

# SMBJ5333B - SMBJ5388B

# SURFACE MOUNT SILICON ZENER DIODES

**V<sub>Z</sub> : 3.3 - 200 Volts**

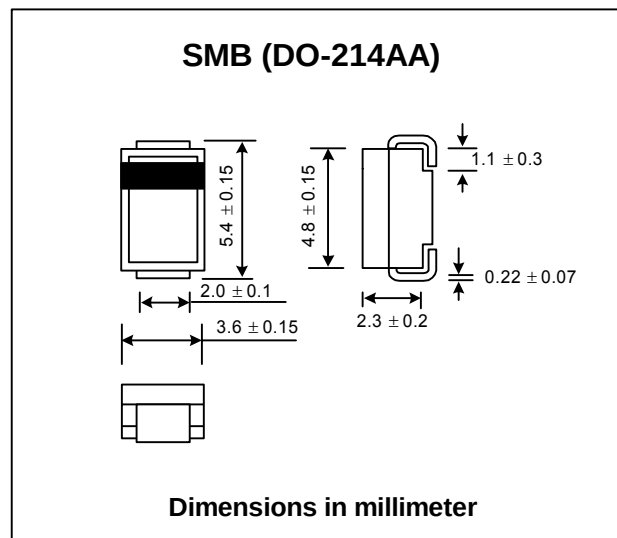
**P<sub>D</sub> : 5 Watts**

## FEATURES :

- \* Complete Voltage Range 3.3 to 200 Volts
- \* High peak reverse power dissipation
- \* High reliability
- \* Low leakage current
- \* **Pb / RoHS Free**

## MECHANICAL DATA

- \* Case : SMB (DO-214AA) Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Lead formed for Surface mount
- \* Polarity : Color band denotes cathode end
- \* Mounting position : Any
- \* Weight : 0.093 gram



## MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified

| Rating                                            | Symbol                            | Value         | Unit |
|---------------------------------------------------|-----------------------------------|---------------|------|
| Power Dissipation at T <sub>L</sub> = 25 °C       | P <sub>D</sub>                    | 5             | W    |
| Maximum Forward Voltage at I <sub>F</sub> = 1.0 A | V <sub>F</sub>                    | 1.2           | V    |
| Thermal Resistance, Junction to Ambient (Note 1)  | R <sub>θJA</sub>                  | 90            | °C/W |
| Thermal Resistance, Junction to Lead (Note 1)     | R <sub>θJL</sub>                  | 25            | °C/W |
| Operating and Storage Temperature Range           | T <sub>J</sub> , T <sub>STG</sub> | - 65 to + 150 | °C   |

### Note :

- (1) When mounted on FR4 PC board (1 oz Cu) with recommended footprint.

