

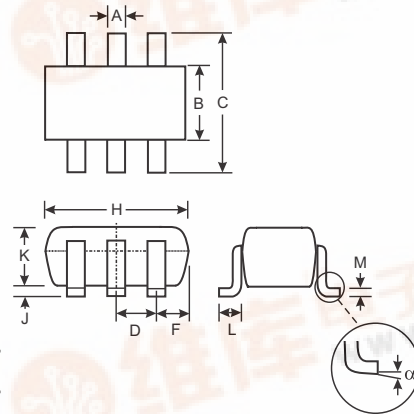


# DMN2004DMK

## DUAL N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

### Features

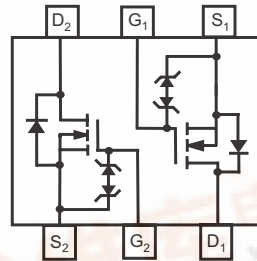
- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **ESD Protected up to 2KV**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 standards for High Reliability**



| SOT-26               |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 0.35  | 0.50 | 0.38 |
| B                    | 1.50  | 1.70 | 1.60 |
| C                    | 2.70  | 3.00 | 2.80 |
| D                    | —     | —    | 0.95 |
| F                    | —     | —    | 0.55 |
| H                    | 2.90  | 3.10 | 3.00 |
| J                    | 0.013 | 0.10 | 0.05 |
| K                    | 1.00  | 1.30 | 1.10 |
| L                    | 0.35  | 0.55 | 0.40 |
| M                    | 0.10  | 0.20 | 0.15 |
| $\alpha$             | 0°    | 8°   | —    |
| All Dimensions in mm |       |      |      |

### 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 Connections: See Diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking: See Page 2
- Ordering & Date Code Information: See Page 2
- Weight: 0.015 grams (approximate)



ESD protected up to 2KV

### Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic                          |              |                                                | Symbol                            | Value       | Units |
|-----------------------------------------|--------------|------------------------------------------------|-----------------------------------|-------------|-------|
| Drain-Source Voltage                    |              |                                                | V <sub>DSS</sub>                  | 20          | V     |
| Gate-Source Voltage                     |              |                                                | V <sub>GSS</sub>                  | ±8          | V     |
| Drain Current (Note 1)                  | Steady State | T <sub>A</sub> = 25°C<br>T <sub>A</sub> = 85°C | I <sub>D</sub>                    | 540<br>390  | mA    |
| Pulsed Drain Current (Note 3)           |              |                                                | I <sub>DM</sub>                   | 1.5         | A     |
| Total Power Dissipation (Note 1)        |              |                                                | P <sub>d</sub>                    | 225         | mW    |
| Thermal Resistance, Junction to Ambient |              |                                                | R <sub>θJA</sub>                  | 556         | °C/W  |
| Operating and Storage Temperature Range |              |                                                | T <sub>j</sub> , T <sub>STG</sub> | -65 to +150 | °C    |

- Note:
1. Device mounted on FR-4 PCB.
  2. No purposefully added lead.
  3. Pulse width  $\leq 10\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .
  4. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).

