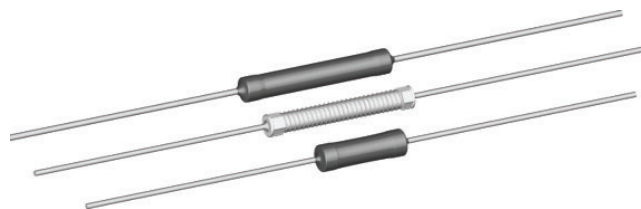




# Wirewound Resistors, Commercial Power, Axial Lead



## FEATURES

- High performance for low cost
- Auto insertable
- CA0001, CA0002 and CA5000 models are supplied with a high temperature silicone coating for additional environmental protection
- Lead forming available
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS\*

Available

HALOGEN  
FREE  
AvailableGREEN  
(5-2008)  
Available

## APPLICATIONS

Kitchen appliances: Percolators, blenders, mixers, ranges, toasters, deep fryers.  
Entertainment devices: Radios, televisions, computers and power supplies.

### Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL <sup>(1)</sup> | HISTORICAL MODEL <sup>(1)</sup> | POWER RATING<br>$P_{25^{\circ}\text{C}}$ W | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$ | WEIGHT (typical)<br>g |
|-----------------------------|---------------------------------|--------------------------------------------|------------------------------|-----------------------|-----------------------|
| CA0001                      | CA-1                            | 1.0                                        | 0.1 to 1K                    | 5, 10                 | 0.65                  |
| CA0002                      | CA-2                            | 2.0                                        | 0.1 to 2.4K                  | 5, 10                 | 0.80                  |
| CA4000                      | CA-4xxx                         | 2.0 to 8.8                                 | 0.1 to 1.02K                 | 5, 10                 | See below             |
| CA5000                      | CA-5xxx                         | 2.5 to 11.0                                | 0.1 to 7K                    | 5, 10                 | See below             |

### Note

<sup>(1)</sup> CA4000 and CA5000 model numbers are calculated from the CA4000 power rating of 4 W per inch and CA5000 power rating of 5 W per inch. The last three digits of the model number are the body length of the resistor in inches (decimal is between the first and second digit). Example: CA5150 = 1.50 inches x 5 W per inch = 7.5 W.

## EXAMPLES

| GLOBAL MODEL  | HISTORICAL MODEL | POWER RATING<br>$P_{25^{\circ}\text{C}}$ W | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$ | WEIGHT (typical)<br>g |
|---------------|------------------|--------------------------------------------|------------------------------|-----------------------|-----------------------|
| CA4050/CA5050 | CA-4050/CA-5050  | 2.0/2.5                                    | 0.1 to 170/0.1 to 2.7K       | 5, 10                 | 0.64/0.78             |
| CA4055/CA5055 | CA-4055/CA-5055  | 2.2/2.75                                   | 0.1 to 195/0.1 to 3.1K       | 5, 10                 | 0.65/0.80             |
| CA4060/CA5060 | CA-4060/CA-5060  | 2.4/3.0                                    | 0.1 to 220/0.1 to 3.5K       | 5, 10                 | 0.66/0.82             |
| CA4070/CA5070 | CA-4070/CA-5070  | 2.8/3.5                                    | 0.1 to 270/0.1 to 4.3K       | 5, 10                 | 0.68/0.86             |
| CA4080/CA5080 | CA-4080/CA-5080  | 3.2/4.0                                    | 0.1 to 320/0.1 to 5.1K       | 5, 10                 | 0.70/0.90             |
| CA4090/CA5090 | CA-4090/CA-5090  | 3.6/4.5                                    | 0.1 to 370/0.1 to 5.9K       | 5, 10                 | 0.72/0.94             |
| CA4100/CA5100 | CA-4100/CA-5100  | 4.0/5.0                                    | 0.15 to 420/0.15 to 6.7K     | 5, 10                 | 0.74/0.98             |
| CA4150/CA5150 | CA-4150/CA-5150  | 6.0/7.5                                    | 0.2 to 630/0.2 to 7K         | 5, 10                 | 0.84/1.19             |
| CA4200/CA5200 | CA-4200/CA-5200  | 8.0/10.0                                   | 0.2 to 920/0.2 to 7K         | 5, 10                 | 0.94/1.40             |
| CA4220/CA5220 | CA-4220/CA-5220  | 8.8/11.0                                   | 0.2 to 1.02K/0.2 to 7K       | 5, 10                 | 0.98/1.48             |

