# DUAL N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ max | $I_D$ max $T_A$ = +25°C |
|---|---|---|
| 50V | 2.0Ω @ $V_{GS}$ = 5V | 305mA |
| | 2.5Ω @ $V_{GS}$ = 2.5V | 280mA |
| | 3.0Ω @ $V_{GS}$ = 1.8V | 265mA |

## Features

- Low On-Resistance
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected up to 2kV**
- **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**
- **PPAP Capable**

## Description and Applications

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

- General Purpose Interfacing Switch
- Power Management Functions

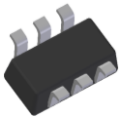
## Mechanical Data

- Case: SOT-26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.015 grams (Approximate)

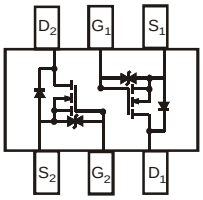
SOT-26

**ESD protected up 2kV**

TOP VIEW



BOTTOM VIEW




TOP VIEW
Internal Schematic

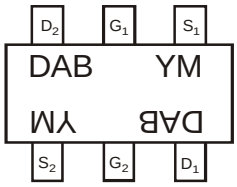
## Ordering Information (Note 5)

| Part Number | Case | Packaging |
|---|---|---|
| DMN5L06DMKQ-7 | SOT-26 | 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

## Marking Information

SOT-26




DAB = Marking Code
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

| Year | 2006 | 2007 | … | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Code | T | U | … | C | D | E | F | G | H | I |

| 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 | | $V_{DSS}$ | 50 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±20 | V |
| Drain Current (Note 6) | Continuous | $I_D$ | 305 | mA |
| | Pulsed (Note 7) | | 800 | |

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

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Total Power Dissipation (Note 6) | $P_D$ | 400 | mW |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 313 | °C/W |
| Operating and Storage Temperature Range | $T_j$, $T_{STG}$ | -65 to +150 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 8)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 50 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 10μA |
| Zero Gate Voltage Drain Current @ $T_C$ = +25°C | $I_{DSS}$ | — | — | 60 | nA | $V_{DS}$ = 50V, $V_{GS}$ = 0V |
| Gate-Body Leakage | $I_{GSS}$ | — | — | 1<br>500<br>50 | μA<br>nA<br>nA | $V_{GS}$ = ±12V, $V_{DS}$ = 0V<br>$V_{GS}$ = ±10V, $V_{DS}$ = 0V<br>$V_{GS}$ = ±5V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 8)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 0.49 | — | 1.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA |
| Static Drain-Source On-Resistance | $R_{DS\ (ON)}$ | —<br>—<br>— | —<br>—<br>— | 3.0<br>2.5<br>2.0 | Ω | $V_{GS}$ = 1.8V, $I_D$ = 50mA<br>$V_{GS}$ = 2.5V, $I_D$ = 50mA<br>$V_{GS}$ = 5.0V, $I_D$ = 50mA |
| On-State Drain Current | $I_{D(ON)}$ | 0.5 | 1.4 | — | A | $V_{GS}$ = 10V, $V_{DS}$ = 7.5V |
| Forward Transconductance | $\|Y_{fs}\|$ | 200 | — | — | mS | $V_{DS}$ =10V, $I_D$ = 0.2A |
| Source-Drain Diode Forward Voltage | $V_{SD}$ | 0.5 | — | 1.4 | V | $V_{GS}$ = 0V, $I_S$ = 115mA |
| **DYNAMIC CHARACTERISTICS** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | — | 50 | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0V<br>f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | — | — | 25 | pF | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | — | 5.0 | pF | |

Notes:
6. Device mounted on FR-4 PCB.
7. Pulse width ≤10μS, Duty Cycle ≤1%.
8. Short duration pulse test used to minimize self-heating effect.


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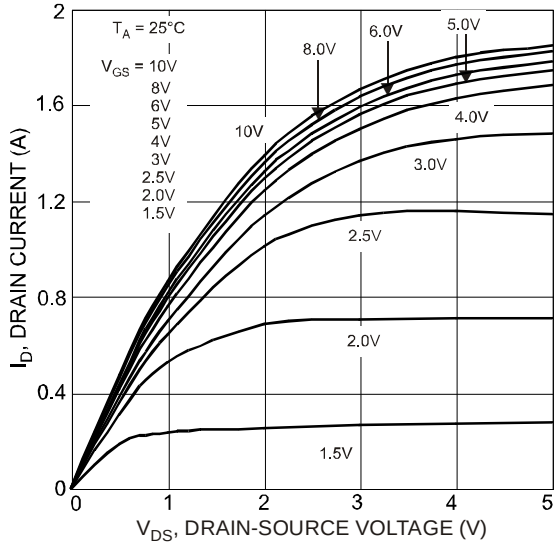


