



**THE DATASHEET OF  
1SMA4750 R3G**



## 1W, 7.5V - 200V Surface Mount Silicon Zener Diodes

### FEATURES

- Built-in strain relief
- Ideal for automated placement
- Glass passivated junction
- Low inductance
- Typical  $I_R$  less than  $1\mu A$  above 11V
- 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-214AC (SMA)**

### MECHANICAL DATA

**Case:** DO-214AC (SMA)

Molding compound, UL flammability classification rating 94V-0

Moisture sensitivity level: level 1, per J-STD-020

Part No. with suffix "H" means AEC-Q101 qualified

Packing code with suffix "G" means green compound (halogen-free)

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

Meet JESD 201 class 2 whisker test

**Polarity:** Indicated by cathode band

**Weight:** 0.06 g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ C$ unless otherwise noted) |           |              |            |
|---|-----------|--------------|------------|
| PARAMETER   | SYMBOL    | VALUE        | UNIT       |
| Power dissipation, $R_{THJA}<30K/W$ , $T_A=60^\circ C$                                    | $P_D$     | 1            | Watts      |
| Power dissipation, $R_{THJA}<100K/W$ , $T_A=25^\circ C$                                   | $P_D$     | 1.25         | Watts      |
| Non repetitive peak power dissipation (Note 1)  | $P_{ZSM}$ | 60           | Watts      |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load       | $I_{FSM}$ | 60           | A          |
| Operating junction temperature range  | $T_J$     | - 55 to +175 | $^\circ C$ |
| Storage temperature range   | $T_{STG}$ | - 55 to +175 | $^\circ C$ |

Note 1: Non Repetitive Peak surge  $P_D$  Test Condition:  $t_p=100\mu s$  sq. pulse,  $T_A=25^\circ C$  prior to surge

| ORDERING INFORMATION |                 |              |                     |            |                          |
|----------------------|-----------------|--------------|---------------------|------------|--------------------------|
| PART NO.             | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | PACKAGE    | PACKING                  |
| 1SMAxxxx<br>(Note 1) | H               | R3           | G                   | SMA        | 1,800 / 7" Plastic reel  |
|                      |                 | R2           |                     | SMA        | 7,500 / 13" Paper reel   |
|                      |                 | M2           |                     | SMA        | 7,500 / 13" Plastic reel |
|                      |                 | F3           |                     | Folded SMA | 1,800 / 7" Plastic reel  |
|                      |                 | F2           |                     | Folded SMA | 7,500 / 13" Paper reel   |
|                      |                 | F4           |                     | Folded SMA | 7,500 / 13" Plastic reel |

Note 1: "xxxx" defines voltage from 7.5V (1SMA4737) to 200V (1SMA200Z)

| EXAMPLE            |          |                 |              |                     |                                      |
|--------------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| PREFERRED PART NO. | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                          |
| 1SMA4737HR3G       | 1SMA4737 | H               | R3           | G                   | AEC-Q101 qualified<br>Green compound |

RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub>=25°C unless otherwise noted)

