

Wirewound Resistors, Precision Power, Surface Mount



FEATURES

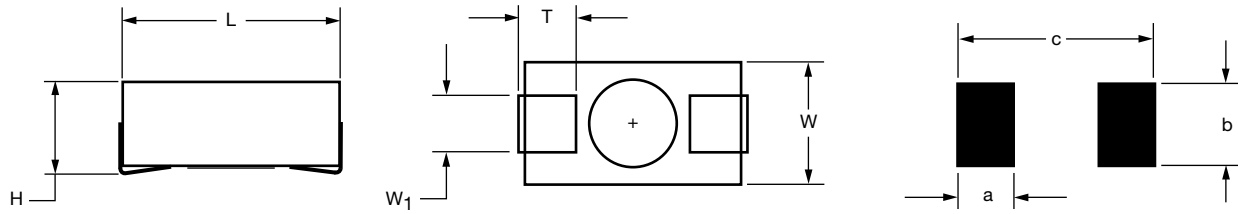
- All welded construction
- Molded encapsulation
- Wraparound terminations
- Excellent stability at different environmental conditions
- High power ratings (up to 4 W)
- Available in non-inductive styles ("NI" SPECIAL) with Ayrton-Perry winding (Resistance max. value is one half standard value)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



| STANDARD ELECTRICAL SPECIFICATIONS | | | | | |
|------------------------------------|------------------|---|------------------------------|-----------------------|-----------------------------------|
| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING $P_{70^{\circ}\text{C}}$ W | RESISTANCE RANGE Ω | TOLERANCE $\pm \%$ | WEIGHT (TYPICAL) g/1000 PIECES |
| SM-1 | SM1 | 0.5 | 0.1 to 400 | 0.1, 0.25, 0.5, 1, 5 | 45 |
| SM-2 | SM2 | 1 | 0.1 to 3K | 0.1, 0.25, 0.5, 1, 5 | 230 |
| SM-3 | SM3 | 3 | 0.1 to 25K | 0.1, 0.25, 0.5, 1, 5 | 1360 |
| SM-4 | SM4 | 2 | 0.1 to 15K | 0.1, 0.25, 0.5, 1, 5 | 680 |
| SM-5 | SM5 | 4 | 0.1 to 50K | 0.1, 0.25, 0.5, 1, 5 | 2040 |

| TECHNICAL SPECIFICATIONS | | |
|---------------------------------|-------------------------|---|
| PARAMETER | UNIT | SM RESISTOR CHARACTERISTICS |
| Temperature Coefficient | ppm/ $^{\circ}\text{C}$ | $\pm 20 > 10 \Omega$, $\pm 50 1 \Omega$ to 10Ω , contact factory for 0.99Ω and below |
| Dielectric Withstanding Voltage | V_{AC} | 1000 |
| Operating Temperature Range | $^{\circ}\text{C}$ | -55 to +275 |
| Maximum Working Voltage | V | $(P \times R)^{1/2}$ |

| GLOBAL PART NUMBER INFORMATION | | | | |
|---|---|---|---|---|
| Global Part Numbering example: SM-2R4000FE6 (visit www.vishay.net SAP parts manual for all options) | | | | |
| S | M | - | 2 | R |
| 4 | 0 | 0 | 0 | F |
| E | 6 | | | |
| GLOBAL MODEL (4 digits) | VALUE (5 digits) | TOLERANCE (1 digit) | PACKAGING CODE (2 digits) | SPECIAL (up to 3 digits) |
| SM-1 SM-2 SM-3 SM-4 SM-5 | R = Decimal K = Thousand 1R500 = 1.5 Ω 4K000 = 4 k Ω | B = $\pm 0.1 \%$ C = $\pm 0.25 \%$ D = $\pm 0.5 \%$ F = $\pm 1 \%$ J = $\pm 5 \%$ | E6 = lead (Pb)-free, 7" tape and reel pack E7 = lead (Pb)-free, 13" tape and reel pack | (Dash Number) From 1 to 999 as applicable NI = Non-inductive |
| Historical Part Number example: SM2-0.4-1% | | | | |
| SM2 | 0.4 Ω | 1 % | | |
| HISTORICAL MODEL | RESISTANCE VALUE | TOLERANCE | | |

