## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ Max | $I_D$ Max $T_A$ = +25°C |
|---|---|---|
| -30V | 65mΩ @ $V_{GS}$ = -10V | -3.9A |
| | 99mΩ @ $V_{GS}$ = -4.5V | -3.2A |

## Description

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

## Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully 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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

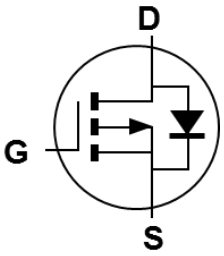
## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Annealed over Copper Lead-Frame. Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

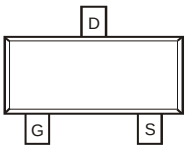
SOT23



Top View




Equivalent Circuit



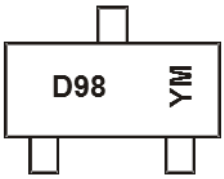

Top View
Pin Configuration

## Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---|---|---|
| DMP3097L-7 | SOT23 | 3000/Tape & Reel |
| DMP3097L-13 | SOT23 | 10000/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




D98= Product Type Marking Code
YM = Date Code Marking
$\overline{Y}$ = Year (ex: H = 2020)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | H | I | J | K | L | M | N | O | P | R | S | T |

| 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 |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | -30 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±20 | V |
| Drain Current (Note 6) $V_{GS}$ = -10V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | -3.9<br>-3.1 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | | | $I_{DM}$ | -20 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Total Power Dissipation (Note 5) | $P_D$ | 1.0 | W |
| Thermal Resistance, Junction to Ambient @ $T_A$ = +25°C (Note 5) | $R_{\theta JA}$ | 123 | °C/W |
| Total Power Dissipation (Note 6) | $P_D$ | 1.52 | W |
| Thermal Resistance, Junction to Ambient @ $T_A$ = +25°C (Note 6) | $R_{\theta JA}$ | 82 | °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 | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 7)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | -30 | — | — | V | $V_{GS}$ = 0V, $I_D$ = -250µA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | — | — | -800 | nA | $V_{DS}$ = -30V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±20V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 7)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | -1.0 | — | -2.1 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -250µA |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 53<br>74 | 65<br>99 | mΩ | $V_{GS}$ = -10V, $I_D$ = -3.8A<br>$V_{GS}$ = -4.5V, $I_D$ = -3.0A |
| Diode Forward Voltage (Note 6) | $V_{SD}$ | — | -0.85 | -1.26 | V | $V_{GS}$ = 0V, $I_S$ = -2.7A |
| **DYNAMIC CHARACTERISTICS (Note 8)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 563 | — | pF | $V_{DS}$ = -25V, $V_{GS}$ = 0V, f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | — | 48 | — | pF | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 41 | — | pF | |
| Gate Resistance | $R_G$ | — | 9.5 | — | Ω | $V_{GS}$ = 0V, $V_{DS}$ = 0V, f = 1MHz |
| Total Gate Charge | $Q_g$ | — | 6.6 | — | nC | $V_{DS}$ = -15V, $V_{GS}$ = -4.5V, $I_D$ = -3.8A |
| | | — | 13.4 | — | | $V_{DS}$ = -15V, $V_{GS}$ = -10V, $I_D$ = -3.8A |
| Gate-Source Charge | $Q_{gs}$ | — | 2.5 | — | | |
| Gate-Drain Charge | $Q_{gd}$ | — | 1.5 | — | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 10 | — | ns | $V_{DS}$ = -15V, $V_{GS}$ = -10V, $I_D$ = -1A, $R_G$ = 6.0Ω |
| Turn-On Rise Time | $t_R$ | — | 2.3 | — | | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 31 | — | | |
| Turn-Off Fall Time | $t_F$ | — | 11 | — | | |

Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.


