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## FEATURES:

- BIDIRECTIONAL
- 1500 WATTS PEAK POWER
- VOLTAGE RANGE FROM 5.5V TO 185V
- LOW INDUCTANCE
- LOW PROFILE PACKAGE FOR SURFACE MOUNTING

## DESCRIPTION:

These Transient Voltage Suppressor devices are a series of Bi-directional Silicon Transient Suppressors used in AC applications where large voltage transients can permanently damage voltage-sensitive components.

These devices are manufactured using two silicon PN<sub>1</sub> junctions in a back to back configuration. They are characterized by their high surge capability, fast response time, and low impedance, ( $R_{on}$ ) for clamping surge.

The SMC series, rated for 1500 watts during a one millisecond pulse, can be used to protect sensitive circuits against transients induced by lighting and inductive load switching. The response time of TAZ clamping action is less than ( $5 \times 10^{-9}$ ) sec; therefore, they can protect Integrated Circuits, MOS devices, Hybrids, and other voltage-sensitive semiconductors and components. This series of devices has also been proven very effective as EMP and ESD suppressors.

## MAXIMUM RATINGS:

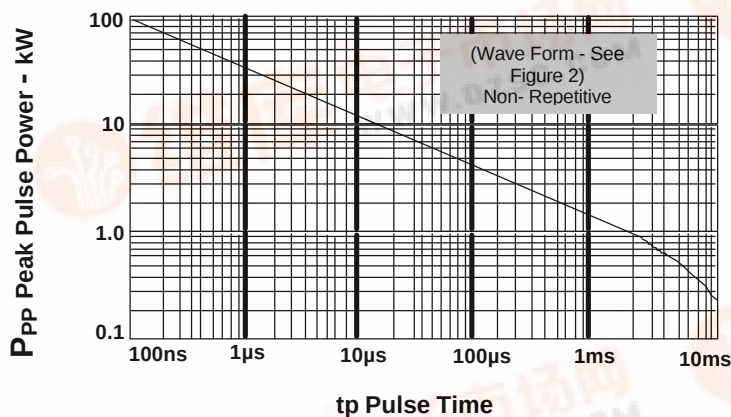
1500 watts of peak pulse power dissipation at 25°C

$t_{clamping}$  (0 volts to  $V_{(BR)}$  min): less than  $5 \times 10^{-9}$  seconds

Operating and Storage Temperature: -65° to +150°C

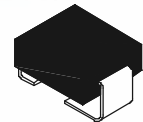
Steady state power dissipation: 5.0 watts at  $T_L = 25^\circ\text{C}$ , at mounting plane.

