

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
- AEC-Q101 qualified



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

Standard Part No. with suffix "H" means automotive grade

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

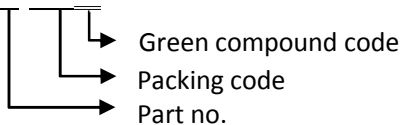
Weight: 0.06 g (approximately)

| 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

ORDER INFORMATION (EXAMPLE)

1SMA4737 R3G



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 accurate 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 listed 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

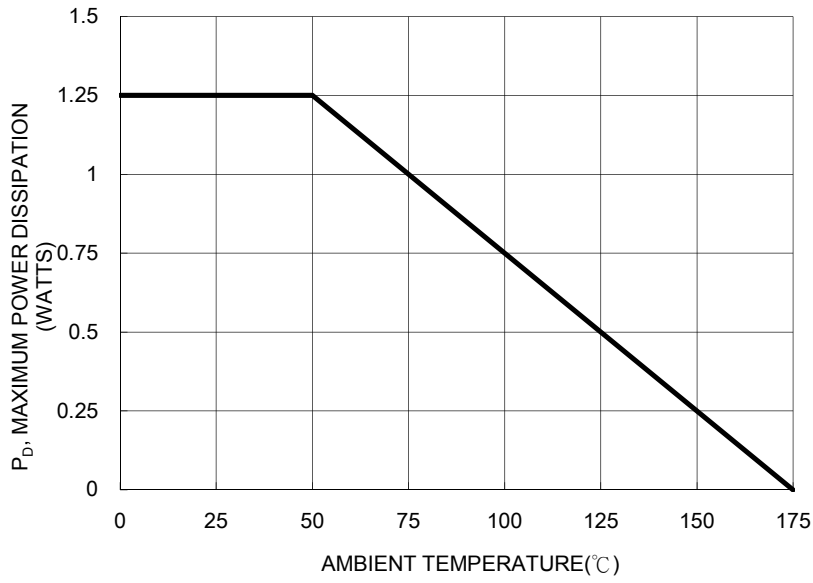


