

## 3W, 11V - 200V Surface Mount Silicon Zener Diode

### FEATURES

- Photo Glass passivated junction
- Ideal for automated placement
- Low inductance
- Moisture sensitivity level: level 1, per J-STD-020
- AEC-Q101 qualified available: ordering code with suffix "H"
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter

### MECHANICAL DATA

- Case: DO-214AA (SMB)
- Molding compound meets UL 94 V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.1 g (approximately)

| KEY PARAMETERS        |                |      |
|-----------------------|----------------|------|
| PARAMETER             | VALUE          | UNIT |
| $V_Z$                 | 11 - 200       | V    |
| Test current $I_{ZT}$ | 1.9 – 34.1     | mA   |
| $P_{tot}$             | 3.0            | W    |
| $T_{J\ MAX}$          | 175            | °C   |
| Package               | DO-214AA (SMB) |      |
| Configuration         | Single die     |      |



**DO-214AA (SMB)**

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

| PARAMETER                                                                                                               | SYMBOL    | VALUE       | UNIT |
|-------------------------------------------------------------------------------------------------------------------------|-----------|-------------|------|
| DC power dissipation at $T_L = 75^\circ\text{C}$ , measure at zero lead length (Note 1) derate above $75^\circ\text{C}$ | $P_{tot}$ | 3           | W    |
| Junction temperature                                                                                                    | $T_J$     | -55 to +175 | °C   |
| Storage temperature                                                                                                     | $T_{STG}$ | -55 to +175 | °C   |

#### Note:

1. Mounted on Cu-Pad size 10mm x 10mm on PCB

### THERMAL PERFORMANCE

| PARAMETER                              | SYMBOL          | TYP | UNIT |
|----------------------------------------|-----------------|-----|------|
| Junction-to-lead thermal resistance    | $R_{\theta JL}$ | 21  | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 59  | °C/W |
| Junction-to-case thermal resistance    | $R_{\theta JC}$ | 23  | °C/W |

