

## Wirewound Resistors, Industrial Power, Silicone Coated, Printed Circuit Board Mount



### FEATURES

- High temperature silicone coating
- Eliminates lead forming to keep parts off of PC board
- Built in standoffs provide PC board heat protection and opposing feet to avoid rocking
- Available in non-inductive style (special "NI") with Ayrton-Perry winding
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING<br>$P_{25^{\circ}\text{C}}$<br>W | RESISTANCE RANGE<br>$\Omega$<br>$\pm 5\%$ | RESISTANCE RANGE<br>$\Omega$<br>$\pm 10\%$ | WEIGHT (typical)<br>g |
|--------------|------------------|-----------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------|
| FS-003       | FS-3             | 3                                             | 1.0 to 6K                                 | 0.1 to 6K                                  | 1.16                  |
| FS-05A       | FS-5A            | 5                                             | 1.0 to 15K                                | 0.1 to 15K                                 | 2.12                  |
| FS-005       | FS-5             | 7                                             | 1.0 to 17.5K                              | 0.1 to 17.5K                               | 3.36                  |
| FS-05S       | FS-5S            | 8                                             | 1.0 to 20.5K                              | 0.1 to 20.5K                               | 4.60                  |
| FS-010       | FS-10            | 10                                            | 1.0 to 29K                                | 0.1 to 29K                                 | 6.24                  |
| FS-10S       | FS-10S           | 12                                            | 1.0 to 58K                                | 0.1 to 58K                                 | 6.60                  |
| FS-020       | FS-20            | 20                                            | 1.0 to 60K                                | 0.1 to 60K                                 | 8.82                  |
| FS-20S       | FS-20S           | 20                                            | 1.0 to 95K                                | 0.1 to 95K                                 | 11.36                 |

### TECHNICAL SPECIFICATIONS

| PARAMETER                       | UNIT                    | FS RESISTOR CHARACTERISTICS                                                                                                     |
|---------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Temperature Coefficient         | ppm/ $^{\circ}\text{C}$ | $\pm 260$ for 20 $\Omega$ and above, $\pm 400$ for 1 $\Omega$ to 19.99 $\Omega$ , special TC's available please contact factory |
| Short Time Overload             | -                       | 10 x rated power for 5 s                                                                                                        |
| Dielectric Withstanding Voltage | $V_{AC}$                | 1000, from terminal to mounting hardware                                                                                        |
| Maximum Working Voltage         | V                       | $(P \times R)^{1/2}$                                                                                                            |
| Operating Temperature Range     | $^{\circ}\text{C}$      | -55 to +350                                                                                                                     |

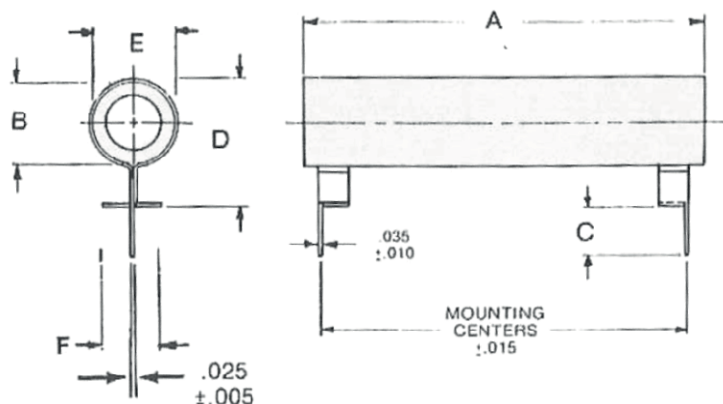
### GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: **FS-010CBE1K000JE** (visit [www.vishay.net](http://www.vishay.net) SAP parts manual for all options)

|                                                      |   |                                    |   |                              |   |                                                                |   |                         |   |                                       |   |                                                                |   |   |   |  |  |
|------------------------------------------------------|---|------------------------------------|---|------------------------------|---|----------------------------------------------------------------|---|-------------------------|---|---------------------------------------|---|----------------------------------------------------------------|---|---|---|--|--|
| F                                                    | S | -                                  | 0 | 1                            | 0 | C                                                              | B | E                       | 1 | K                                     | 0 | 0                                                              | 0 | J | E |  |  |
| GLOBAL MODEL<br>(6 digits)                           |   | TERMINAL DESIGNATION<br>(2 digits) |   | TERMINAL FINISH<br>(1 digit) |   | VALUE<br>(5 digits)                                            |   | TOLERANCE<br>(1 digit)  |   | PACKAGING CODE<br>(1 digit)           |   | SPECIAL<br>(up to 2 digits)                                    |   |   |   |  |  |
| (see Standard Electrical Specifications Global Model |   | CB                                 |   | E = lead (Pb)-free           |   | R = decimal<br>K = thousand<br>1R500 = 1.5 Ω<br>1K500 = 1.5 kΩ |   | J = ± 5 %<br>K = ± 10 % |   | E = lead (Pb)-free cell and bulk pack |   | (dash number) from 1 to 99 as applicable<br>NI = non-inductive |   |   |   |  |  |