FIG. 2 TYPICAL FORWARD CHARACTERISTICS

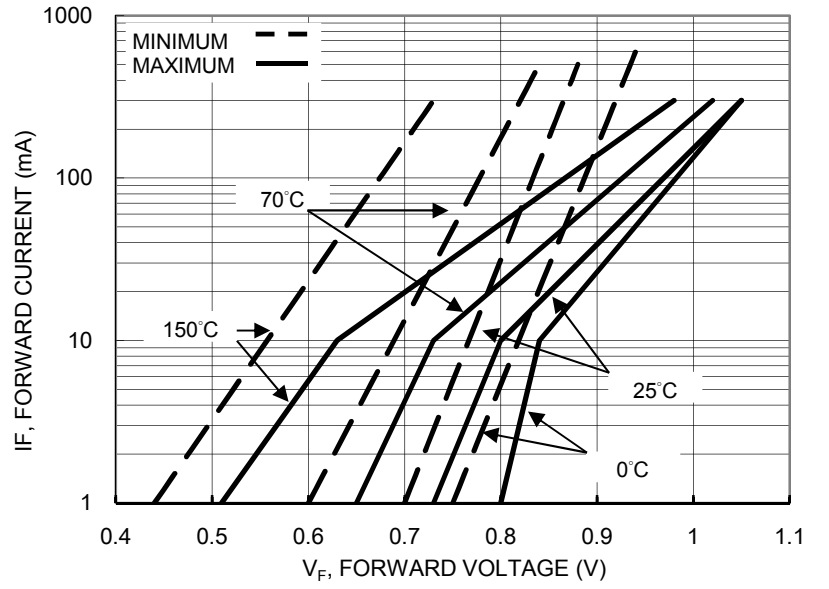


FIG. 3 EFFECT OF ZENER CURRENT ON ZENER IMPEDANCE

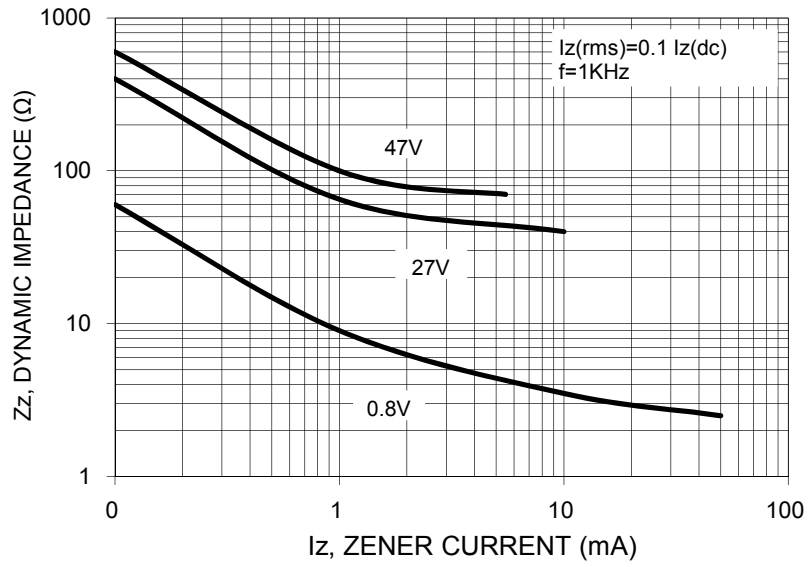


FIG. 4 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

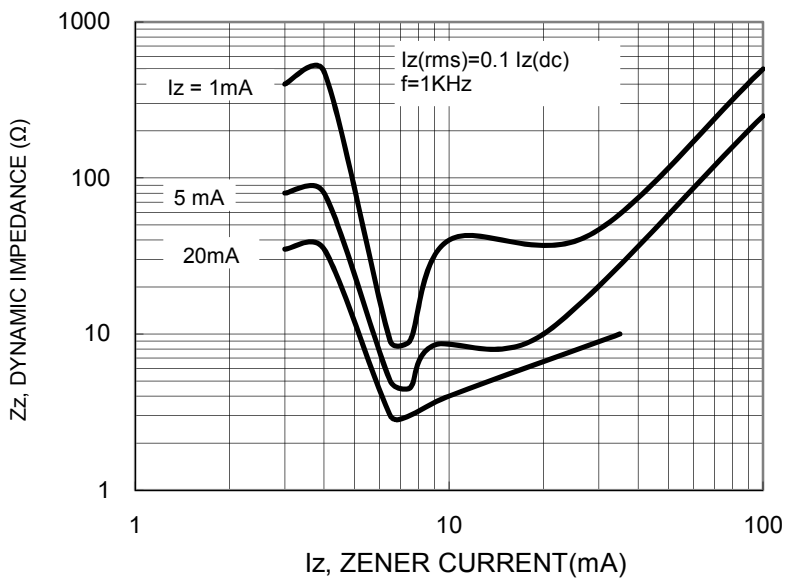


FIG. 5 TYPICAL LEAKAGE CURRENT

