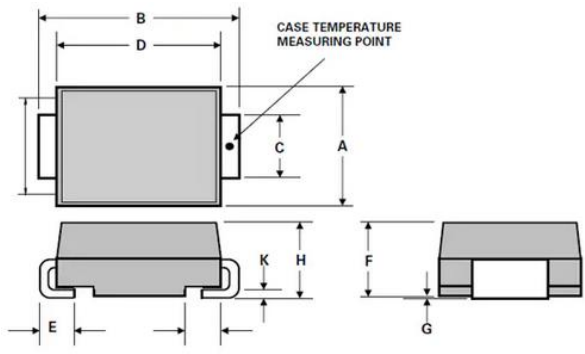


## Silicon SMD Voltage Regulator Zener Diodes

| Primary characteristics   |            |      |
|---------------------------|------------|------|
| Parameter                 | Value      | Unit |
| V <sub>Z</sub> range nom. | 3.3 to 200 | V    |
| V <sub>Z</sub> tolerance  | 5          | %    |
| Power rating              | 3.0        | W    |

### Features

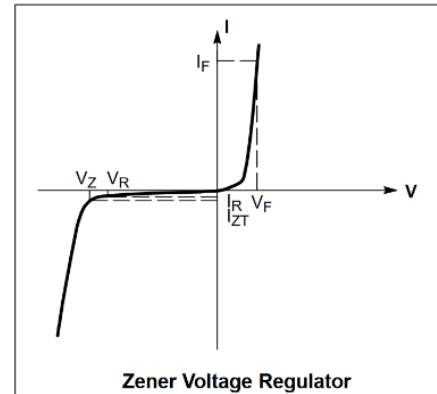
- **SMB (DO-214AA)** case for easy automatic insertion.
- Pb-free and **RoHS** compliant
- Approx. weight: 0.95g / 0.003oz

| Case dimensions                                                                    |                        |                     |                        |                        |                        |                        |                        |               |                        |
|------------------------------------------------------------------------------------|------------------------|---------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------|------------------------|
|  |                        |                     |                        |                        |                        |                        |                        |               |                        |
| SMB (DO-214AA)                                                                     |                        |                     |                        |                        |                        |                        |                        |               |                        |
| Unit                                                                               | A                      | B                   | C                      | D                      | E                      | F                      | G                      | H             | K                      |
| mm                                                                                 | 3.60<br>-0.30<br>+0.35 | 5.3<br>-0.2<br>+0.3 | 2.10<br>-0.15<br>+0.10 | 4.30<br>-0.25<br>+0.30 | 1.20<br>-0.45<br>+0.40 | 2.20<br>-0.30<br>+0.25 | 0.10<br>-0.05<br>+0.10 | 2.30<br>±0.35 | 0.30<br>-0.15<br>+0.11 |

| Part numbering system             |                                                                                                  |                                                 |
|-----------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <b>1SMB59</b><br>↓<br>Series code | <b>19</b><br>↓<br>Reverse Zener Voltage Marking<br>(see: <a href="#">Characteristics table</a> ) | <b>B</b><br>↓<br>5% V <sub>Z</sub><br>tolerance |

| Absolute maximum ratings (T <sub>a</sub> = 25°C)                                  |                  |           |       |
|-----------------------------------------------------------------------------------|------------------|-----------|-------|
| Parameter                                                                         | Symbol           | Value     | Unit  |
| Power Dissipation <sup>1)</sup><br>Derate above 75°C                              | P <sub>D</sub>   | 3.0       | W     |
|                                                                                   |                  | 40        | mW/°C |
| Maximum steady state power dissipation @T <sub>A</sub> =25°C<br>Derate above 25°C | P <sub>D</sub>   | 550       | mW    |
|                                                                                   |                  | 4.4       | mW/°C |
| Junction to ambient thermal resistance                                            | R <sub>θJA</sub> | 226       | °C/W  |
| Junction to lead thermal resistance                                               | R <sub>θJL</sub> | 25        | °C/W  |
| Junction Temperature                                                              | T <sub>j</sub>   | -55 ~ 150 | °C    |
| Storage Temperature Range                                                         | T <sub>stg</sub> | -55 ~ 150 | °C    |
| Note 1) Mounted on Cu-Pad size 5mm x 5mm on PCB                                   |                  |           |       |

| Parameters list |                                  |
|-----------------|----------------------------------|
| Symbol          | Parameter                        |
| $V_Z$           | Reverse Zener Voltage @ $I_{ZT}$ |
| $I_{ZT}$        | Reverse Current                  |
| $I_R$           | Reverse Leakage Current @ $V_R$  |
| $V_R$           | Reverse Voltage                  |
| $I_F$           | Forward Current                  |
| $V_F$           | Forward Voltage @ $I_F$          |

