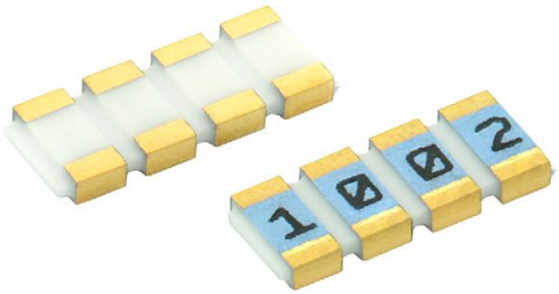
High Temperature (230 °C) High Precision Thin Film Wraparound Chip Resistor Arrays, Sulfur Resistant



DESIGN SUPPORT TOOLS AVAILABLE

3D Models

PRAHT arrays can be used in most applications requiring a matched pair (or set) of resistor elements at very high temperature up to 230 °C. The networks provide 2 ppm/°C TCR tracking, a ratio tolerance as tight as 0.05 % and outstanding stability.
They are available in pitch:

- 1.00 mm for PRAHT 100 (based on case 0603)
- 1.35 mm for PRAHT 135 (based on case 0805)
- 1.82 mm for PRAHT 182 (based on case 1206)

FEATURES

- Tight TCR (10 ppm/°C) and TCR tracking (to 2 ppm/°C)
- 2 to 4 resistors (same or different values)
- Ratio tolerance to 0.05 %
- Gold terminations for temperature up to 230 °C
- High temperature (230 °C)
- SnAg terminations for temperature up to 200 °C
- SMD wraparound chip resistor array
- Thin film technology
- Very low noise < -35 dB and voltage coefficient < 0.01 ppm/V
- Sulfur resistant (per ASTM B809-95 humid vapor test)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

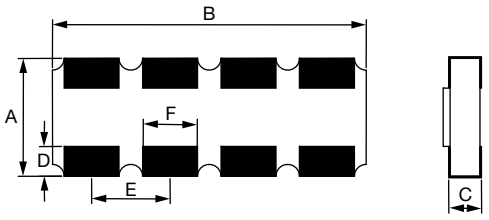
Pb-free
RoHS COMPLIANT
HALOGEN FREE Available
GREEN (5-2008) Available

TYPICAL PERFORMANCE

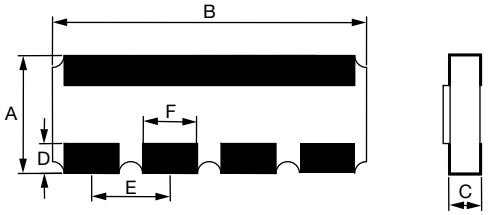
	ABSOLUTE	TRACKING
TCR	10 ppm/°C	2 ppm/°C
	ABSOLUTE	RATIO
TOL.	0.5 %	0.05 %

DIMENSIONS

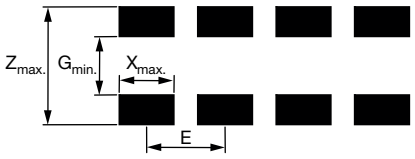
Independent resistors



One common point



Suggested land pattern
(according to IPC-7351A)



DIM.	PRAHT 100 (0603 base)		PRAHT 135 (0805 base)		PRAHT 182 (1206 base)	
	mm	mil	mm	mil	mm	mil
A	1.52 ± 0.152	60 ± 6	1.91 ± 0.152	75 ± 6	3.06 ± 0.152	120 ± 6
B	B = N x E (± 0.2 mm) B = N x E (± 8 mil)					
C	0.5 ± 0.127	20 ± 5	0.5 ± 0.127	20 ± 5	0.5 ± 0.127	20 ± 5
D	0.38 ± 0.13	15 ± 5	0.38 ± 0.13	15 ± 5	0.40 ± 0.13	16 ± 5
E	1	40	1.35	53	1.825	72
F	0.7 ± 0.1	27.6 ± 4	1.05 ± 0.1	41.4 ± 4	1.525 ± 0.1	60 ± 4
$G_{min.}$	0.49	19.3	0.88	34.5	1.99	78.3
$X_{max.}$	0.66	26	1.01	39.8	1.49	58.7
$Z_{max.}$	2.57	101.2	2.96	116.5	4.11	161.8

GLOBAL PART NUMBER INFORMATION (1)