**Thermal Performance Note:** Units mounted on PCB (10mm x 10mm Cu pad test board)

**ELECTRICAL SPECIFICATIONS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Device<br>(Note 1) | Device<br>Marking<br>Code | Nominal Zener<br>Voltage       |                 |        | Test<br>current | Zener Impedance<br>(Note 3) |                                   |                                  | Leakage<br>Current             |                 | Maximum DC<br>Zener<br>Current |
|--------------------|---------------------------|--------------------------------|-----------------|--------|-----------------|-----------------------------|-----------------------------------|----------------------------------|--------------------------------|-----------------|--------------------------------|
|                    |                           | V <sub>Z</sub> @I <sub>Z</sub> |                 |        |                 | I <sub>ZT</sub>             | Z <sub>ZT</sub> @ I <sub>ZT</sub> | Z <sub>ZK</sub> @I <sub>ZK</sub> | I <sub>R</sub> @V <sub>R</sub> | I <sub>ZM</sub> |                                |
|                    |                           | V                              |                 |        | mA              | Ω                           | Ω                                 | mA                               | μA                             | V               | mA(DC)                         |
|                    |                           | Min.                           | Nom<br>(Note 2) | Max.   |                 |                             |                                   |                                  |                                |                 |                                |
| 1PGSMB5926         | P926B                     | 10.45                          | 11              | 11.55  | 34.1            | 5.5                         | 550                               | 0.25                             | 1                              | 8.4             | 136                            |
| 1PGSMB5927         | P927B                     | 11.40                          | 12              | 12.60  | 31.2            | 6.5                         | 550                               | 0.25                             | 1                              | 9.1             | 125                            |
| 1PGSMB5928         | P928B                     | 12.35                          | 13              | 13.65  | 28.8            | 7.0                         | 550                               | 0.25                             | 1                              | 9.9             | 115                            |
| 1PGSMB5929         | P929B                     | 14.25                          | 15              | 15.75  | 25.0            | 9.0                         | 600                               | 0.25                             | 1                              | 11.4            | 100                            |
| 1PGSMB5930         | P930B                     | 15.20                          | 16              | 16.80  | 23.4            | 10.0                        | 600                               | 0.25                             | 1                              | 12.2            | 94                             |
| 1PGSMB5931         | P931B                     | 17.10                          | 18              | 18.90  | 20.8            | 12.0                        | 650                               | 0.25                             | 1                              | 13.7            | 83                             |
| 1PGSMB5932         | P932B                     | 19.00                          | 20              | 21.00  | 18.7            | 14.0                        | 650                               | 0.25                             | 1                              | 15.2            | 75                             |
| 1PGSMB5933         | P933B                     | 20.90                          | 22              | 23.10  | 17.0            | 17.5                        | 650                               | 0.25                             | 1                              | 16.7            | 68                             |
| 1PGSMB5934         | P934B                     | 22.80                          | 24              | 25.20  | 15.6            | 19                          | 700                               | 0.25                             | 1                              | 18.2            | 63                             |
| 1PGSMB5935         | P935B                     | 25.65                          | 27              | 28.35  | 13.9            | 23                          | 700                               | 0.25                             | 1                              | 20.6            | 56                             |
| 1PGSMB5936         | P936B                     | 28.50                          | 30              | 31.50  | 12.5            | 26                          | 750                               | 0.25                             | 1                              | 22.8            | 50                             |
| 1PGSMB5937         | P937B                     | 31.35                          | 33              | 34.65  | 11.4            | 33                          | 800                               | 0.25                             | 1                              | 25.1            | 45                             |
| 1PGSMB5938         | P938B                     | 34.20                          | 36              | 37.80  | 10.4            | 38                          | 850                               | 0.25                             | 1                              | 27.4            | 42                             |
| 1PGSMB5939         | P939B                     | 37.05                          | 39              | 40.95  | 9.6             | 45                          | 900                               | 0.25                             | 1                              | 29.7            | 38                             |
| 1PGSMB5940         | P940B                     | 40.85                          | 43              | 45.15  | 8.7             | 53                          | 950                               | 0.25                             | 1                              | 32.7            | 35                             |
| 1PGSMB5941         | P941B                     | 44.65                          | 47              | 49.35  | 8.0             | 67                          | 1000                              | 0.25                             | 1                              | 35.8            | 32                             |
| 1PGSMB5942         | P942B                     | 48.45                          | 51              | 53.55  | 7.3             | 70                          | 1100                              | 0.25                             | 1                              | 38.8            | 29                             |
| 1PGSMB5943         | P943B                     | 53.20                          | 56              | 58.80  | 6.7             | 86                          | 1300                              | 0.25                             | 1                              | 42.6            | 27                             |
| 1PGSMB5944         | P944B                     | 58.90                          | 62              | 65.10  | 6.0             | 100                         | 1500                              | 0.25                             | 1                              | 47.1            | 24                             |
| 1PGSMB5945         | P945B                     | 64.60                          | 68              | 71.40  | 5.5             | 120                         | 1700                              | 0.25                             | 1                              | 51.7            | 22                             |
| 1PGSMB5946         | P946B                     | 71.25                          | 75              | 78.75  | 5.0             | 140                         | 2000                              | 0.25                             | 1                              | 56.0            | 20                             |
| 1PGSMB5947         | P947B                     | 77.90                          | 82              | 86.10  | 4.6             | 160                         | 2500                              | 0.25                             | 1                              | 62.2            | 18                             |
| 1PGSMB5948         | P948B                     | 86.45                          | 91              | 95.55  | 4.1             | 200                         | 3000                              | 0.25                             | 1                              | 69.2            | 16                             |
| 1PGSMB5949         | P949B                     | 95.00                          | 100             | 105.00 | 3.7             | 250                         | 3100                              | 0.25                             | 1                              | 76.0            | 15                             |
| 1PGSMB5950         | P950B                     | 104.50                         | 110             | 115.50 | 3.4             | 300                         | 4000                              | 0.25                             | 1                              | 83.6            | 13                             |
| 1PGSMB5951         | P951B                     | 114.00                         | 120             | 126.00 | 3.1             | 360                         | 4500                              | 0.25                             | 1                              | 91.2            | 12                             |
| 1PGSMB5952         | P952B                     | 123.50                         | 130             | 136.50 | 2.9             | 450                         | 5000                              | 0.25                             | 1                              | 98.8            | 11                             |
| 1PGSMB5953         | P953B                     | 142.50                         | 150             | 157.50 | 2.5             | 600                         | 6000                              | 0.25                             | 1                              | 114.0           | 10                             |
| 1PGSMB5954         | P954B                     | 152.00                         | 160             | 168.00 | 2.3             | 700                         | 6500                              | 0.25                             | 1                              | 121.6           | 9                              |
| 1PGSMB5955         | P955B                     | 171.00                         | 180             | 189.00 | 2.1             | 900                         | 7000                              | 0.25                             | 1                              | 136.8           | 8                              |
| 1PGSMB5956         | P956B                     | 190.00                         | 200             | 210.00 | 1.9             | 1200                        | 8000                              | 0.25                             | 1                              | 152.0           | 7                              |

