

# SMBJ5338B THRU SMBJ5388B

## Features

- Low Profile Package for Surface Mounting (Flat Handling Surface for Accurate Placement)
- Zener Voltage 5.1V to 200V
- High Surge Current Capability
- For Available Tolerances-see Note 1
- Available on Tape and Reel (see E1A std RS-481)
- Lead Free Finish/Rohs Compliant (Note1) ("P" Suffix designates Compliant. See ordering information)
- Halogen free available upon request by adding suffix "-HF"

## Mechanical Data

- Standard JEDEC Outlines as Shown
- Marking: See page 2
- Maximum Temperature for Soldering: 260°C for 10 Seconds
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

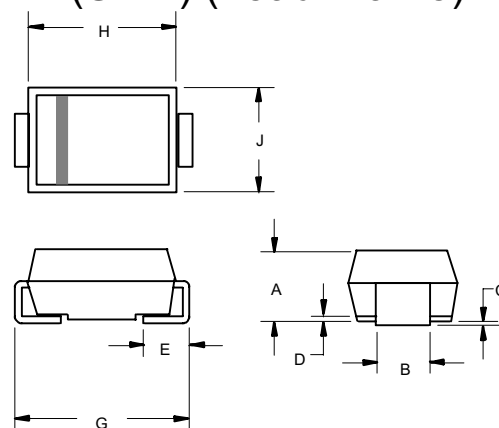
## Electrical Characteristics @ 25°C Unless Otherwise Specified

|                                    |                 |                   |
|------------------------------------|-----------------|-------------------|
| Forward Voltage at 1.0A Current    | $V_F$           | 1.2Volts          |
| Steady State Power Dissipation     | $P_{(AV)}$      | 5Watts See Note 2 |
| Operating and Storage Temperatures | $T_J, T_{STG}$  | -55°C to +150°C   |
| Thermal Resistance                 | $R_{\theta JL}$ | 15°C/W            |
|                                    | $R_{\theta JA}$ | 90°C/W            |

- Note: 1. High Temperature Solder Exemptions Applied, see EU Directive Annex 7.  
2. Lead temperature at 75°C = TL at mounting plane. Derate linearly above 75°C to zero power at 150 °C  
3. Ambient temperature at 15°C = TA at mounting plane. Derate linearly above 15°C to zero power at 150 °C

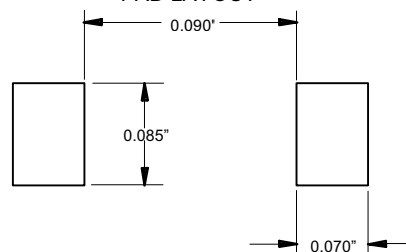
## 5 Watt Surface Mount Silicon Zener Diode 5.1 to 200 Volts

### DO-214AA (SMB) (Lead Frame)



| DIMENSIONS |        |      |      |      |      |
|------------|--------|------|------|------|------|
| DIM        | INCHES |      | MM   |      | NOTE |
|            | MIN    | MAX  | MIN  | MAX  |      |
| A          | .075   | .095 | 1.91 | 2.41 |      |
| B          | .077   | .083 | 1.96 | 2.10 |      |
| C          | .002   | .008 | .05  | .20  |      |
| D          | ----   | .02  | ---- | .51  |      |
| E          | .030   | .060 | .76  | 1.52 |      |
| G          | .200   | .220 | 5.08 | 5.59 |      |
| H          | .160   | .187 | 4.06 | 4.75 |      |
| J          | .130   | .155 | 3.30 | 3.94 |      |

