

Product Summary (@T_A = +25°C)

| P _{PK} | I _{FSM} (A) | V _{RWM} (V) | PM _(AV) |
|-----------------|----------------------|----------------------|--------------------|
| 400W | 40 | 5 to 200 | 5W |

Features and Benefits

- 400W Peak Pulse Power Dissipation
- 5V to 200V Standoff Voltages
- Glass Passivated Die Construction
- Unidirectional and Bidirectional Versions Available
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Description and Applications

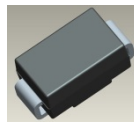
Suitable to protect sensitive automotive circuits against surges defined in ISO7637-2 and against electrostatic discharges according to ISO10605.

Compliance with following standards

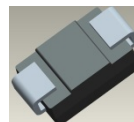
- ISO 10605, C = 150pF, R = 330Ω:
30kV (Air Discharge)
30kV (Contact Discharge)
- ISO 7637-2 (Note 6)
Pulse 1: V_s = -100V
Pulse 2a: V_s = +50V
Pulse 3a: V_s = -150V
Pulse 3b: V_s = +100V

Mechanical Data

- Case: SMA
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead-Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208
- Polarity Indicator: Cathode Band (Bidirectional Devices do not have a Polarity Indicator)
- Weight: 0.064 grams (Approximate)



Top View



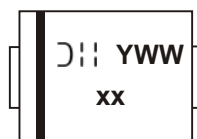
Bottom View

Ordering Information (Note 5)

| Part Number | Qualification | Case | Packaging |
|------------------|---------------|------|------------------|
| SMAJXX(C)AQ-13-F | Automotive | SMA | 5000/Tape & Reel |

*x = Device Voltage, Example: SMAJ14AQ-13-F

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.
 6. Not applicable to parts with stand-off voltage lower than the average battery voltage (13.5V).

Marking Information


- xx = Product Type Marking Code
(See Electrical Characteristics Table)
- DII = Manufacturers' Code Marking
- YWW = Date Code Marking
- Y = Last Digit of Year (ex: 8 for 2018)
- WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|--------------------|-------|------|
| Peak Pulse Power Dissipation (Non-Repetitive Current Pulse Derated Above T _A = +25°C) (Note 7) | P _{PK} | 400 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (Notes 7, 8 & 9) | I _{FSM} | 40 | A |
| Steady State Power Dissipation @ T _L = +75°C | PM _(AV) | 1.0 | W |
| Instantaneous Forward Voltage @ I _{PP} = 35A (Notes 7, 8, & 9) | V _F | 3.5 | V |

- Notes:
- 7. Valid provided that terminals are kept at ambient temperature.
 - 8. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
 - 9. Unidirectional units only.

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|-----------------------------|------------------|-------------|------|
| Operating Temperature Range | T _J | -55 to +150 | °C |
| Storage Temperature Range | T _{STG} | -55 to +175 | °C |

Electrical Characteristics (@T_A = +25°C unless otherwise specified.)

| Part Number Add C For Bidirectional (Note 10) | Reverse Standoff Voltage V _{RWM} (V) | Breakdown Voltage V _{BR} @ I _T (Note 11) | | Test Current I _T (mA) | Max. Reverse Leakage @ V _{RWM} I _R (µA) | Max. Clamping Voltage @ I _{PP} (Note 12) V _C (V) | Max. Peak Pulse Current I _{PP} (A) | Marking Code | |
|--|--|---|---------|--|---|---|--|--------------|------|
| | | Min (V) | Max (V) | | | | | BI- | UNI- |
| SMAJ5.0(C)AQ | 5.0 | 6.40 | 7.25 | 10 | 800 | 9.2 | 43.5 | TE | HE |
| SMAJ14(C)AQ | 14 | 15.6 | 17.2 | 1.0 | 5.0 | 23.2 | 17.2 | UK | IK |
| SMAJ15(C)AQ | 15 | 16.7 | 18.5 | 1.0 | 5.0 | 24.4 | 16.4 | UM | IM |
| SMAJ16(C)AQ | 16 | 17.8 | 19.7 | 1.0 | 5.0 | 26.0 | 15.3 | UP | IP |
| SMAJ17(C)AQ | 17 | 18.9 | 20.9 | 1.0 | 5.0 | 27.6 | 14.5 | UR | IR |
| SMAJ18(C)AQ | 18 | 20.0 | 22.1 | 1.0 | 5.0 | 29.2 | 13.7 | UT | IT |
| SMAJ20(C)AQ | 20 | 22.2 | 24.5 | 1.0 | 5.0 | 32.4 | 12.3 | UV | IV |
| SMAJ22(C)AQ | 22 | 24.4 | 26.9 | 1.0 | 5.0 | 35.5 | 11.2 | UX | IX |
| SMAJ24(C)AQ | 24 | 26.7 | 29.5 | 1.0 | 5.0 | 38.9 | 10.3 | UZ | IZ |
| SMAJ26(C)AQ | 26 | 28.9 | 31.9 | 1.0 | 5.0 | 42.1 | 9.5 | VE | JE |
| SMAJ28(C)AQ | 28 | 31.1 | 34.4 | 1.0 | 5.0 | 45.4 | 8.8 | VG | JG |
| SMAJ30(C)AQ | 30 | 33.3 | 36.8 | 1.0 | 5.0 | 48.4 | 8.3 | VK | JK |
| SMAJ33(C)AQ | 33 | 36.7 | 40.6 | 1.0 | 5.0 | 53.3 | 7.5 | VM | JM |
| SMAJ36(C)AQ | 36 | 40.0 | 44.2 | 1.0 | 5.0 | 58.1 | 6.9 | VP | JP |
| SMAJ200(C)AQ | 200 | 224 | 248 | 1.0 | 1.0 | 324 | 1.2 | YT | ST |

