

**P5KE5.0  
 thru  
 P5KE170A**

**FEATURES:**

- ECONOMICAL SERIES
- AVAILABLE IN BOTH UNIDIRECTIONAL AND BI-DIRECTIONAL CONSTRUCTION
- 5.0 TO 170 STAND-OFF VOLTAGE AVAILABLE
- 500 WATTS PEAK PULSE POWER DISSIPATION
- QUICK RESPONSE

**DESCRIPTION:**

This Transient Voltage Suppressor is an economical, molded, commercial product used to protect voltage sensitive components from destruction or partial degradation. The response time of their clamping action is virtually instantaneous ( $1 \times 10^{-12}$  seconds) and they have a peak pulse power rating of 500 watts for 1 ms as depicted in Figure 1 and 2. Microsemi also offers a great variety of other Transient Voltage Suppressor's to meet higher and lower power demands and special applications.

**5.0 thru 170 volts  
 500 Watts  
 Transient Voltage  
 Suppressors**

**MAXIMUM RATINGS:**

Peak Pulse Power Dissipation at 25°C: 500 Watts

Steady State Power Dissipation: 2.5 Watts at  $T_L = +75^\circ\text{C}$

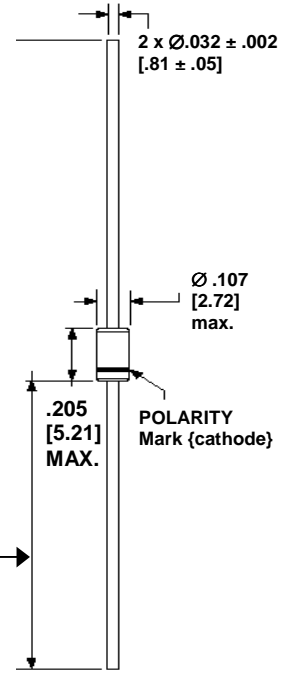
3/8" Lead Length

$t_{\text{clamping}}$  (0 volts to BV Min.):

Unidirectional  $<1 \times 10^{-12}$  Seconds: Bi-directional  $<5 \times 10^{-9}$  Seconds.

Operating and Storage Temperature:  $-55^\circ$  to  $+175^\circ\text{C}$

DO-41



NOTE: DIMENSIONS IN [ ] =MILLIMETERS

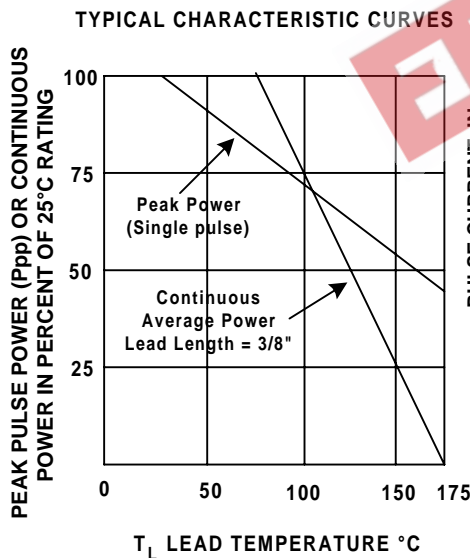


FIGURE 1

DERATING CURVE

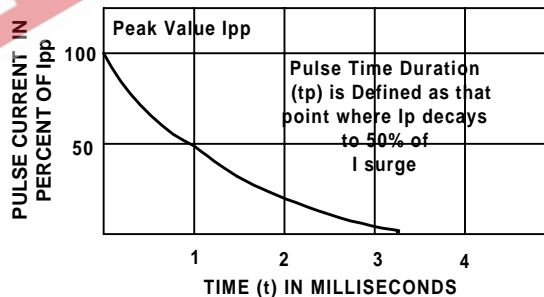


FIGURE 2

PULSE WAVEFORM FOR  
 EXPONENTIAL SURGE

**MECHANICAL  
 CHARACTERISTICS**

**CASE:** Void free transfer molded thermosetting plastic.

**FINISH:** Readily solderable.

**POLARITY:** Band denotes cathode. Bi-directional not marked.

**WEIGHT:** 0.7 gram (Appx.).

**MOUNTING POSITION:** Any



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**ELECTRICAL CHARACTERISTICS AT 25°C**

