

# Metal Oxide Resistors, Special Purpose, High Voltage



## FEATURES

- Low TCR:  $\pm 200$  ppm/ $^{\circ}\text{C}$  standard;  $\pm 100$  ppm/ $^{\circ}\text{C}$ ,  $\pm 50$  ppm/ $^{\circ}\text{C}$  available
- Tolerance:  $\pm 1\%$ ;  $\pm 2\%$ ;  $\pm 5\%$ ;  $\pm 10\%$
- High Voltage (up to 45 kV)
- For oil bath or open air operation
- Matched sets available
- Special testing available upon request
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS\***  
COMPLIANT

## Note

\* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING                  |                               |                                | MAXIMUM WORKING VOLTAGE <sup>(2)</sup><br>V | RESISTANCE RANGE <sup>(3)</sup><br>$\Omega$ | TOLERANCE<br>$\pm \%$ | TEMPERATURE COEFFICIENT<br>$\pm$ ppm/ $^{\circ}\text{C}$ |
|--------------|------------------|-------------------------------|-------------------------------|--------------------------------|---------------------------------------------|---------------------------------------------|-----------------------|----------------------------------------------------------|
|              |                  | $P_{25^{\circ}\text{C}}$<br>W | $P_{70^{\circ}\text{C}}$<br>W | $P_{125^{\circ}\text{C}}$<br>W |                                             |                                             |                       |                                                          |
| ROX050       | ROX-1/2          | 2.0                           | 1.4                           | 1.0                            | 2K                                          | 1M to 100M                                  | 1, 2, 5, 10           | 50                                                       |
|              |                  |                               |                               |                                |                                             | 1K to 100M                                  | 1, 2, 5, 10           | 100                                                      |
|              |                  |                               |                               |                                |                                             | 1K to 1G                                    | 1, 2, 5, 10           | 200                                                      |
| ROX075       | ROX-3/4          | 3.0                           | 2.16                          | 1.5                            | 5K                                          | 1M to 100M                                  | 1, 2, 5, 10           | 50                                                       |
|              |                  |                               |                               |                                |                                             | 1K to 500M                                  | 1, 2, 5, 10           | 100                                                      |
|              |                  |                               |                               |                                |                                             | 1K to 3G                                    | 1, 2, 5, 10           | 200                                                      |
| ROX100       | ROX-1            | 4.0                           | 2.88                          | 2.0                            | 7.5K                                        | 100 to 1M                                   | 1, 2, 5, 10           | Non-inductive <sup>(4)</sup>                             |
|              |                  |                               |                               |                                |                                             | 1M to 100M                                  | 1, 2, 5, 10           | 50                                                       |
|              |                  |                               |                               |                                |                                             | 1K to 500M                                  | 1, 2, 5, 10           | 100                                                      |
| ROX150       | ROX-1-1/2        | 5.0                           | 3.6                           | 2.5                            | 11K                                         | 1K to 3G                                    | 1, 2, 5, 10           | 200                                                      |
|              |                  |                               |                               |                                |                                             | 100 to 1M                                   | 1, 2, 5, 10           | Non-inductive <sup>(4)</sup>                             |
|              |                  |                               |                               |                                |                                             | 1M to 100M                                  | 1, 2, 5, 10           | 50                                                       |
| ROX200       | ROX-2            | 6.0                           | 4.32                          | 3.0                            | 15K                                         | 1K to 500M                                  | 1, 2, 5, 10           | 50                                                       |
|              |                  |                               |                               |                                |                                             | 1K to 1G                                    | 1, 2, 5, 10           | 100                                                      |
|              |                  |                               |                               |                                |                                             | 1K to 3G                                    | 1, 2, 5, 10           | 200                                                      |
| ROX300       | ROX-3            | 10.0                          | 7.2                           | 5.0                            | 22.5K                                       | 100 to 1M                                   | 1, 2, 5, 10           | Non-inductive <sup>(4)</sup>                             |
|              |                  |                               |                               |                                |                                             | 1M to 500M                                  | 1, 2, 5, 10           | 50                                                       |
|              |                  |                               |                               |                                |                                             | 1K to 1G                                    | 1, 2, 5, 10           | 100                                                      |
| ROX400       | ROX-4            | 12.0                          | 8.64                          | 6.0                            | 30K                                         | 1K to 3G                                    | 1, 2, 5, 10           | 200                                                      |
|              |                  |                               |                               |                                |                                             | 400 to 10M                                  | 1, 2, 5, 10           | Non-inductive <sup>(4)</sup>                             |
|              |                  |                               |                               |                                |                                             | 1M to 500M                                  | 1, 2, 5, 10           | 50                                                       |
| ROX500       | ROX-5            | 16.0                          | 11.52                         | 8.0                            | 37.5K                                       | 1K to 1G                                    | 1, 2, 5, 10           | 100                                                      |
|              |                  |                               |                               |                                |                                             | 1K to 3G                                    | 1, 2, 5, 10           | 200                                                      |
|              |                  |                               |                               |                                |                                             | 500 to 10M                                  | 1, 2, 5, 10           | Non-inductive <sup>(4)</sup>                             |
| ROX600       | ROX-6            | 20.0                          | 14.4                          | 10.0                           | 45K                                         | 1M to 500M                                  | 1, 2, 5, 10           | 50                                                       |
|              |                  |                               |                               |                                |                                             | 1K to 1G                                    | 1, 2, 5, 10           | 100                                                      |
|              |                  |                               |                               |                                |                                             | 1K to 3G                                    | 1, 2, 5, 10           | 200                                                      |
|              |                  |                               |                               |                                |                                             | 500 to 10M                                  | 1, 2, 5, 10           | Non-inductive <sup>(4)</sup>                             |

