Metal Film Resistors, Pulse Withstanding Protective

**FEATURES**
- Special Vishay Dale design provides lightning withstand characteristics along with resistor functionality
- A thicker tin oxide power film system provides lightning surge absorption capabilities
- Higher turns ratio and glass substrate provide sharper fusing characteristic than the standard flameproof product line
- Protect against a variety of electrical hazards which can change or destroy sensitive electronic equipment including high energy voltage surges caused by power line anomalies (direct power crosses or inductively coupled effects) and other momentary overvoltages
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

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

### STANDARD ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>GLOBAL MODEL</th>
<th>HISTORICAL MODEL</th>
<th>POWER RATING $P_{70^\circ C}$ W</th>
<th>RESISTANCE RANGE (Ω)</th>
<th>TOLERANCE ± %</th>
<th>CUTOFF VALUE (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP1/2P</td>
<td>FP1/2P</td>
<td>0.5</td>
<td>10 to 1M</td>
<td>1, 2, 5</td>
<td>2K00</td>
</tr>
<tr>
<td>FP001P</td>
<td>FP1P</td>
<td>1</td>
<td>10 to 1M</td>
<td>1, 2, 5</td>
<td>1K00</td>
</tr>
<tr>
<td>FP002P</td>
<td>FP2P</td>
<td>2</td>
<td>355 to 125K</td>
<td>1, 2, 5</td>
<td>355R</td>
</tr>
<tr>
<td>FP003P</td>
<td>FP3P</td>
<td>3</td>
<td>46.4 to 125K</td>
<td>1, 2, 5</td>
<td>250R</td>
</tr>
<tr>
<td>FP069P</td>
<td>FP69P</td>
<td>2</td>
<td>25 to 126K</td>
<td>1, 2, 5</td>
<td>400R</td>
</tr>
</tbody>
</table>

**Notes**
- Pulse withstanding capabilities are value dependent. Values above the cutoff value will meet all of the surge test requirements shown on the following pages.
- Contact factory for values outside these published ranges.

### MARKING

- DALE
- Value
- Tolerance
- Style and case size
- Date code (year/week)

### GLOBAL PART NUMBER INFORMATION

**New Global Part Numbering:** FP002P1K00F9256B8 (preferred part numbering format)

<table>
<thead>
<tr>
<th>F</th>
<th>P</th>
<th>0</th>
<th>0</th>
<th>2</th>
<th>P</th>
<th>1</th>
<th>K</th>
<th>0</th>
<th>0</th>
<th>F</th>
<th>9</th>
<th>2</th>
<th>5</th>
<th>6</th>
<th>B</th>
<th>8</th>
</tr>
</thead>
</table>

**GLOBAL MODEL**
(See Standard Electrical Specifications table)

<table>
<thead>
<tr>
<th>RESISTANCE VALUE</th>
<th>TOLERANCE CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R = \Omega$</td>
<td>$F = \pm 1%$</td>
</tr>
<tr>
<td>$K = k\Omega$</td>
<td>$G = \pm 2%$</td>
</tr>
<tr>
<td>$M = M\Omega$</td>
<td>$J = \pm 5%$</td>
</tr>
</tbody>
</table>

**SPEC CODES**
- 5555 = FP1/2P
- 6206 = FP001P
- 9256 = FP002P
- 9303 = FP003P
- 7532 = FP069P

**PACKAGING**
- EK = Lead (Pb)-free, strip
- EA = Lead (Pb)-free, T/R
- B8 = Tin/lead, strip
- CH = Tin/lead, T/R (750 pieces)
- CJ = Tin/lead, T/R (1000 pieces)

**Historical Part Number:** FP2P 1K00 1 % B8 (will continue to be accepted)

**Notes**
- Some packaging codes are model specific.
- For additional information on packaging, refer to the Through Hole Resistor Packaging document ([www.vishay.com/doc?731544](http://www.vishay.com/doc?731544)).
DIMENSIONS in inches (millimeters)

<table>
<thead>
<tr>
<th>GLOBAL MODEL</th>
<th>A</th>
<th>B</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP1/2P</td>
<td>0.360 ± 0.020 (9.14 ± 0.51)</td>
<td>0.138 ± 0.012 - 0.023 (3.51 ± 0.31 - 0.58)</td>
<td>0.032 ± 0.002 (0.81 ± 0.05)</td>
</tr>
<tr>
<td>FP001P</td>
<td>0.560 ± 0.031 (14.22 ± 0.79)</td>
<td>0.190 ± 0.005 - 0.030 (4.83 ± 0.13 - 0.76)</td>
<td>0.032 ± 0.002 (0.81 ± 0.05)</td>
</tr>
<tr>
<td>FP002P</td>
<td>0.687 ± 0.031 (17.45 ± 0.79)</td>
<td>0.300 ± 0.020 (7.62 ± 0.51)</td>
<td>0.032 ± 0.002 (0.81 ± 0.05)</td>
</tr>
<tr>
<td>FP003P</td>
<td>0.900 ± 0.055 (22.86 ± 1.40)</td>
<td>0.300 ± 0.020 (7.62 ± 0.51)</td>
<td>0.032 ± 0.002 (0.81 ± 0.05)</td>
</tr>
<tr>
<td>FP069P</td>
<td>0.516 ± 0.021 (13.11 ± 0.53)</td>
<td>0.225 ± 0.012 (5.72 ± 0.31)</td>
<td>0.032 ± 0.002 (0.81 ± 0.05)</td>
</tr>
</tbody>
</table>

Note

(1) Lead length for product in strip pack. For product supplied in Tape and Reel, the actual lead length would be based on the body size, tape spacing and lead trim.

DERATING

For technical questions, contact: ff2aresistors@vishay.com

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LIGHTNING PULSE WAVE FORMS

Lightning pulse wave forms are defined by three numbers:

- Maximum time to reach peak voltage level (typically 10 μs)
- Minimum time for voltage to decrease to half value
- The peak voltage level

Three examples are shown below.

1. 10 by 160 μs up to 1500 V  
   FCC - Longitudinal Surge

2. 10 by 560 μs up to 800 V  
   FCC - Metallic Surge

3. 10 by 1000 μs up to 1000 V  
   REA - Current Surge
These graphs show the relationship value and pulse withstanding voltage for FP1/2P thru FP003P using a 1.0 % resistance shift after 10 pulses as the figure of merit. The stable operating region of each package is on the right side of the appropriate line.

### PACKAGING

<table>
<thead>
<tr>
<th>GLOBAL MODEL</th>
<th>PACKAGING TYPE</th>
<th>LEAD (Pb)-BEARING</th>
<th>LEAD (Pb)-FREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP1/2P, FP001P, FP069P</td>
<td>Strip</td>
<td>B8</td>
<td>EK</td>
</tr>
<tr>
<td></td>
<td>Tape/reel</td>
<td>CJ</td>
<td>EA</td>
</tr>
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<td>Strip</td>
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