## TECHNICAL SPECIFICATIONS

| PARAMETER                       | UNIT                    | CA RESISTOR CHARACTERISTICS                                |
|---------------------------------|-------------------------|------------------------------------------------------------|
| Temperature Coefficient         | ppm/ $^{\circ}\text{C}$ | $\pm 300$ 1 $\Omega$ and above, $\pm 600$ below 1 $\Omega$ |
| Short Time Overload             | -                       | 5 x rated power for 5 s                                    |
| Maximum Working Voltage         | V                       | $(P \times R)^{1/2}$                                       |
| Dielectric Withstanding Voltage | $V_{AC}$                | 600 (CA0001, CA0002 and CA5xxx only)                       |
| Operating Temperature Range     | $^{\circ}\text{C}$      | - 65 to + 275                                              |
| Terminal Strength (minimum)     | lb                      | 10                                                         |

### Note

- Wirewound CA resistors can reliably function as a fuse and as a resistor. Such components involve compromise between fusing and resistive functions; therefore, each design should be tailored to the application to ensure optimum performance. Contact factory by using the e-mail address at the bottom of this page for design assistance.

## GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: CA000150R00JR05

|                                                                                          |   |                                                                          |   |                                                         |   |                                                                                                                                     |   |           |   |                                                                          |   |   |   |  |  |  |
|------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------|---|---------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------|---|-----------|---|--------------------------------------------------------------------------|---|---|---|--|--|--|
| C                                                                                        | A | 0                                                                        | 0 | 1                                                       | 5 | 0                                                                                                                                   | R | 0         | 0 | J                                                                        | R | 0 | 5 |  |  |  |
| GLOBAL MODEL<br>(See Standard Electrical Specifications Global Model column for options) |   | VALUE<br>R = Decimal<br>K = Thousand<br>R1500 = 0.15 Ω<br>1K500 = 1500 Ω |   | TOLERANCE<br>H = ± 3.0 %<br>J = ± 5.0 %<br>K = ± 10.0 % |   | PACKAGING<br>E14 = Lead (Pb)-free bulk<br>E05 = Lead (Pb)-free tape and reel<br>B14 = Tin/lead bulk<br>R05 = Tin/lead tape and reel |   |           |   | SPECIAL<br>(Dash Number) (up to 3 digits)<br>From 1 to 999 as applicable |   |   |   |  |  |  |
| Historical Part Numbering example: CA-1 50 Ω 5 % R05                                     |   |                                                                          |   |                                                         |   |                                                                                                                                     |   |           |   |                                                                          |   |   |   |  |  |  |
| CA-1                                                                                     |   | 50 Ω                                                                     |   | 5 %                                                     |   |                                                                                                                                     |   | R05       |   |                                                                          |   |   |   |  |  |  |
| HISTORICAL MODEL                                                                         |   | RESISTANCE VALUE                                                         |   | TOLERANCE CODE                                          |   |                                                                                                                                     |   | PACKAGING |   |                                                                          |   |   |   |  |  |  |

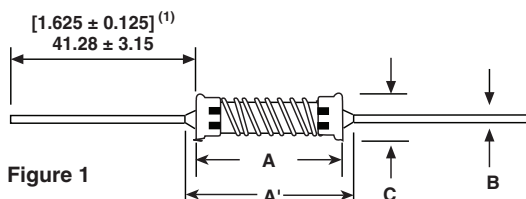
**DIMENSIONS** in inches [millimeters]

Figure 1

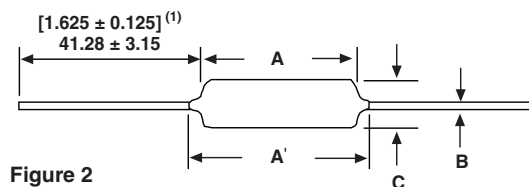


Figure 2

**Note**

(1) On some standard reel pack methods, the leads may be trimmed to a shorter length than shown.

