

High Precision Resistor Chip Arrays



PRA arrays can be used in most applications requiring a matched pair (or set) of resistor elements. The networks provide 1 ppm/°C TCR tracking, a ratio tolerance as tight as 0.01 % and outstanding stability. They are available in 1 mm, 1.35 mm and 1.82 mm pitch.

FEATURES

- High stability passivated nichrome resistive layer 0.02 % on ratio, 1000 h at Pn at + 70 °C
- Tight TCR (10 ppm/°C) and TCR tracking (to 1 ppm/°C)
- Very low noise < 35 dB and voltage coefficient < 0.01 ppm/V
- Ratio tolerance to 0.01 % ($R \geq 200R$)
- Pre-tinned terminations over nickel barrier
- High temperature option (200 °C)
- SMD wraparound chip resistor array
- Compliant to RoHS directive 2002/95/EC

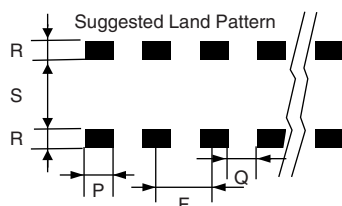


RoHS*
COMPLIANT
GREEN
(5-2008)**
Available

TYPICAL PERFORMANCE

	ABS	TRACKING
TCR	10 ppm/°C	2 ppm/°C
	ABS	RATIO
TOL	0.1 %	0.05 %

DIMENSIONS



DIM.	PRA 100		PRA 135		PRA 182	
	mm	mil	mm	mil	mm	mil
A	1.6 $\begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$	63	1.85 $\begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$	72	3.0 $\begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$	118
B	0.4 $\begin{smallmatrix} +0.2 \\ -0.2 \end{smallmatrix}$	16	0.4 $\begin{smallmatrix} +0.2 \\ -0.2 \end{smallmatrix}$	16	0.4 $\begin{smallmatrix} +0.2 \\ -0.2 \end{smallmatrix}$	16
C	0.65 $\begin{smallmatrix} +0.15 \\ -0.15 \end{smallmatrix}$	25.5	1.05 $\begin{smallmatrix} +0.15 \\ -0.15 \end{smallmatrix}$	41	1.3 $\begin{smallmatrix} +0.35 \\ -0.15 \end{smallmatrix}$	51
D	0.25	10	0.25	10	0.25	10
E ⁽¹⁾	$E = (N \times F) \pm 0.2 \text{ mm}$		$E = (N \times F) \pm 8 \text{ mil}$			
F	1	40	1.35	53.1	1.82	72
G	0.4 $\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$	15	0.4 $\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$	15	0.4 $\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$	15
P	0.7	27.5	1.05	41.3	1.52	59.8
Q	0.3	12	0.3	12	0.3	12
R	1	40	1	40	1	40
S	0.6	23.5	0.8	31.5	1.8	70.8

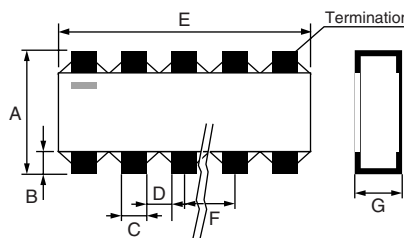
Note

(1) E depends on number of resistors

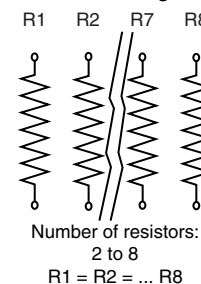
* Pb containing terminations are not RoHS compliant, exemptions may apply

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

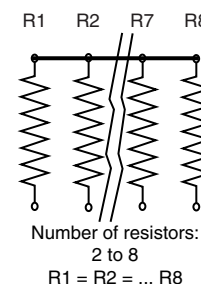
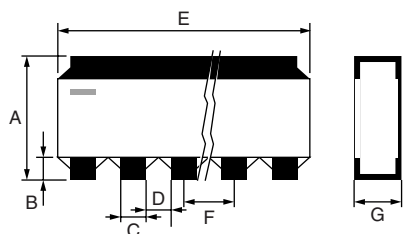
I: Independent resistors



Electrical diagram



C: One common point N resistors



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: PRA100I4-5K62BWB T31

P	R	A	1	0	0	I	4	-	5	K	6	2	B	W	B	T	3	1
GLOBAL MODEL	CONFIG.	NUMBERS OF RESISTORS		VALUE		ABS. TOL.		RATIO TOL.		TERMINATION		PACKAGING		OPTION				
PRA100 PRA135 PRA182	I: Independent C: Common	2 to 8		Decimal R or K		B = 0.1 % D = 0.5 %		B = 0.1 % W = 0.05 % P = 0.02 % L = 0.01 %		B: SnPb over nickel barrier N: SnAg over nickel barrier G: Gold over nickel barrier		Blank = Waffle Pack T (1) = Tape and reel		Leave blank if no option				
												B: Lead bearing version N and G: Lead (Pb)-free/ RoHS version						

For different ohmic values on a given network a specific part number is used

CNW	1368
GLOBAL MODEL	REFERENCE

Historical Part Number example: PRA100 I 4 5K62 0.1 % 0.05 % TR R0031

PRA100	I	4	5K62	0.1 %	0.05 %	TR	R0031
HISTORICAL MODEL	CONFIG.	NUMBERS OF RESISTORS	OHMIC VALUE	ABS. TOL.	RATIO TOL.	PACKAGING	OPTION

