

Features

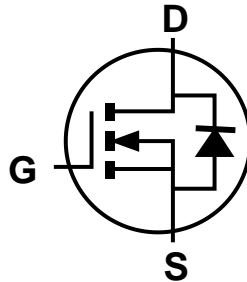
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

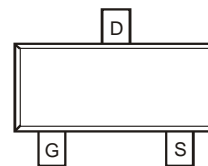
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 (e3)
- Terminals Connections: See Diagram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



Top View



Internal Schematic



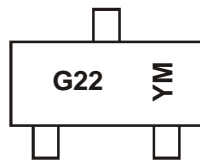
Top View

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------|-------|-------------------|
| DMN2075U-7 | SOT23 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html 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 <http://www.diodes.com/products/packages.html>.

Marking Information



G22 = Product Type Marking Code
 YM = Date Code Marking
 Y or Ȳ = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2009 | ~ | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|------|------|---|------|------|------|------|------|------|------|------|------|
| Code | W | ~ | E | F | G | H | I | J | K | L | M |

| 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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|--|--------------|---------------------------|-----------|---------|-------|
| Drain-Source Voltage | | | V_{DSS} | 20 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 8 | V |
| Continuous Drain Current (Note 5) | Steady State | $T_A = +25^\circ\text{C}$ | I_D | 4.2 | A |
| | | $T_A = +70^\circ\text{C}$ | | 3.4 | |
| Maximum Continuous Body Diode Forward Current (Note 6) | | | I_S | 1.2 | A |
| Pulsed Drain Current (Note 6) | | | I_{DM} | 27 | A |
| Pulsed Body Diode Forward Current (Note 6) | | | I_{SM} | 24 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 5) | P_D | 0.8 | W |
| Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ | $R_{\theta JA}$ | 156 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

- Notes: 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
6. Repetitive rating, pulse width limited by junction temperature.

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|--------------|-----|-------|-----------|------------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | 20 | — | — | V | $V_{GS} = 0V, I_D = 250\mu\text{A}$ |
| Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$ | I_{DSS} | — | — | 100 | nA | $V_{DS} = 16V, V_{GS} = 0V$ |
| Gate-Source Leakage | I_{GSS} | — | — | ± 100 | nA | $V_{GS} = \pm 8V, V_{DS} = 0V$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 0.4 | — | 1.0 | V | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 25 | 38 | m Ω | $V_{GS} = 4.5V, I_D = 3.6A$ |
| | | | 30 | 45 | | $V_{GS} = 2.5V, I_D = 3.1A$ |
| Forward Transfer Admittance | $ Y_{FS} $ | — | 13 | — | S | $V_{DS} = 5V, I_D = 3.6A$ |
| Diode Forward Voltage | V_{SD} | — | 0.75 | 1.0 | V | $V_{GS} = 0V, I_S = 1A$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{ISS} | — | 594.3 | — | pF | $V_{DS} = 10V, V_{GS} = 0V, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{OSS} | — | 64.5 | — | pF | |
| Reverse Transfer Capacitance | C_{RSS} | — | 57.7 | — | pF | |
| Gate Resistance | R_G | — | 1.5 | — | Ω | $V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$ |
| Total Gate Charge | Q_G | — | 7.0 | — | nC | $V_{GS} = 4.5V, V_{DS} = 10V, I_D = 3.6A$ |
| Gate-Source Charge | Q_{GS} | — | 0.9 | — | nC | |
| Gate-Drain Charge | Q_{GD} | — | 1.4 | — | nC | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 7.4 | — | ns | $V_{DD} = 10V, V_{GS} = 4.5V, R_L = 2.78\Omega, R_G = 1.0\Omega$ |
| Turn-On Rise Time | t_R | — | 9.8 | — | ns | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 28.1 | — | ns | |
| Turn-Off Fall Time | t_F | — | 6.7 | — | ns | |

- Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

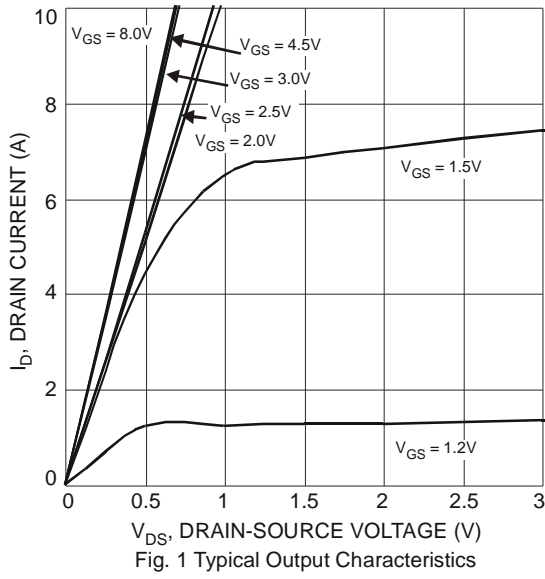


Fig. 1 Typical Output Characteristics

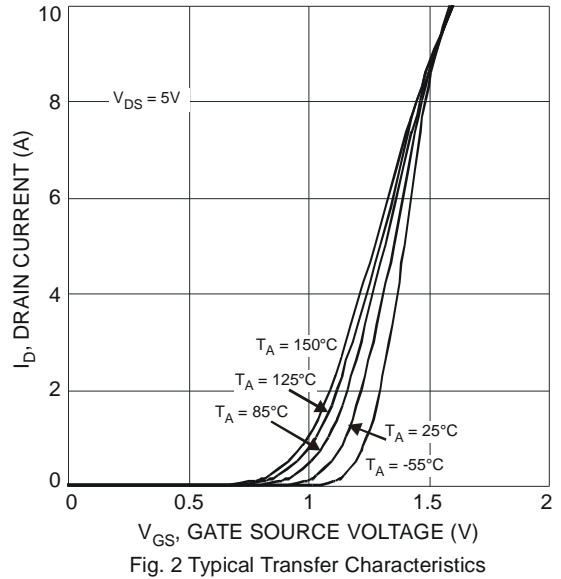


Fig. 2 Typical Transfer Characteristics

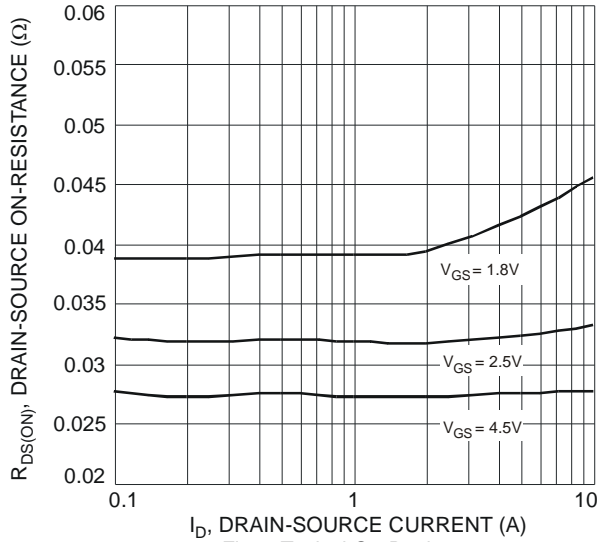


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

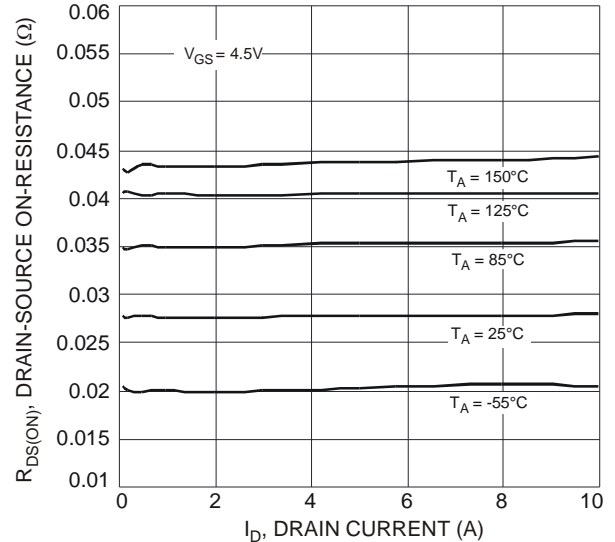


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

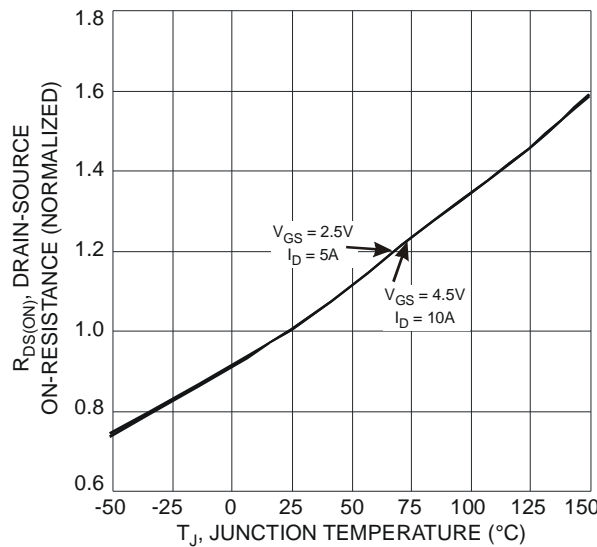