Fig. 1 Typical Output Characteristics

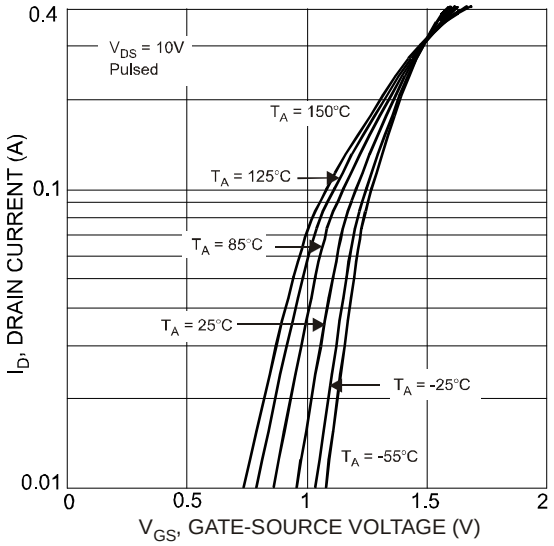


Fig. 2 Typical Transfer Characteristics

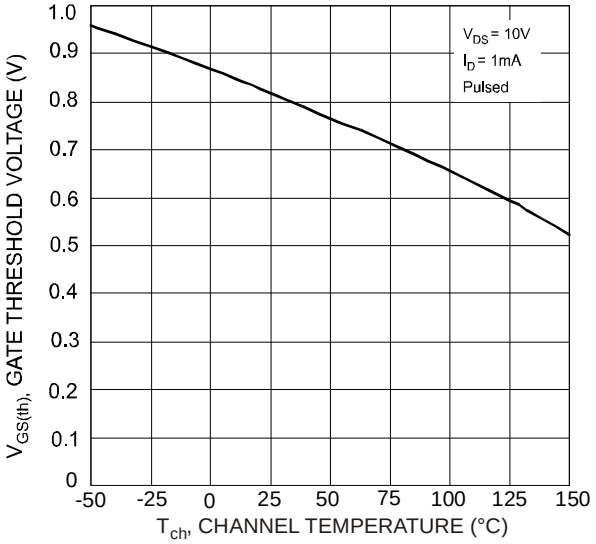


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

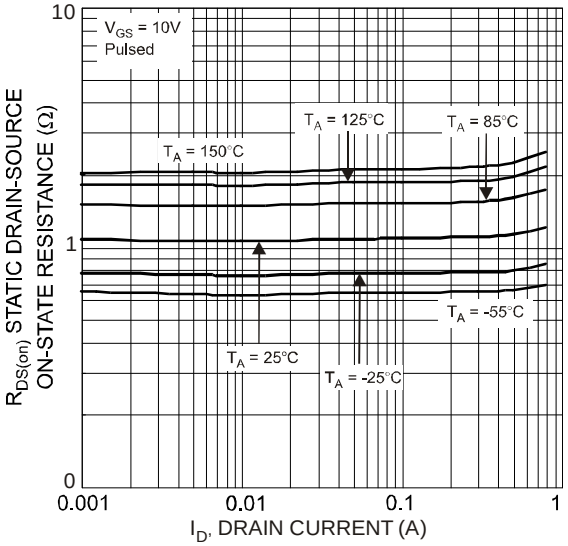


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

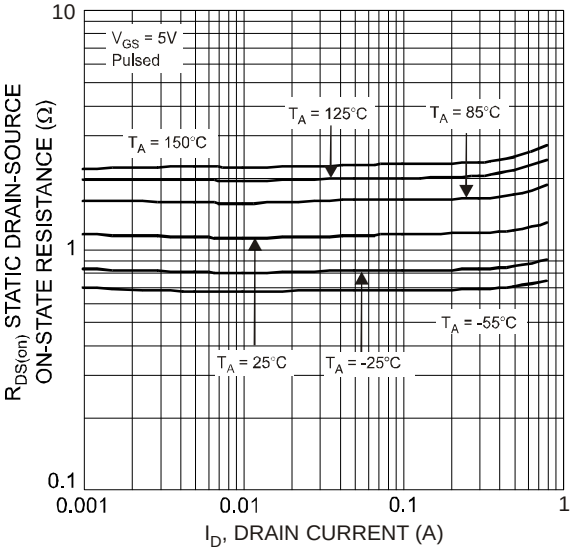


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

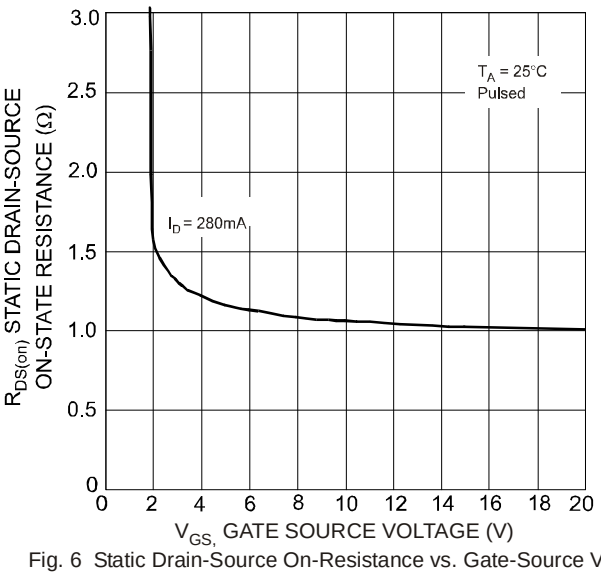


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage


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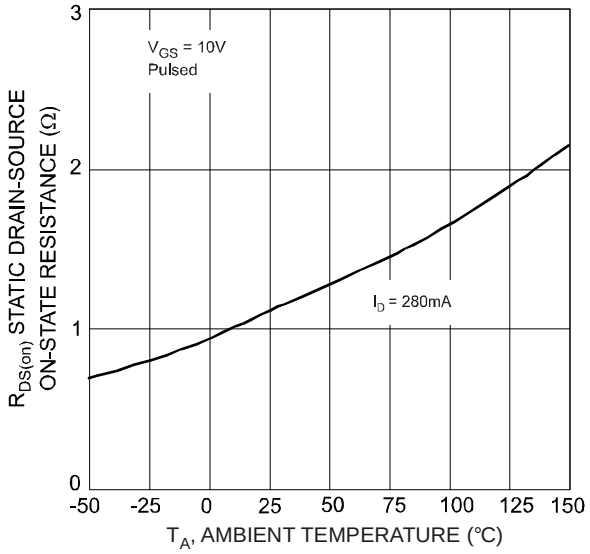


