

## FEATURES

- Total power dissipation: Max. 5000mW.
- Wide zener reverse voltage range 3.3V to 200V.
- Small plastic package suitable for surface mounted design.

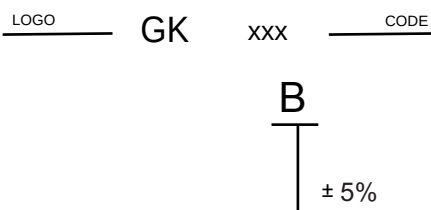
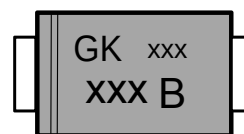
## VOLTAGE RANGE

3.3 to 200 Volts

5000 mW

## MECHANICAL DATA

- Case: SMB
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.095g / 0.0034oz



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating 25°C ambient temperature unless otherwise specified.  
Single phase half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

### MAXIMUM RATINGS

| PARAMETER                                                                    | SYMBOL                               | VALUE       | UNIT               |
|------------------------------------------------------------------------------|--------------------------------------|-------------|--------------------|
| Maximum steady state power dissipation at $T_L = 75^\circ\text{C}$           | $P_{\text{tot}}$                     | 5000        | mW                 |
| Maximum instantaneous forward voltage at 200 mA for all types <sup>(3)</sup> | $V_F$                                | 1.2         | V                  |
| Operating junction and storage temperature range                             | $T_J, T_{\text{STG}}$                | -65 to +150 | $^\circ\text{C}$   |
| Typical thermal resistance, junction to lead                                 | $R_{\theta\text{JL}}$ <sup>(1)</sup> | 226         | $^\circ\text{C/W}$ |
| Typical thermal resistance, junction to ambient                              | $R_{\theta\text{JA}}$ <sup>(2)</sup> | 65          | $^\circ\text{C/W}$ |

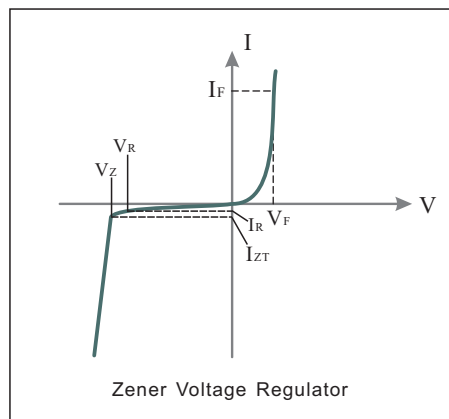
### Notes

- (1) Mounted on PCB with 5.0 mm x 5.0 mm copper pads attached to each terminal
- (2) Mounted on minimum recommended pad layout
- (3) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

### ELECTRICAL CHARACTERISTICS

( $T_L = 30^\circ\text{C}$  unless otherwise noted,  
 $V_F = 1.5\text{ V Max. @ } I_F = 200\text{ mA (DC)}$  for all types)

| Symbol   | Parameter                          |
|----------|------------------------------------|
| $V_Z$    | Reverse Zener Voltage @ $I_{ZT}$   |
| $I_{ZT}$ | Reverse Current                    |
| $Z_{ZT}$ | Maximum Zener Impedance @ $I_{ZT}$ |
| $I_{ZK}$ | Reverse Current                    |
| $Z_{ZK}$ | Maximum Zener Impedance @ $I_{ZK}$ |
| $I_R$    | Reverse Leakage Current @ $V_R$    |
| $V_R$    | Reverse Voltage                    |
| $I_F$    | Forward Current                    |
| $V_F$    | Forward Voltage @ $I_F$            |
| $I_{ZM}$ | Maximum DC Zener Current           |



