

# 1SMA5921~1SMA5945

## SURFACE MOUNT SILICON ZENERDIODE

**VOLTAGE** 6.8 to 68 Volt **POWER** 1.5 Watt

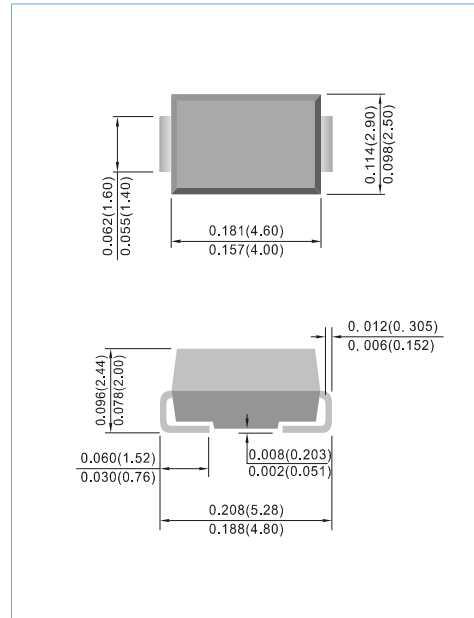
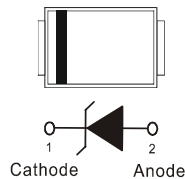
**SMA / DO-214AC** Unit : inch(mm)

### FEATURES

- For surface mounted applications in order to optimize board space
- Glass passivated junction
- Low inductance
- Typical  $I_R$  less than 1 $\mu$ A above 12V
- Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- High temperature soldering : 260°C /10 seconds at terminals
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### MECHANICAL DATA

- Case: JEDEC DO-214AC, Molded plastic over passivated junction
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode end
- Standard Packaging: 12mm tape (EIA-481)
- Weight: 0.0023 ounces, 0.0679 grams



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter                                                                                      | Symbol         | Value        | Units           |
|------------------------------------------------------------------------------------------------|----------------|--------------|-----------------|
| Pwak Pulse Power Dissipation on $T_L = 75^\circ\text{C}$ (Notes A)<br>Derate above 75°C        | $P_D$          | 1.5<br>20    | Watts<br>mW/ °C |
| Peak Forward Surge Current 8.3ms single half sine-wave<br>superimposed on rated load (Notes B) | $I_{FSM}$      | 10           | Amps            |
| Operating Junction and Storage Temperature Range                                               | $T_J, T_{STG}$ | -55 to + 150 | °C              |

### NOTES :

A.Mounted on 5mm<sup>2</sup> (0.013mm thick) land areas.

B.Measured on 8.3ms, and single half sine-wave or equivalent square wave ,duty cycle=4 pulses per minute maximum.



