

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 (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 Green compound |

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

| Device (Note 1) | Device Marking code | Nominal Zener Voltage | Test Current | Zener Impedance | | | Leakage Current | | Surge current |
|--------------------|---------------------------|--------------------------|-----------------|-----------------|-----------------|------|-----------------|-------|---------------|
| | | $V_Z@I_{ZT}$ | I_{ZT} | $Z_{ZT}@I_{ZT}$ | $Z_{ZK}@I_{ZK}$ | | $I_R@V_R$ | | I_R |
| | | V | mA | Ω | Ω | mA | μA | V | mA |
| | | (Note 2) (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 $\pm 5\%$
2. Specials Available Include:
 - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances
 - B. Matched sets
3. Zener Voltage (V_Z) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature (T_L) at $30^\circ\text{C} \pm 1^\circ\text{C}$, from the diode body
4. Zener Impedance (Z_Z) 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_{ZT} or I_{ZK}) is superimposed on I_{ZT} or I_{ZK}
5. Surge Current (I_R) 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_{ZT} per JEDEC registration; however, actual device capability is as described in Figure 10.

FIG. 1 POWER TEMPERATURE DERATING CURVE

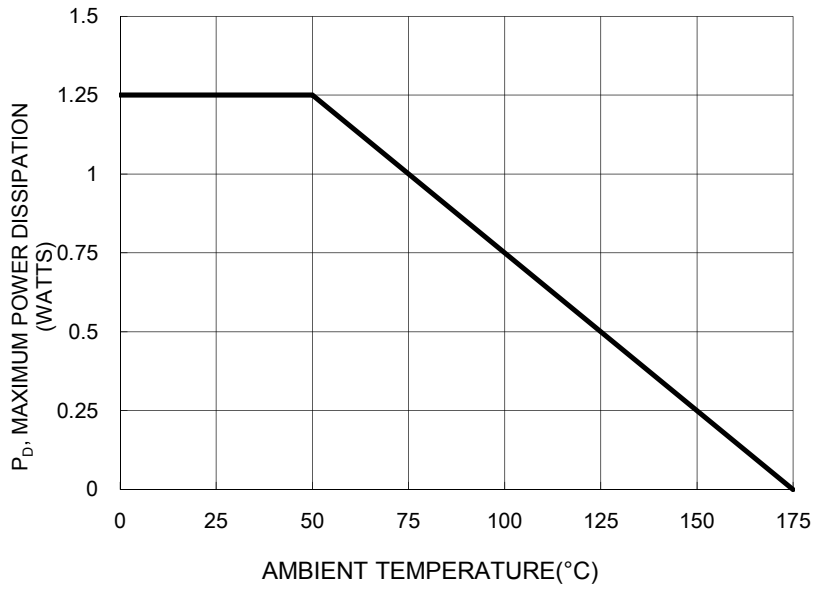


FIG. 2 TYPICAL FORWARD CHARACTERISTICS

