# HIGH VOLTAGE DUAL SWITCHING DIODE

## Features

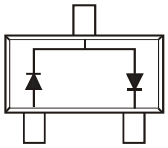
- Fast Switching Speed: Maximum of 50ns
- High Reverse Breakdown Voltage: 300V
- Low Leakage Current: Maximum of 100nA when $V_R$ = 240V at Room Temperature
- Extremely Low Reverse Leakage Current for Extended Safe Operating Area Under High Temperature Applications
- Dual Series Configuration
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DHVSD2004SSQ 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/**

## Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 Lead-Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe) (e3)
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

SOT23

Top View



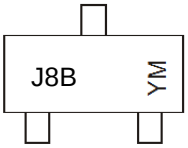
Internal Schematic

## Ordering Information (Note 4)

| Orderable Part Number | Package | Packing | |
|---|---|---|---|
| | | Quantity | Carrier |
| DHVSD2004SSQ-7 | SOT23 | 3,000 | 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




J8B = Product Type Marking Code
YM = Date Code Marking; A bar on top of the 'Y' denotes Assembly & Test Site
Y = Year (ex: L = 2024)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | K | L | M | N | P | R | S | T | U | V | W | X |

| 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 |

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

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Repetitive Peak Reverse Voltage | | $V_{RRM}$ | 300 | V |
| Working Peak Reverse Voltage<br>DC Blocking Voltage | | $V_{RWM}$<br>$V_R$ | 240 | V |
| RMS Reverse Voltage | | $V_{R(RMS)}$ | 170 | V |
| Forward Continuous Current (Note 5) | | $I_{FM}$ | 225 | mA |
| Peak Repetitive Forward Current (Note 5) | | $I_{FRM}$ | 625 | mA |
| Non-Repetitive Peak Forward Surge Current | @ t = 1.0μs<br>@ t = 1.0s | $I_{FSM}$ | 4.0<br>1.0 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 5) | $P_D$ | 325 | mW |
| Thermal Resistance Junction to Ambient Air (Note 5) | $R_{\theta JA}$ | 385 | °C/W |
| Operating and Storage Temperature Range | $T_J$ , $T_{STG}$ | -55 to +150 | °C |

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

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 6) | $V_{(BR)R}$ | 300 | — | V | $I_R$ = 100μA |
| Forward Voltage | $V_F$ | — | 0.87<br>1.0 | V | $I_F$ = 20mA<br>$I_F$ = 100mA |
| Reverse Current (Note 6) | $I_R$ | — | 100<br>35 | nA<br>μA | $V_R$ = 240V<br>$V_R$ = 240V, $T_J$ = +150°C |
| Total Capacitance | $C_T$ | — | 5.0 | pF | $V_R$ = 0, f = 1.0MHz |
| Reverse Recovery Time | $t_{RR}$ | — | 50 | ns | $I_F$ = $I_R$ = 10mA,<br>$I_{RR}$ = 0.1 x $I_R$, $R_L$ = 100Ω |

Notes: 5. Part mounted on FR-4 substrate with pad dimensions 1 inch × 1 inch, 2oz copper, single-sided PC board.
6. Short duration pulse test used to minimize self-heating effect.