Fig. 5 On-Resistance Variation with Temperature

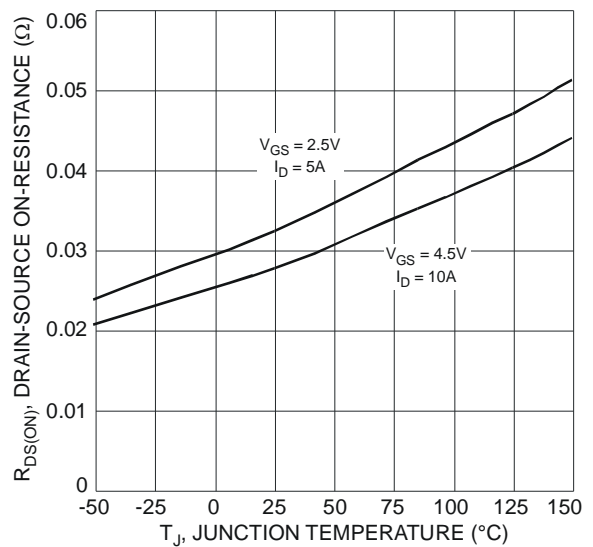


Fig. 6 On-Resistance Variation with Temperature

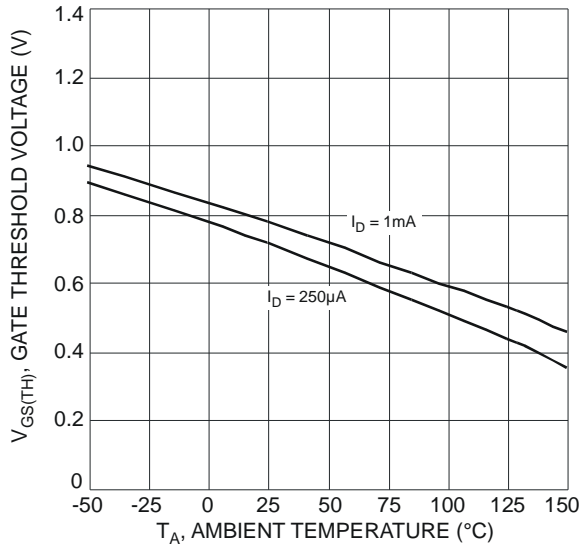


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

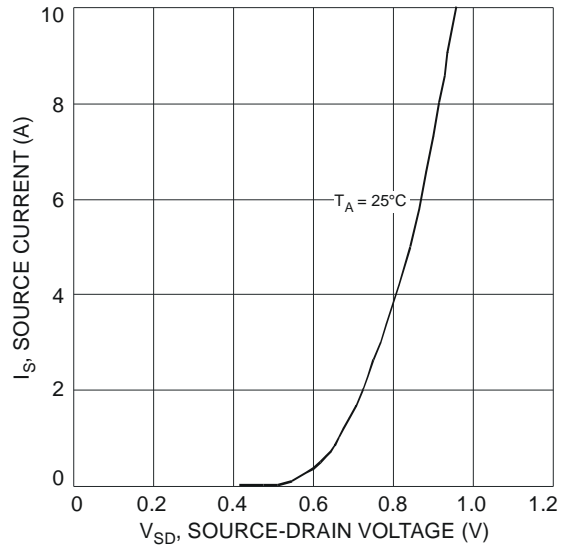


Fig. 8 Diode Forward Voltage vs. Current

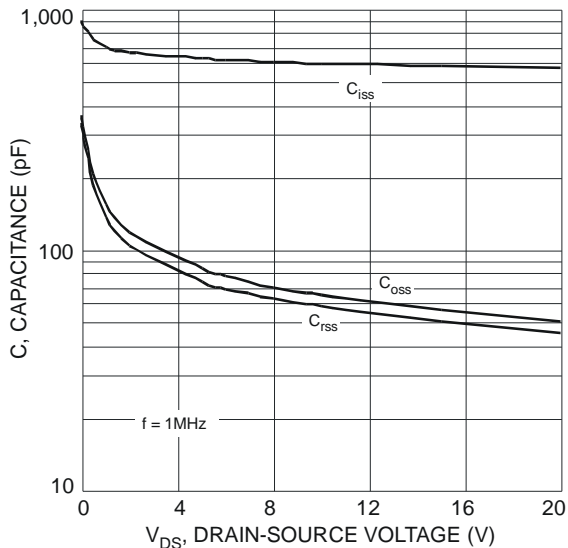


Fig. 9 Typical Capacitance

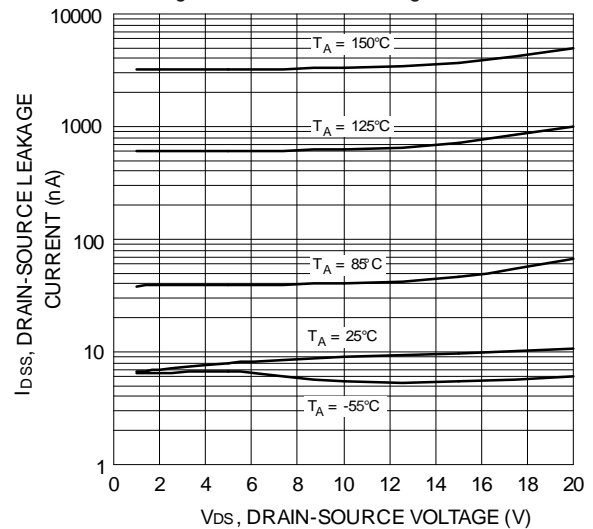


