

Surface Mount Silicon Zener Diodes

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Built-in strain relief
- Low inductance
- 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-214AA (SMB)

MECHANICAL DATA

Case: DO-214AA (SMB)

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: 0.1 g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T _A =25°C unless otherwise noted) | | | |
|--|------------------|--------------|-------|
| PARAMETER | SYMBOL | Value | UNIT |
| DC power dissipation at T _L =75°C, measure at zero lead length (Note 1) derate above 75°C | P _D | 3 | Watts |
| | | 40 | mW/°C |
| DC power dissipation at T _A =25°C Derate above 25°C | P _D | 550 | mW |
| | | 4.4 | mW/°C |
| Thermal Resistance from Junction to Lead | R _{θJL} | 25 | °C /W |
| Thermal Resistance from Junction to Ambient | R _{θJA} | 226 | °C /W |
| Operating junction temperature range | T _J | - 55 to +150 | °C |
| Storage temperature range | T _{STG} | - 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 |
| 1SMBxxxx (Note 1) | Prefix "H" | R5 | Suffix "G" | SMB | 850 / 7" Plastic reel |
| | | R4 | | SMB | 3,000 / 13" Paper reel |
| | | M4 | | SMB | 3,000 / 13" Plastic reel |

Note 1: "xxxx" defines voltage from 11V (1SMB5926) to 200V (1SMB5956)

| EXAMPLE | | | | | |
|---------------|----------|--------------------|--------------|---------------------|--------------------|
| PREFERRED P/N | PART NO. | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | DESCRIPTION |
| 1SMB5926 R5 | 1SMB5926 | | R5 | | |
| 1SMB5926 R5G | 1SMB5926 | | R5 | G | Green compound |
| 1SMB5926HR5 | 1SMB5926 | H | R5 | | AEC-Q101 qualified |

RATINGS AND CHARACTERISTICS CURVES

(TA=25°C unless otherwise noted)