### SUGGESTED SOLDER PAD LAYOUT



# SMBJ5338B thru SMBJ5388B



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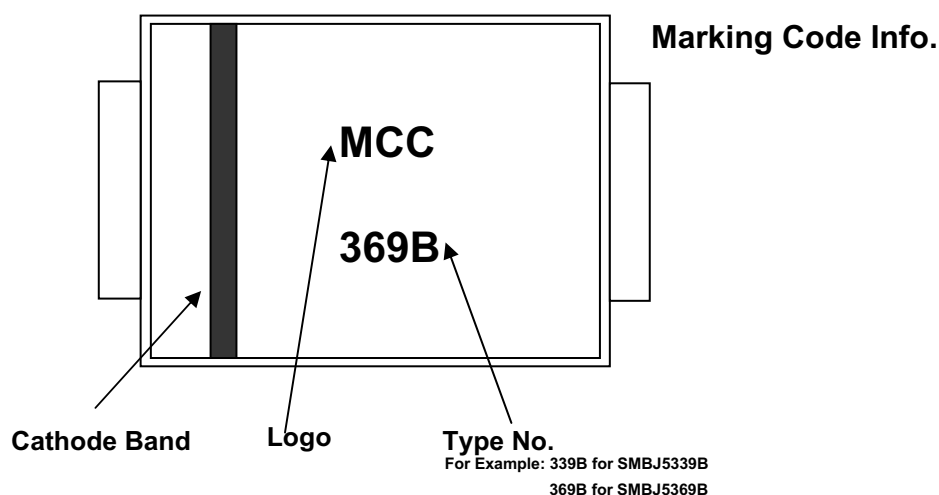
## ELECTRICAL CHARACTERISTICS @25°C