Repetition rate (duty cycle): .01%

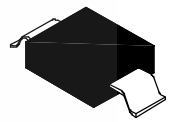


**SMCG/J6036  
thru  
SMCG/J6072A**

5.5 thru 185 Volts  
1500 Watts  
Transient Voltage  
Suppressors



DO-214AB



DO-215AB

## Mechanical Characteristics

**CASE:** Molded, Surface Mountable.

**TERMINALS:** Gull-wing or C-Bend (modified J-bend) leads, tin lead plated

**POLARITY:** No markings on bi-directional devices.

**PACKAGING:** 16mm tape (See EIA Std. RS-481.)

**THERMAL RESISTANCE:** 20°C/W (typical) junction to lead (tab) at mounting plane.



**ELECTRICAL CHARACTERISTICS @ 25°C**

| MICROSEMI<br>PART<br>NUMBER<br><br>MODIFIED<br>"G"<br>BEND LEAD | MICROSEMI<br>PART<br>NUMBER<br><br>MODIFIED<br>"J"<br>BEND LEAD | Rated<br>Stand-Off<br>Voltage<br><br>$V_{RM}$<br>(See Note 1) | BREAKDOWN<br>VOLTAGE<br><br>$V_{(BR)} @ I_T$<br>VOLTS |       |        | MAXIMUM<br>CLAMPING<br>VOLTAGE<br><br>$V_C @ I_{PP}$<br>(1 mSEC) | MAXIMUM<br>STANDOFF<br>CURRENT<br><br>$I_D @ V_{RM}$ | PEAK<br>PULSE<br>CURRENT<br>(See Fig. 2)<br>$I_{PP}$ | Maximum<br>Temperature<br>Coefficient<br><br>$\alpha_{V(BR)}$ |
|-----------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------|-------|--------|------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------|
|                                                                 |                                                                 |                                                               | VOLTS                                                 | MIN   | MAX mA |                                                                  |                                                      |                                                      |                                                               |
| SMCG6036                                                        | SMCJ6036                                                        | 5.5                                                           | 6.75                                                  | 8.25  | 10     | 11.7                                                             | 1000                                                 | 128                                                  | .061                                                          |
| SMCG6036A                                                       | SMCJ6036A                                                       | 6.0                                                           | 7.13                                                  | 7.88  | 10     | 11.3                                                             | 1000                                                 | 132                                                  | .061                                                          |
| SMCG6037                                                        | SMCJ6037                                                        | 6.5                                                           | 7.38                                                  | 9.02  | 10     | 12.5                                                             | 500                                                  | 120                                                  | .065                                                          |
| SMCG6037A                                                       | SMCJ6037A                                                       | 7.0                                                           | 7.79                                                  | 8.61  | 10     | 12.1                                                             | 500                                                  | 124                                                  | .065                                                          |
| SMCG6038                                                        | SMCJ6038                                                        | 7.0                                                           | 8.19                                                  | 10.00 | 10     | 13.8                                                             | 200                                                  | 109                                                  | .068                                                          |
| SMCG6038A                                                       | SMCJ6038A                                                       | 7.5                                                           | 8.65                                                  | 9.55  | 10     | 13.4                                                             | 200                                                  | 112                                                  | .068                                                          |
| SMCG6039                                                        | SMCJ6039                                                        | 8.0                                                           | 9.0                                                   | 11.0  | 1      | 15.0                                                             | 50                                                   | 100                                                  | .073                                                          |
| SMCG6039A                                                       | SMCJ6039A                                                       | 8.5                                                           | 9.5                                                   | 10.5  | 1      | 14.5                                                             | 50                                                   | 103                                                  | .073                                                          |
| SMCG6040                                                        | SMCJ6040                                                        | 8.5                                                           | 9.9                                                   | 12.1  | 1      | 16.2                                                             | 10                                                   | 93                                                   | .075                                                          |
| SMCG6040A                                                       | SMCJ6040A                                                       | 9.0                                                           | 10.5                                                  | 11.6  | 1      | 15.6                                                             | 10                                                   | 96                                                   | .075                                                          |
| SMCG6041                                                        | SMCJ6041                                                        | 9.0                                                           | 10.8                                                  | 13.2  | 1      | 17.3                                                             | 5                                                    | 87                                                   | .078                                                          |
| SMCG6041A                                                       | SMCJ6041A                                                       | 10.0                                                          | 11.4                                                  | 12.6  | 1      | 16.7                                                             | 5                                                    | 90                                                   | .078                                                          |
