

Product Summary (@ $T_A = +25^\circ\text{C}$)

| PPK | IFSM (A) | VRWM (V) | PM(AV) |
|-------|----------|----------|--------|
| 3000W | 300 | 5 to 170 | 5W |

Description and Applications

This device is suitable to protect sensitive automotive circuits against surges defined in ISO7637-2 and against electrostatic discharges according to ISO10605.

Compliance with the following standards:

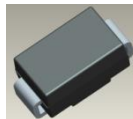
- ISO10605, C = 150pF, R = 330Ω:
30kV (Air Discharge)
30kV (Contact Discharge)
- ISO7637-2:
Pulse 1: $V_s = -150\text{V}$
Pulse 2a: $V_s = +112\text{V}$
Pulse 3a: $V_s = -220\text{V}$
Pulse 3b: $V_s = +150\text{V}$

Features and Benefits

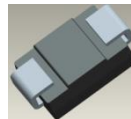
- 3000W Peak Pulse Power Dissipation
- 5V to 170V Standoff Voltages
- Glass Passivated Die Construction
- Excellent Clamping Capability
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Notes 3)
- The 3.0SMCJ5.0(C)AQ - 3.0SMCJ170AQ are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: SMC
- Package Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 (3) Lead-Free Plating (Matte Tin Finish)
- Weight: 0.21 grams (Approximate)



Top View



Bottom View

Ordering Information (Note 4)

| Part Number | Package | Packing | |
|--------------------|---------|---------|-------------|
| | | Qty. | Carrier |
| 3.0SMCJX.X(C)AQ-13 | SMC | 3000 | Tape & Reel |
| 3.0SMCJXX(C)AQ-13 | SMC | 3000 | Tape & Reel |
| 3.0SMCJXXXAQ-13 | SMC | 3000 | Tape & Reel |

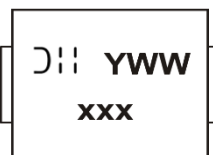
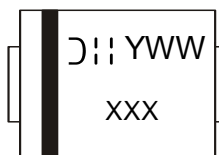
*X = Device Voltage, e.g., 3.0SMCJ14AQ-13.

- Notes:
- EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

Cathode Band for Uni-Directional Device

Bi-Directional Device



XXX = Product Type Marking Code
(See *Electrical Characteristics* Table)
J; = Manufacturers' Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 3 for 2023)
WW = Week Code (01 to 53)

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

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

| Characteristic | Symbol | Value | Unit |
|---|--------|-------|------|
| Peak Pulse Power Dissipation (Note 5) | PPK | 3000 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (Notes 6 & 7) | IFSM | 300 | A |