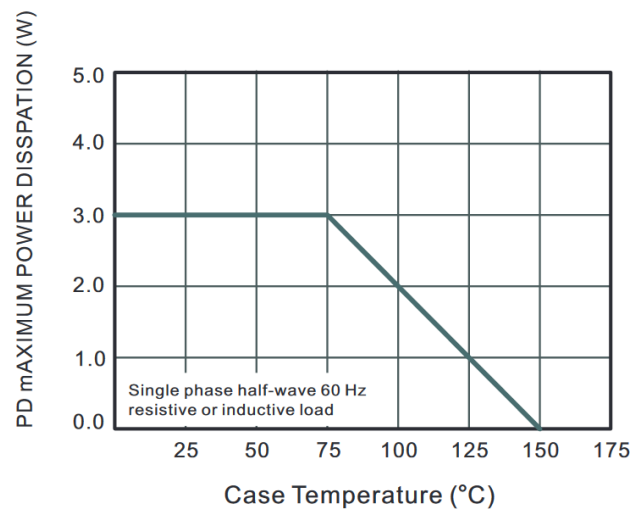


| Characteristics table ( $T_a = 25^\circ\text{C}$ ) |              |                          |               |                 |                                 |                                 |      |                                |      |                          |
|----------------------------------------------------|--------------|--------------------------|---------------|-----------------|---------------------------------|---------------------------------|------|--------------------------------|------|--------------------------|
| Type                                               | Marking code | Zener voltage @ $I_{ZT}$ |               | Reverse current | Dynamic resistance              |                                 |      | Leakage current                |      | Maximum DC Zener current |
|                                                    |              | $V_Z$ nom.<br>V          | $V_{ZT}$<br>V | $I_{ZT}$<br>mA  | $Z_{ZT}$ @ $I_{ZT}$<br>$\Omega$ | $Z_{ZK}$ @ $I_{ZK}$<br>$\Omega$ | mA   | $I_R$ @ $V_R$<br>$\mu\text{A}$ | V    | $I_{ZM}$<br>mA           |
| 1SMB5913B                                          | 913B         | 3.3                      | 3.13 ~ 3.47   | 113.6           | 10                              | 500                             | 1.0  | 100                            | 1.0  | 454                      |
| 1SMB5914B                                          | 914B         | 3.6                      | 3.42 ~ 3.78   | 104.2           | 9.0                             | 500                             | 1.0  | 75                             | 1.0  | 416                      |
| 1SMB5915B                                          | 915B         | 3.9                      | 3.70 ~ 4.10   | 96.1            | 7.5                             | 500                             | 1.0  | 25                             | 1.0  | 384                      |
| 1SMB5916B                                          | 916B         | 4.3                      | 4.08 ~ 4.52   | 87.2            | 6.0                             | 500                             | 1.0  | 5.0                            | 1.0  | 348                      |
| 1SMB5917B                                          | 917B         | 4.7                      | 4.46 ~ 4.94   | 79.8            | 5.0                             | 500                             | 1.0  | 5.0                            | 1.5  | 319                      |
| 1SMB5918B                                          | 918B         | 5.1                      | 4.84 ~ 5.36   | 73.5            | 4.0                             | 350                             | 1.0  | 5.0                            | 2.0  | 294                      |
| 1SMB5919B                                          | 919B         | 5.6                      | 5.32 ~ 5.88   | 66.9            | 2.0                             | 250                             | 1.0  | 5.0                            | 3.0  | 267                      |
| 1SMB5920B                                          | 920B         | 6.2                      | 5.89 ~ 6.51   | 60.5            | 2.0                             | 200                             | 1.0  | 5.0                            | 4.0  | 241                      |
| 1SMB5921B                                          | 921B         | 6.8                      | 6.46 ~ 7.14   | 55.1            | 2.5                             | 200                             | 1.0  | 5.0                            | 5.2  | 220                      |
| 1SMB5922B                                          | 922B         | 7.5                      | 7.12 ~ 7.88   | 50              | 3.0                             | 400                             | 0.5  | 5.0                            | 6.0  | 200                      |
| 1SMB5923B                                          | 923B         | 8.2                      | 7.79 ~ 8.61   | 45.7            | 3.5                             | 400                             | 0.5  | 5.0                            | 6.5  | 182                      |