Historical Part Number example: **FS-10-1K-5 %**

|                  |                               |            |         |
|------------------|-------------------------------|------------|---------|
| <b>FS-10</b>     | <b>1K <math>\Omega</math></b> | <b>5 %</b> |         |
| HISTORICAL MODEL | RESISTANCE VALUE              | TOLERANCE  | SPECIAL |

**DIMENSIONS** in inches [millimeters]

**Note**

- Recommended mounting hole is 0.078 diameter.

| MODEL  | DIMENSIONS in inches [millimeters] |                                    |                                    |           |           |           |                                                             |
|--------|------------------------------------|------------------------------------|------------------------------------|-----------|-----------|-----------|-------------------------------------------------------------|
|        | CORE                               |                                    | C<br>$\pm 0.062$<br>[ $\pm 1.57$ ] | D<br>MAX. | E<br>MAX. | F<br>MAX. | STANDARD MOUNTING<br>CENTERS<br>$\pm 0.015$ [ $\pm 0.381$ ] |
|        | A<br>$\pm 0.062$<br>[ $\pm 1.57$ ] | B<br>$\pm 0.031$<br>[ $\pm 0.78$ ] |                                    |           |           |           |                                                             |
| FS-003 | 1.000                              | 0.200                              | 0.360                              | 0.450     | 0.281     | 0.400     | 0.600                                                       |
| FS-002 | [25.4]                             | [5.08]                             | [9.14]                             | [11.43]   | [7.14]    | [10.16]   | [15.24]                                                     |
| FS-05A | 1.125                              | 0.200                              | 0.360                              | 0.450     | 0.281     | 0.400     | 0.900                                                       |
|        | [28.58]                            | [5.08]                             | [9.14]                             | [11.43]   | [7.14]    | [10.16]   | [22.86]                                                     |
| FS-005 | 1.000                              | 0.312                              | 0.360                              | 0.600     | 0.410     | 0.500     | 0.600                                                       |
| FS-006 | [25.4]                             | [7.94]                             | [9.14]                             | [15.24]   | [10.41]   | [12.7]    | [15.24]                                                     |
| FS-05S | 1.125                              | 0.312                              | 0.360                              | 0.600     | 0.410     | 0.500     | 0.900                                                       |
|        | [28.58]                            | [7.94]                             | [9.14]                             | [15.24]   | [10.41]   | [12.7]    | [22.86]                                                     |
| FS-010 | 1.750                              | 0.312                              | 0.360                              | 0.600     | 0.410     | 0.500     | 1.300                                                       |
|        | [44.45]                            | [7.94]                             | [9.14]                             | [15.24]   | [10.41]   | [12.7]    | [33.02]                                                     |
| FS-10S | 2.125                              | 0.312                              | 0.360                              | 0.600     | 0.410     | 0.500     | 1.700                                                       |
|        | [53.98]                            | [7.94]                             | [9.14]                             | [15.24]   | [10.41]   | [12.7]    | [43.18]                                                     |
| FS-015 | 2.000                              | 0.437                              | 0.19                               | 0.725     | 0.531     | 0.531     | 1.700                                                       |
| FS-020 | [50.8]                             | [11.11]                            | [4.82]                             | [18.41]   | [13.49]   | [13.49]   | [43.18]                                                     |
| FS-20S | 2.375                              | 0.437                              | 0.19                               | 0.725     | 0.531     | 0.531     | 2.200                                                       |
|        | [60.325]                           | [11.11]                            | [4.82]                             | [18.41]   | [13.49]   | [13.49]   | [55.88]                                                     |

**Notes**

- The pin configuration on the terminals for the FS-10S and smaller products is on the center of the terminal.
- The pin configuration on the terminals for the FS-015 and larger products is on the edge of the terminal

**MATERIAL SPECIFICATIONS**

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

**Core:** ceramic, steatite

**Coating:** special high temperature silicone

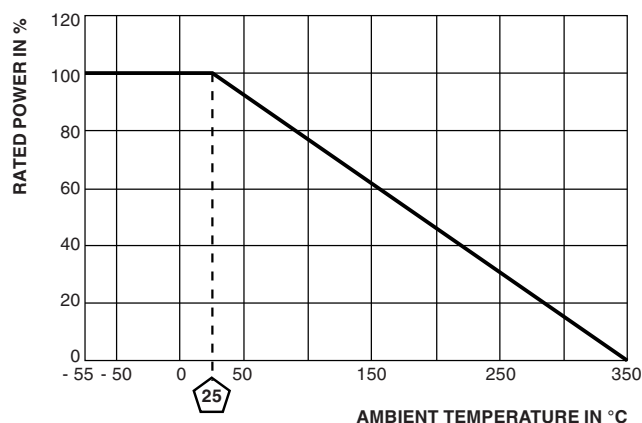
**Standard Terminals:** tinned alloy 42

**Terminal Bands:** alloy 42

**Part Marking:** HEI, model, wattage, value, tolerance, date code

**NON-INDUCTIVE**

Models of equivalent physical and electrical specifications are available with non-inductive (Ayrton-Perry) winding. They are identified by adding the letters "NI" to the end of the part number in the special section. For non-inductive models the maximum resistance values are one-half the standard part.

**DERATING**




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