

## Surface Mount Silicon Zener Diodes

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Built-in strain relief
- 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
- 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

Base P/N with suffix "G" on packing code - green compound (halogen-free)

Base P/N with prefix "H" on packing code - AEC-Q101 qualified

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

Meet JESD 201 class 1A whisker test,

with prefix "H" on packing code meet JESD 201 class 2 whisker test

**Polarity:** Indicated by cathode band

**Weight:** 0.06 g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T <sub>A</sub> =25°C unless otherwise noted)         |                  |              |       |
|------------------------------------------------------------------------------------------------------|------------------|--------------|-------|
| PARAMETER                                                                                            | SYMBOL           | Value        | UNIT  |
| DC power dissipation at T <sub>L</sub> =75°C, measure at zero lead length (Note 1) derate above 75°C | P <sub>D</sub>   | 1.5          | Watts |
|                                                                                                      |                  | 20           | mW/°C |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load                  | I <sub>FSM</sub> | 10           | A     |
| Operating junction temperature range                                                                 | T <sub>J</sub>   | - 55 to +150 | °C    |
| Storage temperature range                                                                            | T <sub>STG</sub> | - 55 to +150 | °C    |

Note 1: Mounted on Cu-Pad size 5mm x 5mm x 1.6mm on PCB

| ORDERING INFORMATION |                    |              |                     |            |                          |
|----------------------|--------------------|--------------|---------------------|------------|--------------------------|
| PART NO.             | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | PACKAGE    | PACKING                  |
| 1SMAxxxx<br>(Note 1) | Prefix "H"         | R3           | Suffix "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 11V (1SMA5926) to 200V (1SMA5956)

| EXAMPLE       |          |                    |              |                     |                    |
|---------------|----------|--------------------|--------------|---------------------|--------------------|
| PREFERRED P/N | PART NO. | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | DESCRIPTION        |
| 1SMA5926 R3   | 1SMA5926 |                    | R3           |                     |                    |
| 1SMA5926 R3G  | 1SMA5926 |                    | R3           | G                   | Green compound     |
| 1SMA5926HR3   | 1SMA5926 | H                  | R3           |                     | AEC-Q101 qualified |

**RATINGS AND CHARACTERISTICS CURVES (TA=25°C unless otherwise noted)**

| Device<br>(Note 1) | Device<br>Marking<br>Code | Nominal Zener Voltage |                   |        | Test<br>Current | Zener Impedance |         |      | Leakage Current |       | Maximum DC<br>Zener Current |
|--------------------|---------------------------|-----------------------|-------------------|--------|-----------------|-----------------|---------|------|-----------------|-------|-----------------------------|
|                    |                           | Vz@Iz                 |                   |        | IzT             | ZzT@IzT         | Zzk@Izk |      | IR@VR           |       | IzM                         |
|                    |                           | V                     |                   |        | mA              | Ω               | Ω       | mA   | μA              | V     | mA(DC)                      |
|                    |                           | Min.                  | Nom.<br>(Notes 2) | 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 ±5%
2. Vz limits are to be guaranteed at thermal equilibrium

