

**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
- **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 (Note 4)**

**Mechanical Data**

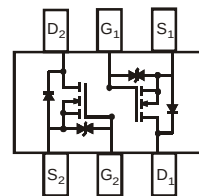
- Case: SOT563
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.006 grams (Approximate)



SOT563



TOP VIEW



TOP VIEW  
Internal Schematic

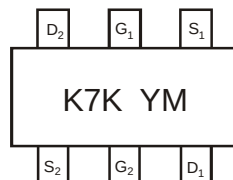
**Ordering Information** (Note 5)

| Part Number | Case   | Packaging         |
|-------------|--------|-------------------|
| DMN601VKQ-7 | SOT563 | 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](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. Refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**

SOT563



K7K = Marking Code  
YM = Date Code Marking  
Y = Year (ex: D = 2016)  
M = Month (ex: 9 = September)

**Date Code Key**

| Month | 2005 | ... | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code  | S    | ... | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    |

| 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic             | Symbol           | Value | Unit |
|----------------------------|------------------|-------|------|
| Drain-Source Voltage       | V <sub>DSS</sub> | 60    | V    |
| Gate-Source Voltage        | V <sub>GSS</sub> | ±20   | V    |
| Drain Current (Note 6)     | I <sub>D</sub>   | 305   | mA   |
| Continuous Pulsed (Note 7) |                  | 800   |      |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                          | Symbol                            | Value       | Unit |
|-----------------------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 6)        | P <sub>D</sub>                    | 250         | mW   |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 500         | °C/W |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic                    | Symbol              | Min | Typ | Max  | Unit | Test Condition                                             |
|-----------------------------------|---------------------|-----|-----|------|------|------------------------------------------------------------|
| OFF CHARACTERISTICS (Note 8)      |                     |     |     |      |      |                                                            |
| Drain-Source Breakdown Voltage    | BV <sub>DSS</sub>   | 60  | —   | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 10μA                |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | —   | —   | 250  | nA   | V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V                |
| Gate-Source Leakage               | I <sub>GSS</sub>    | —   | —   | ±500 | nA   | V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V               |
|                                   |                     | —   | —   | ±100 |      | V <sub>GS</sub> = ±5V, V <sub>DS</sub> = 0V                |
| ON CHARACTERISTICS (Note 8)       |                     |     |     |      |      |                                                            |
| Gate Threshold Voltage            | V <sub>GS(th)</sub> | 1.0 | 1.6 | 2.5  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA |
| Static Drain-Source On-Resistance | R <sub>DS(ON)</sub> | —   | —   | 2.0  | Ω    | V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A               |
|                                   |                     | —   | —   | 3.0  |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 200mA             |
| Forward Transfer Admittance       | Y <sub>fs</sub>     | —   | 284 | —    | ms   | V <sub>DS</sub> =10V, I <sub>D</sub> = 0.2A                |
| Diode Forward Voltage (Note 8)    | V <sub>SD</sub>     | 0.5 | —   | 1.4  | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 115mA               |
| DYNAMIC CHARACTERISTICS           |                     |     |     |      |      |                                                            |
| Input Capacitance                 | C <sub>iss</sub>    | —   | —   | 50   | pF   | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V<br>f = 1.0MHz  |
| Output Capacitance                | C <sub>oss</sub>    | —   | —   | 25   | pF   |                                                            |
| Reverse Transfer Capacitance      | C <sub>rss</sub>    | —   | —   | 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.