| SMCG6042                                                        | SMCJ6042                                                        | 10.0                                                          | 11.7                                                  | 14.3  | 1      | 19.0                                                             | 5                                                    | 79                                                   | .081                                                          |
| SMCG6042A                                                       | SMCJ6042A                                                       | 11.0                                                          | 12.4                                                  | 13.7  | 1      | 18.2                                                             | 5                                                    | 82                                                   | .081                                                          |
| SMCG6043                                                        | SMCJ6043                                                        | 11.0                                                          | 13.5                                                  | 16.5  | 1      | 22.0                                                             | 5                                                    | 68                                                   | .084                                                          |
| SMCG6043A                                                       | SMCJ6043A                                                       | 12.0                                                          | 14.3                                                  | 15.8  | 1      | 21.2                                                             | 5                                                    | 71                                                   | .084                                                          |
| SMCG6044                                                        | SMCJ6044                                                        | 12.0                                                          | 14.4                                                  | 17.5  | 1      | 23.5                                                             | 5                                                    | 64                                                   | .086                                                          |
| SMCG6044A                                                       | SMCJ6044A                                                       | 13.0                                                          | 15.2                                                  | 16.8  | 1      | 22.5                                                             | 5                                                    | 67                                                   | .068                                                          |
| SMCG6045                                                        | SMCJ6045                                                        | 14.0                                                          | 16.2                                                  | 19.8  | 1      | 26.5                                                             | 5                                                    | 56.5                                                 | .088                                                          |
| SMCG6045A                                                       | SMCJ6045A                                                       | 15.0                                                          | 17.1                                                  | 18.9  | 1      | 25.2                                                             | 5                                                    | 59.5                                                 | .088                                                          |
| SMCG6046                                                        | SMCJ6046                                                        | 16.0                                                          | 18.0                                                  | 22.0  | 1      | 29.1                                                             | 5                                                    | 51.5                                                 | .090                                                          |
| SMCG6046A                                                       | SMCJ6046A                                                       | 17.0                                                          | 19.0                                                  | 21.0  | 1      | 27.7                                                             | 5                                                    | 54                                                   | .090                                                          |
| SMCG6047                                                        | SMCJ6047                                                        | 17.0                                                          | 19.8                                                  | 24.2  | 1      | 31.9                                                             | 5                                                    | 47                                                   | .092                                                          |
| SMCG6047A                                                       | SMCJ6047A                                                       | 18.0                                                          | 20.9                                                  | 23.1  | 1      | 30.6                                                             | 5                                                    | 49                                                   | .092                                                          |
| SMCG6048                                                        | SMCJ6048                                                        | 19.0                                                          | 21.6                                                  | 26.4  | 1      | 34.7                                                             | 5                                                    | 43                                                   | .094                                                          |
| SMCG6048A                                                       | SMCJ6048A                                                       | 20.0                                                          | 22.8                                                  | 25.2  | 1      | 33.2                                                             | 5                                                    | 45                                                   | .094                                                          |
| SMCG6049                                                        | SMCJ6049                                                        | 21.0                                                          | 24.3                                                  | 29.7  | 1      | 39.1                                                             | 5                                                    | 38.5                                                 | .095                                                          |
| SMCG6049A                                                       | SMCJ6049A                                                       | 22.0                                                          | 25.7                                                  | 28.4  | 1      | 37.5                                                             | 5                                                    | 40                                                   | .096                                                          |
