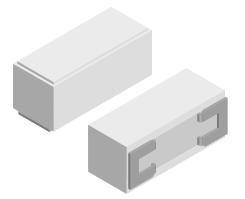


CPSM

Vishay Dale

## Wirewound/Metal Oxide 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



COMPLIANT HALOGEN FREE GREEN

- Superior surge capability
- Material categorization: for definitions of
  <u>(5-2008)</u>
  compliance please see <u>www.vishay.com/doc?99912</u>

| STANDARD ELECTRICAL SPECIFICATIONS |                     |   |   |   |                  |                          |
|------------------------------------|---------------------|---|---|---|------------------|--------------------------|
| GLOBAL<br>MODEL                    | HISTORICAL<br>MODEL | POWER RATING<br>P <sub>40 °C</sub><br>W | $\begin{array}{c} \textbf{RESISTANCE}\\ \textbf{RANGE}\\ \Omega\\ \textbf{WIREWOUND} \end{array}$ | RESISTANCE<br>RANGE<br>Ω<br>METAL OXIDE | TOLERANCE<br>± % | WEIGHT<br>(typical)<br>g |
| CPSM03                             | CPSM-3              | 3                                       | 0.1 to 100  | -                                       | 5, 10            | 5.5                      |
| CPSM05                             | CPSM-5              | 5                                       | 0.1 to 100  | 110 to 33K                              | 5, 10            | 6.5                      |

Note

• E24 decade values are available, although others may be available upon request

| TECHNICAL SPECIFICATIONS    |        |  |  |  |
|-----------------------------|--------|--|--|--|
| PARAMETER                   | UNIT   | CPSM RESISTOR CHARACTERISTICS                          |  |  |
| Temperature Coefficient     | ppm/°C | ± 400  |  |  |
| Short Time Overload         | -      | 5 x rated power for 5 s                                |  |  |
| Maximum Working Voltage     | V      | $(P \times R)^{1/2}$                                   |  |  |
| Terminal Strength           | lb     | 10 minimum   |  |  |
| Operating Temperature Range | °C     | -65 to +275 for wirewound, -65 to +225 for metal oxide |  |  |

| GLOBAL PART NUMBER INFORMATION                 |  |              |  |           |           |  |
|--|--|--------------|--|-----------|-----------|--|
| Global Part Numbering Example: CPSM0315R00JE31 |  |              |  |           |           |  |
| C P S  | S M 0 3 1 5 R 0 0 J E 3 1  |              |  |           |           |  |
|  |  |              |  |           |           |  |
| GLOBAL MODEL                                   | VALUE  | TOLER        | ANCE   | PACKAGING |           | SPECIAL  |
| CPSM03<br>CPSM05                               | R = decimal<br>K = thousand<br>R1500 = 0.15 Ω<br>100R0 = 100 Ω<br>1K000 = 1 kΩ | <b>K</b> = ± | <b>J</b> = ± 5.0 %<br><b>K</b> = ± 10 %<br><b>E31</b> = lead (Pb)-fr<br>4 layer bulk |           | ee,       | (dash number)<br>(up to 3 digits)<br>from <b>1 to 999</b><br>as applicable |
| Historical Part Numbering                      | Historical Part Numbering Example: CPSM-3 15 Ω 5 % E31                         |              |  |           |           |  |
| <b>CPSM-3</b> 15 Ω                             |  | 5 %          |  | E31       |           |  |
|  |  |              |  |           |           |  |
| HISTORICAL MODEL RESISTANCE                    |  | VALUE        | UE TOLERANCE CODE  |           | PACKAGING |  |
|  |  |              |  |           |           |  |

Revision: 05-Feb-2020

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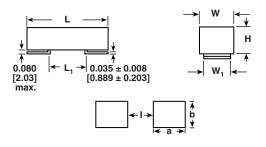
## End of Life July 2020



