

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON) \max}$ | $I_D \max$ $T_A = 25^\circ\text{C}$ |
|---------------|-----------------------|--|
| 60V | 2.4Ω @ $V_{GS} = 10V$ | 510mA |
| | 4.0Ω @ $V_{GS} = 4V$ | 390mA |

Description and Applications

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.

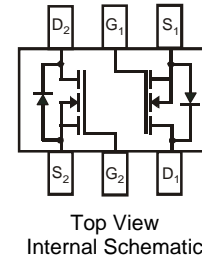
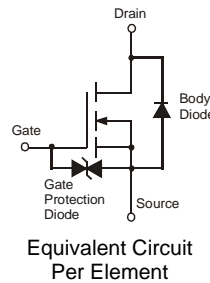
- DC-DC Converters
- Power management functions
- Analog Switch

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected Up To 2kV**
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT26
- 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
- Weight: 0.015 grams (approximate)

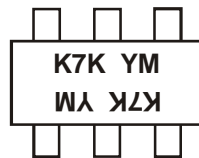


Ordering Information (Note 3)

| Part Number | Case | Packaging |
|-------------|-------|------------------|
| DMN601DMK-7 | SOT26 | 3000/Tape & Reel |

- Notes:
1. No purposefully added lead
 2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
 3. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



K7K = Marking Code
 YM = Date Code Marking
 Y = Year (ex: S = 2005)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| 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 | | | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) V _{GS} = 10V | Steady State | T _A = 25°C T _A = 70°C | I _D | 510 400 | mA |
| | t < 10s | T _A = 25°C T _A = 70°C | I _D | 580 470 | mA |
| Continuous Drain Current (Note 5) V _{GS} = 4V | Steady State | T _A = 25°C T _A = 70°C | I _D | 390 300 | mA |
| | t < 10s | T _A = 25°C T _A = 70°C | I _D | 440 340 | mA |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | | | I _{DM} | 850 | mA |
| Maximum Body Diode Continuous Current | | | I _S | 1.2 | A |

Thermal Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Value | Units |
|--|--------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 4) | | P _D | 0.7 | W |
| Thermal Resistance, Junction to Ambient (Note 4) | Steady state | R _{θJA} | 157 | °C/W |
| | t < 10s | | 121 | |
| Total Power Dissipation (Note 5) | | P _D | 0.98 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state | R _{θJA} | 113 | °C/W |
| | t < 10s | | 88 | |
| Thermal Resistance, Junction to Case (Note 5) | | R _{θJC} | 26 | |
| 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 | — | — | V | V _{GS} = 0V, I _D = 10µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 60V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | µA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 6) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 1.0 | 1.6 | 2.5 | V | V _{DS} = 10V, I _D = 1mA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | — | 2.4 | Ω | V _{GS} = 10V, I _D = 200mA |
| | | | | 4.0 | | V _{GS} = 4V, I _D = 200mA |
| Forward Transfer Admittance | Y _{fs} | 100 | — | — | ms | V _{DS} = 10V, I _D = 200mA |
| Diode Forward Voltage | V _{SD} | 0.5 | — | 1.4 | V | V _{GS} = 0V, I _S = 115mA |
| DYNAMIC CHARACTERISTICS (Note 7) | | | | | | |
| Input Capacitance | C _{iSS} | — | 30 | 50 | pF | V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oSS} | — | 5 | 25 | pF | |
| Reverse Transfer Capacitance | C _{rSS} | — | 3 | 5.0 | pF | |
| Gate Resistance | R _g | — | 133 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge | Q _g | — | 304 | — | nC | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 250mA |
| Gate-Source Charge | Q _{gs} | — | 84 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 203 | — | | |
| Turn-On Delay Time | t _{D(on)} | — | 3.9 | — | ns | V _{DS} = 30V, I _D = 0.2A, V _{GS} = 10V, R _G = 25Ω, R _L = 150Ω |
| Turn-On Rise Time | t _r | — | 3.4 | — | | |
| Turn-Off Delay Time | t _{D(off)} | — | 15.7 | — | | |
| Turn-Off Fall Time | t _f | — | 9.9 | — | | |

