

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ | I_D $T_A = 25^\circ\text{C}$ |
|---------------|---------------------------------------|-----------------------------------|
| 20V | 3.0 Ω @ $V_{GS} = 4.5\text{V}$ | 240mA |
| | 6.0 Ω @ $V_{GS} = 1.8\text{V}$ | 180mA |

Description

This new generation MOSFET has been 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.

Applications

- DC-DC Converters
- Power management functions

Features

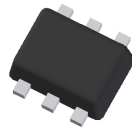
- Dual N-Channel MOSFET
- Low On-Resistance:
 - 3.0 Ω @ 4.5V
 - 4.0 Ω @ 2.5V
 - 6.0 Ω @ 1.8V
 - 10 Ω @ 1.5V
- Very Low Gate Threshold Voltage, 1.05V max
- Low Input Capacitance
- Fast Switching Speed
- Ultra-Small Surface Mount Package
- ESD Protected Gate (HBM 300V)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

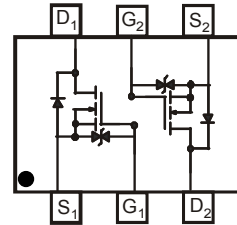
- Case: SOT963
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.0027 grams (approximate)



SOT963



Top View

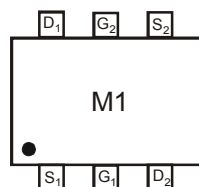

 Top View
Schematic and Transistor Diagram

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|--------------|--------|--------------------|
| DMN26D0UDJ-7 | SOT963 | 10,000/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> 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>.

Marking Information (Note 5)



M1 = Product Type Marking Code

- Notes:
5. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).

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

| Characteristic | | | Symbol | Value | Unit |
|--|--------------|------------------------|------------------|-------|------|
| Drain-Source Voltage | | | V _{DSS} | 20 | V |
| Gate-Source Voltage | | | V _{GSS} | ±10 | V |
| Continuous Drain Current (Note 6) V _{GS} = 4.5V | Steady State | T _A = +25°C | I _D | 240 | mA |
| | | T _A = +70°C | | 190 | |
| Continuous Drain Current (Note 6) V _{GS} = 1.8V | Steady State | T _A = +25°C | I _D | 180 | mA |
| | | T _A = +70°C | | 140 | |
| Pulsed Drain Current - T _P = 10μs | | | I _{DM} | 805 | mA |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 6) | P _D | 300 | mW |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 409 | °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} | 20 | — | — | V | V _{GS} = 0V, I _D = 100μA |
| Zero Gate Voltage Drain Current @ T _C = +25°C | I _{DSS} | — | — | 500 | nA | V _{DS} = 20V, V _{GS} = 0V |
| Gate-Body Leakage | I _{GSS} | — | — | ±1 | μA | V _{GS} = ±10V, V _{DS} = 0V |
| | | | | ±100 | | |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.45 | 0.8 | 1.05 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | 1.8 | 3.0 | Ω | V _{GS} = 4.5V, I _D = 100mA |
| | | | 2.5 | 4.0 | | V _{GS} = 2.5V, I _D = 50mA |
| | | | 3.4 | 6.0 | | V _{GS} = 1.8V, I _D = 20mA |
| | | | 4.7 | 10.0 | | V _{GS} = 1.5V, I _D = 10mA |
| | | | 9.5 | — | | V _{GS} = 1.2V, I _D = 1mA |
| Forward Transconductance | Y _{fs} | 180 | 240 | — | mS | V _{DS} = 10V, I _D = 0.1A |
| Source-Drain Diode Forward Voltage | V _{SD} | 0.5 | 0.8 | 1.0 | V | V _{GS} = 0V, I _S = 10mA |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 14.1 | — | pF | V _{DS} = 15V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 2.9 | — | pF | |
| Reverse Transfer Capacitance | C _{riss} | — | 1.6 | — | pF | |
| SWITCHING CHARACTERISTICS, V_{GS} = 4.5V (Note 8) | | | | | | |
| Turn-On Delay Time | t _{d(on)} | — | 3.8 | — | ns | V _{GS} = 4.5V, V _{DD} = 10V I _D = 200mA, R _G = 2.0Ω |
| Rise Time | t _r | — | 7.9 | — | | |
| Turn-Off Delay Time | t _{d(off)} | — | 13.4 | — | | |
| Fall Time | t _f | — | 15.2 | — | | |

Notes: 6. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch with minimum recommended pad layout; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com>.