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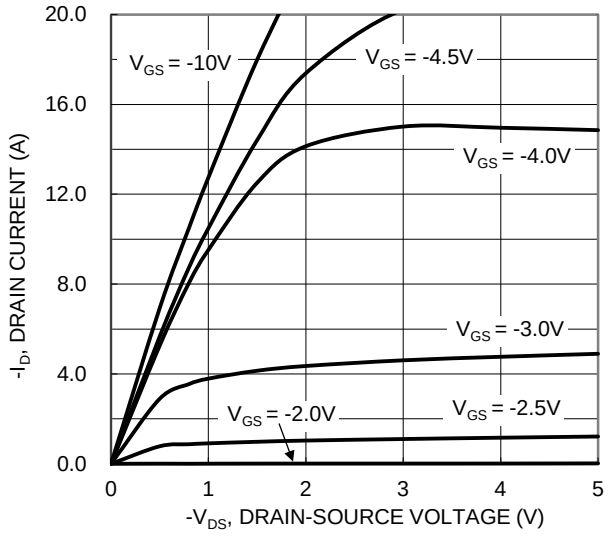



Figure 1.Typical Output Characteristic

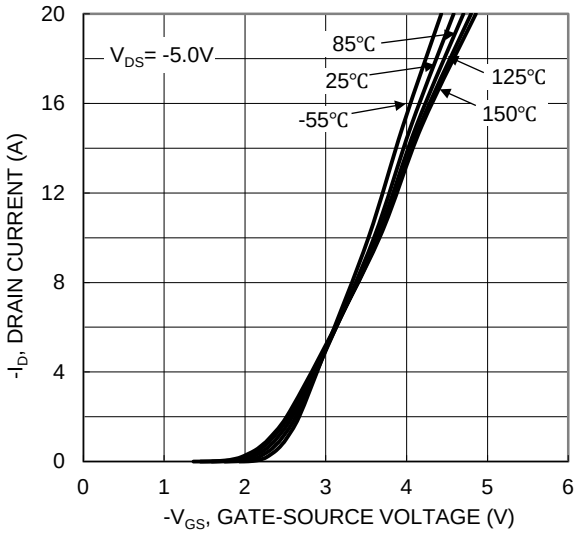



Figure 2. Typical Transfer Characteristic

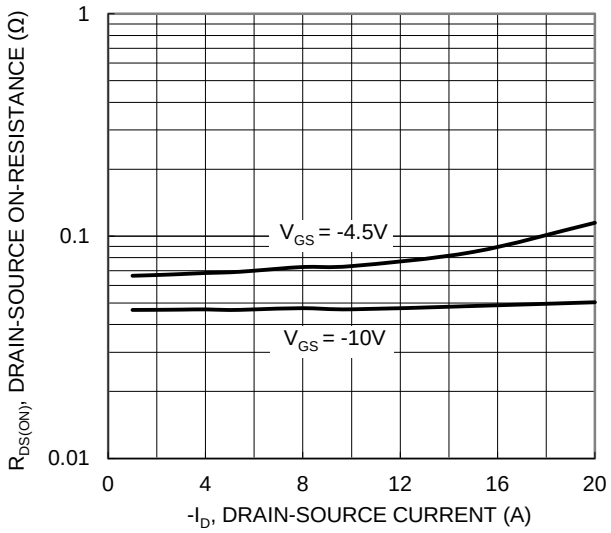



Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

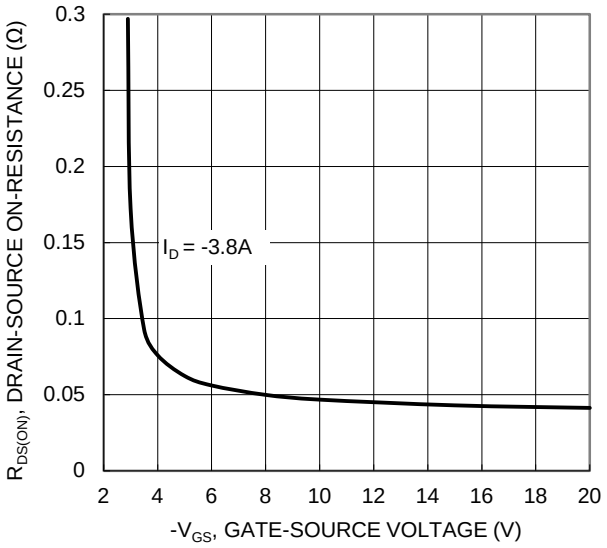