| 1SMB5924B                                          | 924B         | 9.1                      | 8.64 ~ 9.56   | 41.2            | 4.0                             | 500                             | 0.5  | 5.0                            | 7.0  | 164                      |
| 1SMB5925B                                          | 925B         | 10                       | 9.50 ~ 10.50  | 37.5            | 4.5                             | 500                             | 0.25 | 5.0                            | 8.0  | 150                      |
| 1SMB5926B                                          | 926B         | 11                       | 10.45 ~ 11.55 | 34.1            | 5.5                             | 550                             | 0.25 | 1.0                            | 8.4  | 136                      |
| 1SMB5927B                                          | 927B         | 12                       | 11.40 ~ 12.60 | 31.2            | 6.5                             | 550                             | 0.25 | 1.0                            | 9.1  | 125                      |
| 1SMB5928B                                          | 928B         | 13                       | 12.35 ~ 13.65 | 28.8            | 7.0                             | 550                             | 0.25 | 1.0                            | 9.9  | 115                      |
| 1SMB5929B                                          | 929B         | 15                       | 14.25 ~ 15.75 | 25              | 9.0                             | 600                             | 0.25 | 1.0                            | 11.4 | 100                      |
| 1SMB5930B                                          | 930B         | 16                       | 15.20 ~ 16.80 | 23.4            | 10                              | 600                             | 0.25 | 1.0                            | 12.2 | 93                       |
| 1SMB5931B                                          | 931B         | 18                       | 17.10 ~ 18.90 | 20.8            | 12                              | 650                             | 0.25 | 1.0                            | 13.7 | 83                       |
| 1SMB5932B                                          | 932B         | 20                       | 19.00 ~ 21.00 | 18.7            | 14                              | 650                             | 0.25 | 1.0                            | 15.2 | 75                       |
| 1SMB5933B                                          | 933B         | 22                       | 20.90 ~ 23.10 | 17              | 17.5                            | 650                             | 0.25 | 1.0                            | 16.7 | 68                       |
| 1SMB5934B                                          | 934B         | 24                       | 22.80 ~ 25.20 | 15.6            | 19                              | 700                             | 0.25 | 1.0                            | 18.2 | 62                       |
| 1SMB5935B                                          | 935B         | 27                       | 25.65 ~ 28.35 | 13.9            | 23                              | 700                             | 0.25 | 1.0                            | 20.6 | 55                       |
| 1SMB5936B                                          | 936B         | 30                       | 28.50 ~ 31.50 | 12.5            | 28                              | 750                             | 0.25 | 1.0                            | 22.8 | 50                       |
| 1SMB5937B                                          | 937B         | 33                       | 31.35 ~ 34.65 | 11.4            | 33                              | 800                             | 0.25 | 1.0                            | 25.1 | 45                       |

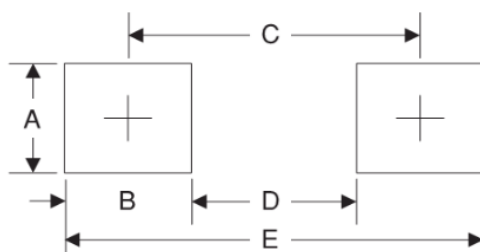
Characteristics table ( $T_a = 25^\circ\text{C}$ )