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 (Note 8) | Reverse Standoff Voltage V _{RWM} (V) | Breakdown Voltage V _{BR} @ I _T (Note 9) | | Test Current I _T (mA) | Max Reverse Leakage @ V _{RWM} (Note 10) I _R (µA) | Max Clamping Voltage @ I _{PP} (Note 11) V _C (V) | Max Peak Pulse Current I _{PP} (A) | Marking Code | |
|-------------------------|--|--|---------|-------------------------------------|--|---|---|--------------|-----|
| | | Min (V) | Max (V) | | | | | Un- | Bi- |
| 3.0SMCJ5.0(C)AQ | 5.0 | 6.40 | 7.07 | 10 | 1000 | 9.2 | 326.1 | HDE | DHS |
| 3.0SMCJ10(C)AQ | 10.0 | 11.10 | 12.27 | 1.0 | 5.0 | 17.0 | 176.5 | HDX | DDX |
| 3.0SMCJ11(C)AQ | 11.0 | 12.20 | 13.5 | 1.0 | 5.0 | 18.2 | 164.8 | HDZ | DDZ |
| 3.0SMCJ12(C)AQ | 12.0 | 13.30 | 14.7 | 1.0 | 5.0 | 19.9 | 150.8 | HEE | DEE |
| 3.0SMCJ13(C)AQ | 13.0 | 14.40 | 15.9 | 1.0 | 5.0 | 21.5 | 139.5 | HEG | DED |
| 3.0SMCJ14(C)AQ | 14.0 | 15.60 | 17.2 | 1.0 | 5.0 | 23.2 | 129.3 | HEK | DEK |
| 3.0SMCJ15(C)AQ | 15.0 | 16.70 | 18.5 | 1.0 | 5.0 | 24.2 | 124.0 | HEM | DEM |
| 3.0SMCJ16(C)AQ | 16.0 | 17.80 | 19.7 | 1.0 | 5.0 | 26.0 | 115.4 | HEP | DEP |
| 3.0SMCJ17(C)AQ | 17.0 | 18.90 | 20.9 | 1.0 | 5.0 | 27.6 | 108.7 | HER | DER |
| 3.0SMCJ18(C)AQ | 18.0 | 20.00 | 22.1 | 1.0 | 5.0 | 29.2 | 102.7 | HET | DET |
| 3.0SMCJ20(C)AQ | 20.0 | 22.20 | 24.5 | 1.0 | 5.0 | 32.4 | 92.6 | HEV | DEV |
| 3.0SMCJ22(C)AQ | 22.0 | 24.40 | 27.0 | 1.0 | 5.0 | 35.5 | 84.5 | HEX | DEX |
| 3.0SMCJ24(C)AQ | 24.0 | 26.70 | 29.5 | 1.0 | 5.0 | 38.9 | 77.1 | HEZ | DEZ |
| 3.0SMCJ26(C)AQ | 26.0 | 28.90 | 31.9 | 1.0 | 5.0 | 42.1 | 71.3 | HFE | DFE |
| 3.0SMCJ28(C)AQ | 28.0 | 31.10 | 34.4 | 1.0 | 5.0 | 45.4 | 66.1 | HFG | DFD |
| 3.0SMCJ30(C)AQ | 30.0 | 33.30 | 36.8 | 1.0 | 5.0 | 48.4 | 62.0 | HFK | DFK |
| 3.0SMCJ33(C)AQ | 33.0 | 36.70 | 40.6 | 1.0 | 5.0 | 53.3 | 56.3 | HFM | DFM |
| 3.0SMCJ36(C)AQ | 36.0 | 40.00 | 44.2 | 1.0 | 5.0 | 58.1 | 51.6 | HFP | DFP |
| 3.0SMCJ58(C)AQ | 58.0 | 64.40 | 71.2 | 1.0 | 5.0 | 93.6 | 32.1 | HGG | DDD |
| 3.0SMCJ100AQ | 100.0 | 111.00 | 122.7 | 1.0 | 5.0 | 162.0 | 18.5 | HGZ | — |
| 3.0SMCJ110AQ | 110.0 | 122.00 | 134.8 | 1.0 | 5.0 | 177.0 | 16.9 | HHE | — |
| 3.0SMCJ120AQ | 120.0 | 133.00 | 147.0 | 1.0 | 5.0 | 193.0 | 15.5 | HHG | — |
| 3.0SMCJ130AQ | 130.0 | 144.00 | 159.2 | 1.0 | 5.0 | 209.0 | 14.4 | HHK | — |
| 3.0SMCJ150AQ | 150.0 | 167.00 | 184.6 | 1.0 | 5.0 | 243.0 | 12.3 | HHM | — |
| 3.0SMCJ160AQ | 160.0 | 178.00 | 196.7 | 1.0 | 5.0 | 259.0 | 11.6 | HHP | — |
| 3.0SMCJ170AQ | 170.0 | 189.00 | 208.9 | 1.0 | 5.0 | 275.0 | 10.9 | HHR | — |

- Notes:
5. Non-repetitive current pulse per Figure 2 and derated above T_A = +25°C per Figure 1.
 6. Mounted on 8.00mm² (0.013mm thick) land areas.
 7. Measured with 8.3ms single half sine wave. Duty cycle = 4 pulses per minute maximum. For uni-directional devices only.
 8. Additional voltages may be available upon request. Please contact the Diodes Incorporated sales department for assistance.
 9. V_{BR} measured with I_T current pulse = 10ms to 15ms.
 10. The I_R limit is double for bi-directional device for V_{RWM} ≤ 10V.
 11. Per 10 × 1000µs waveform. See Figure 4.