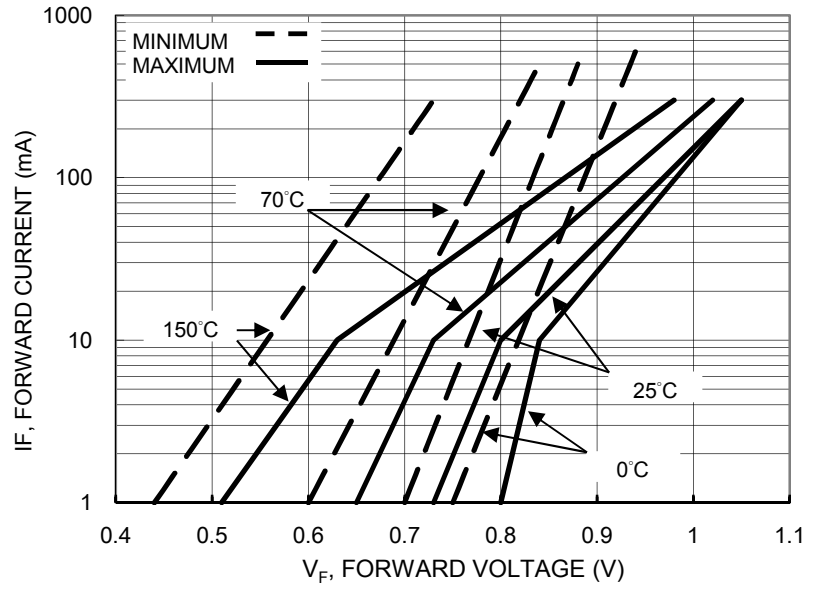


FIG.3 EFFECT OF ZENER CURRENT ON ZENER IMPEDANCE

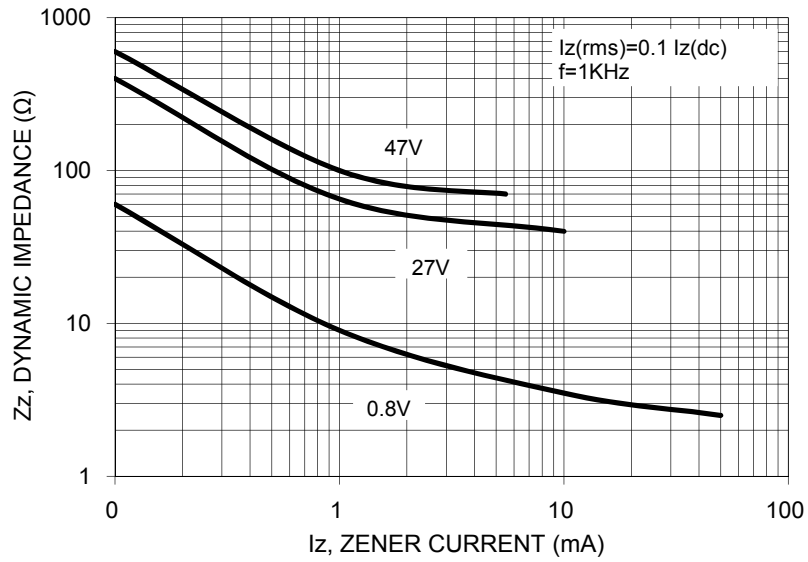


FIG.5 TYPICAL LEAKAGE CURRENT

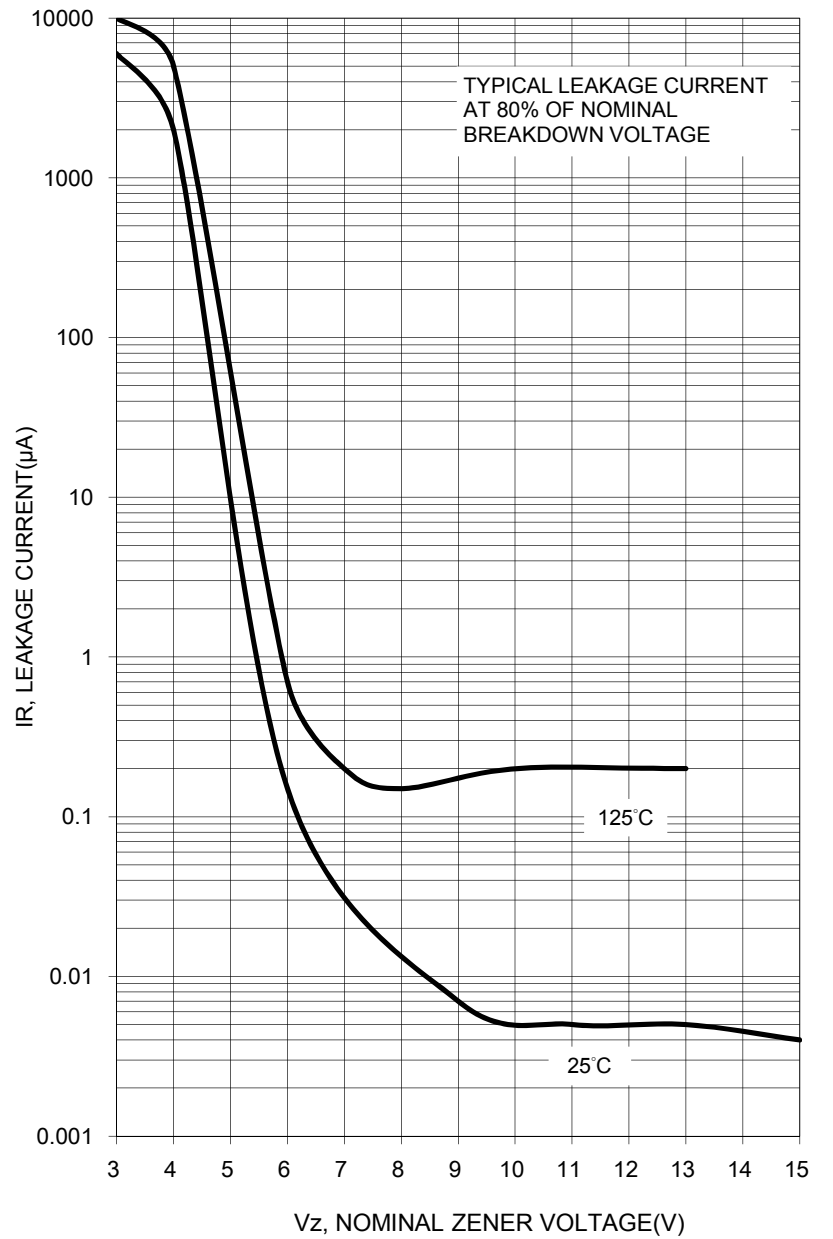


FIG.4 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

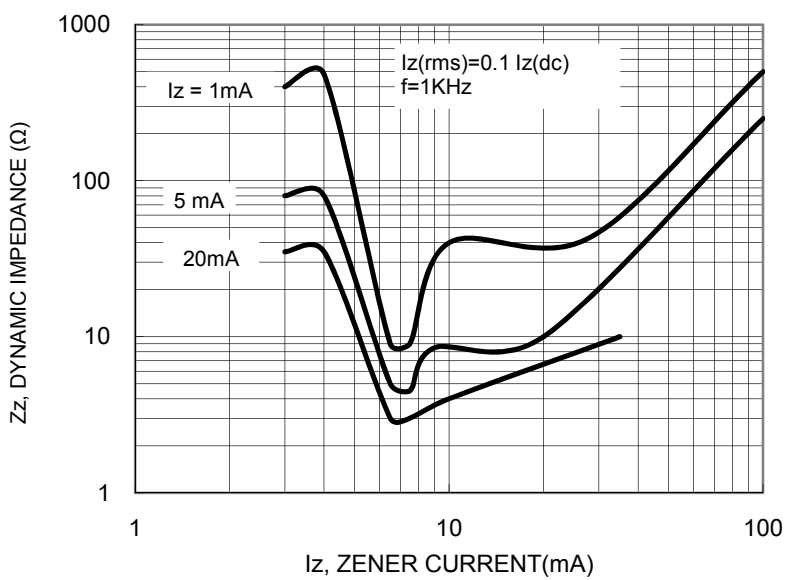


FIG.6 TYPICAL CAPACITANCE versus Vz

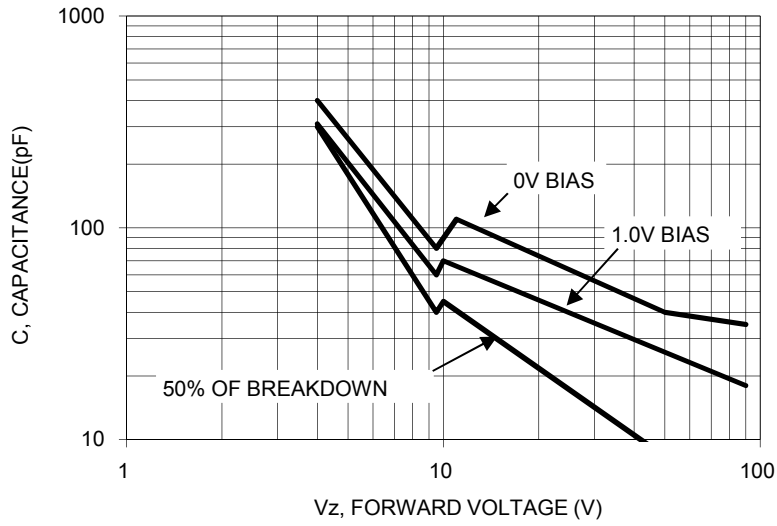


FIG. 7 TEMPERATURE COEFFICIENTS

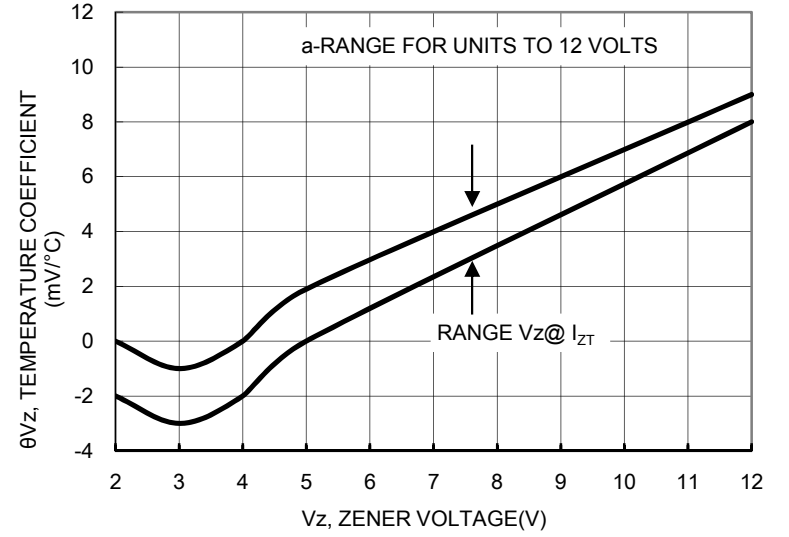