| Device (Note 1) | Device Marking Code | Nominal Zener Voltage | | | Test Current | Zener Impedance (Note 3) | | | Leakage Current | | Maximum DC Zener Current |
|--------------------|---------------------------|-----------------------|------------------|--------|-----------------|-----------------------------|---------|---------|-----------------|-------|-----------------------------|
| | | Vz@Iz | | | | IzT | ZzT@IzT | ZzK@IzK | | IR@VR | |
| | | V | | | mA | | Ω | Ω | mA | μA | V |
| | | Min | Nom (Notes 2) | Max | | | | | | | |
| 1SMB5926 | 926B | 10.45 | 11 | 11.55 | 34.1 | 5.5 | 550 | 0.25 | 1 | 8.4 | 136 |
| 1SMB5927 | 927B | 11.40 | 12 | 12.60 | 31.2 | 6.5 | 550 | 0.25 | 1 | 9.1 | 125 |
| 1SMB5928 | 928B | 12.35 | 13 | 13.65 | 28.8 | 7.0 | 550 | 0.25 | 1 | 9.9 | 115 |
| 1SMB5929 | 929B | 14.25 | 15 | 15.75 | 25.0 | 9.0 | 600 | 0.25 | 1 | 11.4 | 100 |
| 1SMB5930 | 930B | 15.20 | 16 | 16.80 | 23.4 | 10.0 | 600 | 0.25 | 1 | 12.2 | 94 |
| 1SMB5931 | 931B | 17.10 | 18 | 18.90 | 20.8 | 12.0 | 650 | 0.25 | 1 | 13.7 | 83 |
| 1SMB5932 | 932B | 19.00 | 20 | 21.00 | 18.7 | 14.0 | 650 | 0.25 | 1 | 15.2 | 75 |
| 1SMB5933 | 933B | 20.90 | 22 | 23.10 | 17.0 | 17.5 | 650 | 0.25 | 1 | 16.7 | 68 |
| 1SMB5934 | 934B | 22.80 | 24 | 25.20 | 15.6 | 19 | 700 | 0.25 | 1 | 18.2 | 63 |
| 1SMB5935 | 935B | 25.65 | 27 | 28.35 | 13.9 | 23 | 700 | 0.25 | 1 | 20.6 | 56 |
| 1SMB5936 | 936B | 28.50 | 30 | 31.50 | 12.5 | 26 | 750 | 0.25 | 1 | 22.8 | 50 |
| 1SMB5937 | 937B | 31.35 | 33 | 34.65 | 11.4 | 33 | 800 | 0.25 | 1 | 25.1 | 45 |
| 1SMB5938 | 938B | 34.20 | 36 | 37.80 | 10.4 | 38 | 850 | 0.25 | 1 | 27.4 | 42 |
| 1SMB5939 | 939B | 37.05 | 39 | 40.95 | 9.6 | 45 | 900 | 0.25 | 1 | 29.7 | 38 |
| 1SMB5940 | 940B | 40.85 | 43 | 45.15 | 8.7 | 53 | 950 | 0.25 | 1 | 32.7 | 35 |
| 1SMB5941 | 941B | 44.65 | 47 | 49.35 | 8.0 | 67 | 1000 | 0.25 | 1 | 35.8 | 32 |
| 1SMB5942 | 942B | 48.45 | 51 | 53.55 | 7.3 | 70 | 1100 | 0.25 | 1 | 38.8 | 29 |
| 1SMB5943 | 943B | 53.20 | 56 | 58.80 | 6.7 | 86 | 1300 | 0.25 | 1 | 42.6 | 27 |
| 1SMB5944 | 944B | 58.90 | 62 | 65.10 | 6.0 | 100 | 1500 | 0.25 | 1 | 47.1 | 24 |
| 1SMB5945 | 945B | 64.60 | 68 | 71.40 | 5.5 | 120 | 1700 | 0.25 | 1 | 51.7 | 22 |
| 1SMB5946 | 946B | 71.25 | 75 | 78.75 | 5.0 | 140 | 2000 | 0.25 | 1 | 56.0 | 20 |
| 1SMB5947 | 947B | 77.90 | 82 | 86.10 | 4.6 | 160 | 2500 | 0.25 | 1 | 62.2 | 18 |
| 1SMB5948 | 948B | 86.45 | 91 | 95.55 | 4.1 | 200 | 3000 | 0.25 | 1 | 69.2 | 16 |
| 1SMB5949 | 949B | 95.00 | 100 | 105.00 | 3.7 | 250 | 3100 | 0.25 | 1 | 76.0 | 15 |
| 1SMB5950 | 950B | 104.50 | 110 | 115.50 | 3.4 | 300 | 4000 | 0.25 | 1 | 83.6 | 13 |
| 1SMB5951 | 951B | 114.00 | 120 | 126.00 | 3.1 | 360 | 4500 | 0.25 | 1 | 91.2 | 12 |
| 1SMB5952 | 952B | 123.50 | 130 | 136.50 | 2.9 | 450 | 5000 | 0.25 | 1 | 98.8 | 11 |
| 1SMB5953 | 953B | 142.50 | 150 | 157.50 | 2.5 | 600 | 6000 | 0.25 | 1 | 114.0 | 10 |
| 1SMB5954 | 954B | 152.00 | 160 | 168.00 | 2.3 | 700 | 6500 | 0.25 | 1 | 121.6 | 9 |
| 1SMB5955 | 955B | 171.00 | 180 | 189.00 | 2.1 | 900 | 7000 | 0.25 | 1 | 136.8 | 8 |
| 1SMB5956 | 956B | 190.00 | 200 | 210.00 | 1.9 | 1200 | 8000 | 0.25 | 1 | 152.0 | 7 |

Notes:

1. Tolerance and type number designation the type numbers listed indicate a tolerance of 5%
2. Zener voltage (Vz) measurement

Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature 25°C

3. Zener impedance (Zz) derivation : ZzT and ZzK are measured by dividing the AC voltage drop across the device by the AC current applied.

