

## 1.5W, 11V - 200V Surface Mount Zener Diode

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Low inductance
- Typical IR less than 0.5μA above 11V
- ESD Rating of Class 3B (HBM) per JEDEC
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- 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-214AC (SMA)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.060g (approximately)

| KEY PARAMETERS        |                |      |
|-----------------------|----------------|------|
| PARAMETER             | VALUE          | UNIT |
| $V_Z$                 | 11 - 200       | V    |
| Test current $I_{ZT}$ | 1.9 - 34.1     | mA   |
| $P_D$                 | 1.5            | W    |
| $T_{J\text{ MAX}}$    | 150            | °C   |
| Package               | DO-214AC (SMA) |      |
| Configuration         | Single die     |      |



**DO-214AC (SMA)**



### 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 derate above $75^\circ\text{C}^{(1)}$ | $P_D$     | 1.5         | W     |
|                                                                                                                    |           | 20          | mW/°C |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load                                 | $I_{FSM}$ | 10          | A     |
| Junction temperature                                                                                               | $T_J$     | -55 to +150 | °C    |
| Storage temperature                                                                                                | $T_{STG}$ | -55 to +150 | °C    |

#### Notes:

1. Mounted on 5mm x 5mm Cu pad test board

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

| Part number<br>(Note 1) | Marking<br>code | Zener voltage<br>(Note 2) |     |        | Test<br>current | Regulator<br>impedance |                   | Test<br>current | Leakage<br>current |       | Maximum DC<br>Zener<br>Current |
|-------------------------|-----------------|---------------------------|-----|--------|-----------------|------------------------|-------------------|-----------------|--------------------|-------|--------------------------------|
|                         |                 | $V_Z @ I_Z$               |     |        | $I_{ZT}$        | $Z_{ZT} @ I_{ZT}$      | $Z_{ZK} @ I_{ZK}$ | $I_{ZK}$        | $I_R @ V_R$        |       | $I_{ZM}$                       |
|                         |                 | V                         |     |        | mA              | $\Omega$               | $\Omega$          | mA              | $\mu\text{A}$      | V     | mA                             |
|                         |                 | Min                       | Nom | Max    |                 | Max                    | Max               |                 | Max                |       | Max                            |
| 1SMA5926                | 926A            | 10.45                     | 11  | 11.55  | 34.1            | 5.5                    | 550               | 0.25            | 0.5                | 8.4   | 136                            |
| 1SMA5927                | 927A            | 11.40                     | 12  | 12.60  | 31.2            | 6.5                    | 550               | 0.25            | 0.5                | 9.1   | 125                            |
| 1SMA5928                | 928A            | 12.35                     | 13  | 13.65  | 28.8            | 7.0                    | 550               | 0.25            | 0.5                | 9.9   | 115                            |
| 1SMA5929                | 929A            | 14.25                     | 15  | 15.75  | 25.0            | 9.0                    | 600               | 0.25            | 0.5                | 11.4  | 100                            |
| 1SMA5930                | 930A            | 15.20                     | 16  | 16.80  | 23.4            | 10.0                   | 600               | 0.25            | 0.5                | 12.2  | 94                             |
| 1SMA5931                | 931A            | 17.10                     | 18  | 18.90  | 20.8            | 12.0                   | 650               | 0.25            | 0.5                | 13.7  | 83                             |
| 1SMA5932                | 932A            | 19.00                     | 20  | 21.00  | 18.7            | 14.0                   | 650               | 0.25            | 0.5                | 15.2  | 75                             |
| 1SMA5933                | 933A            | 20.90                     | 22  | 23.10  | 17.0            | 17.5                   | 650               | 0.25            | 0.5                | 16.7  | 68                             |
| 1SMA5934                | 934A            | 22.80                     | 24  | 25.20  | 15.6            | 19.0                   | 700               | 0.25            | 0.5                | 18.2  | 63                             |
| 1SMA5935                | 935A            | 25.65                     | 27  | 28.35  | 13.9            | 23.0                   | 700               | 0.25            | 0.5                | 20.6  | 56                             |
