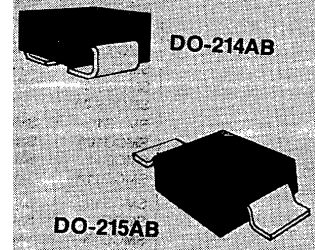


**DESCRIPTION**

These surface mount Transient Voltage Suppressors (TVSs) are used for protecting sensitive components requiring low clamping voltage levels. They are rated at high current impulses typically generated by inductive switching transients. Other benefits are achieved with low-profile surface mount J-bend or Gull-wing terminals for stress-relief and lower weight. Its low-flat profile provides easier insertion or automatic handling benefits compared to other MELF style packages. Options for screening similar to JAN, JANTX, JANTXV, and JANS also exist by using MQ, MX, MV or MSP prefixes respectively for part numbers and high reliability screening in accordance with MIL-PRF-19500/507.

**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**APPEARANCE**



**FEATURES**

- Working Standoff Voltages: 5.5 volts to 185 volts
- Metallurgically bonded
- Reliability data per JESD22-A108, JESD22-A104, JESD22-A113-B, JESD22-A101-B, and JESD22-A102
- Thermally efficient surface mount with J-bends or Gull wings termination for stress relief (flat handling surface and easier placement)
- Options for screening in accordance with MIL-PRF-19500/507 for JAN, JANTX, JANTXV, and JANS are available by adding MQ, MX, MV, or MSP prefixes to part numbers respectively. For example, designate a MXSMCJ6036A for a JANTX screen.

**APPLICATIONS / BENEFITS**

- For high reliability transient voltage suppression in low profile surface mount locations requiring easy placement and strain relief
- Light weight for airborne or satellite applications
- Superior surge quality to protect from ESD and EFT transients per IEC61000-4-2 and -4-4
- Lightning surge protection per IEC61000-4-5 for Class 1 and 2 with source impedance of 42 Ohms as well as Class 3 and 4 selectively at lower voltages ( $V_{WM}$ ) and higher surge current ( $I_{PP}$ ) ratings herein
- Protects sensitive components such as ICs, CMOS, Bipolar, BiCMOS, ECL, DTL, T<sup>2</sup>L, etc.

**MAXIMUM RATINGS**

- Operating temperature: -55°C to +150°C
- Storage temperature: -55°C to +150°C
- 1500 Watts of Peak Pulse Power at 10/1000  $\mu$ s as shown in Figure 3 (see Figure 1 for other  $t_P$  values)
- Thermal resistance,  $R_{\theta JL} = 20^\circ\text{C/W}$
- Impulse repetition rate (duty factor): 0.01%
- 5.0 Watt steady-state maximum power at  $T_L = 25^\circ\text{C}$
- $t_{clamping}$  (0V to  $V_{(BR)}$  min): less than 5 ns

**MECHANICAL AND PACKAGING**

- Molded epoxy package meets UL94V-0
- Terminals: solderable per MIL-STD-750 Method 2026. (max 260 °C for 10 sec.)
- Body marked with P/N without SMCJ or SMCG letters (ie. 6036A, 6039, 6053, 6072A, etc.)
- No polarity band is shown on these bi-directional types
- Weight: 0.25 grams (approximate)
- Tape & Reel packaging per EIA-481 (2500 units/reel)

**ELECTRICAL CHARACTERISTICS @ 25°C (Test Both Polarities)**

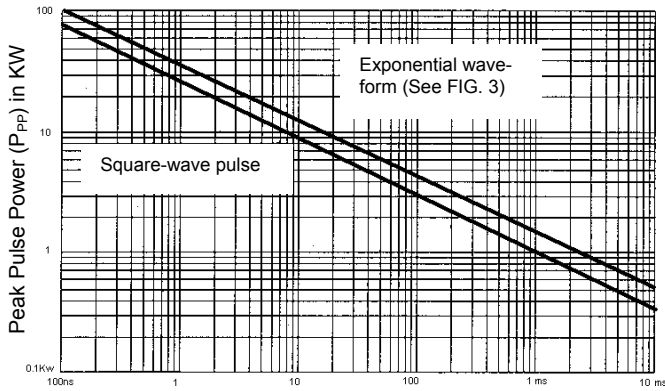
| MICROSEMI Part Number<br><br>Modified "G" Bend Lead | MICROSEMI Part Number<br><br>Modified "J" Bend Lead | Rated Stand-off Voltage (Note 1)<br><br>$V_{WM}$ Volts | Breakdown Voltage* |               | Maximum Clamping Voltage @ $I_{PP}$ (10/1000 $\mu$ s)<br><br>$V_C$ Volts | Maximum Standby Current @ $V_{WM}$<br><br>$I_D$ $\mu$ A | Maximum Peak Pulse Current (Fig. 2)<br><br>$I_{PP}$ A | Maximum Temperature Coefficient of $V_{(BR)}$<br><br>$\alpha_{V(BR)}$ %/°C |
|---|---|--|--------------------|---------------|--|---|---|--|
|   |   |  | $V_{(BR)}$ Volts   | $I_{(BR)}$ 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   |

| MICROSEMI Part Number<br><br>Modified "G" Bend Lead | MICROSEMI Part Number<br><br>Modified "J" Bend Lead | Rated Stand-off Voltage (Note 1)<br><br>V <sub>WM</sub> Volts | Breakdown Voltage*<br><br>V <sub>(BR)</sub> Volts @ I <sub>(BR)</sub> mA |   | Maximum Clamping Voltage @ I <sub>PP</sub> (10/1000 μs)<br><br>V <sub>C</sub> Volts | Maximum Standby Current @ V <sub>WM</sub><br><br>I <sub>D</sub> μA | Maximum Peak Pulse Current (Fig. 2)<br><br>I <sub>PP</sub> A | Maximum Temperature Coefficient of V <sub>(BR)</sub><br><br>α <sub>V(BR)</sub> %/°C |
|---|---|---|--|---|---|--|--|---|
|   |   |   |  |   |   |  |  |   |
| 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  |
| 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  |

NOTE 1: A TVS is normally selected according to the rated "Stand Off Voltage" V<sub>WM</sub> which should be equal to or greater than the dc or continuous peak operating voltage level.