7. Short duration pulse test used to minimize self-heating effect.

8. Switching characteristics are independent of operating junction temperature. Guaranteed by design, not subject to production testing.

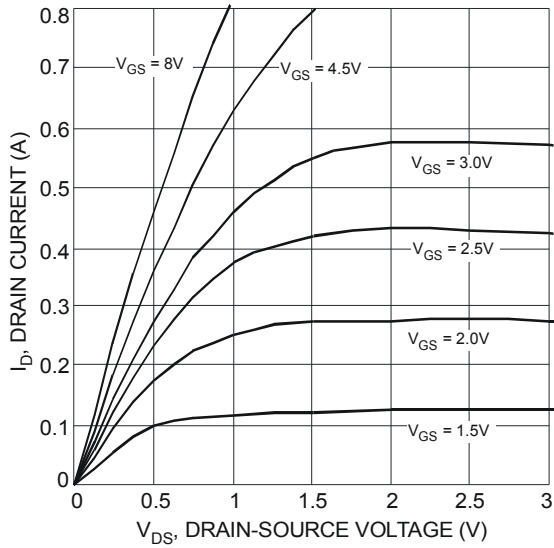


Fig. 1 Typical Output Characteristic

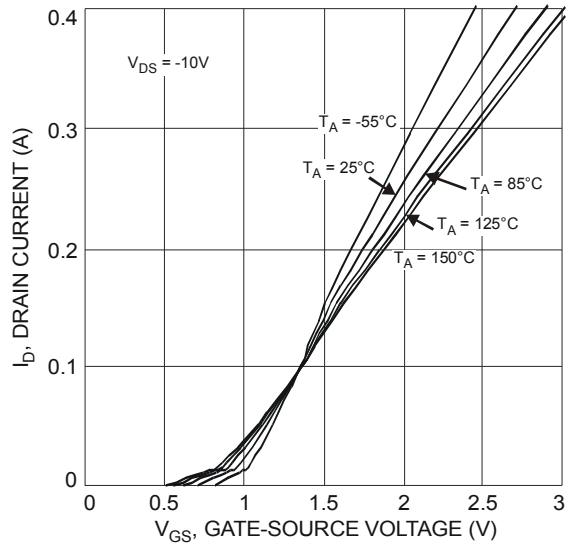


Fig. 2 Typical Transfer Characteristic

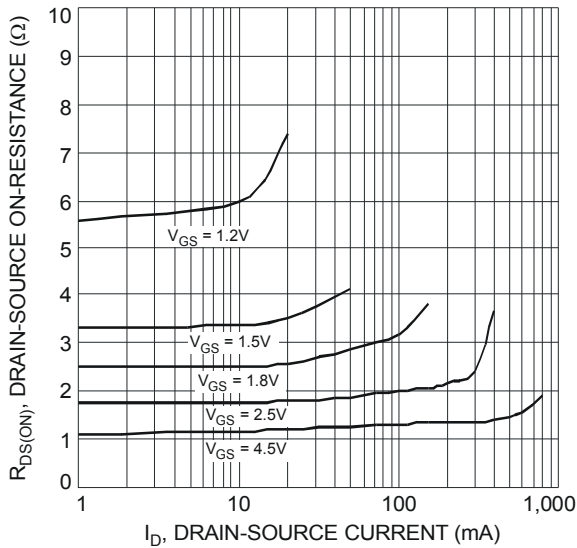


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

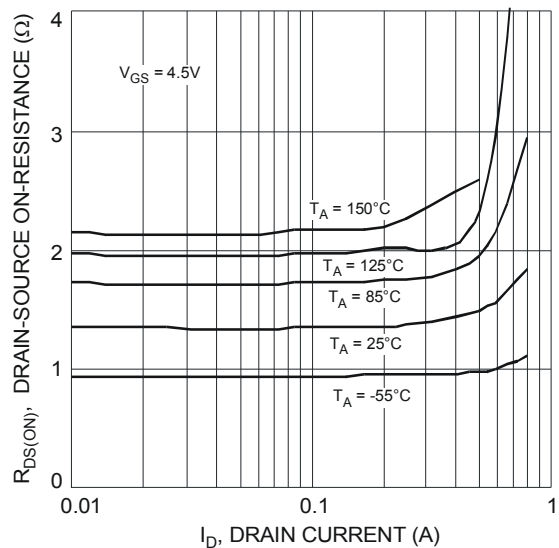


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

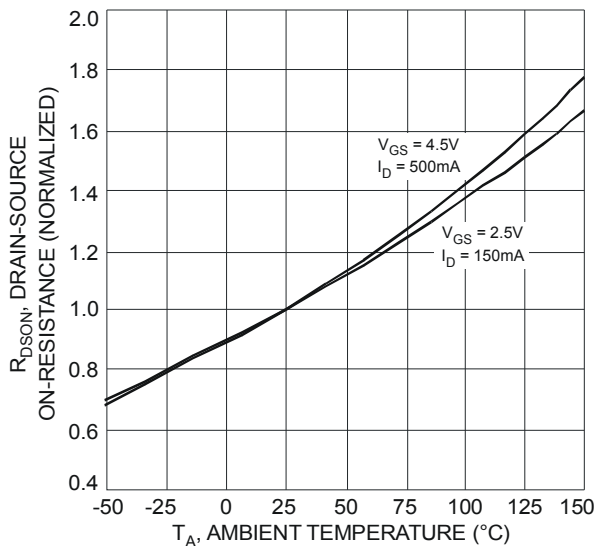