**Notes:**

1. Tolerance and type number designation the type numbers listed indicate a tolerance of 5%
2. Zener voltage ( $V_Z$ ) measurement  
Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature  $25^\circ\text{C}$

3. Zener impedance ( $Z_z$ ) derivation :  $Z_{zT}$  and  $Z_{zK}$  are measured by dividing the AC voltage drop across the device by the AC current applied.

The specified limits are for  $I_z$  (AC) = 0.1  $I_z$  (DC) with the AC frequency = 60 Hz

| <b>ORDERING INFORMATION</b>        |                |                          |               |
|------------------------------------|----------------|--------------------------|---------------|
| <b>ORDERING CODE</b><br>(Note 1,2) | <b>PACKAGE</b> | <b>PACKING</b>           | <b>STATUS</b> |
| 1PGSMBxxxxHR5G                     | SMB            | 850 / 7" Plastic reel    | Active        |
| 1PGSMBxxxxHR4G                     | SMB            | 3,000 / 13" Paper reel   | NRND          |
| 1PGSMBxxxxHM4G                     | SMB            | 3,000 / 13" Plastic reel | Active        |
| 1PGSMBxxxx R5G                     | SMB            | 850 / 7" Plastic reel    | Active        |
| 1PGSMBxxxx R4G                     | SMB            | 3,000 / 13" Paper reel   | NRND          |
| 1PGSMBxxxx M4G                     | SMB            | 3,000 / 13" Plastic reel | Active        |

**Note 1:**

"xxxx" defines voltage from 11V  
(1PGSMB5926) to 200V (1PGSMB5956)

