

SMB* SERIES
5.0 thru 170.0
Volts
600 WATTS

FEATURES

- LOW PROFILE PACKAGE FOR SURFACE MOUNTING
- VOLTAGE RANGE: 5.0 TO 170 VOLTS
- 600 WATTS PEAK POWER
- UNIDIRECTIONAL AND BIDIRECTIONAL
- LOW INDUCTANCE

This series of TAZ (transient absorption zeners), available in small outline surface mountable packages, is designed to optimize board space. Packaged for use with surface mount technology automated assembly equipment, these parts can be placed on printed circuit boards and ceramic substrates to protect sensitive components from transient voltage damage.

The SMB series, rated for 600 watts, during a one millisecond pulse, can be used to protect sensitive circuits against transients induced by lightning and inductive load switching. With a response time of 1×10^{-12} seconds (theoretical) they are also effective against electrostatic discharge and NEMP.

MAXIMUM RATINGS

600 watts of Peak Power dissipation ($10 \times 1000 \mu\text{s}$)
 t_{clamping} (0 volts to V_{BR} min): less than 1×10^{-12} seconds (theoretical)
 Forward surge rating: 50 Amps, 1/120 sec @ 25°C (Excluding Bidirectional)
 Operating and Storage Temperature: -65° to +175°C

NOTE: A TAZ is normally selected according to the reverse "Stand Off Voltage" (V_{RM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

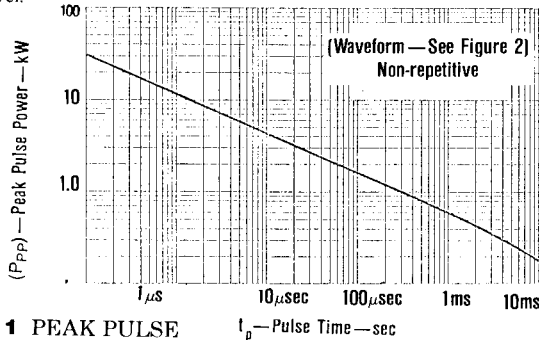


FIGURE 1 PEAK PULSE POWER VS PULSE TIME

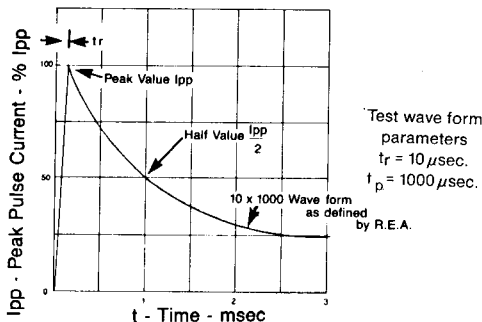
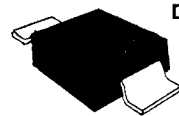


FIGURE 2 PULSE WAVEFORM

UNI- and BI-DIRECTIONAL SURFACE MOUNT



DO-215AA



DO-214AA

See Page 3-39 for Package Dimensions.

* **NOTE:** All SMB series are equivalent to prior SMS package identifications.

MECHANICAL CHARACTERISTICS

CASE: Molded Surface Mountable.
 TERMINALS: Gull-wing or C-bend (modified J-bend) leads, tin lead plated.
 POLARITY: Cathode indicated by band. No marking on bidirectional devices.
 PACKAGING: Standard 12 mm tape (see EIA Std. RS-481).

THERMAL RESISTANCE: 25°C/W (typical) junction to lead (tab) at mounting plane.

