

FEATURES

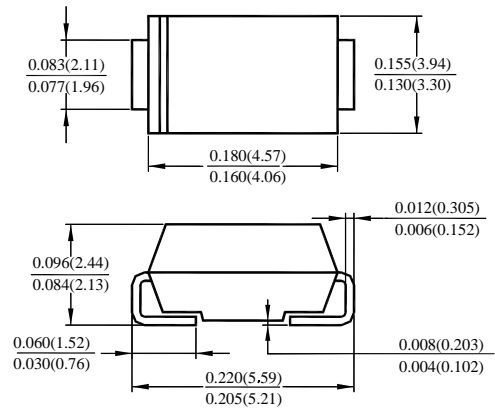
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ For surface mounted applications in order to optimize board space
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Glass passivated junction
- ◆ Low incremental surge resistance
- ◆ 600W peak pulse power capability with a 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- ◆ Excellent clamping capability
- ◆ Fast response time: typically less than 1.0ps from 0 volts to V(BR) for unidirectional and 5.0ns for bidirectional types
- ◆ For devices with V(BR)≥10V, I_D are typically less than 1.0μA
- ◆ High temperature soldering guaranteed: 250°C/10 seconds at terminals

DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional use C or CA suffix (e.g. SMAJ10C, SMAJ10CA).

Electrical characteristics apply in both directions.

SMBJ5.0 -SMBJ170CA



Dimensions in inches and (millimeters)
DO-214AA (SMB)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

| | SYMBOLS | VALUE | UNITS |
|---|-----------------------------------|-------------|-------|
| Peak pulse power dissipation with a 10/1000μs waveform (NOTES 1, 2, FIG. 1) | PPPM | Minimum 600 | Watts |
| Peak pulse current with a 10/1000μs waveform (NOTE 1) | IPPM | SEE TABLE 1 | Amps |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (NOTES 2, 3) - unidirectional only | IFSM | 100.0 | Amps |
| Maximum instantaneous forward voltage at 50A (NOTE 3) unidirectional only | V _F | 3.5 | Volts |
| Operating junction and storage temperature range | T _J , T _{STG} | -55 to +150 | °C |

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 x 5.0mm) copper pads to each terminal
- (3) Measured on 8.3ms single half sine-wave. For uni-directional devices only.

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

| PARAMETER | SYMBOL | VALUE | UNIT |
|--|------------------|-------|------|
| Typical thermal resistance, junction to ambient ⁽¹⁾ | R _{θJA} | 120 | °C/W |
| Typical thermal resistance, junction to lead | R _{θJL} | 30 | °C/W |

Note:

- (1) Mounted on minimum recommended pad layout

Electrical Characteristics (TA=25°C, unless otherwise noted)

SMBJ5.0 -SMBJ170CA

ELECTRICAL CHARACTERISTICS (T = 25 °C unless otherwise noted)

