

**SURFACE MOUNT GPP**  
**GPP TRANSIENT VOLTAGE SUPPRESSOR**  
**600 WATT PEAK POWER 5.0 WATTS STEADY STATE**

**FEATURES**

- \* Plastic package has underwriters laboratory
- \* Glass passivated chip construction
- \* 600 watt surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time

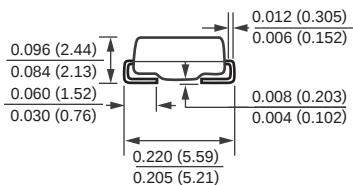
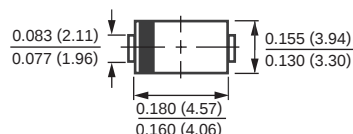
Ratings at 25 °C ambient temperature unless otherwise specified.

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25 °C ambient temperature unless otherwise specified.



**DO-214AA**



Dimensions in inches and (millimeters)

**DEVICES FOR BIPOLAR APPLICATIONS**

For Bidirectional use C or CA suffix for types TFMBJ5.0 thru TFMBJ170

Electrical characteristics apply in both direction

**MAXIMUM RATINGS** (At  $T_A = 25^\circ\text{C}$  unless otherwise noted)

| RATINGS                                                                                                                         | SYMBOL                            | VALUE       | UNITS |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------|-------|
| Peak Power Dissipation with a 10/1000uS (Note 1,2, Fig.1)                                                                       | PPPM                              | Minimum 600 | Watts |
| Peak Pulse Current with a 10/1000uS waveform ( Note 1, Fig.3 )                                                                  | IPPM                              | SEE TABLE 1 | Amps  |
| Steady State Power Dissipation at $T_L = 75^\circ\text{C}$ (Note 2)                                                             | PM(AV)                            | 5.0         | Watts |
| Peak Forward Surge Current 8.3mS single half sine-wave superimposed on rated load (JEDEC method) (Note 2,3) unidirectional only | IFSM                              | 100         | Amps  |
| Maximum Instantaneous Forward Voltage at 50A for unidirectional only (Note 3,4)                                                 | V <sub>F</sub>                    | SEE NOTE 4  | Volts |
| Operating and Storage Temperature Range                                                                                         | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

NOTES : 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A = 25^\circ\text{C}$  per Fig.2.

