Surface Mount TRANSZORB®
Transient Voltage Suppressors

**FEATURES**
- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Available in unidirectional and bidirectional
- 600 W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified

**TYPICAL APPLICATIONS**
Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and telecommunication.

**MECHANICAL DATA**
- **Case:** SMBG (DO-215AA)
- Molding compound meets UL 94 V-0 flammability rating
- Base P/N-E3 - RoHS compliant, industrial grade
- Base P/N-M3 - halogen-free, RoHS compliant, and industrial grade
- Base P/NHE3 - RoHS compliant, AEC-Q101 qualified
- Base P/NHM3 - halogen-free, RoHS compliant, and AEC-Q101 qualified
- **Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
- **Polarity:** for unidirectional types the band denotes cathode end, no marking on bidirectional types

**MAXIMUM RATINGS (TA = 25 °C unless otherwise noted)**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak pulse power dissipation with a 10/1000 μs waveform</td>
<td>P_BPM</td>
<td>600</td>
<td>W</td>
</tr>
<tr>
<td>Peak pulse current with a 10/1000 μs waveform</td>
<td>I_FSM</td>
<td>See next table</td>
<td>A</td>
</tr>
<tr>
<td>Peak forward surge current 8.3 ms single half sine-wave unidirectional only</td>
<td>I_FSM</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>Operating junction and storage temperature range</td>
<td>T_J, T_STG</td>
<td>-55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

**Notes**
(1) Non-repetitive current pulse, per fig. 3 and derated above T_A = 25 °C per fig. 2
(2) Mounted on 0.2” x 0.2” (5.0 mm x 5.0 mm) copper pads to each terminal
SMBG5.0A thru SMBG188CA
Vishay General Semiconductor

**ELECTRICAL CHARACTERISTICS** *(Tₐ = 25 °C unless otherwise noted)*

<table>
<thead>
<tr>
<th>DEVICE TYPE MODIFIED GULL WING</th>
<th>DEVICE MARKING CODE</th>
<th>BREAKDOWN VOLTAGE V everlasting AT I(T) (V)</th>
<th>TEST CURRENT I(T) (mA)</th>
<th>STAND-OFF VOLTAGE V everlasting AT V everlasting I everlasting (μA)</th>
<th>MAXIMUM REVERSE LEAKAGE CURRENT I(V)</th>
<th>MAXIMUM PEAK PULSE SURGE CURRENT I(PPM) (A)</th>
<th>MAXIMUM CLAMPING VOLTAGE AT I(PPM) V everlasting (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UNI</td>
<td>BI</td>
<td>MIN.</td>
<td>MAX.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(+) SMBG5.0A ([5] KE KE 6.40 7.07 10 5.0 800 65.2 9.2</td>
<td>(+) SMBG6.0A KG KG 6.67 7.37 10 6.0 800 58.3 10.3</td>
<td>(+) SMBG6.5A KK AK 7.22 7.98 10 7.0 200 50.0 12.0</td>
<td>(+) SMBG7.0A KM KM 7.78 8.60 10 10.0 100 46.5 12.9</td>
<td>(+) SMBG7.5A KP AP 8.33 9.21 1.0 7.5 100 46.5 12.9</td>
<td>(+) SMBG8.0A KR AR 8.89 9.83 1.0 8.0 50 44.1 13.6</td>
<td>(+) SMBG8.5A KT AT 9.44 10.4 1.0 8.5 20 41.7 14.4</td>
<td>(+) SMBG9.0A KV AV 10.0 11.1 1.0 9.0 10 39.0 15.4</td>
</tr>
</tbody>
</table>

**Notes**

1. Pulse test: tₚ ≤ 50 ms
2. Surge current waveform per fig. 3 and derate per fig. 2
3. For bidirectional types having V everlasting of 10 V and less, the I everlasting limit is doubled
4. All terms and symbols are consistent with ANSI/IEEE C62.35
5. For the bidirectional SMBG5.0CA, the maximum V everlasting is 7.25 V
6. V everlasting = 3.5 V at I everlasting = 50 A (unidirectional only)
7. Underwriters laboratory recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both unidirectional and bidirectional devices
THERMAL CHARACTERISTICS \( (T_A = 25 °C \text{ unless otherwise noted}) \)

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<tr>
<td>Typical thermal resistance, junction to ambient</td>
<td>( R_{JA} )</td>
<td>100</td>
<td>°C/ W</td>
</tr>
<tr>
<td>Typical thermal resistance, junction to lead</td>
<td>( R_{JL} )</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Note

(1) Mounted on minimum recommended pad layout

ORDERING INFORMATION (Example)

<table>
<thead>
<tr>
<th>PREFERRED P/N</th>
<th>UNIT WEIGHT (g)</th>
<th>PREFERRED PACKAGE CODE</th>
<th>BASE QUANTITY</th>
<th>DELIVERY MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMBG5.0A-E3/52</td>
<td>0.096</td>
<td>52</td>
<td>750</td>
<td>7&quot; diameter plastic tape and reel</td>
</tr>
<tr>
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<td>SMBG5.0A-E3/5B</td>
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Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES \( (T_A = 25 °C \text{ unless otherwise noted}) \)

![Fig. 1 - Peak Pulse Power Rating Curve](image1)

![Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature](image2)
Fig. 3 - Pulse Waveform

Fig. 4 - Typical Junction Capacitance

Fig. 5 - Typical Transient Thermal Impedance

Fig. 6 - Maximum Non-Repetitive Peak Forward Surge Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMBG (DO-215AA)

Cathode Band

Mounting Pad Layout

0.085 (2.16) 0.060 (1.27)

0.016 (0.41) 0.006 (0.15)

0.083 (2.10) 0.077 (1.96)

0.058 (1.47) 0.038 (0.97)

0.020 (0.51) MAX. 0.030 (0.76)

0.180 (4.57) 0.255 (6.48)

0.160 (4.06) 0.235 (5.97)

0.155 (3.94) 0.130 (3.30)

0.155 (3.94) 0.130 (3.30)

0.165 (4.19)
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