## Electrical Characteristics

@  $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic                      | Symbol       | Min | Typ | Max     | Unit     | Test Condition                              |
|-------------------------------------|--------------|-----|-----|---------|----------|---------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 5)</b> |              |     |     |         |          |                                             |
| Drain-Source Breakdown Voltage      | $BV_{DSS}$   | 20  | —   | —       | V        | $V_{GS} = 0V, I_D = 10\mu A$                |
| Zero Gate Voltage Drain Current     | $I_{DSS}$    | —   | —   | 1       | $\mu A$  | $V_{DS} = 16V, V_{GS} = 0V$                 |
| Gate-Source Leakage                 | $I_{GSS}$    | —   | —   | $\pm 1$ | $\mu A$  | $V_{GS} = \pm 4.5V, V_{DS} = 0V$            |
| <b>ON CHARACTERISTICS (Note 5)</b>  |              |     |     |         |          |                                             |
| Gate Threshold Voltage              | $V_{GS(th)}$ | 0.5 | —   | 1.0     | V        | $V_{DS} = V_{GS}, I_D = 250\mu A$           |
| Static Drain-Source On-Resistance   | $R_{DS(on)}$ | —   | 0.4 | 0.55    | $\Omega$ | $V_{GS} = 4.5V, I_D = 540mA$                |
|                                     |              |     | 0.5 | 0.70    |          | $V_{GS} = 2.5V, I_D = 500mA$                |
|                                     |              |     | 0.7 | 0.9     |          | $V_{GS} = 1.8V, I_D = 350mA$                |
| Forward Transfer Admittance         | $ Y_{fs} $   | 200 | —   | —       | ms       | $V_{DS} = 10V, I_D = 0.2A$                  |
| Diode Forward Voltage (Note 5)      | $V_{SD}$     | 0.5 | —   | 1.4     | V        | $V_{GS} = 0V, I_S = 115mA$                  |
| <b>DYNAMIC CHARACTERISTICS</b>      |              |     |     |         |          |                                             |
| Input Capacitance                   | $C_{iss}$    | —   | —   | 150     | pF       | $V_{DS} = 16V, V_{GS} = 0V$<br>$f = 1.0MHz$ |
| Output Capacitance                  | $C_{oss}$    | —   | —   | 25      | pF       |                                             |
| Reverse Transfer Capacitance        | $C_{rss}$    | —   | —   | 20      | pF       |                                             |

Notes: 5. Short duration test pulse used to minimize self-heating effect.