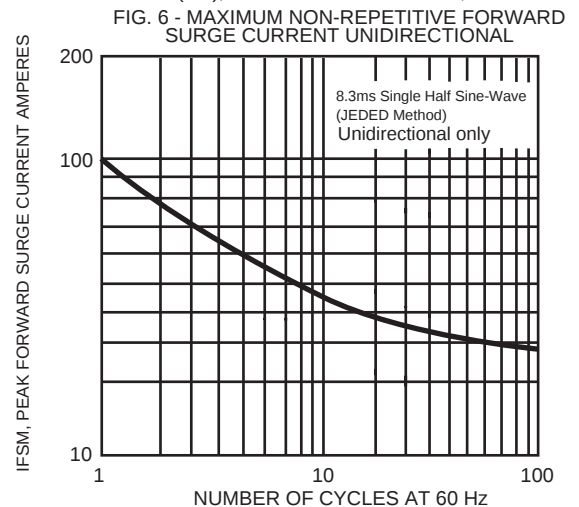
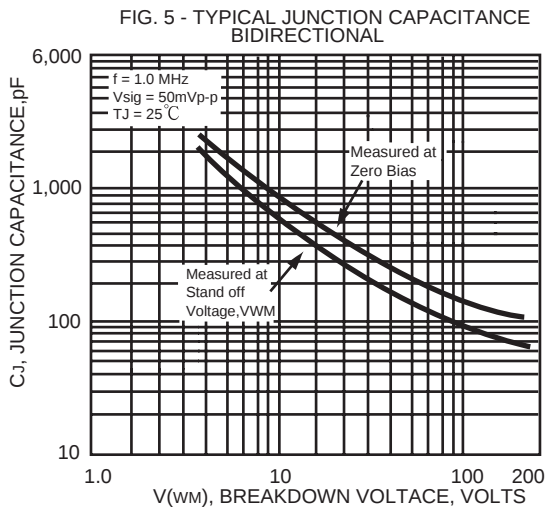
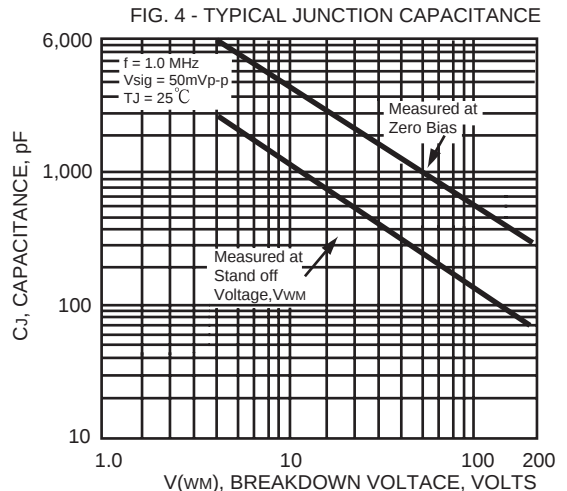
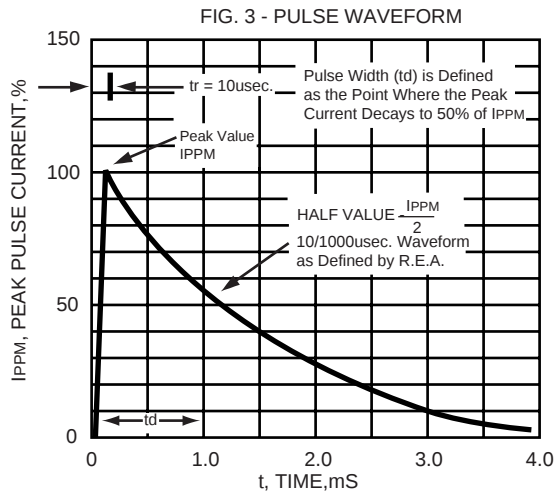
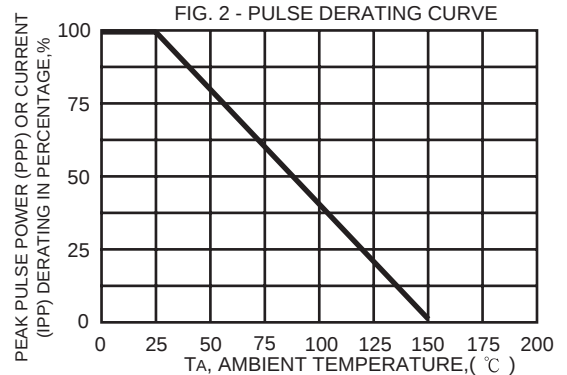
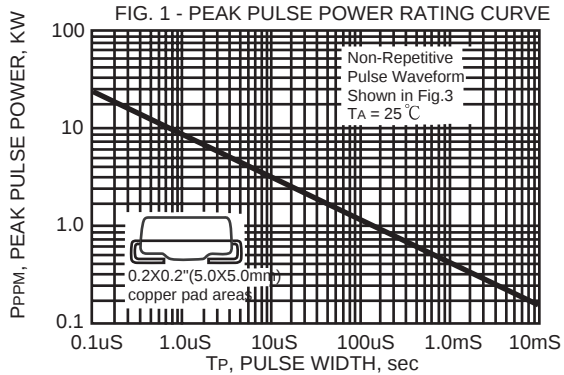
2. Mounted on 0.2 X 0.2" ( 5.0 X 5.0mm ) copper pad to each terminal.

3. Lead temperature at  $T_L = 25^\circ\text{C}$

4. Measured on 8.3mS single half sine-wave duty cycle = 4 pules per minute maximum.

5.  $V_F = 3.5\text{V}$  on TFMBJ-5.0 thru TFMBJ-90 devices and  $V_F = 5.0\text{V}$  on TFMBJ-100 thru TFMBJ-170 devices.