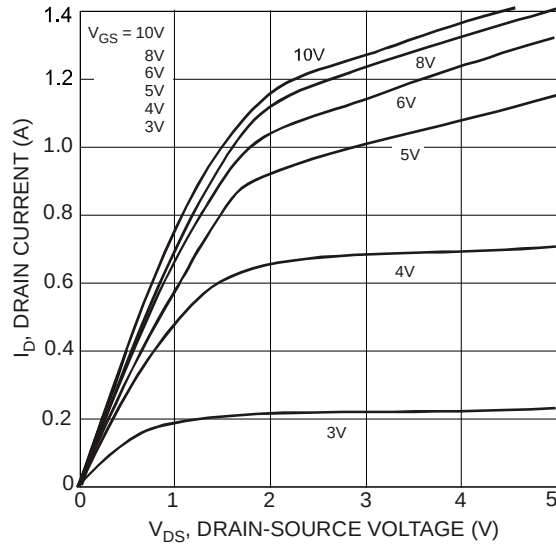


Fig. 1 Typical Output Characteristics

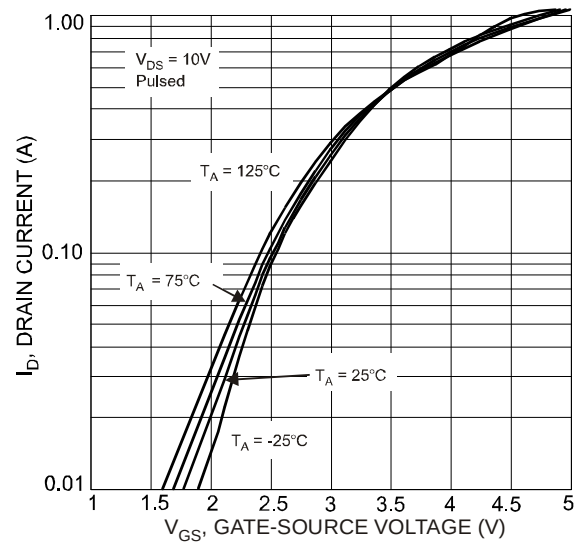


Fig. 2 Typical Transfer Characteristics

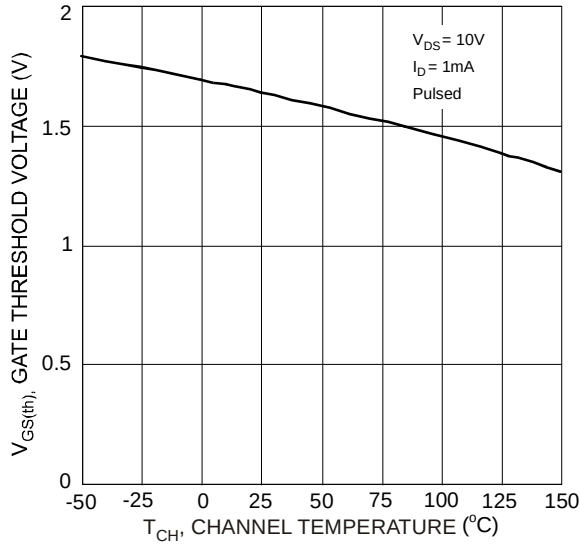


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

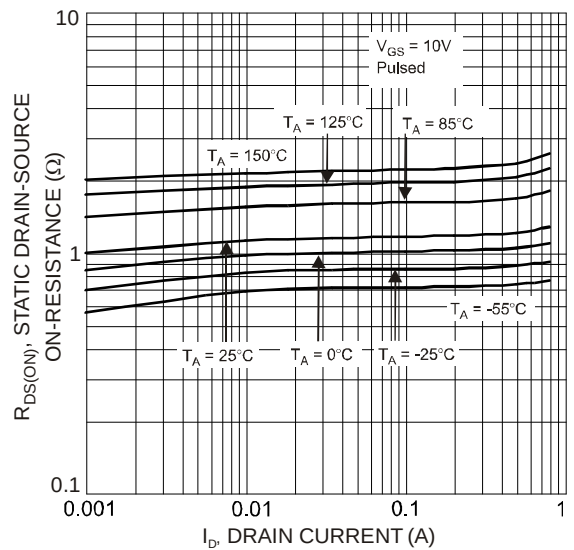


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

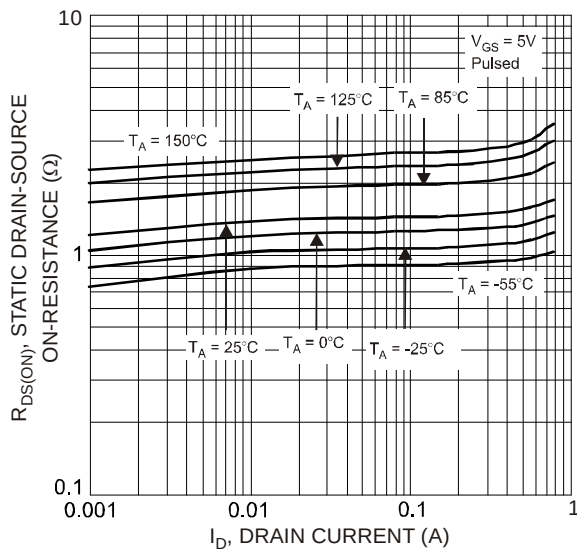


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

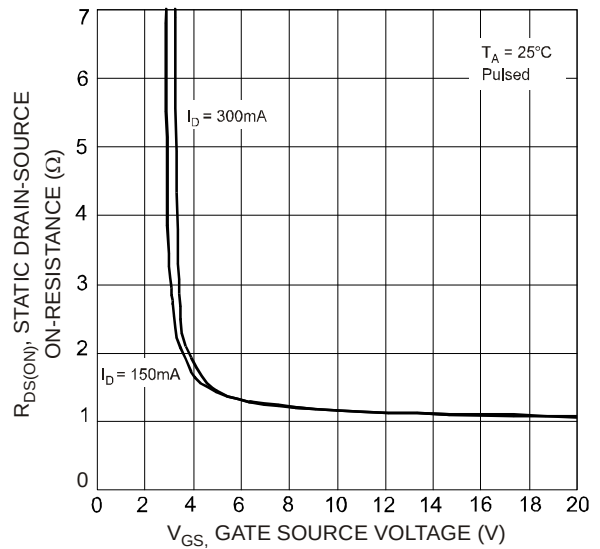


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

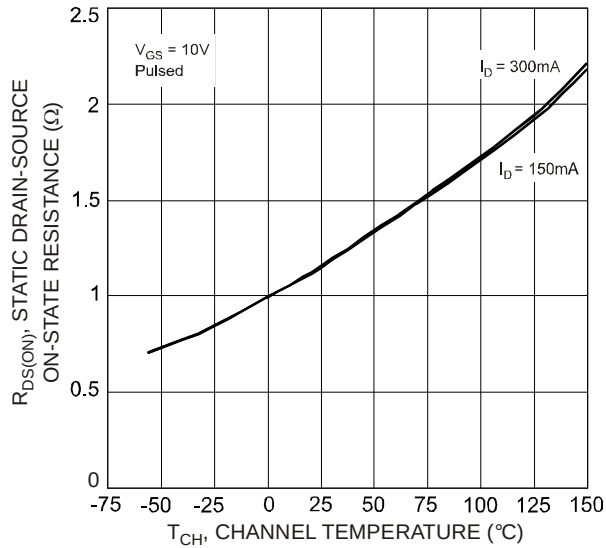


Fig. 7 Static Drain-Source On-State Resistance vs. Channel Temperature

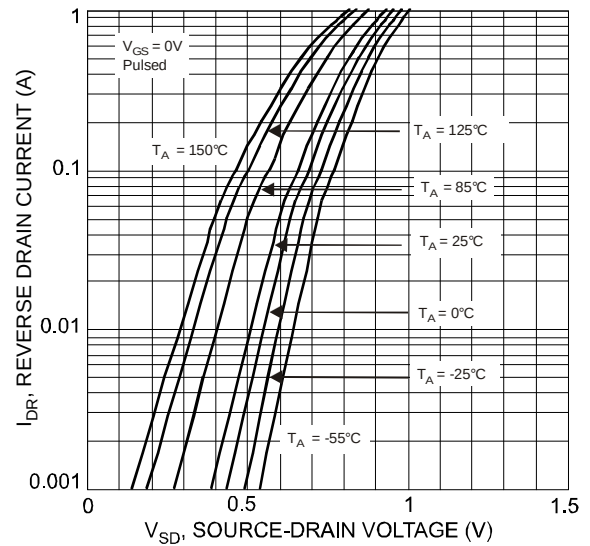