Figure 4. Typical Transfer Characteristic

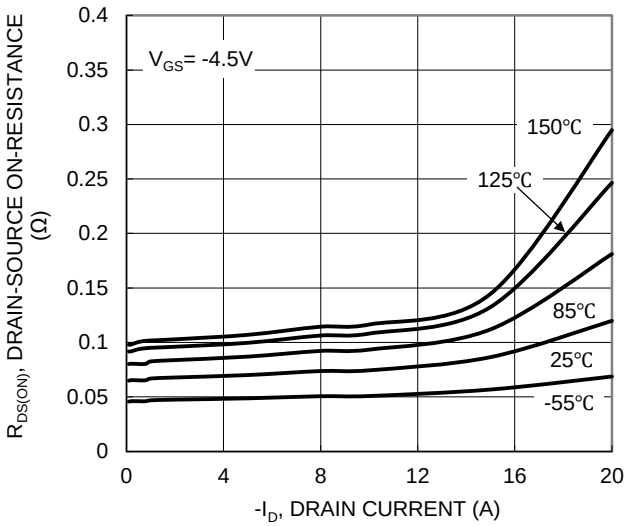



Figure 5. Typical On-Resistance vs. Drain Current and Temperature

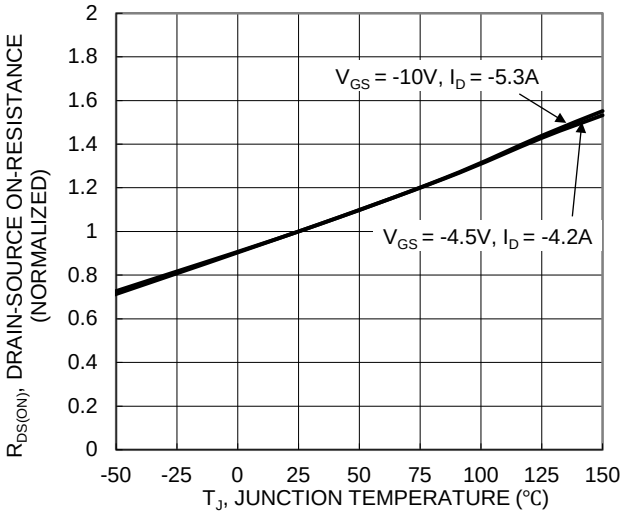



Figure 6. On-Resistance Variation with Temperature


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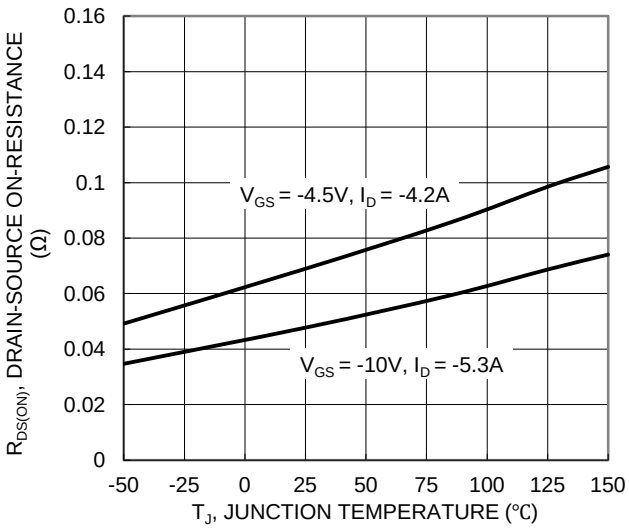