FIG.8 TEMPERATURE COEFFICIENTS

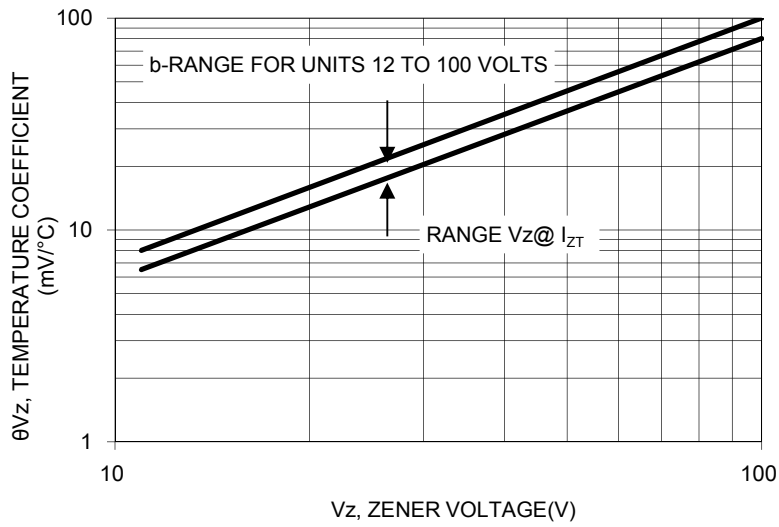


FIG. 9 EFFECT OF ZENER CURRENT

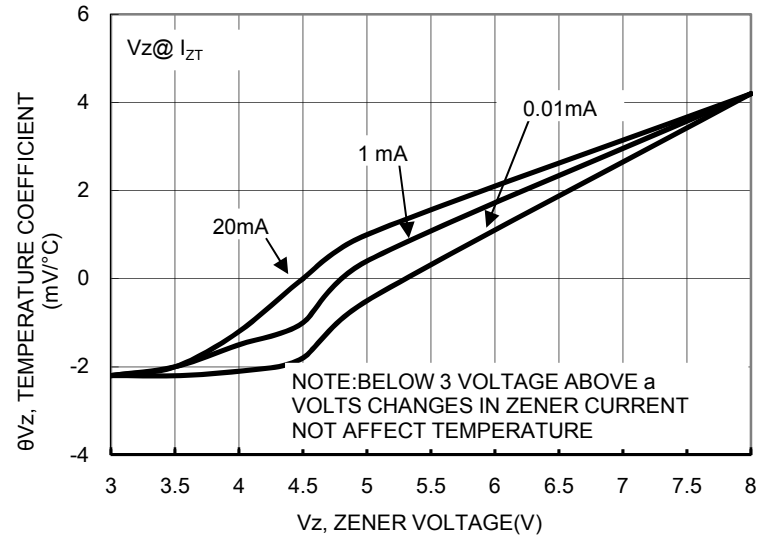
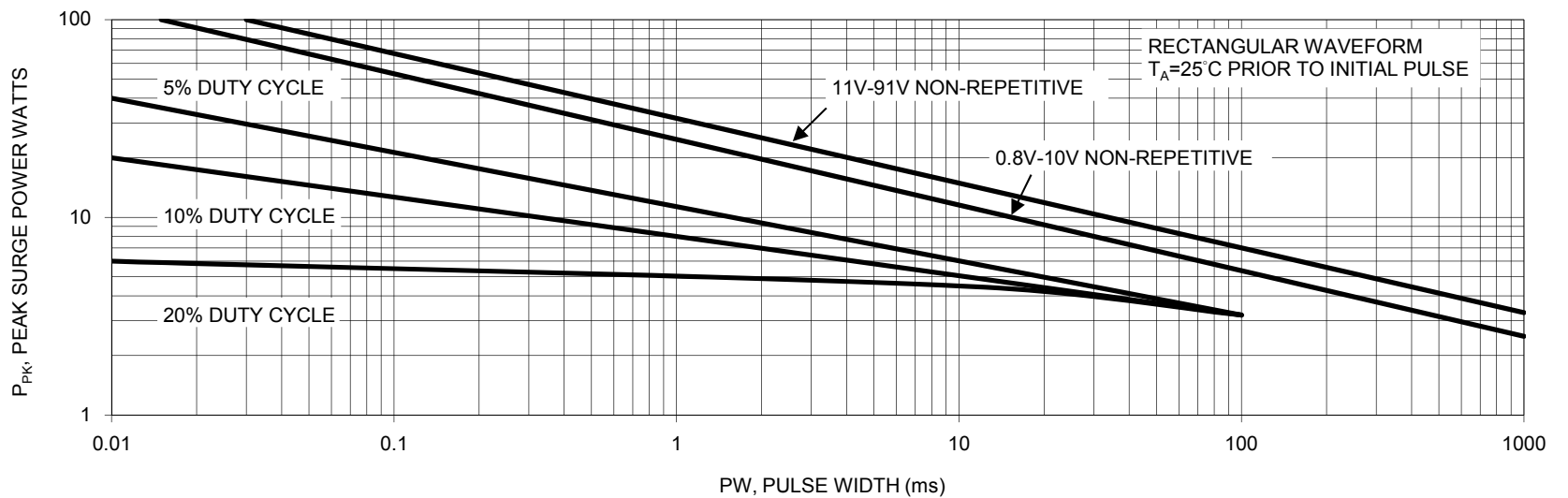
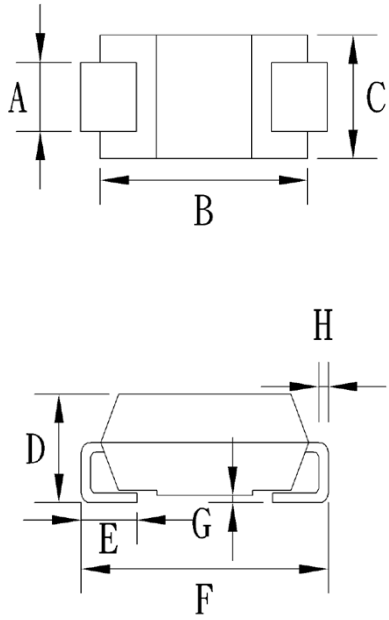


FIG.10 MAXIMUM SURGE POWER

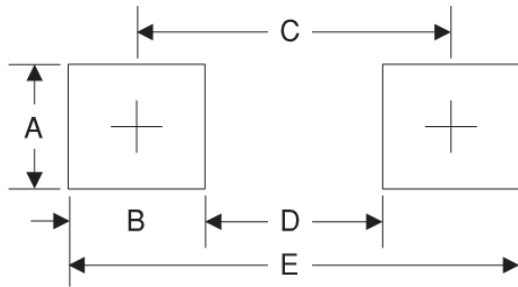


PACKAGE OUTLINE DIMENSIONS
DO-214AC (SMA)



| 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

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.