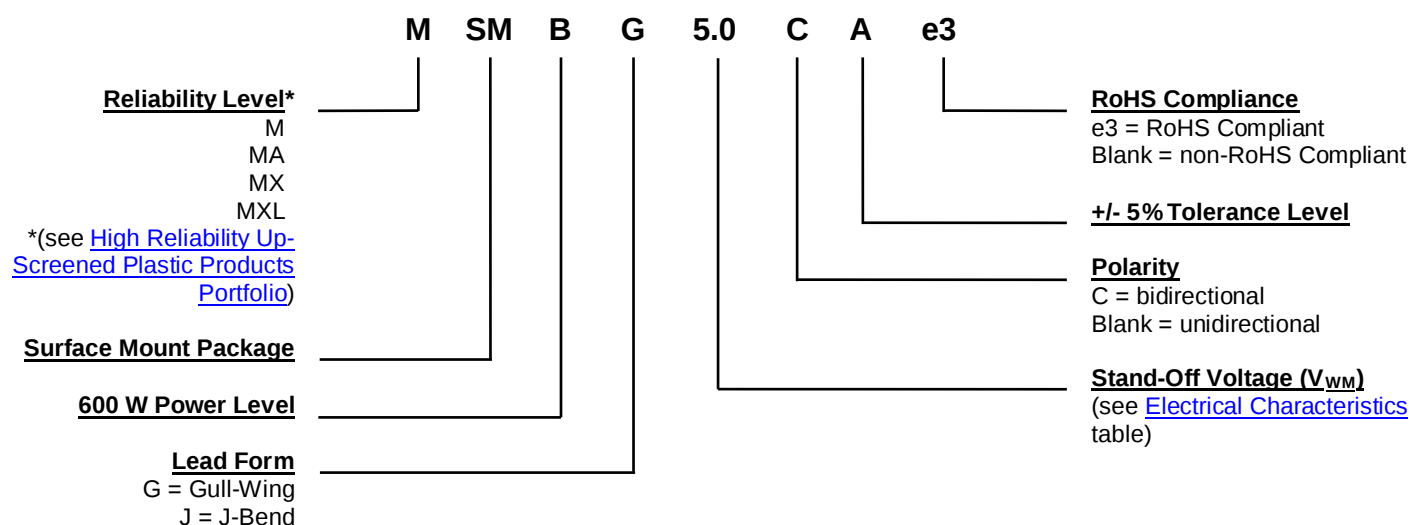


### MECHANICAL and PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0 requirements.
- TERMINALS: Tin-lead or RoHS compliant annealed matte-tin plating readily solderable per MIL-STD-750, method 2026.
- MARKING: Part number.
- POLARITY: Cathode end banded.
- TAPE & REEL option: Standard per EIA-481-1-A (add "TR" suffix to part number). Consult factory for quantities.
- WEIGHT: Approximately 0.1 grams.
- See [Package Dimensions](#) on last page.