Vishay Dale

**CPSM** 

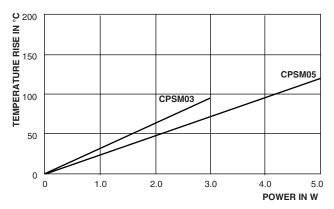
DIMENSIONS



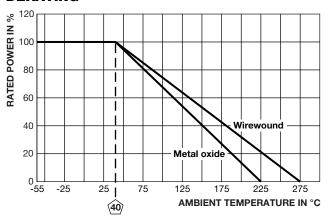
|        | DIMENSIONS in inches [millimeters] |         |                |                |         |  |  |
|--------|------------------------------------|---------|----------------|----------------|---------|--|--|
| MODEL  | L                                  | W       | L <sub>1</sub> | W <sub>1</sub> | H       |  |  |
|        | ± 0.059                            | ± 0.039 | ± 0.059        | ± 0.016        | ± 0.039 |  |  |
|        | [1.50]                             | [0.99]  | [1.50]         | [0.406]        | [0.99]  |  |  |
| CPSM03 | 0.944                              | 0.354   | 0.492          | 0.287          | 0.354   |  |  |
|        | [23.98]                            | [8.99]  | [12.50]        | [7.29]         | [8.99]  |  |  |
| CPSM05 | 1.10                               | 0.394   | 0.590          | 0.287          | 0.394   |  |  |
|        | [27.94]                            | [10.01] | [14.99]        | [7.29]         | [10.01] |  |  |

| MODEL  | SOLDER PAD DIMENSIONS in inches [millimeters] |        |         |  |  |
|--------|---|--------|---------|--|--|
| WODEL  | а   | b      | I       |  |  |
| CPSM03 | 0.420   | 0.340  | 0.380   |  |  |
|        | [10.67]                                       | [8.64] | [9.65]  |  |  |
| CPSM05 | 0.440   | 0.340  | 0.490   |  |  |
|        | [11.18]                                       | [8.64] | [12.45] |  |  |

#### **TEMPERATURE RISE**



#### DERATING



| MATERIAL SPECIFICATIONS |   |  |  |  |
|-------------------------|---|--|--|--|
| Element                 | Wirewound = copper-nickel alloy or nickel-chrome alloy, depending on resistance value;<br>metal oxide = high temperature fired metal oxide film |  |  |  |
| Core                    | Ceramic   |  |  |  |
| Body                    | Steatite ceramic case with cement potting compound  |  |  |  |
| Terminals               | Tin plated steel  |  |  |  |
| Part Marking            | Dale, model, wattage, value, tolerance, date code   |  |  |  |

| PERFORMANCE                     |  |                                   |  |  |  |
|---------------------------------|--|-----------------------------------|--|--|--|
| TEST                            | CONDITIONS OF TEST   | TEST LIMITS                       |  |  |  |
| Thermal Shock                   | -55 °C to +275 °C (+225 °C for metal oxide), 5 cycles, 30 min dwell time | $\pm$ (5.0 % + 0.05 Ω) ΔR         |  |  |  |
| Short Time Overload             | 5 x rated power for 5 s  | $\pm$ (4.0 % + 0.05 Ω) Δ <i>R</i> |  |  |  |
| Dielectric Withstanding Voltage | 1000 V <sub>RMS</sub> for 1 min  | ± (2.0 % + 0.05 Ω) Δ <i>R</i>     |  |  |  |
| Low Temperature Operation       | -65 °C, full rated working voltage for 45 min                            | $\pm$ (3.0 % + 0.05 Ω) Δ <i>R</i> |  |  |  |
| Humidity                        | 75 °C, 90 % to 100 % RH, 240 h   | $\pm$ (5.0 % + 0.05 Ω) Δ <i>R</i> |  |  |  |
| Load Life                       | 1000 h at rated power, +40 °C, 1.5 h "ON", 0.5 h "OFF"                   | ± (10.0 % + 0.05 Ω) Δ <i>R</i>    |  |  |  |
| Terminal Strength               | 5 pounds for 30 s; body twisted about axis, 3 x 360° rotations           | ± (2.0 % + 0.05 Ω) ΔR             |  |  |  |
| Resistance to Solder Heat       | Terminal immersed 3.5 s in molten solder at 1/8" to 3/16" from body      | ± (4.0 % + 0.05 Ω) Δ <i>R</i>     |  |  |  |

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