| Device<br>(Note 1) | Device<br>Marking<br>code | Nominal<br>Zener Voltage        | Test<br>Current | Zener Impedance                  |                                  |      | Leakage Current                |       | Surge current  |
|--------------------|---------------------------|---------------------------------|-----------------|----------------------------------|----------------------------------|------|--------------------------------|-------|----------------|
|                    |                           | V <sub>Z</sub> @I <sub>ZT</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>R</sub> |
|                    |                           | V                               | mA              | Ω                                | Ω                                | mA   | μA                             | V     | mA             |
|                    |                           | (Note 2)<br>(Note 3)            |                 |                                  |                                  |      | Max.                           |       |                |
| 1SMA4737           | 737A                      | 7.5                             | 34              | 4                                | 700                              | 0.50 | 5                              | 5.0   | 605            |
| 1SMA4738           | 738A                      | 8.2                             | 31              | 4.5                              | 700                              | 0.50 | 5                              | 6.0   | 550            |
| 1SMA4739           | 739A                      | 9.1                             | 28              | 5                                | 700                              | 0.50 | 5                              | 7.0   | 500            |
| 1SMA4740           | 740A                      | 10                              | 25              | 7                                | 700                              | 0.25 | 5                              | 7.6   | 454            |
| 1SMA4741           | 741A                      | 11                              | 23              | 8                                | 700                              | 0.25 | 1                              | 8.4   | 414            |
| 1SMA4742           | 742A                      | 12                              | 21              | 9                                | 700                              | 0.25 | 1                              | 9.1   | 380            |
| 1SMA4743           | 743A                      | 13                              | 19              | 10                               | 700                              | 0.25 | 1                              | 9.9   | 344            |
| 1SMA4744           | 744A                      | 15                              | 17              | 14                               | 700                              | 0.25 | 1                              | 11.4  | 304            |
| 1SMA4745           | 745A                      | 16                              | 15.5            | 16                               | 700                              | 0.25 | 1                              | 12.2  | 285            |
| 1SMA4746           | 746A                      | 18                              | 14.0            | 20                               | 750                              | 0.25 | 1                              | 13.7  | 250            |
| 1SMA4747           | 747A                      | 20                              | 12.5            | 22                               | 750                              | 0.25 | 1                              | 15.2  | 225            |
| 1SMA4748           | 748A                      | 22                              | 11.5            | 23                               | 750                              | 0.25 | 1                              | 16.7  | 205            |
| 1SMA4749           | 749A                      | 24                              | 10.5            | 25                               | 750                              | 0.25 | 1                              | 18.2  | 190            |
| 1SMA4750           | 750A                      | 27                              | 9.5             | 35                               | 750                              | 0.25 | 1                              | 20.6  | 170            |
| 1SMA4751           | 751A                      | 30                              | 8.5             | 40                               | 1000                             | 0.25 | 1                              | 22.8  | 150            |
| 1SMA4752           | 752A                      | 33                              | 7.5             | 45                               | 1000                             | 0.25 | 1                              | 25.1  | 135            |
| 1SMA4753           | 753A                      | 36                              | 7.0             | 50                               | 1000                             | 0.25 | 1                              | 27.4  | 125            |
| 1SMA4754           | 754A                      | 39                              | 6.5             | 60                               | 1000                             | 0.25 | 1                              | 29.7  | 115            |
| 1SMA4755           | 755A                      | 43                              | 6.0             | 70                               | 1500                             | 0.25 | 1                              | 32.7  | 110            |
| 1SMA4756           | 756A                      | 47                              | 5.5             | 80                               | 1500                             | 0.25 | 1                              | 35.8  | 95             |
| 1SMA4757           | 757A                      | 51                              | 5.0             | 95                               | 1500                             | 0.25 | 1                              | 38.8  | 90             |
| 1SMA4758           | 758A                      | 56                              | 4.5             | 110                              | 2000                             | 0.25 | 1                              | 42.6  | 80             |
| 1SMA4759           | 759A                      | 62                              | 4.0             | 125                              | 2000                             | 0.25 | 1                              | 47.1  | 70             |
| 1SMA4760           | 760A                      | 68                              | 3.7             | 150                              | 2000                             | 0.25 | 1                              | 51.7  | 65             |
| 1SMA4761           | 761A                      | 75                              | 3.3             | 175                              | 2000                             | 0.25 | 1                              | 56.0  | 60             |
| 1SMA4762           | 762A                      | 82                              | 3.0             | 200                              | 3000                             | 0.25 | 1                              | 62.2  | 55             |
| 1SMA4763           | 763A                      | 91                              | 2.8             | 250                              | 3000                             | 0.25 | 1                              | 69.2  | 50             |
| 1SMA4764           | 764A                      | 100                             | 2.5             | 350                              | 3000                             | 0.25 | 1                              | 76.0  | 45             |
| 1SMA110Z           | 110A                      | 110                             | 2.3             | 450                              | 4000                             | 0.25 | 1                              | 83.6  | -              |
| 1SMA120Z           | 120A                      | 120                             | 2.0             | 550                              | 4500                             | 0.25 | 1                              | 91.2  | -              |
| 1SMA130Z           | 130A                      | 130                             | 1.9             | 700                              | 5000                             | 0.25 | 1                              | 98.8  | -              |
| 1SMA150Z           | 150A                      | 150                             | 1.7             | 1000                             | 6000                             | 0.25 | 1                              | 114.0 | -              |
| 1SMA160Z           | 160A                      | 160                             | 1.6             | 1100                             | 6500                             | 0.25 | 1                              | 121.6 | -              |
| 1SMA180Z           | 180A                      | 180                             | 1.4             | 1200                             | 7000                             | 0.25 | 1                              | 136.8 | -              |
| 1SMA200Z           | 200A                      | 200                             | 1.2             | 1500                             | 8000                             | 0.25 | 1                              | 152.0 | -              |

