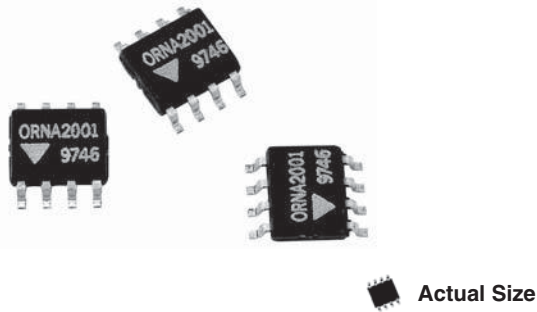
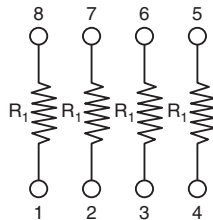


## Molded, 50 mil Pitch, Dual-In-Line Thin Film Resistor, Surface Mount Network



ORN series resistor networks feature four isolated 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.

### SCHEMATIC



### FEATURES

- 0.068" (1.73 mm) maximum seated height
- Rugged molded case construction with no internal solder
- Low temperature coefficient ( $\pm 25$  ppm/ $^{\circ}\text{C}$ )
- JEDEC MS-012 STD variation AA package
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition



**RoHS\***  
COMPLIANT  
HALOGEN  
**FREE**

### Note

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

### TYPICAL PERFORMANCE

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

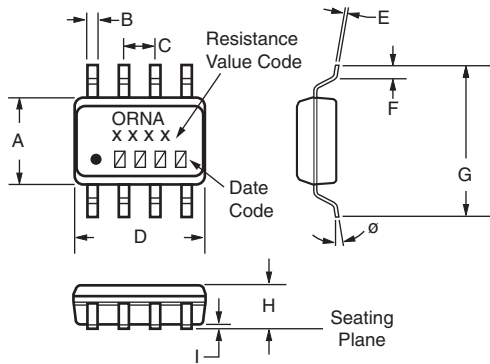
### STANDARD RESISTANCE OFFERING ( $R_1 =$ )

|                 |                |
|-----------------|----------------|
| 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 $\Omega$ per resistor          | -   |
| TCR: Absolute                      | $\pm 25$ ppm/ $^{\circ}\text{C}$                    | - 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$ |
| TCR: Tracking                      | $\pm 5$ ppm/ $^{\circ}\text{C}$                     | - 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$ |
| Tolerance: Absolute                | $\pm 0.05$ % to $\pm 1.0$ %                         | + 25 $^{\circ}\text{C}$                             |
| Tolerance: Ratio                   | $\pm 0.01$ % to $\pm 0.5$ %                         | + 25 $^{\circ}\text{C}$                             |
| Power Rating: Resistor             | 100 mW  | Maximum at + 70 $^{\circ}\text{C}$                  |
| Power Rating: Package              | 400 mW  | Maximum at + 70 $^{\circ}\text{C}$                  |
| Stability: Absolute                | $\Delta R \pm 0.05$ %                               | 2000 h at + 70 $^{\circ}\text{C}$                   |
| Stability: Ratio                   | $\Delta R \pm 0.015$ %                              | 2000 h at + 70 $^{\circ}\text{C}$                   |
| Voltage Coefficient                | 0.1 ppm/V (typical)                                 | -   |
| Working Voltage                    | 100 V max. not to exceed $\sqrt{P \times R}$        | -   |
| Operating Temperature Range        | - 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$ | -   |
| Storage Temperature Range          | - 55 $^{\circ}\text{C}$ to + 150 $^{\circ}\text{C}$ | -   |
| Noise                              | < - 30 dB   | -   |
| Thermal EMF                        | 0.08 $\mu\text{V}/^{\circ}\text{C}$                 | -   |
| Shelf Life Stability: Absolute     | $\Delta R \pm 0.01$ %                               | 1 year at + 25 $^{\circ}\text{C}$                   |
| Shelf Life Stability: Ratio        | $\Delta R \pm 0.002$ %                              | 1 year at + 25 $^{\circ}\text{C}$                   |