New Global Part Numbering: PRAHT100I4-1K00BWGT

P	R	A	H	T	1	0	0	I	4	-	1	K	0	0	B	W	G	T

GLOBAL MODEL	CONFIG.	NUMBERS OF RESISTORS	VALUE (2)	ABS. TOL.	RATIO TOL.	TERMINATION (3)	PACKAGING
PRAHT 100 **PRAHT 135** **PRAHT 182**	**I**: independent **C**: common	**2 to 4**	Decimal R or K	**D** = 0.5 % **F** = 1 % **B** = 0.1 %	**B** = 0.1 % **W** = 0.05 %	**N**: SnAg over nickel barrier **G**: gold over nickel barrier	For more information see “Codification of Packaging” table

N and **G**: lead (Pb)-free/RoHS version

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

CNWHT	2027	T
GLOBAL MODEL	REFERENCE	For more information see “Codification of Packaging” table

Notes

(1) Part number can only have 18 digits. Depending on infomation needed a compromise has to be found. A codification can be used to identify case size + configuration and number of resistors. See table below.
E.g. PRAHT100I4-4K75BWGTA (Part number has more than 18 digts): PRAHT100I4 must be replaced by PRAHT17 = PRAHT17-4K75BWGTA

(2) When the last digit(s) of the ohmic value is (are) 0, it (they) must be omitted.
E.g.: PRAHT100I4-2K20BWGT → must be ordered under PRAHT100I4-2K2BWGT
PRAHT100I4-1K00BWGT → must be ordered under PRAHT100I4-1KBWGT

(3) N termination for temperature up to 200 °C.
G termination for temperature up to 230 °C

CODIFICATION OF SIZE + CONFIGUATION + NUMBER OF RESISTORS

CODE 18	CODE 40	CODE 18	CODE 40	CODE 18	CODE 40	CODE 18	CODE 40	CODE 18	CODE 40
1	PRAHT073I2	15	PRAHT100I2	29	PRAHT182I2	43	PRAHT074C2	57	PRAHT135C2
2	PRAHT073I3	16	PRAHT100I3	30	PRAHT182I3	44	PRAHT074C3	58	PRAHT135C3
3	PRAHT073I4	17	PRAHT100I4	31	PRAHT182I4	45	PRAHT074C4	59	PRAHT135C4
4	PRAHT073I5	18	PRAHT100I5	32	PRAHT182I5	46	PRAHT074C5	60	PRAHT135C5
5	PRAHT073I6	19	PRAHT100I6	33	PRAHT182I6	47	PRAHT074C6	61	PRAHT135C6
6	PRAHT073I7	20	PRAHT100I7	34	PRAHT182I7	48	PRAHT074C7	62	PRAHT135C7
7	PRAHT073I8	21	PRAHT100I8	35	PRAHT182I8	49	PRAHT074C8	63	PRAHT135C8
8	PRAHT074I2	22	PRAHT135I2	36	PRAHT073C2	50	PRAHT100C2	64	PRAHT182C2
9	PRAHT074I3	23	PRAHT135I3	37	PRAHT073C3	51	PRAHT100C3	65	PRAHT182C3
10	PRAHT074I4	24	PRAHT135I4	38	PRAHT073C4	52	PRAHT100C4	66	PRAHT182C4
11	PRAHT074I5	25	PRAHT135I5	39	PRAHT073C5	53	PRAHT100C5	67	PRAHT182C5
12	PRAHT074I6	26	PRAHT135I6	40	PRAHT073C6	54	PRAHT100C6	68	PRAHT182C6
13	PRAHT074I7	27	PRAHT135I7	41	PRAHT073C7	55	PRAHT100C7	69	PRAHT182C7
14	PRAHT074I8	28	PRAHT135I8	42	PRAHT073C8	56	PRAHT100C8	70	PRAHT182C8

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	RESISTANCE RANGE Ω	POWER RATING PER RESISTOR (1) W	ABSOLUTE TOLERANCE ± %	RATIO TOLERANCE %	ABSOLUTE TCR (2) ± ppm/°C	RATIO TCR (2) ± ppm/°C
PRAHT 100	100	10 to 250K	0.010	0.1, 0.5, 1	0.05, 0.1	15	2
PRAHT 135	135	10 to 500K	0.0125	0.1, 0.5, 1	0.05, 0.1	15	2
PRAHT 182	182	10 to 2M	0.020	0.1, 0.5, 1	0.05, 0.1	15	2