FIG. 1 STEADY STATE POWER DERATING

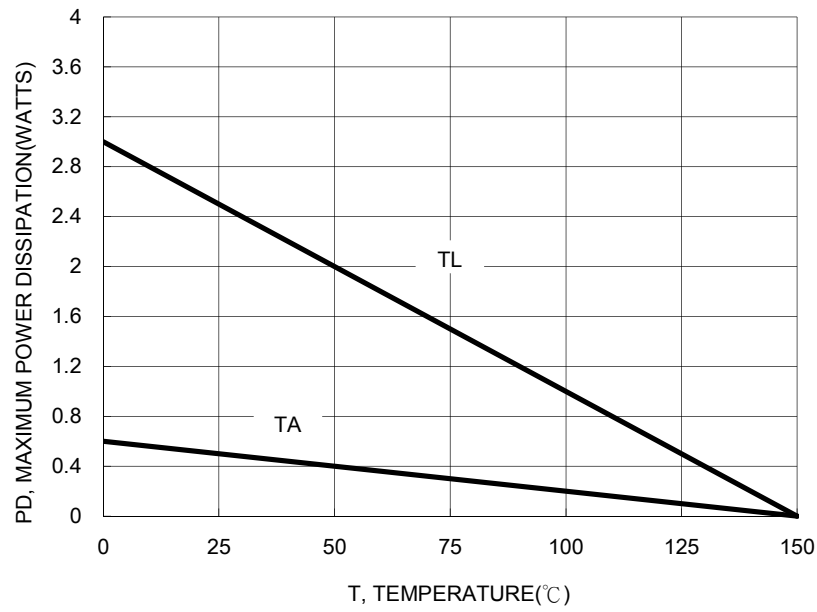


FIG. 2  $V_z = 12$  THRU 68 VOLTS

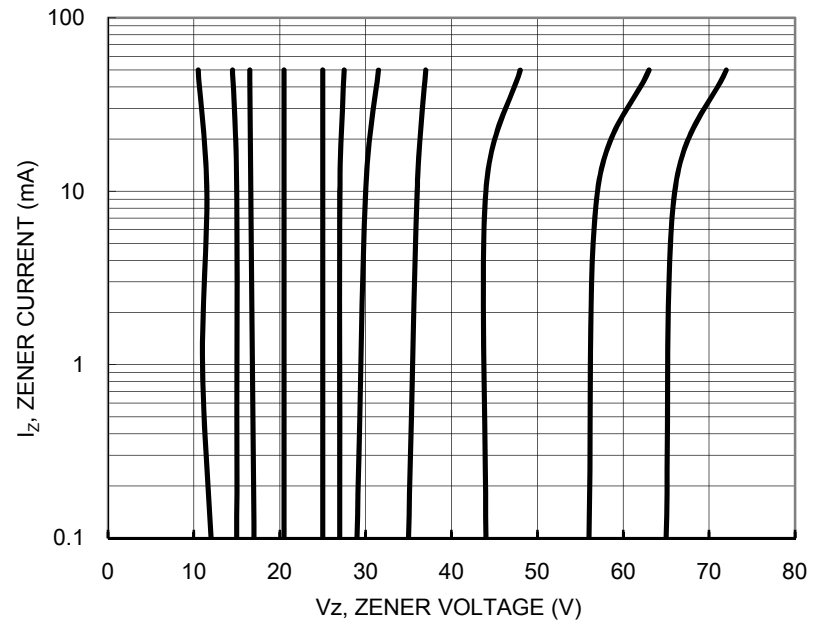


FIG.3 ZENER VOLTAGE 12 TO 68 VOLTS

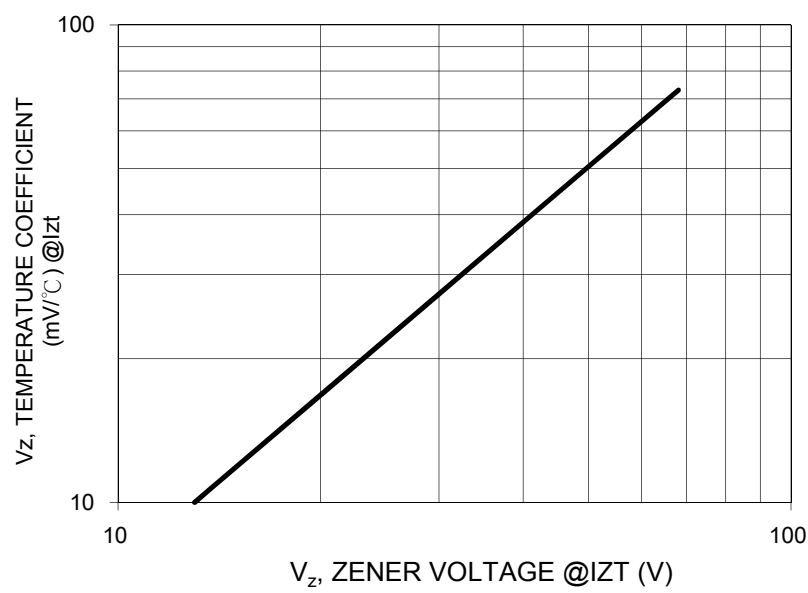


FIG. 4 EFFECT OF ZENER VOLTAGE

