

Surface Mount TRANSZORB® Transient Voltage Suppressors

eSMP™ Series



DO-220AA (SMP)

| PRIMARY CHARACTERISTICS | |
|-------------------------|--------------|
| V_{WM} | 11 V to 36 V |
| P_{PPM} | 400 W |
| I_{FSM} | 40 A |
| T_J max. | 150 °C |

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Available in uni-directional
- 400 W peak pulse power capability with a 10/1000 μ s waveform
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive and telecommunication.

MECHANICAL DATA

Case: DO-220AA (SMP)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | |
|---|----------------|---------------------|------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Peak pulse power dissipation with a 10/1000 μ s waveform ⁽¹⁾⁽²⁾ (Fig. 1) | P_{PPM} | 400 | W |
| Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾ | I_{PPM} | See table next page | A |
| Peak forward surge current 10 ms single half sine-wave ⁽²⁾ | I_{FSM} | 40 | A |
| Maximum instantaneous forward voltage at 25 A ⁽³⁾ | V_F | 2.5 | V |
| Operating junction and storage temperature range | T_J, T_{STG} | - 55 to + 150 | °C |

Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25$ °C per Fig. 2

(2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal

(3) Pulse test: 300 μ s pulse width, 1 % duty cycle



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | | | |
|---|---------------------|--|------|-------------------------|--------------------------------|--|---|---|
| DEVICE TYPE | DEVICE MARKING CODE | BREAKDOWN VOLTAGE V_{BR} AT I_T ⁽¹⁾ (V) | | TEST CURRENT I_T (mA) | STAND-OFF VOLTAGE V_{WM} (V) | MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (μA) ⁽³⁾ | MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (A) ⁽²⁾ | MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V) |
| | | MIN. | MAX. | | | | | |
| SMP11 | AY | 12.2 | 14.9 | 1.0 | 11 | 1.0 | 19.9 | 20.1 |
| SMP11A | AZ | 12.2 | 13.5 | 1.0 | 11 | 1.0 | 22.0 | 18.2 |
| SMP12 | BD | 13.3 | 16.3 | 1.0 | 12 | 1.0 | 18.2 | 22.0 |
| SMP12A | BE | 13.3 | 14.7 | 1.0 | 12 | 1.0 | 20.1 | 19.9 |
| SMP13 | BF | 14.4 | 17.6 | 1.0 | 13 | 1.0 | 16.8 | 23.8 |
| SMP13A | BG | 14.4 | 15.9 | 1.0 | 13 | 1.0 | 18.6 | 21.5 |
| SMP14 | BH | 15.6 | 19.1 | 1.0 | 14 | 1.0 | 15.5 | 25.8 |
| SMP14A | BK | 15.6 | 17.2 | 1.0 | 14 | 1.0 | 17.2 | 23.2 |
| SMP15 | BL | 16.7 | 20.4 | 1.0 | 15 | 1.0 | 14.9 | 26.9 |
| SMP15A | BM | 16.7 | 18.5 | 1.0 | 15 | 1.0 | 16.4 | 24.4 |
| SMP16 | BN | 17.8 | 21.8 | 1.0 | 16 | 1.0 | 13.9 | 28.8 |
| SMP16A | BP | 17.8 | 19.7 | 1.0 | 16 | 1.0 | 15.4 | 26.0 |
| SMP17 | BQ | 18.9 | 23.1 | 1.0 | 17 | 1.0 | 13.1 | 30.5 |
| SMP17A | BR | 18.9 | 20.9 | 1.0 | 17 | 1.0 | 14.5 | 27.6 |
| SMP18 | BS | 20.0 | 24.4 | 1.0 | 18 | 1.0 | 12.4 | 32.2 |
| SMP18A | BT | 20.0 | 22.1 | 1.0 | 18 | 1.0 | 13.7 | 29.2 |
| SMP20 | BU | 22.2 | 27.1 | 1.0 | 20 | 1.0 | 11.2 | 35.8 |
| SMP20A | BV | 22.2 | 24.5 | 1.0 | 20 | 1.0 | 12.3 | 32.4 |
| SMP22 | BW | 24.4 | 29.8 | 1.0 | 22 | 1.0 | 10.2 | 39.4 |
| SMP22A | BX | 24.4 | 26.9 | 1.0 | 22 | 1.0 | 11.3 | 35.5 |
| SMP24 | BY | 26.7 | 32.6 | 1.0 | 24 | 1.0 | 9.3 | 43.0 |
| SMP24A | BZ | 26.7 | 29.5 | 1.0 | 24 | 1.0 | 10.3 | 38.9 |
| SMP26 | CD | 28.9 | 35.3 | 1.0 | 26 | 1.0 | 8.6 | 46.6 |
| SMP26A | CE | 28.9 | 31.9 | 1.0 | 26 | 1.0 | 9.5 | 42.1 |
| SMP28 | CF | 31.1 | 38.0 | 1.0 | 28 | 1.0 | 8.0 | 50.0 |
| SMP28A | CG | 31.1 | 34.4 | 1.0 | 28 | 1.0 | 8.8 | 45.4 |
| SMP30 | CH | 33.3 | 40.7 | 1.0 | 30 | 1.0 | 7.5 | 53.5 |
| SMP30A | CK | 33.3 | 36.8 | 1.0 | 30 | 1.0 | 8.3 | 48.4 |
| SMP33 | CL | 36.7 | 44.9 | 1.0 | 33 | 1.0 | 6.8 | 59.0 |
| SMP33A | CM | 36.7 | 40.6 | 1.0 | 33 | 1.0 | 7.5 | 53.3 |
| SMP36 | CN | 40.0 | 48.9 | 1.0 | 36 | 1.0 | 6.2 | 64.3 |
| SMP36A | CP | 40.0 | 44.2 | 1.0 | 36 | 1.0 | 6.9 | 58.1 |