# RATING AND CHARACTERISTIC CURVES ( TFMBJ5.0 THRU TFMBJ170CA )



# TRANSIENT VOLTAGE SUPPRESSORS

600W SERIES TVS DIODES / DO-214AA ( CASE 3 ) 600W

| Rectron<br>Industry No. | Rectron<br>House No. | Breakdown Voltage |      |                 | Reverse<br>Stand off<br>Voltage<br>VWM<br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at VWM<br>ID(ua) | Maximum<br>Peak Pulse<br>Current<br>IPPM<br>(Amps) | Maximum<br>Clamping<br>Voltage<br>at IPPM<br>VC (Volts) |
|-------------------------|----------------------|-------------------|------|-----------------|---------------------------------------------------|---------------------------------------------------|----------------------------------------------------|---------------------------------------------------------|
|                         |                      | VBR<br>(Volts)    |      | @IT<br><br>(mA) |                                                   |                                                   |                                                    |                                                         |
|                         |                      | MIN.              | MAX. |                 |                                                   |                                                   |                                                    |                                                         |
| SMBJ5.0                 | TFMBJ5.0             | 6.40              | 7.82 | 10              | 5.0                                               | 800.0                                             | 62.5                                               | 9.6                                                     |
| SMBJ5.0A                | TFMBJ5.0A            | 6.40              | 7.07 | 10              | 5.0                                               | 800.0                                             | 65.2                                               | 9.2                                                     |
| SMBJ6.0                 | TFMBJ6.0             | 6.67              | 8.15 | 10              | 6.0                                               | 800.0                                             | 52.6                                               | 11.4                                                    |
| SMBJ6.0A                | TFMBJ6.0A            | 6.67              | 7.37 | 10              | 6.0                                               | 800.0                                             | 58.3                                               | 10.3                                                    |
| SMBJ6.5                 | TFMBJ6.5             | 7.22              | 8.82 | 10              | 6.5                                               | 500.0                                             | 48.8                                               | 12.3                                                    |
| SMBJ6.5A                | TFMBJ6.5A            | 7.22              | 7.98 | 10              | 6.5                                               | 500.0                                             | 53.6                                               | 11.2                                                    |
| SMBJ7.0                 | TFMBJ7.0             | 7.78              | 9.51 | 10              | 7.0                                               | 200.0                                             | 45.1                                               | 13.3                                                    |
| SMBJ7.0A                | TFMBJ7.0A            | 7.78              | 8.60 | 10              | 7.0                                               | 200.0                                             | 50.0                                               | 12.0                                                    |
| SMBJ7.5                 | TFMBJ7.5             | 8.33              | 10.2 | 1.0             | 7.5                                               | 100.0                                             | 42.0                                               | 14.3                                                    |
| SMBJ7.5A                | TFMBJ7.5A            | 8.33              | 9.21 | 1.0             | 7.5                                               | 100.0                                             | 46.5                                               | 12.9                                                    |
| SMBJ8.0                 | TFMBJ8.0             | 8.89              | 10.9 | 1.0             | 8.0                                               | 50.0                                              | 40.0                                               | 15.0                                                    |
| SMBJ8.0A                | TFMBJ8.0A            | 8.89              | 9.83 | 1.0             | 8.0                                               | 50.0                                              | 44.1                                               | 13.6                                                    |
| SMBJ8.5                 | TFMBJ8.5             | 9.44              | 11.5 | 1.0             | 8.5                                               | 20.0                                              | 37.7                                               | 15.9                                                    |
| SMBJ8.5A                | TFMBJ8.5A            | 9.44              | 10.4 | 1.0             | 8.5                                               | 20.0                                              | 41.7                                               | 14.4                                                    |