## RATING AND CHARACTERISTIC CURVES

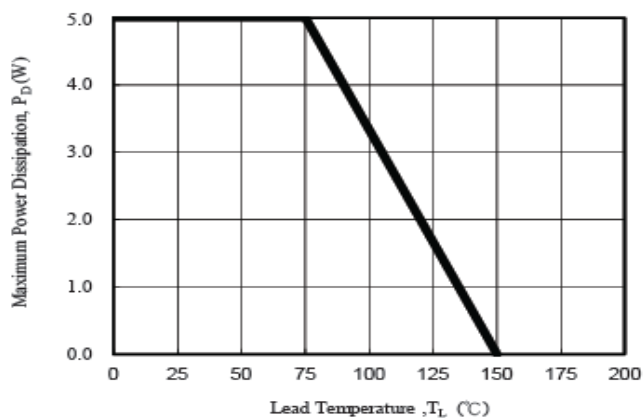


Fig. 1 - Power Temperature Derating Curve

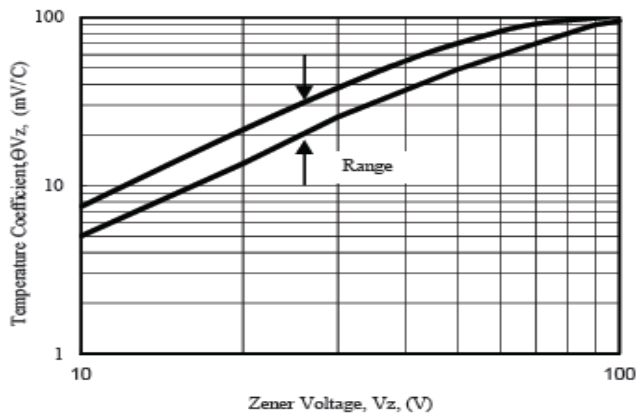


Fig. 2 - Temperature Coefficients v.s. Zener Voltage

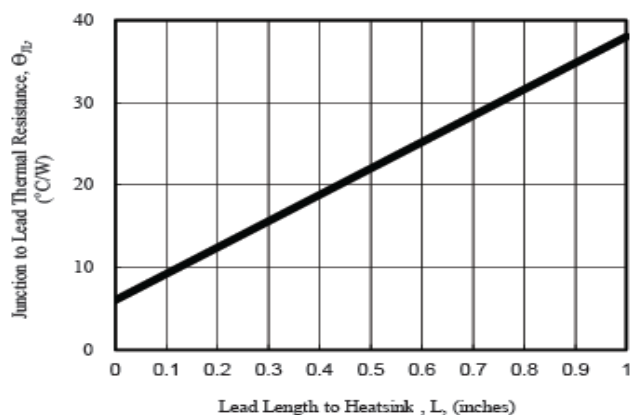


Fig. 3 - Typical Thermal Resistance v.s. Lead Length

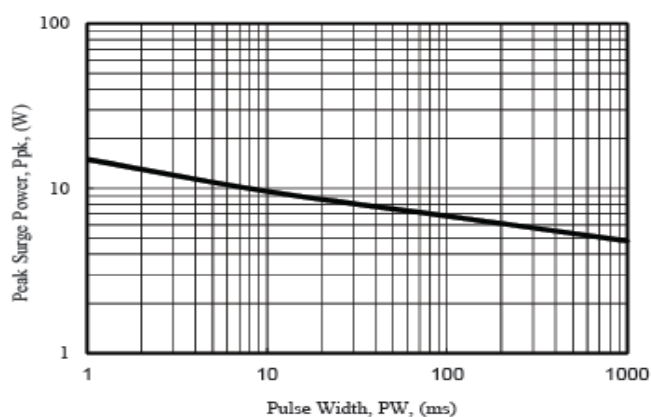