### PART NOMENCLATURE

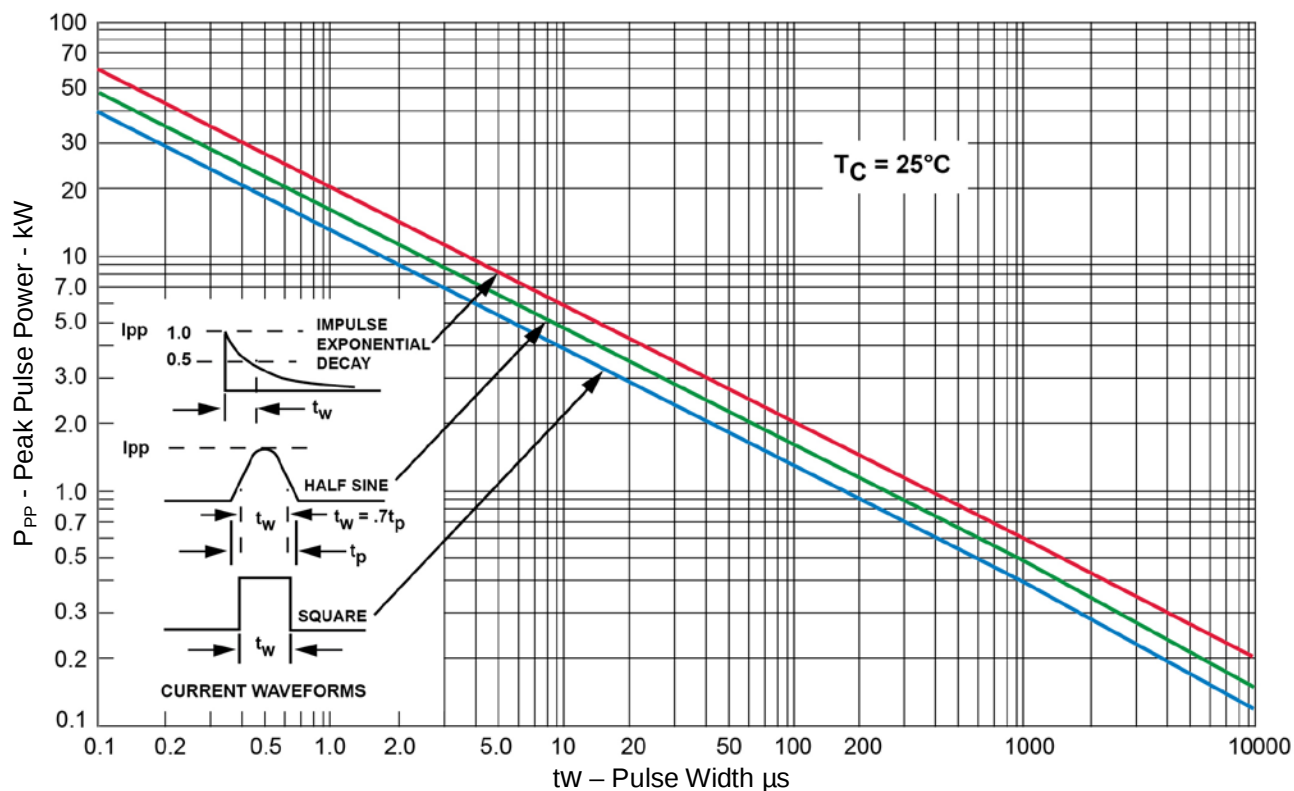


### SYMBOLS & DEFINITIONS

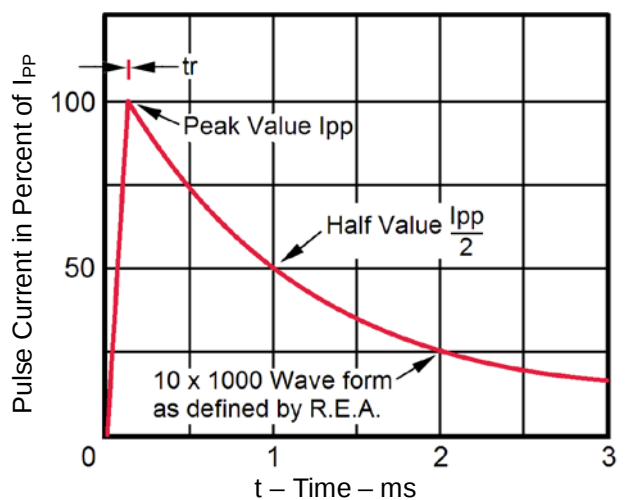
| Symbol     | Definition                                                                                                                                                         |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $V_{WM}$   | Working Peak (Standoff) Voltage - The maximum peak voltage that can be applied over the operating temperature range. This is also referred to as standoff voltage. |
| $P_{PP}$   | Peak Pulse Power - Rated random recurring peak impulse power dissipation.                                                                                          |
| $V_{(BR)}$ | Breakdown Voltage - The minimum voltage the device will exhibit at a specified current.                                                                            |
| $I_D$      | Standby Current - The current at the rated standoff voltage ( $V_{WM}$ ).                                                                                          |
| $I_{PP}$   | Peak Pulse Current - The peak current during the impulse.                                                                                                          |
| $V_C$      | Clamping Voltage - Clamping voltage at $I_{PP}$ (peak pulse current) at the specified pulse conditions (typically shown as maximum value).                         |
| $I_{BR}$   | Breakdown Current - The current used for measuring breakdown voltage $V_{(BR)}$ .                                                                                  |