| SMBJ9.0                 | TFMBJ9.0             | 10.0              | 12.2 | 1.0             | 9.0                                               | 10.0                                              | 35.5                                               | 16.9                                                    |
| SMBJ9.0A                | TFMBJ9.0A            | 10.0              | 11.1 | 1.0             | 9.0                                               | 10.0                                              | 39.0                                               | 15.4                                                    |
| SMBJ10                  | TFMBJ10              | 11.1              | 13.6 | 1.0             | 10.0                                              | 5.0                                               | 31.9                                               | 18.8                                                    |
| SMBJ10A                 | TFMBJ10A             | 11.1              | 12.3 | 1.0             | 10.0                                              | 5.0                                               | 35.3                                               | 17.0                                                    |
| SMBJ11                  | TFMBJ11              | 12.2              | 14.9 | 1.0             | 11.0                                              | 5.0                                               | 29.9                                               | 20.1                                                    |
| SMBJ11A                 | TFMBJ11A             | 12.2              | 13.5 | 1.0             | 11.0                                              | 5.0                                               | 33.0                                               | 18.2                                                    |
| SMBJ12                  | TFMBJ12              | 13.3              | 16.3 | 1.0             | 12.0                                              | 5.0                                               | 27.3                                               | 22.0                                                    |
| SMBJ12A                 | TFMBJ12A             | 13.3              | 14.7 | 1.0             | 12.0                                              | 5.0                                               | 30.2                                               | 19.9                                                    |
| SMBJ13                  | TFMBJ13              | 14.4              | 17.6 | 1.0             | 13.0                                              | 5.0                                               | 25.2                                               | 23.8                                                    |
| SMBJ13A                 | TFMBJ13A             | 14.4              | 15.9 | 1.0             | 13.0                                              | 5.0                                               | 27.9                                               | 21.5                                                    |
| SMBJ14                  | TFMBJ14              | 15.6              | 19.1 | 1.0             | 14.0                                              | 5.0                                               | 23.3                                               | 25.8                                                    |
| SMBJ14A                 | TFMBJ14A             | 15.6              | 17.2 | 1.0             | 14.0                                              | 5.0                                               | 25.9                                               | 23.2                                                    |
| SMBJ15                  | TFMBJ15              | 16.7              | 20.4 | 1.0             | 15.0                                              | 5.0                                               | 22.3                                               | 26.9                                                    |
| SMBJ15A                 | TFMBJ15A             | 16.7              | 18.5 | 1.0             | 15.0                                              | 5.0                                               | 24.6                                               | 24.4                                                    |
| SMBJ16                  | TFMBJ16              | 17.8              | 21.8 | 1.0             | 16.0                                              | 5.0                                               | 20.8                                               | 28.8                                                    |
| SMBJ16A                 | TFMBJ16A             | 17.8              | 19.7 | 1.0             | 16.0                                              | 5.0                                               | 23.1                                               | 26.0                                                    |
| SMBJ17                  | TFMBJ17              | 18.9              | 23.1 | 1.0             | 17.0                                              | 5.0                                               | 19.7                                               | 30.5                                                    |
| SMBJ17A                 | TFMBJ17A             | 18.9              | 20.9 | 1.0             | 17.0                                              | 5.0                                               | 21.7                                               | 27.6                                                    |