- Notes:
- 10. Suffix C denotes bidirectional device.
 - 11. V_{BR} measured with I_T current pulse = 10 – 15 ms.
 - 12. Per 10 × 1000µs waveform. See Figure 4.

NEW PRODUCT

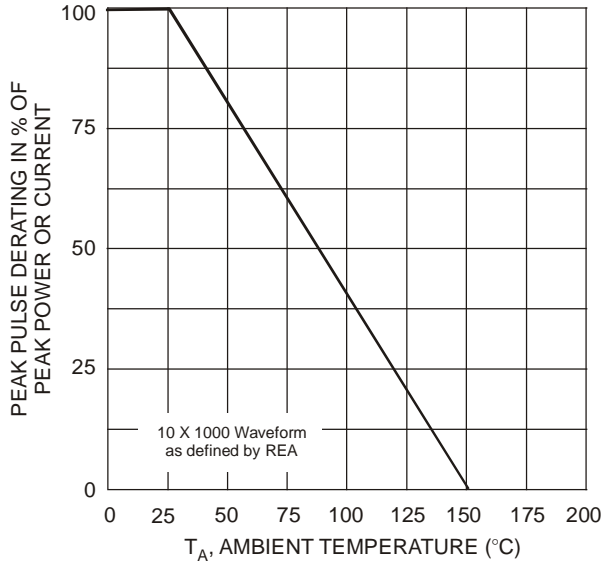


Fig. 1 Pulse Derating Curve

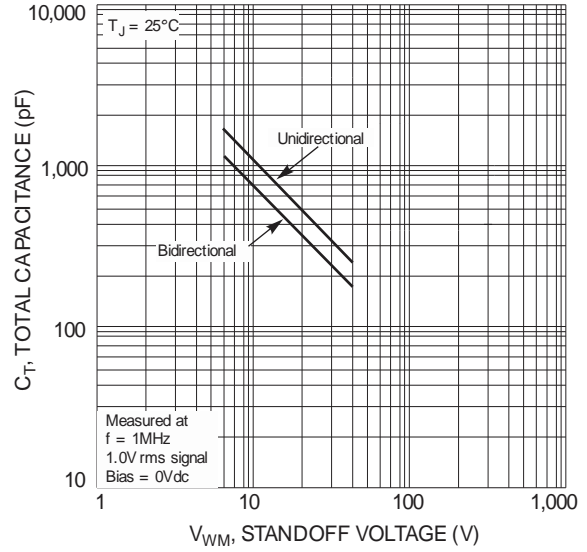


Fig. 2 Typical Total Capacitance

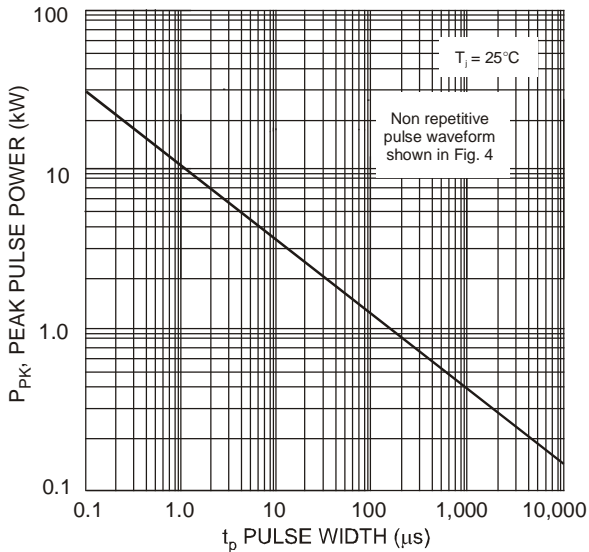


Fig. 3 Pulse Rating Curve

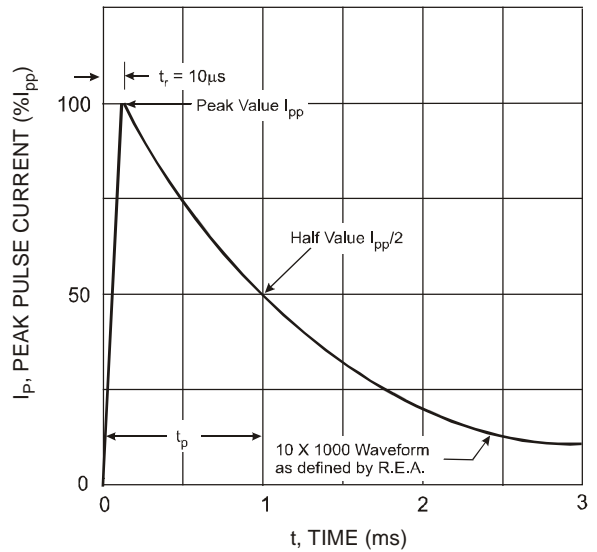


Fig. 4 Pulse Waveform

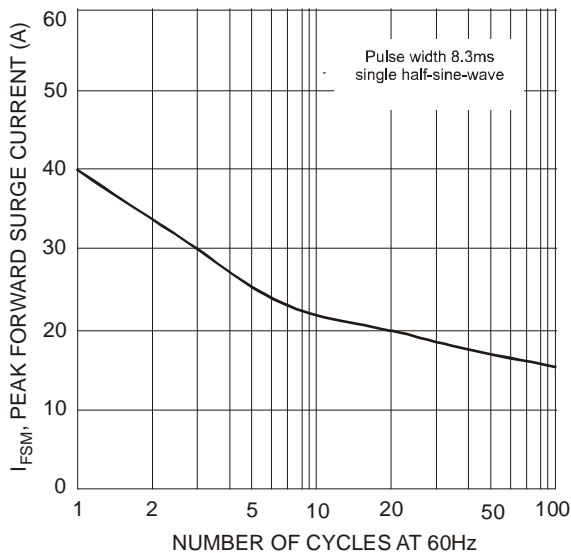


Fig. 5 Maximum Non-Repetitive Surge Current

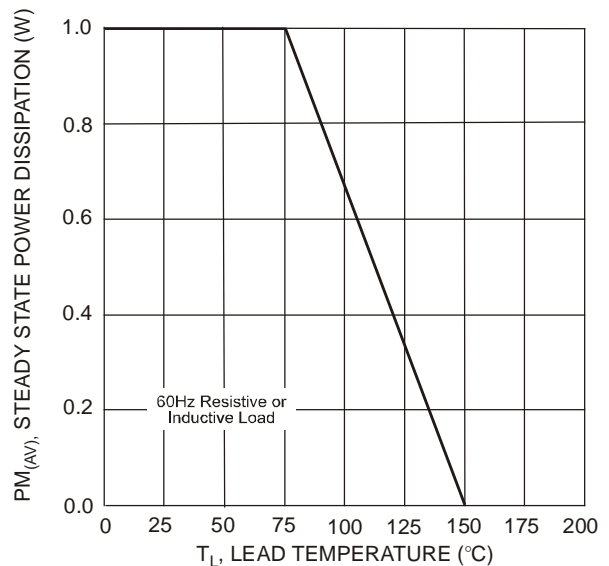
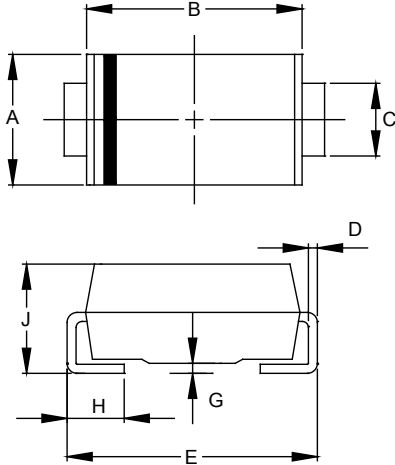


Fig. 6 Steady State Power Derating Curve

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SMA

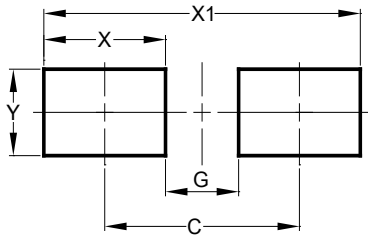


| SMA | | |
|----------------------|------|------|
| Dim | Min | Max |
| A | 2.29 | 2.92 |
| B | 4.00 | 4.60 |
| C | 1.27 | 1.63 |
| D | 0.15 | 0.31 |
| E | 4.80 | 5.59 |
| G | 0.05 | 0.20 |
| H | 0.76 | 1.52 |
| J | 1.96 | 2.40 |
| All Dimensions in mm | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SMA



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 4.00 |
| G | 1.50 |
| X | 2.50 |
| X1 | 6.50 |
| Y | 1.70 |

NEW PRODUCT

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