Fig. 4 - Maximum Surge Power

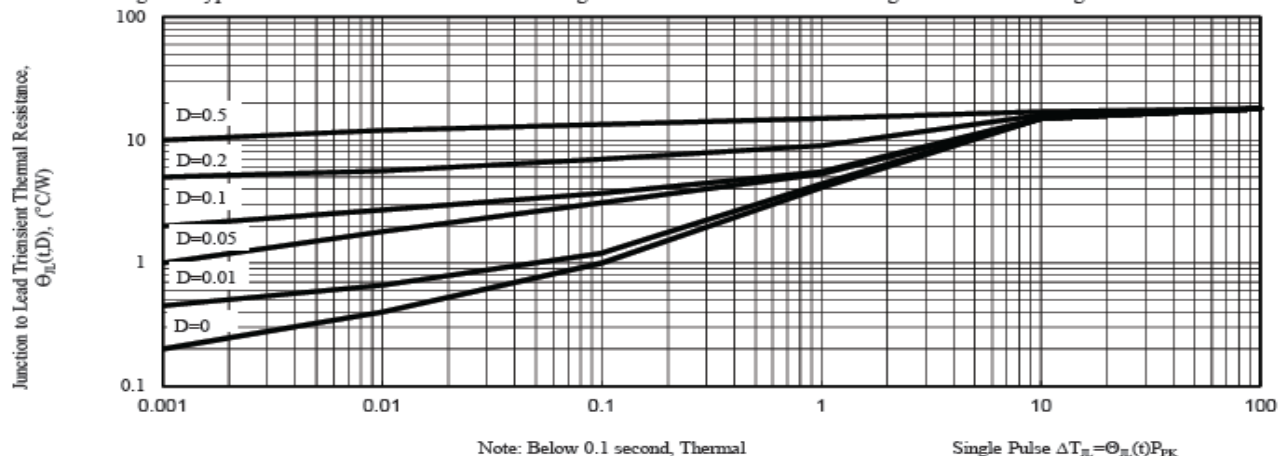


Fig. 5 - Typical Thermal Response L, Lead Length=3/8inch

Note: Below 0.1 second, Thermal

Single Pulse  $\Delta T_{JL} = \Theta_{JL}(t) P_{PK}$



Characteristics at Ta = 25°C (Devices listed in bold, italic are ON Semiconductor Preferred devices.)