The specified limits are for Iz(AC) = 0.1 Iz(DC) with the AC frequency = 60 Hz

FIG. 1 STEADY STATE POWER DERATING

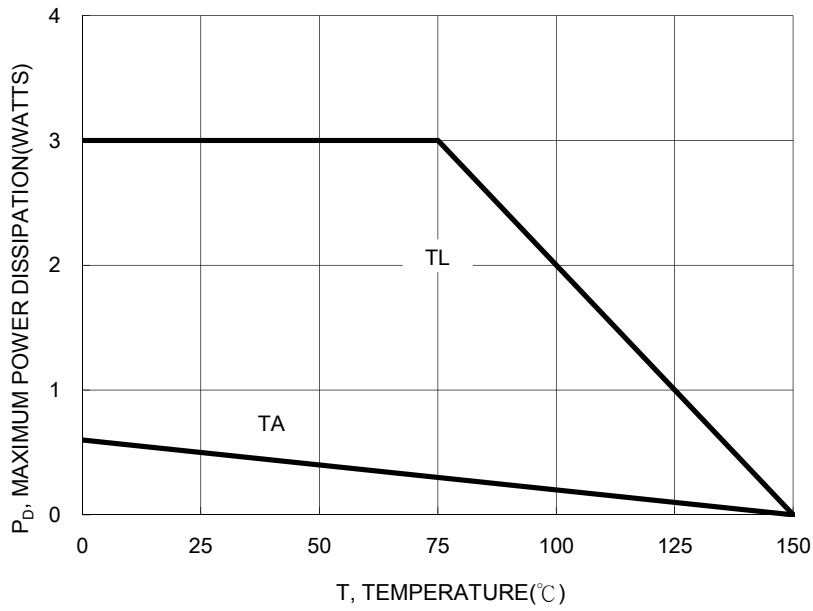


FIG.2 MAXIMUM SURGE POWER

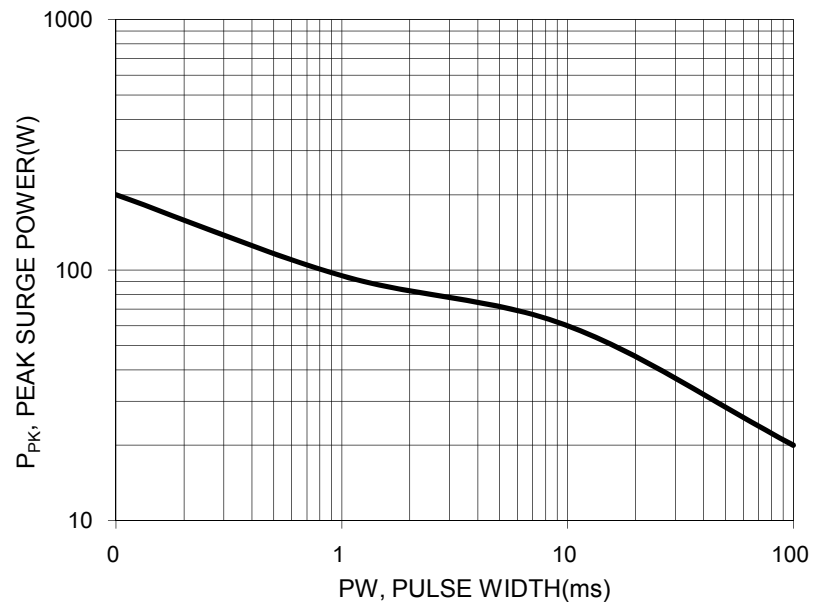


FIG. 3 ZENER VOLTAGE - TO 12 VOLTAGES

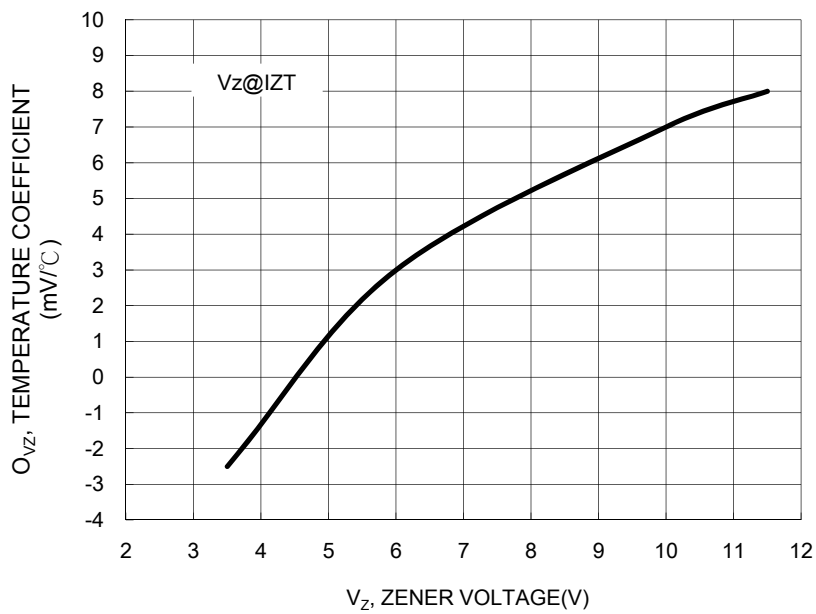


FIG.4 ZENER VOLTAGE 14 TO 200 VOLTAGES