Notes:

1. Tolerance and Type Number Designation. The type numbers listed have a standard tolerance on the nominal zener voltage of ±5%
2. Specials Available Include:
  - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances
  - B. Matched sets
3. Zener Voltage (V<sub>Z</sub>) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature(T<sub>L</sub>) at 30°C±1°C, from the diode body
4. Zener Impedance (Z<sub>Z</sub>) Derivation. The zener impedance is derived from the 60 cycle AC voltage, which results when an ac current having an rms value equal to 10% of the DC zener current (I<sub>ZT</sub> or I<sub>ZK</sub>) is superimposed on I<sub>ZT</sub> or I<sub>ZK</sub>
5. Surge Current (I<sub>R</sub>) Non-Repetitive. The rating list in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current, I<sub>ZT</sub> per JEDEC registration; however, actual device capability is as described in Figure 10.

FIG. 1 POWER TEMPERATURE DERATING CURVE

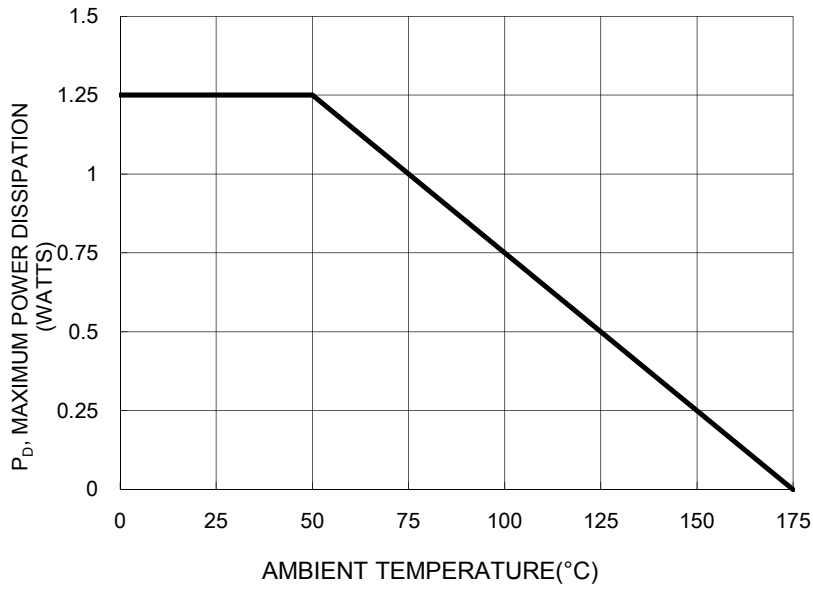