| SMCG6050                                                        | SMCJ6050                                                        | 24.0                                                          | 27.0                                                  | 33.0  | 1      | 43.5                                                             | 5                                                    | 34.5                                                 | .097                                                          |
| SMCG6050A                                                       | SMCJ6050A                                                       | 25.0                                                          | 28.5                                                  | 31.5  | 1      | 41.4                                                             | 5                                                    | 36                                                   | .097                                                          |
| SMCG6051                                                        | SMCJ6051                                                        | 26.0                                                          | 29.7                                                  | 36.3  | 1      | 47.7                                                             | 5                                                    | 31.5                                                 | .098                                                          |
| SMCG6051A                                                       | SMCJ6051A                                                       | 28.0                                                          | 31.4                                                  | 34.7  | 1      | 45.7                                                             | 5                                                    | 33                                                   | .098                                                          |
| SMCG6052                                                        | SMCJ6052                                                        | 29.0                                                          | 32.4                                                  | 39.6  | 1      | 52.0                                                             | 5                                                    | 29                                                   | .099                                                          |
| SMCG6052A                                                       | SMCJ6052A                                                       | 30.0                                                          | 34.2                                                  | 37.8  | 1      | 49.9                                                             | 5                                                    | 30                                                   | .099                                                          |
| SMCG6053                                                        | SMCJ6053                                                        | 31.0                                                          | 35.1                                                  | 42.9  | 1      | 56.4                                                             | 5                                                    | 26.5                                                 | .100                                                          |
| SMCG6053A                                                       | SMCJ6053A                                                       | 33.0                                                          | 37.1                                                  | 41.0  | 1      | 53.9                                                             | 5                                                    | 28                                                   | .100                                                          |
| SMCG6054                                                        | SMCJ6054                                                        | 34.0                                                          | 38.7                                                  | 47.3  | 1      | 61.9                                                             | 5                                                    | 24                                                   | .101                                                          |
| SMCG6054A                                                       | SMCJ6054A                                                       | 36.0                                                          | 40.9                                                  | 45.2  | 1      | 59.3                                                             | 5                                                    | 25.3                                                 | .101                                                          |
| SMCG6055                                                        | SMCJ6055                                                        | 38.0                                                          | 42.3                                                  | 51.7  | 1      | 67.8                                                             | 5                                                    | 22.2                                                 | .101                                                          |
| SMCG6055A                                                       | SMCJ6055A                                                       | 40.0                                                          | 44.7                                                  | 49.4  | 1      | 64.8                                                             | 5                                                    | 23.2                                                 | .101                                                          |
| SMCG6056                                                        | SMCJ6056                                                        | 41.0                                                          | 45.9                                                  | 56.1  | 1      | 73.5                                                             | 5                                                    | 20.4                                                 | .102                                                          |
| SMCG6056A                                                       | SMCJ6056A                                                       | 43.0                                                          | 48.5                                                  | 53.6  | 1      | 70.1                                                             | 5                                                    | 21.4                                                 | .102                                                          |
| SMCG6057                                                        | SMCJ6057                                                        | 45.0                                                          | 50.4                                                  | 61.6  | 1      | 80.5                                                             | 5                                                    | 18.6                                                 | .103                                                          |
| SMCG6057A                                                       | SMCJ6057A                                                       | 47.0                                                          | 53.2                                                  | 58.8  | 1      | 77.0                                                             | 5                                                    | 19.5                                                 | .103                                                          |

