# Metal Oxide Resistors, Special Purpose, High Voltage


**The ROX is an excellent choice for high voltage systems with the advantage of high wattage and space saving dimensions.**

## FEATURES

Pb Available

e3 RoHS* Available

- Low TCR: ± 200 ppm/°C standard; ± 100 ppm/°C, ± 50 ppm/°C available; non-inductive only available with TC of ± 200 ppm/°C
- Tolerance: ± 1 %; ± 2 %; ± 5 %; ± 10 %
- High Voltage (up to 45 kV)
- For oil bath or open air operation
- Standard ROX product is coated; optional uncoated version of the ROX product is available on request
- Matched sets available
- Special testing available upon request
- Applications: HV power supplies; laboratory equipment; power control; aeronautical
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

**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

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING | | | MAXIMUM WORKING VOLTAGE (1) | RESISTANCE RANGE (2) | TOLERANCE | TEMPERATURE COEFFICIENT (3) |
|---|---|---|---|---|---|---|---|---|
| | | $P_{25\ °C}$ W | $P_{70\ °C}$ W | $P_{125\ °C}$ W | V | Ω | ± % | ± ppm/°C |
| ROX050 | ROX-1/2 | 2 | 1.4 | 1 | 2K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 100M | 1, 2, 5, 10 | 100 |
| | | | | | | 100 to 1G | 1, 2, 5, 10 | 200 |
| ROX050..P | ROX-1/2P | 2.8 | 1.96 | 1.4 | 2K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 100M | 1, 2, 5, 10 | 100 |
| | | | | | | 100 to 1G | 1, 2, 5, 10 | 200 |
| ROX075 | ROX-3/4 | 3 | 2.16 | 1.5 | 5K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 500M | 1, 2, 5, 10 | 100 |
| | | | | | | 100 to 3G | 1, 2, 5, 10 | 200 |
| ROX075..N | ROX-3/4N | 3 | 2.16 | 1.5 | 5K | 100 to 1M | 1, 2, 5, 10 | 200 |
| ROX075..P | ROX-3/4P | 4.2 | 3.02 | 2.1 | 5K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 500M | 1, 2, 5, 10 | 100 |
| | | | | | | 100 to 3G | 1, 2, 5, 10 | 200 |
| ROX075..NP | ROX-3/4NP | 4.2 | 3.02 | 2.1 | 5K | 100 to 1M | 1, 2, 5, 10 | 200 |
| ROX100 | ROX-1 | 4 | 2.88 | 2 | 7.5K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 500M | 1, 2, 5, 10 | 100 |
| | | | | | | 150 to 3G | 1, 2, 5, 10 | 200 |
| ROX100..N | ROX-1N | 4 | 2.88 | 2 | 7.5K | 100 to 1M | 1, 2, 5, 10 | 200 |
| ROX100..P | ROX-1P | 5.6 | 4.03 | 2.8 | 7.5K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 500M | 1, 2, 5, 10 | 100 |
| | | | | | | 150 to 3G | 1, 2, 5, 10 | 200 |
| ROX100..NP | ROX-1NP | 5.6 | 4.03 | 2.8 | 7.5K | 100 to 1M | 1, 2, 5, 10 | 200 |
| ROX150 | ROX-1-1/2 | 5 | 3.6 | 2.5 | 11K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 500M | 1, 2, 5, 10 | 100 |
| | | | | | | 200 to 3G | 1, 2, 5, 10 | 200 |
| ROX150..N | ROX-1-1/2N | 5 | 3.6 | 2.5 | 11K | 100 to 1M | 1, 2, 5, 10 | 200 |