## 1SMA5921~1SMA5945

| Part Number | Nominal Zener Voltage |       |       | Maximum Zener Impedance |      |                   |      | Max. Reverse Leakage Current |       | Marking Code |
|-------------|-----------------------|-------|-------|-------------------------|------|-------------------|------|------------------------------|-------|--------------|
|             | $V_Z @ I_{ZT}$        |       |       | $Z_{ZT} @ I_{ZT}$       |      | $Z_{ZK} @ I_{ZK}$ |      | $I_R$                        | $V_R$ |              |
|             | Nom V                 | MinV  | Max V | $\Omega$                | mA   | $\Omega$          | mA   | $\mu A$                      | V     |              |
| 1SMA5921    | 6.8                   | 6.46  | 7.14  | 3                       | 55.1 | 200               | 1    | 5                            | 5.2   | 921A         |
| 1SMA5922    | 7.5                   | 7.13  | 7.88  | 3                       | 50   | 400               | 0.5  | 5                            | 6     | 922A         |
| 1SMA5923    | 8.2                   | 7.79  | 8.61  | 4                       | 45.7 | 400               | 0.5  | 5                            | 6.5   | 923A         |
| 1SMA5924    | 9.1                   | 8.65  | 9.56  | 4                       | 41.2 | 500               | 0.5  | 5                            | 7     | 924A         |
| 1SMA5925    | 10                    | 9.5   | 10.5  | 5                       | 37.5 | 500               | 0.25 | 5                            | 8     | 925A         |
| 1SMA5926    | 11                    | 10.45 | 11.55 | 6                       | 34.1 | 550               | 0.25 | 1                            | 8.4   | 926A         |
| 1SMA5927    | 12                    | 11.4  | 12.6  | 7                       | 31.2 | 550               | 0.25 | 1                            | 9.1   | 927A         |
| 1SMA5928    | 13                    | 12.35 | 13.65 | 7                       | 28.8 | 550               | 0.25 | 1                            | 9.9   | 928A         |
| 1SMA5929    | 15                    | 14.25 | 15.75 | 9                       | 25   | 600               | 0.25 | 1                            | 11.4  | 929A         |
| 1SMA5930    | 16                    | 15.2  | 16.8  | 10                      | 23.4 | 600               | 0.25 | 1                            | 12.2  | 930A         |
| 1SMA5931    | 18                    | 17.1  | 18.9  | 12                      | 20.8 | 650               | 0.25 | 1                            | 13.7  | 931A         |
| 1SMA5932    | 20                    | 19    | 21    | 14                      | 18.7 | 650               | 0.25 | 1                            | 15.2  | 932A         |
| 1SMA5933    | 22                    | 20.9  | 23.1  | 18                      | 17   | 650               | 0.25 | 1                            | 16.7  | 933A         |
| 1SMA5934    | 24                    | 22.8  | 25.2  | 19                      | 15.6 | 700               | 0.25 | 1                            | 18.2  | 934A         |
| 1SMA5935    | 27                    | 25.65 | 28.35 | 23                      | 13.9 | 700               | 0.25 | 1                            | 20.6  | 935A         |
| 1SMA5936    | 30                    | 28.5  | 31.5  | 26                      | 12.5 | 750               | 0.25 | 1                            | 22.8  | 936A         |
| 1SMA5937    | 33                    | 31.35 | 34.65 | 33                      | 11.4 | 800               | 0.25 | 1                            | 25.1  | 937A         |
| 1SMA5938    | 36                    | 34.2  | 37.8  | 38                      | 10.4 | 850               | 0.25 | 1                            | 27.4  | 938A         |
| 1SMA5939    | 39                    | 37.05 | 40.95 | 45                      | 9.6  | 900               | 0.25 | 1                            | 29.7  | 939A         |
| 1SMA5940    | 43                    | 40.85 | 45.15 | 53                      | 8.7  | 950               | 0.25 | 1                            | 32.7  | 940A         |
| 1SMA5941    | 47                    | 44.65 | 49.35 | 67                      | 8    | 1000              | 0.25 | 1                            | 35.8  | 941A         |
| 1SMA5942    | 51                    | 48.45 | 53.55 | 70                      | 7.3  | 1100              | 0.25 | 1                            | 38.8  | 942A         |
| 1SMA5943    | 56                    | 53.2  | 58.8  | 86                      | 6.7  | 1300              | 0.25 | 1                            | 42.6  | 943A         |
| 1SMA5944    | 62                    | 58.9  | 65.1  | 100                     | 6    | 1500              | 0.25 | 1                            | 47.1  | 944A         |
| 1SMA5945    | 68                    | 64.6  | 71.4  | 120                     | 5.5  | 1700              | 0.25 | 1                            | 51.7  | 945A         |

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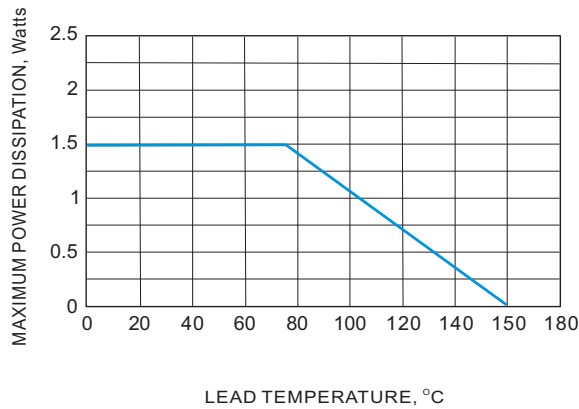