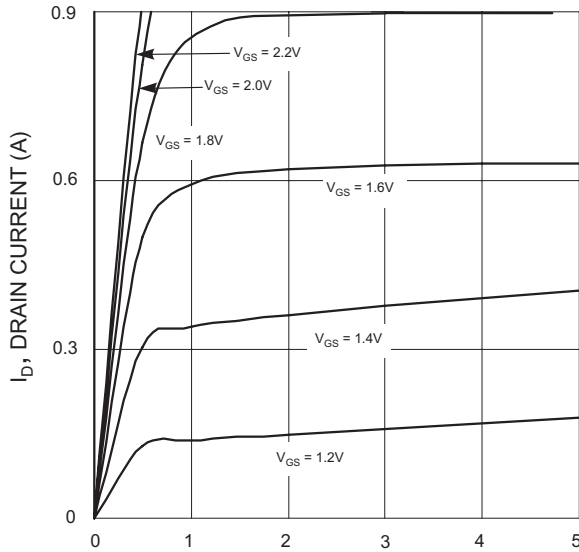


Fig. 1 Typical Output Characteristics

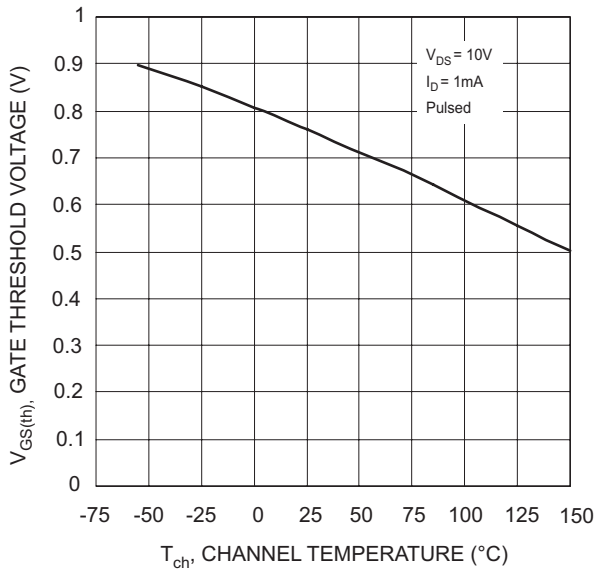


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

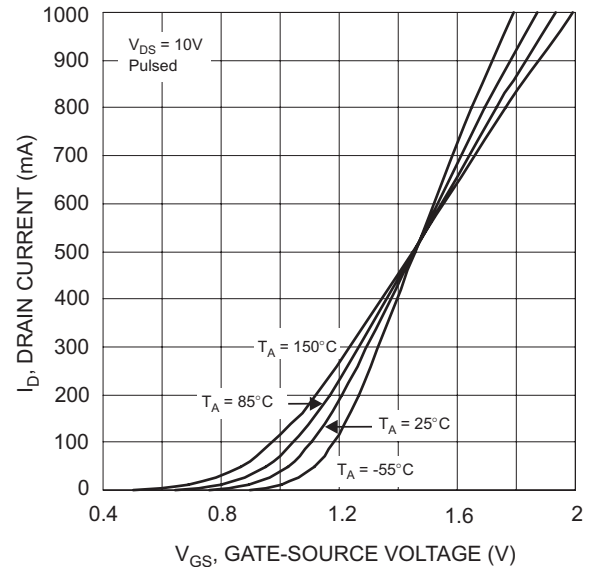


Fig. 2 Reverse Drain Current vs. Source-Drain Voltage

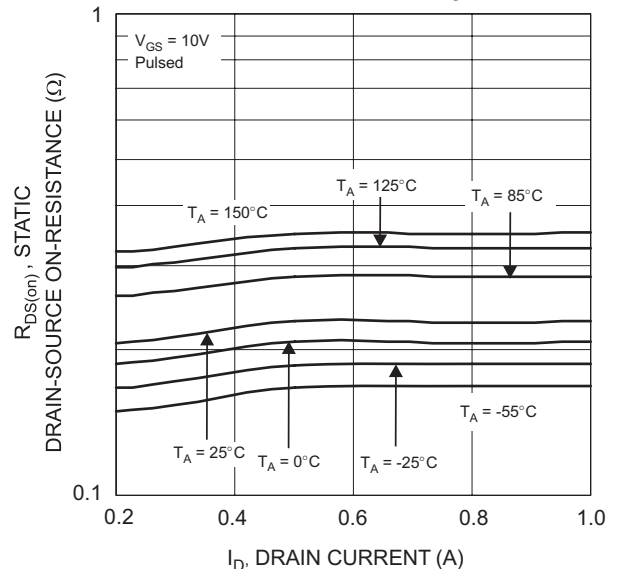


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

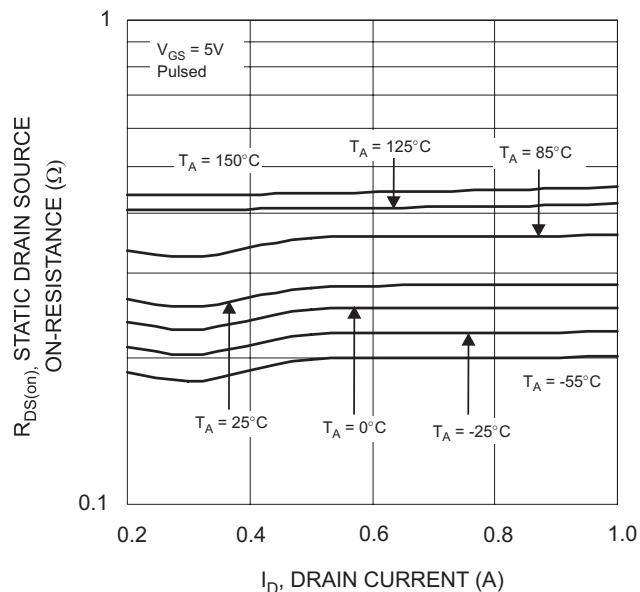


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

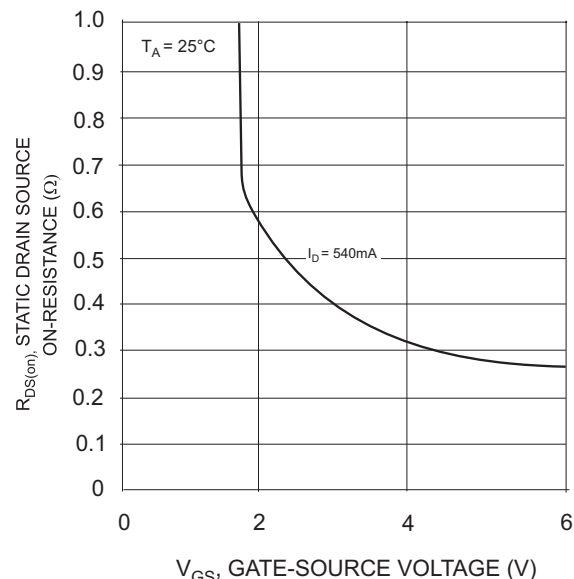


Fig. 6 Static Drain-Source, On-Resistance vs. Gate-Source Voltage