SMB 5.0 thru 170 Volts

ELECTRICAL CHARACTERISTICS @ 25°C

| MICROSEMI CORP. PART NUMBER | | REVERSE STAND-OFF VOLTAGE (See Note) V_{WM} VOLTS | BREAKDOWN VOLTAGE V_{BR} @ I_T VOLTS | | I_T mA | MAXIMUM CLAMPING VOLTAGE @ I_{PP} VOLTS | PEAK PULSE CURRENT (See Fig. 2) I_{PP} AMPS | MAXIMUM REVERSE LEAKAGE @ V_{WM} I_{R} μ A |
|--------------------------------|---------------------------|--------------------------------------------------------------------|---------------------------------------------------|------|-------------|-------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------|
| GULL-WING LEAD | MODIFIED "J" BEND LEAD | | MIN. | MAX. | | | | |
| SMBG5.0 | SMBJ5.0 | 5.0 | 6.40 - 7.30 | 10 | 9.6 | 62.5 | 800 | |
| SMBG5.0A | SMBJ5.0A | 5.0 | 6.40 - 7.00 | 10 | 9.2 | 65.2 | 800 | |
| SMBG6.0 | SMBJ6.0 | 6.0 | 6.67 - 8.15 | 10 | 11.4 | 52.6 | 800 | |
| SMBG6.0A | SMBJ6.0A | 6.0 | 6.67 - 7.37 | 10 | 10.3 | 58.3 | 800 | |
| SMBG6.5 | SMBJ6.5 | 6.5 | 7.22 - 8.82 | 10 | 12.3 | 48.7 | 500 | |
| SMBG6.5A | SMBJ6.5A | 6.5 | 7.22 - 7.98 | 10 | 11.2 | 53.6 | 500 | |
| SMBG7.0 | SMBJ7.0 | 7.0 | 7.78 - 9.51 | 10 | 13.3 | 45.1 | 200 | |
| SMBG7.0A | SMBJ7.0A | 7.0 | 7.78 - 8.60 | 10 | 12.0 | 50.0 | 200 | |
| SMBG7.5 | SMBJ7.5 | 7.5 | 8.33 - 10.2 | 1 | 14.3 | 42.0 | 100 | |
| SMBG7.5A | SMBJ7.5A | 7.5 | 8.33 - 9.21 | 1 | 12.9 | 46.5 | 100 | |
| SMBG8.0 | SMBJ8.0 | 8.0 | 8.89 - 10.9 | 1 | 15.0 | 40.0 | 50 | |
| SMBG8.0A | SMBJ8.0A | 8.0 | 8.89 - 9.83 | 1 | 13.6 | 44.1 | 50 | |
| SMBG8.5 | SMBJ8.5 | 8.5 | 9.44 - 11.5 | 1 | 15.9 | 37.7 | 10 | |
| SMBG8.5A | SMBJ8.5A | 8.5 | 9.44 - 10.4 | 1 | 14.4 | 41.7 | 10 | |
| SMBG9.0 | SMBJ9.0 | 9.0 | 10.0 - 12.2 | 1 | 16.9 | 35.5 | 5 | |