# ELECTRICAL CHARACTERISTICS (Rating at 25 °C ambient temperature unless otherwise specified)

| TYPE      | Regulator Voltage |          | Maximum Zener Impedance |                   |          | Maximum Reverse Leakage Current |      | Maximum Zener Current | Maximum Surge Current | Maximum Voltage Regulator |
|-----------|-------------------|----------|-------------------------|-------------------|----------|---------------------------------|------|-----------------------|-----------------------|---------------------------|
|           | $V_Z @ I_{ZT}$    | $I_{ZT}$ | $Z_{ZT} @ I_{ZT}$       | $Z_{ZK} @ I_{ZK}$ | $I_{ZK}$ | $I_R @ V_R$                     |      | $I_{ZM}$              | $I_{ZSM}$             | $\Delta V_Z$              |
|           | (V)               | (mA)     | ( $\Omega$ )            | ( $\Omega$ )      | (mA)     | ( $\mu A$ )                     | (V)  | (mA)                  | (A)                   |                           |
| SMBJ5333B | 3.3               | 380      | 3.0                     | 400               | 1.0      | 300                             | 1.0  | 1440                  | 20.0                  | 0.85                      |
| SMBJ5334B | 3.6               | 350      | 2.5                     | 500               | 1.0      | 150                             | 1.0  | 1320                  | 18.7                  | 0.80                      |
| SMBJ5335B | 3.9               | 320      | 2.0                     | 500               | 1.0      | 50                              | 1.0  | 1220                  | 17.6                  | 0.54                      |
| SMBJ5336B | 4.3               | 290      | 2.0                     | 500               | 1.0      | 10                              | 1.0  | 1100                  | 16.4                  | 0.49                      |
| SMBJ5337B | 4.7               | 260      | 2.0                     | 450               | 1.0      | 5.0                             | 1.0  | 1010                  | 15.3                  | 0.44                      |
| SMBJ5338B | 5.1               | 240      | 1.5                     | 400               | 1.0      | 1.0                             | 1.0  | 930                   | 14.4                  | 0.39                      |
| SMBJ5339B | 5.6               | 220      | 1.0                     | 400               | 1.0      | 1.0                             | 2.0  | 856                   | 13.4                  | 0.25                      |
| SMBJ5340B | 6.0               | 200      | 1.0                     | 300               | 1.0      | 1.0                             | 3.0  | 790                   | 12.7                  | 0.19                      |
| SMBJ5341B | 6.2               | 200      | 1.0                     | 200               | 1.0      | 1.0                             | 3.0  | 765                   | 12.4                  | 0.10                      |
| SMBJ5342B | 6.8               | 175      | 1.0                     | 200               | 1.0      | 10                              | 5.2  | 700                   | 11.5                  | 0.15                      |
| SMBJ5343B | 7.5               | 175      | 1.5                     | 200               | 1.0      | 10                              | 5.7  | 630                   | 10.7                  | 0.15                      |
| SMBJ5344B | 8.2               | 150      | 1.5                     | 200               | 1.0      | 10                              | 6.2  | 580                   | 10.0                  | 0.20                      |
| SMBJ5345B | 8.7               | 150      | 2.0                     | 200               | 1.0      | 10                              | 6.6  | 545                   | 9.5                   | 0.20                      |
| SMBJ5346B | 9.1               | 150      | 2.0                     | 150               | 1.0      | 7.5                             | 6.9  | 520                   | 9.2                   | 0.22                      |
| SMBJ5347B | 10                | 125      | 2.0                     | 125               | 1.0      | 5.0                             | 7.6  | 475                   | 8.6                   | 0.22                      |
| SMBJ5348B | 11                | 125      | 2.5                     | 125               | 1.0      | 5.0                             | 8.4  | 430                   | 8.0                   | 0.25                      |
| SMBJ5349B | 12                | 100      | 2.5                     | 125               | 1.0      | 2.0                             | 9.1  | 395                   | 7.5                   | 0.25                      |
| SMBJ5350B | 13                | 100      | 2.5                     | 100               | 1.0      | 1.0                             | 9.9  | 365                   | 7.0                   | 0.25                      |
| SMBJ5351B | 14                | 100      | 2.5                     | 75                | 1.0      | 1.0                             | 10.6 | 340                   | 6.7                   | 0.25                      |
| SMBJ5352B | 15                | 75       | 2.5                     | 75                | 1.0      | 1.0                             | 11.5 | 315                   | 6.3                   | 0.25                      |
| SMBJ5353B | 16                | 75       | 2.5                     | 75                | 1.0      | 1.0                             | 12.2 | 295                   | 6.0                   | 0.30                      |
| SMBJ5354B | 17                | 70       | 2.5                     | 75                | 1.0      | 0.5                             | 12.9 | 280                   | 5.8                   | 0.35                      |
| SMBJ5355B | 18                | 65       | 2.5                     | 75                | 1.0      | 0.5                             | 13.7 | 265                   | 5.5                   | 0.40                      |
| SMBJ5356B | 19                | 65       | 3.0                     | 75                | 1.0      | 0.5                             | 14.4 | 250                   | 5.3                   | 0.40                      |
| SMBJ5357B | 20                | 65       | 3.0                     | 75                | 1.0      | 0.5                             | 15.2 | 237                   | 5.1                   | 0.40                      |
| SMBJ5358B | 22                | 50       | 3.5                     | 75                | 1.0      | 0.5                             | 16.7 | 216                   | 4.7                   | 0.45                      |
| SMBJ5359B | 24                | 50       | 3.5                     | 100               | 1.0      | 0.5                             | 18.2 | 198                   | 4.4                   | 0.55                      |
| SMBJ5360B | 25                | 50       | 4.0                     | 110               | 1.0      | 0.5                             | 19.0 | 190                   | 4.3                   | 0.55                      |
| SMBJ5361B | 27                | 50       | 5.0                     | 120               | 1.0      | 0.5                             | 20.6 | 176                   | 4.1                   | 0.60                      |
| SMBJ5362B | 28                | 50       | 6.0                     | 130               | 1.0      | 0.5                             | 21.2 | 170                   | 3.9                   | 0.60                      |
| SMBJ5363B | 30                | 40       | 8.0                     | 140               | 1.0      | 0.5                             | 22.8 | 158                   | 3.7                   | 0.60                      |
| SMBJ5364B | 33                | 40       | 10                      | 150               | 1.0      | 0.5                             | 25.1 | 144                   | 3.5                   | 0.60                      |
| SMBJ5365B | 36                | 30       | 11                      | 160               | 1.0      | 0.5                             | 27.4 | 132                   | 3.3                   | 0.65                      |
| SMBJ5366B | 39                | 30       | 14                      | 170               | 1.0      | 0.5                             | 29.7 | 122                   | 3.1                   | 0.65                      |
| SMBJ5367B | 43                | 30       | 20                      | 190               | 1.0      | 0.5                             | 32.7 | 110                   | 2.8                   | 0.70                      |
| SMBJ5368B | 47                | 25       | 25                      | 210               | 1.0      | 0.5                             | 35.8 | 100                   | 2.7                   | 0.80                      |
| SMBJ5369B | 51                | 25       | 27                      | 230               | 1.0      | 0.5                             | 38.8 | 93.0                  | 2.5                   | 0.90                      |
| SMBJ5370B | 56                | 20       | 35                      | 280               | 1.0      | 0.5                             | 42.6 | 86.0                  | 2.3                   | 1.00                      |
| SMBJ5371B | 60                | 20       | 40                      | 350               | 1.0      | 0.5                             | 45.5 | 79.0                  | 2.2                   | 1.20                      |
| SMBJ5372B | 62                | 20       | 42                      | 400               | 1.0      | 0.5                             | 47.1 | 76.0                  | 2.1                   | 1.35                      |
| SMBJ5373B | 68                | 20       | 44                      | 500               | 1.0      | 0.5                             | 51.7 | 70.0                  | 2.0                   | 1.50                      |
| SMBJ5374B | 75                | 20       | 45                      | 620               | 1.0      | 0.5                             | 56.0 | 63.0                  | 1.9                   | 1.60                      |
| SMBJ5375B | 82                | 15       | 65                      | 720               | 1.0      | 0.5                             | 62.2 | 58.0                  | 1.8                   | 1.80                      |
| SMBJ5376B | 87                | 15       | 75                      | 760               | 1.0      | 0.5                             | 66.0 | 54.5                  | 1.7                   | 2.00                      |
| SMBJ5377B | 91                | 15       | 75                      | 760               | 1.0      | 0.5                             | 69.2 | 52.5                  | 1.6                   | 2.20                      |
| SMBJ5378B | 100               | 12       | 90                      | 800               | 1.0      | 0.5                             | 76.0 | 47.5                  | 1.5                   | 2.30                      |
| SMBJ5379B | 110               | 12       | 125                     | 1000              | 1.0      | 0.5                             | 83.6 | 43.0                  | 1.4                   | 2.50                      |
| SMBJ5380B | 120               | 10       | 170                     | 1150              | 1.0      | 0.5                             | 91.2 | 39.5                  | 1.3                   | 2.50                      |
| SMBJ5381B | 130               | 10       | 190                     | 1250              | 1.0      | 0.5                             | 98.8 | 36.6                  | 1.2                   | 2.50                      |
| SMBJ5382B | 140               | 8.0      | 230                     | 1500              | 1.0      | 0.5                             | 106  | 34.0                  | 1.2                   | 2.50                      |
| SMBJ5383B | 150               | 8.0      | 330                     | 1500              | 1.0      | 0.5                             | 114  | 31.6                  | 1.1                   | 3.00                      |
| SMBJ5384B | 160               | 8.0      | 350                     | 1650              | 1.0      | 0.5                             | 122  | 29.4                  | 1.1                   | 3.00                      |
| SMBJ5385B | 170               | 8.0      | 380                     | 1750              | 1.0      | 0.5                             | 129  | 28.0                  | 1.0                   | 3.00                      |
| SMBJ5386B | 180               | 5.0      | 430                     | 1750              | 1.0      | 0.5                             | 137  | 26.4                  | 1.0                   | 4.00                      |
| SMBJ5387B | 190               | 5.0      | 450                     | 1850              | 1.0      | 0.5                             | 144  | 25.0                  | 0.9                   | 5.00                      |
| SMBJ5388B | 200               | 5.0      | 480                     | 1850              | 1.0      | 0.5                             | 152  | 23.6                  | 0.9                   | 5.00                      |