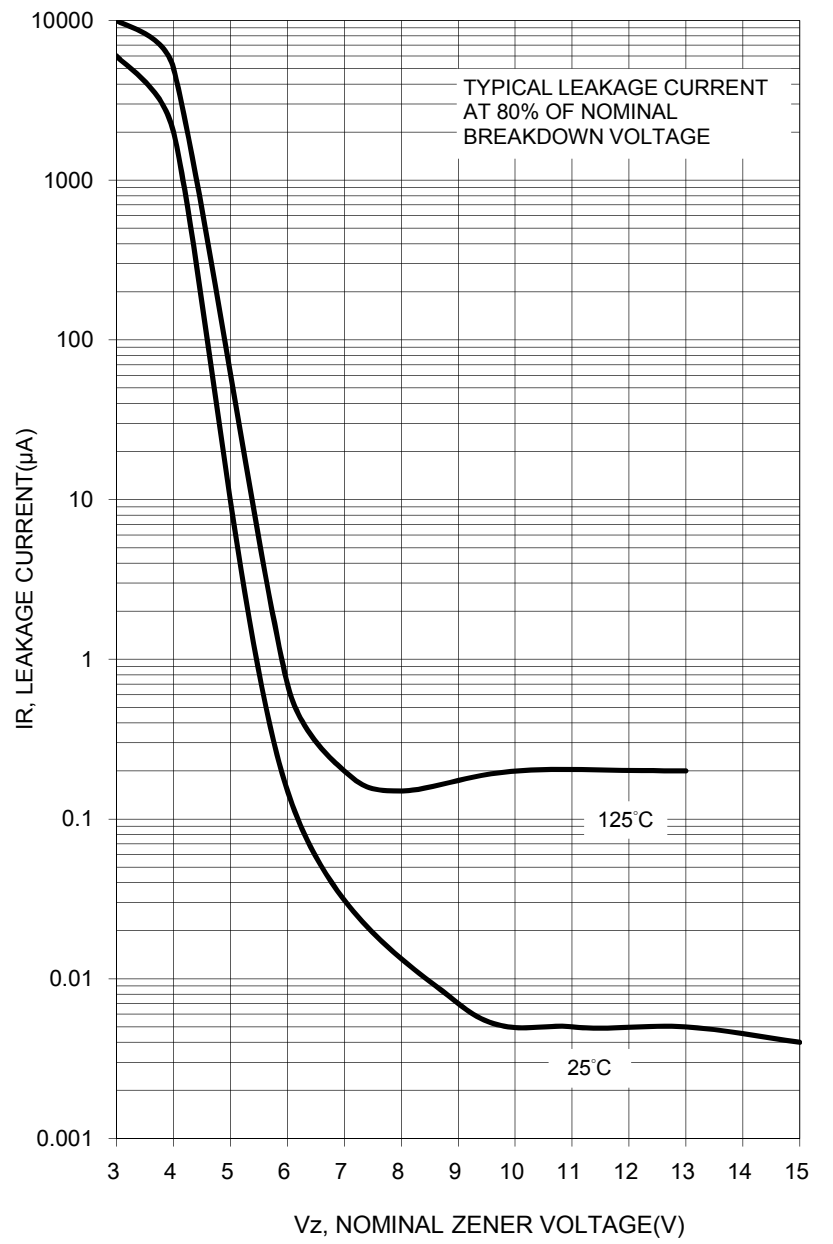


FIG.6 TYPICAL CAPACITANCE versus Vz

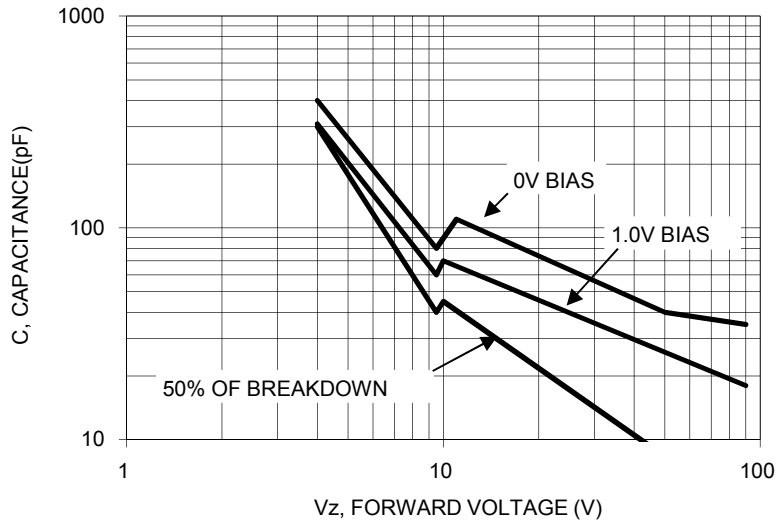


FIG. 7 TEMPERATURE COEFFICIENTS

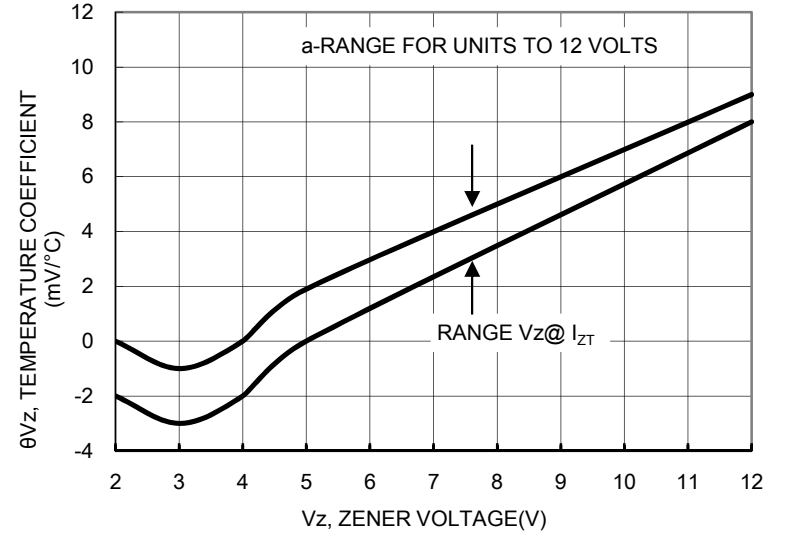


FIG.8 TEMPERATURE COEFFICIENTS

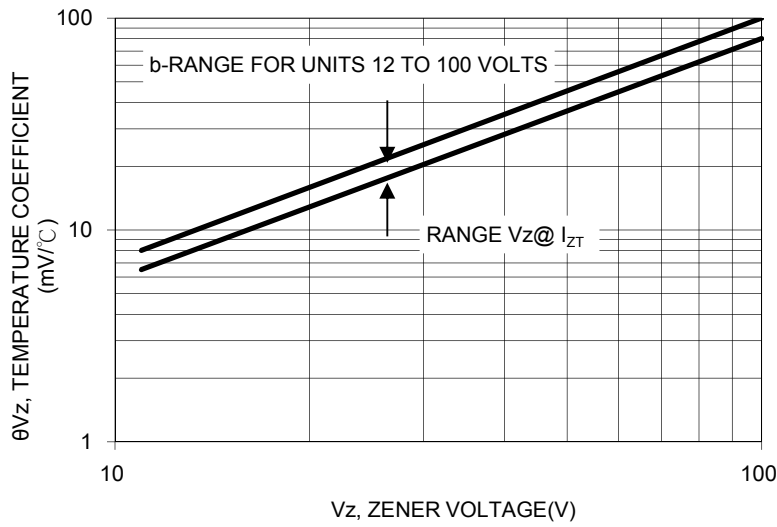


FIG. 9 EFFECT OF ZENER CURRENT

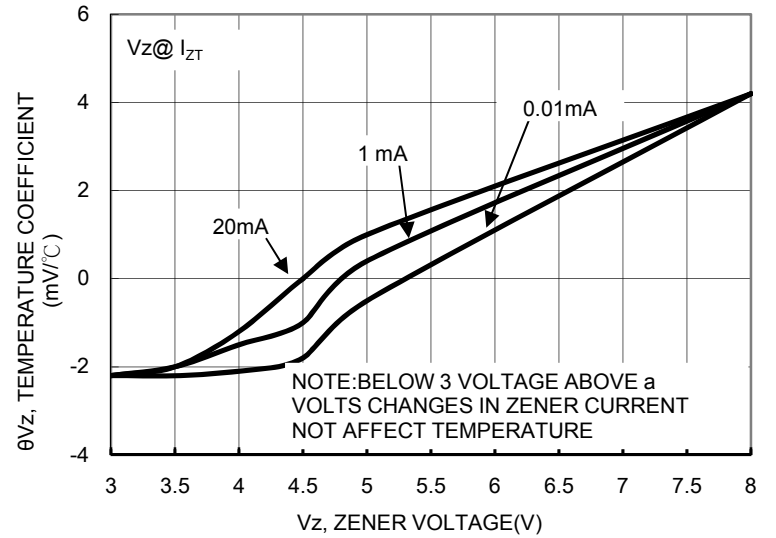