| SMBJ18                  | TFMBJ18              | 20.0              | 24.4 | 1.0             | 18.0                                              | 5.0                                               | 18.6                                               | 32.2                                                    |
| SMBJ18A                 | TFMBJ18A             | 20.0              | 22.1 | 1.0             | 18.0                                              | 5.0                                               | 20.5                                               | 29.2                                                    |
| SMBJ20                  | TFMBJ20              | 22.2              | 27.1 | 1.0             | 20.0                                              | 5.0                                               | 16.8                                               | 35.8                                                    |
| SMBJ20A                 | TFMBJ20A             | 22.2              | 24.5 | 1.0             | 20.0                                              | 5.0                                               | 18.5                                               | 32.4                                                    |
| SMBJ22                  | TFMBJ22              | 24.4              | 29.8 | 1.0             | 22.0                                              | 5.0                                               | 15.2                                               | 39.4                                                    |
| SMBJ22A                 | TFMBJ22A             | 24.4              | 26.9 | 1.0             | 22.0                                              | 5.0                                               | 16.9                                               | 35.5                                                    |
| SMBJ24                  | TFMBJ24              | 26.7              | 32.6 | 1.0             | 24.0                                              | 5.0                                               | 14.0                                               | 43.0                                                    |
| SMBJ24A                 | TFMBJ24A             | 26.7              | 29.5 | 1.0             | 24.0                                              | 5.0                                               | 15.4                                               | 38.9                                                    |
| SMBJ26                  | TFMBJ26              | 28.9              | 35.3 | 1.0             | 26.0                                              | 5.0                                               | 12.9                                               | 46.6                                                    |
| SMBJ26A                 | TFMBJ26A             | 28.9              | 31.9 | 1.0             | 26.0                                              | 5.0                                               | 14.3                                               | 42.1                                                    |
| SMBJ28                  | TFMBJ28              | 31.1              | 38.0 | 1.0             | 28.0                                              | 5.0                                               | 12.0                                               | 50.0                                                    |
| SMBJ28A                 | TFMBJ28A             | 31.1              | 34.4 | 1.0             | 28.0                                              | 5.0                                               | 13.2                                               | 45.4                                                    |
| SMBJ30                  | TFMBJ30              | 33.3              | 40.7 | 1.0             | 30.0                                              | 5.0                                               | 11.2                                               | 53.5                                                    |
| SMBJ30A                 | TFMBJ30A             | 33.3              | 36.8 | 1.0             | 30.0                                              | 5.0                                               | 12.4                                               | 48.4                                                    |
| SMBJ33                  | TFMBJ33              | 36.7              | 44.9 | 1.0             | 33.0                                              | 5.0                                               | 10.2                                               | 59.0                                                    |
| SMBJ33A                 | TFMBJ33A             | 36.7              | 40.6 | 1.0             | 33.0                                              | 5.0                                               | 11.3                                               | 53.3                                                    |
| SMBJ36                  | TFMBJ36              | 40.0              | 48.9 | 1.0             | 36.0                                              | 5.0                                               | 9.3                                                | 64.3                                                    |
| SMBJ36A                 | TFMBJ36A             | 40.0              | 44.2 | 1.0             | 36.0                                              | 5.0                                               | 10.3                                               | 58.1                                                    |