| MCC PART NUMBER | REGULATOR VOLTAGE<br>$V_Z$ | TEST CURRENT<br>$I_Z$ | MAXIMUM DYNAMIC IMPEDANCE<br>$Z_{ZT}$ | MAXIMUM REVERSE CURRENT<br>$I_R$ | TEST VOLTAGE<br>$V_R$ | MAXIMUM REGULATOR CURRENT<br>$I_{ZM}$ | MAXIMUM DYNAMIC KNEE IMPEDANCE<br>$Z_{ZK}@1.0mA$ | MAXIMUM SURGE CURRENT<br>$I_{ZSM}$ | MAXIMUM VOLTAGE REGULATION |
|-----------------|----------------------------|-----------------------|---------------------------------------|----------------------------------|-----------------------|---------------------------------------|--------------------------------------------------|------------------------------------|----------------------------|
|                 | VOLTS                      | mA                    | OHMS                                  | $\mu A$                          | VOLTS                 | mA                                    | OHMS                                             | A                                  | VOLTS                      |
| SMBJ5338B       | 5.1                        | 240                   | 1.5                                   | 1                                | 1                     | 930                                   | 400                                              | 14.4                               | 0.39                       |
| SMBJ5339B       | 5.6                        | 220                   | 1                                     | 1                                | 2                     | 865                                   | 400                                              | 13.4                               | 0.25                       |
| SMBJ5340B       | 6                          | 200                   | 1                                     | 1                                | 3                     | 790                                   | 300                                              | 12.7                               | 0.19                       |
| SMBJ5341B       | 6.2                        | 200                   | 1                                     | 1                                | 3                     | 765                                   | 200                                              | 12.4                               | 0.1                        |
| SMBJ5342B       | 6.8                        | 175                   | 1                                     | 10                               | 5.2                   | 700                                   | 200                                              | 11.5                               | 0.15                       |
| SMBJ5343B       | 7.5                        | 175                   | 1.5                                   | 10                               | 5.7                   | 630                                   | 200                                              | 10.7                               | 0.15                       |
| SMBJ5344B       | 8.2                        | 150                   | 1.5                                   | 10                               | 6.2                   | 580                                   | 200                                              | 10                                 | 0.2                        |
| SMBJ5345B       | 8.7                        | 150                   | 2                                     | 10                               | 6.6                   | 545                                   | 200                                              | 9.5                                | 0.2                        |
| SMBJ5346B       | 9.1                        | 150                   | 2                                     | 7.5                              | 6.9                   | 520                                   | 150                                              | 9.2                                | 0.22                       |
| SMBJ5347B       | 10                         | 125                   | 2                                     | 5                                | 7.6                   | 475                                   | 125                                              | 8.6                                | 0.22                       |
| SMBJ5348B       | 11                         | 125                   | 2.5                                   | 5                                | 8.4                   | 430                                   | 125                                              | 8                                  | 0.25                       |
| SMBJ5349B       | 12                         | 100                   | 2.5                                   | 2                                | 9.1                   | 395                                   | 125                                              | 7.5                                | 0.25                       |
| SMBJ5350B       | 13                         | 100                   | 2.5                                   | 1                                | 9.9                   | 365                                   | 100                                              | 7                                  | 0.25                       |
| SMBJ5351B       | 14                         | 100                   | 2.5                                   | 1                                | 10.6                  | 340                                   | 75                                               | 6.7                                | 0.25                       |
| SMBJ5352B       | 15                         | 75                    | 2.5                                   | 1                                | 11.5                  | 315                                   | 75                                               | 6.3                                | 0.25                       |
| SMBJ5353B       | 16                         | 75                    | 2.5                                   | 1                                | 12.2                  | 295                                   | 75                                               | 6                                  | 0.3                        |
| SMBJ5354B       | 17                         | 70                    | 2.5                                   | 0.5                              | 12.9                  | 280                                   | 75                                               | 5.8                                | 0.35                       |
| SMBJ5355B       | 18                         | 65                    | 2.5                                   | 0.5                              | 13.7                  | 264                                   | 75                                               | 5.5                                | 0.4                        |
| SMBJ5356B       | 19                         | 65                    | 3                                     | 0.5                              | 14.4                  | 250                                   | 75                                               | 5.3                                | 0.4                        |
| SMBJ5357B       | 20                         | 65                    | 3                                     | 0.5                              | 15.2                  | 237                                   | 75                                               | 5.1                                | 0.4                        |
| SMBJ5358B       | 22                         | 50                    | 3.5                                   | 0.5                              | 16.7                  | 216                                   | 75                                               | 4.7                                | 0.45                       |
| SMBJ5359B       | 24                         | 50                    | 3.5                                   | 0.5                              | 18.2                  | 198                                   | 100                                              | 4.4                                | 0.55                       |
| SMBJ5360B       | 25                         | 50                    | 4                                     | 0.5                              | 19                    | 190                                   | 110                                              | 4.3                                | 0.55                       |
| SMBJ5361B       | 27                         | 50                    | 5                                     | 0.5                              | 20.6                  | 176                                   | 120                                              | 4.1                                | 0.6                        |