**ELECTRICAL CHARACTERISTICS @ 25 °C**

| PART NUMBER |           | REVERSE<br>STAND-OFF<br>VOLTAGE<br>V <sub>WM</sub> | BREAKDOWN VOLTAGE<br><br>V(BR) @ I(BR) |    | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>V <sub>C</sub> @ I <sub>PP</sub> | PEAK PULSE<br>CURRENT<br>(see Fig. 2)<br>I <sub>PP</sub> | MAXIMUM<br>STANDBY<br>CURRENT<br>I <sub>D</sub> @ V <sub>WM</sub> |
|-------------|-----------|----------------------------------------------------|----------------------------------------|----|--------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------|
| Gull-Wing   | J-Bend    | V                                                  | V                                      | mA | V                                                                  | A                                                        | μA                                                                |
| MSMBG5.0A   | MSMBJ5.0A | 5                                                  | 6.40 – 7.00                            | 10 | 9.2                                                                | 65.2                                                     | 800                                                               |
| MSMBG6.0A   | MSMBJ6.0A | 6                                                  | 6.67 – 7.37                            | 10 | 10.3                                                               | 58.3                                                     | 800                                                               |
| MSMBG6.5A   | MSMBJ6.5A | 6.5                                                | 7.22 – 7.98                            | 10 | 11.2                                                               | 53.6                                                     | 500                                                               |
| MSMBG7.0A   | MSMBJ7.0A | 7                                                  | 7.78 – 8.60                            | 10 | 12                                                                 | 50                                                       | 200                                                               |
| MSMBG7.5A   | MSMBJ7.5A | 7.5                                                | 8.33 – 9.21                            | 1  | 12.9                                                               | 46.5                                                     | 100                                                               |
| MSMBG8.0A   | MSMBJ8.0A | 8                                                  | 8.89 – 9.83                            | 1  | 13.6                                                               | 44.1                                                     | 50                                                                |
| MSMBG8.5A   | MSMBJ8.5A | 8.5                                                | 9.44 – 10.4                            | 1  | 14.4                                                               | 41.7                                                     | 10                                                                |
| MSMBG9.0A   | MSMBJ9.0A | 9                                                  | 10.0 – 11.1                            | 1  | 15.4                                                               | 39                                                       | 5                                                                 |
| MSMBG10A    | MSMBJ10A  | 10                                                 | 11.1 – 12.3                            | 1  | 17                                                                 | 35.3                                                     | 5                                                                 |
| MSMBG11A    | MSMBJ11A  | 11                                                 | 12.2 – 13.5                            | 1  | 18.2                                                               | 33                                                       | 5                                                                 |
| MSMBG12A    | MSMBJ12A  | 12                                                 | 13.3 – 14.7                            | 1  | 19.9                                                               | 30.2                                                     | 5                                                                 |
| MSMBG13A    | MSMBJ13A  | 13                                                 | 14.4 – 15.9                            | 1  | 21.5                                                               | 27.9                                                     | 1                                                                 |
| MSMBG14A    | MSMBJ14A  | 14                                                 | 15.6 – 17.2                            | 1  | 23.2                                                               | 25.8                                                     | 1                                                                 |
| MSMBG15A    | MSMBJ15A  | 15                                                 | 16.7 – 18.5                            | 1  | 24.4                                                               | 24                                                       | 1                                                                 |
| MSMBG16A    | MSMBJ16A  | 16                                                 | 17.8 – 19.7                            | 1  | 26                                                                 | 23.1                                                     | 1                                                                 |
| MSMBG17A    | MSMBJ17A  | 17                                                 | 18.9 – 20.9                            | 1  | 27.6                                                               | 21.7                                                     | 1                                                                 |
| MSMBG18A    | MSMBJ18A  | 18                                                 | 20.0 – 22.1                            | 1  | 29.2                                                               | 20.5                                                     | 1                                                                 |
| MSMBG20A    | MSMBJ20A  | 20                                                 | 22.2 – 24.5                            | 1  | 32.4                                                               | 18.5                                                     | 1                                                                 |
| MSMBG22A    | MSMBJ22A  | 22                                                 | 24.4 – 26.9                            | 1  | 35.5                                                               | 16.9                                                     | 1                                                                 |
| MSMBG24A    | MSMBJ24A  | 24                                                 | 26.7 – 29.5                            | 1  | 38.9                                                               | 15.4                                                     | 1                                                                 |
| MSMBG26A    | MSMBJ26A  | 26                                                 | 28.9 – 31.9                            | 1  | 42.1                                                               | 14.2                                                     | 1                                                                 |
| MSMBG28A    | MSMBJ28A  | 28                                                 | 31.1 – 34.4                            | 1  | 45.4                                                               | 13.2                                                     | 1                                                                 |
