

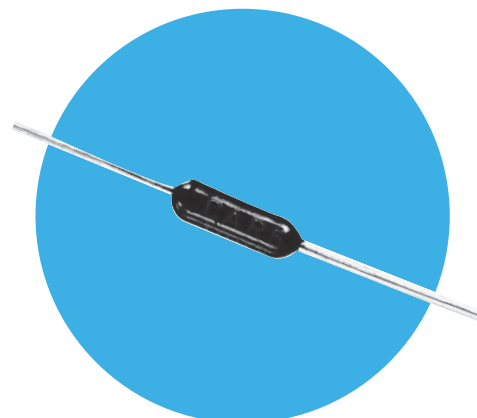
Ultra Precision Metal Film Resistors

CAR series

- Tolerance down to 0.01%
- Low TCR's
- High reliability
- Superior moisture performance
- Non standard values available
- Highest stability metal film available
- Matched sets and networks



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



Electrical Data

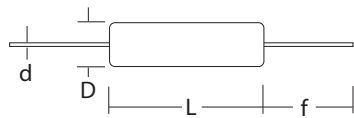
		CAR5	CAR6	CAR7	Notes
Power rating at 70°C	watts	0.25	0.33	0.5	See tolerance/TCR combinations below
Power rating at 85°C	watts	0.125	0.25	0.33	
Resistance range	ohms	10R0 to 3M	10R0 to 5M	10R0 to 10M	
Limiting element voltage	volts	250	350	500	
TCR (20 to +70°C)	ppm/°C	5, 10, 15, 25, 50			
Resistance tolerance	%	0.01, 0.02, 0.05, 0.1, 0.25, 0.5 & 1			
Standard values		E24, E96 preferred			
Thermal impedance	°C/watt	110	70	60	
Ambient temperature range	°C	-55 to +155			

Table of Resistance Restrictions

TCR ppm/°C	Tolerance								
	CAR5			CAR6			CAR7		
	0.01-0.02%	0.05%	0.1-1%	0.01-0.02%	0.05%	0.1-1%	0.01-0.02%	0.05%	0.1-1%
5 ¹	50 to 300k	10 to 500k	10 to 500k	50 to 500k	10 to 500k	10 to 500k	50 to 750k	10 to 750k	10 to 750k
10	50 to 300k	10 to 1M	10 to 1M	50 to 500k	10 to 1M	10 to 1M	50 to 750k	10 to 1M	10 to 1.5M
15	50 to 300k	10 to 1M	10 to 1M	50 to 500k	10 to 1M	10 to 1M	50 to 750k	10 to 1M	10 to 3.5M
25	50 to 300k	10 to 1M	10 to 1.5M	50 to 500k	10 to 1M	10 to 3M	50 to 750k	10 to 1M	10 to 5M
50	50 to 300k	10 to 1M	10 to 3M	50 to 500k	10 to 1M	10 to 5M	50 to 750k	10 to 1M	10 to 10M

Note1: Based on sampling. 100% screened product is available.

Physical Data

Dimensions (mm) and Weight (g)								
Type	L Max	D Max	f min	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	10.0	3.7	30	0.6	12.7	0.6	0.40	
CAR7	15.5	5.5	30	0.8	18.4	1.2	1.15	

General Note

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All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

CAR series

Construction

Ceramic rods are coated with a metal film and plated steel caps are force fitted. A helical cut is used to adjust the film to its final value.

Termination wires are welded to the caps and the resistor is protected with a specially formulated epoxy coating.

Terminations

Material	Solderable finish 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 value marking conforms to IEC 62.

Solvent Resistance

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

Performance Data

		Values $10 \leq 250k$		Values $> 250k$	
		Actual Performance		Actual Performance	
		Maximum	Typical	Maximum	Typical
Load at rated power : 1000 hrs at 70°C (or 85°C)	$\Delta R \%$	0.05	0.02	0.25	0.05
Load at rated power : 8000 hrs at 70°C (or 85°C)	$\Delta R \%$	0.1	0.04	0.5	0.1
Dry heat : 1000 hrs at 155°C	$\Delta R \%$	0.15	0.08	1	0.2
Shelf life : 12 months at room temperature	$\Delta R \%$	0.01	0.003	0.04	0.02
Derating from rated power at 70°C (or 85°C)		Zero at 155°C		Zero at 155°C	
Short term overload	$\Delta R \%$	0.01	0.001	0.08	0.01
Climatic	$\Delta R \%$	0.05	0.02	0.2	0.05
Climatic category		55/155/56		55/155/56	
Long term damp heat	$\Delta R \%$	0.05	0.02	0.2	0.05
Temperature rapid change	$\Delta R \%$	0.04	0.02	0.25	0.05
Resistance to solder heat	$\Delta R \%$	0.02	0.003	0.05	0.005
Vibration and bump	$\Delta R \%$	0.02	0.002	0.06	0.02
Noise (in a decade of frequency)	$\mu V/V$	0.2	0.03	1	0.1
Voltage coefficient of resistance	ppm/V	0.3	<0.05	0.2	<0.05

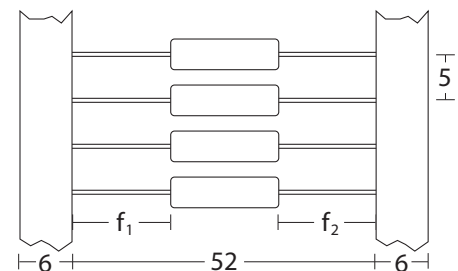
Application Notes

Resistors can be supplied matched for tolerance and TCR down to $\pm 0.005\%$ and $\pm 1\text{ppm}/^\circ\text{C}$, respectively, 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 $\pm 0.01\%$ and a TCR of $\pm 5\text{ppm}/^\circ\text{C}$.

Packaging

CAR5 and CAR6 standard packing is in tape, as shown below, whilst CAR7 is bulk packed.



Body location $f_1 - f_2 \leq 1.4 \text{ mm}$

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Ordering Procedure

This product has two valid part numbers:

European (Welwyn) Part Number: 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 Type	2 TCR (ppm/ $^\circ\text{C}$)	3 Value	4 Tolerance	5 Finish, Screening & Packing		
CAR5	V = ± 5	E24 = 3/4 characters E96 = 4/5 characters R = ohms K = kilohms M = megohms	L = $\pm 0.01\%$	I = Standard packing & Pb-free		
CAR6	T = ± 10		P = $\pm 0.02\%$	SC = Standard packing & Pb-free with 5ppm/ $^\circ\text{C}$ screened		
CAR7	Y = ± 15		W = $\pm 0.05\%$			
	D = ± 25		B = $\pm 0.1\%$	PB = Standard packing & SnPb		
	C = ± 50		C = $\pm 0.25\%$	CAR5	Ammo	Up to 5000/box
			D = $\pm 0.5\%$	CAR6	Ammo	Up to 2500/box
			F = $\pm 1\%$	CAR7	Bulk	250/box

USA (IRC) Part Number: 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 SnPb	V = ± 5	3 digits + multiplier R = ohms for values <100 ohms	L = $\pm 0.01\%$	A	CAR5	Ammo up to 5000/box
CAR6	LF = Pb-free	T = ± 10		P = $\pm 0.02\%$		CAR6	Ammo up to 2500/box
CAR7		Y = ± 15		W = $\pm 0.05\%$	B	CAR7	Bulk 250/box
		D = ± 25		B = $\pm 0.1\%$			
		C = ± 50		C = $\pm 0.25\%$			
				D = $\pm 0.5\%$			
				F = $\pm 1\%$			

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Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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