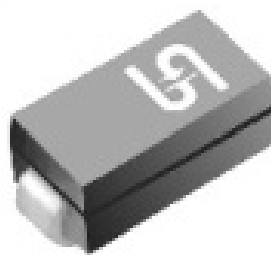


## Surface Mount Silicon Zener Diodes

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Built-in strain relief
- Low inductance
- Moisture sensitivity level: level 1, per J-STD-020
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition


**DO-214AA (SMB)**

### MECHANICAL DATA

**Case:** DO-214AA (SMB)

Molding compound, UL flammability classification rating 94V-0

Base P/N with suffix "G" on packing code - green compound (halogen-free)

Base P/N with prefix "H" on packing code - AEC-Q101 qualified

**Terminal:** Matte tin plated leads, solderable per JESD22-B102

Meet JESD 201 class 1A whisker test,

with prefix "H" on packing code meet JESD 201 class 2 whisker test

**Polarity:** Indicated by cathode band

**Weight:** 0.1 g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T <sub>A</sub> =25°C unless otherwise noted)         |                  |              |        |
|------------------------------------------------------------------------------------------------------|------------------|--------------|--------|
| PARAMETER                                                                                            | SYMBOL           | Value        | UNIT   |
| DC power dissipation at T <sub>L</sub> =75°C, measure at zero lead length (Note 1) derate above 75°C | P <sub>D</sub>   | 3            | Watts  |
|                                                                                                      |                  | 40           | mW/°C  |
| DC power dissipation at T <sub>A</sub> =25°C<br>Derate above 25°C                                    | P <sub>D</sub>   | 550          | mW     |
|                                                                                                      |                  | 4.4          | mW/°C  |
| Thermal Resistance from Junction to Lead                                                             | R <sub>θJL</sub> | 25           | °C / W |
| Thermal Resistance from Junction to Ambient                                                          | R <sub>θJA</sub> | 226          | °C / W |
| Operating junction temperature range                                                                 | T <sub>J</sub>   | - 55 to +150 | °C     |
| Storage temperature range                                                                            | T <sub>STG</sub> | - 55 to +150 | °C     |

Note 1: Mounted on Cu-Pad size 5mm x 5mm x 1.6mm on PCB

| ORDERING INFORMATION |                    |              |                     |         |                          |
|----------------------|--------------------|--------------|---------------------|---------|--------------------------|
| PART NO.             | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | PACKAGE | PACKING                  |
| 1SMBxxxx<br>(Note 1) | Prefix "H"         | R5           | Suffix "G"          | SMB     | 850 / 7" Plastic reel    |
|                      |                    | R4           |                     | SMB     | 3,000 / 13" Paper reel   |
|                      |                    | M4           |                     | SMB     | 3,000 / 13" Plastic reel |

Note 1: "xxxx" defines voltage from 11V (1SMB5926) to 200V (1SMB5956)

| EXAMPLE       |          |                    |              |                     |                    |
|---------------|----------|--------------------|--------------|---------------------|--------------------|
| PREFERRED P/N | PART NO. | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | DESCRIPTION        |
| 1SMB5926 R5   | 1SMB5926 |                    | R5           |                     |                    |
| 1SMB5926 R5G  | 1SMB5926 |                    | R5           | G                   | Green compound     |
| 1SMB5926HR5   | 1SMB5926 | H                  | R5           |                     | AEC-Q101 qualified |

**RATINGS AND CHARACTERISTICS CURVES**

(TA=25°C unless otherwise noted)