**DIMENSIONS AND IMPRINTING** in inches and millimeters


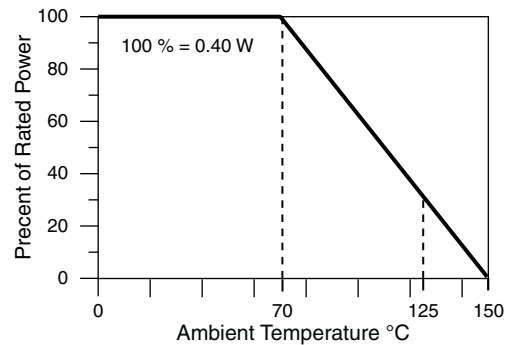
| DIMENSION | INCHES          | MILLIMETERS |
|-----------|-----------------|-------------|
| A         | 0.157           | 3.99        |
| B         | 0.0165 ± 0.0025 | 0.4 ± 0.06  |
| C         | 0.050           | 1.27        |
| D         | 0.195 max.      | 4.93        |
| E         | 0.008 ± 0.001   | 0.20 ± 0.03 |
| F         | 0.028 ± 0.001   | 0.71 ± 0.02 |
| G         | 0.239 ± 0.005   | 6.07 ± 0.13 |
| H         | 0.068 max.      | 1.73        |
| I         | 0.008 ± 0.002   | 0.22 ± 0.06 |
| Ø         | 2° to 6°        | 2° to 6°    |

**Note**

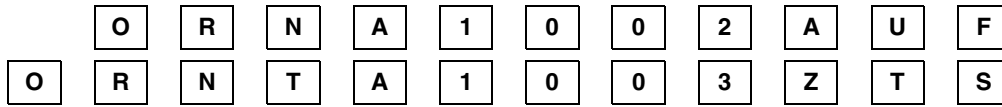
- Marking - Vishay symbol, part number from ordering information