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate
 - Short duration pulse test used to minimize self-heating effect
 - Guaranteed by design. Not subject to production testing

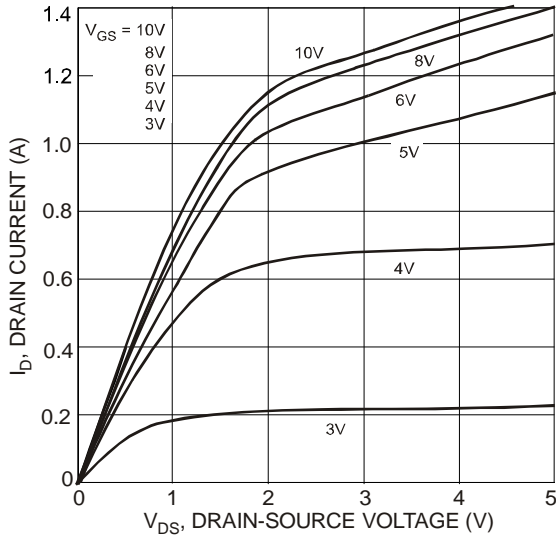


Fig. 1 Typical Output Characteristics

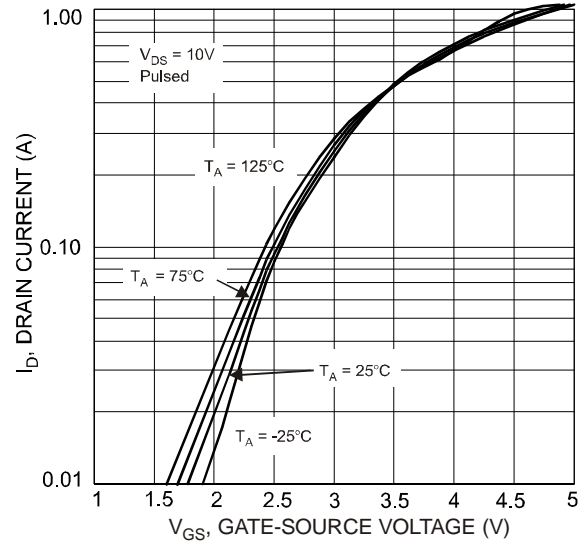


Fig. 2 Typical Transfer Characteristics

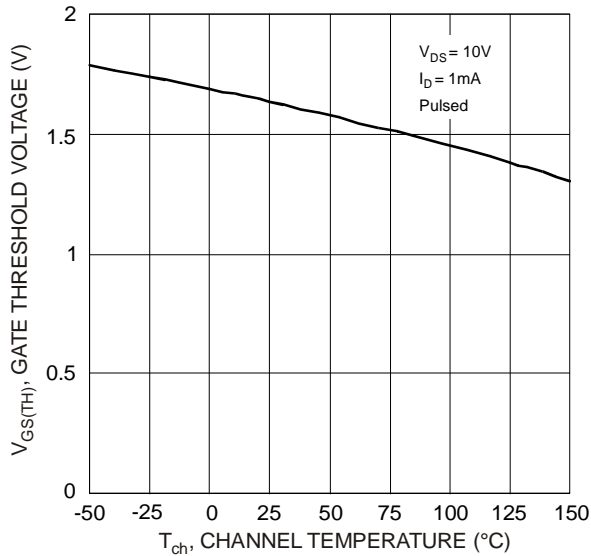


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

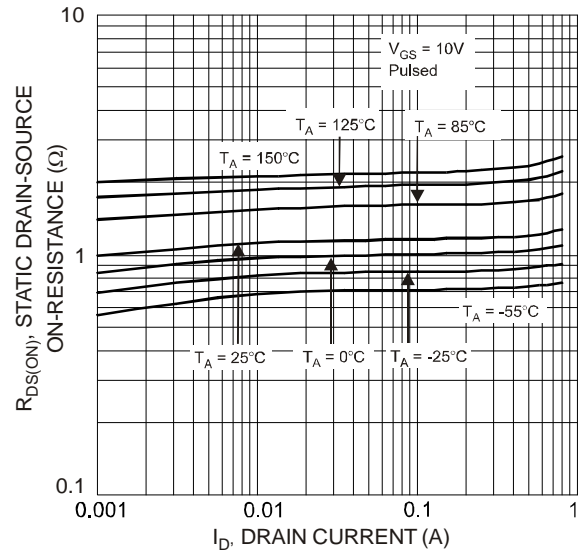


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