| Device Type Gull Wing Lead | Device Type Modified "J" Bend Lead | Device Marking Code | | Breakdown Voltage V _(BR) (Volts) (NOTE 1) (MIN /MAX) | Test Current at I _T (mA) | Stand-off Voltage V _{WM} (Volts) | Maximum Reverse Leakage I _D at V _{WM} (µA) (NOTE 3) | Maximum Peak Pulse Surge Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _C (Volts) |
|----------------------------------|--|---------------------------|----|---|---|---|---|---|--|
| | | UNI | BI | | | | | | |
| SMBG5.0 | SMBJ5.0 | KD | KD | 6.40 / 7.82 | 10 | 5.0 | 800 | 62.5 | 9.6 |
| SMBG5.0A | SMBJ5.0A | KE | KE | 6.40 / 7.07 | 10 | 5.0 | 800 | 65.2 | 9.2 |
| SMBG6.0 | SMBJ6.0 | KF | KF | 6.67 / 8.15 | 10 | 6.0 | 800 | 52.6 | 11.4 |
| SMBG6.0A | SMBJ6.0A | KG | KG | 6.67 / 7.37 | 10 | 6.0 | 800 | 58.3 | 10.3 |
| SMBG6.5 | SMBJ6.5 | KH | AH | 7.22 / 8.82 | 10 | 6.5 | 500 | 48.8 | 12.3 |
| SMBG6.5A | SMBJ6.5A | KK | AK | 7.22 / 7.98 | 10 | 6.5 | 500 | 53.6 | 11.2 |
| SMBG7.0 | SMBJ7.0 | KL | KL | 7.78 / 9.51 | 10 | 7.0 | 200 | 45.1 | 13.3 |
| SMBG7.0A | SMBJ7.0A | KM | KM | 7.78 / 8.60 | 10 | 7.0 | 200 | 50.0 | 12.0 |
| SMBG7.5 | SMBJ7.5 | KN | AN | 8.33 / 10.2 | 1.0 | 7.5 | 100 | 42.0 | 14.3 |
| SMBG7.5A | SMBJ7.5A | KP | AP | 8.33 / 9.21 | 1.0 | 7.5 | 100 | 46.5 | 12.9 |
| SMBG8.0 | SMBJ8.0 | KQ | AQ | 8.89 / 10.9 | 1.0 | 8.0 | 50 | 40.0 | 15.0 |
| SMBG8.0A | SMBJ8.0A | KR | AR | 8.89 / 9.83 | 1.0 | 8.0 | 50 | 44.1 | 13.6 |
| SMBG8.5 | SMBJ8.5 | KS | AS | 9.44 / 11.5 | 1.0 | 8.5 | 20 | 37.7 | 15.9 |
| SMBG8.5A | SMBJ8.5A | KT | AT | 9.44 / 10.4 | 1.0 | 8.5 | 20 | 41.7 | 14.4 |
| SMBG9.0 | SMBJ9.0 | KU | AU | 10.0 / 12.2 | 1.0 | 9.0 | 10 | 35.5 | 16.9 |
