# 3600W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

NEW PRODUCT

## Product Summary (@$T_A$ = +25°C)

| $P_{PK}$ | $I_{FSM}$ (A) | $V_{RWM}$ (V) | $PM_{(AV)}$ |
|---|---|---|---|
| 3600W | 500 | 22 | 5W |

## Features and Benefits

- 3600W Peak Pulse Power Dissipation
- High Current Capability
- Glass Passivated Die Construction
- Low Reverse Current
- Low Thermal Resistance
- Low Power Loss And High Efficiency
- Excellent High Temperature Stability
- Meets ISO7637-2 Surge Capability
- Meets ISO16750-2 Surge Specification
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DM5W27Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  **https://www.diodes.com/quality/product-definitions/**

## Description and Applications

Suitable to protect sensitive automotive circuits against surges defined in ISO7637-2 and against load dump surge according to ISO16750-2.

Compliance with following standards

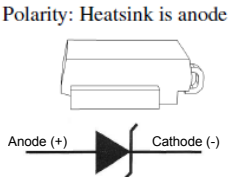
- ISO 16750-2, Pulse A and Pulse B
- ISO 7637-2
  Pulse 1, Pulse 2a, Pulse 3a, Pulse 3b

## Mechanical Data

- Case: DO-218
- 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 e3
- Polarity Indicator: Heatsink Is Anode
- Weight: 2.74 grams (Approximate)

DO-218 (Type E)

Top View




Pin Information

## Ordering Information (Note 4)

| Part Number | Qualification | Case | Packaging |
|---|---|---|---|
| DM5W27Q-13 | Automotive | DO-218 (Type E) | 750/Tape & Reel |

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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

## Marking Information

Pin1


M5W27 = Product Type Marking Code
YWW = Date Code Marking
Y = Last Digit of Year (ex: 9 for 2019)
WW = Week Code (01 to 53)
Bar Denotes Cathode Pin, Circle Denotes Anode

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## 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 5) | 10/1000µs Waveform | $P_{PK}$ | 3600 | W |
| | 10/10000µs Waveform | | 2800 | |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (Notes 5 and 6 ) | | $I_{FSM}$ | 500 | A |
| Non-Repetitive Peak Reverse Surge Current for 10µs/10ms Exponentially Decaying Waveform | | $I_{RSM}$ | 70 | A |
| Instantaneous Forward Voltage, $I_F$ = 6.0A | | $V_F$ | 1.0 | V |
| Zener Voltage Temperature Coefficient, $I_Z$ = 10mA | | $V_{ZTC}$ | 36 | mV/°C |
| Steady State Power Dissipation @ $T_C$ = +25°C | | $PM_{(AV)}$ | 5.0 | W |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1.1 | °C/W |
| Operating Temperature Range | $T_J$ | -55 to +175 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +175 | °C |

Notes: 5. Valid provided that terminals are kept at ambient temperature.
6. Measured on 8.3ms single half sine-wave or equivalent square wave. Duty cycle = 4 pulses per minute maximum.

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

| Part Number | Reverse Standoff Voltage | Breakdown Voltage $V_{BR}$ @ $I_T$ (Note 7) | | Test Current | Maximum Reverse Leakage @ $V_{RWM}$ | Maximum Clamping Voltage @ $I_{PP}$ | Maximum Peak Pulse Current $I_{PP}$ at 10/1000µs | Maximum Leakage at $V_{WM}$ $T_J$ = +175°C |
|---|---|---|---|---|---|---|---|---|
| | $V_{RWM}$ (V) | Min (V) | Max (V) | $I_T$ (mA) | $I_R$ (µA) | $V_C$ (V) | (A) | $I_D$ (µA) |
| DM5W27Q | 22 | 24 | 30 | 10.0 | 0.2 | 40 | 55 | 10 |

Note: 7. $V_{BR}$ measured with $I_T$ current pulse = 10ms to 15ms.

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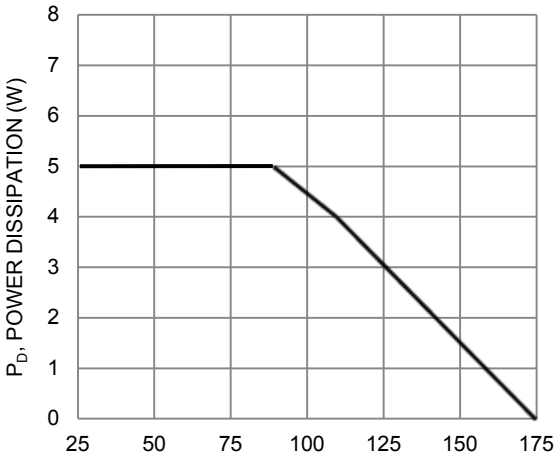