| GLOBAL MODEL | DIMENSIONS in inches [millimeters] |               |                   |                              | FIGURE |
|--------------|------------------------------------|---------------|-------------------|------------------------------|--------|
|              | A ± 0.031 [0.794]                  | A' (MAXIMUM)  | B ± 0.001 [0.025] | C                            |        |
| CA0001       | 0.400 [10.16]                      | 0.460 [11.68] | 0.032 [0.813]     | 0.170 maximum [4.32 maximum] | 2      |
| CA0002       | 0.570 [14.48]                      | 0.630 [16.00] | 0.032 [0.813]     | 0.170 maximum [4.32 maximum] | 2      |
| CA4050       | 0.500 [12.70]                      | 0.594 [15.09] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4055       | 0.550 [13.97]                      | 0.644 [16.36] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4060       | 0.600 [15.24]                      | 0.694 [17.63] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4070       | 0.700 [17.78]                      | 0.794 [20.17] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4080       | 0.800 [20.32]                      | 0.894 [22.71] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4090       | 0.900 [22.86]                      | 0.994 [25.25] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4100       | 1.00 [25.40]                       | 1.094 [27.79] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4150       | 1.50 [38.10]                       | 1.594 [40.49] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4200       | 2.00 [50.80]                       | 2.094 [53.19] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA4220       | 2.20 [55.88]                       | 2.294 [58.27] | 0.032 [0.813]     | 0.140 ± 0.031 [3.56 ± 0.794] | 1      |
| CA5050       | 0.500 [12.70]                      | 0.625 [15.88] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5055       | 0.550 [13.97]                      | 0.675 [17.15] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5060       | 0.600 [15.24]                      | 0.725 [18.42] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5070       | 0.700 [17.78]                      | 0.825 [20.96] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5080       | 0.800 [20.32]                      | 0.925 [23.50] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5090       | 0.900 [22.86]                      | 1.025 [26.04] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5100       | 1.00 [25.40]                       | 1.125 [28.58] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5150       | 1.50 [38.10]                       | 1.625 [41.28] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5200       | 2.00 [50.80]                       | 2.125 [53.98] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |
| CA5220       | 2.20 [55.88]                       | 2.325 [59.06] | 0.036 [0.914]     | 0.170 ± 0.031 [4.32 ± 0.794] | 2      |

**MATERIAL SPECIFICATIONS**

**Element:** Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

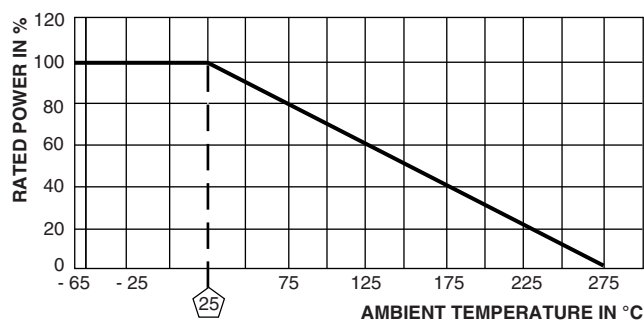
**Core:** Woven fiberglass

**Coating:** Special high temperature silicone (CA4000 series is not coated)

**Terminals:** Tin/lead electroplated copper (lead (Pb)-free will be 100 % tin)

**End Caps:** Tin plated steel

**Part Marking:** CA0001 and CA0002 are printed with value and tolerance

**DERATING****PERFORMANCE**

| TEST                            | CONDITIONS OF TEST                                                  | TEST LIMITS (EIA RS-344) |
|---------------------------------|---------------------------------------------------------------------|--------------------------|
| Thermal Shock                   | - 55 °C to + 275 °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 | 600 V <sub>AC</sub> for 1 min (CA0001, CA0002 and CA5xxx only)      | ± (2.0 % + 0.05 Ω) ΔR    |
| Low Temperature Storage         | - 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, + 25 °C, 1.5 h "ON", 0.5 h "OFF"             | ± (10.0 % + 0.05 Ω) ΔR   |
| Terminal Strength               | 10 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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