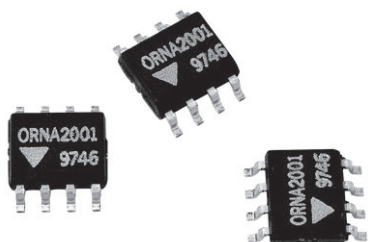


# Molded, 50 mil Pitch, Dual-In-Line Thin Film Resistor, Surface-Mount Network



Actual Size

ORN series resistor networks feature 4 isolated resistors or 7 bussed resistors with standard 50 mil pitch lead spacing. The networks feature close TCR tracking and tight ratio tolerance and are ideally suited for unity gain operational amplifier circuitry. The standard resistance offering listed are available for immediate delivery.

## FEATURES

- 0.068" (1.73 mm) maximum seated height
- Rugged molded case construction with no internal solder
- Low temperature coefficient ( $\pm 25$  ppm/ $^{\circ}$ C)
- JEDEC<sup>®</sup> MS-012 STD variation AA package
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
Available  
**HALOGEN  
FREE**

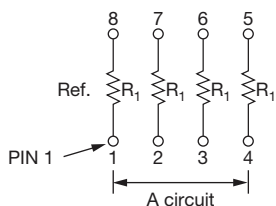
## Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

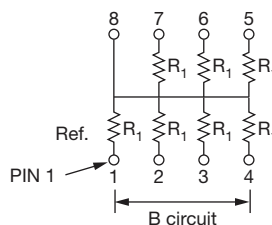
## TYPICAL PERFORMANCE

|      | ABSOLUTE | TRACKING |
|------|----------|----------|
| TCR  | 25       | 5        |
|      | ABSOLUTE | RATIO    |
| TOL. | 0.1      | 0.05     |

## SCHEMATIC



The A circuit provides a choice of 4 nominally equal resistors with each resistor isolated from all others and wired directly across.



The B circuit provides 7 nominally equal resistors, each connected between a common lead (8) and a discrete PC board pin.

## STANDARD RESISTANCE OFFERING ( $R_1 =$ )

|                 |                |
|-----------------|----------------|
| 49.9 $\Omega$   | 10 k $\Omega$  |
| 100 $\Omega$    | 20 k $\Omega$  |
| 500 $\Omega$    | 50 k $\Omega$  |
| 1 k $\Omega$    | 100 k $\Omega$ |
| 2 k $\Omega$    | 200 k $\Omega$ |
| 4.99 k $\Omega$ | 500 k $\Omega$ |
| 5 k $\Omega$    |                |