| 1SMA5936                | 936A            | 28.50                     | 30  | 31.50  | 12.5            | 26.0                   | 750               | 0.25            | 0.5                | 22.8  | 50                             |
| 1SMA5937                | 937A            | 31.35                     | 33  | 34.65  | 11.4            | 33.0                   | 800               | 0.25            | 0.5                | 25.1  | 45                             |
| 1SMA5938                | 938A            | 34.20                     | 36  | 37.80  | 10.4            | 38.0                   | 850               | 0.25            | 0.5                | 27.4  | 42                             |
| 1SMA5939                | 939A            | 37.05                     | 39  | 40.95  | 9.6             | 45.0                   | 900               | 0.25            | 0.5                | 29.7  | 38                             |
| 1SMA5940                | 940A            | 40.85                     | 43  | 45.15  | 8.7             | 53.0                   | 950               | 0.25            | 0.5                | 32.7  | 35                             |
| 1SMA5941                | 941A            | 44.65                     | 47  | 49.35  | 8.0             | 67.0                   | 1000              | 0.25            | 0.5                | 35.8  | 32                             |
| 1SMA5942                | 942A            | 48.45                     | 51  | 53.55  | 7.3             | 70.0                   | 1100              | 0.25            | 0.5                | 38.8  | 29                             |
| 1SMA5943                | 943A            | 53.20                     | 56  | 58.80  | 6.7             | 86.0                   | 1300              | 0.25            | 0.5                | 42.6  | 27                             |
| 1SMA5944                | 944A            | 58.90                     | 62  | 65.10  | 6.0             | 100.0                  | 1500              | 0.25            | 0.5                | 47.1  | 24                             |
| 1SMA5945                | 945A            | 64.60                     | 68  | 71.40  | 5.5             | 120.0                  | 1700              | 0.25            | 0.5                | 51.7  | 22                             |
| 1SMA5946                | 946A            | 71.25                     | 75  | 78.75  | 5.0             | 140.0                  | 2000              | 0.25            | 0.5                | 56.0  | 20                             |
| 1SMA5947                | 947A            | 77.90                     | 82  | 86.10  | 4.6             | 160.0                  | 2500              | 0.25            | 0.5                | 62.2  | 18                             |
| 1SMA5948                | 948A            | 86.45                     | 91  | 95.55  | 4.1             | 200.0                  | 3000              | 0.25            | 0.5                | 69.2  | 16                             |
| 1SMA5949                | 949A            | 95.00                     | 100 | 105.00 | 3.7             | 250.0                  | 3100              | 0.25            | 0.5                | 76.0  | 15                             |
| 1SMA5950                | 950A            | 104.50                    | 110 | 115.50 | 3.4             | 300.0                  | 4000              | 0.25            | 0.5                | 83.6  | 13                             |
| 1SMA5951                | 951A            | 114.00                    | 120 | 126.00 | 3.1             | 360.0                  | 4500              | 0.25            | 0.5                | 91.2  | 12                             |
| 1SMA5952                | 952A            | 123.50                    | 130 | 136.50 | 2.9             | 450.0                  | 5000              | 0.25            | 0.5                | 98.8  | 11                             |
| 1SMA5953                | 953A            | 142.50                    | 150 | 157.50 | 2.5             | 600.0                  | 6000              | 0.25            | 0.5                | 114.0 | 10                             |
| 1SMA5954                | 954A            | 152.00                    | 160 | 168.00 | 2.3             | 700.0                  | 6500              | 0.25            | 0.5                | 121.6 | 9                              |
| 1SMA5955                | 955A            | 171.00                    | 180 | 189.00 | 2.1             | 900.0                  | 7000              | 0.25            | 0.5                | 136.8 | 8                              |
| 1SMA5956                | 956A            | 190.00                    | 200 | 210.00 | 1.9             | 1200.0                 | 8000              | 0.25            | 0.5                | 152.0 | 7                              |

**Notes:**

1. Tolerance and Voltage Regulation Designation. The type number listed indicates a tolerance of  $\pm 5\%$
2.  $V_Z$  limits are to be guaranteed at thermal equilibrium

**ORDERING INFORMATION**

| ORDERING CODE <sup>(1)</sup> | PACKAGE        | PACKING             |
|------------------------------|----------------|---------------------|
| 1SMA59x                      | DO-214AC (SMA) | 7,500 / Tape & Reel |

