



## Metal Film Resistors, Industrial, Flameproof



### FEATURES

- Small physical size
- Low cost
- FP resistors have the ability to withstand overloads up to 100 times rated power without any trace of flame
- Exceptional frequency characteristics
- Especially suited for circuitry where functions, environments and duty cycles demand power resistors
- Electroplated tin-lead or lead (Pb)-free solder finish leads
- Tighter tolerances available on request
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
COMPLIANT

### Note

\* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING<br>$P_{25^{\circ}\text{C}}$<br>W | POWER RATING<br>$P_{40^{\circ}\text{C}}$<br>W | POWER RATING<br>$P_{70^{\circ}\text{C}}$<br>W | MAXIMUM WORKING VOLTAGE <sup>(1)</sup><br>V | RESISTANCE RANGE <sup>(2)</sup><br>$\Omega$ | TOLERANCE<br>$\pm \%$ | TEMPERATURE COEFFICIENT<br>$\pm \text{ppm}/^{\circ}\text{C}$ |
|--------------|------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|-----------------------|--------------------------------------------------------------|
| FP01/2       | FP1/2            | -                                             | -                                             | 0.5                                           | 350                                         | 10 to 1M                                    | 1, 2, 5, 10           | 150                                                          |
| FP0001       | FP1              | -                                             | -                                             | 1                                             | 500                                         | 10 to 1M                                    | 1, 2, 5, 10           | 150                                                          |
| FP0032       | FP32             | -                                             | -                                             | 1                                             | 500                                         | 10 to 1M                                    | 1, 2, 5, 10           | 150                                                          |
| FP0002       | FP2              | 3.5                                           | 3                                             | 2                                             | 500                                         | 25 to 125K                                  | 1, 2, 5, 10           | 150                                                          |
| FP0042       | FP42             | -                                             | -                                             | 2                                             | 500                                         | 25 to 125K                                  | 1, 2, 5, 10           | 150                                                          |
| FP0003       | FP3              | 4                                             | 4                                             | 3                                             | 500                                         | 22 to 125K                                  | 1, 2, 5, 10           | 150                                                          |
| FP0004       | FP4              | 5.5                                           | 5                                             | 4                                             | 500                                         | 70 to 125K                                  | 1, 2, 5, 10           | 150                                                          |
| FP0005       | FP5              | 6.5                                           | 6                                             | 5                                             | 600                                         | 70 to 125K                                  | 1, 2, 5, 10           | 150                                                          |
| FP0007       | FP7              | 7.5                                           | -                                             | 7                                             | 700                                         | 25 to 125K                                  | 1, 2, 5, 10           | 150                                                          |
| FP0010       | FP10             | -                                             | 10                                            | -                                             | 700                                         | 25 to 125K                                  | 1, 2, 5, 10           | 150                                                          |
| FP0067       | FP67             | 5                                             | -                                             | -                                             | 500                                         | 35 to 19K                                   | 1, 2, 5, 10           | 150                                                          |
| FP0069       | FP69             | 3                                             | -                                             | 2                                             | 500                                         | 25 to 126K                                  | 1, 2, 5, 10           | 150                                                          |

### Notes

<sup>(1)</sup> Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less.

<sup>(2)</sup> Contact factory for values outside these published range.

### GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: FP000251K1F9251B8 (preferred part numbering format)

F P 0 0 0 2 5 1 K 1 F 9 2 5 1 B 8

| GLOBAL MODEL                                   | RESISTANCE VALUE                                                                                                     | TOLERANCE CODE                                                        | SPEC CODES             | PACKAGING <sup>(3)</sup>                                                                                                                                                                                                                                                                                   |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (See Standard Electrical Specifications table) | $R = \Omega$<br>$K = k\Omega$<br>$M = M\Omega$<br>$10R0 = 10 \Omega$<br>$1K30 = 1.3 k\Omega$<br>$1M00 = 1.0 M\Omega$ | $F = \pm 1 \%$<br>$G = \pm 2 \%$<br>$J = \pm 5 \%$<br>$K = \pm 10 \%$ | (See Spec Codes table) | <b>EK</b> = Lead (Pb)-free, strip<br><b>EL</b> = Lead (Pb)-free, lacer<br><b>EA</b> = Lead (Pb)-free, T/R<br><br><b>B8</b> = Tin/lead, strip<br><b>LB</b> = Tin/lead, lacer<br><b>CH</b> = Tin/lead, T/R (750 pieces)<br><b>CJ</b> = Tin/lead, T/R (1000 pieces)<br><b>G1</b> = Tin/lead, T/R (600 pieces) |

Historical Part Number: FP2 5112 F B8 (will continue to be accepted)

|                  |                  |                |           |
|------------------|------------------|----------------|-----------|
| FP2              | 5112             | F              | B8        |
| HISTORICAL MODEL | RESISTANCE VALUE | TOLERANCE CODE | PACKAGING |

### Notes

<sup>(3)</sup> Some packaging codes are model specific.

<sup>(4)</sup> For additional information on packaging, refer to the Through Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544)).

**DIMENSIONS** in inches (millimeters)

| GLOBAL MODEL | A                                          | B                                          | D                           |
|--------------|--------------------------------------------|--------------------------------------------|-----------------------------|
| FP01/2       | 0.360 ± 0.020 (9.14 ± 0.51) <sup>(2)</sup> | 0.138 + 0.012 - 0.023 (3.51 + 0.31 - 0.58) | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0001       | 0.560 ± 0.031 (14.22 ± 0.79)               | 0.190 + 0.005 - 0.030 (4.83 + 0.13 - 0.76) | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0032       | 0.560 ± 0.031 (14.22 ± 0.79)               | 0.190 + 0.005 - 0.030 (4.83 + 0.13 - 0.76) | 0.040 ± 0.002 (1.02 ± 0.05) |
| FP0002       | 0.687 ± 0.031 (17.45 ± 0.79)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0042       | 0.687 ± 0.031 (17.45 ± 0.79)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.045 ± 0.002 (1.14 ± 0.05) |
| FP0003       | 0.900 ± 0.031 (22.86 ± 0.79)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0004       | 1.530 ± 0.035 (38.86 ± 0.89)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0005       | 1.710 ± 0.035 (43.43 ± 0.89)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0007       | 2.040 ± 0.035 (51.82 ± 0.89)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0010       | 2.040 ± 0.035 (51.82 ± 0.89)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0067       | 0.900 ± 0.031 (22.86 ± 0.79)               | 0.300 ± 0.020 (7.62 ± 0.51)                | 0.032 ± 0.002 (0.81 ± 0.05) |
| FP0069       | 0.516 ± 0.021 (13.11 ± 0.53)               | 0.225 ± 0.012 (5.72 ± 0.31)                | 0.032 ± 0.002 (0.81 ± 0.05) |

**Notes**

- (1) Lead length for product in strip pack. For product supplied in Tape and Reel, the actual lead length would be based on body size, tape spacing and lead trim.
- (2) Clean lead to clean lead dimensions on FP1/2 are 0.347" (11.10 mm) maximum.