| Device<br>(Note 1) | Device<br>Marking<br>Code | Nominal Zener Voltage          |                  |        | Test<br>Current | Zener Impedance<br>(Note 3)      |                                  |      | Leakage Current                |       | Maximum DC<br>Zener 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>(Notes 2) | Max    |                 |                                  |                                  |      |                                |       |                             |
| 1SMB5926           | 926B                      | 10.45                          | 11               | 11.55  | 34.1            | 5.5                              | 550                              | 0.25 | 1                              | 8.4   | 136                         |
| 1SMB5927           | 927B                      | 11.40                          | 12               | 12.60  | 31.2            | 6.5                              | 550                              | 0.25 | 1                              | 9.1   | 125                         |
| 1SMB5928           | 928B                      | 12.35                          | 13               | 13.65  | 28.8            | 7.0                              | 550                              | 0.25 | 1                              | 9.9   | 115                         |
| 1SMB5929           | 929B                      | 14.25                          | 15               | 15.75  | 25.0            | 9.0                              | 600                              | 0.25 | 1                              | 11.4  | 100                         |
| 1SMB5930           | 930B                      | 15.20                          | 16               | 16.80  | 23.4            | 10.0                             | 600                              | 0.25 | 1                              | 12.2  | 94                          |
| 1SMB5931           | 931B                      | 17.10                          | 18               | 18.90  | 20.8            | 12.0                             | 650                              | 0.25 | 1                              | 13.7  | 83                          |
| 1SMB5932           | 932B                      | 19.00                          | 20               | 21.00  | 18.7            | 14.0                             | 650                              | 0.25 | 1                              | 15.2  | 75                          |
| 1SMB5933           | 933B                      | 20.90                          | 22               | 23.10  | 17.0            | 17.5                             | 650                              | 0.25 | 1                              | 16.7  | 68                          |
| 1SMB5934           | 934B                      | 22.80                          | 24               | 25.20  | 15.6            | 19                               | 700                              | 0.25 | 1                              | 18.2  | 63                          |
| 1SMB5935           | 935B                      | 25.65                          | 27               | 28.35  | 13.9            | 23                               | 700                              | 0.25 | 1                              | 20.6  | 56                          |
| 1SMB5936           | 936B                      | 28.50                          | 30               | 31.50  | 12.5            | 26                               | 750                              | 0.25 | 1                              | 22.8  | 50                          |
| 1SMB5937           | 937B                      | 31.35                          | 33               | 34.65  | 11.4            | 33                               | 800                              | 0.25 | 1                              | 25.1  | 45                          |
| 1SMB5938           | 938B                      | 34.20                          | 36               | 37.80  | 10.4            | 38                               | 850                              | 0.25 | 1                              | 27.4  | 42                          |
| 1SMB5939           | 939B                      | 37.05                          | 39               | 40.95  | 9.6             | 45                               | 900                              | 0.25 | 1                              | 29.7  | 38                          |
| 1SMB5940           | 940B                      | 40.85                          | 43               | 45.15  | 8.7             | 53                               | 950                              | 0.25 | 1                              | 32.7  | 35                          |
| 1SMB5941           | 941B                      | 44.65                          | 47               | 49.35  | 8.0             | 67                               | 1000                             | 0.25 | 1                              | 35.8  | 32                          |
| 1SMB5942           | 942B                      | 48.45                          | 51               | 53.55  | 7.3             | 70                               | 1100                             | 0.25 | 1                              | 38.8  | 29                          |
| 1SMB5943           | 943B                      | 53.20                          | 56               | 58.80  | 6.7             | 86                               | 1300                             | 0.25 | 1                              | 42.6  | 27                          |
| 1SMB5944           | 944B                      | 58.90                          | 62               | 65.10  | 6.0             | 100                              | 1500                             | 0.25 | 1                              | 47.1  | 24                          |
| 1SMB5945           | 945B                      | 64.60                          | 68               | 71.40  | 5.5             | 120                              | 1700                             | 0.25 | 1                              | 51.7  | 22                          |
| 1SMB5946           | 946B                      | 71.25                          | 75               | 78.75  | 5.0             | 140                              | 2000                             | 0.25 | 1                              | 56.0  | 20                          |
| 1SMB5947           | 947B                      | 77.90                          | 82               | 86.10  | 4.6             | 160                              | 2500                             | 0.25 | 1                              | 62.2  | 18                          |
| 1SMB5948           | 948B                      | 86.45                          | 91               | 95.55  | 4.1             | 200                              | 3000                             | 0.25 | 1                              | 69.2  | 16                          |
| 1SMB5949           | 949B                      | 95.00                          | 100              | 105.00 | 3.7             | 250                              | 3100                             | 0.25 | 1                              | 76.0  | 15                          |
| 1SMB5950           | 950B                      | 104.50                         | 110              | 115.50 | 3.4             | 300                              | 4000                             | 0.25 | 1                              | 83.6  | 13                          |
| 1SMB5951           | 951B                      | 114.00                         | 120              | 126.00 | 3.1             | 360                              | 4500                             | 0.25 | 1                              | 91.2  | 12                          |
| 1SMB5952           | 952B                      | 123.50                         | 130              | 136.50 | 2.9             | 450                              | 5000                             | 0.25 | 1                              | 98.8  | 11                          |
| 1SMB5953           | 953B                      | 142.50                         | 150              | 157.50 | 2.5             | 600                              | 6000                             | 0.25 | 1                              | 114.0 | 10                          |
| 1SMB5954           | 954B                      | 152.00                         | 160              | 168.00 | 2.3             | 700                              | 6500                             | 0.25 | 1                              | 121.6 | 9                           |
| 1SMB5955           | 955B                      | 171.00                         | 180              | 189.00 | 2.1             | 900                              | 7000                             | 0.25 | 1                              | 136.8 | 8                           |
| 1SMB5956           | 956B                      | 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<sub>Z</sub>) measurement

Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature 25°C

3. Zener impedance (Z<sub>Z</sub>) derivation : Z<sub>ZT</sub> and Z<sub>ZK</sub> are measured by dividing the AC voltage drop across the device by the AC current applied.

The specified limits are for I<sub>Z</sub>(AC) = 0.1 I<sub>Z</sub>(DC) with the AC frequency = 60 Hz

FIG. 1 STEADY STATE POWER DERATING

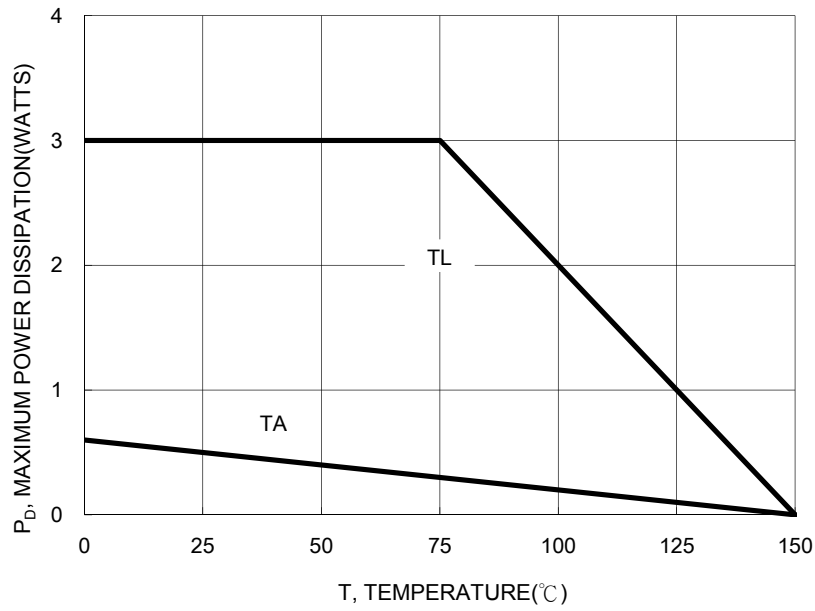


FIG.2 MAXIMUM SURGE POWER

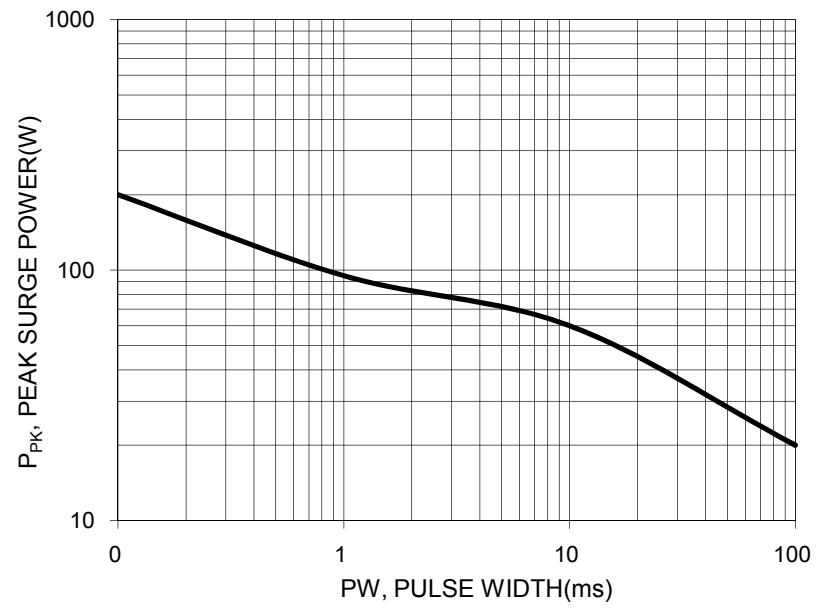


FIG. 3 ZENER VOLTAGE - TO 12 VOLTAGES

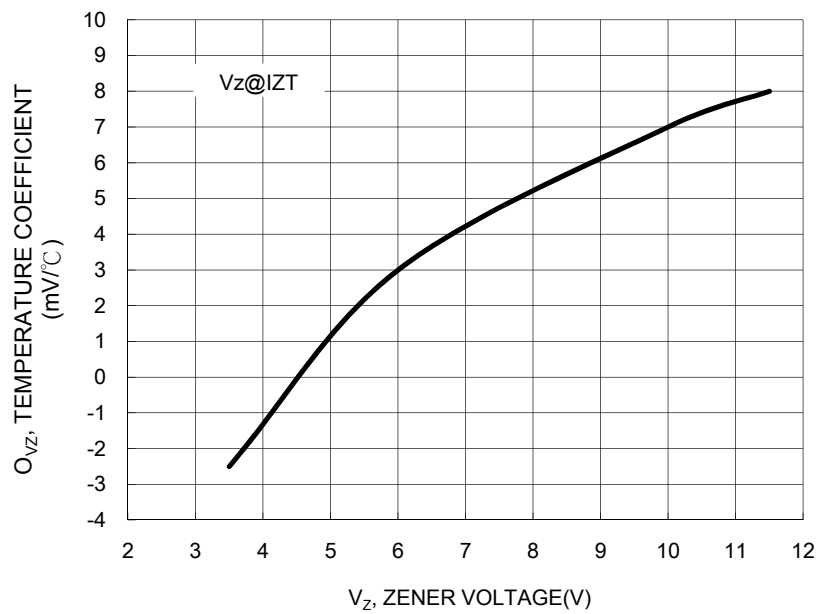


FIG.4 ZENER VOLTAGE 14 TO 200 VOLTAGES

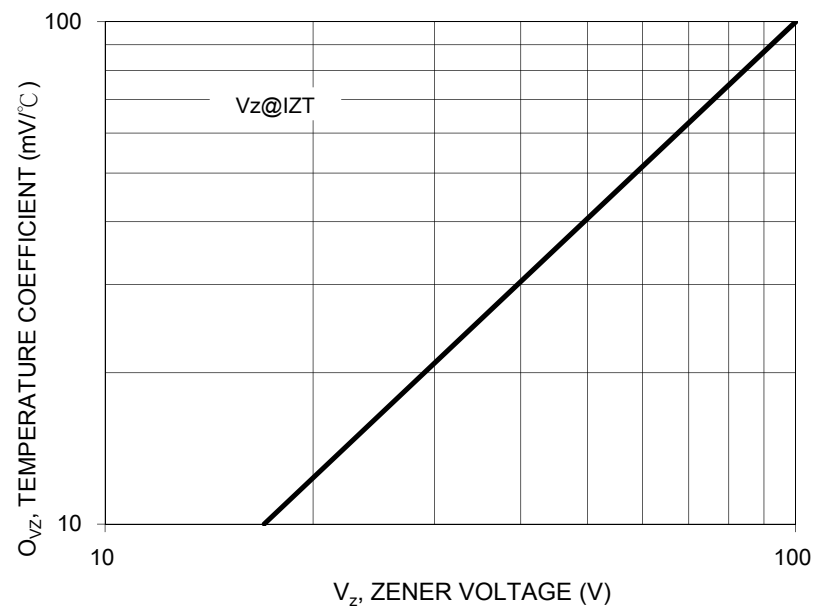