DIMENSIONS in inches [millimeters]


| GLOBAL MODEL | DIMENSIONS in inches [millimeters] | | | | | SOLDER PAD DIMENSIONS | | |
|--------------|------------------------------------|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | $L \pm 0.015$ [0.381] | $W \pm 0.015$ [0.381] | $H \pm 0.015$ [0.381] | $W1 \pm 0.015$ [0.381] | $T \pm 0.015$ [0.381] | $a \pm 0.015$ [0.381] | $b \pm 0.015$ [0.381] | $c \pm 0.015$ [0.381] |
| SM-1 | 0.190 [4.83] | 0.130 [3.30] | 0.110 [2.79] | 0.060 [1.52] | 0.040 [1.02] | 0.062 [1.57] | 0.100 [2.54] | 0.250 [6.35] |
| SM-2 | 0.260 [6.60] | 0.155 [3.94] | 0.125 [3.18] | 0.070 [1.78] | 0.070 [1.78] | 0.096 [2.44] | 0.112 [2.84] | 0.337 [8.56] |
| SM-3 | 0.625 [15.88] | 0.270 [6.86] | 0.250 [6.35] | 0.120 [3.05] | 0.135 [3.43] | 0.200 [5.08] | 0.150 [3.81] | 0.700 [17.78] |
| SM-4 | 0.450 [11.43] | 0.250 [6.35] | 0.180 [4.57] | 0.120 [3.05] | 0.100 [2.54] | 0.155 [3.94] | 0.230 [5.84] | 0.540 [13.72] |
| SM-5 | 0.820 [20.83] | 0.295 [7.49] | 0.305 [7.75] | 0.150 [3.81] | 0.190 [4.83] | 0.220 [5.59] | 0.250 [6.35] | 0.900 [22.86] |

MATERIAL SPECIFICATIONS
Element: copper-nickel alloy

Encapsulation: molded epoxy

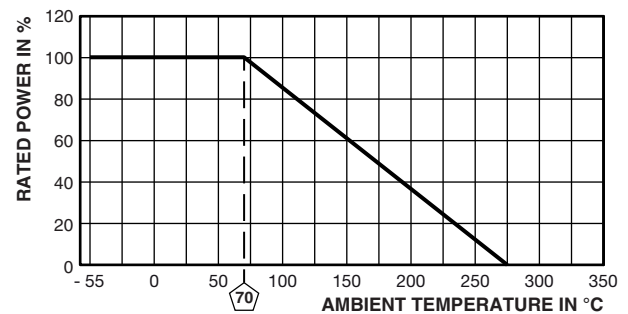
Core: ceramic

Terminal: matte tin

Part Marking: HEI, model, value, tolerance, date code

Note

- Due to resistor size limitations some resistors will have minimal information marked on parts

DERATING


| PERFORMANCE | | |
|---------------------------|--|------------------|
| TEST | CONDITIONS OF TEST | TEST LIMITS |
| Thermal Shock | -55 °C to +150 °C, 1000 cycles, 15 min at each extreme | ± 0.5 % + 0.05 Ω |
| Short Time Overload | 5x rated power for 5 s | ± 0.5 % + 0.05 Ω |
| Low Temperature Storage | -55 °C for 24 h | ± 0.5 % + 0.05 Ω |
| Load Life | 1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF" | ± 1.0 % + 0.05 Ω |
| Resistance to Solder Heat | MIL-STD 202; 260 °C, 10 s | ± 0.5 % + 0.05 Ω |
| Moisture Resistance | Per MIL-STD 202 | ± 1.0 % + 0.05 Ω |

| PACKAGING | | | | |
|-----------|------------------------|------------|-------------|--------------|
| MODEL | REEL | | | |
| | TAPE WIDTH | DIAMETER | PIECES/REEL | PACKAGE CODE |
| SM-1 | 12 mm/embossed plastic | 178 mm/7" | 650 | E6 |
| | | 330 mm/13" | 3000 | E7 |
| SM-2 | 16 mm/embossed plastic | 178 mm/7" | 600 | E6 |
| | | 330 mm/13" | 2000 | E7 |
| SM-3 | 24 mm/embossed plastic | 178 mm/7" | 125 | E6 |
| | | 330 mm/13" | 500 | E7 |
| SM-4 | 24 mm/embossed plastic | 178 mm/7" | 250 | E6 |
| | | 330 mm/13" | 1000 | E7 |
| SM-5 | 32 mm/embossed plastic | 178 mm/7" | 180 | E6 |
| | | 330 mm/13" | 500 | E7 |



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Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.