

# Wirewound Resistors, Commercial Power, Surface Mount



## FEATURES

- Direct mounting on printed circuit board
- High wattage capabilities, low board temperatures
- Meets or exceeds EIA-RS-344 requirements
- Special inorganic potting compound and ceramic case provide high thermal conductivity in a fireproof package
- Superior surge capability
- Compliant to RoHS Directive 2002/95/EC



## Notes

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

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

| STANDARD ELECTRICAL SPECIFICATIONS |                  |   |                              |                       |                       |
|------------------------------------|------------------|---|------------------------------|-----------------------|-----------------------|
| GLOBAL MODEL                       | HISTORICAL MODEL | POWER RATING<br>$P_{40^\circ\text{C}}$<br>W | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$ | WEIGHT (typical)<br>g |
| CPSM03                             | CPSM-3           | 3   | 0.1 to 1K                    | 5, 10                 | 5.5                   |
| CPSM05                             | CPSM-5           | 5   | 0.1 to 1K                    | 5, 10                 | 6.5                   |

| TECHNICAL SPECIFICATIONS        |                       |  |
|---------------------------------|-----------------------|--|
| PARAMETER                       | UNIT                  | CPSM RESISTOR CHARACTERISTICS                                      |
| Temperature Coefficient         | ppm/ $^\circ\text{C}$ | $\pm 300$ for 1.0 $\Omega$ and above; $\pm 600$ below 1.0 $\Omega$ |
| Short Time Overload             | -                     | 5 x rated power for 5 s  |
| Operating Temperature           | $^\circ\text{C}$      | - 65 to + 275  |
| Dielectric Withstanding Voltage | $V_{AC}$              | 1000   |
| Maximum Working Voltage         | V                     | $(P \times R)^{1/2}$   |

| GLOBAL PART NUMBER INFORMATION                                |   |   |   |  |   |
|---|---|---|---|--|---|
| Global Part Numbering example: CPSM0315R00JB31                |   |   |   |  |   |
| C   | P | S   | M | 0  | 3 |
| 1   | 5 | R   | 0 | 0  | J |
| B   | 3 | 1   |   |  |   |
| GLOBAL MODEL<br>CPSM03<br>CPSM05                              |   | VALUE<br>R = Decimal<br>K = Thousand<br>R1500 = 0.15 $\Omega$<br>100R0 = 100 $\Omega$<br>1K000 = 1 k $\Omega$ |   | TOLERANCE<br>H = $\pm 3.0 \%$<br>J = $\pm 5.0 \%$<br>K = $\pm 10 \%$                 |   |
|   |   |   |   | PACKAGING<br>E31 = Lead(Pb)-free,<br>4 layer bulk<br>B31 = Tin/lead,<br>4 layer bulk |   |
|   |   |   |   | SPECIAL<br>(Dash number)<br>(Up to 3 digits)<br>From 1 to 999<br>as applicable       |   |
| Historical Part Numbering example: CPSM-3 15 $\Omega$ 5 % B31 |   |   |   |  |   |
| CPSM-3  |   | 15 $\Omega$   |   | 5 %  |   |
| HISTORICAL MODEL  |   | RESISTANCE VALUE  |   | TOLERANCE CODE   |   |
|   |   |   |   | B31  |   |
|   |   |   |   | PACKAGING  |   |

**DIMENSIONS**


| MODEL  | DIMENSIONS in inches [millimeters] |                         |                                     |  |                         |
|--------|------------------------------------|-------------------------|-------------------------------------|--|-------------------------|
|        | L<br>± 0.032<br>[0.813]            | W<br>± 0.031<br>[0.787] | L <sub>1</sub><br>± 0.062<br>[1.57] | W <sub>1</sub><br>+ 0.032<br>[0.813]<br>- 0.012<br>[0.305] | H<br>± 0.031<br>[0.787] |
| CPSM03 | 0.906<br>[23.01]                   | 0.374<br>[9.50]         | 0.480<br>[12.19]                    | 0.287<br>[7.29]  | 0.374<br>[9.50]         |
| CPSM05 | 1.060<br>[26.92]                   | 0.374<br>[9.50]         | 0.590<br>[14.99]                    | 0.287<br>[7.29]  | 0.374<br>[9.50]         |

| MODEL  | SOLDER PAD DIMENSIONS in inches [millimeters] |                 |                  |
|--------|---|-----------------|------------------|
|        | a   | b               | l                |
| CPSM03 | 0.420<br>[10.67]                              | 0.340<br>[8.64] | 0.380<br>[9.65]  |
| CPSM05 | 0.440<br>[11.18]                              | 0.340<br>[8.64] | 0.490<br>[12.45] |

**TEMPERATURE RISE**

**DERATING**

**MATERIAL SPECIFICATIONS**

|              |   |
|--------------|---|
| Element      | Copper-nickel alloy or nickel-chrome alloy, depending on resistance value |
| Core         | Woven fiberglass  |
| Body         | Steatite ceramic case with inorganic potting compound                     |
| Terminals    | Tin/lead plated steel (lead (Pb)-free version will be 100 % tin)          |
| Part Marking | DALE, model, wattage, value, tolerance, date code                         |

**PERFORMANCE**

| TEST                            | CONDITIONS OF TEST                                      | TEST LIMITS (EIA RS-344) |
|---------------------------------|---|--------------------------|
| Thermal shock                   | - 55 °C to + 165 °C, 5 cycles, 30 min dwell time        | ± (5.0 % + 0.05 Ω) ΔR    |
| Short time overload             | 5 x rated power for 5 s                                 | ± (4.0 % + 0.05 Ω) ΔR    |
| Dielectric withstanding voltage | 1000 V <sub>RMS</sub> for one min                       | ± (2.0 % + 0.05 Ω) ΔR    |
| Low temperature operation       | - 65 °C, full rated working voltage for 45 min          | ± (3.0 % + 0.05 Ω) ΔR    |
| Humidity                        | 75 °C, 90 % to 100 % RH, 240 h                          | ± (5.0 % + 0.05 Ω) ΔR    |
| Load life                       | 1000 h at rated power, + 40 °C, 1.5 h "ON", 0.5 h "OFF" | ± (10.0 % + 0.05 Ω) ΔR   |
| Resistance to solder heat       | + 260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence  | ± (4.0 % + 0.05 Ω) ΔR    |



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