FIG. 5 Vz = 3.3 THRU 10 VOLTS

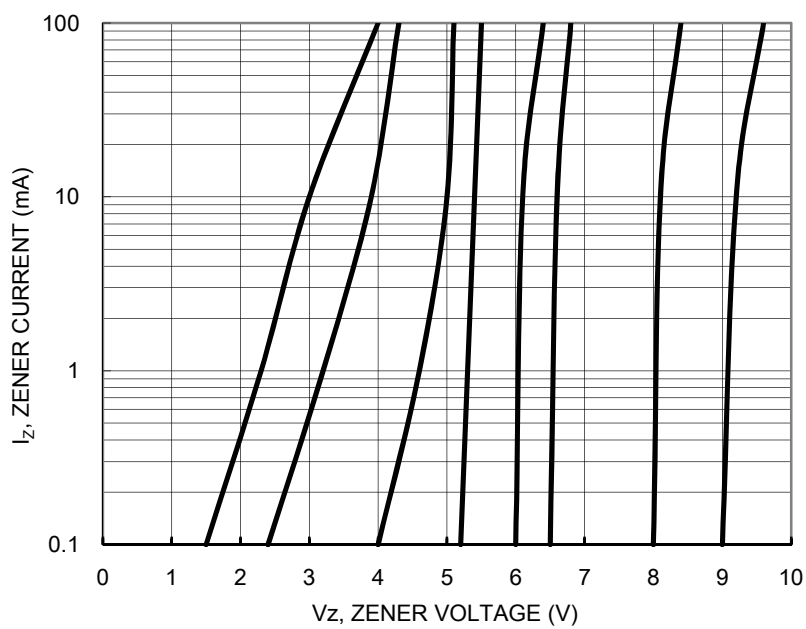


FIG. 6 Vz = 12 THRU 82 VOLTS

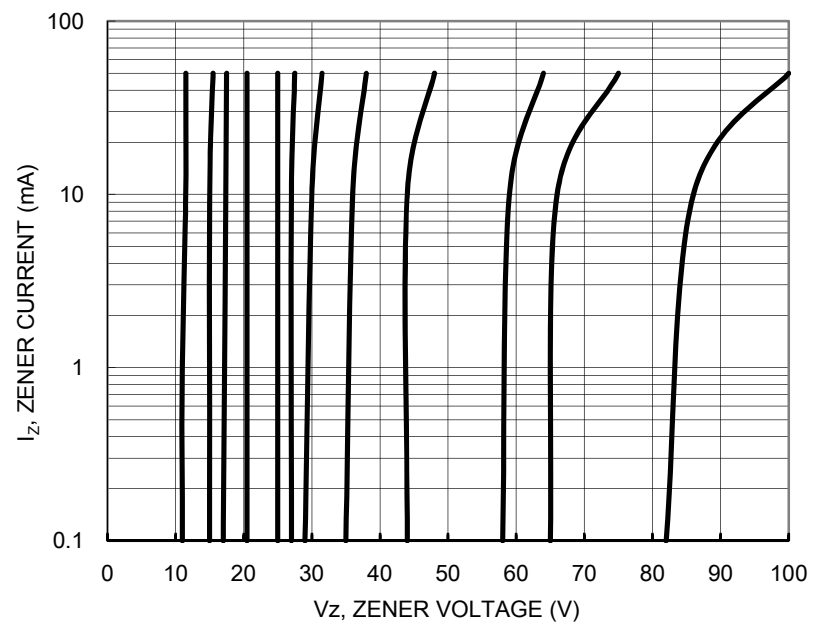


FIG. 7 EFFECT OF ZENER VOLTAGE

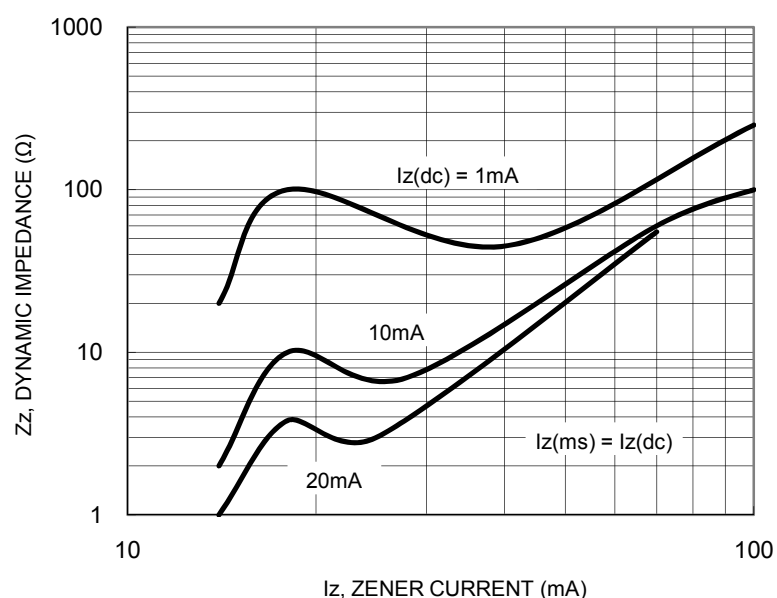


FIG. 8 EFFECT OF ZENER CURRENT

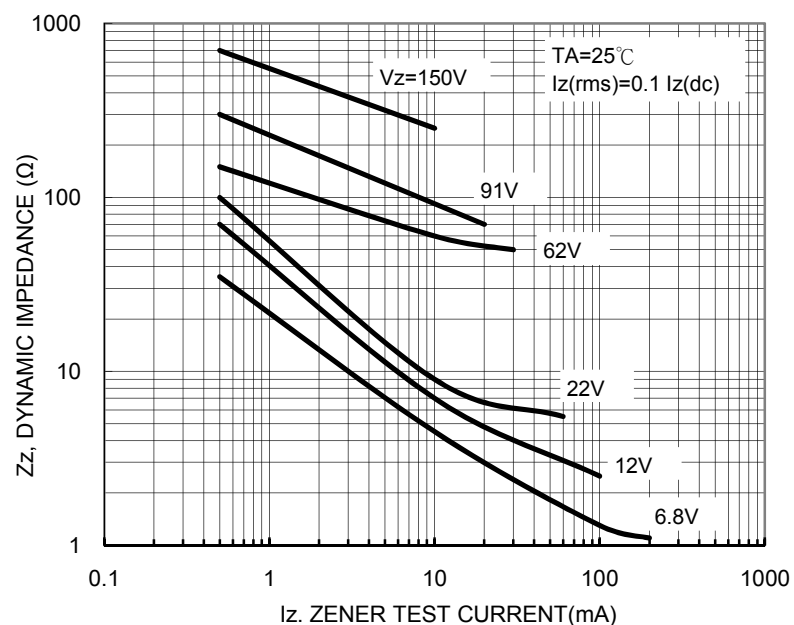


FIG. 9 CAPACITANCE CURVE