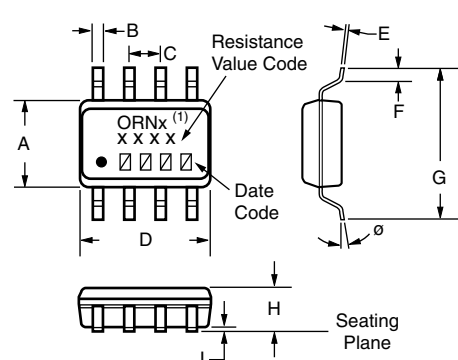
## Note

- Consult factory for additional values and schematics

| STANDARD ELECTRICAL SPECIFICATIONS |                                                                                                              |                                       |
|------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------|
| TEST                               | SPECIFICATIONS                                                                                               | CONDITIONS                            |
| Material                           | Passivated nichrome                                                                                          | -                                     |
| Pin/Lead Number                    | 8                                                                                                            | -                                     |
| Resistance Range                   | 33 $\Omega$ to 500 k $\Omega$ (isolated) per resistor<br>33 $\Omega$ to 250 k $\Omega$ (bussed) per resistor | -                                     |
| Resistance for Jumper              | $\leq 50$ m $\Omega$                                                                                         | -                                     |
| TCR: Absolute                      | $\pm 25$ ppm/ $^{\circ}$ C                                                                                   | -55 $^{\circ}$ C to +125 $^{\circ}$ C |
| TCR: Tracking                      | $\pm 5$ ppm/ $^{\circ}$ C                                                                                    | -55 $^{\circ}$ C to +125 $^{\circ}$ C |
| Tolerance: Absolute                | $\pm 0.05$ % to $\pm 1.0$ %                                                                                  | +25 $^{\circ}$ C                      |
| Tolerance: Ratio                   | $\pm 0.01$ % to $\pm 0.5$ %                                                                                  | +25 $^{\circ}$ C                      |
| Power Rating: Resistor             | 100 mW                                                                                                       | Maximum at +70 $^{\circ}$ C           |
| Power Rating: Package              | 400 mW                                                                                                       | Maximum at +70 $^{\circ}$ C           |
| Stability: Absolute                | $\Delta R \pm 0.05$ %                                                                                        | 2000 h at +70 $^{\circ}$ C            |
| Stability: Ratio                   | $\Delta R \pm 0.015$ %                                                                                       | 2000 h at +70 $^{\circ}$ C            |
| Voltage Coefficient                | 0.1 ppm/V (typical)                                                                                          | -                                     |
| Working Voltage                    | 100 V max. not to exceed $\sqrt{P \times R}$                                                                 | -                                     |
| Operating Temperature Range        | -55 $^{\circ}$ C to +125 $^{\circ}$ C                                                                        | -                                     |
| Storage Temperature Range          | -55 $^{\circ}$ C to +150 $^{\circ}$ C                                                                        | -                                     |
| Noise                              | < -30 dB                                                                                                     | -                                     |
| Thermal EMF                        | 0.08 $\mu$ V/ $^{\circ}$ C                                                                                   | -                                     |
| Shelf Life Stability: Absolute     | $\Delta R \pm 0.01$ %                                                                                        | 1 year at +25 $^{\circ}$ C            |
| Shelf Life Stability: Ratio        | $\Delta R \pm 0.002$ %                                                                                       | 1 year at +25 $^{\circ}$ C            |

**Note**

- TCR and TCR tracking are not available for parts with zero ohm jumpers

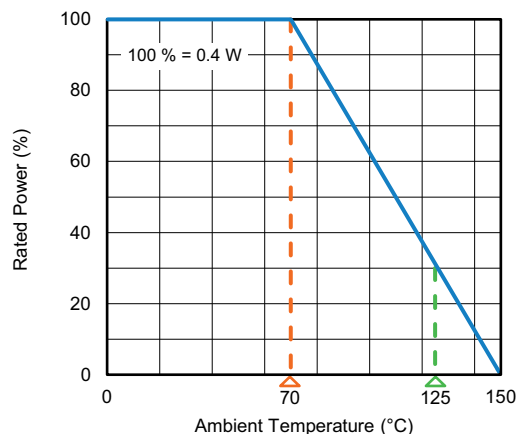
| DIMENSIONS AND IMPRINTING in inches and millimeters                                 |               |                              |                              |
|-------------------------------------------------------------------------------------|---------------|------------------------------|------------------------------|
|  | DIMENSION     | INCHES                       | MILLIMETERS                  |
|                                                                                     | A             | 0.154 $\pm$ 0.003            | 3.90 $\pm$ 0.09              |
|                                                                                     | B             | 0.016 $\pm$ 0.002            | 0.4 $\pm$ 0.06               |
|                                                                                     | C             | 0.050                        | 1.27                         |
|                                                                                     | D             | 0.193 $\pm$ 0.004            | 4.90 $\pm$ 0.1               |
|                                                                                     | E             | 0.008 $\pm$ 0.001            | 0.20 $\pm$ 0.03              |
|                                                                                     | F             | 0.032 $\pm$ 0.016            | 0.81 $\pm$ 0.4               |
|                                                                                     | G             | 0.236 $\pm$ 0.008            | 6.00 $\pm$ 0.2               |
|                                                                                     | H             | 0.068 max.                   | 1.73                         |
|                                                                                     | I             | 0.007 $\pm$ 0.003            | 0.18 $\pm$ 0.07              |
|                                                                                     | $\varnothing$ | 2 $^{\circ}$ to 6 $^{\circ}$ | 2 $^{\circ}$ to 6 $^{\circ}$ |