FIG. 2 TYPICAL FORWARD CHARACTERISTICS

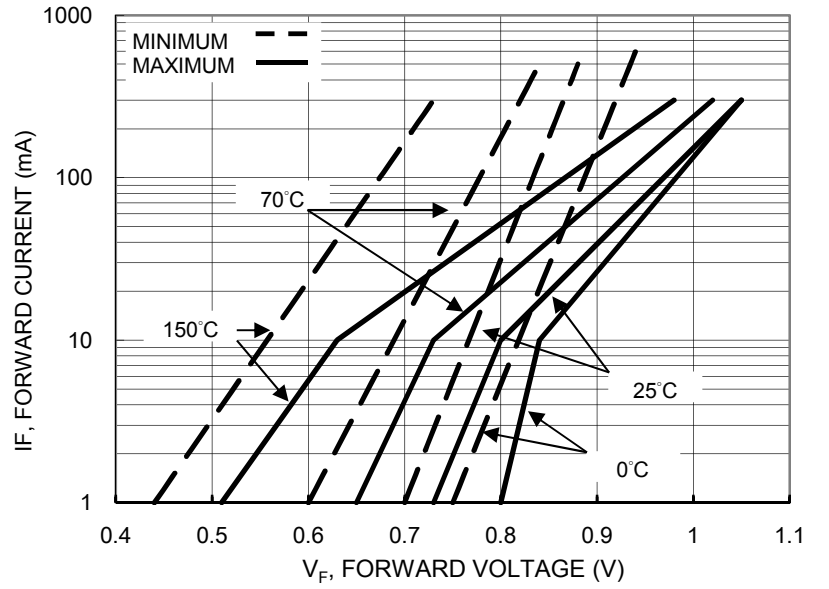


FIG.3 EFFECT OF ZENER CURRENT ON ZENER IMPEDANCE

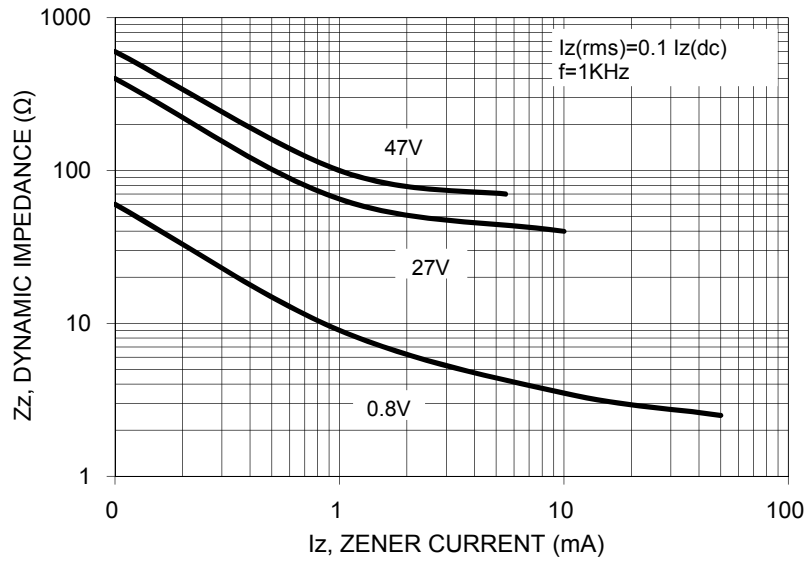


FIG.5 TYPICAL LEAKAGE CURRENT

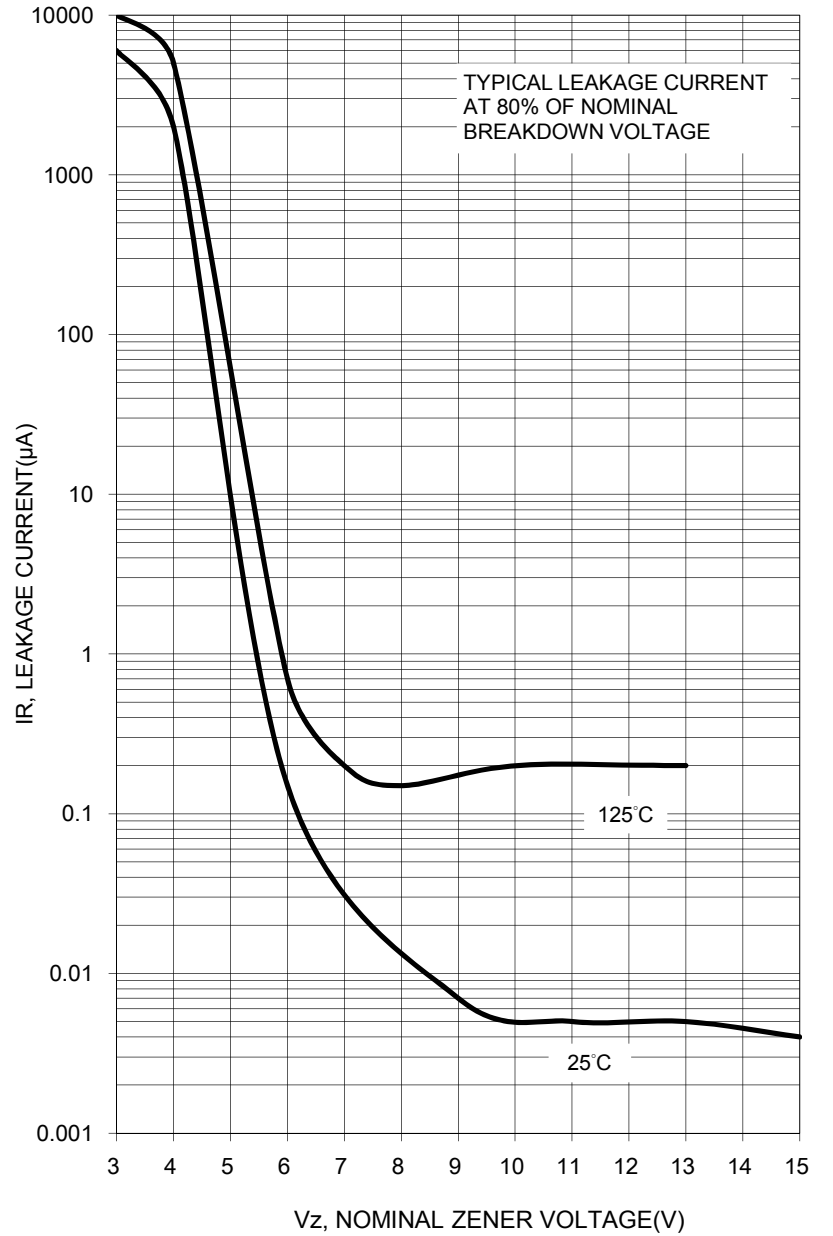


FIG.4 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

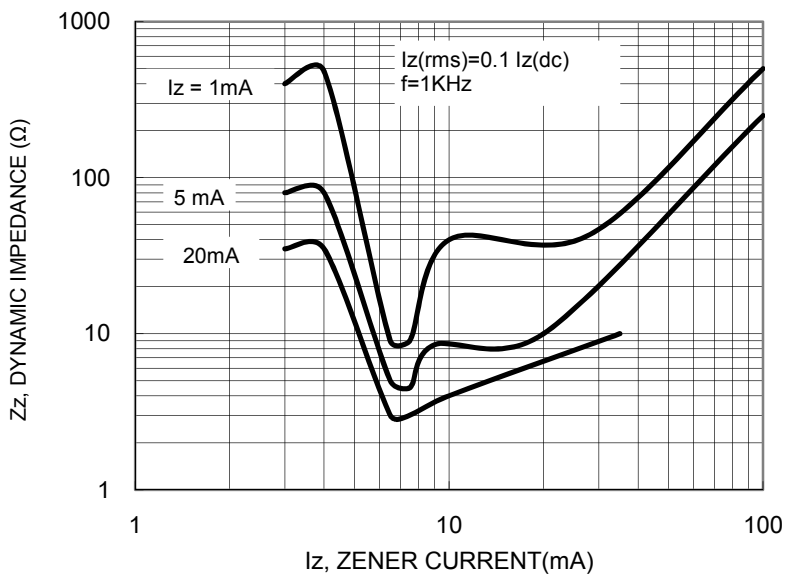


FIG.6 TYPICAL CAPACITANCE versus Vz

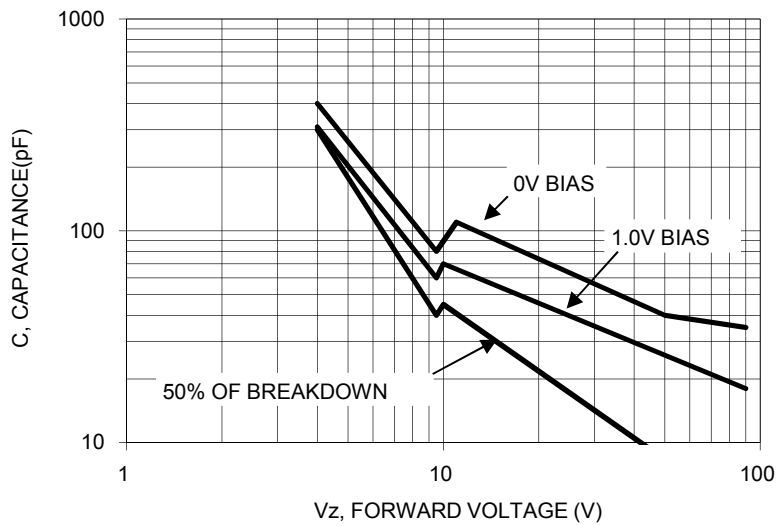


FIG. 7 TEMPERATURE COEFFICIENTS