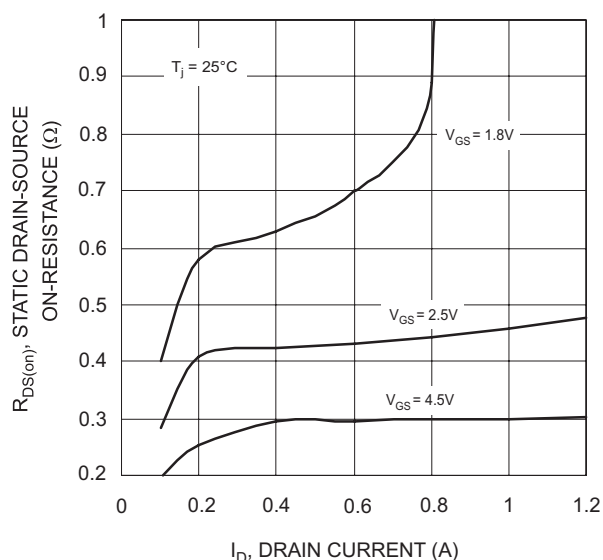


Fig. 7 On-Resistance vs. Drain Current and Gate Voltage

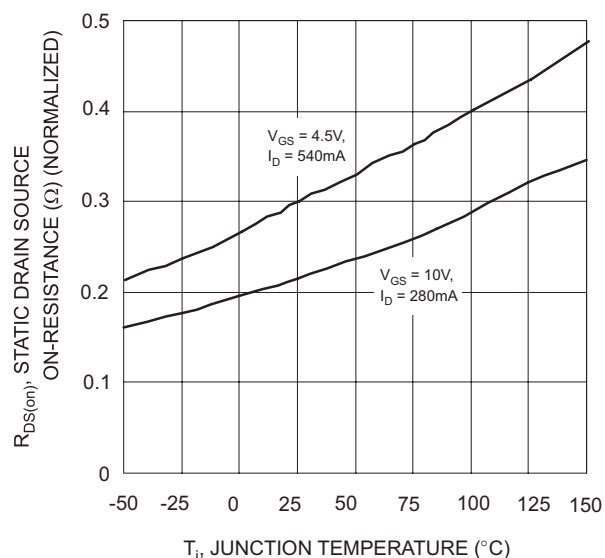


Fig. 8 Static Drain-Source, On-Resistance vs. Temperature

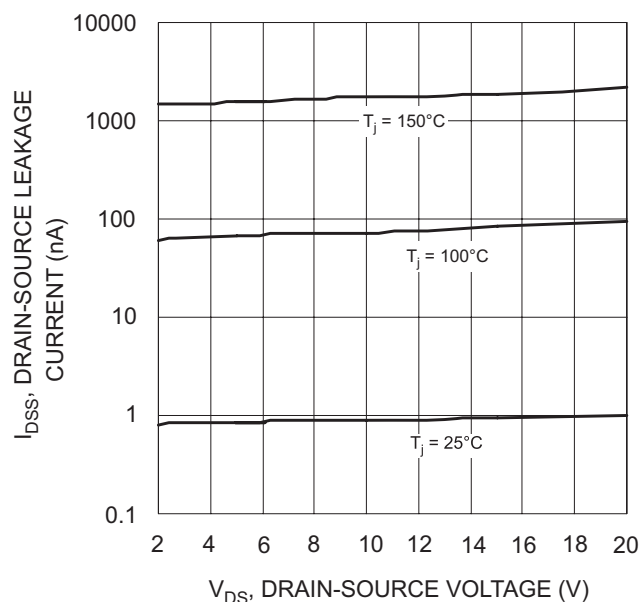


Fig. 9 Drain Source Leakage Current vs. Voltage

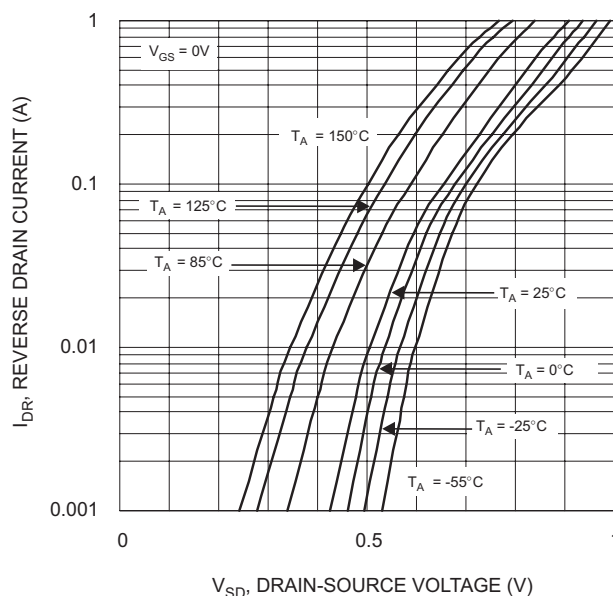


Fig. 10 Reverse Drain Current vs. Source Drain Voltage

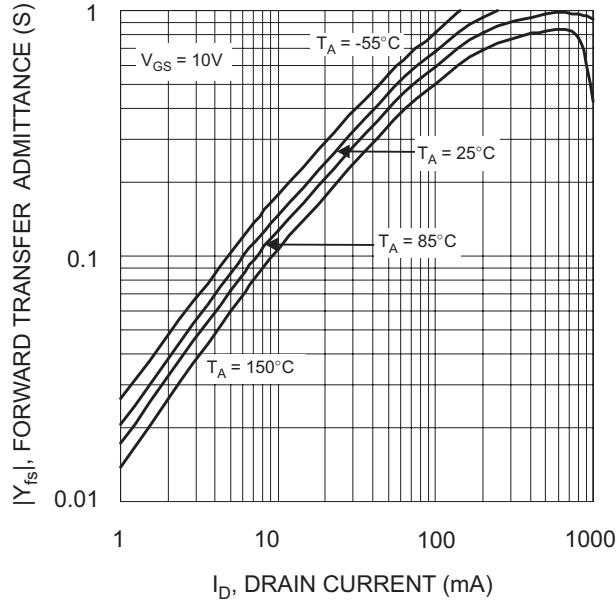


Fig. 11 Forward Transfer Admittance vs. Drain Current

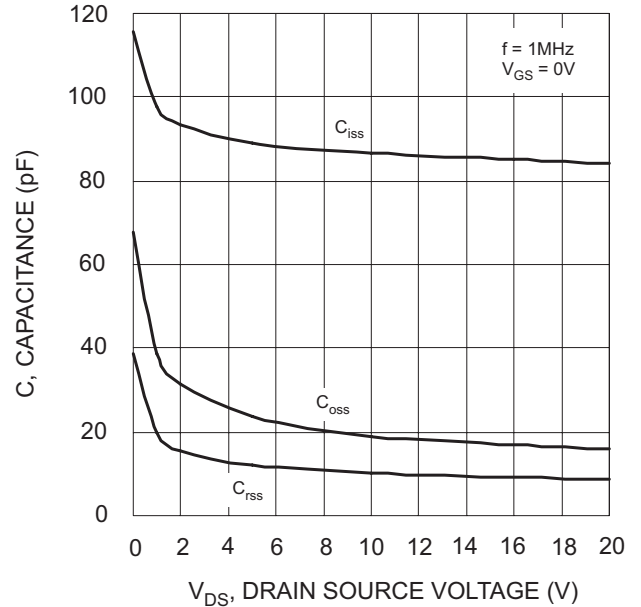


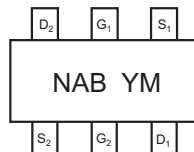
Fig. 12 Capacitance Variation

## Ordering Information (Note 6)

| Device       | Packaging | Shipping         |
|--------------|-----------|------------------|
| DMN2004DMK-7 | SOT-26    | 3000/Tape & Reel |

Notes: 6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



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

### Date Code Key

| Year | 2006 | 2007 | 2008 | 2009 |
|------|------|------|------|------|
| Code | T    | U    | V    | W    |

| Month | Jan | Feb | March | 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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