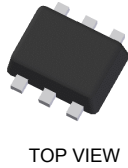


### Features

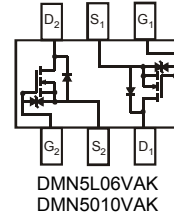
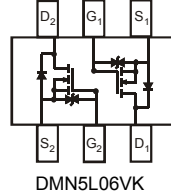
- Dual N-Channel MOSFET
- Low On-Resistance
- Very Low Gate Threshold Voltage, 1.0V max
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3)**
- **ESD Protected up to 2kV**



SOT-563

### Mechanical Data

- Case: SOT-563
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)



### Maximum Ratings @<sub>TA</sub> = 25°C unless otherwise specified

| Characteristic                              | Symbol    | Value      | Unit     |
|---|-----------|------------|----------|
| Drain Source Voltage                        | $V_{DSS}$ | 50         | V        |
| Drain-Gate Voltage $R_{GS} \leq 1.0M\Omega$ | $V_{DGR}$ | 50         | V        |
| Gate-Source Voltage                         | $V_{GSS}$ | Continuous | $\pm 20$ |
|   |           | Pulsed     | $\pm 40$ |
| Drain Current (Note 1)                      | $I_D$     | Continuous | 280      |
|   |           | Pulsed     | 1.5      |
|   | $I_{DM}$  |            | A        |

### Thermal Characteristics @<sub>TA</sub> = 25°C unless otherwise specified

| Characteristic                                   | Symbol          | Value       | Unit |
|--|-----------------|-------------|------|
| Total Power Dissipation (Note 1)                 | $P_D$           | 250         | mW   |
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 500         | °C/W |
| Operating and Storage Temperature Range          | $T_j, T_{STG}$  | -55 to +150 | °C   |

### Electrical Characteristics @<sub>TA</sub> = 25°C unless otherwise specified

| Characteristic                      | Symbol       | Min  | Typ | Max | Unit     | Test Condition                              |
|-------------------------------------|--------------|------|-----|-----|----------|---|
| <b>OFF CHARACTERISTICS (Note 4)</b> |              |      |     |     |          |   |
| Drain-Source Breakdown Voltage      | $BV_{DSS}$   | 50   | —   | —   | V        | $V_{GS} = 0V, I_D = 10\mu A$                |
| Zero Gate Voltage Drain Current     | $I_{DSS}$    | —    | —   | 60  | nA       | $V_{DS} = 50V, V_{GS} = 0V$                 |
| Gate-Body Leakage                   | $I_{GSS}$    | —    | —   | 1   | $\mu A$  | $V_{GS} = \pm 12V, V_{DS} = 0V$             |
|                                     |              |      |     | 500 | nA       | $V_{GS} = \pm 10V, V_{DS} = 0V$             |
|                                     |              |      |     | 50  | nA       | $V_{GS} = \pm 5V, V_{DS} = 0V$              |
| <b>ON CHARACTERISTICS (Note 4)</b>  |              |      |     |     |          |   |
| Gate Threshold Voltage              | $V_{GS(th)}$ | 0.49 | —   | 1.0 | V        | $V_{DS} = V_{GS}, I_D = 250\mu A$           |
| Static Drain-Source On-Resistance   | $R_{DS(on)}$ | —    | —   | 3.0 | $\Omega$ | $V_{GS} = 1.8V, I_D = 50mA$                 |
|                                     |              |      |     | 2.5 | $\Omega$ | $V_{GS} = 2.5V, I_D = 50mA$                 |
|                                     |              |      |     | 2.0 | $\Omega$ | $V_{GS} = 5.0V, I_D = 50mA$                 |
| 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        | $V_{GS} = 0V, I_S = 115mA$                  |
| <b>DYNAMIC CHARACTERISTICS</b>      |              |      |     |     |          |   |
| 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:
1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  2. No purposefully added lead.
  3. 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).
  4. Short duration pulse test used to minimize self-heating effect.