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

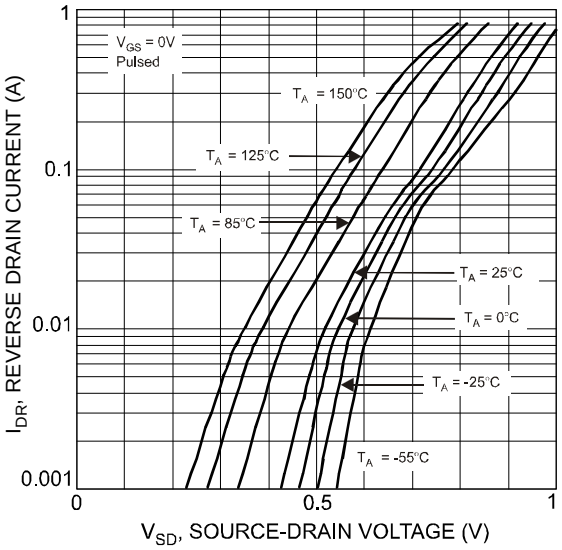


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

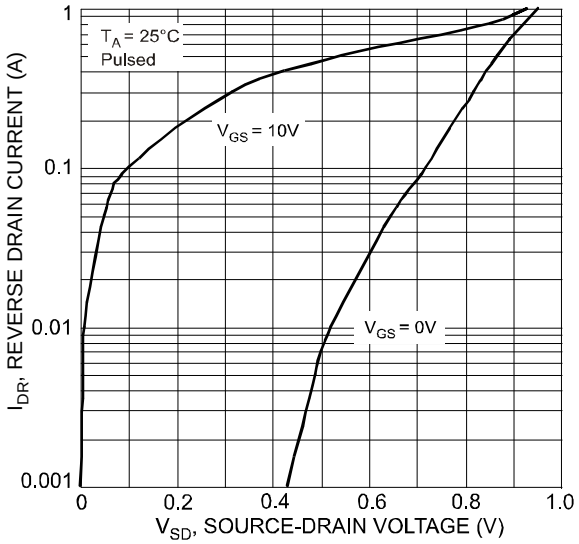


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

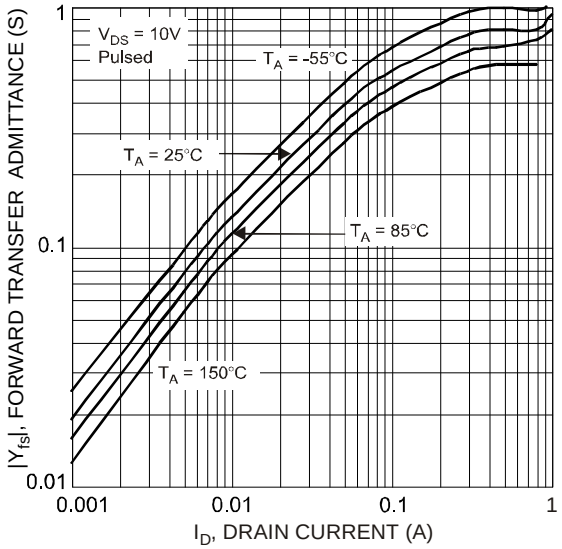


Fig.10 Forward Transfer Admittance vs. Drain Current

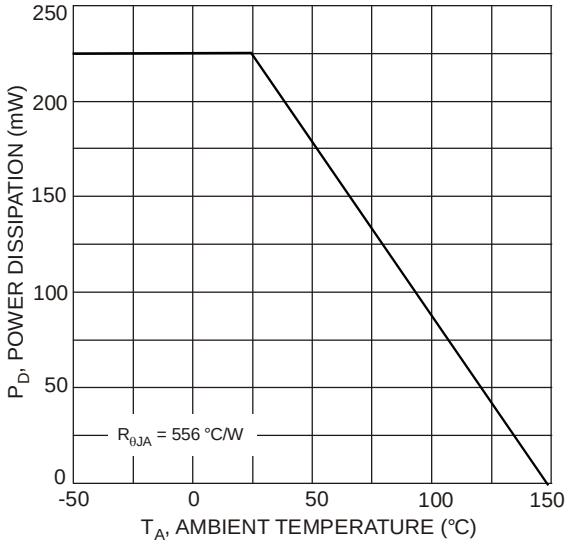


Fig. 11 Derating Curve - Total


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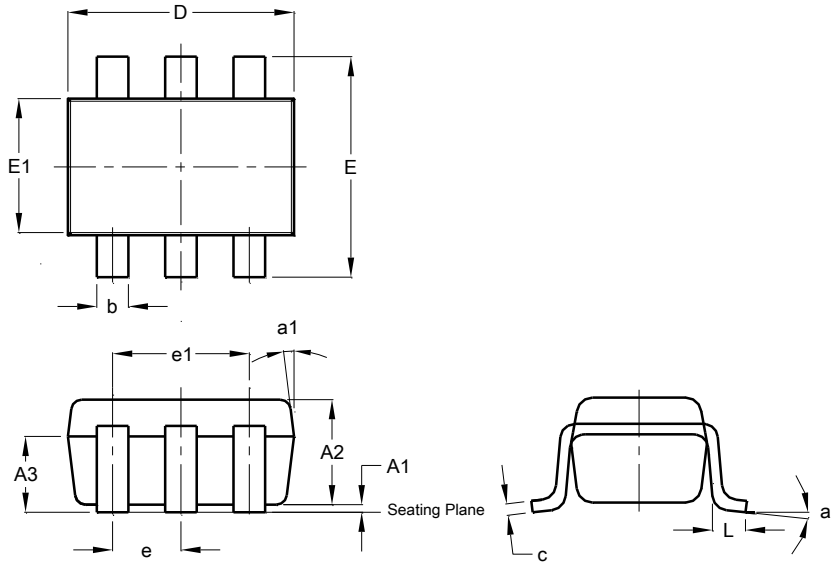
## Package Outline Dimensions

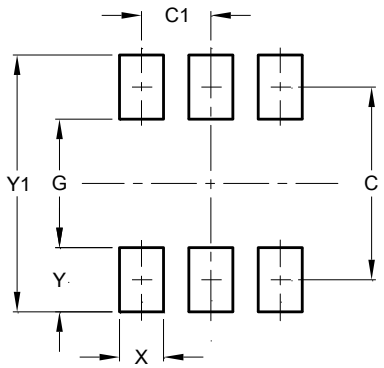
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.




| SOT26 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A1** | 0.013 | 0.10 | 0.05 |
| **A2** | 1.00 | 1.30 | 1.10 |
| **A3** | 0.70 | 0.80 | 0.75 |
| **b** | 0.35 | 0.50 | 0.38 |
| **c** | 0.10 | 0.20 | 0.15 |
| **D** | 2.90 | 3.10 | 3.00 |
| **e** | - | - | 0.95 |
| **e1** | - | - | 1.90 |
| **E** | 2.70 | 3.00 | 2.80 |
| **E1** | 1.50 | 1.70 | 1.60 |
| **L** | 0.35 | 0.55 | 0.40 |
| **a** | - | - | 8° |
| **a1** | - | - | 7° |
| **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** | 2.40 |
| **C1** | 0.95 |
| **G** | 1.60 |
| **X** | 0.55 |
| **Y** | 0.80 |
| **Y1** | 3.20 |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