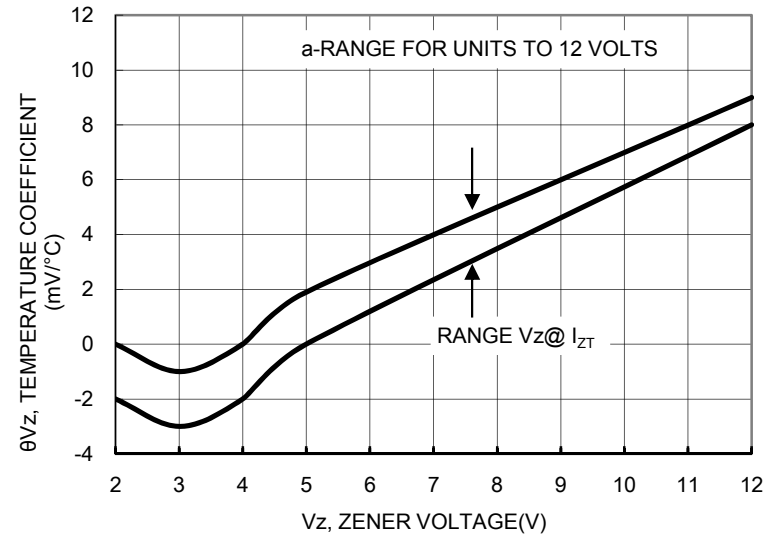


FIG.8 TEMPERATURE COEFFICIENTS

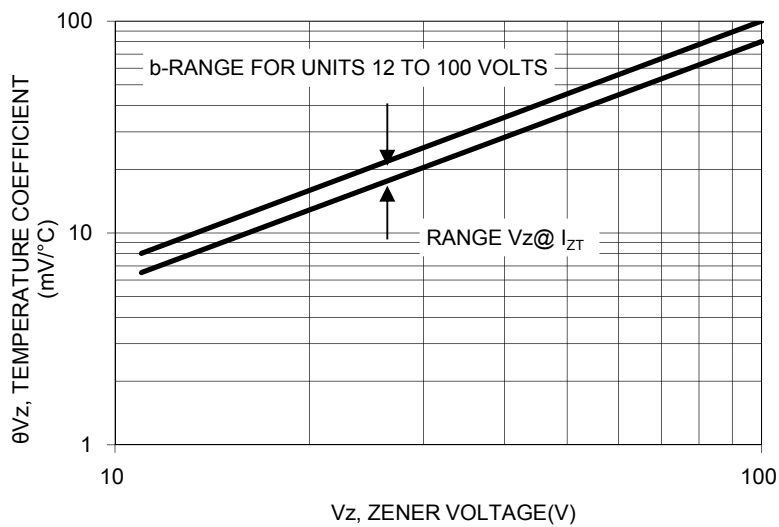


FIG. 9 EFFECT OF ZENER CURRENT

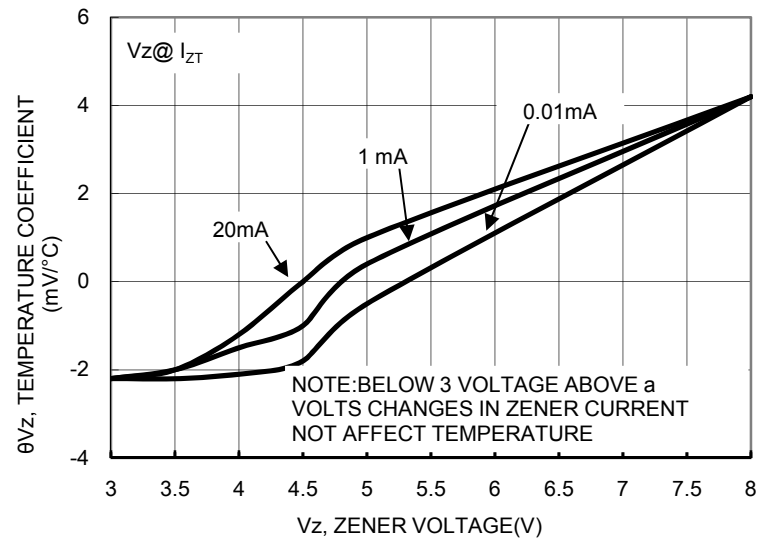
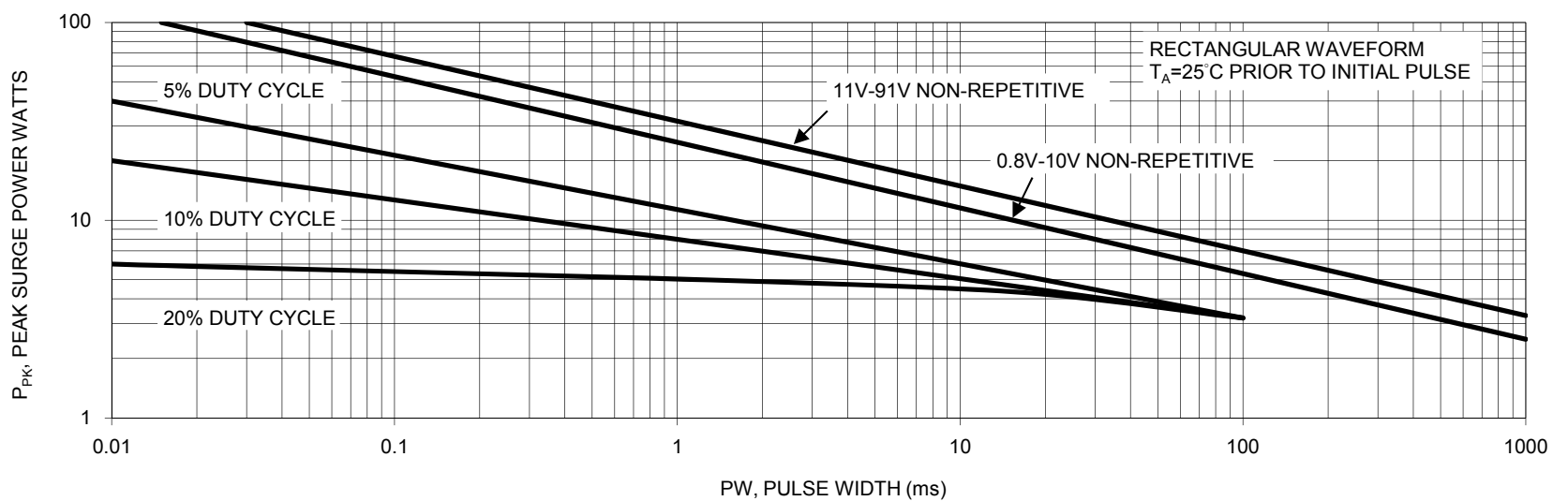
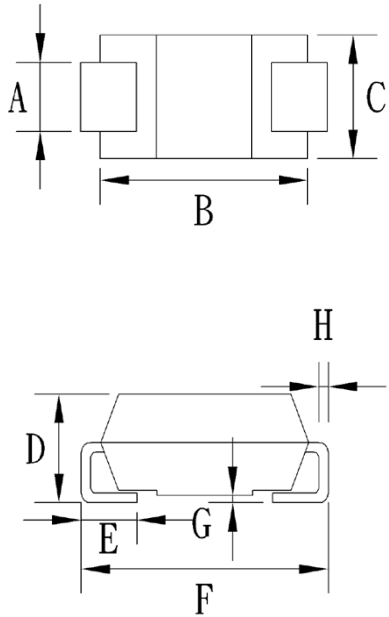


FIG.10 MAXIMUM SURGE POWER

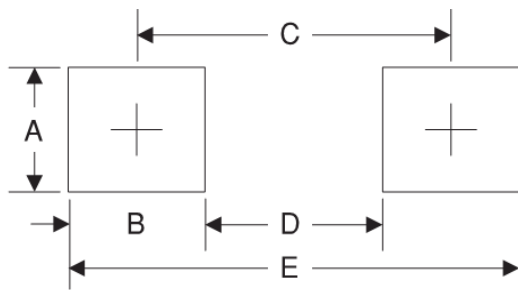


PACKAGE OUTLINE DIMENSIONS  
**DO-214AC (SMA)**



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.27      | 1.58 | 0.050       | 0.062 |
| B    | 4.06      | 4.60 | 0.160       | 0.181 |
| C    | 2.29      | 2.83 | 0.090       | 0.111 |
| D    | 1.99      | 2.50 | 0.078       | 0.098 |
| E    | 0.90      | 1.41 | 0.035       | 0.056 |
| F    | 4.95      | 5.33 | 0.195       | 0.210 |
| 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      | 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 = Device Marking Code
- G = Green Compound
- YW = Date Code
- F = Factory Code

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