| MSMBG30A    | MSMBJ30A  | 30                                                 | 33.3 – 36.8                            | 1  | 48.4                                                               | 12.4                                                     | 1                                                                 |
| MSMBG33A    | MSMBJ33A  | 33                                                 | 36.7 – 40.6                            | 1  | 53.3                                                               | 11.3                                                     | 1                                                                 |
| MSMBG36A    | MSMBJ36A  | 36                                                 | 40.0 – 44.2                            | 1  | 58.1                                                               | 10.3                                                     | 1                                                                 |
| MSMBG40A    | MSMBJ40A  | 40                                                 | 44.4 – 49.1                            | 1  | 64.5                                                               | 9.3                                                      | 1                                                                 |
| MSMBG43A    | MSMBJ43A  | 43                                                 | 47.8 – 52.8                            | 1  | 69.4                                                               | 8.6                                                      | 1                                                                 |
| MSMBG45A    | MSMBJ45A  | 45                                                 | 50.0 – 55.3                            | 1  | 72.7                                                               | 8.3                                                      | 1                                                                 |
| MSMBG48A    | MSMBJ48A  | 48                                                 | 53.3 – 58.9                            | 1  | 77.4                                                               | 7.7                                                      | 1                                                                 |
| MSMBG51A    | MSMBJ51A  | 51                                                 | 56.7 – 62.7                            | 1  | 82.4                                                               | 7.3                                                      | 1                                                                 |
| MSMBG54A    | MSMBJ54A  | 54                                                 | 60.0 – 66.3                            | 1  | 87.1                                                               | 6.9                                                      | 1                                                                 |
| MSMBG58A    | MSMBJ58A  | 58                                                 | 64.4 – 71.2                            | 1  | 93.6                                                               | 6.4                                                      | 1                                                                 |
| MSMBG60A    | MSMBJ60A  | 60                                                 | 66.7 – 73.7                            | 1  | 96.8                                                               | 6.2                                                      | 1                                                                 |
| MSMBG64A    | MSMBJ64A  | 64                                                 | 71.1 – 78.6                            | 1  | 103                                                                | 5.8                                                      | 1                                                                 |
| MSMBG70A    | MSMBJ70A  | 70                                                 | 77.8 – 86.0                            | 1  | 113                                                                | 5.3                                                      | 1                                                                 |
| MSMBG75A    | MSMBJ75A  | 75                                                 | 83.3 – 92.1                            | 1  | 121                                                                | 4.9                                                      | 1                                                                 |
| MSMBG78A    | MSMBJ78A  | 78                                                 | 86.7 – 95.8                            | 1  | 126                                                                | 4.7                                                      | 1                                                                 |
| MSMBG85A    | MSMBJ85A  | 85                                                 | 94.4 – 104                             | 1  | 137                                                                | 4.4                                                      | 1                                                                 |
| MSMBG90A    | MSMBJ90A  | 90                                                 | 100 – 111                              | 1  | 146                                                                | 4.1                                                      | 1                                                                 |
| MSMBG100A   | MSMBJ100A | 100                                                | 111 – 123                              | 1  | 162                                                                | 3.7                                                      | 1                                                                 |
| MSMBG110A   | MSMBJ110A | 110                                                | 122 – 135                              | 1  | 177                                                                | 3.4                                                      | 1                                                                 |
| MSMBG120A   | MSMBJ120A | 120                                                | 133 – 147                              | 1  | 193                                                                | 3.1                                                      | 1                                                                 |
| MSMBG130A   | MSMBJ130A | 130                                                | 144 – 159                              | 1  | 209                                                                | 2.9                                                      | 1                                                                 |
| MSMBG150A   | MSMBJ150A | 150                                                | 167 – 185                              | 1  | 243                                                                | 2.5                                                      | 1                                                                 |
| MSMBG160A   | MSMBJ160A | 160                                                | 178 – 197                              | 1  | 259                                                                | 2.3                                                      | 1                                                                 |
| MSMBG170A   | MSMBJ170A | 170                                                | 189 – 209                              | 1  | 275                                                                | 2.2                                                      | 1                                                                 |

