## Product Summary

| $V_{BR\ Min}$ | $I_{PP\ Max}$ | $C_{T\ Max}$ |
|---|---|---|
| 6.0V | 7.0A | 40pF |

## Description

Designed to replace multilayer varistors (MLVs) in portable applications where low operating voltage is vital. They offer superior electrical characteristics such as lower clamping voltage and no device degradation when compared to MLVs. They are designed to protect sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD), lightning, electrical fast transients (EFT), and cable discharge events (CDE).

## Applications

- Cellular handsets & accessories
- Cordless phones
- Notebooks & handhelds & keyboards
- Portable instrumentation
- Digital cameras
- Peripherals
- I/O ports

## Features

- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- 6 Channel of ESD Protection
- Protects One Power or I/O Line
- Max Peak Pulse Power: $P_{PP}$ = 100W at $t_p$ = 8/20µs
- Low Clamping Voltage
- **Totally Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

## Mechanical Data

- Package: SOT666
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.004 grams (Approximate)

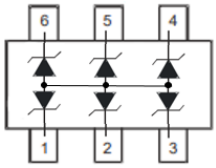
SOT666



Top View



Bottom View



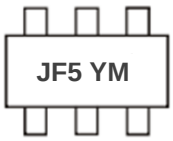

Device Schematic

## Ordering Information (Note 4)

| Part Number | Package | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|---|---|---|---|---|---|---|
| | | | | | Qty. | Carrier |
| D5V0M6B6V-7 | SOT666 | JF5 | 7 | 8 | 3000 | Tape & Reel |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
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




JF5 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: L = 2024)
M = Month (ex: 3 = March)

Date Code Key

| Year | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | L | M | N | P | R | S | T | U | V | W | X | Y |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |


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

| Characteristic | Symbol | Value | Unit | Conditions |
|---|---|---|---|---|
| Peak Pulse Power Dissipation | $P_{PP}$ | 100 | W | 8/20μs, Per Figure 3 |
| Peak Pulse Current | $I_{PP}$ | 7.0 | A | 8/20μs, Per Figure 3 |
| ESD Protection – Contact Discharge | $V_{ESD_Contact}$ | ±30 | kV | Standard IEC 61000-4-2 |
| ESD Protection – Air Discharge | $V_{ESD_Air}$ | ±30 | kV | Standard IEC 61000-4-2 |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Package Power Dissipation (Note 5) | $P_D$ | 410 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\Theta JA}$ | 300 | °C/W |
| Operating Temperature Range | $T_J$ | -55 to +125 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |
| Soldering Temperature, t max = 10s | $T_L$ | +260 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Reverse Working Voltage | $V_{RWM}$ | — | — | 5.0 | V | — |
| Reverse Current (Note 6) | $I_{RM}$ | — | — | 1.0 | μA | $V_{DRM} = V_{RWM}$ = 5.0V |
| | | — | — | 0.5 | | $V_{DRM} = V_{RWM}$ = 3.0V |
| Punch Through Voltage | $V_{BR}$ | 6.0 | — | 9.0 | V | $I_R$ = 1mA |
| Reverse Clamping Voltage | $V_{CL}$ | — | — | 9.0 | V | $I_{PP}$ = 1A, $t_p$ = 8/20μs |
| | | — | — | 12.0 | | $I_{PP}$ = 7A, $t_p$ = 8/20μs |
| Capacitance | $C_T$ | — | — | 40 | pF | $V_R$ = 0, f = 1MHz |

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown in Diodes Incorporated's package outline PDFs, which can be found on our website at http://www.diodes.com/package-outlines.html.
6. Short duration pulse test used to minimize self-heating effect.