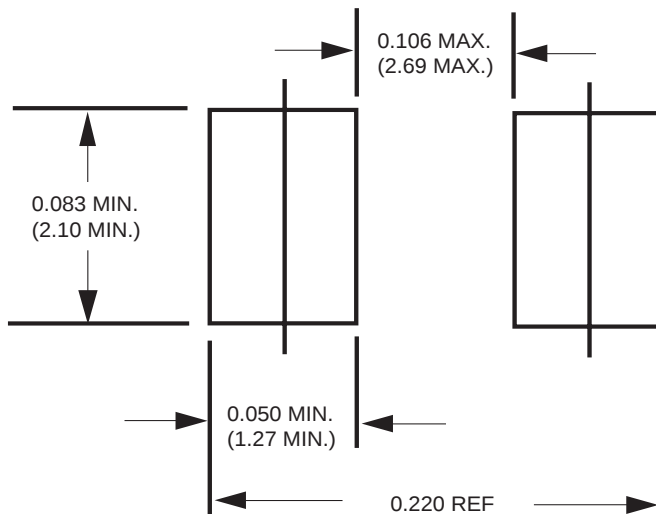
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| Rectron<br>Industry No. | Rectron<br>House No. | Breakdown Voltage |      |      | Reverse<br>Stand off<br>Voltage<br>VWM<br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at VWM<br>ID(uA) | Maximum<br>Peak Pulse<br>Current<br>IPPM<br>(Amps) | Maximum<br>Clamping<br>Voltage<br>at IPPM<br>VC (Volts) |
|-------------------------|----------------------|-------------------|------|------|---------------------------------------------------|---------------------------------------------------|----------------------------------------------------|---------------------------------------------------------|
|                         |                      | VBR<br>(Volts)    |      | @IT  |                                                   |                                                   |                                                    |                                                         |
|                         |                      | MIN.              | MAX. | (mA) |                                                   |                                                   |                                                    |                                                         |
| SMBJ40                  | TFMBJ40              | 44.4              | 54.3 | 1.0  | 40                                                | 5.0                                               | 8.4                                                | 71.4                                                    |
| SMBJ40A                 | TFMBJ40A             | 44.4              | 49.1 | 1.0  | 40                                                | 5.0                                               | 9.3                                                | 64.5                                                    |
| SMBJ43                  | TFMBJ43              | 47.8              | 58.4 | 1.0  | 43                                                | 5.0                                               | 7.8                                                | 76.7                                                    |
| SMBJ43A                 | TFMBJ43A             | 47.8              | 52.8 | 1.0  | 43                                                | 5.0                                               | 8.6                                                | 69.4                                                    |
| SMBJ45                  | TFMBJ45              | 50.0              | 61.1 | 1.0  | 45                                                | 5.0                                               | 7.5                                                | 80.3                                                    |
| SMBJ45A                 | TFMBJ45A             | 50.0              | 55.3 | 1.0  | 45                                                | 5.0                                               | 8.3                                                | 72.7                                                    |
| SMBJ48                  | TFMBJ48              | 53.3              | 65.1 | 1.0  | 48                                                | 5.0                                               | 7.0                                                | 85.5                                                    |
| SMBJ48A                 | TFMBJ48A             | 53.3              | 58.9 | 1.0  | 48                                                | 5.0                                               | 7.8                                                | 77.4                                                    |
| SMBJ51                  | TFMBJ51              | 56.7              | 69.3 | 1.0  | 51                                                | 5.0                                               | 6.6                                                | 91.1                                                    |
| SMBJ51A                 | TFMBJ51A             | 56.7              | 62.7 | 1.0  | 51                                                | 5.0                                               | 7.3                                                | 82.4                                                    |
| SMBJ54                  | TFMBJ54              | 60.0              | 73.3 | 1.0  | 54                                                | 5.0                                               | 6.2                                                | 96.3                                                    |
| SMBJ54A                 | TFMBJ54A             | 60.0              | 66.3 | 1.0  | 54                                                | 5.0                                               | 6.9                                                | 87.1                                                    |
| SMBJ58                  | TFMBJ58              | 64.4              | 78.7 | 1.0  | 58                                                | 5.0                                               | 5.8                                                | 103                                                     |
| SMBJ58A                 | TFMBJ58A             | 64.4              | 71.2 | 1.0  | 58                                                | 5.0                                               | 6.4                                                | 93.6                                                    |
| SMBJ60                  | TFMBJ60              | 66.7              | 81.5 | 1.0  | 60                                                | 5.0                                               | 5.6                                                | 107                                                     |
| SMBJ60A                 | TFMBJ60A             | 66.7              | 73.7 | 1.0  | 60                                                | 5.0                                               | 6.2                                                | 96.8                                                    |
| SMBJ64                  | TFMBJ64              | 71.1              | 86.9 | 1.0  | 64                                                | 5.0                                               | 5.3                                                | 114                                                     |
| SMBJ64A                 | TFMBJ64A             | 71.1              | 78.6 | 1.0  | 64                                                | 5.0                                               | 5.8                                                | 103                                                     |
| SMBJ70                  | TFMBJ70              | 77.8              | 95.1 | 1.0  | 70                                                | 5.0                                               | 4.8                                                | 125                                                     |
| SMBJ70A                 | TFMBJ70A             | 77.8              | 86.0 | 1.0  | 70                                                | 5.0                                               | 5.3                                                | 113                                                     |