Notes : (1) Suffix " B " indicates  $\pm 5\%$  tolerance, suffix " A " indicates  $\pm 10\%$  tolerance.

(2) The surge current ( $I_{ZSM}$ ) is specified as the maximum peak of a non- recurrent half-sin wave of 8.3 ms duration.

(3) Voltage regulation ( $V_Z$ ) is the difference between the voltage measured at 10% and 50% of  $I_{ZM}$

## RATING AND CHARACTERISTIC CURVES ( SMBJ5333B - SMBJ5388B )

Fig. 1 POWER DERATING CURVE

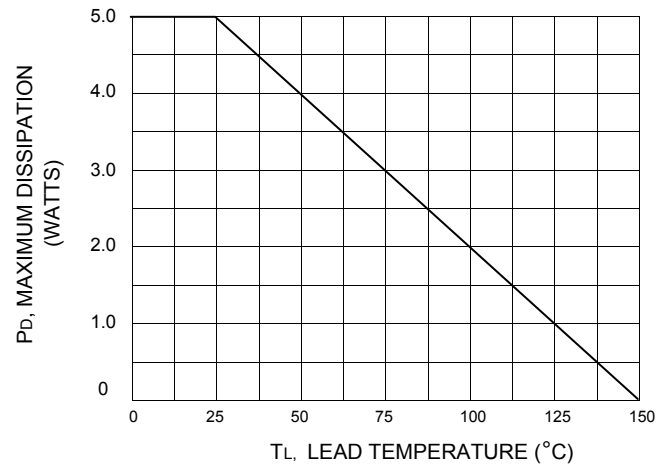


Fig.2 Maximum Non-Repetitive Surg Current versus Nominal Zener Voltage