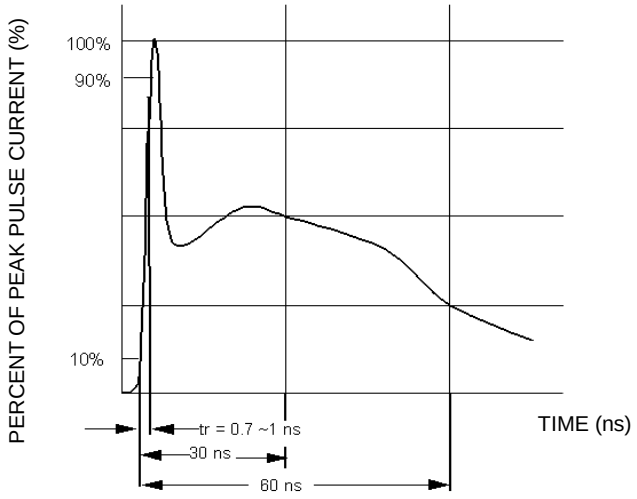



Figure 1. ESD Pulse Waveform According to IEC 61000-4-2

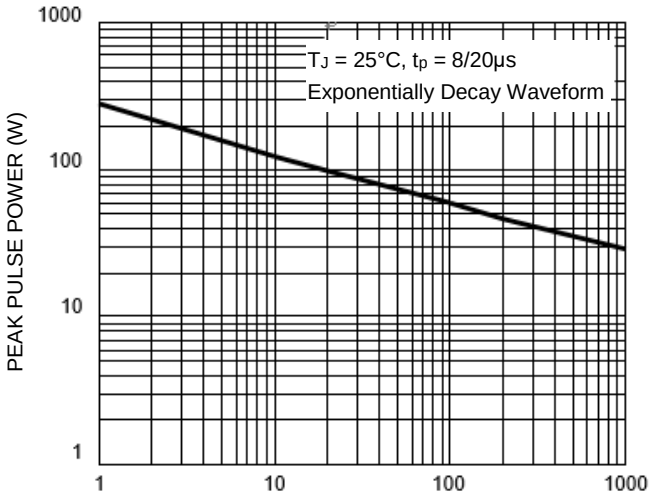



Figure 2. Power Dissipation Versus Pulse Time


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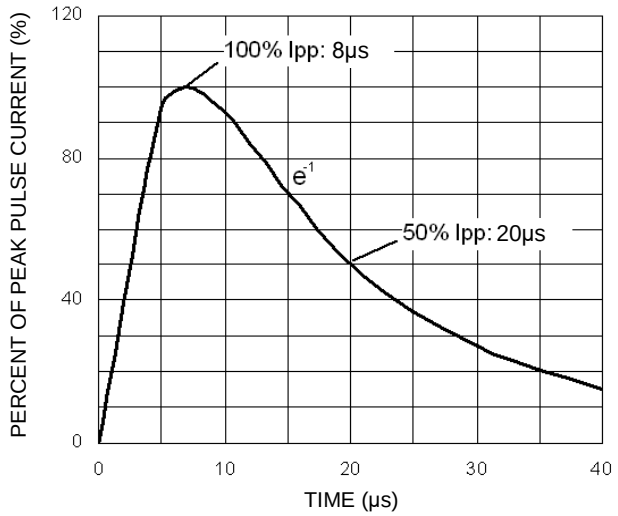