| SMBG9.0A | SMBJ9.0A | 9.0 | 10.0 - 11.1 | 1 | 15.4 | 39.0 | 5 | |
| SMBG10 | SMBJ10 | 10 | 11.1 - 13.6 | 1 | 18.8 | 31.9 | 5 | |
| SMBG10A | SMBJ10A | 10 | 11.1 - 12.3 | 1 | 17.0 | 35.3 | 5 | |
| SMBG11 | SMBJ11 | 11 | 12.2 - 14.9 | 1 | 20.1 | 29.9 | 5 | |
| SMBG11A | SMBJ11A | 11 | 12.2 - 13.5 | 1 | 18.2 | 33.0 | 5 | |
| SMBG12 | SMBJ12 | 12 | 13.3 - 16.3 | 1 | 22.0 | 27.3 | 5 | |
| SMBG12A | SMBJ12A | 12 | 13.3 - 14.7 | 1 | 19.9 | 30.2 | 5 | |
| SMBG13 | SMBJ13 | 13 | 14.4 - 17.6 | 1 | 23.8 | 25.2 | 5 | |
| SMBG13A | SMBJ13A | 13 | 14.4 - 15.9 | 1 | 21.5 | 27.9 | 5 | |
| SMBG14 | SMBJ14 | 14 | 15.6 - 19.1 | 1 | 25.8 | 23.3 | 5 | |
| SMBG14A | SMBJ14A | 14 | 15.6 - 17.2 | 1 | 23.2 | 25.8 | 5 | |
| SMBG15 | SMBJ15 | 15 | 16.7 - 20.4 | 1 | 26.9 | 22.3 | 5 | |
| SMBG15A | SMBJ15A | 15 | 16.7 - 18.5 | 1 | 24.4 | 24.0 | 5 | |
| SMBG16 | SMBJ16 | 16 | 17.8 - 21.8 | 1 | 28.8 | 20.8 | 5 | |
| SMBG16A | SMBJ16A | 16 | 17.8 - 19.7 | 1 | 26.0 | 23.1 | 5 | |
| SMBG17 | SMBJ17 | 17 | 18.9 - 23.1 | 1 | 30.5 | 19.7 | 5 | |
| SMBG17A | SMBJ17A | 17 | 18.9 - 20.9 | 1 | 27.6 | 21.7 | 5 | |
| SMBG18 | SMBJ18 | 18 | 20.0 - 24.4 | 1 | 32.2 | 18.6 | 5 | |
| SMBG18A | SMBJ18A | 18 | 20.0 - 22.1 | 1 | 29.2 | 20.5 | 5 | |
| SMBG20 | SMBJ20 | 20 | 22.2 - 27.1 | 1 | 35.8 | 16.7 | 5 | |
| SMBG20A | SMBJ20A | 20 | 22.2 - 24.5 | 1 | 32.4 | 18.5 | 5 | |
| SMBG22 | SMBJ22 | 22 | 24.4 - 29.8 | 1 | 39.4 | 15.2 | 5 | |
| SMBG22A | SMBJ22A | 22 | 24.4 - 26.9 | 1 | 35.5 | 16.9 | 5 | |
| SMBG24 | SMBJ24 | 24 | 26.7 - 32.6 | 1 | 43.0 | 14.0 | 5 | |
| SMBG24A | SMBJ24A | 24 | 26.7 - 29.5 | 1 | 38.9 | 15.4 | 5 | |
| SMBG26 | SMBJ26 | 26 | 28.9 - 35.3 | 1 | 46.6 | 12.4 | 5 | |