Note

⁽¹⁾ Tape and reel not available for all sizes - see table

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITION
Resistance range:	PRA 100	100 Ω to 250 k Ω
	PRA 135	100 Ω to 400 k Ω
	PRA 182	100 Ω to 1.6 M Ω
Tolerance:	Absolute	$\pm 0.5 \%$ to $\pm 0.1 \%$
	Ratio	0.1 %, 0.05 %, 0.02 %, 0.01 % ($R \geq 200 R$)
TCR:	Absolute	$\pm 10 \text{ ppm}/^\circ\text{C}$
	Ratio	2 ppm/ $^\circ\text{C}$ (1 ppm/ $^\circ\text{C}$ on request)
Power rating:	PRA 100	100 mW per resistor
	PRA 135	125 mW per resistor
	PRA 182	200 mW per resistor
Operating temperature range ⁽²⁾	- 55 $^\circ\text{C}$ to + 155 $^\circ\text{C}$	
Noise	$\leq - 35 \text{ dB}$	
Voltage coefficient	$\leq 0.01 \text{ ppm/V}$	
Limiting voltage:	PRA 100	50 V
	PRA 135	100 V
	PRA 182	150 V

Note

⁽²⁾ For temperature up to 200 $^\circ\text{C}$, please consult factory

HIGH TEMPERATURE OPTION: 0031

Vishay Sfernice offers a high temperature option for applications requiring withstanding to temperature up to 200 °C. Please refer to application note "Power Dissipation - High Temperature SCH" www.vishay.com/doc?53047 for recommendations and mounting considerations.

Operating temperature range: - 55 °C; + 200 °C

Minimum ohmic value: 250 Ω

Absolute TCR: 10 ppm/°C typical (maximum 15 ppm/°C)

TCR tracking: 2 ppm/°C typical (maximum 5 ppm/°C)

Load life stability at 200 °C: < 0.1 % at 0.1 Pn after 1000 h

Tooling charges might be required for custom networks series (definitive set of masks).

MECHANICAL SPECIFICATIONS

Substrate	Alumina
Technology	Thin Film
Film	Nickel chromium with mineral passivation
Terminations	B type: SnPb over nickel barrier
	N type: SnAg over nickel barrier
	G type: Gold over nickel barrier

QUICK PROTOTYPING

Vishay Sfernice can offer quick prototyping service in 3 weeks production time for standard and custom networks (independent resistors - For networks with common point lead time might be longer). (Logistics time to add to this lead time). No NRE require for prototyping (small quantity).

SPECIAL FEATURES

Resistance values can be different on a given network (R_{max}/R_{min} as high as 300). Tooling charges might be required depending on the ohmic values in the same network. Please, consult Vishay Sfernice for ohmic values, tolerances and also temperature coefficient (e.g. ± 1 ppm/°C) outside the standard range.

PACKAGING

Several types of packaging are available: Waffle-pack and tape and reel.

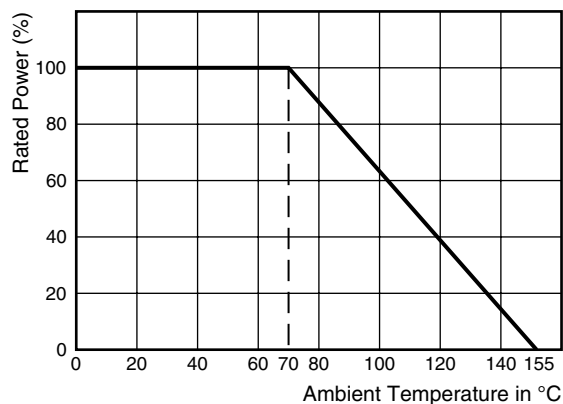
SIZE	MOQ	NUMBER OF PIECES PER PACKAGE		
		WAFFLE PACK MAX. QUANTITY PER BOX	TAPE AND REEL ⁽¹⁾	
			MIN.	MAX.
PRA100 X 2	100	100	100	4000
PRA100 X 3		140	100	4000
PRA100 X 4		60	100	4000
PRA100 X 5		50		
PRA100 X 6		50	100	4000
PRA100 X 7		50		
PRA100 X 8		28	100	4000
PRA135 X 2	100	140	100	4000
PRA135 X 3		60		
PRA135 X 4		60	100	4000
PRA135 X 5		50		
PRA135 X 6		28	100	4000
PRA135 X 7		24		
PRA135 X 8		24		
PRA182 X 2	100	60	100	4000
PRA182 X 3		60	100	4000
PRA182 X 4		50	100	4000
PRA182 X 5		21	100	4000
PRA182 X 6		24		
PRA182 X 7		24		
PRA182 X 8		20		

Note

⁽¹⁾ Other sizes upon request



POWER RATING



MARKING

On the primary package, printed information includes VISHAY S.A. trademark series and model, schematic number of resistors, ohmic value, absolute tolerance, ratio tolerance, type of termination: B tinned over nickel barrier.

PERFORMANCE

TESTS	CONDITIONS CECC REQUIREMENTS	DRIFTS	
		ABSOLUTE PER (Typical Values)	RATIO
Overload	2.5 Un/2 s	0.05 % Rn + 0.05 Ω	0.01 % Rn
Climatic sequences	- 55 °C + 155 °C/5 moisture cycles	0.1 % Rn + 0.05 Ω	0.01 % Rn
Thermal shock	- 55 °C + 155 °C/5 cycles 30'	0.05 % Rn + 0.05 Ω	0.01 % Rn
Load life	1000 h/Pn at + 70 °C	0.1 % Rn + 0.05 Ω	0.02 % Rn
Resistance to solder heat	260 °C/10 s	0.05 % Rn + 0.05 Ω	0.01 % Rn
Moisture resistance	0.01 Pn at + 40 °C 93 % RH	0.1 % Rn + 0.05 Ω	0.01 % Rn
High temperature storage	1000 h/no load at + 155 °C	0.1 % Rn + 0.05 Ω	0.02 % Rn

Note

- Rn: Nominal resistance



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All product specifications and data are subject to change without notice.

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