## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ max | $I_D$ max $T_A$ = +25°C |
|---|---|---|
| 60V | 5Ω @ $V_{GS}$ = 10V | 115mA |

## Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate, 1KV (HBM)
- **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/**

## Description and Applications

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

- Load switches
- Power management functions
- Motor controls
- PWM applications

## Mechanical Data

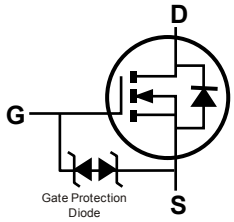
- Case: SOT523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208 e3
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Weight: 0.002 grams (approximate)



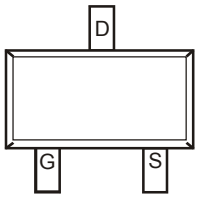

SOT523



Top View




Equivalent Circuit




Top View
Pin Out

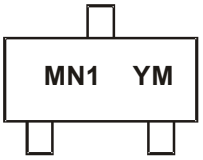
## Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---|---|---|
| DMN66D0LT-7 | SOT523 | 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/.


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## Marking Information




MN1 = Product Type Marking Code
YM = Date Code Marking
Y or Y= Year ex: I = 2021
M = Month ex: 9 = September

Date Code Key

| Year | 2008 | …… | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | V | …… | I | J | K | L | M | N | O | P | R | S |

| 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 | Units |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 60 | V |
| Gate-Source Voltage | Continuous | Continuous | ±20 | V |
| Drain Current (Note 5) | Continuous<br>Continuous @ +100°C<br>Pulsed | Continuous | 115<br>73<br>800 | mA |

## Thermal Characteristics (@ $T_A$ = +25°C unless otherwise specified)

| Characteristic | Symbol | Value | Units |
|---|---|---|---|
| Total Power Dissipation (Note 5) | $P_D$ | 200 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 625 | °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 6)** | | | | | | | |
| Drain-Source Breakdown Voltage | | $BV_{DSS}$ | 60 | 70 | — | V | $V_{GS}$ = 0V, $I_D$ = 10μA |
| Zero Gate Voltage Drain Current | @ $T_C$ = +25°C<br>@ $T_C$ = +125°C | $I_{DSS}$ | — | — | 1.0<br>500 | μA | $V_{DS}$ = 60V, $V_{GS}$ = 0V |
| Gate-Body Leakage | | $I_{GSS}$ | — | — | ±5 | μA | $V_{GS}$ = ±20V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 6)** | | | | | | | |
| Gate Threshold Voltage | | $V_{GS(th)}$ | 1.2 | — | 2.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA |
| Static Drain-Source On-Resistance | @ $T_C$ = +25°C | $R_{DS(on)}$ | — | 3.5 | 6 | Ω | $V_{GS}$ = 5.0V, $I_D$ = 0.115A |
| | @ $T_C$ = +125°C | | | 3.0 | 5 | | $V_{GS}$ = 10V, $I_D$ = 0.115A |
| Forward Transconductance | | $g_{FS}$ | 80 | — | — | mS | $V_{DS}$ = 10V, $I_D$ = 0.115A |
| **DYNAMIC CHARACTERISTICS (Note 7)** | | | | | | | |
| Input Capacitance | | $C_{iss}$ | — | 23 | — | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0V, f = 1.0MHz |
| Output Capacitance | | $C_{oss}$ | — | 3.4 | — | pF | |
| Reverse Transfer Capacitance | | $C_{rss}$ | — | 1.4 | — | pF | |
| **SWITCHING CHARACTERISTICS (Note 7)** | | | | | | | |
| Turn-On Delay Time | | $t_{D(on)}$ | — | 10 | — | ns | $V_{DD}$ = 30V, $I_D$ = 0.115A, $R_L$ = 150Ω, $V_{GEN}$ = 10V, $R_{GEN}$ = 25Ω |
| Turn-Off Delay Time | | $t_{D(off)}$ | — | 33 | — | ns | |

Notes: 5. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to product testing.


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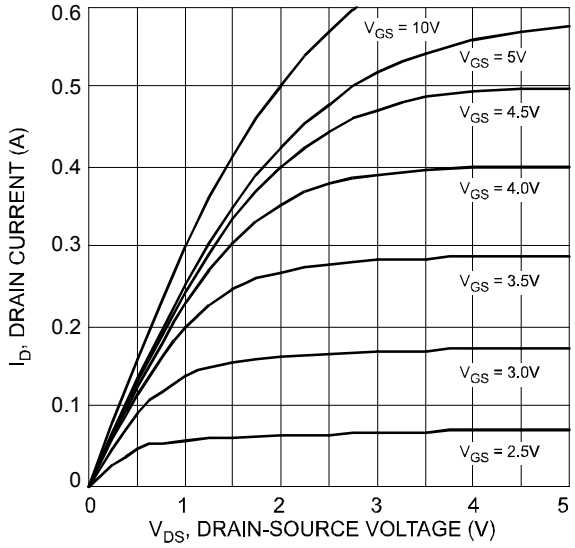