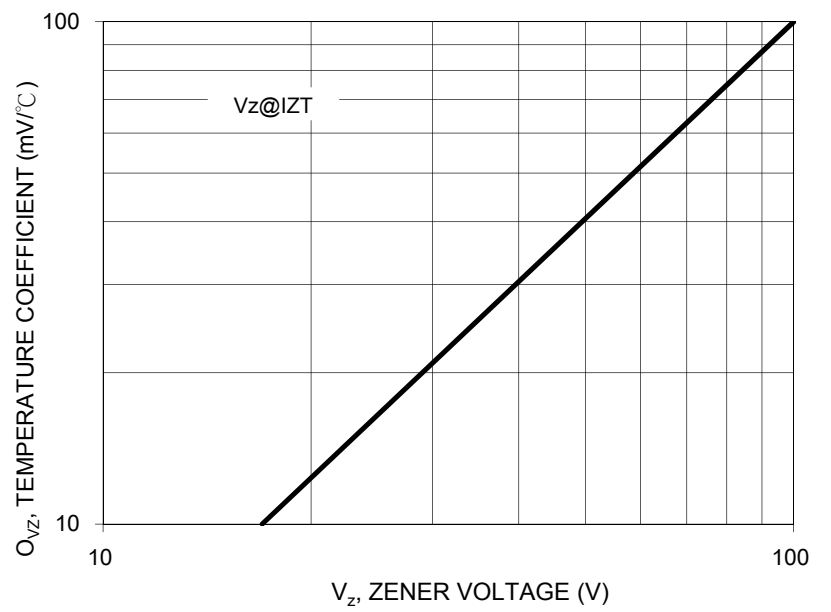


FIG. 5 $V_z = 3.3$ THRU 10 VOLTS

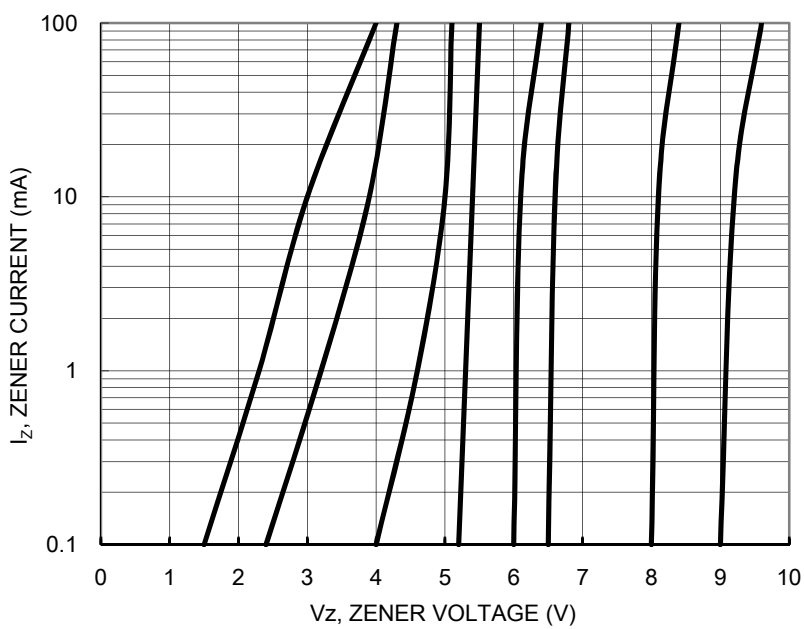


FIG. 6 $V_z = 12$ THRU 82 VOLTS

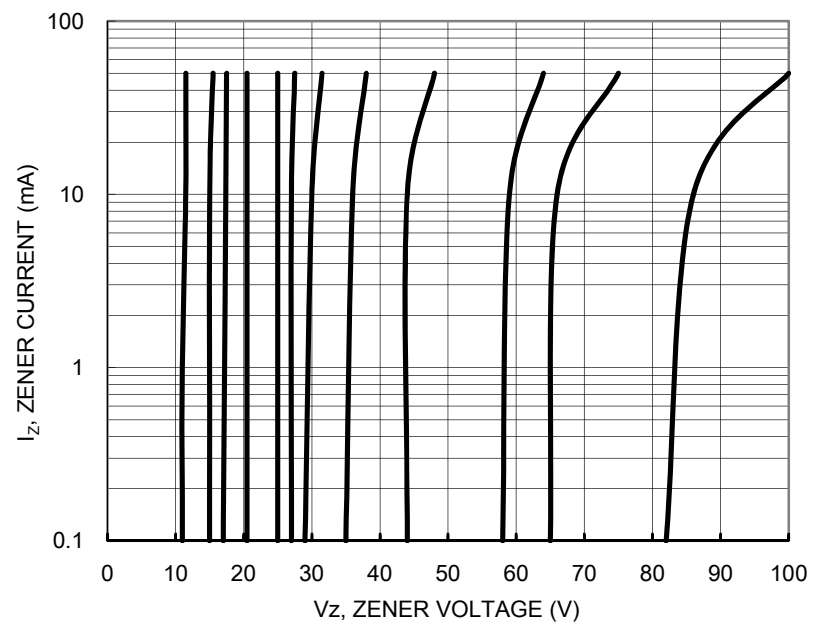


FIG. 7 EFFECT OF ZENER VOLTAGE

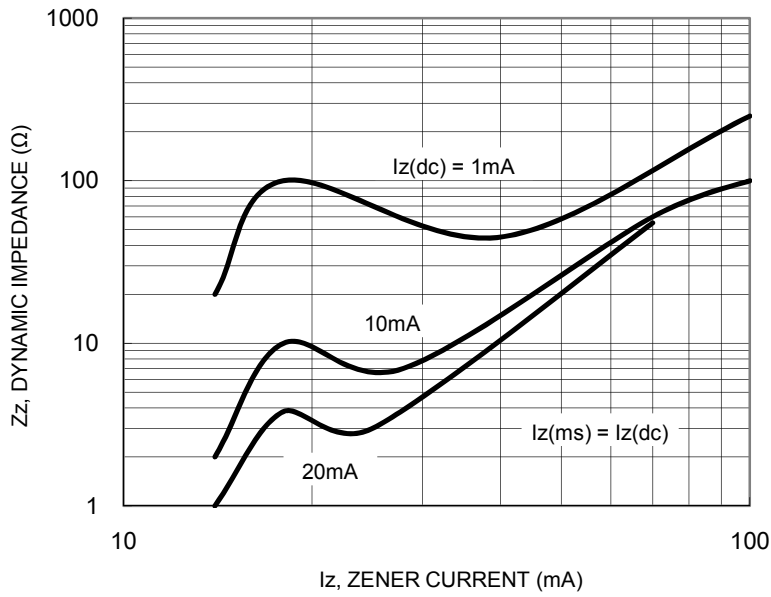


FIG. 8 EFFECT OF ZENER CURRENT

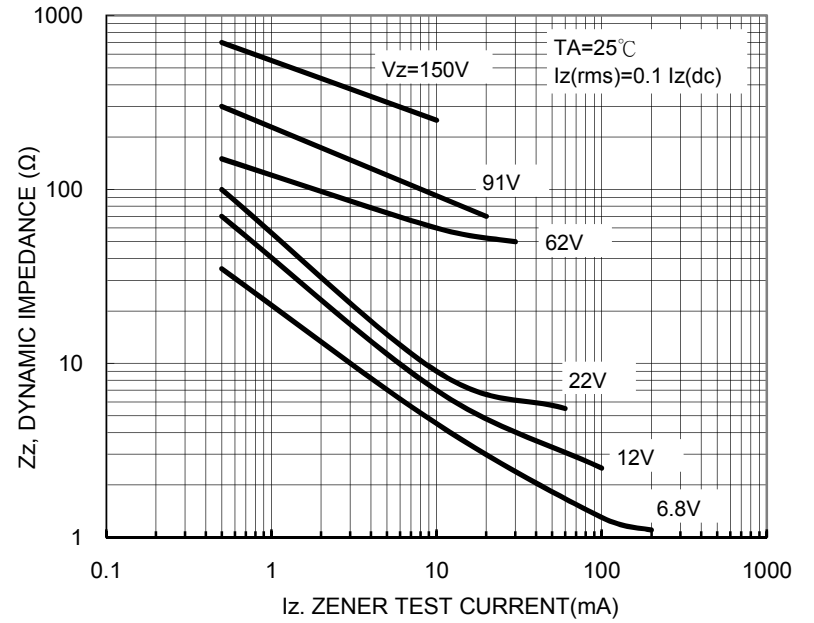