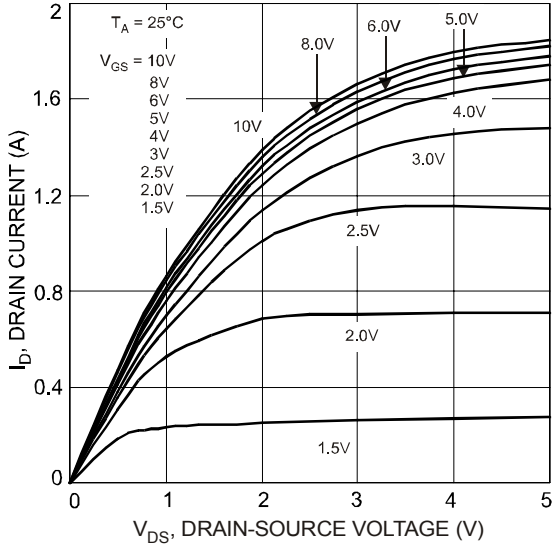


Fig. 1 Typical Output Characteristics

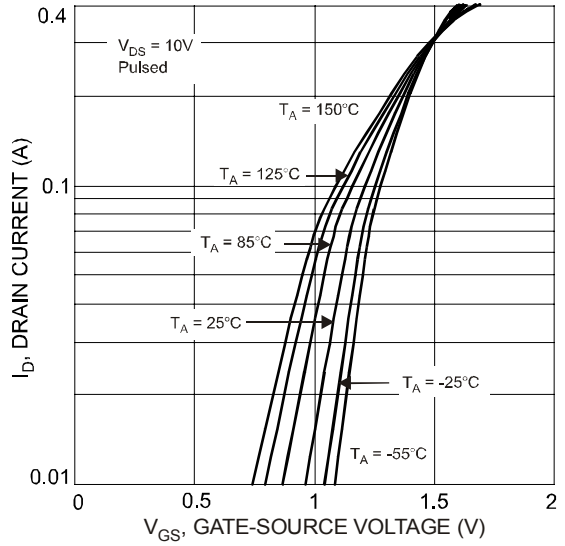


Fig. 2 Typical Transfer Characteristics

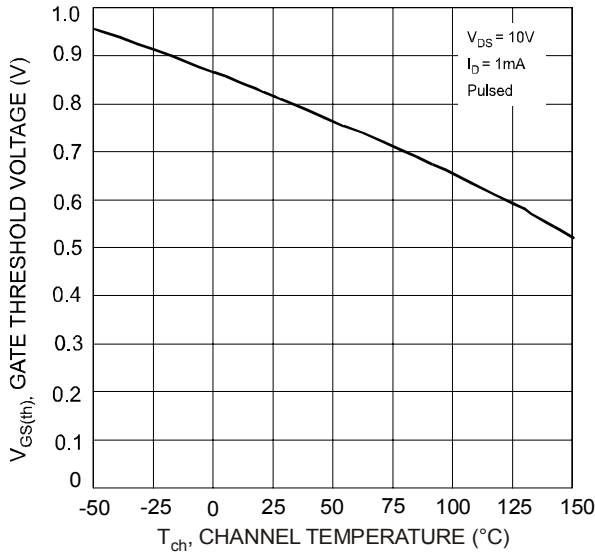


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

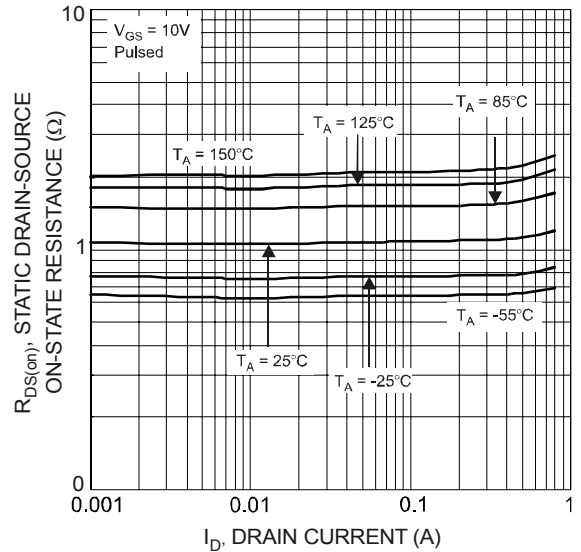


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

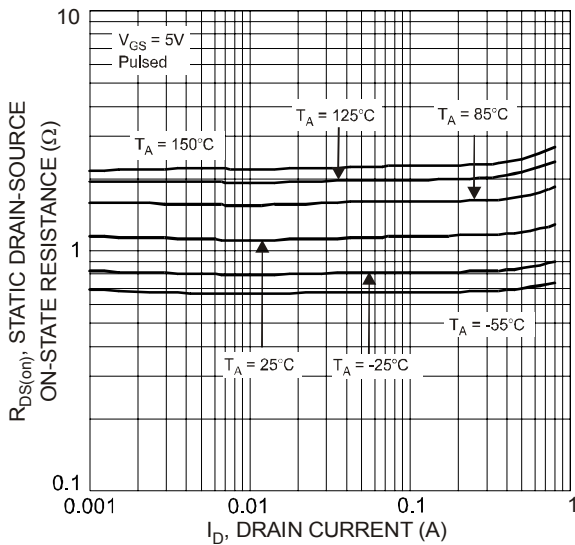


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

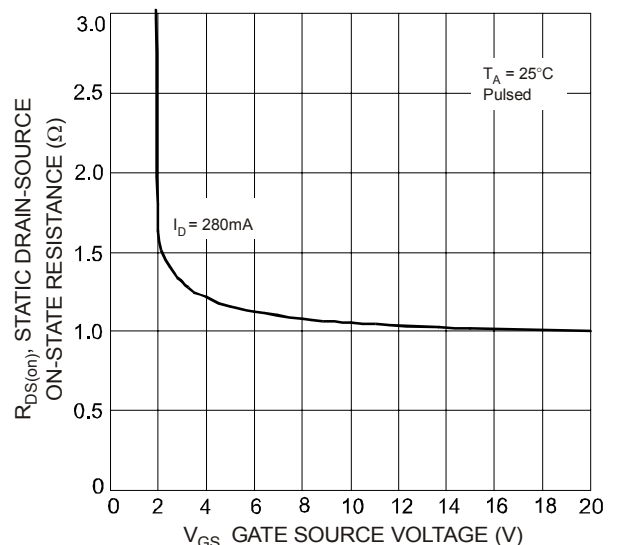


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

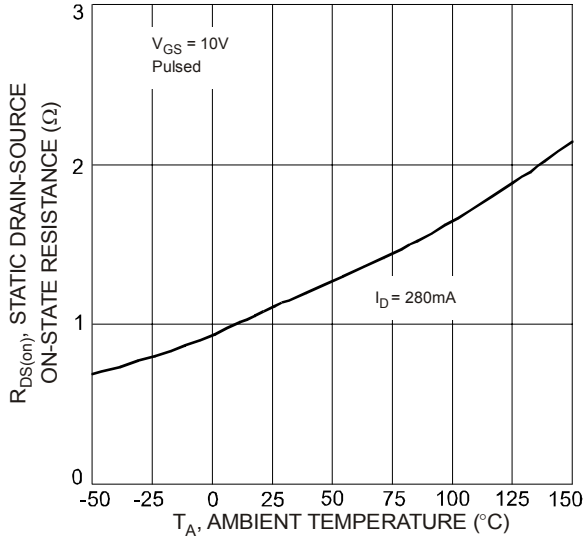


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

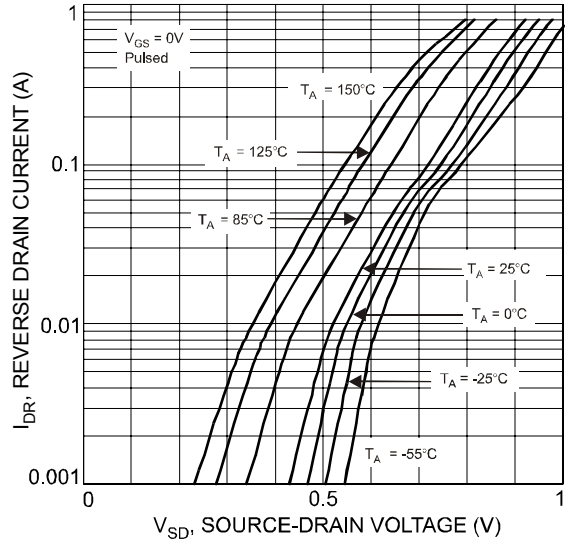


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

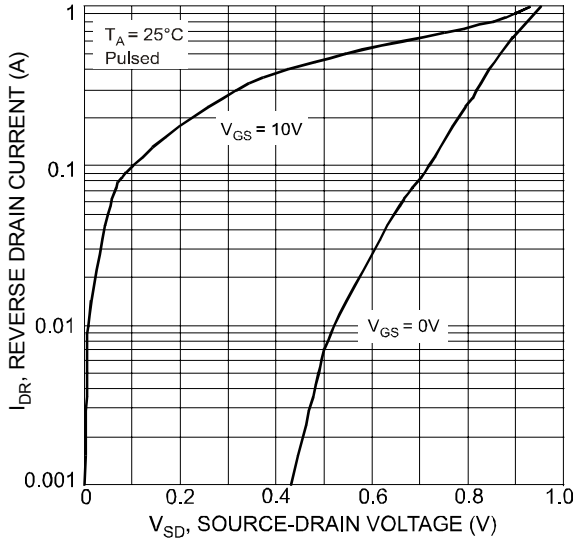


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

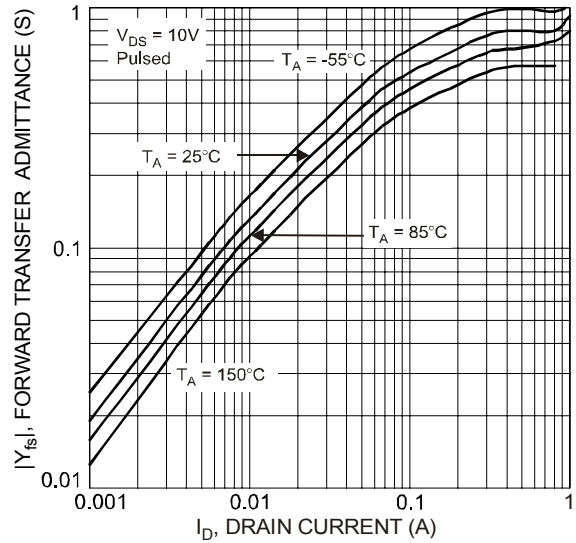


