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## Features

- Low On-Resistance
- Ideal for Notebook Computer, Portable Phone, PCMCIA Cards, and Battery Power Circuits
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **ESD Protected Gate**
- **"Green" Device (Note 3)**

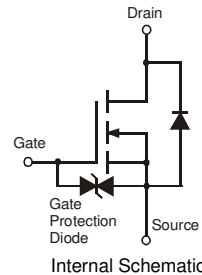


ESD protected

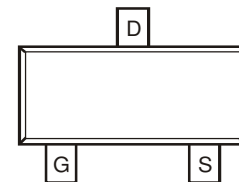


TOP VIEW

SC-59



Internal Schematic



TOP VIEW

## Mechanical Data

- Case: SC59
- 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 Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.014 grams (approximate)

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

| Characteristic       | Symbol           | Value | Unit |
|----------------------|------------------|-------|------|
| Drain-Source Voltage | V <sub>DSS</sub> | 20    | V    |
| Gate-Source Voltage  | V <sub>GSS</sub> | ±12   | V    |
| Drain Current        | I <sub>D</sub>   | 1.2   | A    |
|                      |                  | 4.0   | A    |

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

| Characteristic                          | Symbol                            | Value       | Unit   |
|-----------------------------------------|-----------------------------------|-------------|--------|
| Total Power Dissipation                 | P <sub>d</sub>                    | 500         | mW     |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 250         | °C / W |
| Operating and Storage Temperature Range | T <sub>j</sub> , T <sub>STG</sub> | -55 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 1)                            |                      |        |        |                |      |                                                                                                 |
| Drain-Source Breakdown Voltage                          | BV <sub>DSS</sub>    | 20     | —      | —              | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                    |
| Zero Gate Voltage Drain Current @ T <sub>J</sub> = 25°C | I <sub>DSS</sub>     | —      | —      | 10             | μA   | V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V                                                     |
| Gate-Body Leakage                                       | I <sub>GSS</sub>     | —      | —      | ±10            | μA   | V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V                                                    |
| ON CHARACTERISTICS (Note 1)                             |                      |        |        |                |      |                                                                                                 |
| Gate Threshold Voltage                                  | V <sub>GS(th)</sub>  | 0.7    | —      | 1.40           | V    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 1.0mA                                                   |
| Static Drain-Source On-Resistance                       | R <sub>DS (ON)</sub> | —<br>— | —<br>— | 0.100<br>0.160 | Ω    | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.5A<br>V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 0.5A  |
| Forward Transfer Admittance                             | Y <sub>fs</sub>      | —      | 3.3    | —              | S    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.5A                                                    |
| Diode Forward Voltage                                   | V <sub>SD</sub>      | —      | 0.8    | 1.1            | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 1.0A                                                     |
| DYNAMIC CHARACTERISTICS                                 |                      |        |        |                |      |                                                                                                 |
| Input Capacitance                                       | C <sub>iss</sub>     | —      | 180    | —              | pF   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                      |
| Output Capacitance                                      | C <sub>oss</sub>     | —      | 120    | —              | pF   |                                                                                                 |
| Reverse Transfer Capacitance                            | C <sub>rss</sub>     | —      | 45     | —              | pF   |                                                                                                 |
| SWITCHING CHARACTERISTICS                               |                      |        |        |                |      |                                                                                                 |
| Turn-On Delay Time                                      | t <sub>D(ON)</sub>   | —      | 10     | —              | ns   | V <sub>DD</sub> = 10V, I <sub>D</sub> = 0.5A,<br>V <sub>GS</sub> = 5.0V, R <sub>GEN</sub> = 50Ω |
| Turn-Off Delay Time                                     | t <sub>D(OFF)</sub>  | —      | 50     | —              | ns   |                                                                                                 |
| Turn-On Rise Time                                       | t <sub>r</sub>       | —      | 15     | —              | ns   |                                                                                                 |
| Turn-Off Fall Time                                      | t <sub>f</sub>       | —      | 45     | —              | ns   |                                                                                                 |

Notes: 1. Pulse width ≤300μs, duty cycle ≤2%.  
 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).