Notes

(1) At +215 °C

(2) At -40 °C to +215 °C

CLIMATIC SPECIFICATIONS	
Operating temperature range	-55 °C to +215 °C
Storage temperature range	-55 °C to +230 °C

PERFORMANCE VS. HUMID SULFUR VAPOR	
Test conditions	50 °C ± 2 °C, 85 % ± 4 % RH, exposure time 500 h
Test results	Resistance drift < (0.05 % R + 0.05 Ω), no corrosion products observed

MECHANICAL SPECIFICATIONS	
Substrate	Alumina
Technology	Thin Film
Film	Nickel chromium with mineral passivation
Terminations (1)	N type: SnAg over nickel barrier
	G type: Gold over nickel barrier

Note
(1) N terminations for temperatures up to 200°C.
G terminations for temperatures up to 230°C

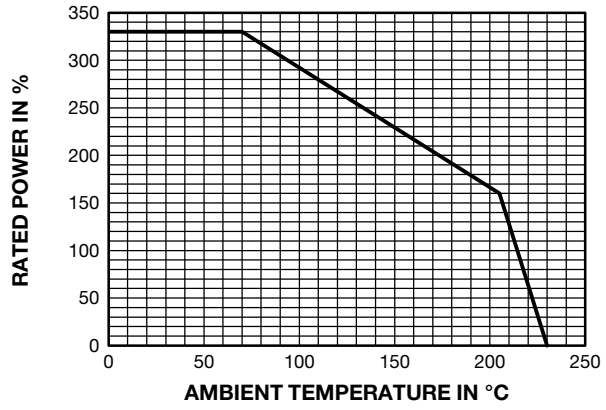
PERFORMANCES		
TEST		**SPECIFICATIONS**
Noise		≤ -35 dB
Voltage coefficient		≤ 0.01 ppm/V
Limiting voltage	PRAHT 100	50 V
	PRAHT 135	100 V
	PRAHT 182	150 V

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 MIN.	TAPE AND REEL MAX.
PRA100 x 2	100	100	100	4000
PRA100 x 3		140		
PRA100 x 4		60		
PRA135 x 2		140	100	4000
PRA135 x 3		60		
PRA135 x 4		60		
PRA182 x 2		60	100	2000
PRA182 x 3		60		4000
PRA182 x 4		50		2000

DERATING



PACKAGING RULES

Waffle Pack

Can be filled up to maximum quantity indicated in the table here above, taking into account the minimum order quantity. When quantity ordered exceeds maximum quantity of a single waffle pack, the waffle packs are stacked up on the top of each other and closed by one single cover.

To get "not stacked up" waffle pack in case of ordered quantity > maximum number of pieces per package: Please consult Vishay Sfernice for specific ordering code.

Tape and Reel

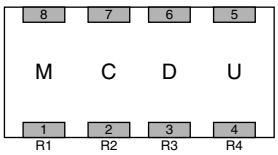
Can be filled up to maximum quantity indicated in the table here above, taking into account the minimum order quantity. When quantity ordered is between the MOQ and the maximum reel capacity, only one reel is provided.

When several reels are needed for ordered quantity within MOQ and maximum reel capacity: Please consult Vishay Sfernice for specific ordering code.

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.

Marking on parts:



E.g.: Ohmic value 13K:
coded 1302: M = 1, C = 3, D = 0, U = 2

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 to +155 °C/5 moisture cycles	0.1 % Rn + 0.05 Ω	0.01 % Rn
Thermal shock	-55 °C to +155 °C/5 cycles 30'	0.05 % Rn + 0.05 Ω	0.01 % Rn
Load life	1000 h/Pn at 215 °C	0.5 % Rn	0.25 % Rn
	8000 h/Pn at 215 °C	0.7 % Rn	0.4 % 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

CODIFICATION OF PACKAGING	
CODE 18	PACKAGING
WAFFLE PACK	
W	100 min., 1 mult
PLASTIC TAPE	
T	100 min., 1 mult
TA	100 min., 100 mult
TB	250 min., 250 mult
TC	500 min., 500 mult
TD	1000 min., 1000 mult
TE	2500min., 2500 mult
TF	Full tape (quantity depending on size of chips)

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