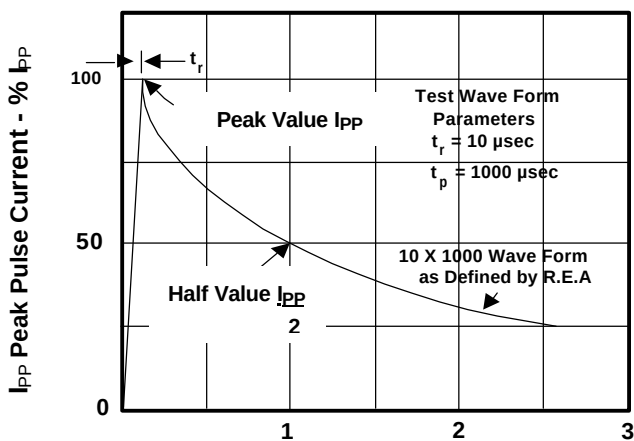
**ELECTRICAL CHARACTERISTICS @ 25°C**

| MICROSEMI<br>PART<br>NUMBER<br><br>MODIFIED<br>"G"<br>BEND LEAD | MICROSEMI<br>PART<br>NUMBER<br><br>MODIFIED<br>"J"<br>BEND LEAD | Rated<br>Stand-Off<br>Voltage<br><br>$V_{RM}$<br>(See Note 1) | BREAKDOWN<br>VOLTAGE<br><br>$V_{(BR)}$ @ $I_T$<br>VOLTS |       |    | MAXIMUM<br>CLAMPING<br>VOLTAGE<br><br>$V_C$ @ $I_{PP}$<br>(1 mSEC) | MAXIMUM<br>STANDOFF<br>CURRENT<br><br>$I_D$ @ $V_{RM}$ | PEAK<br>PULSE<br>CURRENT<br>(See Fig. 2)<br><br>$I_{PP}$ | Maximum<br>Temperature<br>Coefficient<br><br>$\alpha_{V(BR)}$ |
|-----------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|-------|----|--------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------|
|                                                                 |                                                                 | VOLTS                                                         | MIN                                                     | MAX   | mA | VOLTS                                                              | $\mu A$                                                | A                                                        | %/°C                                                          |
| SMCG6058                                                        | SMCJ6058                                                        | 48.0                                                          | 55.8                                                    | 68.2  | 1  | 89.0                                                               | 5                                                      | 16.9                                                     | .104                                                          |
| SMCG6058A                                                       | SMCJ6058A                                                       | 53.0                                                          | 58.9                                                    | 65.1  | 1  | 85.0                                                               | 5                                                      | 17.7                                                     | .104                                                          |
| SMCG6059                                                        | SMCJ6059                                                        | 55.0                                                          | 61.2                                                    | 74.8  | 1  | 98.0                                                               | 5                                                      | 15.3                                                     | .104                                                          |
| SMCG6059A                                                       | SMCJ6059A                                                       | 58.0                                                          | 64.6                                                    | 71.4  | 1  | 92.0                                                               | 5                                                      | 16.3                                                     | .104                                                          |
| SMCG6060                                                        | SMCJ6060                                                        | 60.0                                                          | 67.5                                                    | 82.5  | 1  | 108.0                                                              | 5                                                      | 13.9                                                     | .105                                                          |
| SMCG6060A                                                       | SMCJ6060A                                                       | 64.0                                                          | 71.3                                                    | 78.8  | 1  | 103.0                                                              | 5                                                      | 14.6                                                     | .105                                                          |
| SMCG6061                                                        | SMCJ6061                                                        | 66.0                                                          | 73.8                                                    | 90.2  | 1  | 118.0                                                              | 5                                                      | 12.7                                                     | .105                                                          |
| SMCG6061A                                                       | SMCJ6061A                                                       | 70.0                                                          | 77.9                                                    | 86.1  | 1  | 113.0                                                              | 5                                                      | 13.3                                                     | .105                                                          |
| SMCG6062                                                        | SMCJ6062                                                        | 73.0                                                          | 81.9                                                    | 100.0 | 1  | 131.0                                                              | 5                                                      | 11.4                                                     | .106                                                          |
| SMCG6062A                                                       | SMCJ6062A                                                       | 75.0                                                          | 86.5                                                    | 95.5  | 1  | 125.0                                                              | 5                                                      | 12.0                                                     | .106                                                          |
| SMCG6063                                                        | SMCJ6063                                                        | 81.0                                                          | 90.0                                                    | 110.0 | 1  | 144.0                                                              | 5                                                      | 10.4                                                     | .106                                                          |
| SMCG6063A                                                       | SMCJ6063A                                                       | 82.0                                                          | 95.0                                                    | 105.0 | 1  | 137.0                                                              | 5                                                      | 11.0                                                     | .106                                                          |
| SMCG6064                                                        | SMCJ6064                                                        | 90.0                                                          | 99.0                                                    | 121.0 | 1  | 158.0                                                              | 5                                                      | 9.5                                                      | .107                                                          |
| SMCG6064A                                                       | SMCJ6064A                                                       | 94.0                                                          | 105.0                                                   | 116.0 | 1  | 152.0                                                              | 5                                                      | 9.9                                                      | .107                                                          |