FIG.9 CAPACITANCE CURVE

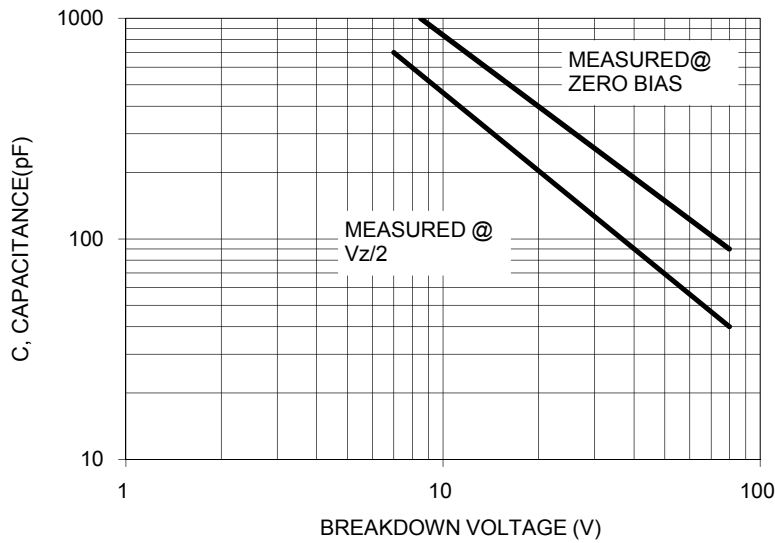


FIG. 10 TYPICAL PULSE RATING CURVE

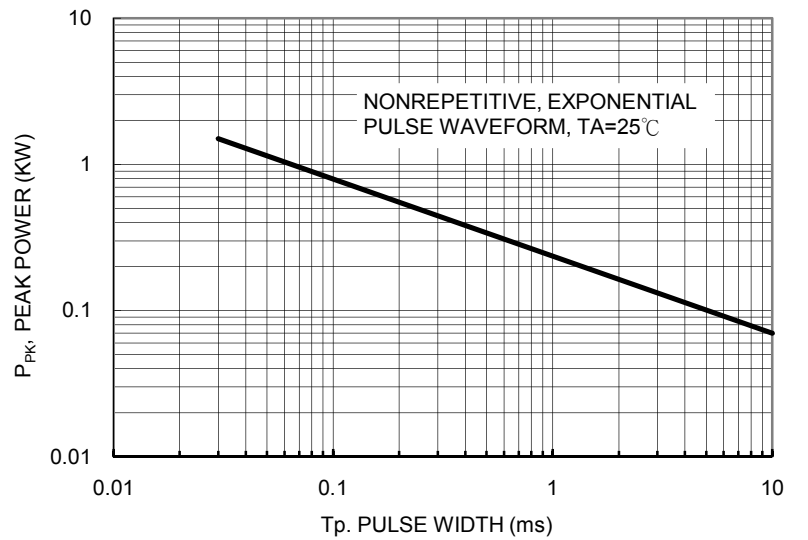


FIG. 11 PULSE WAVEFORM

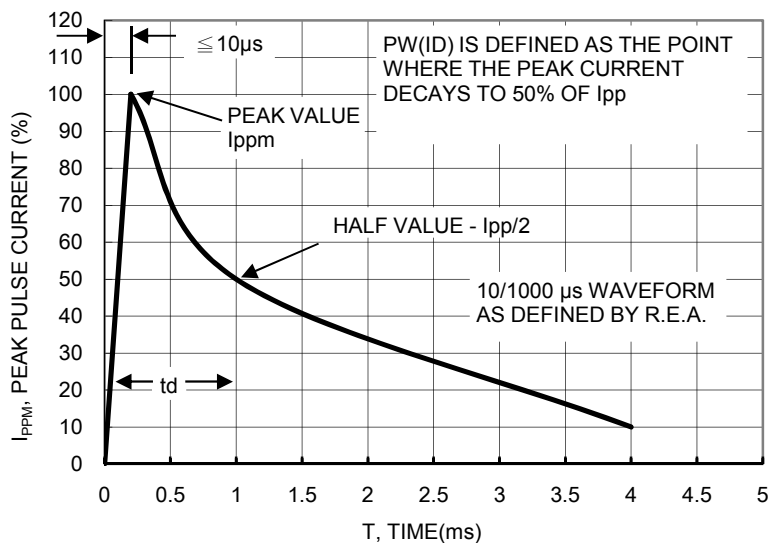
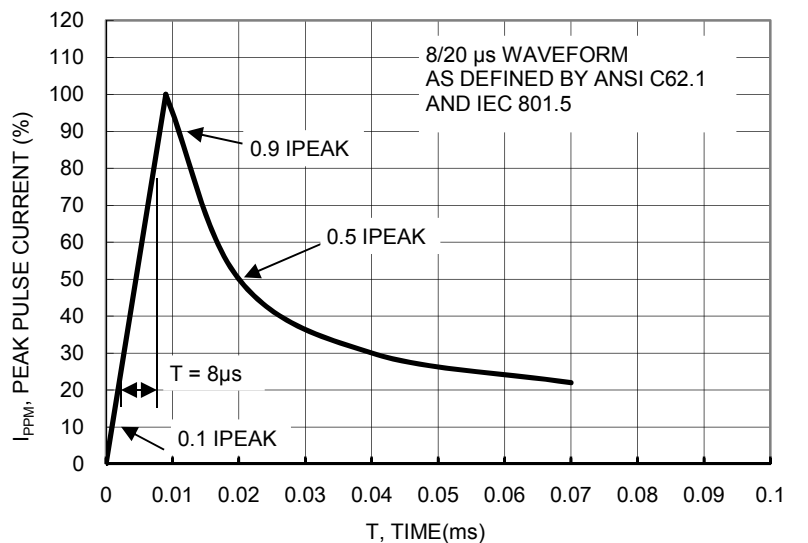
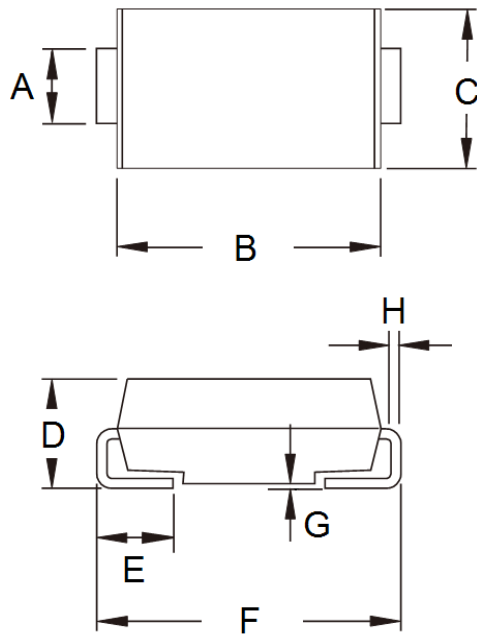


FIG. 12 PULSE WAVEFORM

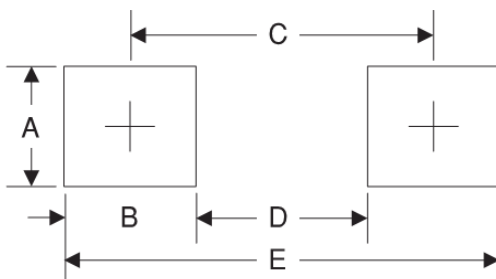


PACKAGE OUTLINE DIMENSIONS
DO-214AA (SMB)



| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|------|-------------|-------|
| | Min | Max | Min | Max |
| A | 1.95 | 2.10 | 0.077 | 0.083 |
| B | 4.25 | 4.75 | 0.167 | 0.187 |
| C | 3.48 | 3.73 | 0.137 | 0.147 |
| D | 1.99 | 2.61 | 0.078 | 0.103 |
| E | 0.90 | 1.41 | 0.035 | 0.056 |
| F | 5.10 | 5.30 | 0.201 | 0.209 |
| 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 | 2.3 | 0.091 |
| B | 2.5 | 0.098 |
| C | 4.3 | 0.169 |
| D | 1.8 | 0.071 |
| E | 6.8 | 0.268 |

MARKING DIAGRAM



- P/N = Device Marking Code
- G = Green Compound
- YW = Date Code
- F = Factory Code

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