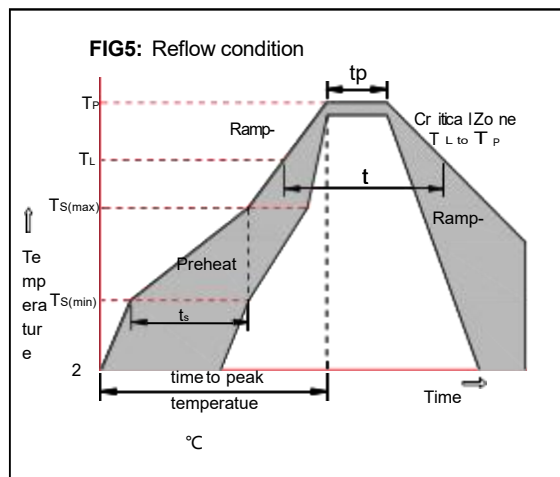
| Part Number | Device Marking Code | Nominal Zener Voltage @I <sub>T</sub> |                         |                         | I <sub>ZT</sub> (mA) | Maximum Zener Impedance                      |                                              |                      | Maximum Reverse Leakage Current        |                    | Maximum DC Zener Current |
|-------------|---------------------|---------------------------------------|-------------------------|-------------------------|----------------------|----------------------------------------------|----------------------------------------------|----------------------|----------------------------------------|--------------------|--------------------------|
|             |                     | V <sub>Z AVE.</sub> (V)               | V <sub>Z MIN.</sub> (V) | V <sub>Z MAX.</sub> (V) |                      | Z <sub>KT MAX.</sub> (Ω)<br>@I <sub>ZT</sub> | Z <sub>ZK MAX.</sub> (Ω)<br>@I <sub>ZK</sub> | I <sub>ZK</sub> (mA) | I <sub>R</sub> (μA)<br>@V <sub>R</sub> | V <sub>R</sub> (V) |                          |
| SMBJ5333B   | 333B                | 3.3                                   | 3.14                    | 3.47                    | 380                  | 3.0                                          | 400                                          | 1.00                 | 300                                    | 1.0                | 1437.0                   |
| SMBJ5334B   | 334B                | 3.6                                   | 3.42                    | 3.78                    | 350.0                | 2.5                                          | 500                                          | 1.00                 | 150                                    | 1.0                | 1317.0                   |
| SMBJ5335B   | 335B                | 3.9                                   | 3.71                    | 4.10                    | 320.0                | 2.0                                          | 500                                          | 1.00                 | 50                                     | 1.0                | 1216.0                   |
| SMBJ5336B   | 336B                | 4.3                                   | 4.09                    | 4.52                    | 290.0                | 2.0                                          | 500                                          | 1.00                 | 10                                     | 1.0                | 1103.0                   |
| SMBJ5337B   | 337B                | 4.7                                   | 4.47                    | 4.94                    | 260.0                | 2.0                                          | 450                                          | 1.00                 | 5                                      | 1.0                | 1009.0                   |
| SMBJ5338B   | 338B                | 5.1                                   | 4.85                    | 5.36                    | 240.0                | 1.5                                          | 400                                          | 1.00                 | 1.0                                    | 1.0                | 930.0                    |
| SMBJ5339B   | 339B                | 5.6                                   | 5.32                    | 5.88                    | 220.0                | 1.0                                          | 400                                          | 1.00                 | 1.0                                    | 2.0                | 846.0                    |
| SMBJ5340B   | 340B                | 6.0                                   | 5.70                    | 6.30                    | 200.0                | 1.0                                          | 300                                          | 1.00                 | 1.0                                    | 3.0                | 790.0                    |
| SMBJ5341B   | 341B                | 6.2                                   | 5.89                    | 6.51                    | 200.0                | 1.0                                          | 200                                          | 1.00                 | 1.0                                    | 3.0                | 765.0                    |
| SMBJ5342B   | 342B                | 6.8                                   | 6.46                    | 7.14                    | 175.0                | 1.0                                          | 200                                          | 1.00                 | 10.0                                   | 5.2                | 700.0                    |
| SMBJ5343B   | 343B                | 7.5                                   | 7.13                    | 7.88                    | 175.0                | 1.5                                          | 200                                          | 1.00                 | 10.0                                   | 5.7                | 630.0                    |
| SMBJ5344B   | 344B                | 8.2                                   | 7.79                    | 8.61                    | 150.0                | 1.5                                          | 200                                          | 1.00                 | 10.0                                   | 6.2                | 580.0                    |
| SMBJ5345B   | 345B                | 8.7                                   | 8.27                    | 9.14                    | 150.0                | 2.0                                          | 200                                          | 1.00                 | 10.0                                   | 6.6                | 545.0                    |
| SMBJ5346B   | 346B                | 9.1                                   | 8.65                    | 9.56                    | 150.0                | 2.0                                          | 150                                          | 1.00                 | 7.5                                    | 6.9                | 520.0                    |
| SMBJ5347B   | 347B                | 10.0                                  | 9.50                    | 10.50                   | 125.0                | 2.0                                          | 125                                          | 1.00                 | 5                                      | 7.6                | 475.0                    |
| SMBJ5348B   | 348B                | 11.0                                  | 10.45                   | 11.55                   | 125.0                | 2.5                                          | 125                                          | 1.00                 | 5                                      | 8.4                | 430.0                    |
| SMBJ5349B   | 349B                | 12.0                                  | 11.40                   | 12.60                   | 100.0                | 2.5                                          | 125                                          | 1.00                 | 2                                      | 9.1                | 395.0                    |