| PART NUMBER | BREAKDOWN VOLTAGE V(BR) |              | TEST CURRENT<br>I <sub>T</sub> | RATED STAND OFF VOLTAGE<br>V <sub>WM</sub> | MAX. REVERSE STANDBY CURRENT<br>I <sub>D</sub> @<br>V <sub>WM</sub> | MAX. PEAK REVERSE VOLTAGE<br>V <sub>C</sub> MAX.<br>@ I <sub>PP</sub> | MAX. PEAK PULSE CURRENT<br>I <sub>PP</sub><br>(Figure 2) | MAX. TEMP. COEFFICIENT<br>OF V(BR)<br>-55°C TO<br>175°C<br>α <sub>V(BR)</sub> |
|-------------|-------------------------|--------------|--------------------------------|--------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
|             | MIN.<br>VOLTS           | MAX<br>VOLTS |                                |                                            |                                                                     |                                                                       |                                                          |                                                                               |
| P5KE5.0     | 6.40                    | 7.30         | 10                             | 5.0                                        | 600                                                                 | 9.6                                                                   | 52                                                       | .057                                                                          |
| P5KE5.0A    | 6.40                    | 7.00         | 10                             | 5.0                                        | 600                                                                 | 9.2                                                                   | 54.3                                                     | .057                                                                          |
| P5KE6.0     | 6.67                    | 8.15         | 10                             | 6.0                                        | 600                                                                 | 11.4                                                                  | 43.9                                                     | .059                                                                          |
| P5KE6.0A    | 6.67                    | 7.37         | 10                             | 6.0                                        | 600                                                                 | 10.3                                                                  | 48.5                                                     | .059                                                                          |
| P5KE6.5     | 7.22                    | 8.82         | 10                             | 6.5                                        | 400                                                                 | 12.3                                                                  | 40.7                                                     | .061                                                                          |
| P5KE6.5A    | 7.22                    | 7.98         | 10                             | 6.5                                        | 400                                                                 | 11.2                                                                  | 44.7                                                     | .061                                                                          |
| P5KE7.0     | 7.78                    | 9.51         | 10                             | 7.0                                        | 150                                                                 | 13.3                                                                  | 37.8                                                     | .065                                                                          |
| P5KE7.0A    | 7.78                    | 8.60         | 10                             | 7.0                                        | 150                                                                 | 12.0                                                                  | 41.7                                                     | .065                                                                          |
| P5KE7.5     | 8.33                    | 10.2         | 1                              | 7.5                                        | 50                                                                  | 14.3                                                                  | 35.0                                                     | .067                                                                          |
| P5KE7.5A    | 8.33                    | 9.21         | 1                              | 7.5                                        | 50                                                                  | 12.9                                                                  | 38.8                                                     | .067                                                                          |
| P5KE8.0     | 8.89                    | 10.9         | 1                              | 8.0                                        | 25                                                                  | 15.0                                                                  | 33.3                                                     | .070                                                                          |
| P5KE8.0A    | 8.89                    | 9.83         | 1                              | 8.0                                        | 25                                                                  | 13.6                                                                  | 36.7                                                     | .070                                                                          |
| P5KE8.5     | 9.44                    | 11.5         | 1                              | 8.5                                        | 5                                                                   | 15.9                                                                  | 31.4                                                     | .073                                                                          |
| P5KE8.5A    | 9.44                    | 10.4         | 1                              | 8.5                                        | 5                                                                   | 14.4                                                                  | 34.7                                                     | .073                                                                          |
| P5KE9.0     | 10.0                    | 12.2         | 1                              | 9.0                                        | 1                                                                   | 16.9                                                                  | 29.5                                                     | .076                                                                          |
| P5KE9.0A    | 10.0                    | 11.1         | 1                              | 9.0                                        | 1                                                                   | 15.4                                                                  | 32.5                                                     | .076                                                                          |
| P5KE10      | 11.1                    | 13.6         | 1                              | 10                                         | 1                                                                   | 18.8                                                                  | 26.6                                                     | .078                                                                          |
| P5KE10A     | 11.1                    | 12.3         | 1                              | 10                                         | 1                                                                   | 17.0                                                                  | 29.4                                                     | .078                                                                          |
| P5KE11      | 12.2                    | 14.9         | 1                              | 11                                         | 1                                                                   | 20.1                                                                  | 24.9                                                     | .081                                                                          |
| P5KE11A     | 12.2                    | 13.5         | 1                              | 11                                         | 1                                                                   | 18.2                                                                  | 27.4                                                     | .081                                                                          |
| P5KE12      | 13.3                    | 16.3         | 1                              | 12                                         | 1                                                                   | 22.0                                                                  | 22.7                                                     | .082                                                                          |
| P5KE12A     | 13.3                    | 14.7         | 1                              | 12                                         | 1                                                                   | 19.9                                                                  | 25.1                                                     | .082                                                                          |
| P5KE13      | 14.4                    | 17.6         | 1                              | 13                                         | 1                                                                   | 23.8                                                                  | 21.0                                                     | .084                                                                          |
| P5KE13A     | 14.4                    | 15.9         | 1                              | 13                                         | 1                                                                   | 21.5                                                                  | 23.2                                                     | .084                                                                          |
| P5KE14      | 15.6                    | 19.1         | 1                              | 14                                         | 1                                                                   | 25.8                                                                  | 19.4                                                     | .086                                                                          |
| P5KE14A     | 15.6                    | 17.2         | 1                              | 14                                         | 1                                                                   | 23.2                                                                  | 21.5                                                     | .086                                                                          |
| P5KE15      | 16.7                    | 20.4         | 1                              | 15                                         | 1                                                                   | 26.9                                                                  | 18.8                                                     | .087                                                                          |
| P5KE15A     | 16.7                    | 18.5         | 1                              | 15                                         | 1                                                                   | 24.4                                                                  | 20.6                                                     | .087                                                                          |
| P5KE16      | 17.8                    | 21.8         | 1                              | 16                                         | 1                                                                   | 28.8                                                                  | 17.6                                                     | .088                                                                          |
| P5KE16A     | 17.8                    | 19.7         | 1                              | 16                                         | 1                                                                   | 26.0                                                                  | 19.2                                                     | .088                                                                          |
| P5KE17      | 18.9                    | 23.1         | 1                              | 17                                         | 1                                                                   | 30.5                                                                  | 16.4                                                     | .090                                                                          |
| P5KE17A     | 18.9                    | 20.9         | 1                              | 17                                         | 1                                                                   | 27.6                                                                  | 18.1                                                     | .090                                                                          |
| P5KE18      | 20.0                    | 24.4         | 1                              | 18                                         | 1                                                                   | 32.2                                                                  | 15.5                                                     | .092                                                                          |
| P5KE18A     | 20.0                    | 22.1         | 1                              | 18                                         | 1                                                                   | 29.2                                                                  | 17.2                                                     | .092                                                                          |
| P5KE20      | 22.2                    | 27.1         | 1                              | 20                                         | 1                                                                   | 35.8                                                                  | 13.9                                                     | .093                                                                          |
| P5KE20A     | 22.2                    | 24.5         | 1                              | 20                                         | 1                                                                   | 32.4                                                                  | 15.4                                                     | .093                                                                          |

