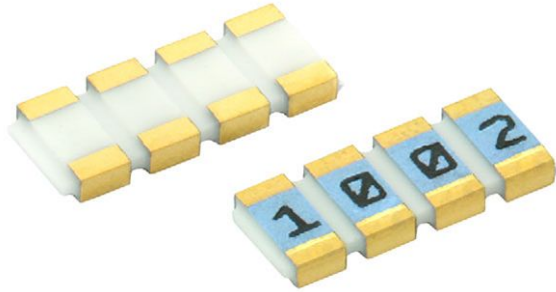




High Temperature (230 °C) High Precision Thin Film Wraparound Chip Resistor Arrays, Sulfur Resistant



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



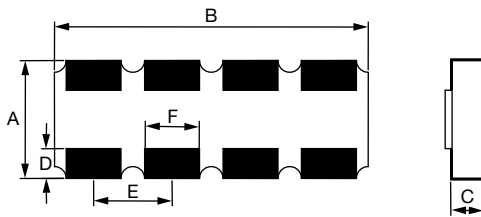
RoHS COMPLIANT
HALOGEN FREE
Available
GREEN
(5-2008)
Available

TYPICAL PERFORMANCE

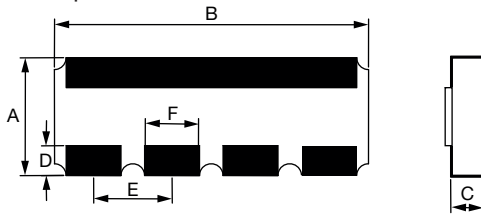
| | ABSOLUTE | TRACKING |
|------|-----------|----------|
| TCR | 10 ppm/°C | 2 ppm/°C |
| | ABSOLUTE | RATIO |
| TOL. | 0.5 % | 0.05 % |

DIMENSIONS

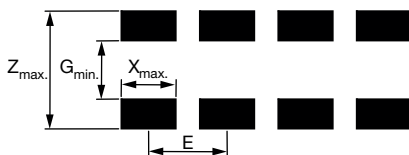
Independent resistors



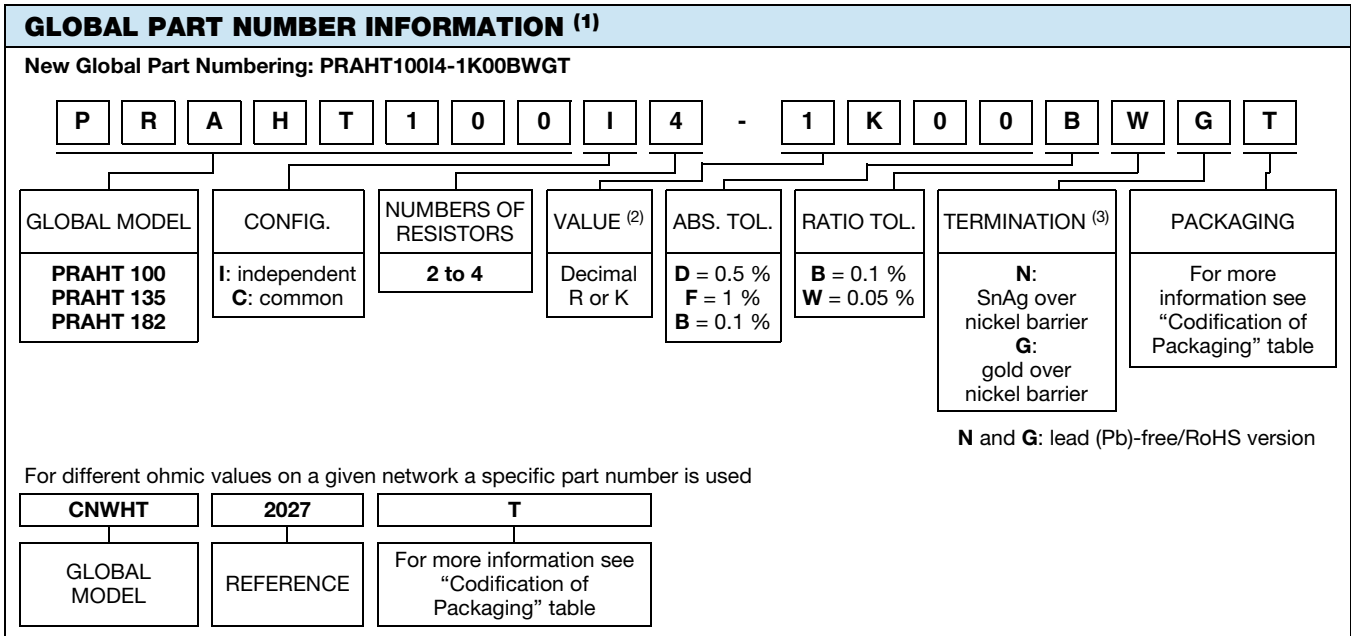
One common point



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 |



Notes

- (1) Part number can only have 18 digits. Depending on information 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 digits): PRAHT100I4 must be replaced by PRAHT17 = PRAHT17-4K75BWGTA
- (2) When the last digit(s) of the ohmic value is (are) 0, it (they) can be omitted.
 E.g.: PRAHT100I4-2K20BWGT → can be ordered under PRAHT100I4-2K2BWGT
 PRAHT100I4-1K00BWGT → can 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 + CONFIGURATION + 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

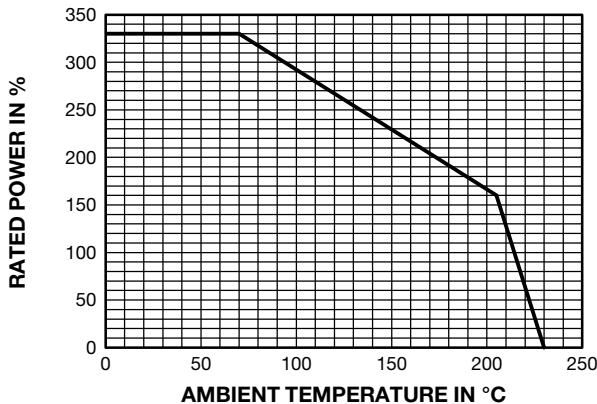
| PERFORMANCES | | |
|---------------------|----------------|-------|
| TEST | SPECIFICATIONS | |
| Noise | ≤ -35 dB | |
| Voltage coefficient | ≤ 0.01 ppm/V | |
| Limiting voltage | PRAHT 100 | 50 V |
| | PRAHT 135 | 100 V |
| | PRAHT 182 | 150 V |

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. | 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 | | |
| PRA182 x 3 | | 60 | 100 | 2000 |
| PRA182 x 4 | | 50 | | 4000 |
| | | | | 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

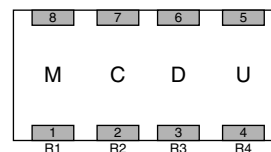
Can be filled up to maximum quantity indicated in the table here above, taking into account the minimum order quantity. When quantity ordered is between the MOQ and the maximum reel capacity, only one reel is provided.

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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