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

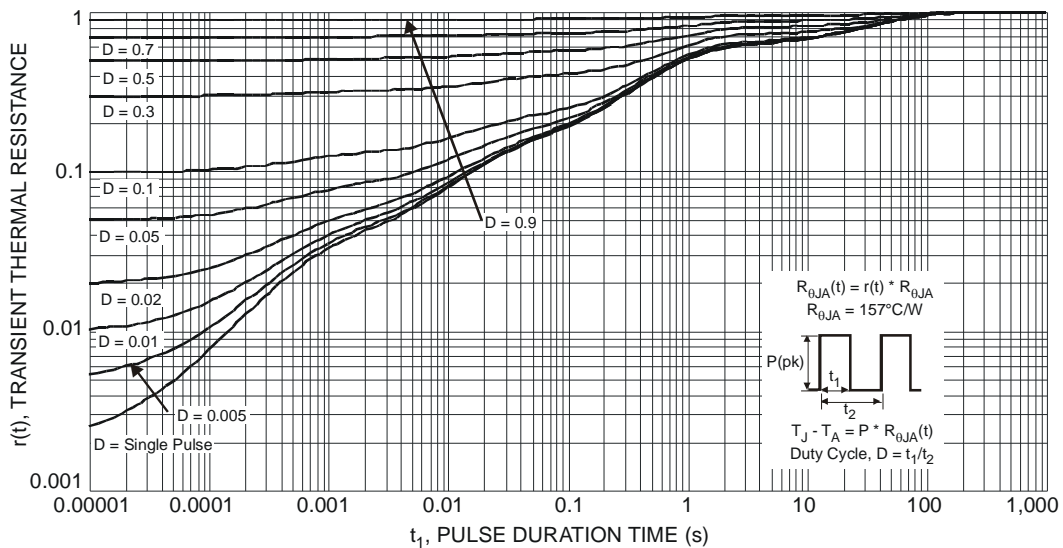
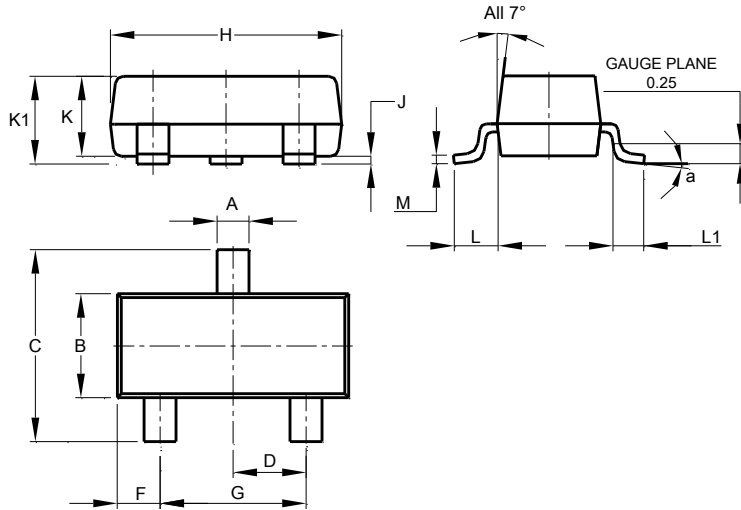


Fig. 11 Transient Thermal Response

Package Outline Dimensions

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

SOT23

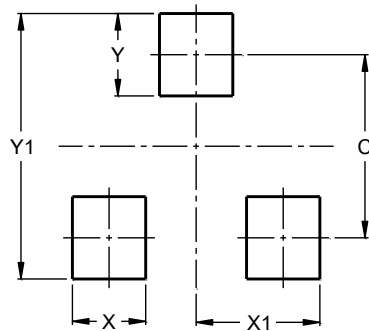


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 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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