Figure 3. Typical 8 × 20µs Pulse Waveform

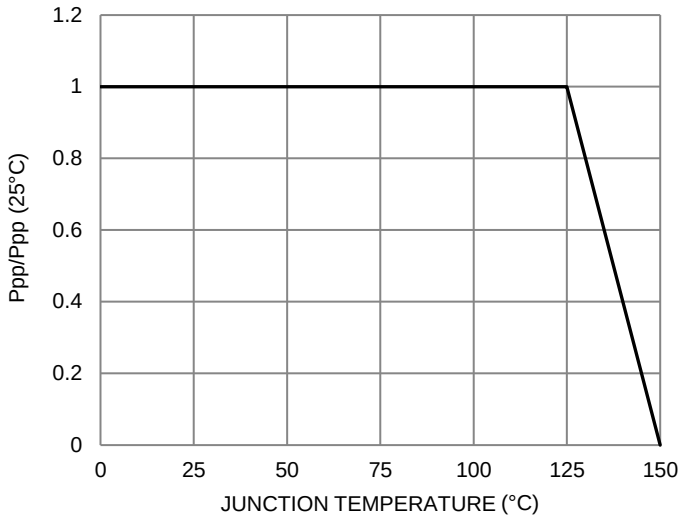



Figure 4. Peak Pulse Power Versus $T_J$

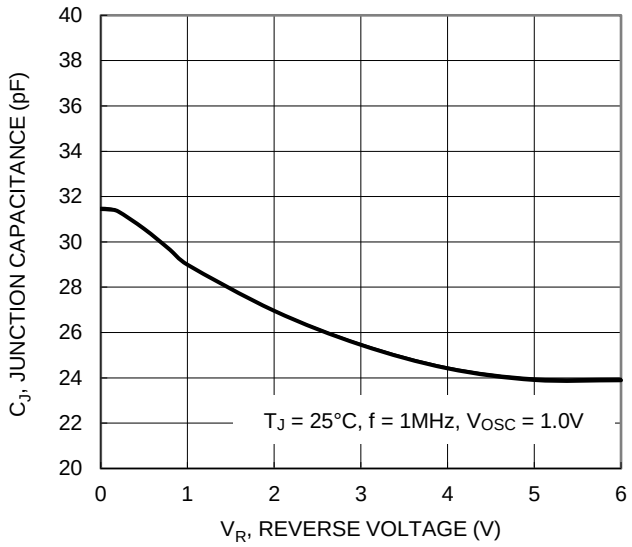



Figure 5. Typical Junction Capacitance

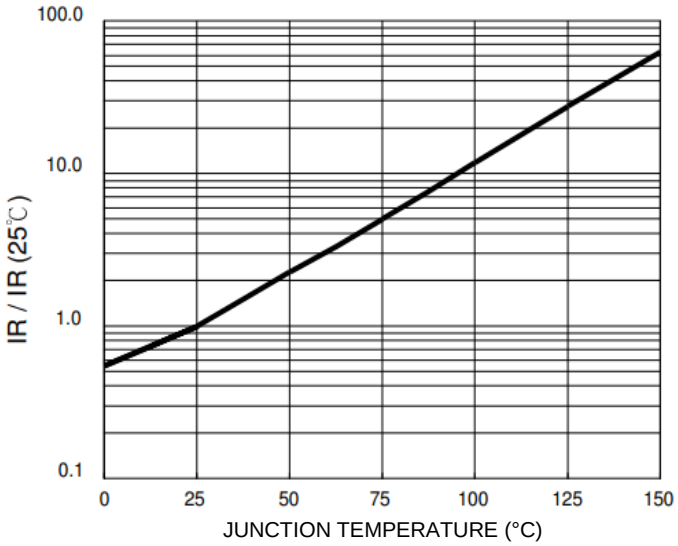



Figure 6. Reverse Leakage Current Versus $T_J$

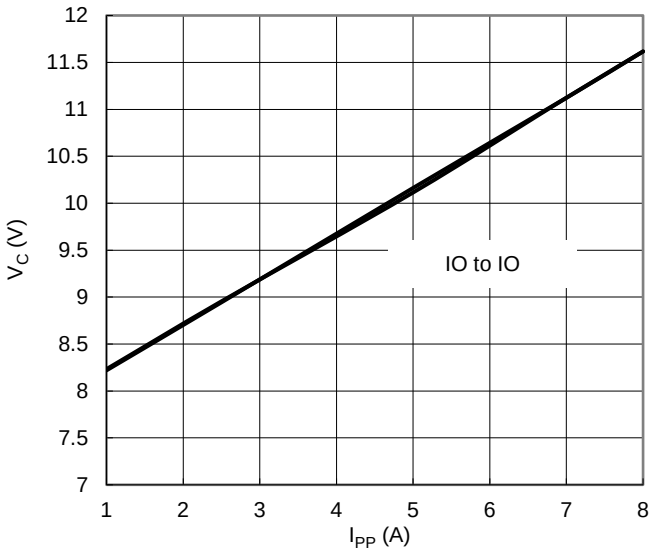



Figure 7. Typical Peak Clamping Voltage $V_C$ vs. Peak Pulse Current $I_{PP}$

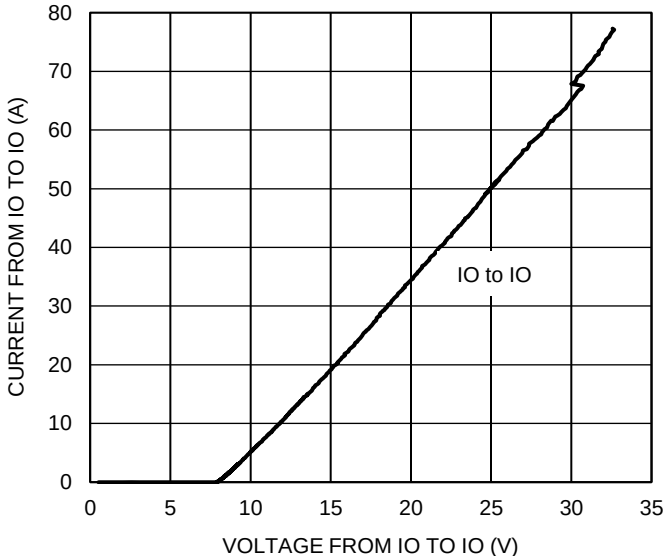


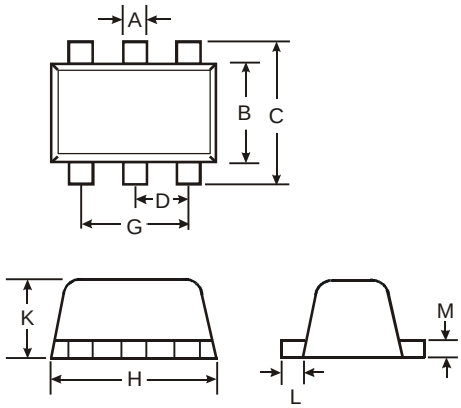

Figure 8. TLP Curve


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## Package Outline Dimensions

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

**SOT666**

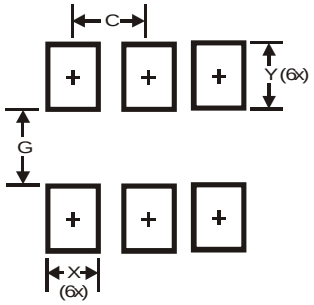



| SOT666 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.15 | 0.30 | 0.20 |
| **B** | 1.10 | 1.25 | 1.20 |
| **C** | 1.55 | 1.70 | 1.60 |
| **D** | - | 0.50 | - |
| **G** | 0.90 | 1.10 | 1.00 |
| **H** | 1.50 | 1.70 | 1.60 |
| **K** | 0.55 | 0.60 | 0.60 |
| **L** | 0.10 | 0.30 | 0.20 |
| **M** | 0.10 | 0.18 | 0.15 |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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

**SOT666**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 0.50 |
| **G** | 0.80 |
| **X** | 0.35 |
| **Y** | 0.50 |


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