**DERATING**



## SPEC CODES

| GLOBAL MODEL | SPEC | RESISTOR TOLERANCE | DESCRIPTION                                       |
|--------------|------|--------------------|---------------------------------------------------|
| FP01/2       | 5605 | 1, 2, 5, 10        | Color banded, 4 or 5 bands depending on tolerance |
|              | 5610 | 1, 2, 5, 10        | Alphanumeric marking                              |
| FP0001       | 6200 | 2, 5, 10           | Color banded, 4 bands                             |
|              | 6201 | 1                  | Color banded, 5 bands                             |
| FP0032       | 6601 | 1                  | Color banded, 5 bands                             |
|              | 6602 | 2, 5, 10           | Color banded, 4 bands                             |
| FP0002       | 9251 | 1, 2, 5, 10        | Alphanumeric marking                              |
| FP0042       | 9201 | 1                  | Color banded, 5 bands                             |
|              | 9202 | 2, 5, 10           | Color banded, 4 bands                             |
| FP0003       | 9300 | 1, 2, 5, 10        | Alphanumeric marking                              |
|              | 9320 | 2, 5, 10           | Color banded, 4 bands                             |
|              | 9330 | 1                  | Color banded, 5 bands                             |
| FP0004       | 9400 | 1, 2, 5, 10        | Alphanumeric marking                              |
| FP0005       | 9500 | 1, 2, 5, 10        | Alphanumeric marking                              |
| FP0007       | 9700 | 1, 2, 5, 10        | Alphanumeric marking                              |
| FP0010       | 9800 | 1, 2, 5, 10        | Alphanumeric marking                              |
| FP0067       | 9550 | 1, 2, 5, 10        | Alphanumeric marking                              |
| FP0069       | 7500 | 1, 2, 5, 10        | Alphanumeric marking                              |
|              | 7536 | 2, 5, 10           | Color banded, 4 bands                             |
|              | 7538 | 1                  | Color banded, 5 bands                             |

## MARKING

| - DALE                                                                                                  | - Value | - Tolerance                                                                                                                                                 | - Model and case size<br>(Date and source code included on some styles) |
|---------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b><math>\pm 1\%</math> tolerance parts are marked with 5 color bands. 5 bands, EIA Standard RS196.</b> |         | <b><math>\pm 2\%</math>, <math>\pm 5\%</math> and <math>\pm 10\%</math> tolerance parts are marked with 4 color bands. 4 band commercial, EIA Standard.</b> |                                                                         |
|                                                                                                         |         |                                                                                                                                                             |                                                                         |



| PERFORMANCE                         |                                                |        |        |        |        |        |        |        |        |        |        |        |
|-------------------------------------|------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| TEST                                | MAXIMUM $\Delta R$ (TYPICAL TEST LOTS) $\pm$ % |        |        |        |        |        |        |        |        |        |        |        |
|                                     | FP01/2                                         | FP0001 | FP0032 | FP0002 | FP0042 | FP0003 | FP0004 | FP0005 | FP0007 | FP0010 | FP0067 | FP0069 |
| Short Time Overload                 | 0.5                                            | 1.0    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    |
| Low Temperature Operation           | 0.5                                            | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.25   | 0.25   |
| Moisture Resistance                 | 1.0                                            | 1.5    | 1.5    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    |
| Shock                               | 0.5                                            | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    |
| Vibration                           | 0.5                                            | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    |
| Temperature Cycle                   | 1.0                                            | 1.0    | 1.0    | 0.5    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 0.5    |
| Load Life (1000 h Rated Conditions) | 1.0                                            | 2.0    | 2.0    | 5.0    | 2.0    | 5.0    | 5.0    | 5.0    | 5.0    | 5.0    | 5.0    | 3.0    |
| Terminal Strength                   | 0.5                                            | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    |
| Dielectric Withstanding Voltage     | 0.5                                            | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.25   | 0.25   |
| Effect Solder Heat                  | 0.5                                            | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.5    | 0.25   | 0.25   |

| PACKAGING                      |                |                   |                |
|--------------------------------|----------------|-------------------|----------------|
| GLOBAL MODEL                   | PACKAGING TYPE | PACKAGING CODE    |                |
|                                |                | LEAD (Pb)-BEARING | LEAD (Pb)-FREE |
| FP01/2, FP0001, FP0032, FP0069 | Strip          | B8                | EK             |
|                                | Tape/reel      | CJ                | EA             |
| FP0002, FP0003, FP0042, FP0067 | Strip          | B8                | EK             |
|                                | Tape/reel      | CH                | EA             |
| FP0004                         | Lacer          | LB                | EL             |
|                                | Tape/reel      | G1                | EA             |
| FP0005, FP0007, FP0010         | Lacer          | LB                | EL             |



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