**Notes**

- Marking - Vishay symbol, part number from ordering information
- (1) A for isolated or B for bussed

**MECHANICAL SPECIFICATIONS**

|                                           |                     |
|-------------------------------------------|---------------------|
| <b>Resistive Element</b>                  | Passivated nichrome |
| <b>Substrate Material</b>                 | Silicon             |
| <b>Body</b>                               | Molded epoxy        |
| <b>Terminals</b>                          | Copper alloy        |
| <b>Lead (Pb)-free Option</b>              | 100 % matte tin     |
| <b>Tin Lead Option</b>                    | Sn90                |
| <b>Tin Lead and Lead (Pb)-free Finish</b> | Plated              |

**DERATING CURVE****GLOBAL PART NUMBER INFORMATION**

New Global Part Numbering: ORNA1002AUF

|   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|
|   | O | R | N | A | 1 | 0 | 0 | 2 | A | U | F |
| O | R | N | T | B | 1 | 0 | 0 | 3 | Z | T | S |
| O | R | N | T | A | 0 | 0 | 0 | 0 | N | T | 1 |

| GLOBAL MODEL<br>(3 or 4 digits)         | SCHEMATIC                                | RESISTANCE                                                                                                                                         | TOLERANCE AND<br>RATIO TOLERANCE                                                                                                                                                                                                                                                                                             | PACKAGING                                                                                                                                                                                                                |
|-----------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ORN</b><br>(Tin lead)                | <b>A</b> = 4 isolated<br>equal resistors | The first 3 digits are significant<br>figures and the last digit<br>specifies the number of zeros<br>to follow. R designates the<br>decimal point. | Abs. Tol.      Ratio                                                                                                                                                                                                                                                                                                         | <b>TAPE AND REEL</b>                                                                                                                                                                                                     |
| <b>ORNT</b><br>(Lead (Pb)-free)<br>(e3) | <b>B</b> = 7 bussed<br>equal resistors   | Example:<br>1002 = 10 kΩ<br>1003 = 100 kΩ<br>4991 = 4.99 kΩ<br>50R0 = 50 Ω<br>0000 = 4 isolated jumpers <sup>(4)</sup>                             | <b>A</b> = ± 0.1 % <sup>(3)</sup> ± 0.05 %<br><b>B</b> = ± 0.1 %        ± 0.1 %<br><b>C</b> = ± 0.25 %       ± 0.1 %<br><b>D</b> = ± 0.5 %        ± 0.1 %<br><b>F</b> = ± 1 %           ± 0.5 %<br><b>Q</b> = ± 0.05 % <sup>(1)</sup> ± 0.01 %<br><b>Z</b> = ± 0.1 % <sup>(1)</sup> ± 0.025 %<br><b>N</b> = for jumpers only | <b>T0</b> = 100 min., 100 mult.<br><b>T1</b> = 1000 min., 1000 mult. <sup>(2)</sup><br><b>T3</b> = 300 min., 300 mult.<br><b>T5</b> = 500 min., 500 mult.<br><b>TF</b> = full reel 3000<br><b>TS</b> = 100 min., 1 mult. |
|                                         |                                          |                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                              | <b>UF</b> = TUBED                                                                                                                                                                                                        |

Historical Part Number Example: ORNA1001F (for reference purposes only)

|            |           |             |                                  |
|------------|-----------|-------------|----------------------------------|
| <b>ORN</b> | <b>A</b>  | <b>1001</b> | <b>F</b>                         |
| SERIES     | SCHEMATIC | RESISTANCE  | TOLERANCE AND<br>RATIO TOLERANCE |

**Notes**

- (1) Tol. available 1K and up  
 (2) Preferred packaging code  
 (3) Ratio tolerance available 250 Ω and up  
 (4) Jumpers only available in A schematic



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