| SMBJ5362B       | 28                         | 50                    | 6                                     | 0.5                              | 21.2                  | 170                                   | 130                                              | 3.9                                | 0.6                        |
| SMBJ5363B       | 30                         | 40                    | 8                                     | 0.5                              | 22.8                  | 158                                   | 140                                              | 3.7                                | 0.6                        |
| SMBJ5364B       | 33                         | 40                    | 10                                    | 0.5                              | 25.1                  | 144                                   | 150                                              | 3.5                                | 0.6                        |
| SMBJ5365B       | 36                         | 30                    | 11                                    | 0.5                              | 27.4                  | 132                                   | 160                                              | 3.3                                | 0.65                       |
| SMBJ5366B       | 39                         | 30                    | 14                                    | 0.5                              | 29.7                  | 122                                   | 170                                              | 3.1                                | 0.65                       |
| SMBJ5367B       | 43                         | 30                    | 20                                    | 0.5                              | 32.7                  | 110                                   | 190                                              | 2.8                                | 0.7                        |
| SMBJ5368B       | 47                         | 25                    | 25                                    | 0.5                              | 35.8                  | 100                                   | 210                                              | 2.7                                | 0.8                        |
| SMBJ5369B       | 51                         | 25                    | 27                                    | 0.5                              | 38.8                  | 93                                    | 230                                              | 2.5                                | 0.9                        |
| SMBJ5370B       | 56                         | 20                    | 35                                    | 0.5                              | 42.6                  | 86                                    | 280                                              | 2.3                                | 1                          |
| SMBJ5371B       | 60                         | 20                    | 40                                    | 0.5                              | 45.5                  | 79                                    | 350                                              | 2.2                                | 1.2                        |
| SMBJ5372B       | 62                         | 20                    | 42                                    | 0.5                              | 47.1                  | 76                                    | 400                                              | 2.1                                | 1.35                       |
| SMBJ5373B       | 68                         | 20                    | 44                                    | 0.5                              | 51.7                  | 70                                    | 500                                              | 2                                  | 1.5                        |
| SMBJ5374B       | 75                         | 20                    | 45                                    | 0.5                              | 56                    | 63                                    | 620                                              | 1.9                                | 1.6                        |
| SMBJ5375B       | 82                         | 15                    | 65                                    | 0.5                              | 62.2                  | 58                                    | 720                                              | 1.8                                | 1.8                        |
| SMBJ5376B       | 87                         | 15                    | 75                                    | 0.5                              | 66                    | 54.5                                  | 760                                              | 1.7                                | 2                          |
| SMBJ5377B       | 91                         | 15                    | 75                                    | 0.5                              | 69.2                  | 52.5                                  | 760                                              | 1.6                                | 2.2                        |
| SMBJ5378B       | 100                        | 12                    | 90                                    | 0.5                              | 76                    | 47.5                                  | 800                                              | 1.5                                | 2.3                        |
| SMBJ5379B       | 110                        | 12                    | 125                                   | 0.5                              | 83.6                  | 43                                    | 1000                                             | 1.4                                | 2.5                        |
| SMBJ5380B       | 120                        | 10                    | 170                                   | 0.5                              | 91.2                  | 39.5                                  | 1150                                             | 1.3                                | 2.5                        |
| SMBJ5381B       | 130                        | 10                    | 190                                   | 0.5                              | 98.8                  | 36.6                                  | 1250                                             | 1.2                                | 2.5                        |
| SMBJ5382B       | 140                        | 8.0                   | 230                                   | 0.5                              | 106                   | 34                                    | 1500                                             | 1.2                                | 2.5                        |
| SMBJ5383B       | 150                        | 8.0                   | 330                                   | 0.5                              | 114                   | 31.6                                  | 1500                                             | 1.1                                | 3                          |
| SMBJ5384B       | 160                        | 8.0                   | 350                                   | 0.5                              | 122                   | 29.4                                  | 1650                                             | 1.1                                | 3                          |
| SMBJ5385B       | 170                        | 8.0                   | 380                                   | 0.5                              | 129                   | 28                                    | 1750                                             | 1.0                                | 3                          |
| SMBJ5386B       | 180                        | 5.0                   | 430                                   | 0.5                              | 137                   | 26.4                                  | 1750                                             | 1.0                                | 4                          |
| SMBJ5387B       | 190                        | 5.0                   | 450                                   | 0.5                              | 144                   | 25                                    | 1850                                             | 0.9                                | 5                          |
| SMBJ5388B       | 200                        | 5.0                   | 480                                   | 0.5                              | 152                   | 23.6                                  | 1850                                             | 0.9                                | 5                          |