**ELECTRICAL CHARACTERISTICS AT 25°C**

| PART NUMBER | BREAKDOWN VOLTAGE V(BR) |              | TEST CURRENT<br>I <sub>T</sub> | RATED STAND OFF VOLTAGE<br>V <sub>WM</sub> | MAX. REVERSE STANDBY CURRENT<br>I <sub>D</sub> @<br>V <sub>WM</sub> | MAX. PEAK REVERSE VOLTAGE<br>V <sub>C</sub> MAX.<br>@ I <sub>PP</sub> | MAX. PEAK PULSE CURRENT<br>I <sub>PP</sub><br>(Figure 2) | MAX. TEMP. COEFFICIENT<br>OF V(BR)<br>-55°C TO<br>175°C<br>$\alpha_{V(BR)}$ |
|-------------|-------------------------|--------------|--------------------------------|--------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------|
|             | MIN.<br>VOLTS           | MAX<br>VOLTS |                                |                                            |                                                                     |                                                                       |                                                          |                                                                             |
| P5KE22      | 24.4                    | 29.8         | 1                              | 22                                         | 1                                                                   | 39.4                                                                  | 12.7                                                     | .094                                                                        |
| P5KE22A     | 24.4                    | 26.9         | 1                              | 22                                         | 1                                                                   | 35.5                                                                  | 14.1                                                     | .094                                                                        |
| P5KE24      | 26.7                    | 32.6         | 1                              | 24                                         | 1                                                                   | 43.0                                                                  | 11.6                                                     | .096                                                                        |
| P5KE24A     | 26.7                    | 29.5         | 1                              | 24                                         | 1                                                                   | 38.9                                                                  | 12.8                                                     | .096                                                                        |
| P5KE26      | 28.9                    | 35.3         | 1                              | 26                                         | 1                                                                   | 46.6                                                                  | 10.7                                                     | .097                                                                        |
| P5KE26A     | 28.9                    | 31.9         | 1                              | 26                                         | 1                                                                   | 42.1                                                                  | 11.9                                                     | .097                                                                        |