Fig.1 Steady State Power Derating

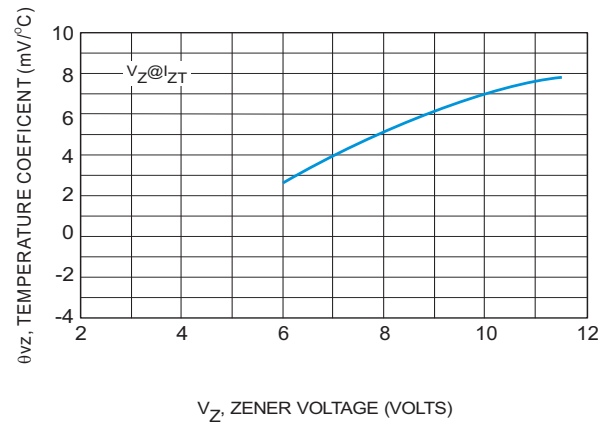


Fig.2 Zener Voltage - to 12 volts

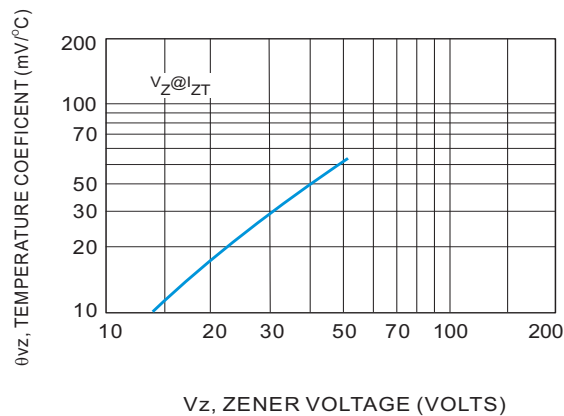


Fig.3 Zener Voltage - 14 to 200 Volts

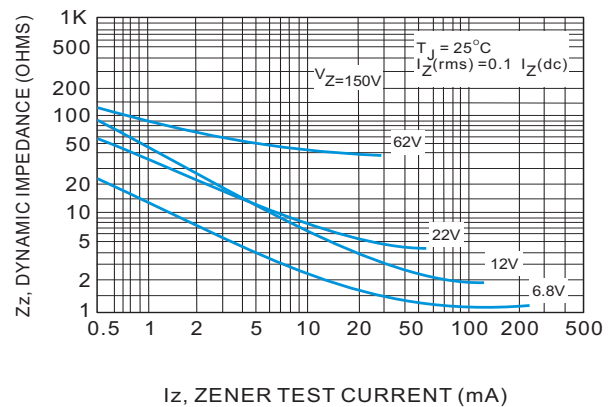


Fig.4 Effect of Zener Current

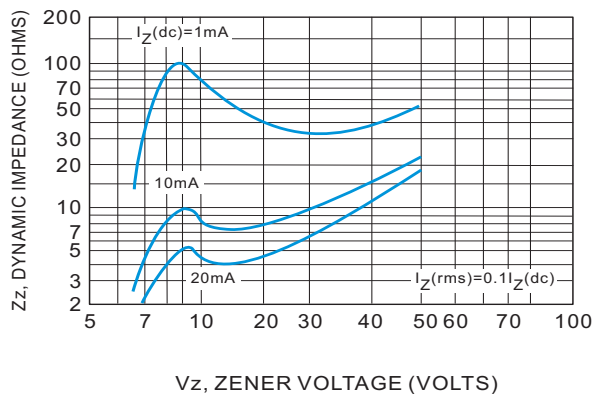


Fig.5 Effect of Zener Voltage

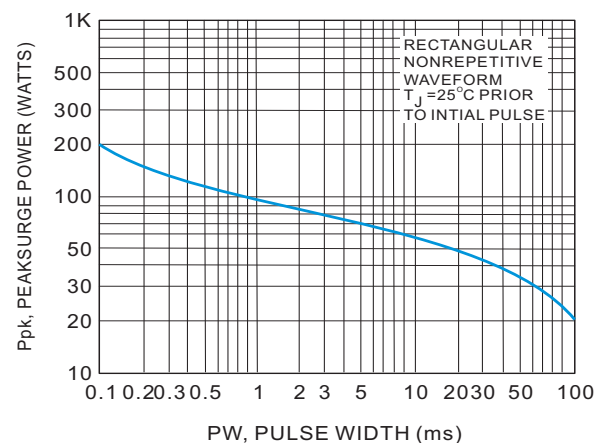


Fig.6 Maximum Surge Power

## 1SMA5921~1SMA5945

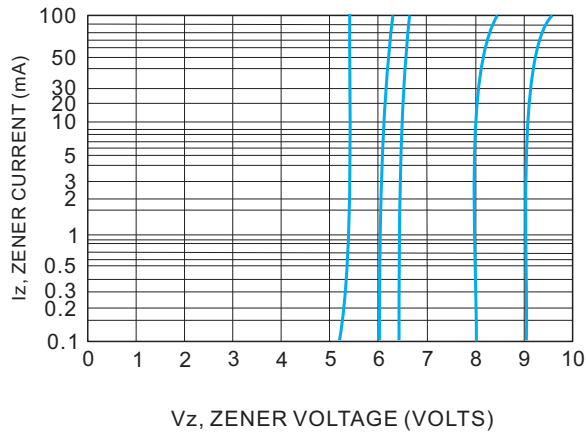


Fig.7  $V_z = 6.8$  thru 10 Volts

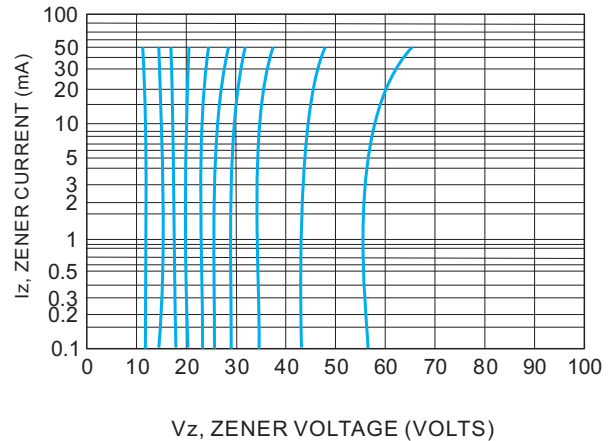


Fig.8  $V_z = 12$  thru 82 Volts

### NOTE 3. ZENER VOLTAGE ( $V_z$ ) MEASUREMENT

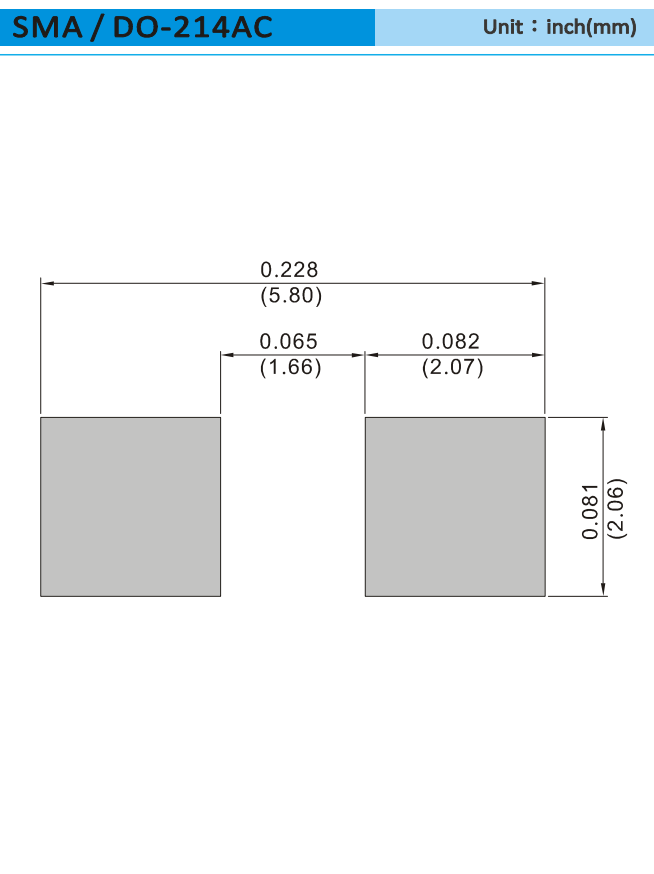
Nominal zener voltage is measured with the device function in thermal equilibrium with ambient temperature at 25°C

### NOTE 4. ZENER IMPEDANCE ( $Z_z$ ) DERIVATION

$Z_{zt}$  and  $Z_{zk}$  are measured by dividing the ac voltage drop across the device by the accurent applied. The specified limits are for  $I_z(ac) = 0.1 I_z, (dc)$  with the ac frequency = 60Hz

## 1SMA5921~1SMA5945

### MOUNTING PAD LAYOUT



### ORDER INFORMATION

- Packing information
  - T/R - 7.5K per 13" plastic Reel
  - T/R - 1.8K per 7" plastic Reel

## 1SMA5921~1SMA5945

### Part No\_packing code\_Version

1SMA5921\_R1\_00001

1SMA5921\_R2\_00001

For example :

**RB500V-40\_R2\_00001**

Part No.

Serial number

Version code means HF

Packing size code means 13"

Packing type means T/R

| Packing Code <b>XX</b>               |                      |                                  |                      | Version Code <b>XXXXX</b> |                      |                                       |