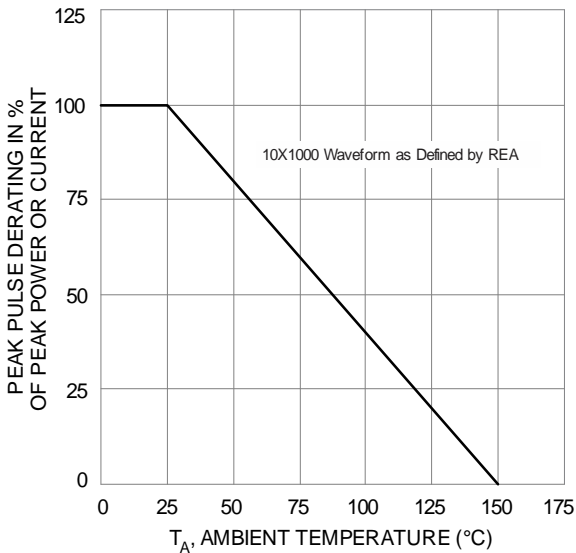


Figure 1. Pulse Derating Curve

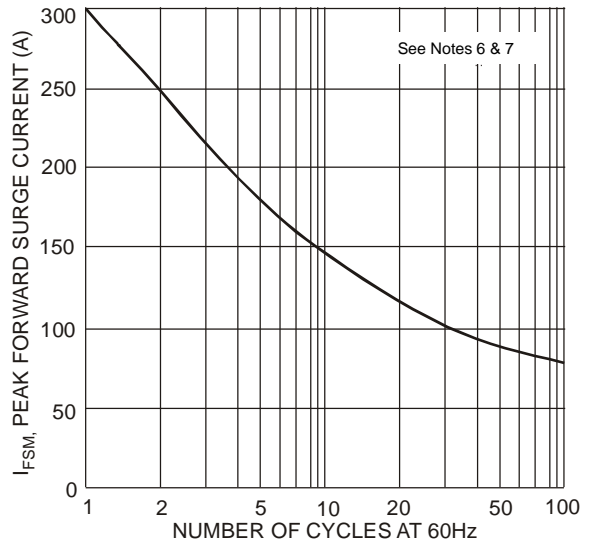


Figure 2. Maximum Non-Repetitive Surge Current

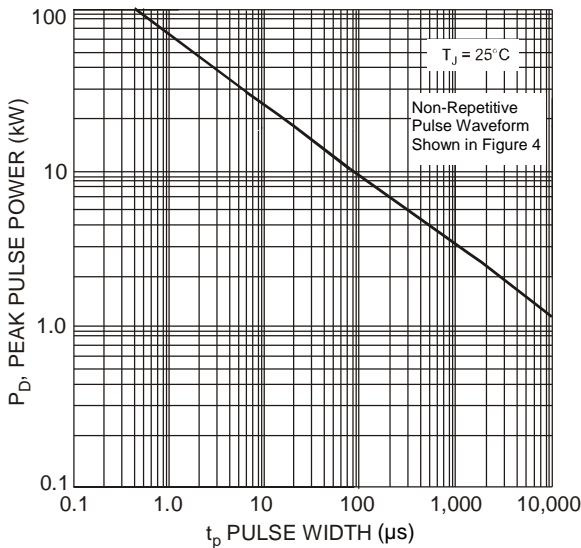


Figure 3. Pulse Rating Curve

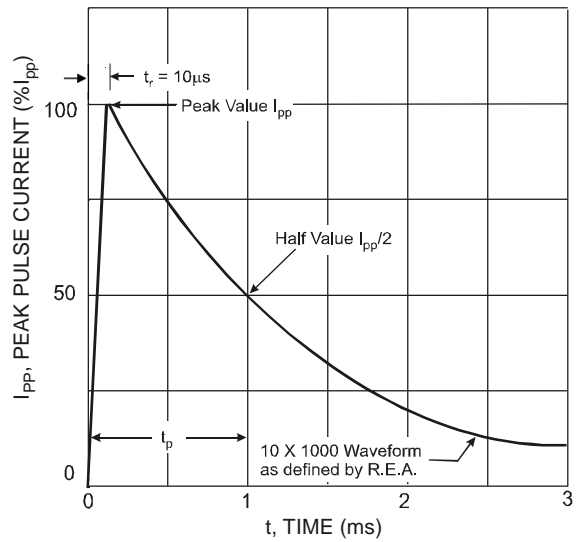


Figure 4. Pulse Waveform

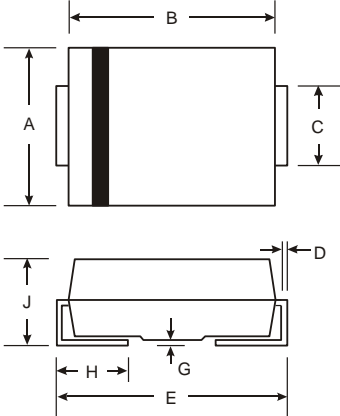
Notes:

- 6. Mounted on 8.00mm² (0.013mm thick) land areas.
- 7. Measured with 8.3ms single half sine wave. Duty cycle = 4 pulses per minute maximum. For uni-directional devices only.

Package Outline Dimensions

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

SMC

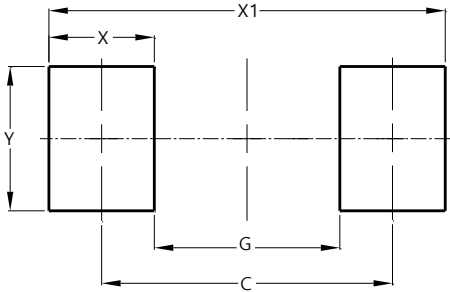


| SMC | | |
|----------------------|------|------|
| Dim | Min | Max |
| A | 5.59 | 6.22 |
| B | 6.60 | 7.11 |
| C | 2.75 | 3.18 |
| D | 0.15 | 0.31 |
| E | 7.75 | 8.13 |
| G | 0.10 | 0.20 |
| H | 0.76 | 1.52 |
| J | 2.00 | 2.50 |
| All Dimensions in mm | | |

Suggested Pad Layout

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

SMC



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 6.90 |
| G | 4.40 |
| X | 2.50 |
| X1 | 9.40 |
| Y | 3.30 |

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