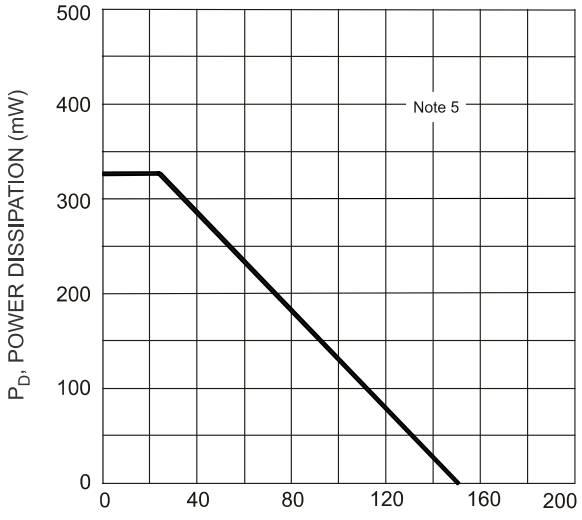


Figure 1 Power Derating Curve, Total Package

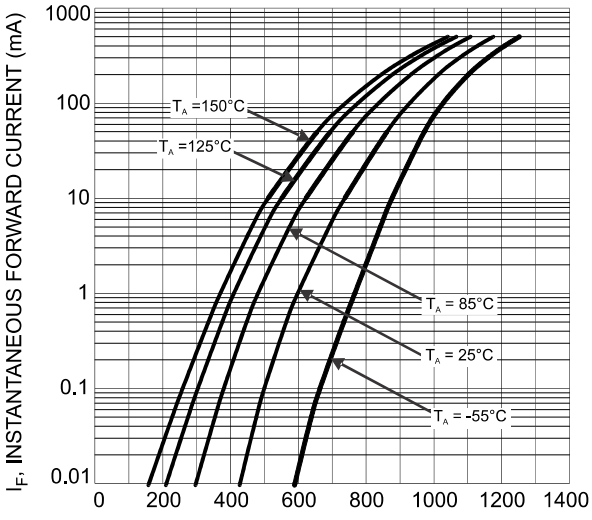


Figure 2 Typical Forward Characteristics, Per Element

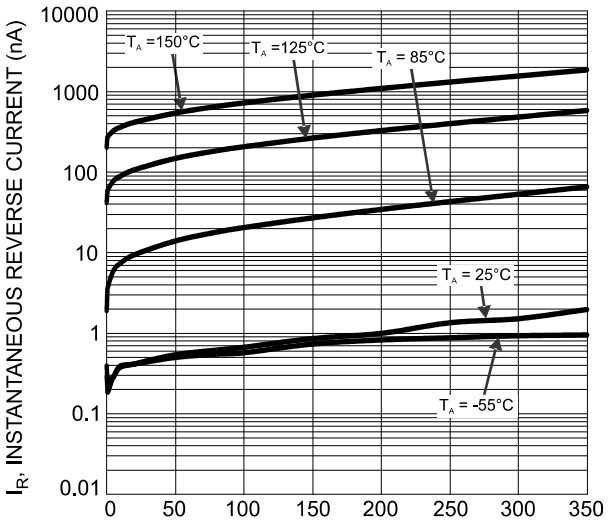


Figure 3 Typical Reverse Characteristics, Per Element

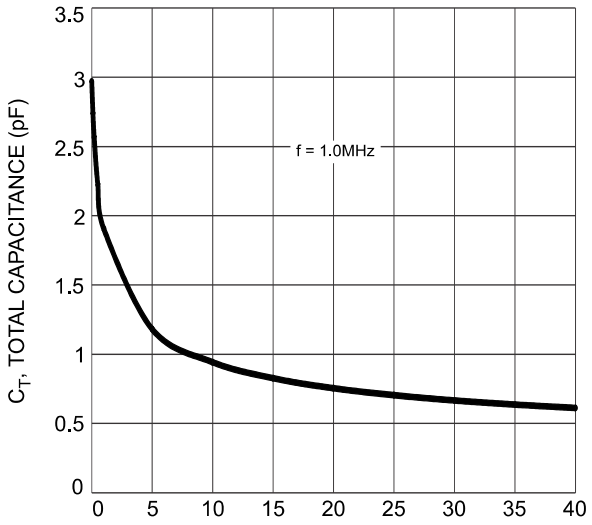
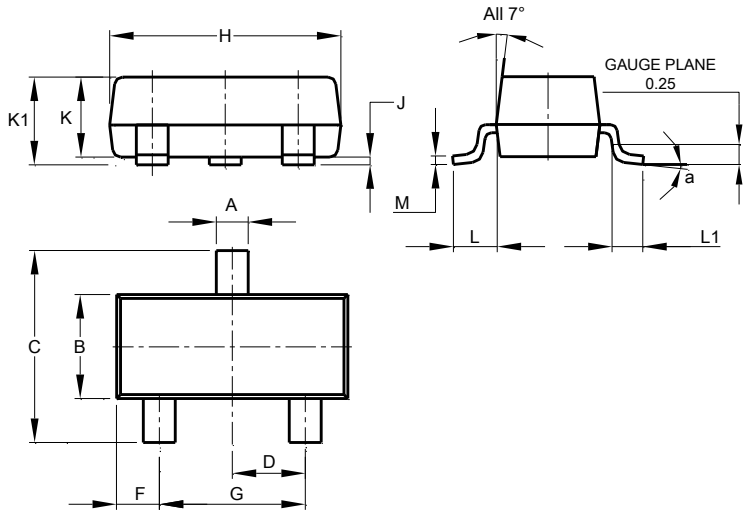


Figure 4 Typical Total Capacitance, Per Element

## Package Outline Dimensions

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

**SOT23**

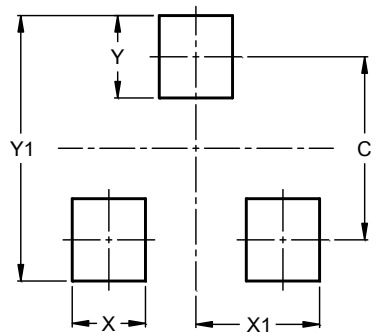



| SOT23 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.37 | 0.51 | 0.40 |
| **B** | 1.20 | 1.40 | 1.30 |
| **C** | 2.30 | 2.50 | 2.40 |
| **D** | 0.89 | 1.03 | 0.915 |
| **F** | 0.45 | 0.60 | 0.535 |
| **G** | 1.78 | 2.05 | 1.83 |
| **H** | 2.80 | 3.00 | 2.90 |
| **J** | 0.013 | 0.10 | 0.05 |
| **K** | 0.890 | 1.00 | 0.975 |
| **K1** | 0.903 | 1.10 | 1.025 |
| **L** | 0.45 | 0.61 | 0.55 |
| **L1** | 0.25 | 0.55 | 0.40 |
| **M** | 0.085 | 0.150 | 0.110 |
| **a** | 0° | 8° | -- |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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

**SOT23**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 2.0 |
| **X** | 0.8 |
| **X1** | 1.35 |
| **Y** | 0.9 |
| **Y1** | 2.9 |

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