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**P5KE5.0  
thru  
P5KE170A**

**ELECTRICAL CHARACTERISTICS AT 25°C**

| PART NUMBER | BREAKDOWN VOLTAGE V(BR) |              | TEST CURRENT<br>I <sub>T</sub> | RATED STAND OFF VOLTAGE<br>V <sub>WM</sub> | MAX. REVERSE STANDBY CURRENT<br>I <sub>D</sub> @<br>V <sub>WM</sub> | MAX. PEAK REVERSE VOLTAGE<br>V <sub>C</sub> MAX.<br>@ I <sub>PP</sub> | MAX. PEAK PULSE CURRENT<br>I <sub>PP</sub><br>(Figure 2) | MAX. TEMP. COEFFICIENT<br>OF V(BR)<br>-55°C TO<br>175°C<br>α <sub>V(BR)</sub> |
|-------------|-------------------------|--------------|--------------------------------|--------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
|             | MIN.<br>VOLTS           | MAX<br>VOLTS |                                |                                            |                                                                     |                                                                       |                                                          |                                                                               |
| P5KE78      | 86.7                    | 106.0        | 1                              | 78                                         | 1                                                                   | 139.0                                                                 | 3.6                                                      | .106                                                                          |
| P5KE78A     | 86.7                    | 95.8         | 1                              | 78                                         | 1                                                                   | 126.0                                                                 | 4.0                                                      | .106                                                                          |
| P5KE85      | 94.4                    | 115.0        | 1                              | 85                                         | 1                                                                   | 151.0                                                                 | 3.3                                                      | .106                                                                          |
| P5KE85A     | 94.4                    | 104.0        | 1                              | 85                                         | 1                                                                   | 137.0                                                                 | 3.6                                                      | .106                                                                          |
| P5KE90      | 100.0                   | 122.0        | 1                              | 90                                         | 1                                                                   | 160.0                                                                 | 3.1                                                      | .107                                                                          |
| P5KE90A     | 100.0                   | 111.0        | 1                              | 90                                         | 1                                                                   | 146.0                                                                 | 3.4                                                      | .107                                                                          |
| P5KE100     | 111.0                   | 136.0        | 1                              | 100                                        | 1                                                                   | 179.0                                                                 | 2.8                                                      | .107                                                                          |
| P5KE100A    | 111.0                   | 123.0        | 1                              | 100                                        | 1                                                                   | 162.0                                                                 | 3.1                                                      | .107                                                                          |
| P5KE110     | 122.0                   | 149.0        | 1                              | 110                                        | 1                                                                   | 196.0                                                                 | 2.6                                                      | .107                                                                          |
| P5KE110A    | 122.0                   | 135.0        | 1                              | 110                                        | 1                                                                   | 177.0                                                                 | 2.8                                                      | .107                                                                          |
| P5KE120     | 133.0                   | 163.0        | 1                              | 120                                        | 1                                                                   | 214.0                                                                 | 2.3                                                      | .107                                                                          |
| P5KE120A    | 133.0                   | 147.0        | 1                              | 120                                        | 1                                                                   | 193.0                                                                 | 2.0                                                      | .107                                                                          |
| P5KE130     | 144.0                   | 176.0        | 1                              | 130                                        | 1                                                                   | 231.0                                                                 | 2.2                                                      | .108                                                                          |
| P5KE130A    | 144.0                   | 159.0        | 1                              | 130                                        | 1                                                                   | 209.0                                                                 | 2.4                                                      | .108                                                                          |
| P5KE150     | 167.0                   | 204.0        | 1                              | 150                                        | 1                                                                   | 268.0                                                                 | 1.9                                                      | .108                                                                          |
| P5KE150A    | 167.0                   | 185.0        | 1                              | 150                                        | 1                                                                   | 243.0                                                                 | 2.1                                                      | .108                                                                          |
| P5KE160     | 178.0                   | 218.0        | 1                              | 160                                        | 1                                                                   | 287.0                                                                 | 1.7                                                      | .108                                                                          |
| P5KE160A    | 178.0                   | 197.0        | 1                              | 160                                        | 1                                                                   | 259.0                                                                 | 1.9                                                      | .108                                                                          |
| P5KE170     | 189.0                   | 231.0        | 1                              | 170                                        | 1                                                                   | 304.0                                                                 | 1.6                                                      | .108                                                                          |
| P5KE170A    | 189.0                   | 209.0        | 1                              | 170                                        | 1                                                                   | 275.0                                                                 | 1.8                                                      | .108                                                                          |