| SMBJ5350B   | 350B                | 13.0                                  | 12.35                   | 13.65                   | 100.0                | 2.5                                          | 100                                          | 1.00                 | 1                                      | 9.9                | 365.0                    |
| SMBJ5351B   | 351B                | 14.0                                  | 13.30                   | 14.70                   | 100.0                | 2.5                                          | 75                                           | 1.00                 | 1                                      | 10.6               | 340.0                    |
| SMBJ5352B   | 352B                | 15.0                                  | 14.25                   | 15.75                   | 75.0                 | 2.5                                          | 75                                           | 1.00                 | 1                                      | 11.5               | 315.0                    |
| SMBJ5353B   | 353B                | 16.0                                  | 15.20                   | 16.80                   | 75.0                 | 2.5                                          | 75                                           | 1.00                 | 1                                      | 12.2               | 295.0                    |
| SMBJ5354B   | 354B                | 17.0                                  | 16.15                   | 17.85                   | 70.0                 | 2.5                                          | 75                                           | 1.00                 | 0.5                                    | 12.9               | 280.0                    |
| SMBJ5355B   | 355B                | 18.0                                  | 17.10                   | 18.90                   | 65.0                 | 2.5                                          | 75                                           | 1.00                 | 0.5                                    | 13.7               | 265.0                    |
| SMBJ5356B   | 356B                | 19.0                                  | 18.05                   | 19.95                   | 65.0                 | 3.0                                          | 75                                           | 1.00                 | 0.5                                    | 14.4               | 250.0                    |
| SMBJ5357B   | 357B                | 20.0                                  | 19.00                   | 21.00                   | 65.0                 | 3.0                                          | 75                                           | 1.00                 | 0.5                                    | 15.2               | 237.0                    |
| SMBJ5358B   | 358B                | 22.0                                  | 20.90                   | 23.10                   | 50.0                 | 3.5                                          | 75                                           | 1.00                 | 0.5                                    | 16.7               | 216.0                    |
| SMBJ5359B   | 359B                | 24.0                                  | 22.80                   | 25.20                   | 50.0                 | 3.5                                          | 100                                          | 1.00                 | 0.5                                    | 18.2               | 198.0                    |
| SMBJ5360B   | 360B                | 25.0                                  | 23.75                   | 26.25                   | 50.0                 | 4.0                                          | 110                                          | 1.00                 | 0.5                                    | 19.0               | 190.0                    |
| SMBJ5361B   | 361B                | 27.0                                  | 25.65                   | 28.35                   | 50.0                 | 5.0                                          | 120                                          | 1.00                 | 0.5                                    | 20.6               | 176.0                    |
| SMBJ5362B   | 362B                | 28.0                                  | 26.60                   | 29.40                   | 50.0                 | 6.0                                          | 130                                          | 1.00                 | 0.5                                    | 21.2               | 170.0                    |
| SMBJ5363B   | 363B                | 30.0                                  | 28.50                   | 31.50                   | 40.0                 | 8.0                                          | 140                                          | 1.00                 | 0.5                                    | 22.8               | 158.0                    |
| SMBJ5364B   | 364B                | 33.0                                  | 31.35                   | 34.65                   | 40.0                 | 10.0                                         | 150                                          | 1.00                 | 0.5                                    | 25.1               | 144.0                    |
| SMBJ5365B   | 365B                | 36.0                                  | 34.20                   | 37.80                   | 30.0                 | 11.0                                         | 160                                          | 1.00                 | 0.5                                    | 27.4               | 132.0                    |
| SMBJ5366B   | 366B                | 39.0                                  | 37.05                   | 40.95                   | 30.0                 | 14.0                                         | 170                                          | 1.00                 | 0.5                                    | 29.7               | 122.0                    |
| SMBJ5367B   | 367B                | 43.0                                  | 40.85                   | 45.15                   | 30.0                 | 20.0                                         | 190                                          | 1.00                 | 0.5                                    | 32.7               | 110.0                    |
| SMBJ5368B   | 368B                | 47.0                                  | 44.65                   | 49.35                   | 25.0                 | 25.0                                         | 210                                          | 1.00                 | 0.5                                    | 35.8               | 100.0                    |
