





#### N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

#### **Features**

- Low On-Resistance: R<sub>DS(ON)</sub>
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 2, 4 and 6)
- ESD Protected Up To 2kV

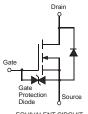
### **Mechanical Data**

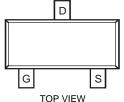
- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)





SOT-23





EQUIVALENT CIRCUIT

Pin Out Configuration

### **Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic         |                               | Symbol    | Value      | Units |
|------------------------|-------------------------------|-----------|------------|-------|
| Drain-Source Voltage   |                               | $V_{DSS}$ | 60         | V     |
| Gate-Source Voltage    |                               | $V_{GSS}$ | ±20        | V     |
| Drain Current (Note 1) | Continuous<br>Pulsed (Note 3) |           | 300<br>800 | mA    |

## **Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

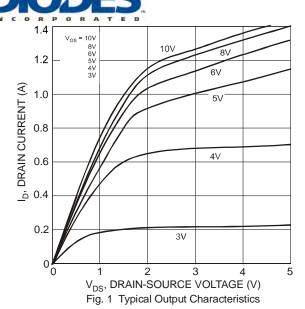
| Characteristic                          | Symbol           | Value       | Units |
|---|------------------|-------------|-------|
| Total Power Dissipation (Note 1)        | Pd               | 350         | mW    |
| Thermal Resistance, Junction to Ambient | $R_{	heta JA}$   | 357         | °C/W  |
| Operating and Storage Temperature Range | $T_{j,} T_{STG}$ | -65 to +150 | °C    |

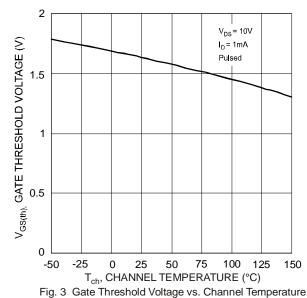
### **Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

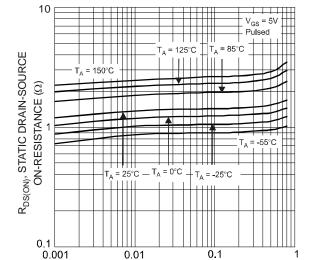
| Characteristic                      | Symbol               | Min | Тур | Max | Unit | Test Condition                          |  |
|-------------------------------------|----------------------|-----|-----|-----|------|---|--|
| OFF CHARACTERISTICS (Note 5)        |                      |     |     |     |      |   |  |
| Drain-Source Breakdown Voltage      | BV <sub>DSS</sub>    | 60  | _   | _   | V    | $V_{GS} = 0V, I_{D} = 10\mu A$          |  |
| Zero Gate Voltage Drain Current     | I <sub>DSS</sub>     |     | _   | 1.0 | μΑ   | $V_{DS} = 60V, V_{GS} = 0V$             |  |
| Gate-Source Leakage                 | I <sub>GSS</sub>     | _   | _   | ±10 | μΑ   | $V_{GS} = \pm 20V, V_{DS} = 0V$         |  |
| ON CHARACTERISTICS (Note 5)         |                      |     |     |     |      |   |  |
| 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 <sub>DS (ON)</sub> | _   | _   | 2.0 |      | $V_{GS} = 10V, I_D = 0.5A$              |  |
| Static Dialif-Source Off-Resistance |                      | _   |     | 3.0 |      | $V_{GS} = 5V, I_D = 0.05A$              |  |
| Forward Transfer Admittance         | Y <sub>fs</sub>      | 80  | _   | _   | ms   | $V_{DS} = 10V, I_D = 0.2A$              |  |
| DYNAMIC CHARACTERISTICS             |                      |     |     |     |      |   |  |
| Input Capacitance                   | C <sub>iss</sub>     | _   | _   | 50  | pF   |   |  |
| Output Capacitance                  | Coss                 | _   | _   | 25  | pF   | $V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$ |  |
| Reverse Transfer Capacitance        | C <sub>rss</sub>     |     |     | 5.0 | pF   |   |  |

Notes:

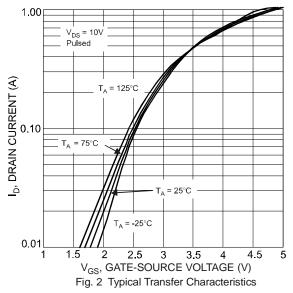
- 1. Device mounted on FR-4 PCB.
- Device mounted on FR-4 FCB.
   No purposefully added lead. Halogen and Antimony Free.
- 3. Pulse width  $\leq 10 \mu S$ , Duty Cycle  $\leq 1\%$ .
- 4. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead\_free/index.php.
- Short duration pulse test used to minimize self-heating effect.
- Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.