| SMBG9.0A | SMBJ9.0A | KV | AV | 10.0 / 11.1 | 1.0 | 9.0 | 10 | 39.0 | 15.4 |
| SMBG10 | SMBJ10 | KW | AW | 11.1 / 13.6 | 1.0 | 10 | 5.0 | 31.9 | 18.8 |
| SMBG10A | SMBJ10A | KX | AX | 11.1 / 12.3 | 1.0 | 10 | 5.0 | 35.3 | 17.0 |
| SMBG11 | SMBJ11 | KY | KY | 12.2 / 14.9 | 1.0 | 11 | 5.0 | 29.9 | 20.1 |
| SMBG11A | SMBJ11A | KZ | KZ | 12.2 / 13.5 | 1.0 | 11 | 5.0 | 33.0 | 18.2 |
| SMBG12 | SMBJ12 | LD | BD | 13.3 / 16.3 | 1.0 | 12 | 5.0 | 27.3 | 22.0 |
| SMBG12A | SMBJ12A | LE | BE | 13.3 / 14.7 | 1.0 | 12 | 5.0 | 30.2 | 19.9 |
| SMBG13 | SMBJ13 | LF | LF | 14.4 / 17.6 | 1.0 | 13 | 5.0 | 25.2 | 23.8 |
| SMBG13A | SMBJ13A | LG | LG | 14.4 / 15.9 | 1.0 | 13 | 5.0 | 27.9 | 21.5 |
| SMBG14 | SMBJ14 | LH | BH | 15.6 / 19.1 | 1.0 | 14 | 5.0 | 23.3 | 25.8 |
| SMBG14A | SMBJ14A | LK | BK | 15.6 / 17.2 | 1.0 | 14 | 5.0 | 25.9 | 23.2 |
| SMBG15 | SMBJ15 | LL | BL | 16.7 / 20.4 | 1.0 | 15 | 5.0 | 22.3 | 26.9 |
| SMBG15A | SMBJ15A | LM | BM | 16.7 / 18.5 | 1.0 | 15 | 5.0 | 24.6 | 24.4 |
| SMBG16 | SMBJ16 | LN | LN | 17.8 / 21.8 | 1.0 | 16 | 5.0 | 20.8 | 28.8 |
| SMBG16A | SMBJ16A | LP | LM | 17.8 / 19.7 | 1.0 | 16 | 5.0 | 23.1 | 26.0 |
| SMBG17 | SMBJ17 | LQ | LQ | 18.9 / 23.1 | 1.0 | 17 | 5.0 | 19.7 | 30.5 |
| SMBG17A | SMBJ17A | LR | LR | 18.9 / 20.9 | 1.0 | 17 | 5.0 | 21.7 | 27.6 |
| SMBG18 | SMBJ18 | LS | BS | 20.0 / 24.4 | 1.0 | 18 | 5.0 | 18.6 | 32.2 |
| SMBG18A | SMBJ18A | LT | BT | 20.0 / 22.1 | 1.0 | 18 | 5.0 | 20.5 | 29.2 |
| SMBG20 | SMBJ20 | LU | LU | 22.2 / 27.1 | 1.0 | 20 | 5.0 | 16.8 | 35.8 |
| SMBG20A | SMBJ20A | LV | LV | 22.2 / 24.5 | 1.0 | 20 | 5.0 | 18.5 | 32.4 |
| SMBG22 | SMBJ22 | LW | BW | 24.4 / 29.8 | 1.0 | 22 | 5.0 | 15.2 | 39.4 |
| SMBG22A | SMBJ22A | LX | BX | 24.4 / 26.9 | 1.0 | 22 | 5.0 | 16.9 | 35.5 |