Fig. 10 Forward Transfer Admittance vs. Drain Current

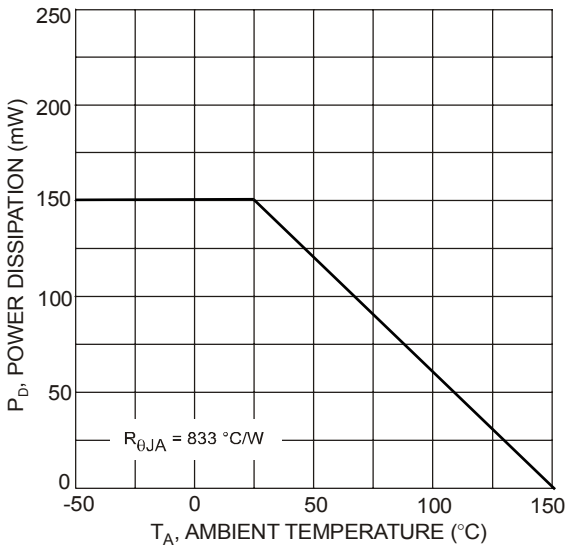


Fig. 11 Derating Curve - Total

**Ordering Information** (Note 5)

| Part Number  | Case    | Packaging        |
|--------------|---------|------------------|
| DMN5L06VK-7  | SOT-563 | 3000/Tape & Reel |
| DMN5L06VAK-7 | SOT-563 | 3000/Tape & Reel |
| DMN5010VAK-7 | SOT-563 | 3000/Tape & Reel |

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information** (Note 6)

| DMN5L06VK  | DMN5010VAK<br>DMN5L06VAK  |
|--|---|
| <p>KAB= DMN5L06VK Product Type Marking Code (See Note 6)<br/>YM= Date Code Marking<br/>Y = Year ex: T = 2006<br/>M = Month ex: 9 = September</p> | <p>xxx = Product Type Marking Code: KAE or KAC (See Note 6)<br/>YM= Date Code Marking<br/>Y = Year ex: T = 2006<br/>M = Month ex: 9 = September</p> |

Notes: 6. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).