Fig. 1 Power Derating Curve

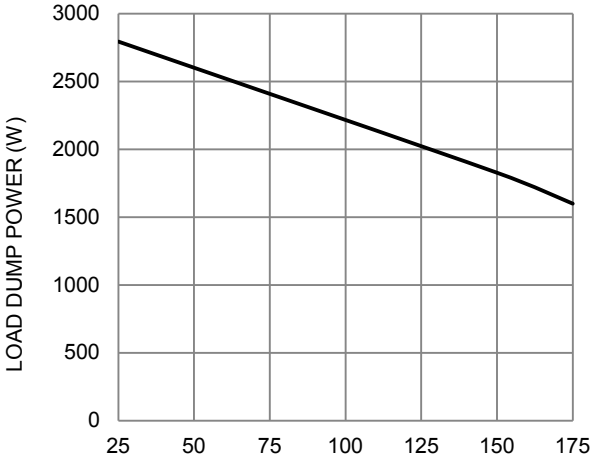


Fig. 2 Load Dump Power Characteristics
(10ms Exponential Waveform)

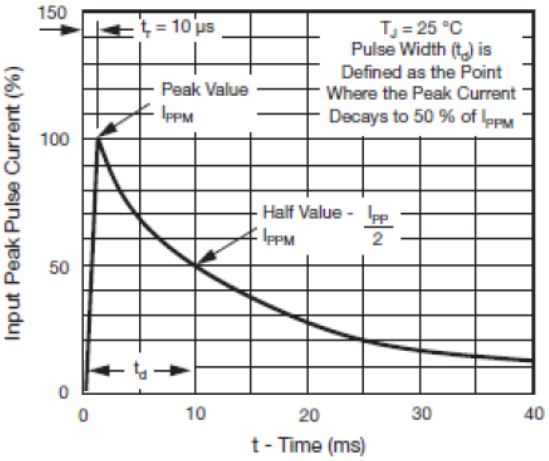


Fig. 3 - Pulse Waveform

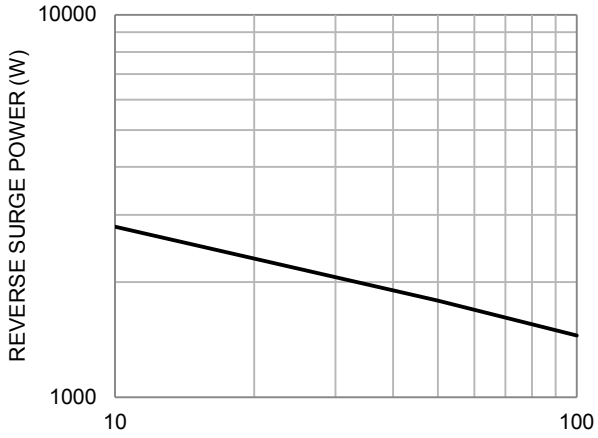


Fig. 4 Reverse Power Capability

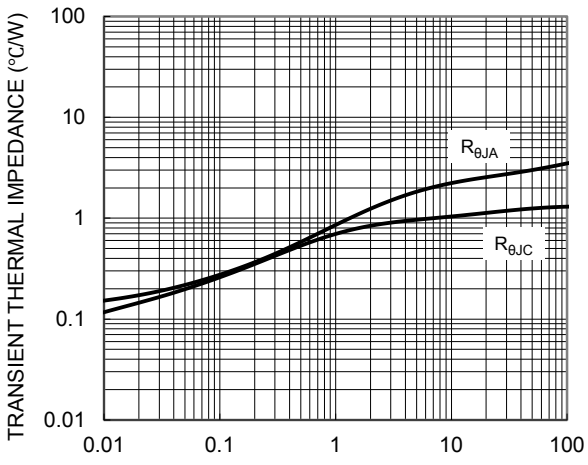


Fig. 5 Typical Transient Thermal Impedance

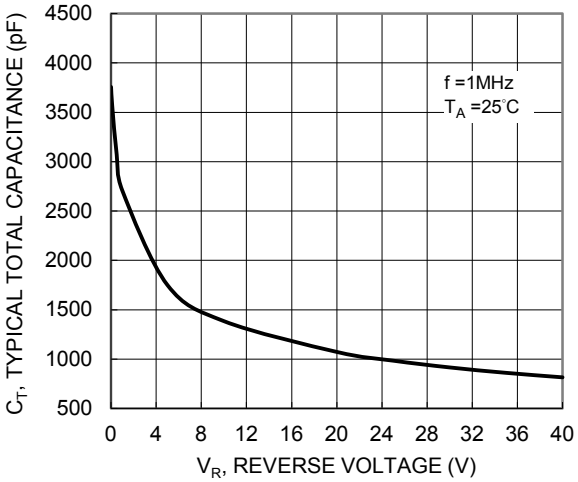


Fig. 6 Typical Total Capacitance

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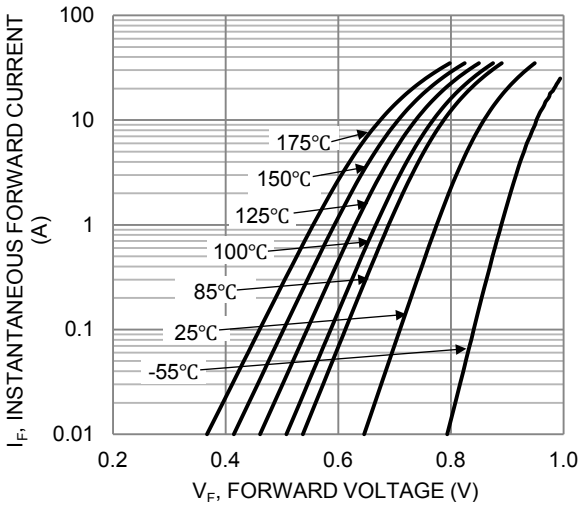