|--------------------------------------|----------------------|----------------------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type                         | 1 <sup>st</sup> Code | Packing size code                | 2 <sup>nd</sup> Code | HF or RoHS                | 1 <sup>st</sup> Code | 2 <sup>nd</sup> ~5 <sup>th</sup> Code |
| Tape and Ammunition Box (T/B)        | <b>A</b>             | N/A                              | <b>0</b>             | HF                        | <b>0</b>             | serial number                         |
| Tape and Reel (T/R)                  | <b>R</b>             | 7"                               | <b>1</b>             | RoHS                      | <b>1</b>             | serial number                         |
| Bulk Packing (B/P)                   | <b>B</b>             | 13"                              | <b>2</b>             |                           |                      |                                       |
| Tube Packing (T/P)                   | <b>T</b>             | 26mm                             | <b>X</b>             |                           |                      |                                       |
| Tape and Reel (Right Oriented) (TRR) | <b>S</b>             | 52mm                             | <b>Y</b>             |                           |                      |                                       |
| Tape and Reel (Left Oriented) (TRL)  | <b>L</b>             | PANASERT T/B CATHODE UP (PBCU)   | <b>U</b>             |                           |                      |                                       |
| FORMING                              | <b>F</b>             | PANASERT T/B CATHODE DOWN (PBCD) | <b>D</b>             |                           |                      |                                       |



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