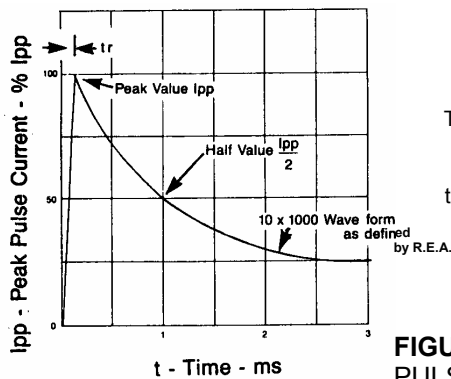
\* V<sub>(BR)</sub> is measured after I<sub>(BR)</sub> has been applied for ≤ 300 ms. No suffix is 10% tolerance and suffix A is 5% tolerance for V<sub>(BR)</sub>.

**OUTLINE AND CIRCUIT**



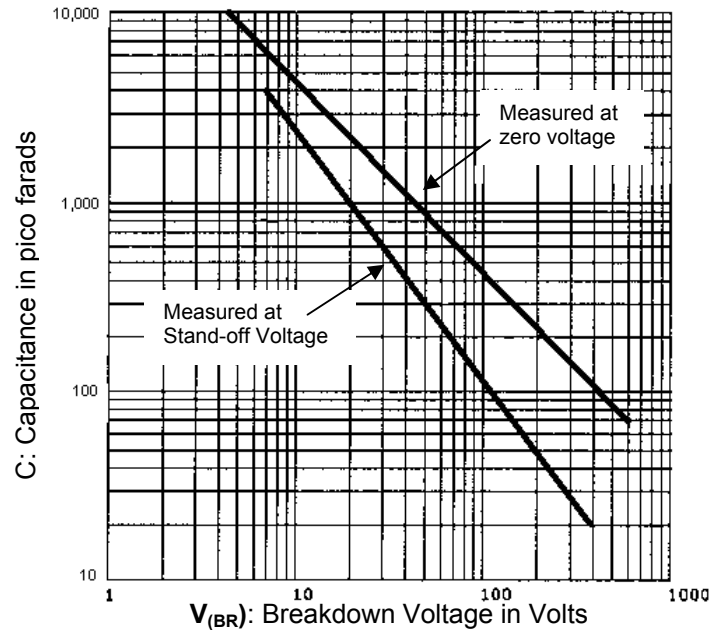
**FIGURE 1**  
Non-repetitive peak pulse power rating curve.

**Note:** Peak power defined as peak voltage times peak current.

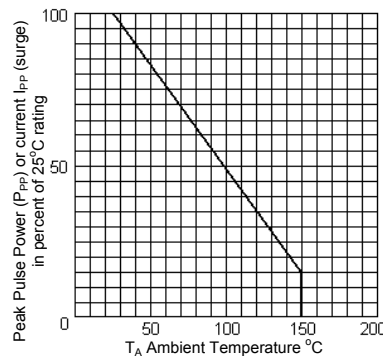


Test waveform parameters  
 $t_r = 10\mu\text{sec.}$   
 $t_p = 1000\mu\text{sec.}$

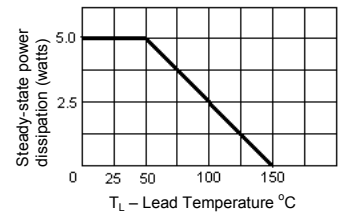
**FIGURE 3**  
PULSE WAVEFORM



**FIGURE 2** TYPICAL CAPACITANCE vs. BREAKDOWN VOLTAGE

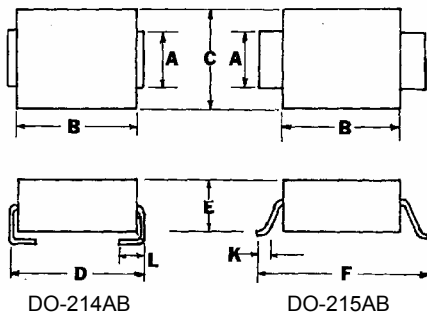


**FIGURE 4** Derating curve



**FIGURE 5**  
Steady-state power derating curve

**PACKAGE DIMENSIONS**



**DIMENSIONS IN INCHES**

|     |      |      |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|------|------|
|     | A    | B    | C    | D    | E    | F    | K    | L    |
| MIN | .115 | .260 | .220 | .305 | .075 | .380 | .025 | .30  |
| MAX | .121 | .280 | .245 | .320 | .095 | .400 | .040 | .060 |

**DIMENSIONS IN MILLIMETERS**

|     |      |      |      |      |      |       |       |       |
|-----|------|------|------|------|------|-------|-------|-------|
|     | A    | B    | C    | D    | E    | F     | K     | L     |
| MIN | 2.92 | 6.60 | 5.59 | 7.75 | 1.90 | 9.65  | 0.635 | 0.760 |
| MAX | 3.07 | 7.11 | 6.22 | 8.13 | 2.41 | 10.16 | 1.016 | 1.520 |