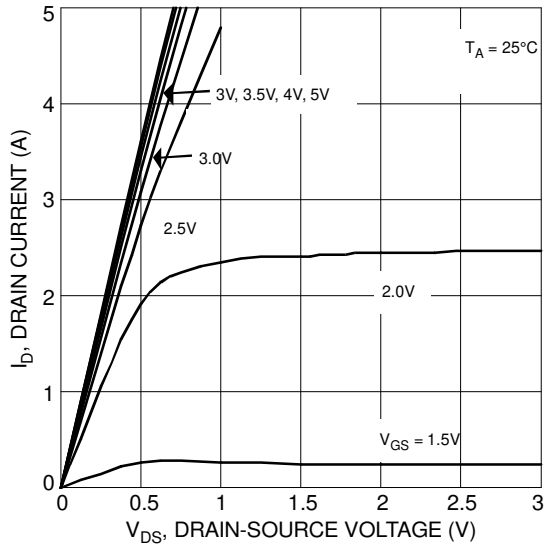


Fig. 1 Typical Output Characteristics

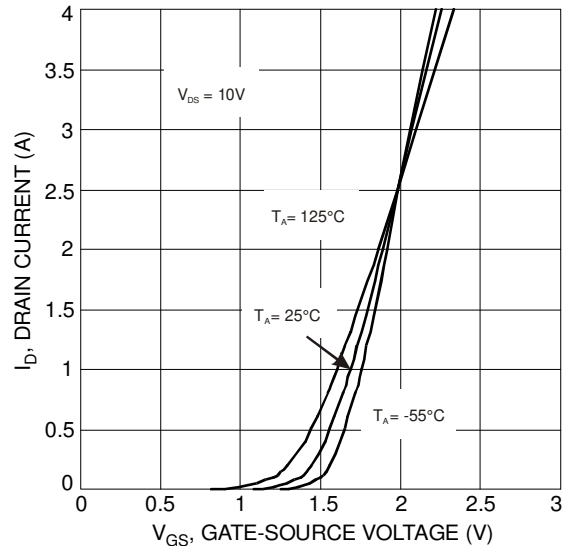


Fig. 2 Typical Transfer Characteristics

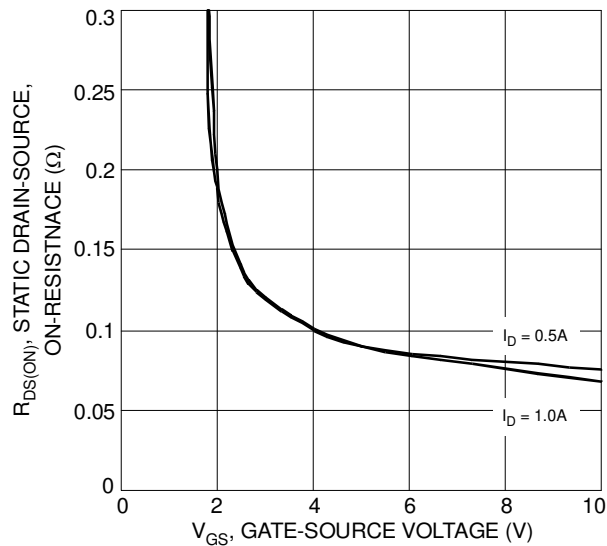


Fig. 3 On-Resistance vs. Gate Voltage

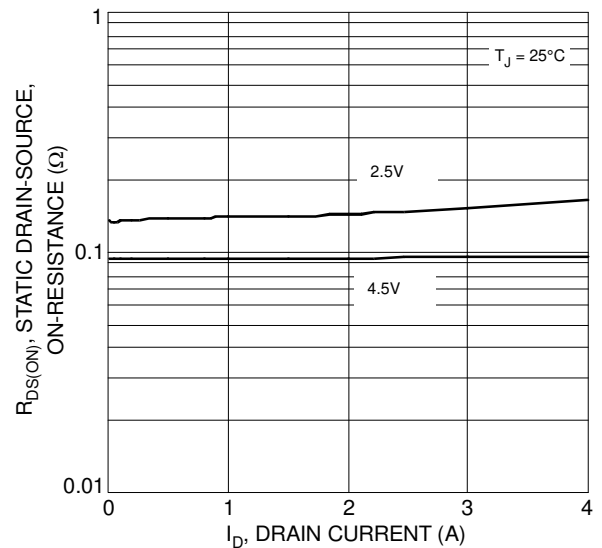


Fig. 4 On-Resistance vs. Drain Current

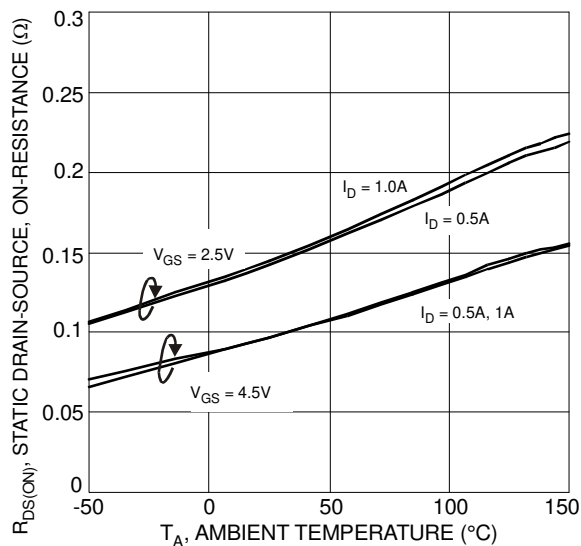


Fig. 5 On-Resistance Variation with Temperature

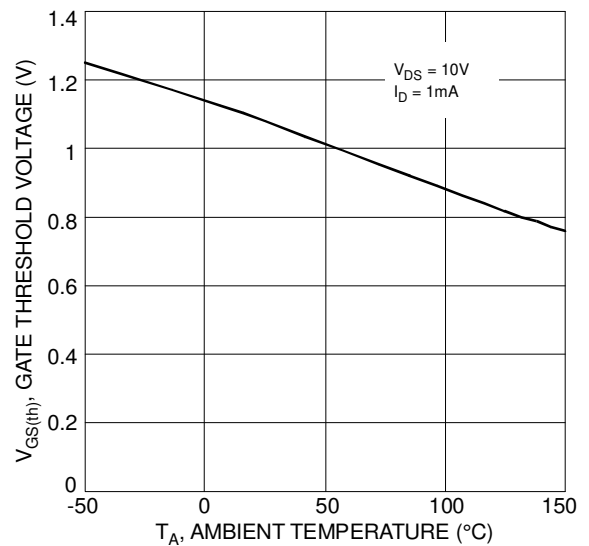


Fig. 6 Gate Threshold Voltage vs. Temperature



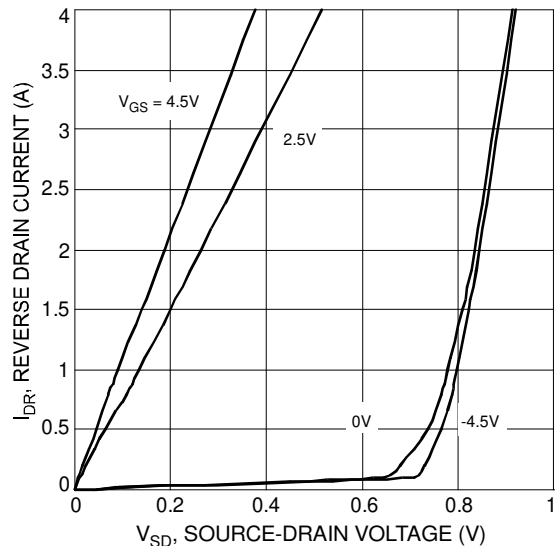


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

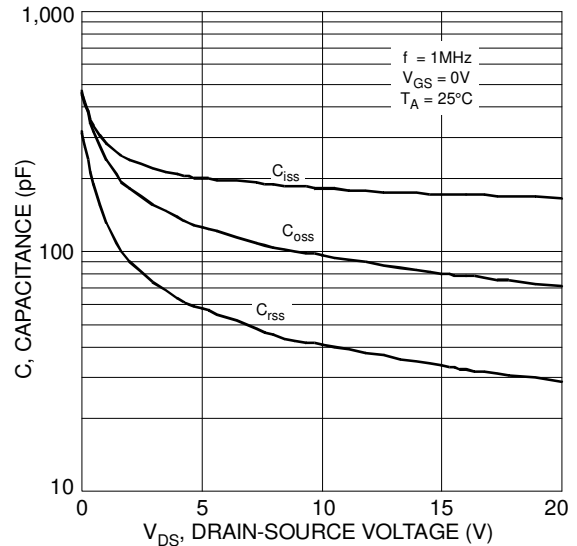


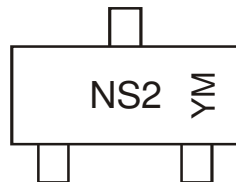
Fig. 8 Typical Total Capacitance

