



# 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)



RoHS\* COMPLIANT

### Note

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

STANDARD ELECTRICAL SPECIFICATIONS					
GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{70^{\circ}\text{C}}$ W	RESISTANCE RANGE <sup>(2)</sup> $\Omega$	TOLERANCE $\pm$ %	CUTOFF VALUE <sup>(1)</sup>
FP1/2P	FP1/2P	0.5	10 to 1M	1, 2, 5	2K00
FP001P	FP1P	1	10 to 1M	1, 2, 5	1K00
FP002P	FP2P	2	355 to 125K	1, 2, 5	355R
FP003P	FP3P	3	46.4 to 125K	1, 2, 5	250R
FP069P	FP69P	2	25 to 126K	1, 2, 5	400R

### Notes

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

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

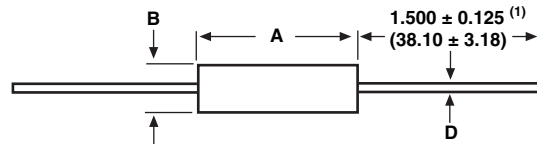
GLOBAL PART NUMBER INFORMATION																
New Global Part Numbering: FP002P1K00F9256B8 (preferred part numbering format)																
F	P	0	0	2	P	1	K	0	0	F	9	2	5	6	B	8
GLOBAL MODEL (See Standard Electrical Specifications table)	RESISTANCE VALUE $R = \Omega$ $K = k\Omega$ $M = M\Omega$ 10R0 = 10 $\Omega$ 1K30 = 1.3 k $\Omega$ 1M00 = 1.0 M $\Omega$		TOLERANCE CODE $F = \pm 1\%$ $G = \pm 2\%$ $J = \pm 5\%$		SPEC CODES 5555 = FP1/2P 6206 = FP001P 9256 = FP002P 9303 = FP003P 7532 = FP069P		PACKAGING <sup>(3)</sup> 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)																
FP2P	1K00		1%		B8											
HISTORICAL MODEL	RESISTANCE VALUE		TOLERANCE CODE		PACKAGING											

### Notes

- (3) Some packaging codes are model specific.
- (4) For additional information on packaging, refer to the Through Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544)).



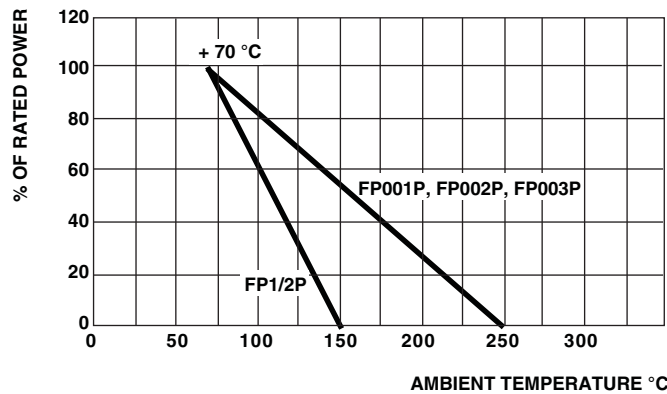
**DIMENSIONS** in inches (millimeters)



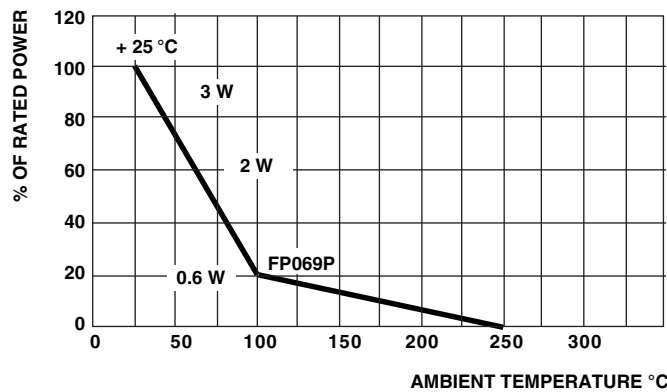
GLOBAL MODEL	A	B	D
FP1/2P	0.360 ± 0.020 (9.14 ± 0.51)	0.138 + 0.012 - 0.023 (3.51 + 0.31 - 0.58)	0.032 ± 0.002 (0.81 ± 0.05)
FP001P	0.560 ± 0.031 (14.22 ± 0.79)	0.190 + 0.005 - 0.030 (4.83 + 0.13 - 0.76)	0.032 ± 0.002 (0.81 ± 0.05)
FP002P	0.687 ± 0.031 (17.45 ± 0.79)	0.300 ± 0.020 (7.62 ± 0.51)	0.032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

