101-804 BT
RC55D-31K6BPB-804 CECC 40101-804 AE

Legacy Part Numbers

This product has a legacy part number format. This is still available for ordering, but for new designs use of the Global Part Number is recommended.

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

Note 1: The optional family prefix RC- may be used, e.g. RC-RC55.

Note 2: For product released to EN140101 or CECC40101 the global part number must be used – see above for details.