| SMBG24 | SMBJ24 | LY | BY | 26.7 / 32.6 | 1.0 | 24 | 5.0 | 14.0 | 43.0 |
| SMBG24A | SMBJ24A | LZ | BZ | 26.7 / 29.5 | 1.0 | 24 | 5.0 | 15.4 | 38.9 |
| SMBG26 | SMBJ26 | MD | CD | 28.9 / 35.3 | 1.0 | 26 | 5.0 | 12.9 | 46.6 |
| SMBG26A | SMBJ26A | ME | CE | 28.9 / 31.9 | 1.0 | 26 | 5.0 | 14.3 | 42.1 |
| SMBG28 | SMBJ28 | MF | MF | 31.1 / 38.0 | 1.0 | 28 | 5.0 | 12.0 | 50.0 |
| SMBG28A | SMBJ28A | MG | MG | 31.1 / 34.4 | 1.0 | 28 | 5.0 | 13.2 | 45.4 |
| SMBG30 | SMBJ30 | MH | CH | 33.3 / 40.7 | 1.0 | 30 | 5.0 | 11.2 | 53.5 |
| SMBG30A | SMBJ30A | MK | CK | 33.3 / 36.8 | 1.0 | 30 | 5.0 | 12.4 | 48.4 |
| SMBG33 | SMBJ33 | ML | CL | 36.7 / 44.9 | 1.0 | 33 | 5.0 | 10.2 | 59.0 |
| SMBG33A | SMBJ33A | MM | CM | 36.7 / 40.6 | 1.0 | 33 | 5.0 | 11.3 | 53.3 |
| SMBG36 | SMBJ36 | MN | CN | 40.0 / 48.9 | 1.0 | 36 | 5.0 | 9.3 | 64.3 |
| SMBG36A | SMBJ36A | MP | CP | 40.0 / 44.2 | 1.0 | 36 | 5.0 | 10.3 | 58.1 |
| SMBG40 | SMBJ40 | MQ | CQ | 44.4 / 54.3 | 1.0 | 40 | 5.0 | 8.4 | 71.4 |
| SMBG40A | SMBJ40A | MR | CR | 44.4 / 49.1 | 1.0 | 40 | 5.0 | 9.3 | 64.5 |
| SMBG43 | SMBJ43 | MS | CS | 47.8 / 58.4 | 1.0 | 43 | 5.0 | 7.8 | 76.7 |
| SMBG43A | SMBJ43A | MT | CT | 47.8 / 52.8 | 1.0 | 43 | 5.0 | 8.6 | 69.4 |
| SMBG45 | SMBJ45 | MU | MU | 50.0 / 61.1 | 1.0 | 45 | 5.0 | 7.5 | 80.3 |
| SMBG45A | SMBJ45A | MV | MV | 50.0 / 55.3 | 1.0 | 45 | 5.0 | 8.3 | 72.7 |
| SMBG48 | SMBJ48 | MW | MW | 53.3 / 65.1 | 1.0 | 48 | 5.0 | 7.0 | 85.5 |
| SMBG48A | SMBJ48A | MX | MX | 53.3 / 58.9 | 1.0 | 48 | 5.0 | 7.8 | 77.4 |
| SMBG51 | SMBJ51 | MY | MY | 56.7 / 69.3 | 1.0 | 51 | 5.0 | 6.6 | 91.1 |
| SMBG51A | SMBJ51A | MZ | MZ | 56.7 / 62.7 | 1.0 | 51 | 5.0 | 7.3 | 82.4 |