Fig.1 Typical Output Characteristic

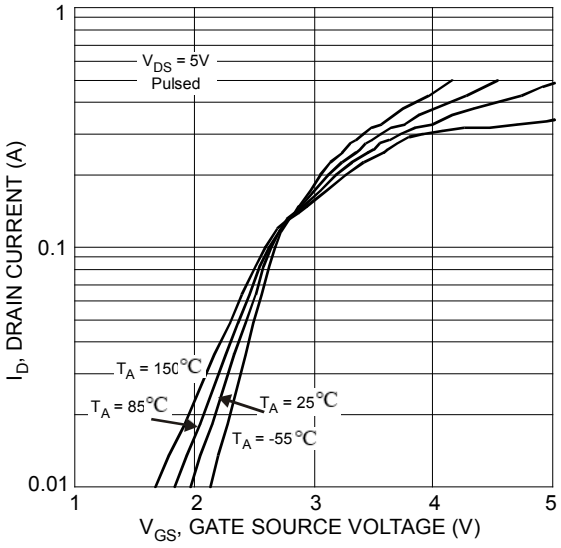



Fig. 2 Typical Transfer Characteristics

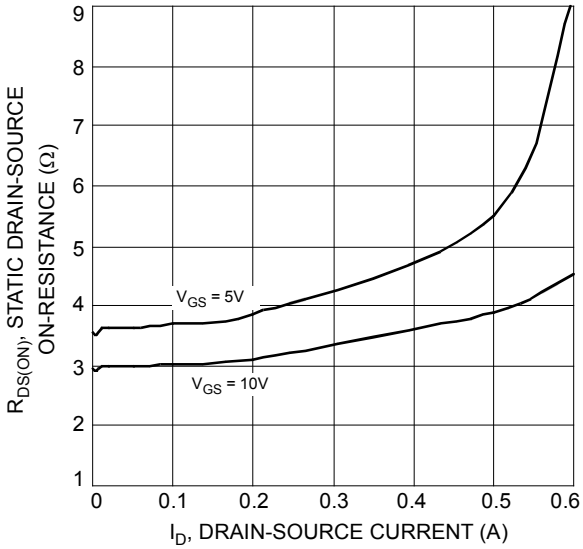



Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

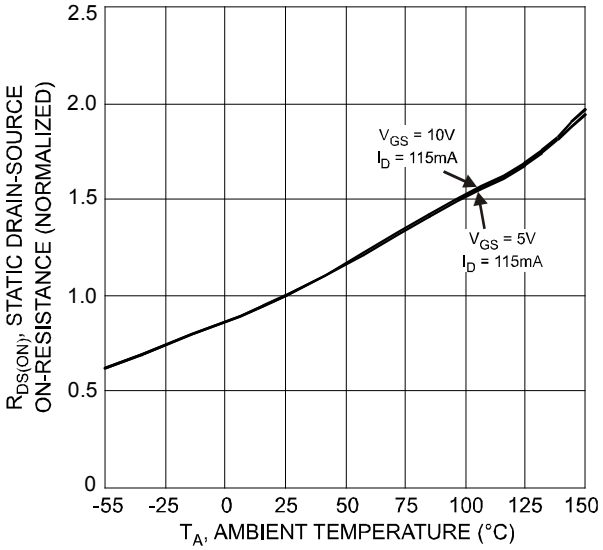



Fig. 4 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

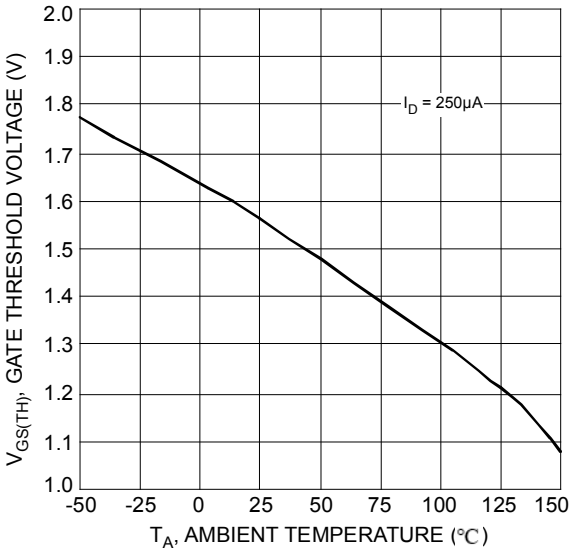



Fig. 5 Gate Threshold Variation vs. Ambient Temperature

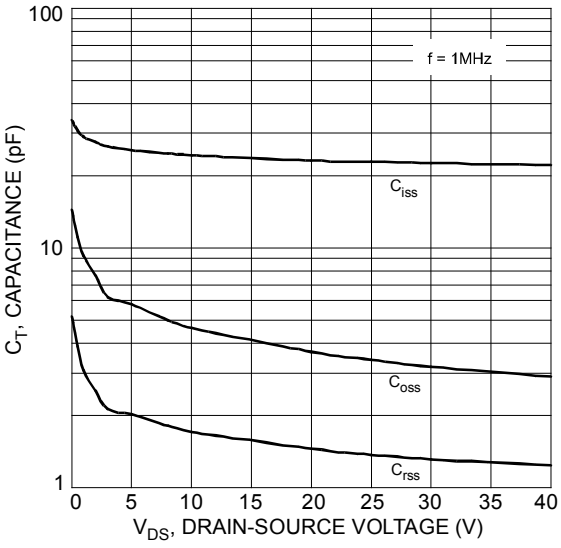



Fig. 6 Typical Total Capacitance


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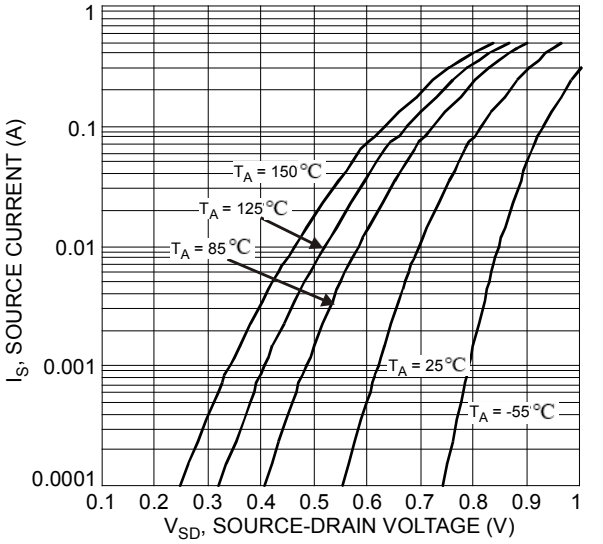


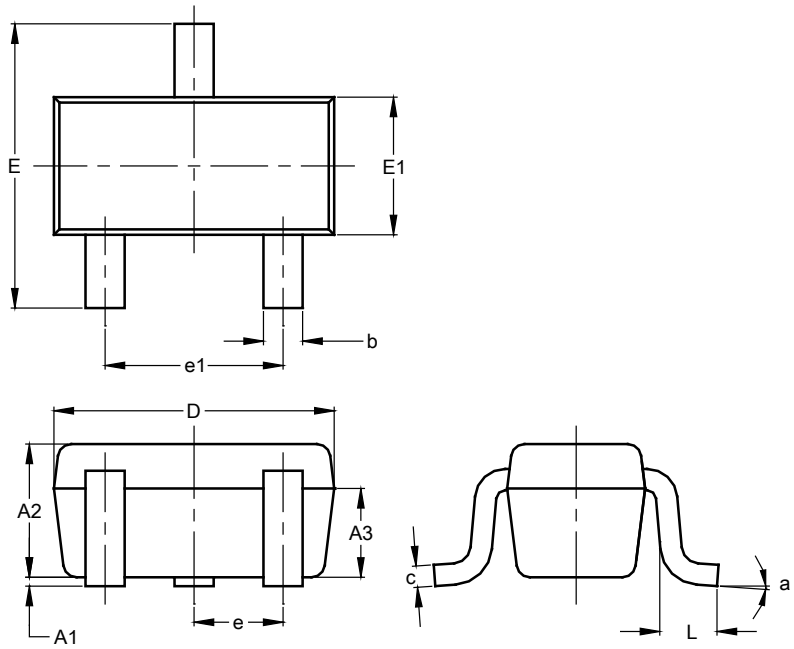

Fig. 7 Reverse Drain Current vs. Source-Drain Voltage


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## Package Outline Dimensions