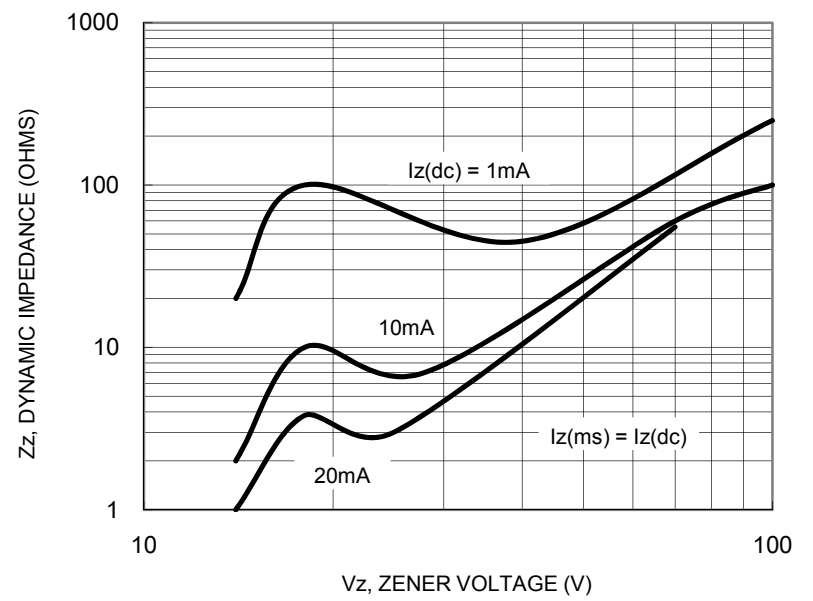


FIG.5 CAPACITANCE CURVE

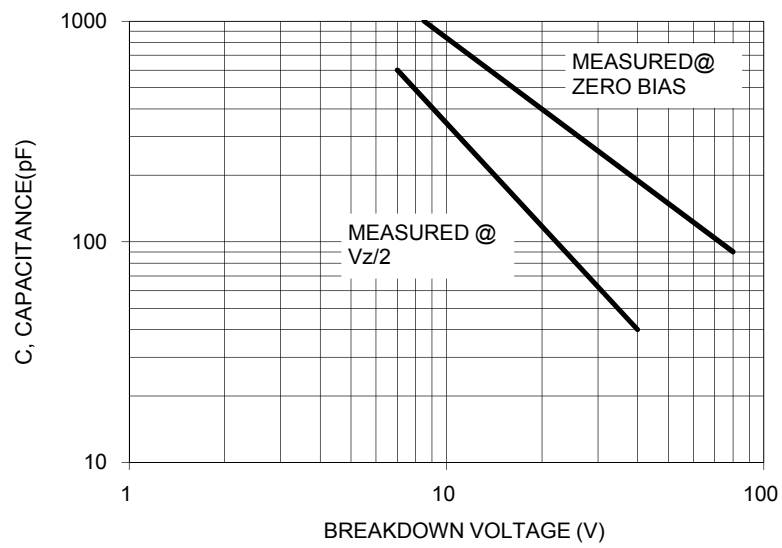


FIG. 6 TYPICAL PULSE RATING CURVE

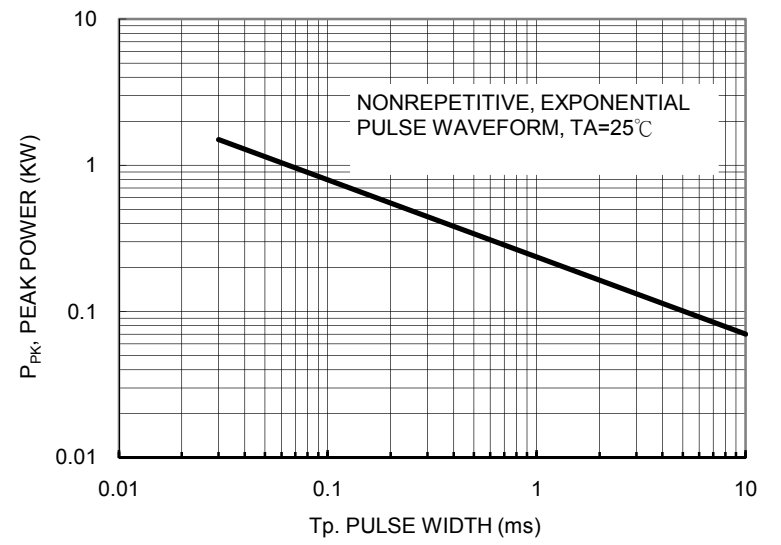


FIG. 7 PULSE WAVEFORM

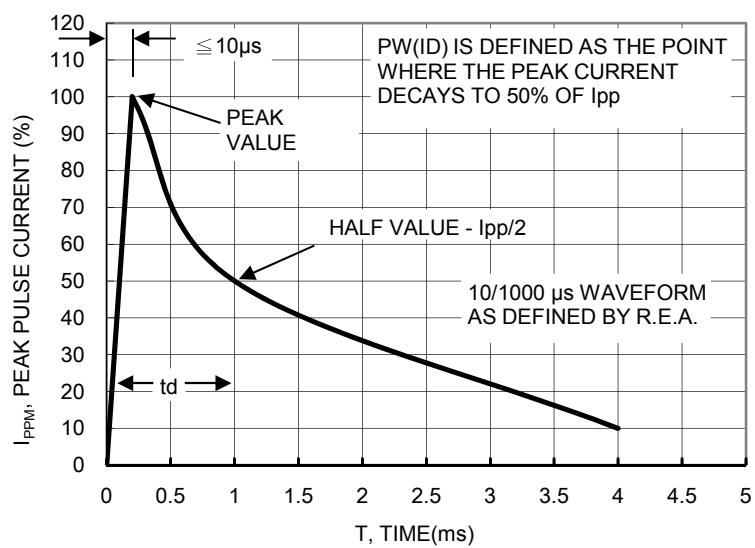
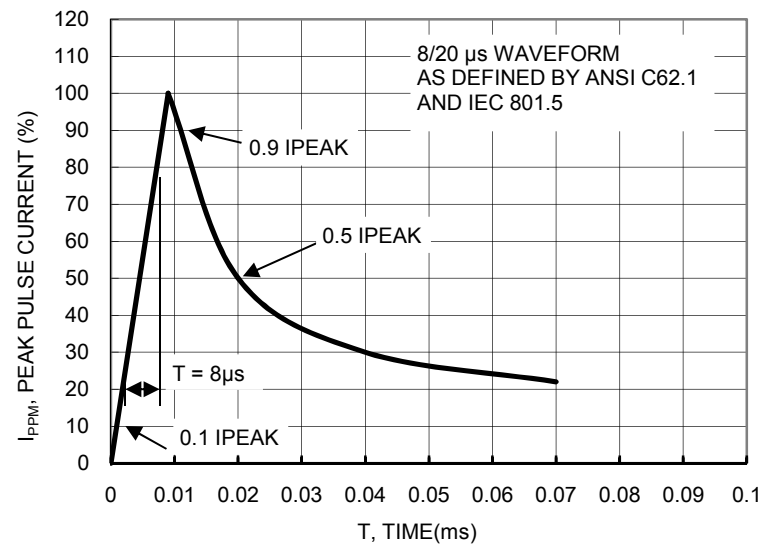