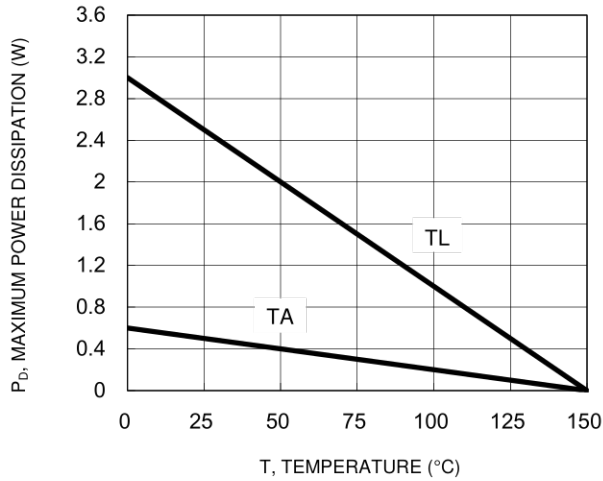
**Notes:**

1. "x" defines voltage from 11V(1SMA5926) to 200V(1SMA5956)

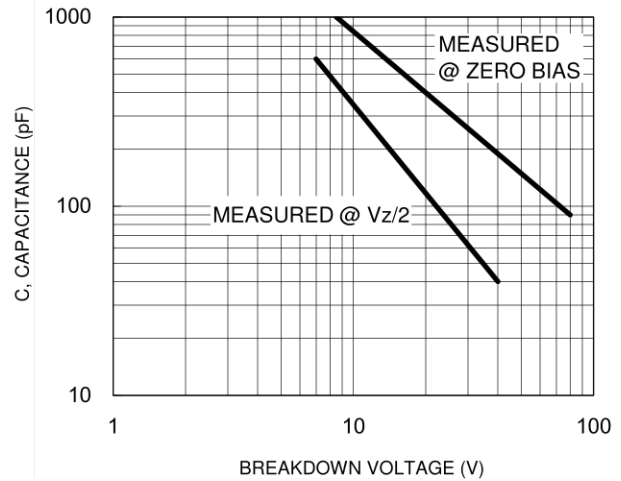
## CHARACTERISTICS CURVES

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

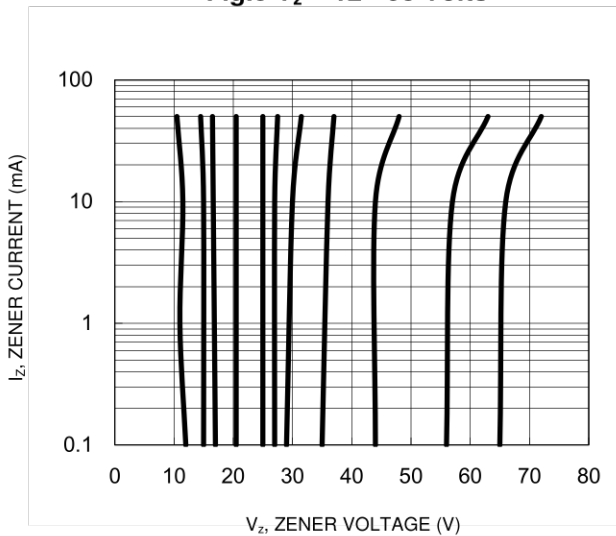
**Fig.1 Steady State Power Derating**



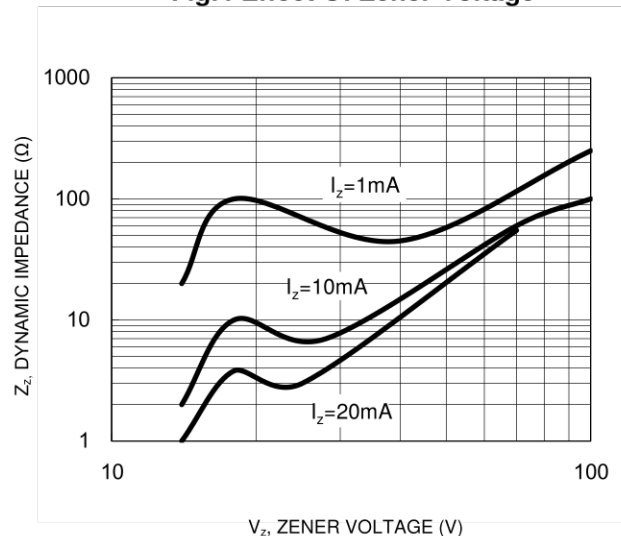
**Fig.2 Capacitance Curve**



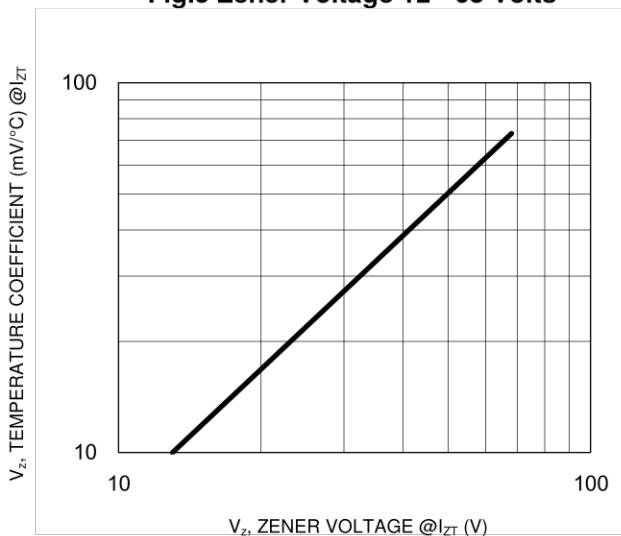
**Fig.3  $V_Z = 12 - 68$  Volts**



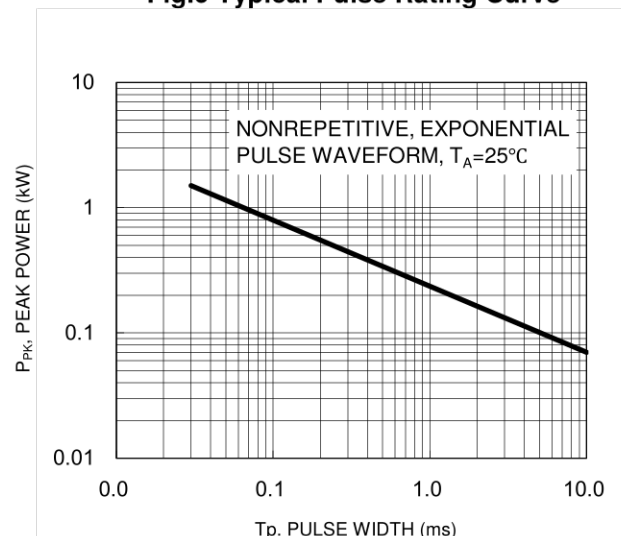
**Fig.4 Effect Of Zener Voltage**



**Fig.5 Zener Voltage 12 - 68 Volts**



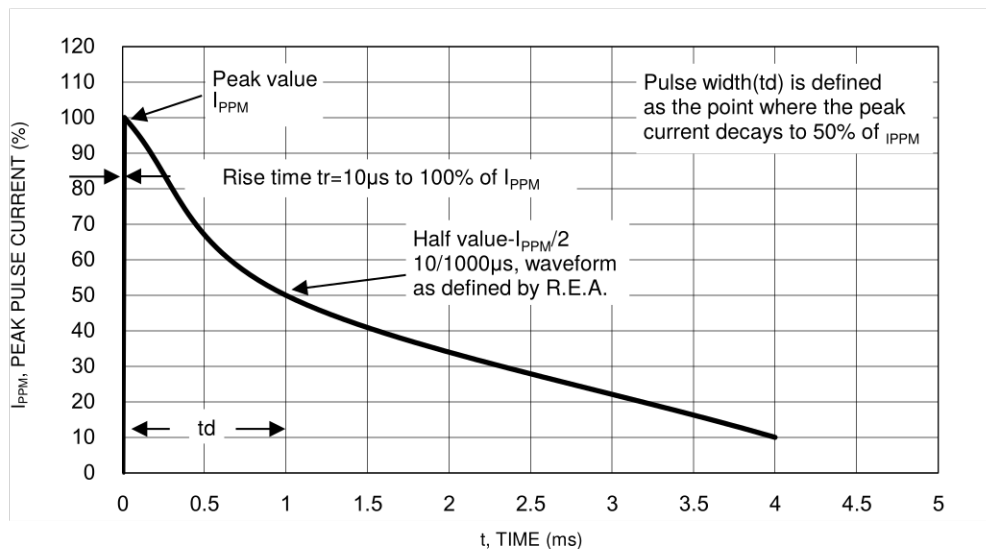