**MECHANICAL SPECIFICATIONS**

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

**DERATING CURVE**

**GLOBAL PART NUMBER INFORMATION**

New Global Part Numbering: ORNA1002AUF



| GLOBAL MODEL<br>(3 or 4 digits)   | SCHEMATIC                             | RESISTANCE   | TOLERANCE AND RATIO TOLERANCE   | PACKAGING |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
|---|---------------------------------------|--|---|-----------|-----------|--|-------------|--------------------|--|---------------------|----------|-------------------------------|---------|------------------|---------|------------------------------------|----------|-----------------------------------|-----------|---|---------------|--------------------------------|---|--------------------------------|--------------------------------|----------------------------|------------------------------|
| <b>ORN</b><br>(Tin lead)<br><br><b>ORNT</b><br>(Lead (Pb)-free)<br>(e3)           | <b>A</b> = 4 isolated equal resistors | The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. R designates the decimal point.<br><br>Example:<br>1002 = 10 kΩ<br>1003 = 100 kΩ<br>4991 = 4.99 kΩ<br>50R0 = 50 Ω | <table border="1"> <thead> <tr> <th>Abs. Tol.</th> <th>Ratio</th> </tr> </thead> <tbody> <tr> <td><b>A</b> = ± 0.1 % <sup>(3)</sup></td> <td>± 0.05 %</td> </tr> <tr> <td><b>B</b> = ± 0.1 %</td> <td>± 0.1 %</td> </tr> <tr> <td><b>C</b> = ± 0.25 %</td> <td>± 0.1 %</td> </tr> <tr> <td><b>D</b> = ± 0.5 %</td> <td>± 0.1 %</td> </tr> <tr> <td><b>F</b> = ± 1 %</td> <td>± 0.5 %</td> </tr> <tr> <td><b>Q</b> = ± 0.05 % <sup>(1)</sup></td> <td>± 0.01 %</td> </tr> <tr> <td><b>Z</b> = ± 0.1 % <sup>(1)</sup></td> <td>± 0.025 %</td> </tr> </tbody> </table> | Abs. Tol. | Ratio     | <b>A</b> = ± 0.1 % <sup>(3)</sup>  | ± 0.05 %    | <b>B</b> = ± 0.1 % | ± 0.1 %  | <b>C</b> = ± 0.25 % | ± 0.1 %  | <b>D</b> = ± 0.5 %            | ± 0.1 % | <b>F</b> = ± 1 % | ± 0.5 % | <b>Q</b> = ± 0.05 % <sup>(1)</sup> | ± 0.01 % | <b>Z</b> = ± 0.1 % <sup>(1)</sup> | ± 0.025 % | <table border="1"> <thead> <tr> <th>TAPE AND REEL</th> </tr> </thead> <tbody> <tr> <td><b>T0</b> = 100 min., 100 mult</td> </tr> <tr> <td><b>T1</b> = 1000 min., 1000 mult <sup>(2)</sup></td> </tr> <tr> <td><b>T3</b> = 300 min., 300 mult</td> </tr> <tr> <td><b>T5</b> = 500 min., 500 mult</td> </tr> <tr> <td><b>TF</b> = Full reel 3000</td> </tr> <tr> <td><b>TS</b> = 100 min., 1 mult</td> </tr> </tbody> </table> <p><b>UF</b> = TUBED</p> | TAPE AND REEL | <b>T0</b> = 100 min., 100 mult | <b>T1</b> = 1000 min., 1000 mult <sup>(2)</sup> | <b>T3</b> = 300 min., 300 mult | <b>T5</b> = 500 min., 500 mult | <b>TF</b> = Full reel 3000 | <b>TS</b> = 100 min., 1 mult |
| Abs. Tol.   | Ratio                                 |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>A</b> = ± 0.1 % <sup>(3)</sup>   | ± 0.05 %                              |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>B</b> = ± 0.1 %  | ± 0.1 %                               |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>C</b> = ± 0.25 %   | ± 0.1 %                               |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>D</b> = ± 0.5 %  | ± 0.1 %                               |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>F</b> = ± 1 %  | ± 0.5 %                               |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>Q</b> = ± 0.05 % <sup>(1)</sup>  | ± 0.01 %                              |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>Z</b> = ± 0.1 % <sup>(1)</sup>   | ± 0.025 %                             |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| TAPE AND REEL   |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>T0</b> = 100 min., 100 mult  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>T1</b> = 1000 min., 1000 mult <sup>(2)</sup>                                   |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>T3</b> = 300 min., 300 mult  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>T5</b> = 500 min., 500 mult  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>TF</b> = Full reel 3000  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>TS</b> = 100 min., 1 mult  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>Historical Part Number example: ORNA1001F (for reference purposes only)</b>    |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <table border="1"> <tr><td><b>ORN</b></td></tr> <tr><td>SERIES</td></tr> </table> | <b>ORN</b>                            | SERIES   | <table border="1"> <tr><td><b>A</b></td></tr> <tr><td>SCHEMATIC</td></tr> </table>  | <b>A</b>  | SCHEMATIC | <table border="1"> <tr><td><b>1001</b></td></tr> <tr><td>RESISTANCE</td></tr> </table> | <b>1001</b> | RESISTANCE         | <table border="1"> <tr><td><b>F</b></td></tr> <tr><td>TOLERANCE AND RATIO TOLERANCE</td></tr> </table> |                     | <b>F</b> | TOLERANCE AND RATIO TOLERANCE |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>ORN</b>  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| SERIES  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>A</b>  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| SCHEMATIC   |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>1001</b>   |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| RESISTANCE  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| <b>F</b>  |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |
| TOLERANCE AND RATIO TOLERANCE   |                                       |  |   |           |           |  |             |                    |  |                     |          |                               |         |                  |         |                                    |          |                                   |           |   |               |                                |   |                                |                                |                            |                              |

**Notes**

- Tol. available 1K and up
- Preferred packaging code
- Ratio tolerance available 250 Ω and up



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