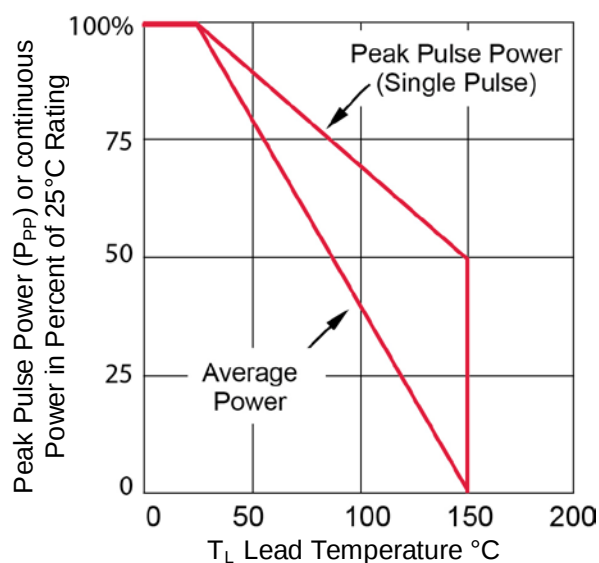
**GRAPHS**


**FIGURE 1**  
Peak Pulse Power vs Pulse Time

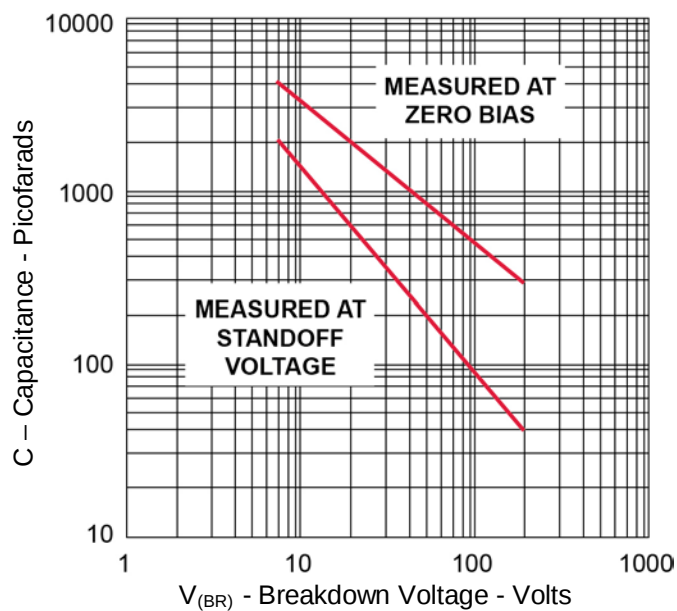


Test waveform parameters:  $t_r = 10 \mu\text{s}$ ,  $t_p = 1000 \mu\text{s}$

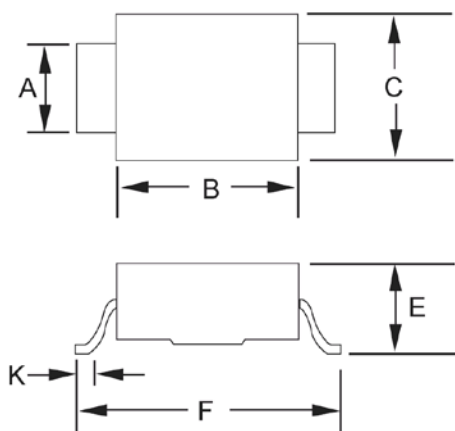
**FIGURE 2**  
Pulse Waveform for 10/1000 Exponential Surge

**GRAPHS (continued)**


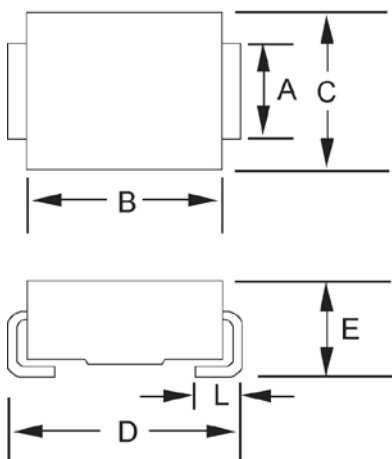
**FIGURE 3**  
Derating Curve



**FIGURE 4**  
Typical Capacitance vs. Breakdown Voltage  
NOTE: Bidirectional capacitance is half that shown at zero volts.

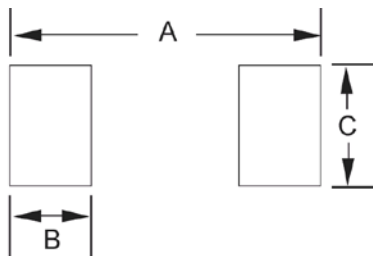
**PACKAGE DIMENSIONS**

**SMBG (DO-215AA)**

| Ltr | Dimensions |      |             |      |
|-----|------------|------|-------------|------|
|     | Inch       |      | Millimeters |      |
|     | Min        | Max  | Min         | Max  |
| A   | .077       | .083 | 1.96        | 2.10 |
| B   | .160       | .180 | 4.06        | 4.57 |
| C   | .130       | .155 | 3.30        | 3.94 |
| E   | .077       | .104 | 1.95        | 2.65 |
| F   | .235       | .255 | 5.97        | 6.48 |
| K   | .015       | .030 | .381        | .762 |


**SMBJ (DO-214AA)**

| Ltr | Dimensions |      |             |      |