| SMBJ75                  | TFMBJ75              | 83.3              | 102  | 1.0  | 75                                                | 5.0                                               | 4.5                                                | 134                                                     |
| SMBJ75A                 | TFMBJ75A             | 83.3              | 92.1 | 1.0  | 75                                                | 5.0                                               | 5.0                                                | 121                                                     |
| SMBJ78                  | TFMBJ78              | 86.7              | 106  | 1.0  | 78                                                | 5.0                                               | 4.3                                                | 139                                                     |
| SMBJ78A                 | TFMBJ78A             | 86.7              | 95.8 | 1.0  | 78                                                | 5.0                                               | 4.8                                                | 126                                                     |
| SMBJ85                  | TFMBJ85              | 94.4              | 115  | 1.0  | 85                                                | 5.0                                               | 4.0                                                | 151                                                     |
| SMBJ85A                 | TFMBJ85A             | 94.4              | 104  | 1.0  | 85                                                | 5.0                                               | 4.4                                                | 137                                                     |
| SMBJ90                  | TFMBJ90              | 100               | 122  | 1.0  | 90                                                | 5.0                                               | 3.8                                                | 160                                                     |
| SMBJ90A                 | TFMBJ90A             | 100               | 111  | 1.0  | 90                                                | 5.0                                               | 4.1                                                | 146                                                     |
| SMBJ100                 | TFMBJ100             | 111               | 136  | 1.0  | 100                                               | 5.0                                               | 3.4                                                | 179                                                     |
| SMBJ100A                | TFMBJ100A            | 111               | 123  | 1.0  | 100                                               | 5.0                                               | 3.7                                                | 162                                                     |
| SMBJ110                 | TFMBJ110             | 122               | 149  | 1.0  | 110                                               | 5.0                                               | 3.1                                                | 196                                                     |
| SMBJ110A                | TFMBJ110A            | 122               | 135  | 1.0  | 110                                               | 5.0                                               | 3.4                                                | 177                                                     |
| SMBJ120                 | TFMBJ120             | 133               | 163  | 1.0  | 120                                               | 5.0                                               | 2.8                                                | 214                                                     |
| SMBJ120A                | TFMBJ120A            | 133               | 147  | 1.0  | 120                                               | 5.0                                               | 3.1                                                | 193                                                     |
| SMBJ130                 | TFMBJ130             | 144               | 176  | 1.0  | 130                                               | 5.0                                               | 2.6                                                | 231                                                     |
| SMBJ130A                | TFMBJ130A            | 144               | 159  | 1.0  | 130                                               | 5.0                                               | 2.9                                                | 209                                                     |
| SMBJ150                 | TFMBJ150             | 167               | 204  | 1.0  | 150                                               | 5.0                                               | 2.2                                                | 268                                                     |
| SMBJ150A                | TFMBJ150A            | 167               | 185  | 1.0  | 150                                               | 5.0                                               | 2.5                                                | 243                                                     |
| SMBJ160                 | TFMBJ160             | 178               | 218  | 1.0  | 160                                               | 5.0                                               | 2.1                                                | 287                                                     |
| SMBJ160A                | TFMBJ160A            | 178               | 197  | 1.0  | 160                                               | 5.0                                               | 2.3                                                | 259                                                     |
| SMBJ170                 | TFMBJ170             | 189               | 231  | 1.0  | 170                                               | 5.0                                               | 2.0                                                | 304                                                     |
| SMBJ170A                | TFMBJ170A            | 189               | 209  | 1.0  | 170                                               | 5.0                                               | 2.2                                                | 275                                                     |

- Notes :
1.  $V_{BR}$  measured after  $I_T$  applied for 300ms.  $I_T$  = square pulse or equivalent.
  2. For bidirectional use C or CA suffixs for all types (ex. SMBJ5.0C, SMBJ170CA) electrical characteristics apply in both directions.
  3. For bidirectional types having  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled.
  4. All devices UL listed file# E211196.

## Mounting Pad Layout



Dimensions in inches and (millimeters)