| SMCG6065                                                        | SMCJ6065                                                        | 95.0                                                          | 108.0                                                   | 132.0 | 1  | 176.0                                                              | 5                                                      | 8.5                                                      | .107                                                          |
| SMCG6065A                                                       | SMCJ6065A                                                       | 100.0                                                         | 114.0                                                   | 126.0 | 1  | 168.0                                                              | 5                                                      | 8.9                                                      | .107                                                          |
| SMCG6066                                                        | SMCJ6066                                                        | 105.0                                                         | 117.0                                                   | 143.0 | 1  | 191.0                                                              | 5                                                      | 7.8                                                      | .107                                                          |
| SMCG6066A                                                       | SMCJ6066A                                                       | 110.0                                                         | 124.0                                                   | 137.0 | 1  | 182.0                                                              | 5                                                      | 8.2                                                      | .107                                                          |
| SMCG6067                                                        | SMCJ6067                                                        | 121.0                                                         | 135.0                                                   | 165.0 | 1  | 223.0                                                              | 5                                                      | 6.7                                                      | .108                                                          |
| SMCG6067A                                                       | SMCJ6067A                                                       | 128.0                                                         | 143.0                                                   | 158.0 | 1  | 213.0                                                              | 5                                                      | 7.0                                                      | .108                                                          |
| SMCG6068                                                        | SMCJ6068                                                        | 137.0                                                         | 153.0                                                   | 187.0 | 1  | 258.0                                                              | 5                                                      | 5.8                                                      | .108                                                          |
| SMCG6068A                                                       | SMCJ6068A                                                       | 145.0                                                         | 162.0                                                   | 179.0 | 1  | 245.0                                                              | 5                                                      | 6.1                                                      | .108                                                          |
| SMCG6069                                                        | SMCJ6069                                                        | 145.0                                                         | 162.0                                                   | 198.0 | 1  | 274.0                                                              | 5                                                      | 5.5                                                      | .108                                                          |
| SMCG6069A                                                       | SMCJ6069A                                                       | 150.0                                                         | 171.0                                                   | 189.0 | 1  | 261.0                                                              | 5                                                      | 5.7                                                      | .108                                                          |
| SMCG6070                                                        | SMCJ6070                                                        | 155.0                                                         | 171.0                                                   | 210.0 | 1  | 292.0                                                              | 5                                                      | 5.1                                                      | .108                                                          |
| SMCG6070A                                                       | SMCJ6070A                                                       | 160.0                                                         | 181.0                                                   | 200.0 | 1  | 278.0                                                              | 5                                                      | 5.4                                                      | .108                                                          |
| SMCG6071                                                        | SMCJ6071                                                        | 165.0                                                         | 180.0                                                   | 220.0 | 1  | 308.0                                                              | 5                                                      | 4.9                                                      | .108                                                          |
| SMCG6071A                                                       | SMCJ6071A                                                       | 170.0                                                         | 190.0                                                   | 210.0 | 1  | 294.0                                                              | 5                                                      | 5.1                                                      | .108                                                          |
| SMCG6072                                                        | SMCJ6072                                                        | 175.0                                                         | 198.0                                                   | 242.0 | 1  | 344.0                                                              | 5                                                      | 4.3                                                      | .108                                                          |
| SMCG6072A                                                       | SMCJ6072A                                                       | 185.0                                                         | 209.0                                                   | 231.0 | 1  | 328.0                                                              | 5                                                      | 4.6                                                      | .108                                                          |