Electrical Characteristics (TA=25°C, unless otherwise noted)

SMBJ5.0 -SMBJ170CA

ELECTRICAL CHARACTERISTICS (TA = 25 °C unless otherwise noted)

| Device Type Gull Wing Lead | Device Type Modified "J" Bend Lead | Device Marking Code | | Breakdown Voltage V _(BR) (Volts) (NOTE 1) (Min /Max) | Test Current at I _T (mA) | Stand-off Voltage V _{WM} (Volts) | Maximum Reverse Leakage I _D at V _{WM} (μ A)(NOTE 3) | Maximum Peak Pulse Surge Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _C (Volts) |
|----------------------------------|--|---------------------------|----|---|---|---|--|---|--|
| | | UNI | BI | | | | | | |
| SMBG54 | SMBJ54 | ND | ND | 60.0 / 73.3 | 1.0 | 54 | 5.0 | 6.2 | 96.3 |
| SMBG54A | SMBJ54A | NE | NE | 60.0 / 66.3 | 1.0 | 54 | 5.0 | 6.9 | 87.1 |
| SMBG58 | SMBJ58 | NF | NF | 64.4 / 78.7 | 1.0 | 58 | 5.0 | 5.8 | 103 |
| SMBG58A | SMBJ58A | NG | NG | 64.4 / 71.2 | 1.0 | 58 | 5.0 | 6.4 | 93.6 |
| SMBG60 | SMBJ60 | NH | NH | 66.7 / 81.5 | 1.0 | 60 | 5.0 | 5.6 | 107 |
| SMBG60A | SMBJ60A | NK | NK | 66.7 / 73.7 | 1.0 | 60 | 5.0 | 6.2 | 96.8 |
| SMBG64 | SMBJ64 | NL | NL | 71.1 / 86.9 | 1.0 | 64 | 5.0 | 5.3 | 114 |
| SMBG64A | SMBJ64A | NM | NM | 71.1 / 78.6 | 1.0 | 64 | 5.0 | 5.8 | 103 |
| SMBG70 | SMBJ70 | NN | NN | 77.8 / 95.1 | 1.0 | 70 | 5.0 | 4.8 | 125 |
| SMBG70A | SMBJ70A | NP | NP | 77.8 / 86.0 | 1.0 | 70 | 5.0 | 5.3 | 113 |
| SMBG75 | SMBJ75 | NQ | NQ | 83.3 / 102 | 1.0 | 75 | 5.0 | 4.5 | 134 |
| SMBG75A | SMBJ75A | NR | NR | 83.3 / 92.1 | 1.0 | 75 | 5.0 | 5.0 | 121 |
| SMBG78 | SMBJ78 | NS | NS | 86.7 / 106 | 1.0 | 78 | 5.0 | 4.3 | 139 |
| SMBG78A | SMBJ78A | NT | NT | 86.7 / 95.8 | 1.0 | 78 | 5.0 | 4.8 | 126 |
| SMBG85 | SMBJ85 | NU | NU | 94.4 / 115 | 1.0 | 85 | 5.0 | 4.0 | 151 |
| SMBG85A | SMBJ85A | NV | NV | 94.4 / 104 | 1.0 | 85 | 5.0 | 4.4 | 137 |
| SMBG90 | SMBJ90 | NW | NW | 100 / 122 | 1.0 | 90 | 5.0 | 3.8 | 160 |
| SMBG90A | SMBJ90A | NX | NX | 100 / 111 | 1.0 | 90 | 6.0 | 4.1 | 146 |
| SMBG100 | SMBJ100 | NY | NY | 111 / 136 | 1.0 | 100 | 5.0 | 3.4 | 179 |
| SMBG100A | SMBJ100A | NZ | NZ | 111 / 123 | 1.0 | 100 | 5.0 | 3.7 | 162 |
| SMBG110 | SMBJ110 | PD | PD | 122 / 149 | 1.0 | 110 | 5.0 | 3.1 | 196 |
| SMBG110A | SMBJ110A | PE | PE | 122 / 135 | 1.0 | 110 | 5.0 | 3.4 | 177 |
| SMBG120 | SMBJ120 | PF | PF | 133 / 163 | 1.0 | 120 | 5.0 | 2.8 | 214 |
| SMBG120A | SMBJ120A | PG | PG | 133 / 147 | 1.0 | 120 | 5.0 | 3.1 | 193 |
| SMBG130 | SMBJ130 | PH | PH | 144 / 176 | 1.0 | 130 | 5.0 | 2.6 | 231 |
| SMBG130A | SMBJ130A | PK | PK | 144 / 159 | 1.0 | 130 | 5.0 | 2.9 | 209 |
| SMBG150 | SMBJ150 | PL | PL | 167 / 204 | 1.0 | 150 | 5.0 | 2.2 | 268 |
| SMBG150A | SMBJ150A | PM | PM | 167 / 185 | 1.0 | 150 | 5.0 | 2.5 | 243 |
| SMBG160 | SMBJ160 | PN | PN | 178 / 218 | 1.0 | 160 | 5.0 | 2.1 | 287 |
| SMBG160A | SMBJ160A | PP | PP | 178 / 197 | 1.0 | 160 | 5.0 | 2.3 | 259 |
| SMBG170 | SMBJ170 | PQ | PQ | 189 / 231 | 1.0 | 170 | 5.0 | 2.0 | 304 |
| SMBG170A | SMBJ170A | PR | PR | 189 / 209 | 1.0 | 170 | 5.0 | 2.2 | 275 |