## Ordering Information (Note 4)

| Part Number | Case | Packaging        |
|-------------|------|------------------|
| DMN2114SN-7 | SC59 | 3000/Tape & Reel |

Notes: 4. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



NS2 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: T = 2006  
 M = Month ex: 9 = September

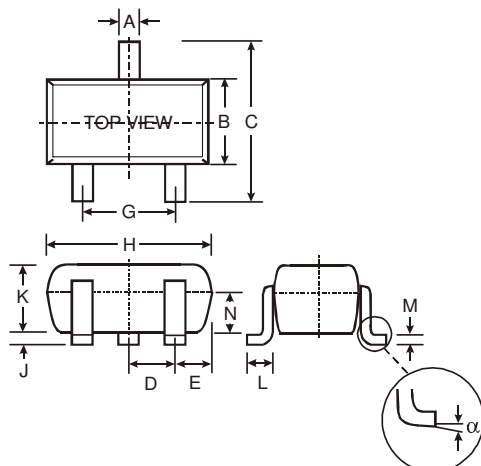
### Date Code Key

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

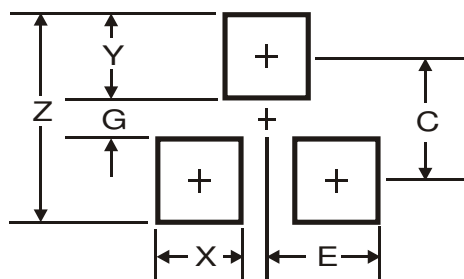
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

## Package Outline Dimensions



| SC59                 |       |      |
|----------------------|-------|------|
| Dim                  | Min   | Max  |
| A                    | 0.35  | 0.50 |
| B                    | 1.50  | 1.70 |
| C                    | 2.70  | 3.00 |
| D                    | 0.95  |      |
| E                    | —     |      |
| G                    | 1.90  |      |
| H                    | 2.90  | 3.10 |
| J                    | 0.013 | 0.10 |
| K                    | 1.00  | 1.30 |
| L                    | 0.35  | 0.55 |
| M                    | 0.10  | 0.20 |
| N                    | 0.70  | 0.80 |
| α                    | 0°    | 8°   |
| All Dimensions in mm |       |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 4.0           |
| G          | 1.2           |
| X          | 0.9           |
| Y          | 1.4           |
| C          | 2.6           |
| E          | 0.95          |

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