Fig. 5 On-Resistance Variation with Temperature

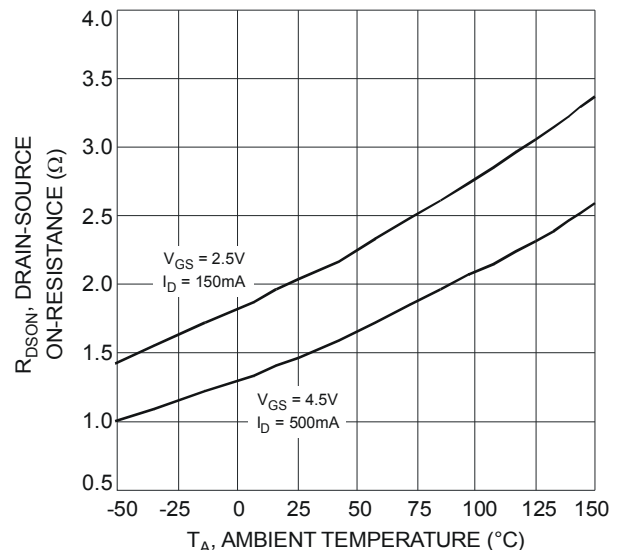


Fig. 6 On-Resistance Variation with Temperature

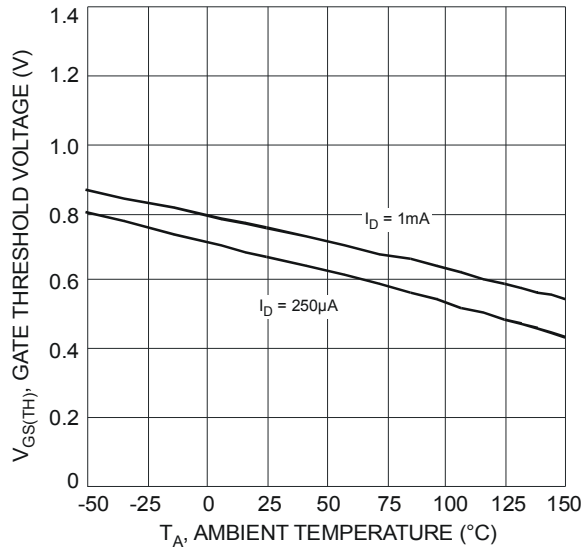


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

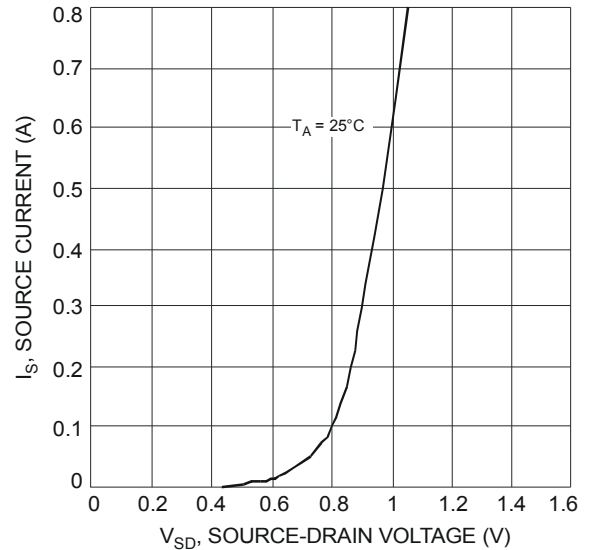


Fig. 8 Diode Forward Voltage vs. Current

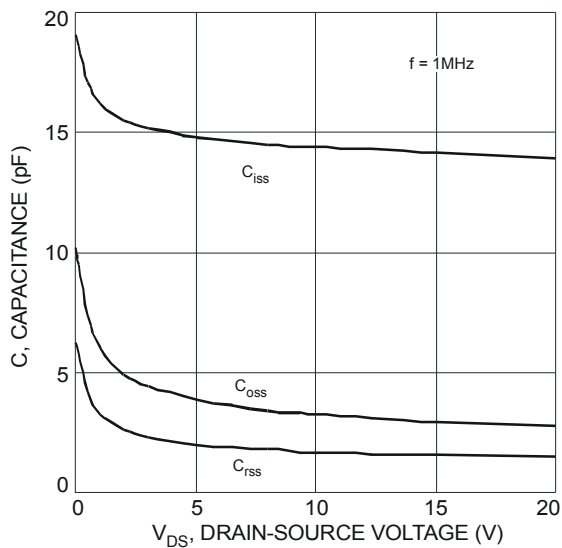


Fig. 9 Typical Total Capacitance

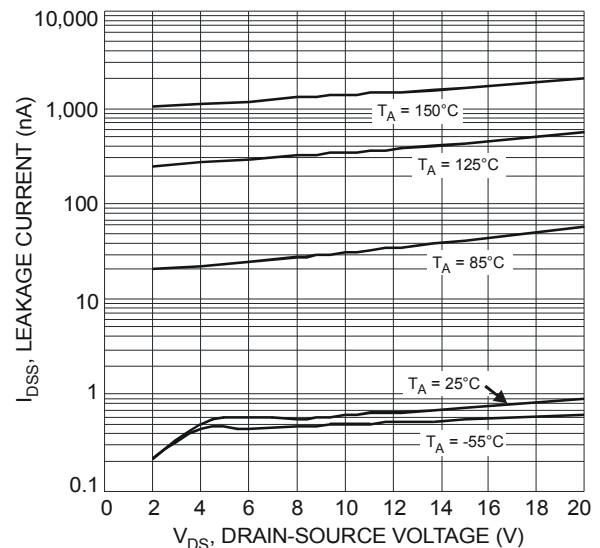
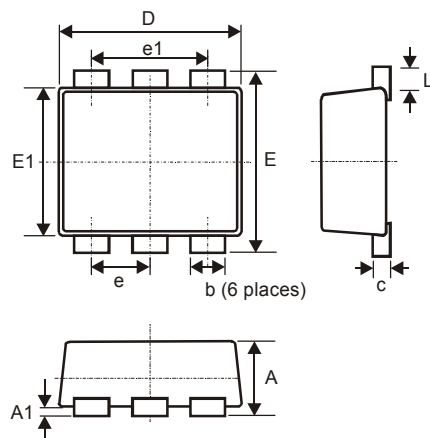


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

Package Outline Dimensions

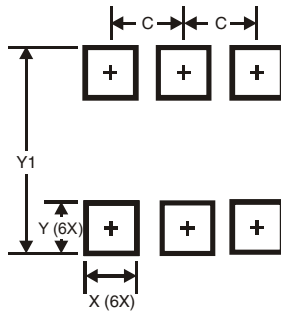
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT963 | | | |
|----------------------|----------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.40 | 0.50 | 0.45 |
| A1 | 0 | 0.05 | - |
| c | 0.120 | 0.180 | 0.150 |
| D | 0.95 | 1.05 | 1.00 |
| E | 0.95 | 1.05 | 1.00 |
| E1 | 0.75 | 0.85 | 0.80 |
| L | 0.05 | 0.15 | 0.10 |
| b | 0.10 | 0.20 | 0.15 |
| e | 0.35 Typ | | |
| e1 | 0.70 Typ | | |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.350 |
| X | 0.200 |
| Y | 0.200 |
| Y1 | 1.100 |

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