**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**



**DERATING**

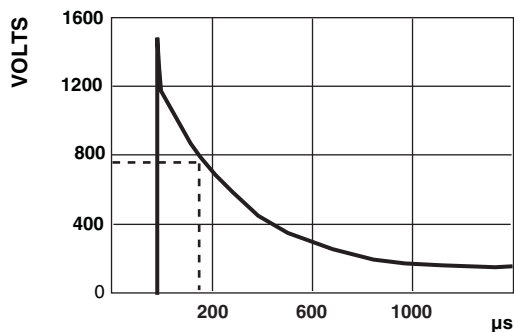


**LIGHTNING PULSE WAVE FORMS**

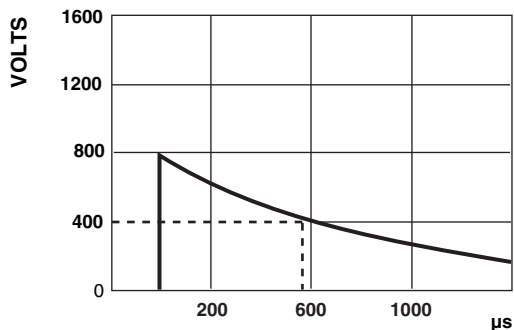
Lightning pulse wave forms are defined by three numbers:

- Maximum time to reach peak voltage level (typically 10  $\mu$ s)
- Minimum time for voltage to decrease to half value
- The peak voltage level

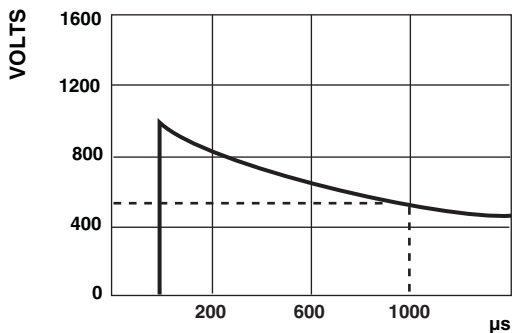
Three examples are shown below.



10 by 160  $\mu$ s up to 1500 V FCC - Longitudinal Surge



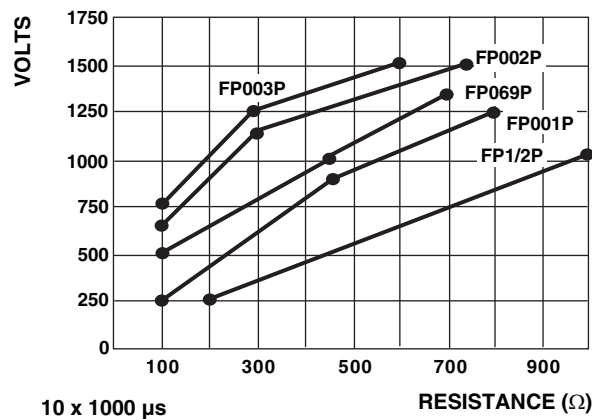
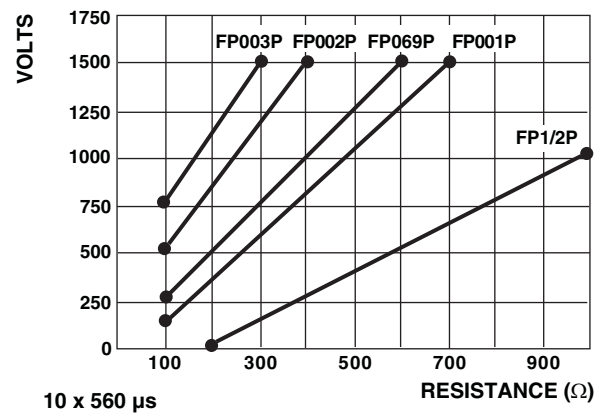
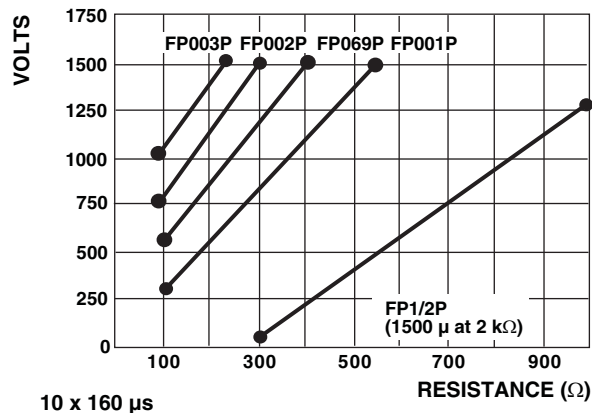
10 by 560  $\mu$ s up to 800 V FCC - Metallic Surge



10 by 1000  $\mu$ s 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			
GLOBAL MODEL	PACKAGING TYPE	PACKAGING CODE	
		LEAD (Pb)-BEARING	LEAD (Pb)-FREE
FP1/2P, FP001P, FP069P	Strip	B8	EK
	Tape/reel	CJ	EA
FP002P, FP003P	Strip	B8	EK
	Tape/reel	CH	EA



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