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

**SOT523**

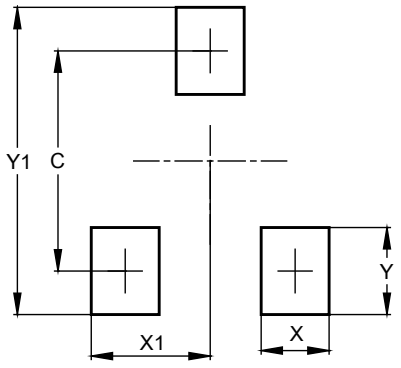



| SOT523 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A1** | 0.00 | 0.10 | 0.05 |
| **A2** | 0.60 | 0.80 | 0.75 |
| **A3** | 0.45 | 0.65 | 0.50 |
| **b** | 0.15 | 0.30 | 0.22 |
| **c** | 0.10 | 0.20 | 0.12 |
| **D** | 1.50 | 1.70 | 1.60 |
| **E** | 1.45 | 1.75 | 1.60 |
| **E1** | 0.75 | 0.85 | 0.80 |
| **e** | 0.50 BSC | | |
| **e1** | 0.90 | 1.10 | 1.00 |
| **L** | 0.20 | 0.40 | 0.33 |
| **a** | 0° | -- | 8° |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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

**SOT523**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 1.29 |
| **X** | 0.40 |
| **X1** | 0.70 |
| **Y** | 0.51 |
| **Y1** | 1.80 |


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