Note: For Bi-directional construction, indicate a C or CA suffix after the part number, i.e. P5KE5.0CA

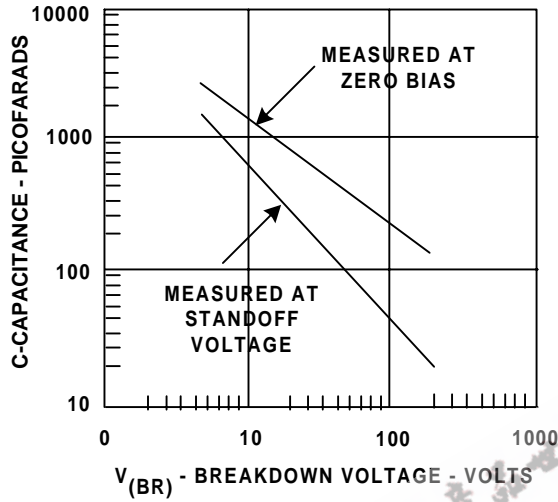
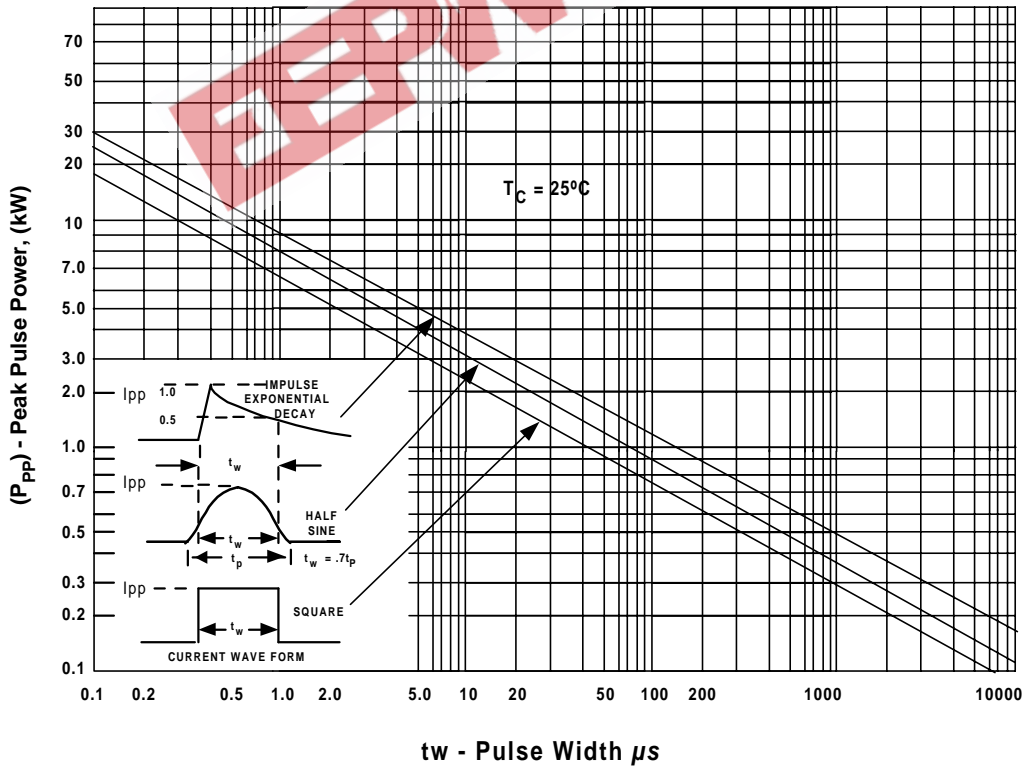


FIGURE 3  
TYPICAL CAPACITANCE VS  
BREAKDOWN VOLTAGE



tw - Pulse Width  $\mu$ s  
FIGURE 4  
PEAK PULSE POWER VS. PULSE TIME