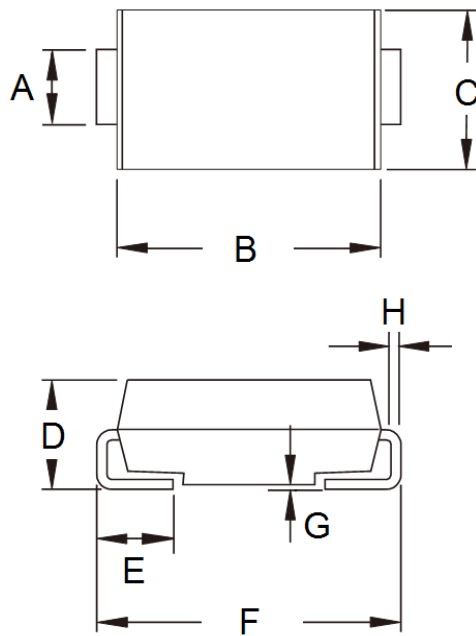


FIG. 8 PULSE WAVEFORM

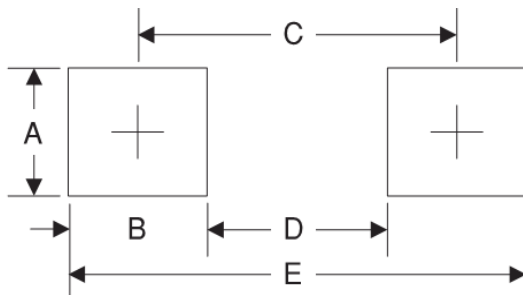


**PACKAGE OUTLINE DIMENSIONS**



| 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 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.