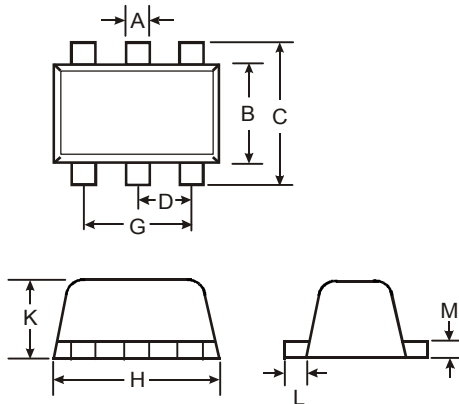
Date Code Key

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|
| Code | T    | U    | V    | W    | X    | Y    | Z    |

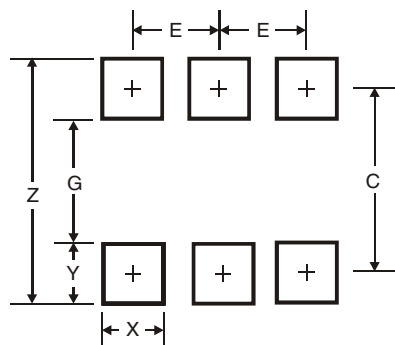
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

**Package Outline Dimensions**



| SOT-563              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.25 |
| 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                    | 0.56 | 0.60 | 0.60 |
| L                    | 0.15 | 0.25 | 0.20 |
| M                    | 0.10 | 0.18 | 0.11 |
| All Dimensions in mm |      |      |      |

**Suggested Pad Layout**



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

**IMPORTANT NOTICE**

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

**LIFE SUPPORT**

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.