| SMBJ5369B   | 369B                | 51.0                                  | 48.45                   | 53.55                   | 25.0                 | 27.0                                         | 230                                          | 1.00                 | 0.5                                    | 38.8               | 93.0                     |
| SMBJ5370B   | 370B                | 56.0                                  | 53.20                   | 58.80                   | 20.0                 | 35.0                                         | 280                                          | 1.00                 | 0.5                                    | 42.6               | 86.0                     |
| SMBJ5371B   | 371B                | 60.0                                  | 57.00                   | 63.00                   | 20.0                 | 40.0                                         | 350                                          | 1.00                 | 0.5                                    | 42.5               | 79.0                     |
| SMBJ5372B   | 372B                | 62.0                                  | 58.90                   | 65.10                   | 20.0                 | 42.0                                         | 400                                          | 1.00                 | 0.5                                    | 47.1               | 76.0                     |
| SMBJ5373B   | 373B                | 68.0                                  | 64.60                   | 71.40                   | 20.0                 | 44.0                                         | 500                                          | 1.00                 | 0.5                                    | 51.7               | 70.0                     |
| SMBJ5374B   | 374B                | 75.0                                  | 71.25                   | 78.75                   | 20.0                 | 45.0                                         | 620                                          | 1.00                 | 0.5                                    | 56.0               | 63.0                     |
| SMBJ5375B   | 375B                | 82.0                                  | 77.90                   | 86.10                   | 15.0                 | 65.0                                         | 720                                          | 1.00                 | 0.5                                    | 62.2               | 58.0                     |
| SMBJ5376B   | 376B                | 87.0                                  | 82.65                   | 91.35                   | 15.0                 | 75.0                                         | 760                                          | 1.00                 | 0.5                                    | 66.0               | 54.5                     |
| SMBJ5377B   | 377B                | 91.0                                  | 86.45                   | 95.55                   | 15.0                 | 75.0                                         | 760                                          | 1.00                 | 0.5                                    | 69.2               | 52.5                     |
| SMBJ5378B   | 378B                | 100.0                                 | 95.00                   | 105.00                  | 12.0                 | 90.0                                         | 800                                          | 1.00                 | 0.5                                    | 76.0               | 47.5                     |
| SMBJ5379B   | 379B                | 110.0                                 | 104.50                  | 115.50                  | 12.0                 | 125.0                                        | 1000                                         | 1.00                 | 0.5                                    | 83.6               | 43.0                     |
| SMBJ5380B   | 380B                | 120.0                                 | 114.00                  | 126.00                  | 10.0                 | 170.0                                        | 1150                                         | 1.00                 | 0.5                                    | 91.2               | 39.5                     |
| SMBJ5381B   | 381B                | 130.0                                 | 123.50                  | 136.50                  | 10.0                 | 190.0                                        | 1250                                         | 1.00                 | 0.5                                    | 98.8               | 36.6                     |
| SMBJ5382B   | 382B                | 140.0                                 | 133.00                  | 147.00                  | 8.0                  | 230.0                                        | 1500                                         | 1.00                 | 0.5                                    | 106.0              | 34.0                     |
| SMBJ5383B   | 383B                | 150.0                                 | 142.50                  | 157.50                  | 8.0                  | 330.0                                        | 1500                                         | 1.00                 | 0.5                                    | 114.0              | 31.6                     |
| SMBJ5384B   | 384B                | 160.0                                 | 152.00                  | 168.00                  | 8.0                  | 350.0                                        | 1650                                         | 1.00                 | 0.5                                    | 122.0              | 29.4                     |
| SMBJ5385B   | 385B                | 170.0                                 | 161.50                  | 178.50                  | 8.0                  | 380.0                                        | 1750                                         | 1.00                 | 0.5                                    | 129.0              | 28.0                     |
| SMBJ5386B   | 386B                | 180.0                                 | 171.00                  | 189.00                  | 5.0                  | 430.0                                        | 1750                                         | 1.00                 | 0.5                                    | 137.0              | 26.4                     |
| SMBJ5387B   | 387B                | 190.0                                 | 180.50                  | 199.50                  | 5.0                  | 450.0                                        | 1850                                         | 1.00                 | 0.5                                    | 144.0              | 25.0                     |
| SMBJ5388B   | 388B                | 200.0                                 | 190.00                  | 210.00                  | 5.0                  | 480.0                                        | 1850                                         | 1.00                 | 0.5                                    | 152.0              | 23.6                     |