Figure 7. On-Resistance Variation with Temperature

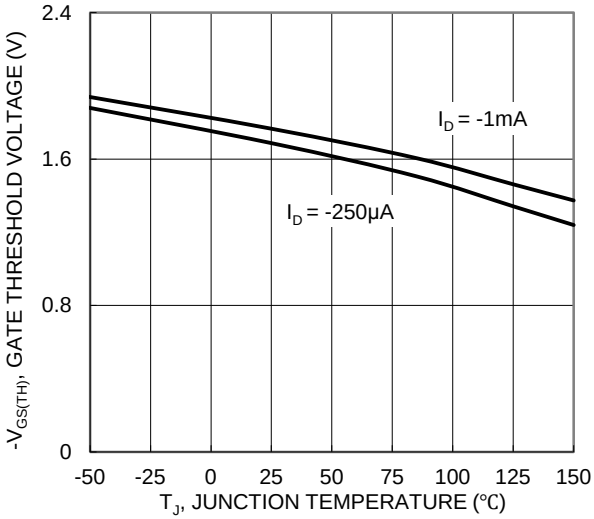



Figure 8. Gate Threshold Variation vs. JunctionTemperature

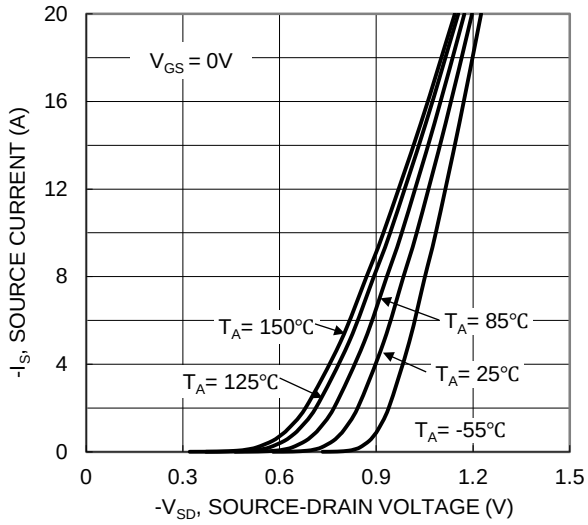



Figure 9. Diode Forward Voltage vs. Current

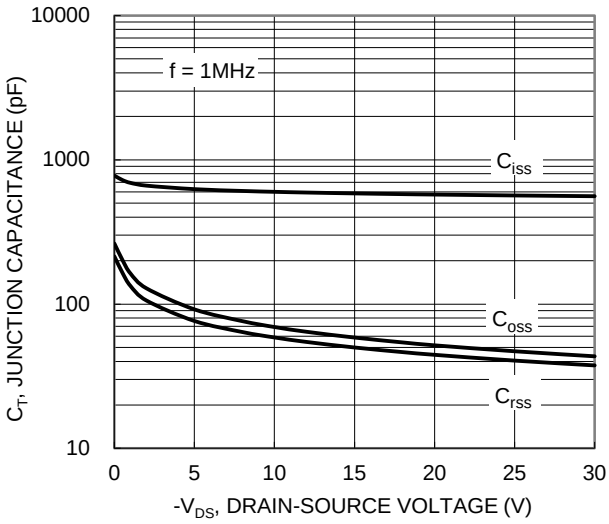



Figure 10. Typical Junction Capacitance

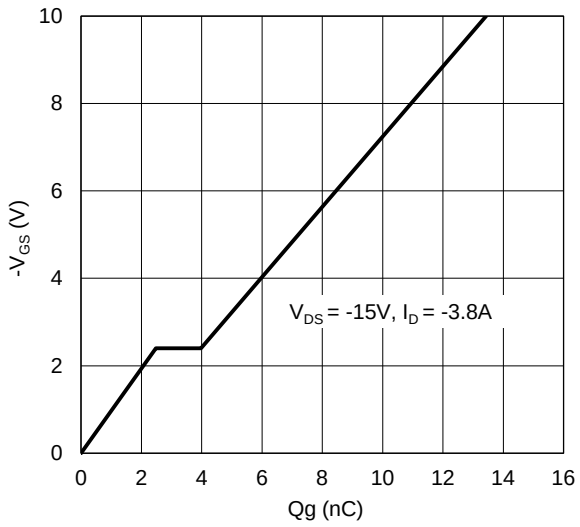



Figure 11. Gate Charge

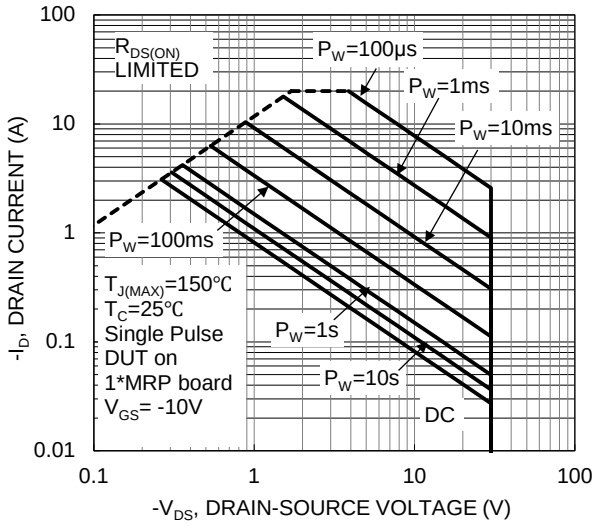



Figure 12. SOA, Safe Operation Area


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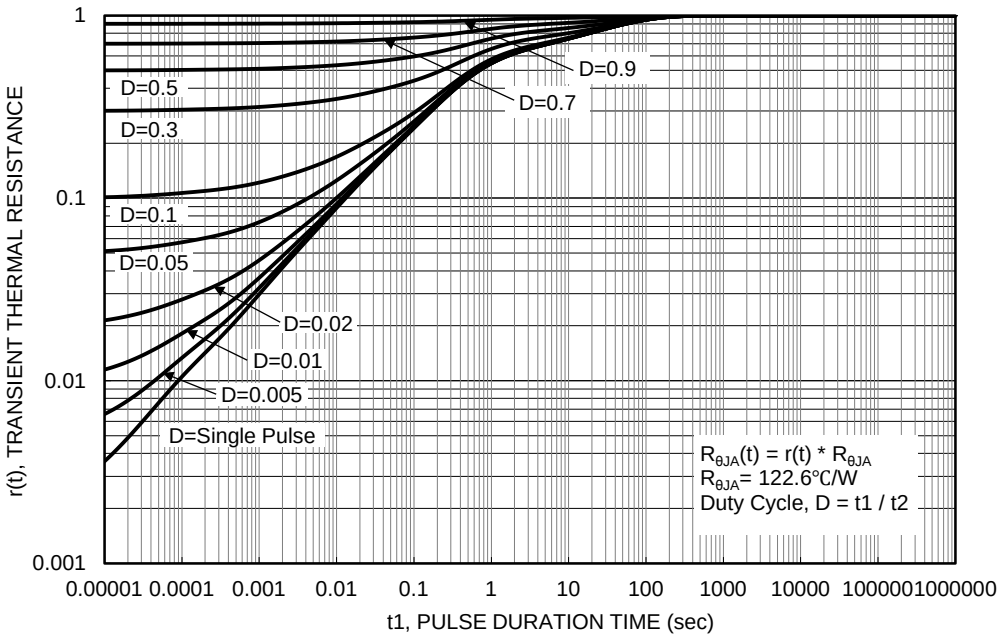



Figure 13. Transient Thermal Resistance