Microsemi Corp.'s SMC Series (1500W) surface mountable packages are designed specifically for transient voltage suppression. The wide leads assure a large surface contact and low resistance path for surge current flow to ground. These high-speed transient voltage suppressors can be used to effectively protect sensitive components such as integrated circuits and MOS devices.

**Note 1:** A TAZ is normally selected according to the rated "Stand Off Voltage"  $V_{RM}$  which should be equal to or greater than the DC or continuous peak operating voltage level.

## TRANSIENT VOLTAGE SUPPRESSORS



t - Time - msec  
Figure 2  
Pulse Waveform

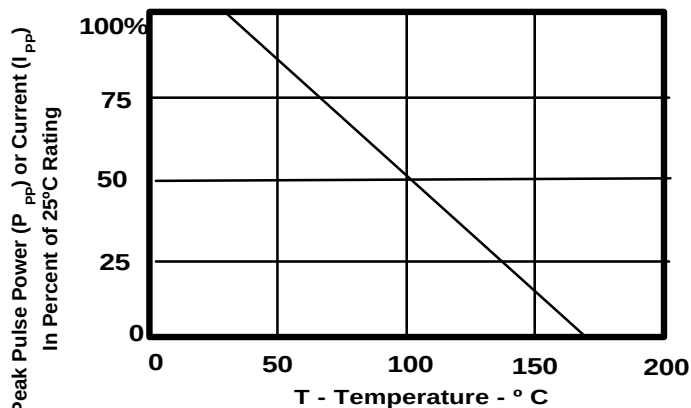


FIGURE 3  
Derating Curve

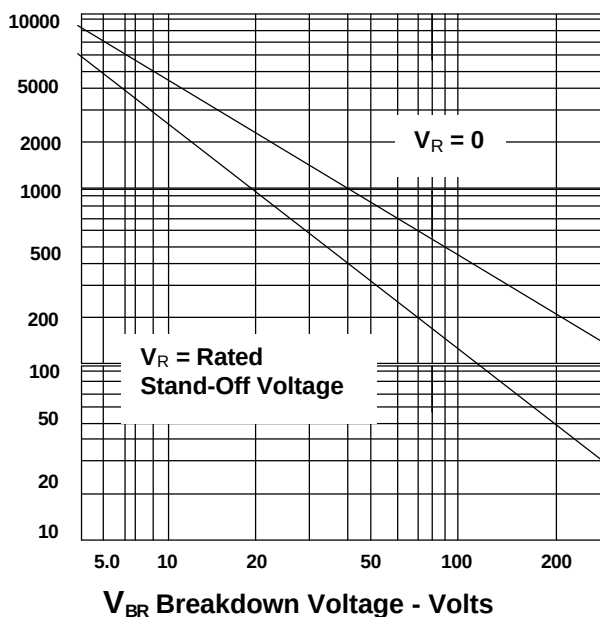
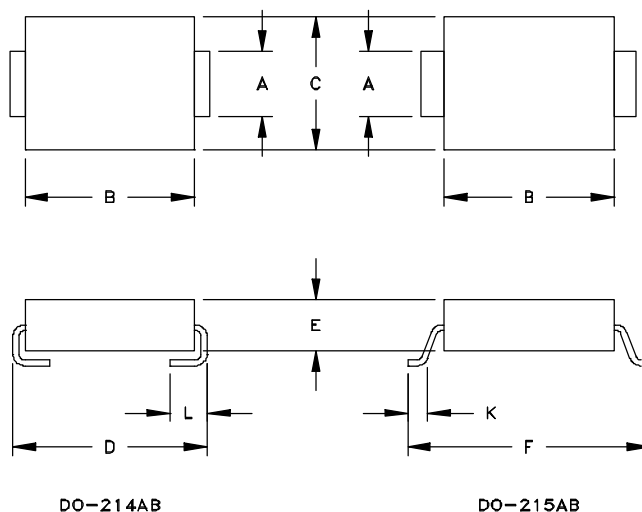


Figure 4  
TYPICAL CAPACITANCE  
VS BREAKDOWN VOLTAGE



| DIMENSIONS IN INCHES      |      |      |      |      |      |       |       |
|---------------------------|------|------|------|------|------|-------|-------|
|                           | A    | B    | C    | D    | E    | F     | K     |
| MIN.                      | .115 | .260 | .220 | .305 | .075 | .380  | .025  |
| MAX.                      | .121 | .280 | .245 | .320 | .095 | .400  | .040  |
| DIMENSIONS IN MILLIMETERS |      |      |      |      |      |       |       |
|                           | A    | B    | C    | D    | E    | F     | K     |
| MIN.                      | 2.92 | 6.60 | 5.59 | 7.75 | 1.90 | 9.65  | 0.635 |
| MAX.                      | 3.07 | 7.11 | 6.22 | 8.13 | 2.41 | 10.16 | 1.016 |

Typical Standoff Height: 0.004" - 0.008" (0.1mm - 0.2mm)