



### Features:

- Tolerance down to 0.01%
- TCR down to 5ppm/°C
- High reliability
- Superior moisture performance
- Non-standard values available
- High stability metal film
- Matched sets available



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

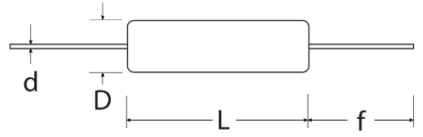
## Electrical Data

		CAR5	CAR6
Power rating @70°C	W	0.25	0.33
Power rating @85°C	W	0.125	0.25
Resistance range	ohms	10R – 3M0	10R – 5M0
Limiting element voltage	V	250	350
TCR (20 - 70°C) <sup>1</sup>	ppm/°C	5, 10, 15, 25, 50	
Resistance tolerance <sup>1</sup>	%	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	
Standard values <sup>2</sup>		E24 & E96 preferred	
Thermal impedance	°C/W	110	70
Ambient temperature range	°C	-55 to 155	

Note 1: See table of resistance restrictions

Note 2: Non-standard values may be requested

## 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	
CAR5	7.2	2.5	30	0.6	10.2	0.6	0.24	
CAR6	10	3.7	30	0.6	12.7	0.6	0.4	

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 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

		Values ≤250K		Values >250K	
		Maximum	Typical	Maximum	Typical
Load at rated power: Load, 1000 hours at 70°C / 85°C	±ΔR%	0.05	0.02	0.25	0.05
Load at rated power: Load, 8000 hours at 70°C / 85°C	±ΔR%	0.1	0.04	0.5	0.1
Dry heat: No load, 1000 hours at 155°C	±ΔR%	0.15	0.08	1	0.2
Shelf life test: 12 months at room temperature	±ΔR%	0.01	0.003	0.04	0.02
Derating from rated power at 70°C / 85°C		Zero @155°C			
Short term overload: Lesser of 6.25xPr or 2.5xLEV for 5s	±ΔR%	0.01	0.001	0.08	0.01
Climatic	±ΔR%	0.05	0.02	0.2	0.05
Climatic category		55/155/56			
Long term damp heat	±ΔR%	0.05	0.02	0.2	0.05
Temperature rapid change	±ΔR%	0.04	0.02	0.25	0.05
Resistance to solder heat	±ΔR%	0.02	0.003	0.05	0.005
Vibration	±ΔR%	0.02	0.002	0.06	0.02
Bump	±ΔR%	0.02	0.002	0.06	0.02
Noise in a decade of frequency	μV/V	0.2	0.03	1	0.1
Voltage coefficient of resistance	ppm/V	0.3	<0.05	0.2	<0.05

### Table of Resistance Restrictions

TCR ppm/°C	Tolerance %					
	CAR5			CAR6		
	0.01 – 0.02	0.05	0.1 - 1	0.01 – 0.02	0.05	0.1 - 1
5 <sup>1</sup>	50R to 300K	10R to 500K		50R to 500K	10R to 500K	
10		10R to 1M0	10R to 1M0		10R to 1M0	10R to 1M0
15			10R to 1M5			10R to 3M0
25			10R to 3M0			10R to 5M0
50						

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

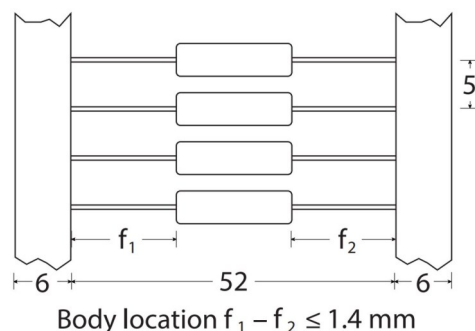
### Application Notes

#### 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 ±0.005% and ±1ppm/°C.

#### Packaging

CAR5 and CAR6 standard packing is in tape, as shown below.



### Ordering Procedure

**Global Part Number Example: CAR5V-31K6PI** (CAR5 with TCR  $\pm 5\text{ppm}/^\circ\text{C}$  at 31.6 kilohms  $\pm 0.02\%$ , Pb-free)

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

1	2	3	4	5		
Type	TCR (ppm/°C)	Value	Tolerance	Finish, Screening & Packing		
CAR5	V = ±5	E24 = 3/4 characters E96 = 3/4 characters  Custom values may use more than 4 characters  R = ohms K = kilohms M = megohms	L = ±0.01%	I	Pb-free (RoHS)	
CAR6	T = ±10		P = ±0.02%	SC	Pb-free with screened TCR (5ppm only)	
	Y = ±15		W = ±0.05%	PB	Sn(95)Pb(5) finish	
	D = ±25		B = ±0.1%	All above in Standard Packing		
	C = ±50		C = ±0.25%	CAR5	Ammo	Up to 5000/box
			D = ±0.5%	CAR6		Up to 2500/box
			F = ±1%			

### 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: CAR5LFV3162PA** (CAR5 with TCR  $\pm 5\text{ppm}/^\circ\text{C}$  at 31.6 kilohms  $\pm 0.02\%$ , Pb-free)

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

1 Type	2 Termination	3 TCR (ppm/ $^\circ\text{C}$ )	4 Value	5 Tolerance	6 Packing		
CAR5	Omit for	V = $\pm 5$	3 digits + multiplier	L = $\pm 0.01\%$	A	CAR5	Ammo, up to 5000/box
CAR6	Sn(95)Pb(5)	T = $\pm 10$	R = ohms for values <100 ohms	P = $\pm 0.02\%$		CAR6	Ammo, up to 2500/box
	LF = Pb-free	Y = $\pm 15$		W = $\pm 0.05\%$			
		D = $\pm 25$		B = $\pm 0.1\%$			
		C = $\pm 50$		C = $\pm 0.25\%$			
				D = $\pm 0.5\%$			
				F = $\pm 1\%$			