I<sub>D</sub>, DRAIN CURRENT (A)
Fig. 5 Static Drain-Source On-Resistance
vs. Drain Current



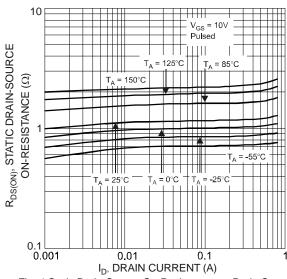


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

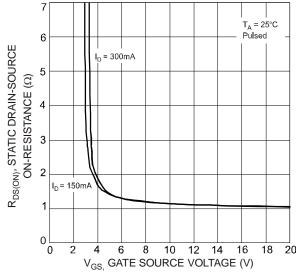
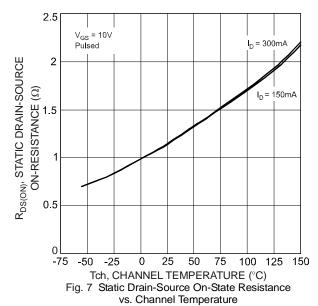
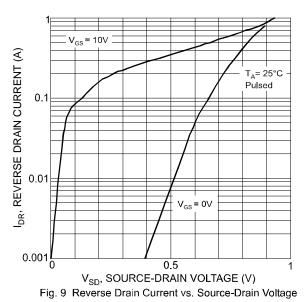
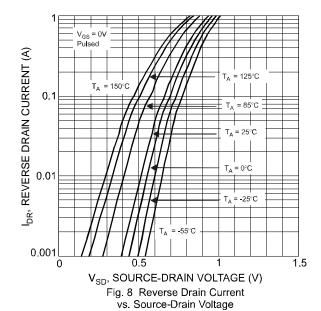


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage









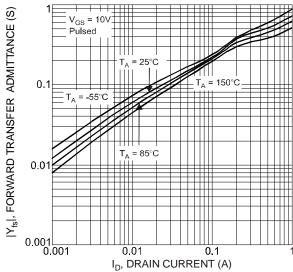


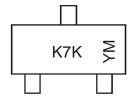
Fig.10 Forward Transfer Admittance vs. Drain Current

# Ordering Information (Note 7)

| Part Number | Case   | Packaging        |
|-------------|--------|------------------|
| DMN601K-7   | SOT-23 | 3000/Tape & Reel |

Notes: 7. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

# **Marking Information**



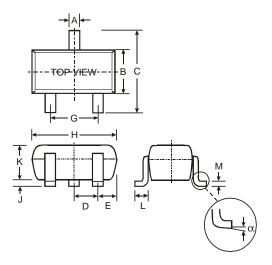
K7K = Product Type Marking Code YM = Date Code Marking Y = Year ex: S = 2005 M = Month ex: 9 = September

Date Code Key

| Year  | 2005 |     | 2006 | 2007 |     | 2008 | 2009 | )   | 2010 | 2011 |     | 2012 |
|-------|------|-----|------|------|-----|------|------|-----|------|------|-----|------|
| Code  | S    |     | T    | U    |     | V    | W    |     | Χ    | Υ    |     | Z    |
| Month | Jan  | Feb | Mar  | Apr  | May | Jun  | Jul  | Aug | Sep  | Oct  | Nov | Dec  |
|       |      |     |      |      |     |      |      |     |      |      |     |      |

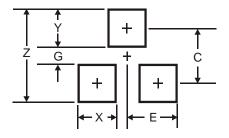


## **Package Outline Dimensions**



|         | SOT-23               |       |  |  |  |
|---------|----------------------|-------|--|--|--|
| Dim     | Min                  | Max   |  |  |  |
| Α       | 0.37                 | 0.51  |  |  |  |
| В       | 1.20                 | 1.40  |  |  |  |
| С       | 2.30                 | 2.50  |  |  |  |
| D       | 0.89                 | 1.03  |  |  |  |
| E       | 0.45                 | 0.60  |  |  |  |
| G       | 1.78                 | 2.05  |  |  |  |
| Н       | 2.80                 | 3.00  |  |  |  |
| J       | 0.013                | 0.10  |  |  |  |
| K       | 0.903                | 1.10  |  |  |  |
| L       | 0.45                 | 0.61  |  |  |  |
| М       | 0.085                | 0.180 |  |  |  |
| α       | 0°                   | 8°    |  |  |  |
| All Dir | All Dimensions in mm |       |  |  |  |

## **Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 3.4           |
| G          | 0.7           |
| X          | 0.9           |
| Υ          | 1.4           |
| С          | 2.0           |
| E          | 0.9           |

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