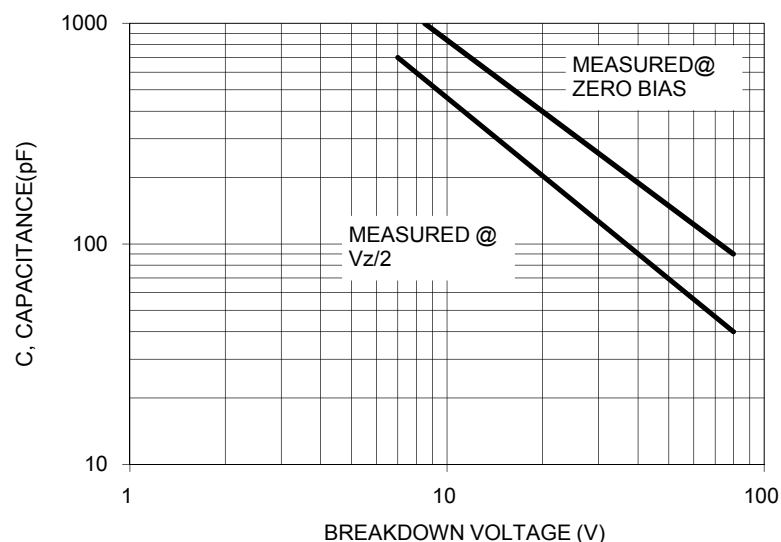


FIG. 10 TYPICAL PULSE RATING CURVE

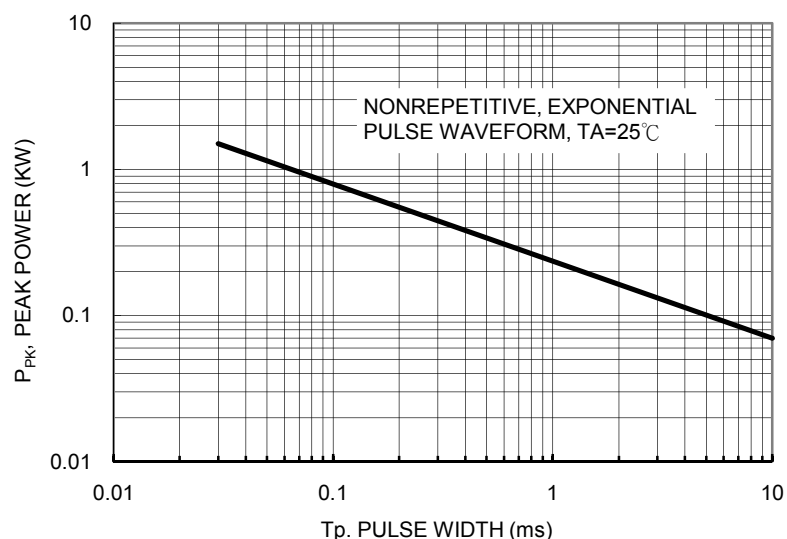


FIG. 11 PULSE WAVEFORM

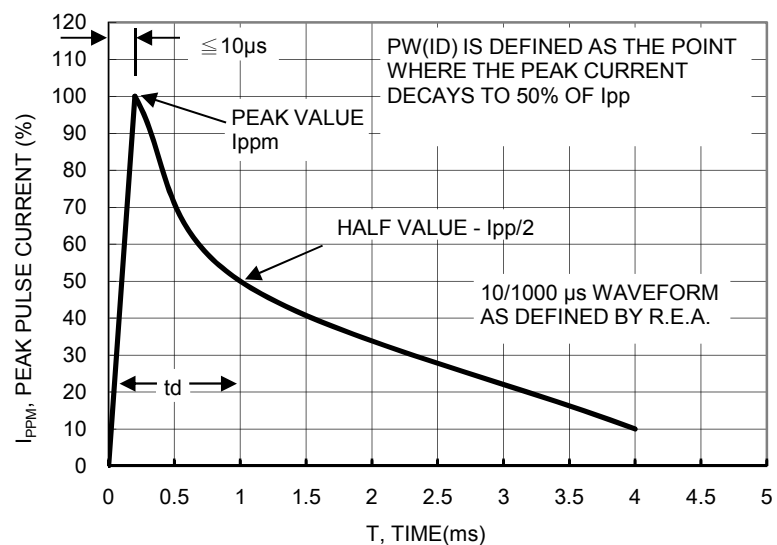
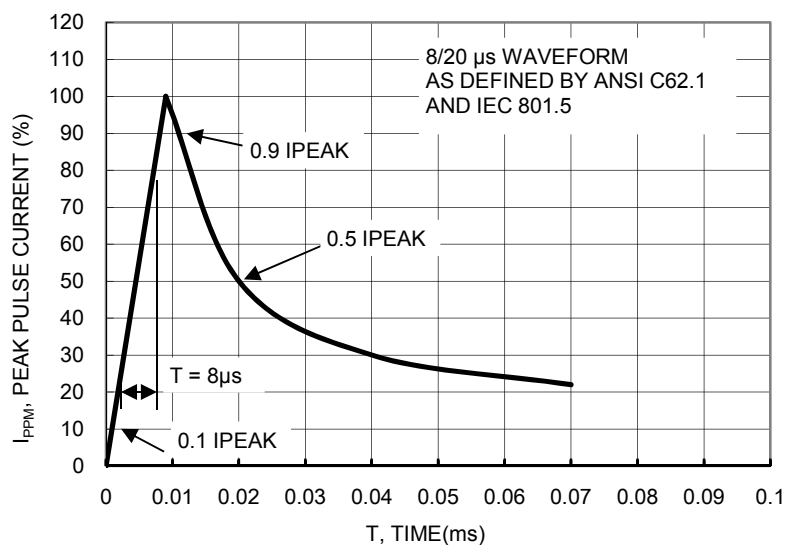
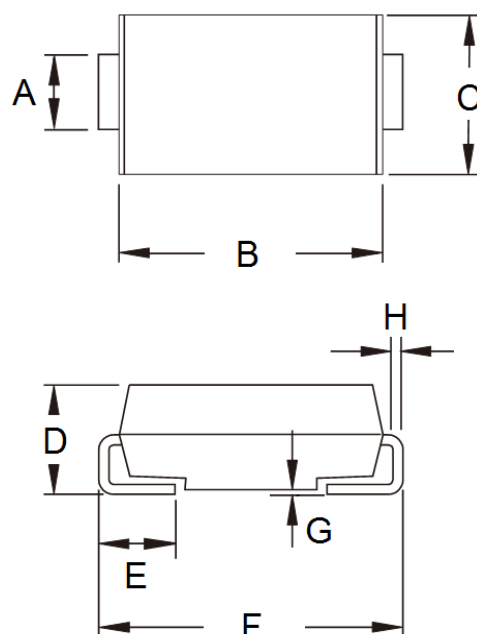


FIG. 12 PULSE WAVEFORM

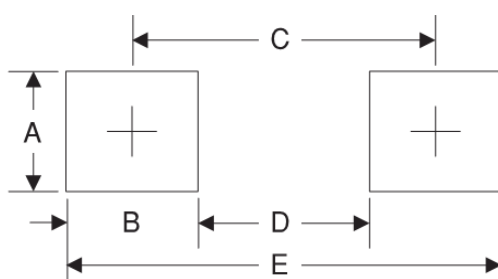


**PACKAGE OUTLINE DIMENSIONS**  
**DO-214AA (SMB)**



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.95      | 2.10 | 0.077       | 0.083 |
| B    | 4.25      | 4.75 | 0.167       | 0.187 |
| C    | 3.48      | 3.73 | 0.137       | 0.147 |
| D    | 1.99      | 2.61 | 0.078       | 0.103 |
| E    | 0.90      | 1.41 | 0.035       | 0.056 |
| F    | 5.10      | 5.30 | 0.201       | 0.209 |
| G    | 0.10      | 0.20 | 0.004       | 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 = Device Marking Code  
G = Green Compound  
YW = Date Code  
F = Factory Code

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