## STANDARD ELECTRICAL SPECIFICATIONS

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|---|---|---|---|---|---|---|---|---|
| | | $P_{25\ °C}$ W | $P_{70\ °C}$ W | $P_{125\ °C}$ W | V | Ω | ± % | ± ppm/°C |
| ROX150..P | ROX-1-1/2P | 7 | 5.04 | 3.5 | 11K | 1M to 100M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 500M | 1, 2, 5, 10 | 100 |
| | | | | | | 200 to 3G | 1, 2, 5, 10 | 200 |
| ROX150..NP | ROX-1-1/2NP | 7 | 5.04 | 3.5 | 11K | 100 to 1M | 1, 2, 5, 10 | 200 |
| ROX200 | ROX-2 | 6 | 4.32 | 3 | 15K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 205 to 3G | 1, 2, 5, 10 | 200 |
| ROX200..N | ROX-2N | 6 | 4.32 | 3 | 15K | 100 to 1M | 1, 2, 5, 10 | 200 |
| ROX200..P | ROX-2P | 8.4 | 6.05 | 4.2 | 15K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 205 to 3G | 1, 2, 5, 10 | 200 |
| ROX200..NP | ROX-2NP | 8.4 | 6.05 | 4.2 | 15K | 100 to 1M | 1, 2, 5, 10 | 200 |
| ROX300 | ROX-3 | 10 | 7.2 | 5 | 22.5K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 330 to 3G | 1, 2, 5, 10 | 200 |
| ROX300..N | ROX-3N | 10 | 7.2 | 5 | 22.5K | 400 to 10M | 1, 2, 5, 10 | 200 |
| ROX300..P | ROX-3P | 14 | 10.1 | 7 | 22.5K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 330 to 3G | 1, 2, 5, 10 | 200 |
| ROX300..NP | ROX-3NP | 14 | 10.1 | 7 | 22.5K | 400 to 10M | 1, 2, 5, 10 | 200 |
| ROX400 | ROX-4 | 12 | 8.64 | 6 | 30K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 600 to 3G | 1, 2, 5, 10 | 200 |
| ROX400..N | ROX-4N | 12 | 8.64 | 6 | 30K | 500 to 10M | 1, 2, 5, 10 | 200 |
| ROX400..P | ROX-4P | 16.8 | 12.1 | 8.4 | 30K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 600 to 3G | 1, 2, 5, 10 | 200 |
| ROX400..NP | ROX-4NP | 16.8 | 12.1 | 8.4 | 30K | 500 to 10M | 1, 2, 5, 10 | 200 |
| ROX500 | ROX-5 | 16 | 11.5 | 8 | 37.5K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 750 to 3G | 1, 2, 5, 10 | 200 |
| ROX500..N | ROX-5N | 16 | 11.5 | 8 | 37.5K | 500 to 10M | 1, 2, 5, 10 | 200 |
| ROX500..P | ROX-5P | 22.4 | 16.1 | 11.2 | 37.5K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 750 to 3G | 1, 2, 5, 10 | 200 |
| ROX500..NP | ROX-5NP | 22.4 | 16.1 | 11.2 | 37.5K | 500 to 10M | 1, 2, 5, 10 | 200 |
| ROX600 | ROX-6 | 20 | 14.4 | 10 | 45K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 850 to 3G | 1, 2, 5, 10 | 200 |
| ROX600..N | ROX-6N | 20 | 14.4 | 10 | 45K | 500 to 10M | 1, 2, 5, 10 | 200 |
| ROX600..P | ROX-6P | 28 | 20.2 | 14 | 45K | 1M to 500M | 1, 2, 5, 10 | 50 |
| | | | | | | 1k to 1G | 1, 2, 5, 10 | 100 |
| | | | | | | 850 to 3G | 1, 2, 5, 10 | 200 |
| ROX600..NP | ROX-6NP | 28 | 20.2 | 14 | 45K | 500 to 10M | 1, 2, 5, 10 | 200 |

**Notes**

- **Resistance values of 1 kΩ and below are calibrated at 1 $V_{DC}$, values above 1 kΩ up to 100 kΩ are calibrated at 10 $V_{DC}$, and values above 100 kΩ are calibrated at 100 $V_{DC}$. Calibration at other voltages available**
- ± 1 % not available above 1 GΩ
- Part marking: Print marked - Dale, model, value, tolerance, temperature coefficient, date code

(1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less
(2) For resistance values above and below those listed please contact us
(3) Typical TCR results

## GLOBAL PART NUMBER INFORMATION

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

| R | O | X | 3 | 0 | 0 | 1 | 0 | 0 | M | G | N | F | 5 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| GLOBAL MODEL | RESISTANCE VALUE | TOLERANCE CODE | TEMP. COEFFICIENT | PACKAGING (1) | CONSTRUCTION | SPECIAL |
|---|---|---|---|---|---|---|
| (see Electrical Specifications table) | **R** = Ω<br>**K** = kΩ<br>**M** = MΩ<br>**G** = GΩ<br>**910R** = 910 Ω<br>**10M0** = 10 MΩ<br>**1G00** = 1.0 GΩ | **F** = ± 1 %<br>**G** = ± 2 %<br>**J** = ± 5 %<br>**K** = ± 10 % | **H** = 50 ppm<br>**K** = 100 ppm<br>**N** = 200 ppm | **EL** = lead (Pb)-free, lacer (all, except 3, 4, 5, 6)<br>**EE** = lead (Pb)-free, T / R (1/2, 3/4, 1 only)<br>**EM** = lead (Pb)-free, foam (3, 4, 5, 6 only)<br>**LB** = tin / lead, lacer (all, except 3, 4, 5, 6)<br>**RF** = tin / lead, T / R (1/2, 3/4, 1 only)<br>**F5** = tin / lead, foam (3, 4, 5, 6 only) | (up to 2 digits)<br>blank = standard<br>**N** = non-inductive<br>**P** = 0.040 Ø leads<br>**S** = solid body, axial<br>**T** = threaded terminals<br>**-18** = Uncoated<br>**Y** = one end axial, one threaded terminal | blank = standard (dash number) (up to 3 digits) from **1 to 999** as applicable |

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

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

**Notes**

(1) Some packaging codes are model specific.

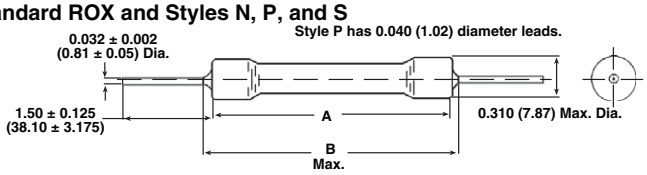
- For additional information on packaging, refer to the Through-Hole Resistor Packaging document (www.vishay.com/doc?31544).