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

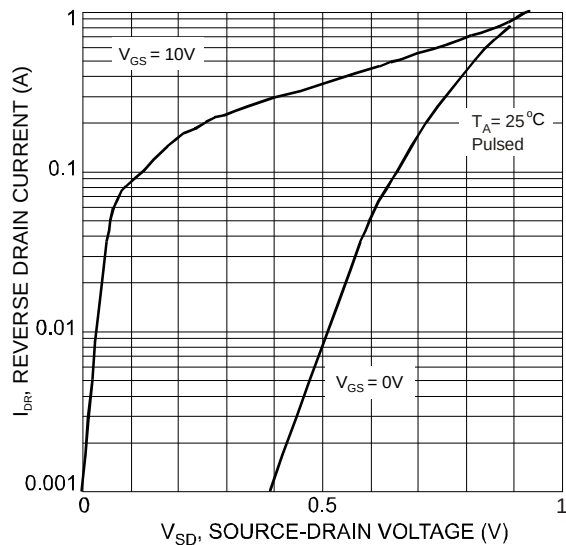


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

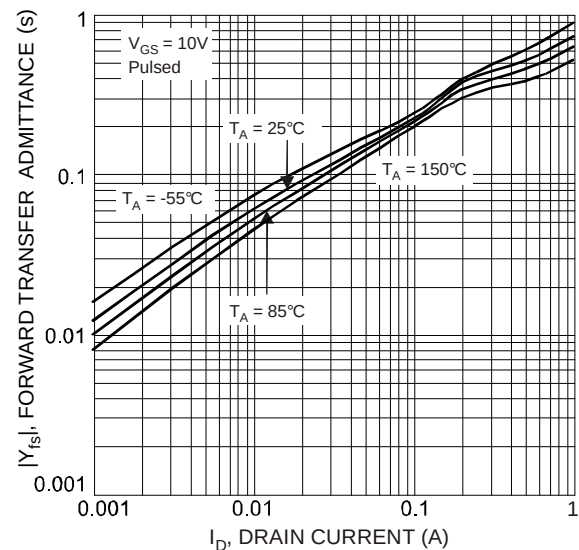
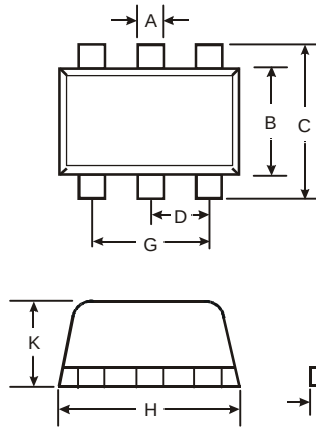


Fig. 10 Forward Transfer Admittance vs. Drain Current

## Package Outline Dimensions

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) for the latest version.

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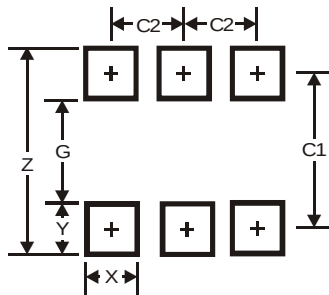


| SOT563               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.20 |
| B                    | 1.10 | 1.25 | 1.20 |
| C                    | 1.55 | 1.70 | 1.60 |
| D                    | -    | -    | 0.50 |
| G                    | 0.90 | 1.10 | 1.00 |
| H                    | 1.50 | 1.70 | 1.60 |
| K                    | 0.55 | 0.60 | 0.60 |
| L                    | 0.10 | 0.30 | 0.20 |
| M                    | 0.10 | 0.18 | 0.11 |
| All Dimensions in mm |      |      |      |

## Suggested Pad Layout

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) for the latest version.

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| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.2           |
| G          | 1.2           |
| X          | 0.375         |
| Y          | 0.5           |
| C1         | 1.7           |
| C2         | 0.5           |

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