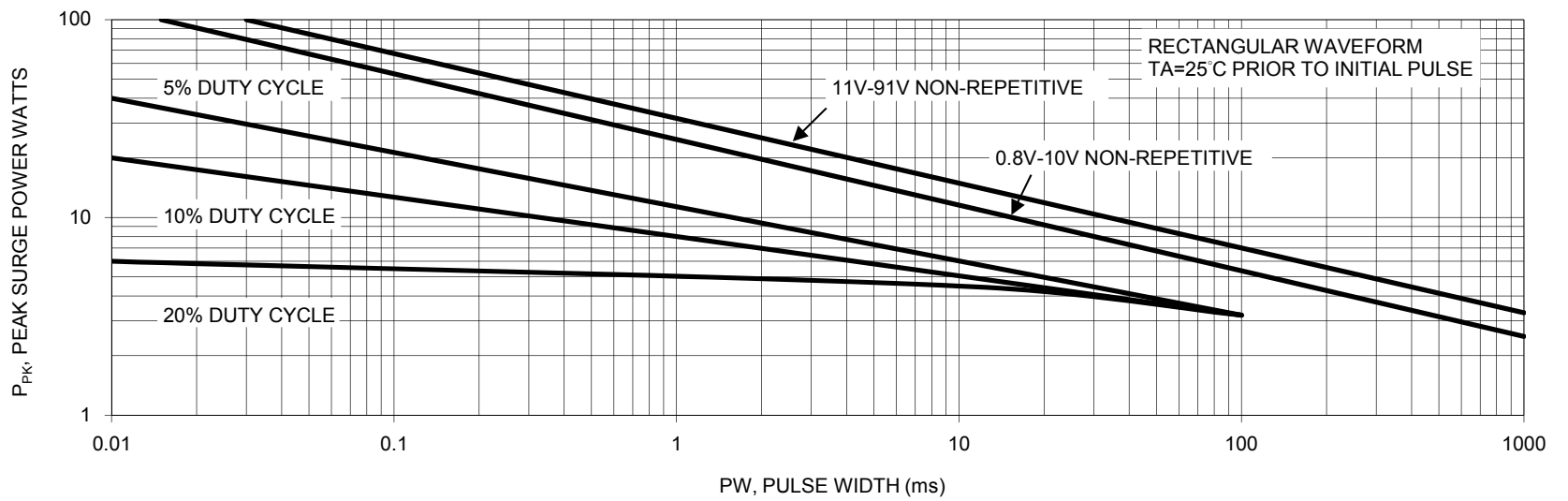
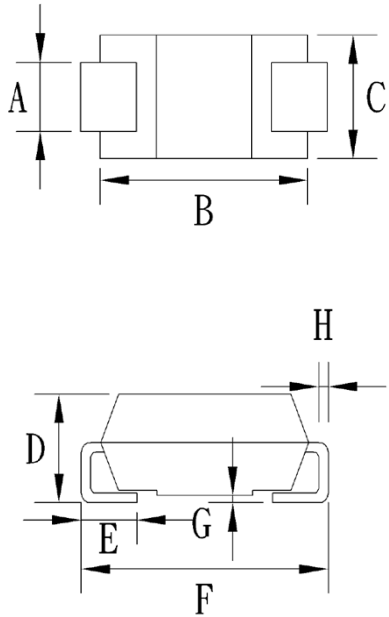


FIG.10 MAXIMUM SURGE POWER

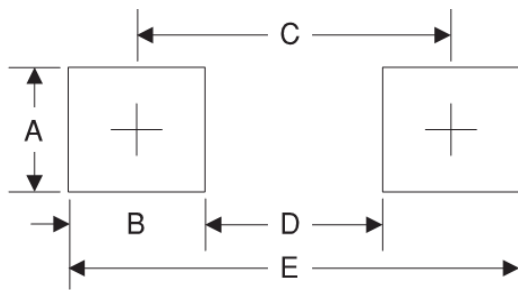


PACKAGE OUTLINE DIMENSIONS
DO-214AC (SMA)



| 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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