

## 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



### APPLICATIONS

Kitchen appliances: Percolators, blenders, mixers, ranges, toasters, deep fryers. Automotive devices: Horns, ignitions, windshield wipers, voltage regulators, instrument gauges. Entertainment devices: Radios, televisions, computers and power supplies.

RoHS\* COMPLIANT

| STANDARD ELECTRICAL SPECIFICATIONS |                                 |   |  |                       |
|------------------------------------|---------------------------------|---|--|-----------------------|
| GLOBAL <sup>(1)</sup> MODEL        | HISTORICAL <sup>(1)</sup> MODEL | POWER RATING<br><i>P</i> <sub>25 °C</sub> W | RESISTANCE RANGE Ω<br>± 10 % Standard, ± 5 % Available | WEIGHT<br>(Typical) g |
| CA0001                             | CA-1                            | 1.0   | 0.1 - 1K   | 0.65                  |
| CA0002                             | CA-2                            | 2.0   | 0.1 - 2.4K   | 0.80                  |
| CA4050/CA5050                      | CA-4050/CA-5050                 | 2.0/2.5                                     | 0.1 - 170/0.1 - 2.7K                                   | 0.64/0.78             |
| CA4055/CA5055                      | CA-4055/CA-5055                 | 2.2/2.75                                    | 0.1 - 195/0.1 - 3.1K                                   | 0.65/0.80             |
| CA4060/CA5060                      | CA-4060/CA-5060                 | 2.4/3.0                                     | 0.1 - 220/0.1 - 3.5K                                   | 0.66/0.82             |
| CA4070/CA5070                      | CA-4070/CA-5070                 | 2.8/3.5                                     | 0.1 - 270/0.1 - 4.3K                                   | 0.68/0.86             |
| CA4080/CA5080                      | CA-4080/CA-5080                 | 3.2/4.0                                     | 0.1 - 320/0.1 - 5.1K                                   | 0.70/0.90             |
| CA4090/CA5090                      | CA-4090/CA-5090                 | 3.6/4.5                                     | 0.1 - 370/0.1 - 5.9K                                   | 0.72/0.94             |
| CA4100/CA5100                      | CA-4100/CA-5100                 | 4.0/5.0                                     | 0.15 - 420/0.15 - 6.7K                                 | 0.74/0.98             |
| CA4150/CA5150                      | CA-4150/CA-5150                 | 6.0/7.5                                     | 0.2 - 630/0.2 - 7K                                     | 0.84/1.19             |
| CA4200/CA5200                      | CA-4200/CA-5200                 | 8.0/10.0                                    | 0.2 - 920/0.2 - 7K                                     | 0.94/1.40             |
| CA4220/CA5220                      | CA-4220/CA-5220                 | 8.8/11.0                                    | 0.2 - 1.02K/0.2 - 7K                                   | 0.98/1.48             |

**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.

| TECHNICAL SPECIFICATIONS        |                 |                                      |            |            |            |
|---------------------------------|-----------------|--------------------------------------|------------|------------|------------|
| PARAMETER                       | UNIT            | CA0001                               | CA0002     | CA4000     | CA5000     |
| Temperature Coefficient         | ppm/°C          | ± 600 below 1 Ω, ± 300 1 Ω and above |            |            |            |
| Power Rating                    | W               | 1                                    | 2          | 4 per inch | 5 per inch |
| Short Time Overload             | -               | 5 x rated power for 5 s              |            |            |            |
| Maximum Working Voltage         | V               | $(P \times R)^{1/2}$                 |            |            |            |
| Dielectric Withstanding Voltage | V <sub>AC</sub> | 1000                                 | 1000       | 1000       | 1000       |
| Operating Temperature Range     | °C              | - 65/+ 275                           | - 65/+ 275 | - 65/+ 275 | - 65/+ 275 |
| Terminal Strength (minimum)     | lb              | 10                                   | 10         | 10         | 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   |  |   |   |  |   |
|--|--|---|---|--|---|
| New Global Part Numbering: CA000150R00JR05 (preferred part number format)                                  |  |   |   |  |   |
| C  | A  | 0   | 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) From 1 - 999 as applicable |   |
| Historical Part Number example: CA-1 50 Ω 5 % R05 (will continue to be accepted for tin/lead product only) |  |   |   |  |   |
| CA-1   | 50 Ω   | 5 %   | R05   |  |   |
| HISTORICAL MODEL   | RESISTANCE VALUE   | TOLERANCE CODE  | PACKAGING   |  |   |

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

**DIMENSIONS** in inches [millimeters]



**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:** DALE, model, wattage, value, tolerance, date code



**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> , (CA0001, CA0002) for 1 min                    | ± (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 % - 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, 3 360° 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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