Figure 7. Typical Forward Characterisitic

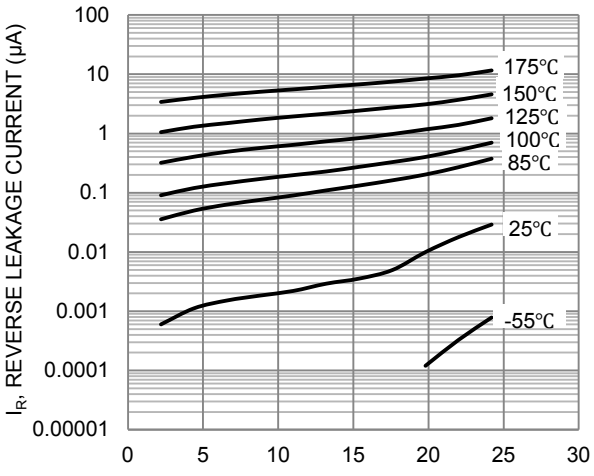


Figure 8. Typical Reverse Characteristic

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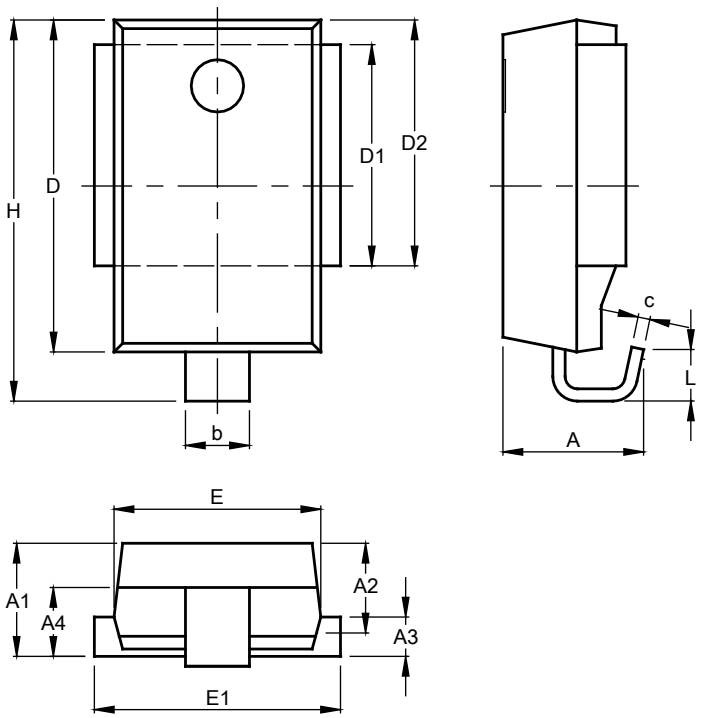
## Package Outline Dimensions

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

**DO-218 (Type E)**

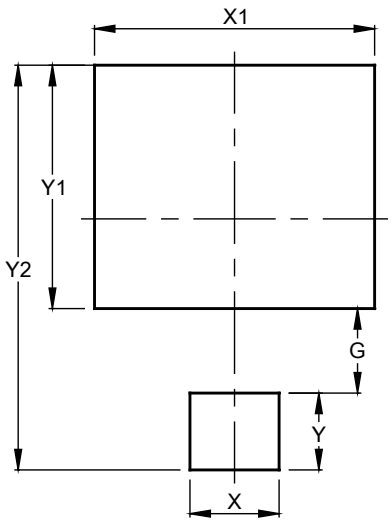



| DO-218 (Type E) | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 4.70 | 5.70 | -- |
| **A1** | 4.70 | 5.25 | 5.00 |
| **A2** | 3.45 | 4.25 | 3.95 |
| **A3** | 1.70 | 2.50 | 2.00 |
| **A4** | 2.65 | 3.55 | 3.10 |
| **b** | 2.30 | 3.00 | -- |
| **c** | 0.45 | 0.90 | -- |
| **D** | 13.20 | 13.80 | 13.50 |
| **D1** | 8.70 | 9.30 | 9.00 |
| **D2** | 9.70 | 10.30 | 10.00 |
| **E** | 8.20 | 8.80 | 8.50 |
| **E1** | 9.50 | 10.00 | -- |
| **H** | 15.00 | 16.00 | 15.50 |
| **L** | 1.50 | 2.50 | 2.00 |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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

**DO-218 (Type E)**




| Dimensions | Value (in mm) |
|---|---|
| **G** | 3.30 |
| **X** | 3.50 |
| **X1** | 11.00 |
| **Y** | 3.00 |
| **Y1** | 9.50 |
| **Y2** | 15.80 |

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