Remark:

The device numbers listed have a standard tolerance on the nominal zener voltage of  $\pm 5\%$ .

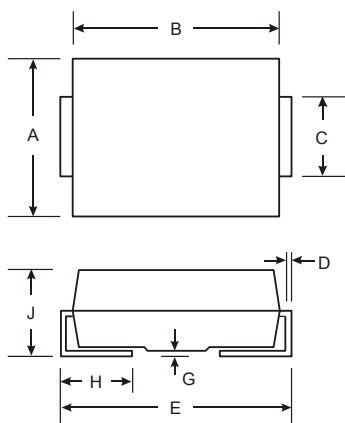
## Soldering parameters

| Reflow Condition                                        |                                   | Pb-Free assembly<br>(see as below) |
|---------------------------------------------------------|-----------------------------------|------------------------------------|
| Pre Heat                                                | -Temperature Min ( $T_{s(min)}$ ) | +150°C                             |
|                                                         | -Temperature Max( $T_{s(max)}$ )  | +200°C                             |
|                                                         | -Time (Min to Max) (ts)           | 60-180 secs.                       |
| Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak) |                                   | 3°C/sec. Max                       |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                    |                                   | 3°C/sec. Max                       |
| Reflow                                                  | -Temperature( $T_L$ )(Liquid us)  | +217°C                             |
|                                                         | -Temperature( $t_L$ )             | 60-150 secs.                       |
| Peak Temp ( $T_P$ )                                     |                                   | +260(+0/-5)°C                      |
| Time within 5°C of actual Peak Temp ( $t_P$ )           |                                   | 30 secs. Max                       |
| Ramp-down Rate                                          |                                   | 6°C/sec. Max                       |
| Time 25°C to Peak Temp ( $T_P$ )                        |                                   | 8 min. Max                         |
| Do not exceed                                           |                                   | +260°C                             |

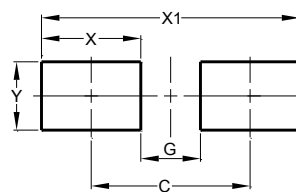


## Package Dimensions & Suggested Pad Layout

### SMB



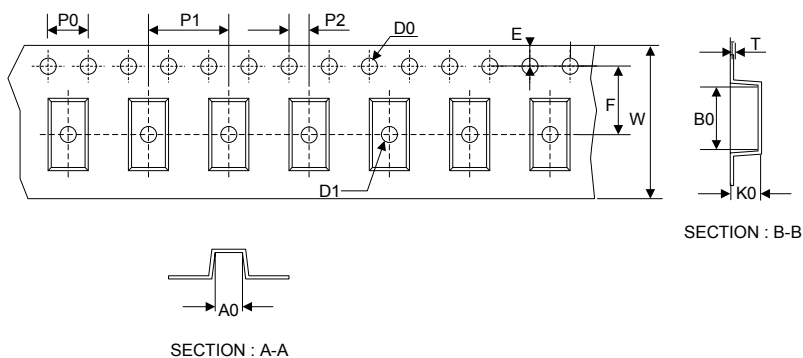
| SMB                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 3.30 | 3.94 |
| B                    | 4.06 | 4.70 |
| C                    | 1.91 | 2.11 |
| D                    | 0.15 | 0.31 |
| E                    | 5.08 | 5.59 |
| G                    |      | 0.20 |
| H                    | 0.76 | 1.50 |
| J                    | 2.13 | 2.44 |
| All Dimensions in mm |      |      |



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 4.70          |
| G          | 2.20          |
| X          | 2.50          |
| X1         | 7.20          |
| Y          | 2.80          |

## Tape & reel specification

### Tape



| Symbol            | Dimension (mm) |
|-------------------|----------------|
| P0                | 4.00±0.20      |
| P1                | 8.00±0.20      |
| P2                | 2.00±0.20      |
| D0                | 1.60±0.20      |
| D1                | 1.60±0.20      |
| E                 | 1.75±0.20      |
| F                 | 5.50±0.15      |
| W                 | 12.00±0.20     |
| A0                | 4.00±0.20      |
| B0                | 5.45±0.20      |
| K0                | 2.50±0.25      |
| T                 | 0.20±0.10      |
| D2                | 330.0±5.0      |
| D3                | 73.0Min.       |
| D4                | 14.0±2.5       |
| W1                | 16.0±2.5       |
| Quantity: 3000PCS |                |

### 13" Reel