| SMBG26A | SMBJ26A | 26 | 28.9 - 31.9 | 1 | 42.1 | 14.2 | 5 | |
| SMBG28 | SMBJ28 | 28 | 31.1 - 38.0 | 1 | 50.0 | 12.0 | 5 | |
| SMBG28A | SMBJ28A | 28 | 31.1 - 34.4 | 1 | 45.4 | 13.2 | 5 | |
| SMBG30 | SMBJ30 | 30 | 33.3 - 40.7 | 1 | 53.5 | 11.2 | 5 | |
| SMBG30A | SMBJ30A | 30 | 33.3 - 36.8 | 1 | 48.4 | 12.4 | 5 | |
| SMBG33 | SMBJ33 | 33 | 36.7 - 44.9 | 1 | 59.0 | 10.2 | 5 | |
| SMBG33A | SMBJ33A | 33 | 36.7 - 40.6 | 1 | 53.3 | 11.3 | 5 | |
| SMBG36 | SMBJ36 | 36 | 40.0 - 48.9 | 1 | 64.3 | 9.3 | 5 | |
| SMBG36A | SMBJ36A | 36 | 40.0 - 44.2 | 1 | 58.1 | 10.3 | 5 | |
| SMBG40 | SMBJ40 | 40 | 44.4 - 54.3 | 1 | 71.4 | 8.4 | 5 | |
| SMBG40A | SMBJ40A | 40 | 44.4 - 49.1 | 1 | 64.5 | 9.3 | 5 | |
| SMBG43 | SMBJ43 | 43 | 47.8 - 58.4 | 1 | 76.7 | 7.8 | 5 | |
| SMBG43A | SMBJ43A | 43 | 47.8 - 52.8 | 1 | 69.4 | 8.6 | 5 | |
| SMBG45 | SMBJ45 | 45 | 50.0 - 61.1 | 1 | 80.3 | 7.5 | 5 | |
| SMBG45A | SMBJ45A | 45 | 50.0 - 55.3 | 1 | 72.7 | 8.3 | 5 | |
| SMBG48 | SMBJ48 | 48 | 53.3 - 65.1 | 1 | 85.5 | 7.0 | 5 | |
| SMBG48A | SMBJ48A | 48 | 53.3 - 58.9 | 1 | 77.4 | 7.7 | 5 | |
| SMBG51 | SMBJ51 | 51 | 56.7 - 69.3 | 1 | 91.1 | 6.6 | 5 | |
| SMBG51A | SMBJ51A | 51 | 56.7 - 62.7 | 1 | 82.4 | 7.3 | 5 | |
| SMBG54 | SMBJ54 | 54 | 60.0 - 73.3 | 1 | 96.3 | 6.2 | 5 | |
| SMBG54A | SMBJ54A | 54 | 60.0 - 66.3 | 1 | 87.1 | 6.9 | 5 | |
| SMBG58 | SMBJ58 | 58 | 64.4 - 78.7 | 1 | 103.0 | 5.8 | 5 | |
| SMBG58A | SMBJ58A | 58 | 64.4 - 71.2 | 1 | 93.6 | 6.4 | 5 | |
| SMBG60 | SMBJ60 | 60 | 66.7 - 81.5 | 1 | 107.0 | 5.6 | 5 | |
| SMBG60A | SMBJ60A | 60 | 66.7 - 73.7 | 1 | 96.8 | 6.2 | 5 | |
| SMBG64 | SMBJ64 | 64 | 71.1 - 86.9 | 1 | 114.0 | 5.3 | 5 | |
| SMBG64A | SMBJ64A | 64 | 71.1 - 78.6 | 1 | 103.0 | 5.8 | 5 | |