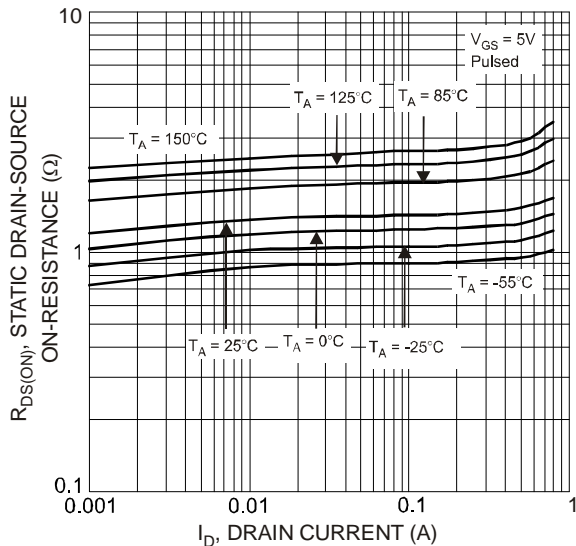


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

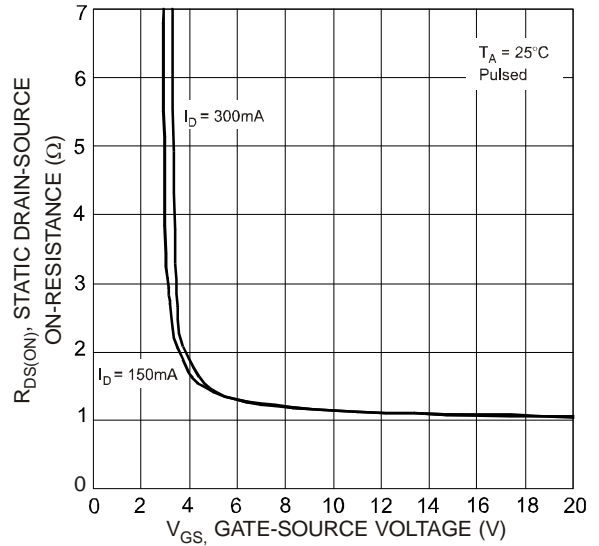


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

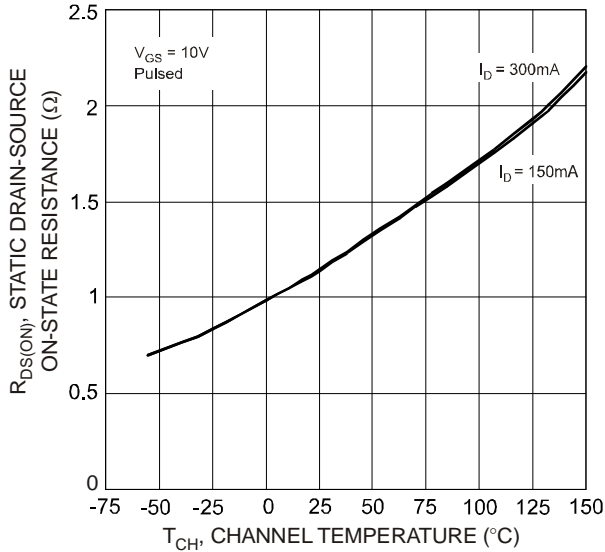


Fig. 7 Static Drain-Source On-State Resistance vs. Channel Temperature

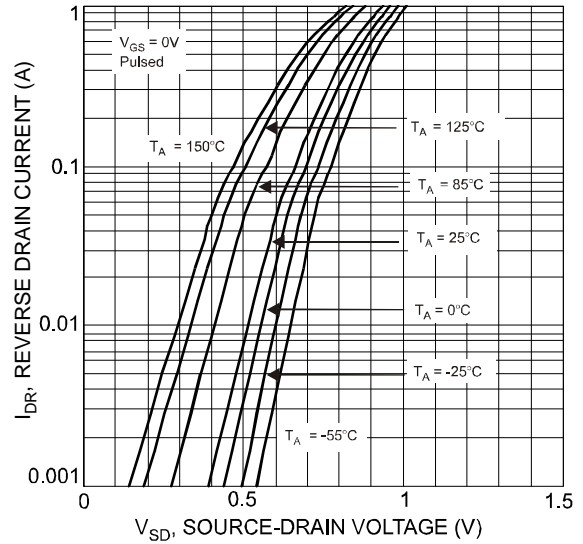


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

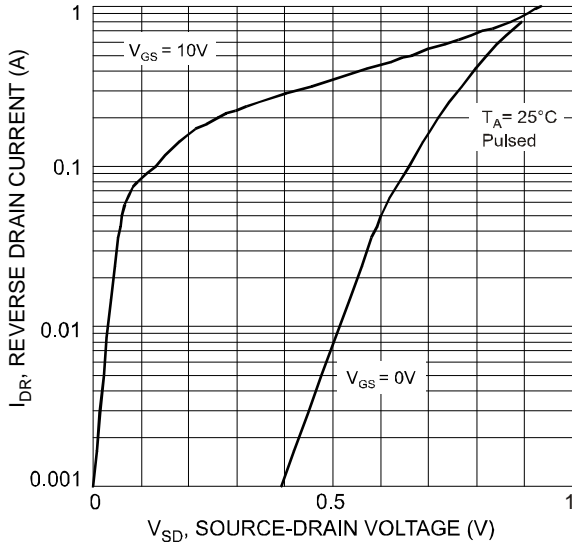


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

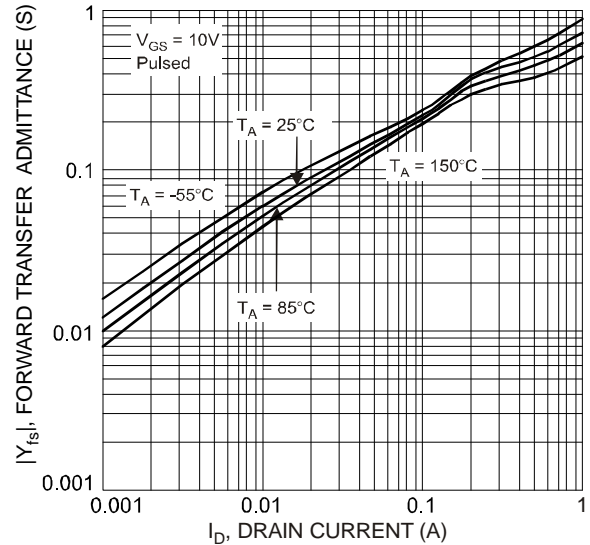
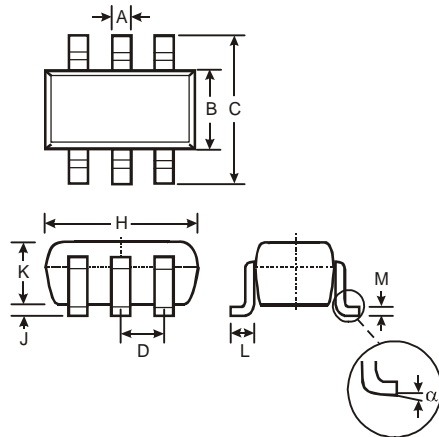


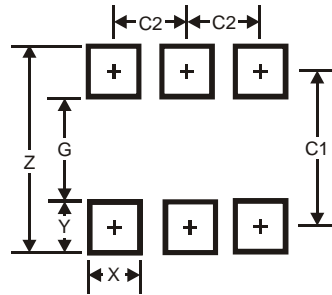
Fig.10 Forward Transfer Admittance vs. Drain Current

Package Outline Dimensions



| SOT26 | | | |
|-----------------------------|-------|------|------|
| 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 |
| 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 |
| α | 0° | 8° | — |
| All Dimensions in mm | | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 3.20 |
| G | 1.60 |
| X | 0.55 |
| Y | 0.80 |
| C1 | 2.40 |
| C2 | 0.95 |

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