|-----|------------|------|-------------|------|
|     | Inch       |      | Millimeters |      |
|     | Min        | Max  | Min         | Max  |
| A   | .077       | .083 | 1.96        | 2.10 |
| B   | .160       | .180 | 4.06        | 4.57 |
| C   | .130       | .155 | 3.30        | 3.94 |
| D   | .205       | .220 | 5.21        | 5.59 |
| E   | .077       | .104 | 1.95        | 2.65 |
| L   | .030       | .060 | .760        | 1.52 |

See pad layout on next page.

**PAD LAYOUT**


| <b>SMBG (DO-215AA)</b> |             |                    |
|------------------------|-------------|--------------------|
| <b>Ltr</b>             | <b>Inch</b> | <b>Millimeters</b> |
| <b>A</b>               | 0.320       | 8.13               |
| <b>B</b>               | 0.085       | 2.16               |
| <b>C</b>               | 0.110       | 2.79               |

| <b>SMBJ (DO-214AA)</b> |             |                    |
|------------------------|-------------|--------------------|
| <b>Ltr</b>             | <b>Inch</b> | <b>Millimeters</b> |
| <b>A</b>               | 0.260       | 6.60               |
| <b>B</b>               | 0.085       | 2.16               |
| <b>C</b>               | 0.110       | 2.79               |