| Type      | Marking code | Zener voltage @ $I_{ZT}$ |               | Reverse current | Dynamic resistance              |                     |      | Leakage current |       | Maximum DC Zener current |
|-----------|--------------|--------------------------|---------------|-----------------|---------------------------------|---------------------|------|-----------------|-------|--------------------------|
|           |              | $V_Z$ nom.<br>V          | $V_{ZT}$<br>V | $I_{ZT}$<br>mA  | $Z_{ZT}$ @ $I_{ZT}$<br>$\Omega$ | $Z_{ZK}$ @ $I_{ZK}$ |      | $I_R$ @ $V_R$   |       | $I_{ZM}$<br>mA           |
| 1SMB5938B | 938B         | 36                       | 34.20 ~ 37.80 | 10.4            | 38                              | 850                 | 0.25 | 1.0             | 27.4  | 41                       |
| 1SMB5939B | 939B         | 39                       | 37.05 ~ 40.95 | 9.6             | 45                              | 900                 | 0.25 | 1.0             | 29.7  | 38                       |
| 1SMB5940B | 940B         | 43                       | 40.85 ~ 45.15 | 8.7             | 53                              | 950                 | 0.25 | 1.0             | 32.7  | 34                       |
| 1SMB5941B | 941B         | 47                       | 44.65 ~ 49.35 | 8               | 67                              | 1000                | 0.25 | 1.0             | 35.8  | 31                       |
| 1SMB5942B | 942B         | 51                       | 48.45 ~ 53.55 | 7.3             | 70                              | 1100                | 0.25 | 1.0             | 38.8  | 29                       |
| 1SMB5943B | 943B         | 56                       | 53.20 ~ 58.80 | 6.7             | 86                              | 1300                | 0.25 | 1.0             | 42.6  | 26                       |
| 1SMB5944B | 944B         | 62                       | 58.90 ~ 65.10 | 6               | 100                             | 1500                | 0.25 | 1.0             | 47.1  | 24                       |
| 1SMB5945B | 945B         | 68                       | 64.60 ~ 71.40 | 5.5             | 120                             | 1700                | 0.25 | 1.0             | 51.7  | 22                       |
| 1SMB5946B | 946B         | 75                       | 71.25 ~ 78.75 | 5               | 140                             | 2000                | 0.25 | 1.0             | 56    | 20                       |
| 1SMB5947B | 947B         | 82                       | 77.90 ~ 86.10 | 4.6             | 160                             | 2500                | 0.25 | 1.0             | 62.2  | 18                       |
| 1SMB5948B | 948B         | 91                       | 86.45 ~ 95.55 | 4.1             | 200                             | 3000                | 0.25 | 1.0             | 69.2  | 16                       |
| 1SMB5949B | 949B         | 100                      | 95.0 ~ 105.0  | 3.7             | 250                             | 3100                | 0.25 | 1.0             | 76    | 15                       |
| 1SMB5950B | 950B         | 110                      | 104.5 ~ 115.5 | 3.4             | 300                             | 4000                | 0.25 | 1.0             | 83.6  | 13                       |
| 1SMB5951B | 951B         | 120                      | 114.0 ~ 126.0 | 3.1             | 380                             | 4500                | 0.25 | 1.0             | 91.2  | 12                       |
| 1SMB5952B | 952B         | 130                      | 123.5 ~ 136.5 | 2.9             | 450                             | 5000                | 0.25 | 1.0             | 98.8  | 11                       |
| 1SMB5953B | 953B         | 150                      | 142.5 ~ 157.5 | 2.5             | 600                             | 6000                | 0.25 | 1.0             | 114   | 10                       |
| 1SMB5954B | 954B         | 160                      | 152.0 ~ 168.0 | 2.3             | 700                             | 6500                | 0.25 | 1.0             | 121.6 | 9                        |
| 1SMB5955B | 955B         | 180                      | 171.0 ~ 189.0 | 2.1             | 900                             | 7000                | 0.25 | 1.0             | 136.8 | 8                        |
| 1SMB5956B | 956B         | 200                      | 190.0 ~ 210.0 | 1.9             | 1200                            | 8000                | 0.25 | 1.0             | 152   | 7                        |

Power derating curve



## Suggested soldering pad layout



## SMB (DO-214AA)

| Unit | A   | B   | C   | D   | E   |
|------|-----|-----|-----|-----|-----|
| mm   | 2.8 | 2.4 | 4.6 | 2.2 | 7.0 |

## Ordering information

| Part Number           | Package        | Shipping Quantity   | Industry standard |
|-----------------------|----------------|---------------------|-------------------|
| 1SMB5913B ~ 1SMB5956B | SMB (DO-214AA) | 3000 pcs / 13" reel | EIA-481-1         |

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