**Fig.6 Typical Pulse Rating Curve**



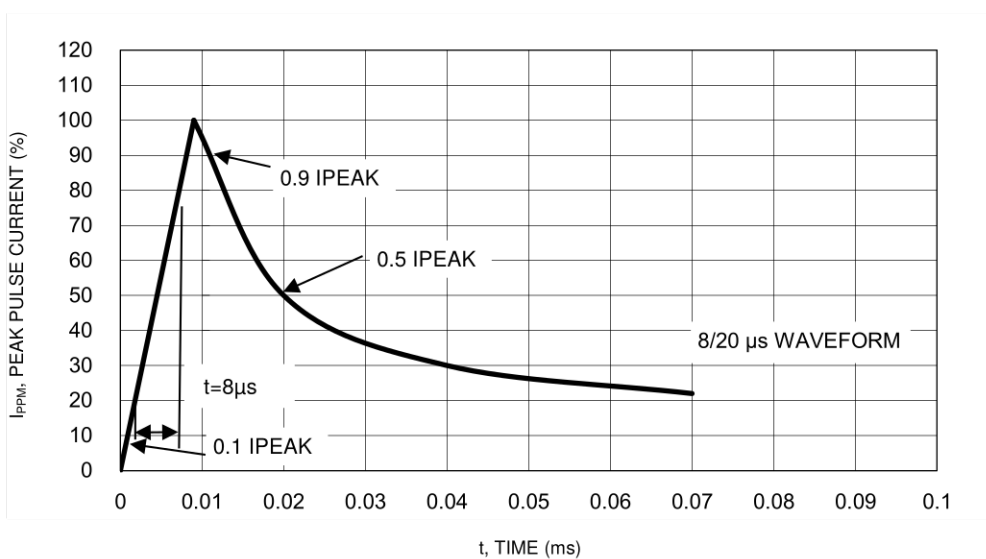
## CHARACTERISTICS CURVES

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

**Fig.7 Pulse Waveform**

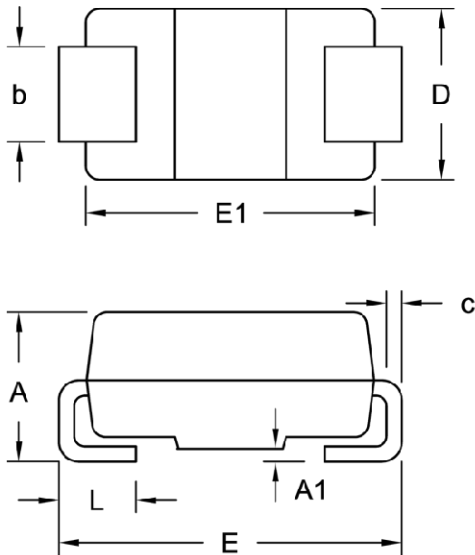


**Fig.8 Pulse Waveform**



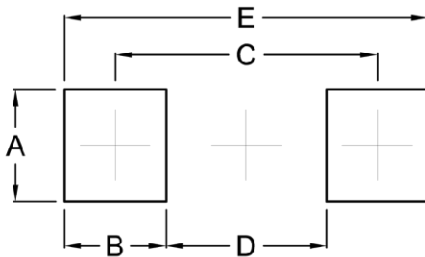
## PACKAGE OUTLINE DIMENSIONS

DO-214AC (SMA)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 1.99      | 2.50 | 0.078       | 0.098 |
| A1   | 0.10      | 0.20 | 0.004       | 0.008 |
| b    | 1.27      | 1.58 | 0.050       | 0.062 |
| c    | 0.15      | 0.31 | 0.006       | 0.012 |
| D    | 2.29      | 2.83 | 0.090       | 0.111 |
| E    | 4.95      | 5.33 | 0.195       | 0.210 |
| E1   | 4.06      | 4.60 | 0.160       | 0.181 |
| L    | 0.90      | 1.41 | 0.035       | 0.056 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.68      | 0.066       |
| B      | 1.52      | 0.060       |
| C      | 3.93      | 0.155       |
| D      | 2.41      | 0.095       |
| E      | 5.45      | 0.215       |

## MARKING DIAGRAM



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

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