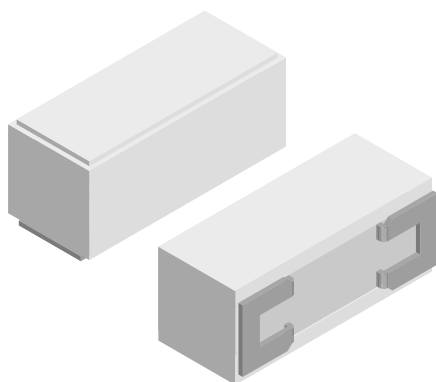




## Wirewound/Metal Oxide Resistors, Commercial Power, Surface Mount



### 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
- Superior surge capability
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING<br>$P_{40^\circ\text{C}}$<br>W | RESISTANCE RANGE<br>$\Omega$<br>WIREWOUND | RESISTANCE RANGE<br>$\Omega$<br>METAL OXIDE | TOLERANCE<br>$\pm \%$ | 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/ $^\circ\text{C}$ | $\pm 400$                                              |
| 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 | $^\circ\text{C}$      | -65 to +275 for wirewound, -65 to +225 for metal oxide |

### GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: CPSM0315R00JE31

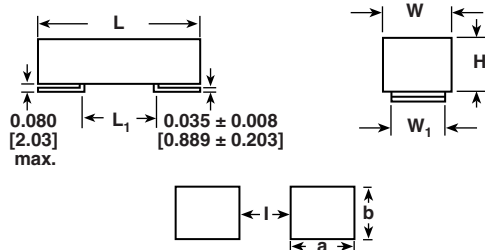
|                  |   |   |   |                                                                                                      |   |   |   |                                     |   |                                       |   |                                                                     |   |   |  |  |  |
|------------------|---|---|---|------------------------------------------------------------------------------------------------------|---|---|---|-------------------------------------|---|---------------------------------------|---|---------------------------------------------------------------------|---|---|--|--|--|
| C                | P | S | M | 0                                                                                                    | 3 | 1 | 5 | R                                   | 0 | 0                                     | J | E                                                                   | 3 | 1 |  |  |  |
| GLOBAL MODEL     |   |   |   | VALUE                                                                                                |   |   |   | TOLERANCE                           |   | PACKAGING                             |   | SPECIAL                                                             |   |   |  |  |  |
| CPSM03<br>CPSM05 |   |   |   | R = decimal<br>K = thousand<br>R1500 = 0.15 $\Omega$<br>100R0 = 100 $\Omega$<br>1K000 = 1 k $\Omega$ |   |   |   | J = $\pm 5.0 \%$<br>K = $\pm 10 \%$ |   | E31 = lead (Pb)-free,<br>4 layer bulk |   | (dash number)<br>(up to 3 digits)<br>from 1 to 999<br>as applicable |   |   |  |  |  |

Historical Part Numbering Example: CPSM-3 15  $\Omega$  5 % E31

|                  |                  |                |           |
|------------------|------------------|----------------|-----------|
| CPSM-3           | 15 $\Omega$      | 5 %            | E31       |
| HISTORICAL MODEL | RESISTANCE VALUE | TOLERANCE CODE | PACKAGING |



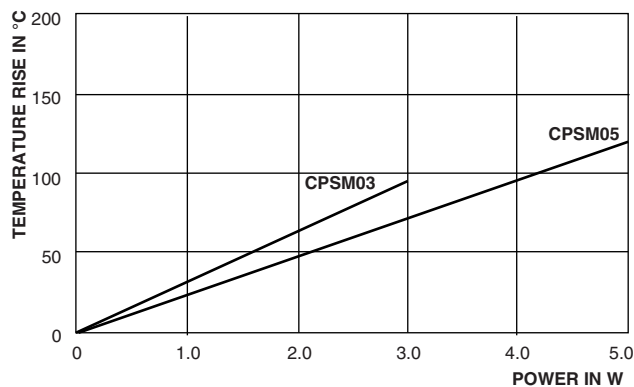
## DIMENSIONS



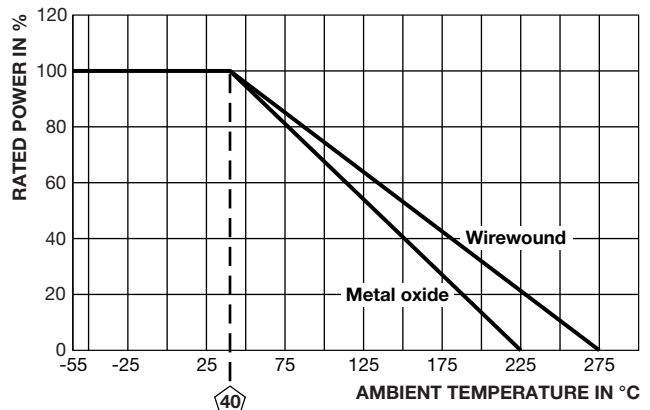
| MODEL  | DIMENSIONS in inches [millimeters] |                        |                                     |                                      |                        |
|--------|------------------------------------|------------------------|-------------------------------------|--------------------------------------|------------------------|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

| 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      | 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 | ± (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 1 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 |
| 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) ΔR  |



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