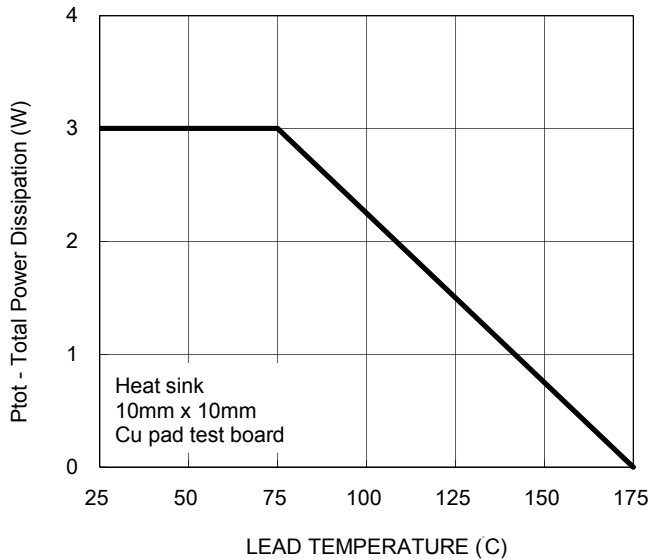
**Note 2:**

"H" means AEC-Q101 qualified

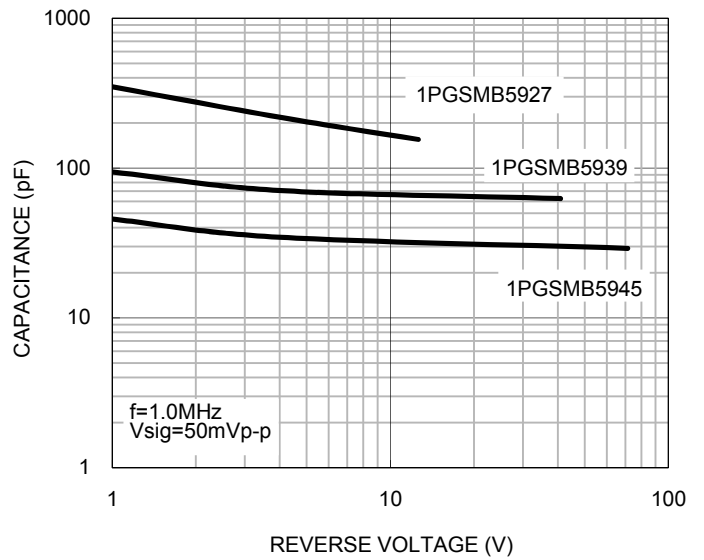
## CHARACTERISTICS CURVES

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

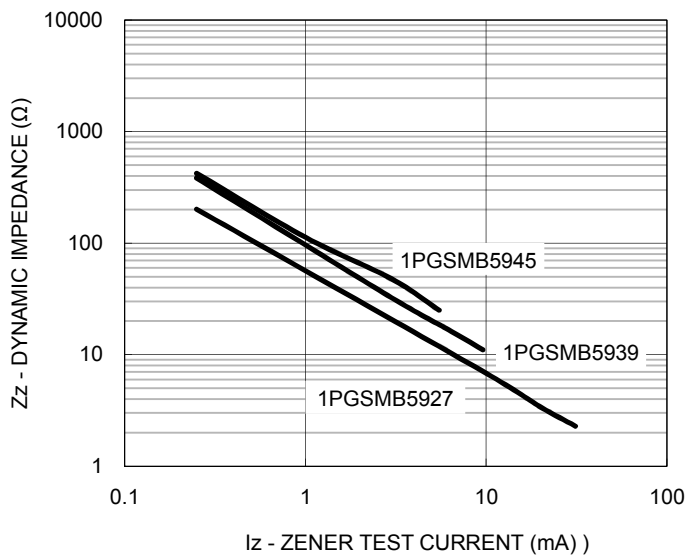
**Fig.1 Steady State Power Derating**



**Fig.2 Typical Junction Capacitance**

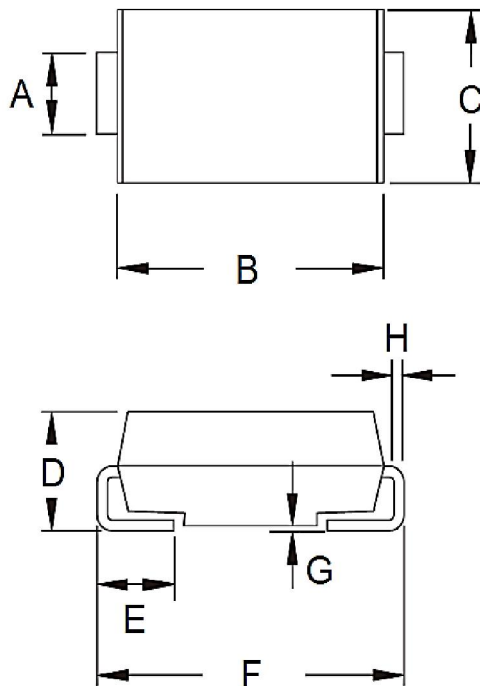


**Fig.3 Typical Zener Impedance**



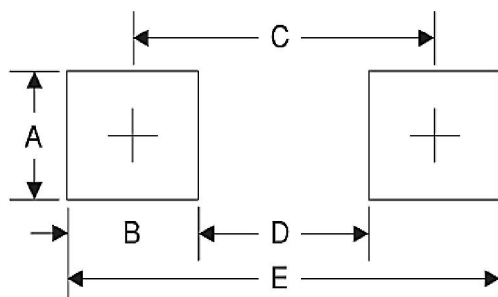
## PACKAGE OUTLINE DIMENSIONS

DO-214AA (SMB)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.95      | 2.20 | 0.077       | 0.087 |
| B    | 4.05      | 4.60 | 0.159       | 0.181 |
| C    | 3.30      | 3.95 | 0.130       | 0.156 |
| D    | 1.95      | 2.65 | 0.077       | 0.104 |
| E    | 0.75      | 1.60 | 0.030       | 0.063 |
| F    | 5.10      | 5.60 | 0.201       | 0.220 |
| G    | 0.05      | 0.20 | 0.002       | 0.008 |
| H    | 0.15      | 0.31 | 0.006       | 0.012 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 2.3       | 0.091       |
| B      | 2.5       | 0.098       |
| C      | 4.3       | 0.169       |
| D      | 1.8       | 0.071       |
| E      | 6.8       | 0.268       |

## MARKING DIAGRAM



P/N = Marking Code  
 G = Green Compound  
 YW = Date Code  
 F = Factory Code

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