## TECHNICAL SPECIFICATIONS

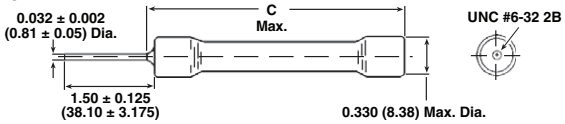
| PARAMETER | UNIT | ROX050 | ROX075 | ROX100 | ROX150 | ROX200 | ROX300 | ROX400 | ROX500 | ROX600 |
|---|---|---|---|---|---|---|---|---|---|---|
| Insulation Resistance | Ω | ≥ $10^{11}$ | | | | | | | | |
| Category Temperature Range | °C | Epoxy coated = -55 / +180; Silicone coated = -55 / +230 |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

## DIMENSIONS in inches (millimeters)

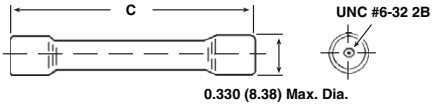
**Standard ROX and Styles N, P, and S**




**Style Y**




**Style T**

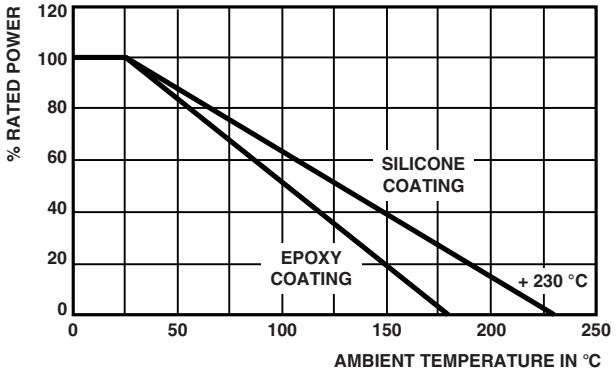



| GLOBAL MODEL | STANDARD ROX AND STYLES N, P, S | | STYLE T | STYLE Y |
|---|---|---|---|---|
| | A | B | C | C MAX. |
| ROX050 | 0.550 ± 0.032 (13.97 ± 0.81) | 0.700 (17.78) | N/A | N/A |
| ROX075 | 0.800 ± 0.032 (20.32 ± 0.81) | 0.900 (22.86) | 1.168 ± 0.022 (29.66 ± 0.56) | 1.050 (26.67) |
| ROX100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

**Note**

- All dimensions given are for the standard coated version of the ROX parts.

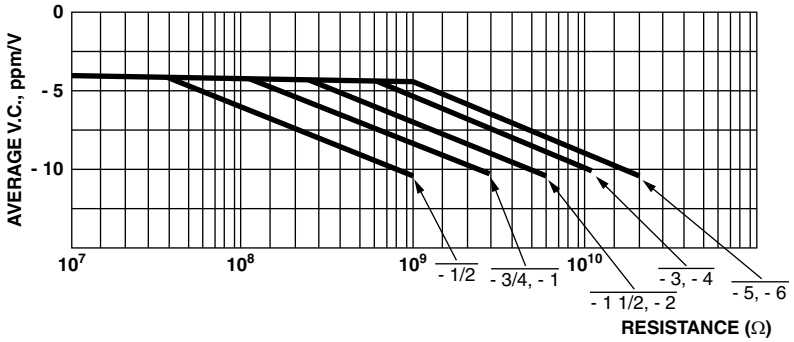
## DERATING



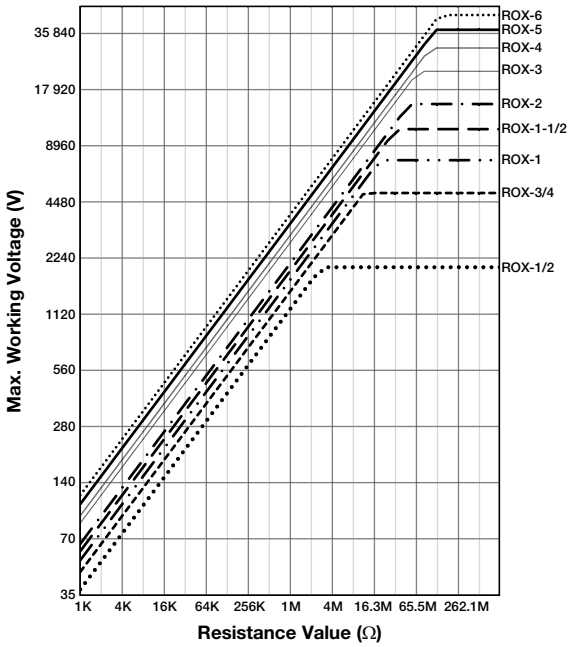

| MECHANICAL SPECIFICATIONS | |
|---|---|
| **Terminal Strength** | 10 pound pull test |
| **Solderability** | Continuous satisfactory coverage when tested in accordance with MIL-STD-202, Method 208 |

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

## VOLTAGE COEFFICIENT




## ROX MAXIMUM WORKING VOLTAGE



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