SMB 5.0 thru 170 Volts

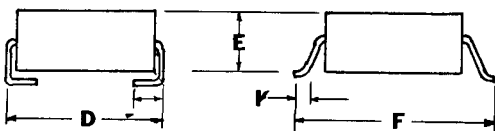
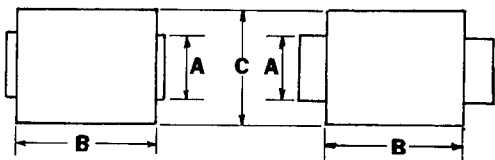
ELECTRICAL CHARACTERISTICS @ 25°C

| MICROSEMI CORP. PART NUMBER | | REVERSE STAND-OFF VOLTAGE (See Note) V_{WM} VOLTS | BREAKDOWN VOLTAGE $V_{(BR)}$ @ I_T VOLTS | | MAXIMUM CLAMPING VOLTAGE @ I_{PP} VOLTS | PEAK PULSE CURRENT (See Fig. 2) I_{PP} AMPS | MAXIMUM REVERSE LEAKAGE @ V_{WM} I_D μA |
|--------------------------------|---------------------------|--------------------------------------------------------------------|-----------------------------------------------------|------|-------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------|
| GULL-WING LEAD | MODIFIED "J" BEND LEAD | | MIN. | MAX. | | | |
| SMBG70 | SMBJ70 | 70 | 77.8-95.1 | 1 | 125 | 4.8 | 5 |
| SMBG70A | SMBJ70A | 70 | 77.8-86.0 | 1 | 113 | 5.3 | 5 |
| SMBG75 | SMBJ75 | 75 | 83.3-102.0 | 1 | 134 | 4.5 | 5 |
| SMBG75A | SMBJ75A | 75 | 83.3-92.1 | 1 | 121 | 4.9 | 5 |
| SMBG78 | SMBJ78 | 78 | 86.7-106.0 | 1 | 139 | 4.3 | 5 |
| SMBG78A | SMBJ78A | 78 | 86.7-95.8 | 1 | 126 | 4.7 | 5 |
| SMBG85 | SMBJ85 | 85 | 94.4-115.0 | 1 | 151 | 3.9 | 5 |
| SMBG85A | SMBJ85A | 85 | 94.4-104.0 | 1 | 137 | 4.4 | 5 |
| SMBG90 | SMBJ90 | 90 | 100-122 | 1 | 160 | 3.8 | 5 |
| SMBG90A | SMBJ90A | 90 | 100-111 | 1 | 146 | 4.1 | 5 |
| SMBG100 | SMBJ100 | 100 | 111-136 | 1 | 179 | 3.4 | 5 |
| SMBG100A | SMBJ100A | 100 | 111-123 | 1 | 162 | 3.7 | 5 |
| SMBG110 | SMBJ110 | 110 | 122-149 | 1 | 196 | 3.0 | 5 |
| SMBG110A | SMBJ110A | 110 | 122-135 | 1 | 177 | 3.4 | 5 |
| SMBG120 | SMBJ120 | 120 | 133-163 | 1 | 214 | 2.8 | 5 |
| SMBG120A | SMBJ120A | 120 | 133-147 | 1 | 193 | 3.1 | 5 |
| SMBG130 | SMBJ130 | 130 | 144-176 | 1 | 231 | 2.6 | 5 |
| SMBG130A | SMBJ130A | 130 | 144-159 | 1 | 209 | 2.9 | 5 |
| SMBG150 | SMBJ150 | 150 | 167-204 | 1 | 268 | 2.2 | 5 |
| SMBG150A | SMBJ150A | 150 | 167-185 | 1 | 243 | 2.5 | 5 |
| SMBG160 | SMBJ160 | 160 | 178-218 | 1 | 287 | 2.1 | 5 |
| SMBG160A | SMBJ160A | 160 | 178-197 | 1 | 259 | 2.3 | 5 |
| SMBG170 | SMBJ170 | 170 | 189-231 | 1 | 304 | 2.0 | 5 |
| SMBG170A | SMBJ170A | 170 | 189-209 | 1 | 275 | 2.2 | 5 |

For Bidirectional indicate a C or CA suffix after the part number. (i.e.: SMBG170CA or SMBJ170C)

Microsemi Corp.'s SMB Series (600W) surface mountable packages are designed specifically for transient voltage suppression. The wide leads assure a large surface contact for good heat dissipation, and a 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.

PACKAGE DIMENSIONS



DO-214AA

DO-215AA

DIMENSIONS IN INCHES

| | A | B | C | D | E | F | K | L |
|---------------------------|------|------|------|------|------|------|-------|-------|
| MIN. | .077 | .160 | .130 | .205 | .075 | .235 | .015 | .030 |
| MAX. | .083 | .180 | .155 | .220 | .095 | .255 | .030 | .060 |
| DIMENSIONS IN MILLIMETERS | | | | | | | | |
| MIN. | 1.96 | 4.06 | 3.30 | 5.21 | 1.90 | 5.97 | 0.381 | 0.760 |
| MAX. | 2.10 | 4.57 | 3.94 | 5.59 | 2.41 | 6.48 | 0.762 | 1.520 |

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

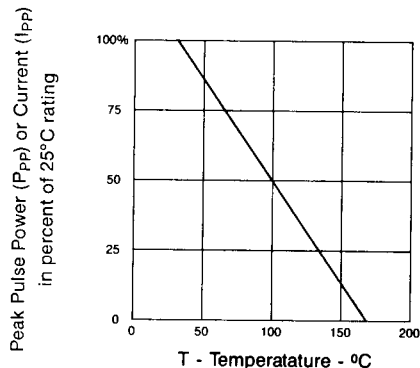


FIGURE 3 DERATING CURVE

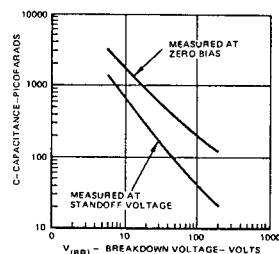


FIGURE 4
TYPICAL CAPACITANCE VS.
BREAKDOWN VOLTAGE