Notes:

- (1) V_{BR} measured after I_T applied for 300 μs , I_T = square wave pulse or equivalent
(2) Surge current waveform per Fig. 3 and derate per Fig. 2
(3) All terms and symbols are consistent with ANSI/IEEE C62.35

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| SMP11A-E3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| SMP11A-E3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |

RATINGS AND CHARACTERISTICS CURVES

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

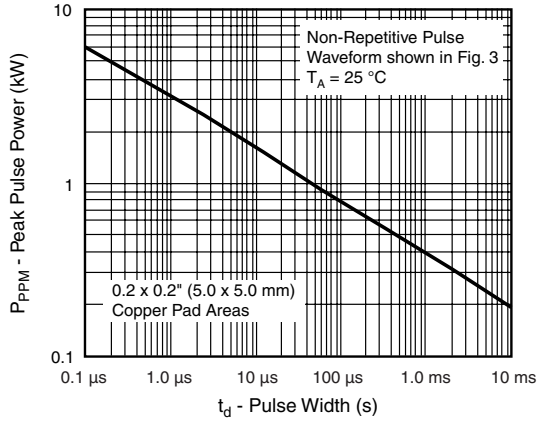


Figure 1. Peak Pulse Power Rating Curve

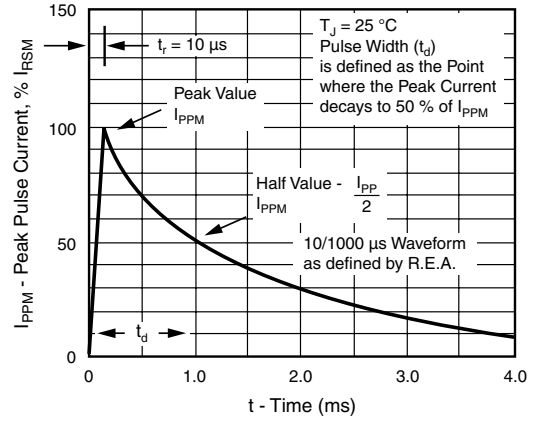


Figure 3. Pulse Waveform

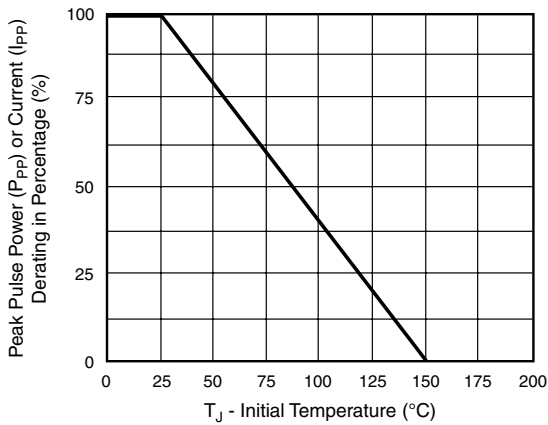


Figure 2. Pulse Derating Curve

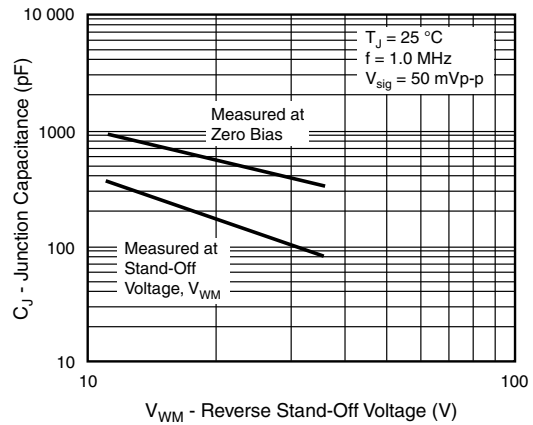
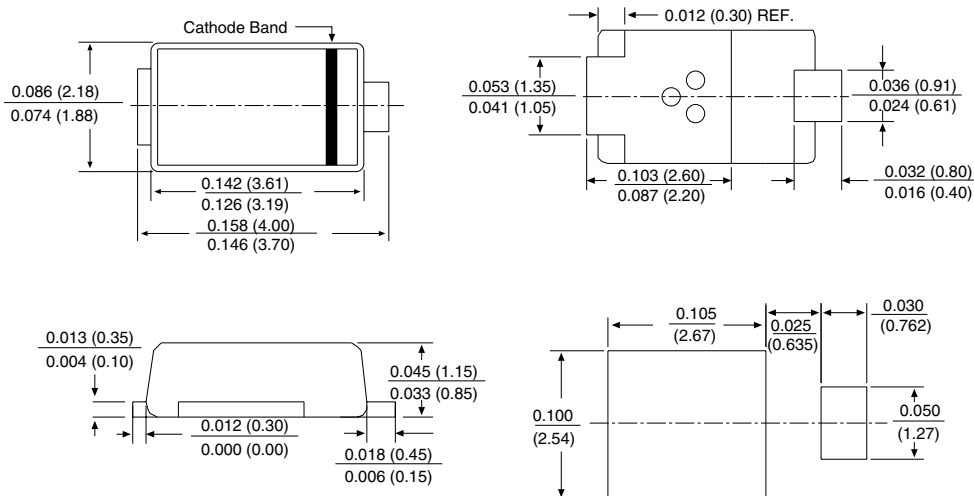


Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





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All product specifications and data are subject to change without notice.

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