## Notes

- All resistance values are calibrated at 100 V<sub>DC</sub>. Calibration at other voltages available.
- $\pm 1\%$  not available above 1 G $\Omega$
- Part marking: Print marked - Dale, model, value, tolerance, temperature coefficient, date code
- (1) Increase wattage by 40 % for 0.040" (1.02 mm) diameter leads
- (2) Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less.
- (3) For resistance values above and below those listed please contact us
- (4) Non-inductive  $\pm 200$  ppm/ $^{\circ}\text{C}$  TCR only

## TECHNICAL SPECIFICATIONS

| PARAMETER                  | UNIT               | ROX050                                                  | ROX075 | ROX100 | ROX150 | ROX200 | ROX300 | ROX400 | ROX500 | ROX600 |
|----------------------------|--------------------|---------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Insulation Resistance      | $\Omega$           | $\geq 10^{11}$                                          |        |        |        |        |        |        |        |        |
| Category Temperature Range | $^{\circ}\text{C}$ | Epoxy coated = - 55/+ 180; Silicone coated = - 55/+ 230 |        |        |        |        |        |        |        |        |

## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: ROX300100MGNF5 (preferred part numbering format)

|                                                              |                                                                                                                                                                                                                        |          |                                                                                                                        |          |                                                                                           |          |                                                                                                                                                                                                                                                                                                                                                        |          |                                                                                                                                                                                                                                                     |          |                                                                                                            |          |          |  |  |  |  |  |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------|----------|----------|--|--|--|--|--|
| <b>R</b>                                                     | <b>O</b>                                                                                                                                                                                                               | <b>X</b> | <b>3</b>                                                                                                               | <b>0</b> | <b>0</b>                                                                                  | <b>1</b> | <b>0</b>                                                                                                                                                                                                                                                                                                                                               | <b>0</b> | <b>M</b>                                                                                                                                                                                                                                            | <b>G</b> | <b>N</b>                                                                                                   | <b>F</b> | <b>5</b> |  |  |  |  |  |
| <b>GLOBAL MODEL</b><br>(See Electrical Specifications table) | <b>RESISTANCE VALUE</b><br><b>R</b> = $\Omega$<br><b>K</b> = k $\Omega$<br><b>M</b> = M $\Omega$<br><b>G</b> = G $\Omega$<br><b>910R</b> = 910 $\Omega$<br><b>10M0</b> = 10 M $\Omega$<br><b>1G00</b> = 1.0 G $\Omega$ |          | <b>TOLERANCE CODE</b><br><b>F</b> = $\pm 1\%$<br><b>G</b> = $\pm 2\%$<br><b>J</b> = $\pm 5\%$<br><b>K</b> = $\pm 10\%$ |          | <b>TEMP. COEFFICIENT</b><br><b>H</b> = 50 ppm<br><b>K</b> = 100 ppm<br><b>N</b> = 200 ppm |          | <b>PACKAGING (1)</b><br><b>EL</b> = Lead (Pb)-free, lacer (all, except 3, 4, 5, 6)<br><b>EE</b> = Lead (Pb)-free, T/R (1/2, 3/4, 1 only)<br><b>EM</b> = Lead (Pb)-free, foam (3, 4, 5, 6 only)<br><b>LB</b> = Tin/lead, lacer (all, except 3, 4, 5, 6)<br><b>RF</b> = Tin/lead, T/R (1/2, 3/4, 1 only)<br><b>F5</b> = Tin/lead, foam (3, 4, 5, 6 only) |          | <b>CONSTRUCTION</b><br>(Up to 2 digits)<br>Blank = Standard<br><b>N</b> = Non-inductive<br><b>P</b> = 0.040 $\varnothing$ leads<br><b>S</b> = Solid body, axial<br><b>T</b> = Threaded terminals<br><b>Y</b> = One end axial, one threaded terminal |          | <b>SPECIAL</b><br>Blank = Standard (Dash number)<br>(Up to 3 digits)<br>From <b>1 to 999</b> as applicable |          |          |  |  |  |  |  |

Historical Part Number example: ROX-3100MGN (will continue to be accepted)

|                  |              |                  |                |                   |            |
|------------------|--------------|------------------|----------------|-------------------|------------|
| <b>ROX-3</b>     |              | <b>100M</b>      | <b>G</b>       | <b>N</b>          | <b>F05</b> |
| HISTORICAL MODEL | CONSTRUCTION | RESISTANCE VALUE | TOLERANCE CODE | TEMP. COEFFICIENT | PACKAGING  |

### Notes

(1) Some packaging codes are model specific.

