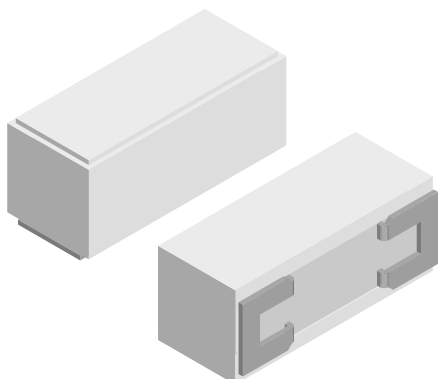


# Wirewound Resistors, Commercial Power, Surface Mount



## 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



**RoHS\***  
COMPLIANT  
**GREEN**  
(5-2008)\*\*  
Available

## 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<br>(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 |
|--------------|
| CPSM03       |
| CPSM05       |

| VALUE                 |
|-----------------------|
| R = Decimal           |
| K = Thousand          |
| R1500 = 0.15 $\Omega$ |
| 100R0 = 100 $\Omega$  |
| 1K000 = 1 k $\Omega$  |

| TOLERANCE        |
|------------------|
| H = $\pm 3.0 \%$ |
| J = $\pm 5.0 \%$ |
| K = $\pm 10 \%$  |

| PACKAGING                            |
|--------------------------------------|
| E31 = Lead(Pb)-free,<br>4 layer bulk |
| B31 = Tin/lead,<br>4 layer bulk      |

| SPECIAL                                                             |
|---------------------------------------------------------------------|
| (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

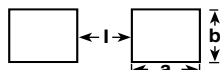
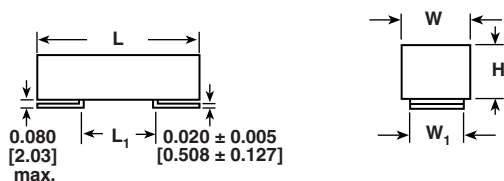
| CPSM-3           |
|------------------|
| HISTORICAL MODEL |

| 15 $\Omega$      |
|------------------|
| RESISTANCE VALUE |

| 5 %            |
|----------------|
| TOLERANCE CODE |

| B31       |
|-----------|
| PACKAGING |

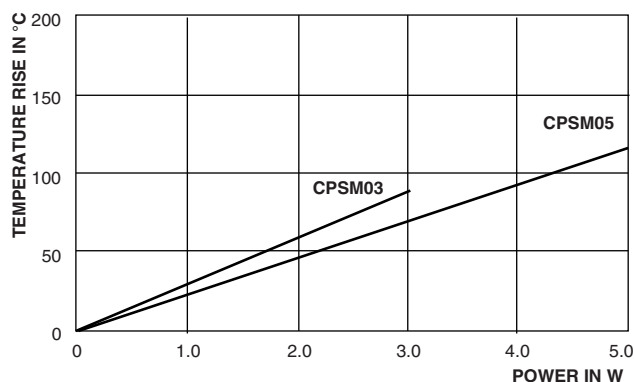
## DIMENSIONS



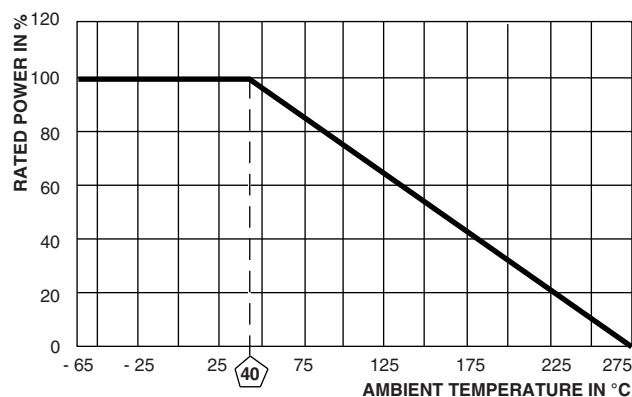
| MODEL  | DIMENSIONS in inches [millimeters] |                         |                                     |                                                            |                         |
|--------|------------------------------------|-------------------------|-------------------------------------|------------------------------------------------------------|-------------------------|
|        | 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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