# SMBJ5338B thru SMBJ5388B



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**Note 1** Devices listed have a  $\pm 5\%$  tolerance on nominal  $V_Z$ . Suffix C denotes a  $\pm 2\%$

**Note 2** Nominal Zener Voltage ( $V_Z$ ) is tested with a 40  $\pm 10$  milliseconds pulse current at 25°C to avoid self-heat affection.

**Note 3** The Zener impedance ( $Z_{ZT}$  or  $Z_{ZK}$ ) is derived from the 60 Hz ac voltage, which results when an ac current having a rms value equal to 10% of the dc zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$  respectively.

**Note 4** The Maximum Reverse (leakage) Current is specified for devices with  $\pm 20\%$  and  $\pm 10\%$  voltage tolerances on nominal  $V_Z$  in another column.

**Note 5** The Maximum Zener Current ( $I_{ZM}$ ) shown is for  $\pm 5\%$  tolerance devices.  $I_{ZM}$  for  $\pm 10\%$  and  $\pm 20\%$  devices can be calculated using the formula:

$$I_{ZM} = \frac{P}{V_{ZM}}$$

Where " $V_{ZM}$ " is  $V_Z$  at the high end of the voltage tolerance specified and "P" is the rated power of the device.

**Note 6** The Surge Current ( $I_{ZM}$ ) is specified as the maximum peak of a nonrecurring sine wave of 8.3 milliseconds duration.

**Note 7** Voltage Regulation ( $\Delta V_Z$ ) is the difference between the voltage measured at 10% and 50%  $I_{ZM}$ .

# RATING AND CHARACTERISTICS CURVES

SMBJ5338B THRU SMBJ5388B

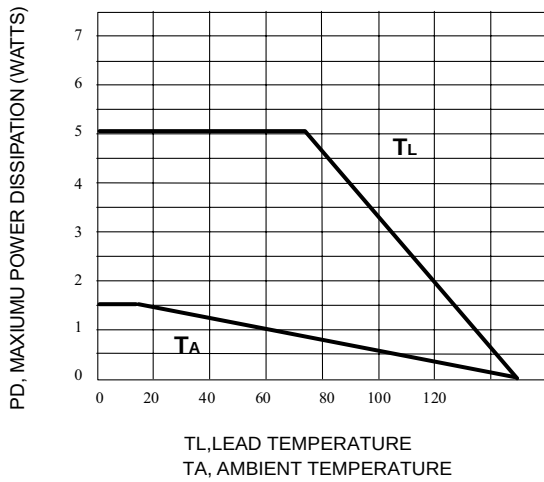


Fig. 1-POWER TEMPERATURE DERATING CURVE

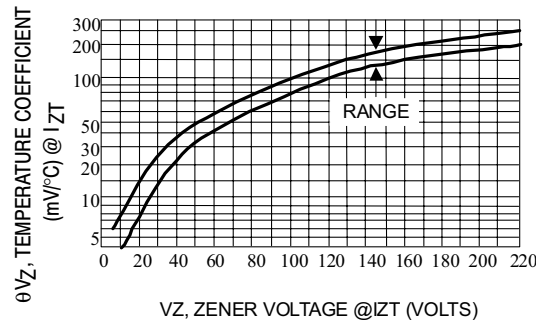


Fig. 2-TEMPERATURE COEFFICIENT-RANGE FOR UNITS 6 TO 51 VOLTS

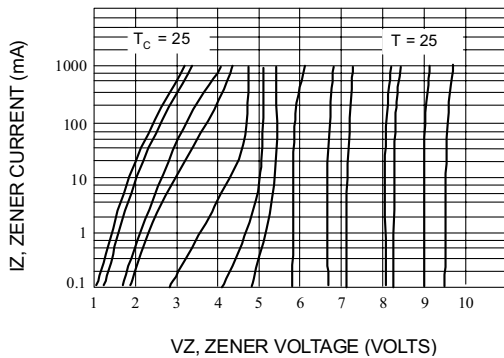


Fig. 3-ZENER VOLTAGE VERSUS ZENER CURRENT  
VZ = 6.8 THRU 10 VOLTS

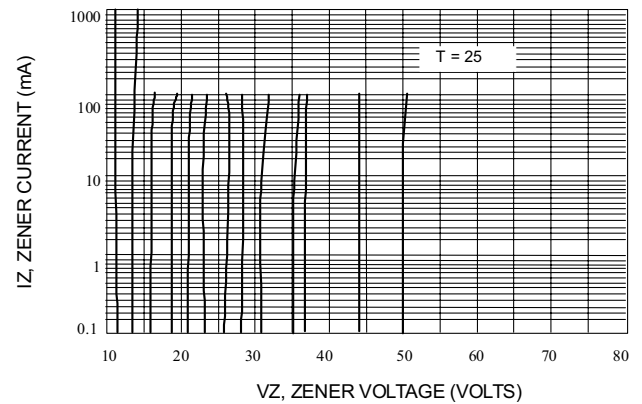


Fig. 4-ZENER VOLTAGE VERSUS ZENER CURRENT  
VZ = 11 THRU 51 VOLTS



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## Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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