- For additional information on packaging, refer to the Through-Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544)).

## DIMENSIONS in inches (millimeters)



| GLOBAL MODEL | STYLE N, P, S                         |                | STYLE T                               | STYLE Y        |
|--------------|---------------------------------------|----------------|---------------------------------------|----------------|
|              | A                                     | B              | C                                     | C MAX.         |
| ROX050       | 0.550 $\pm$ 0.032 (13.97 $\pm$ 0.81)  | 0.700 (17.78)  | N/A                                   | N/A            |
| ROX075       | 0.800 $\pm$ 0.032 (20.32 $\pm$ 0.81)  | 0.900 (22.86)  | 1.168 $\pm$ 0.022 (29.66 $\pm$ 0.56)  | 1.050 (26.67)  |
| ROX100       | 0.920 $\pm$ 0.032 (23.37 $\pm$ 0.81)  | 1.020 (25.91)  | 1.288 $\pm$ 0.022 (32.72 $\pm$ 0.56)  | 1.170 (29.72)  |
| ROX150       | 1.550 $\pm$ 0.032 (39.37 $\pm$ 0.81)  | 1.650 (41.91)  | 1.918 $\pm$ 0.022 (48.72 $\pm$ 0.56)  | 1.800 (45.72)  |
| ROX200       | 2.050 $\pm$ 0.032 (52.07 $\pm$ 0.81)  | 2.150 (54.61)  | 2.418 $\pm$ 0.022 (61.42 $\pm$ 0.56)  | 2.300 (58.42)  |
| ROX300       | 3.050 $\pm$ 0.032 (77.47 $\pm$ 0.81)  | 3.150 (80.01)  | 3.418 $\pm$ 0.022 (86.82 $\pm$ 0.56)  | 3.300 (83.82)  |
| ROX400       | 4.050 $\pm$ 0.032 (102.87 $\pm$ 0.81) | 4.150 (105.41) | 4.418 $\pm$ 0.022 (112.22 $\pm$ 0.56) | 4.300 (109.22) |
| ROX500       | 5.050 $\pm$ 0.032 (128.27 $\pm$ 0.81) | 5.150 (130.81) | 5.418 $\pm$ 0.022 (137.62 $\pm$ 0.56) | 5.300 (134.62) |
| ROX600       | 6.050 $\pm$ 0.032 (153.67 $\pm$ 0.81) | 6.150 (156.21) | 6.418 $\pm$ 0.022 (163.02 $\pm$ 0.56) | 6.300 (160.02) |

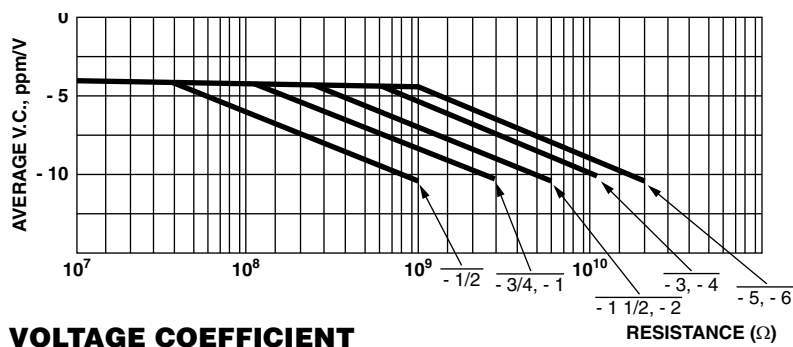


## MECHANICAL SPECIFICATIONS

|                          |                                                                                         |
|--------------------------|-----------------------------------------------------------------------------------------|
| <b>Terminal Strength</b> | 10 pound pull test                                                                      |
| <b>Solderability</b>     | Continuous satisfactory coverage when tested in accordance with MIL-STD-202, Method 208 |

## MATERIAL SPECIFICATIONS

|                    |                                                                                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Element</b>     | High temperature fired cermet film                                                                                            |
| <b>Core</b>        | High purity 96 % alumina, tubular or solid                                                                                    |
| <b>Coating</b>     | Blue flame-retardant epoxy on ROX050 thru ROX200. Black flameproof silicone on ROX300 thru ROX600                             |
| <b>Termination</b> | Standard lead material is solder-coated copper; solderable and weldable. 0.032" (0.813 mm) style P 0.040" (1.02 mm) available |





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**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331