NOTES:

- (1) V_(BR) measured after I_T applied for 300 μ s square wave pulse or equivalent
- (2) Surge current waveform per Fig. 3 and derate per Fig. 2
- (3) For bi-directional types having V_{WM} of 10 Volts and less, the I_D limit is doubled
- (4) For the bi-directional SMBG/SMBJ5.0CA, the maximum V_(BR) is 7.25 Volts
- (5) All terms and symbols are consistent with ANSI/IEEE C62.35

SMBJ5.0 -SMBJ170CA Typical Characteristics

FIG. 1 - PEAK PULSE POWER RATING CURVE

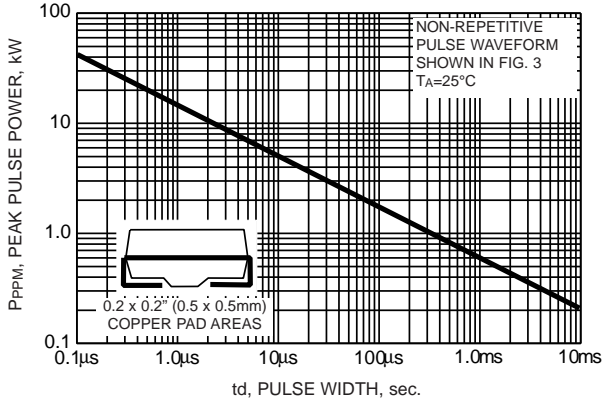


FIG. 2 - PULSE DERATING CURVE

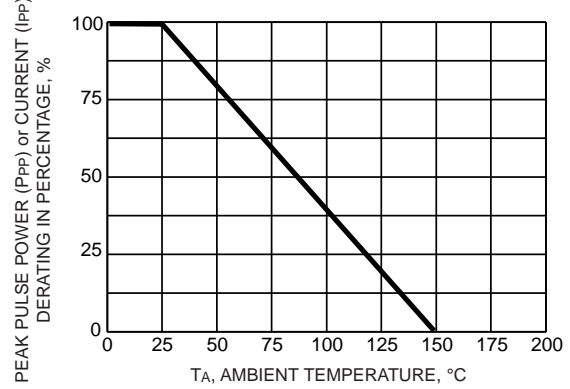


FIG. 3 - PULSE WAVEFORM

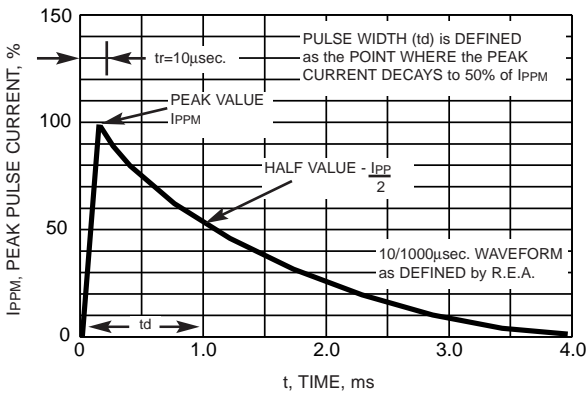


FIG. 4 - TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

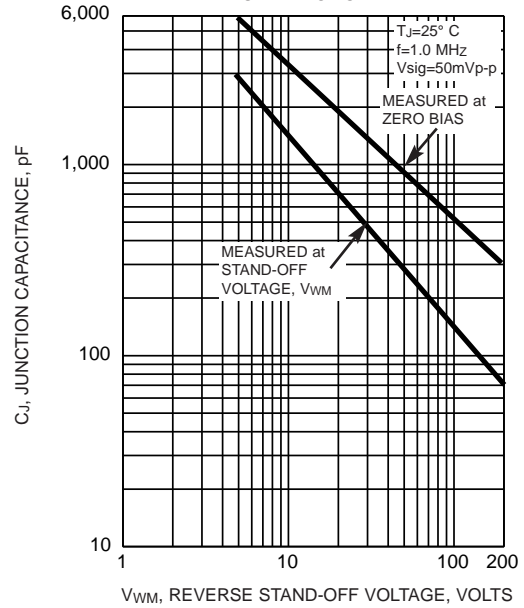


FIG. 5 - TYPICAL JUNCTION CAPACITANCE BIDIRECTIONAL

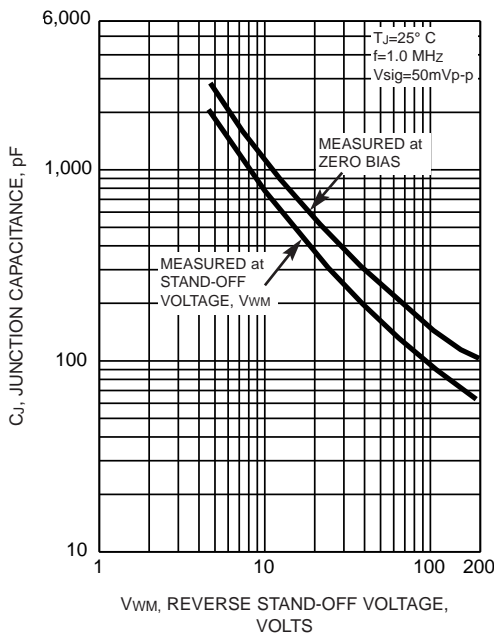


FIG. 6 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