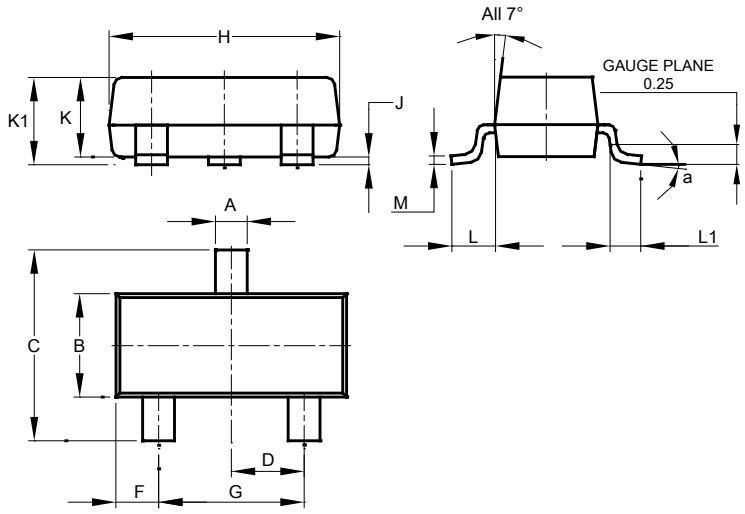

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## Package Outline Dimensions

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

**SOT23**

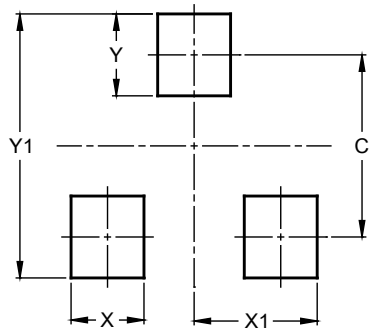



| SOT23 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.37 | 0.51 | 0.40 |
| **B** | 1.20 | 1.40 | 1.30 |
| **C** | 2.30 | 2.50 | 2.40 |
| **D** | 0.89 | 1.03 | 0.915 |
| **F** | 0.45 | 0.60 | 0.535 |
| **G** | 1.78 | 2.05 | 1.83 |
| **H** | 2.80 | 3.00 | 2.90 |
| **J** | 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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