

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **ESD Protected Gate**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 standards for High Reliability**

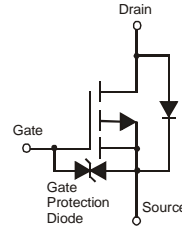


ESD protected

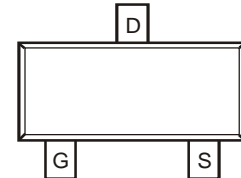


TOP VIEW

SC59



EQUIVALENT CIRCUIT



Internal Schematic

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 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|-------------------------------------|-----------|----------|------|
| Drain-Source Voltage | V_{DSS} | -30 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Drain Current (Note 1) Steady State | I_D | -0.7 | A |
| Pulsed Drain Current (Note 3) | I_{DM} | -2.8 | A |

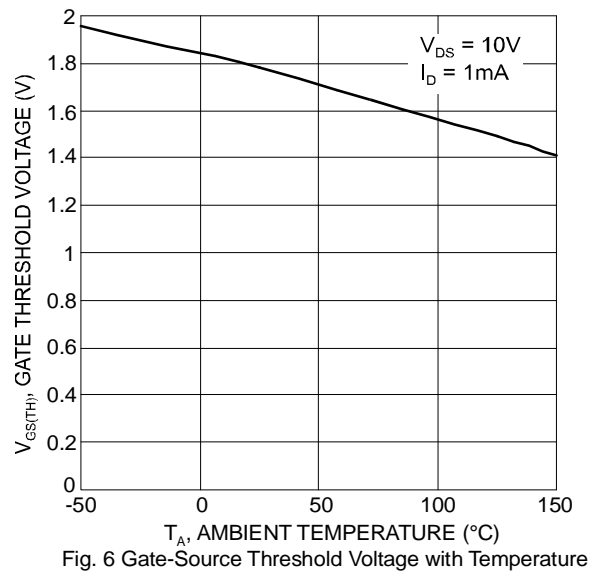
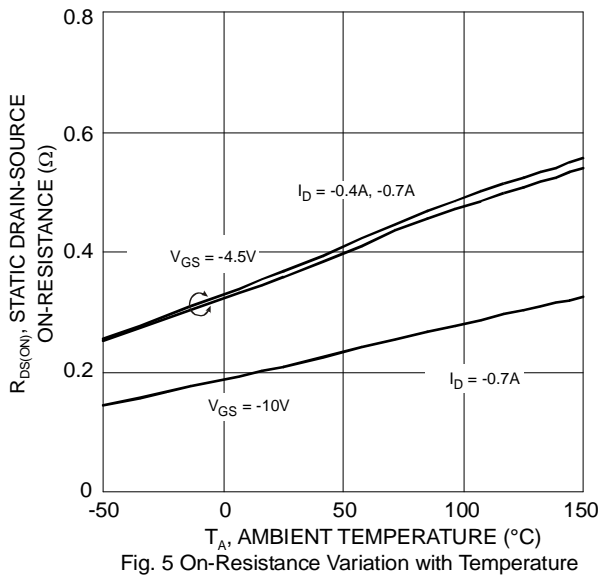
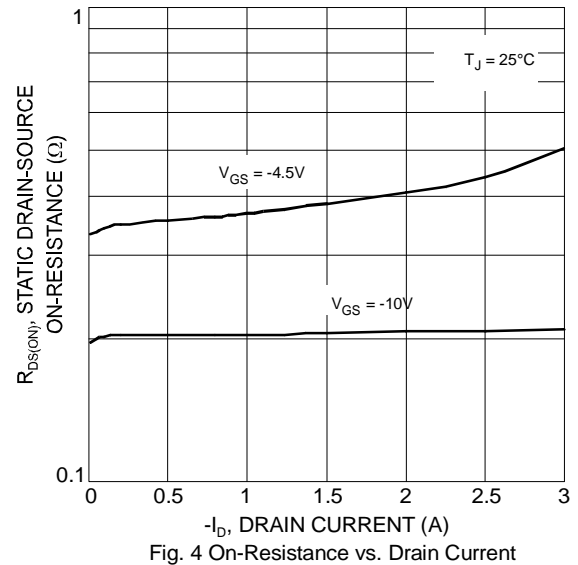
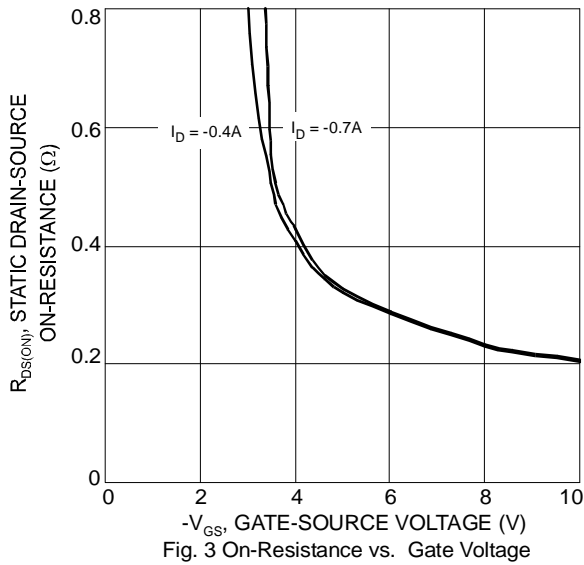
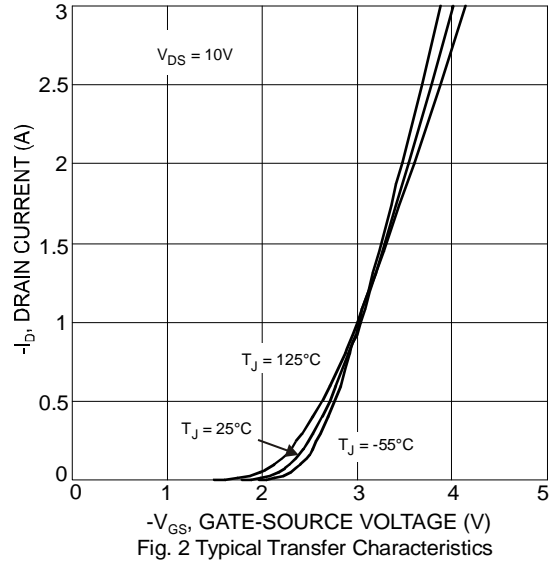
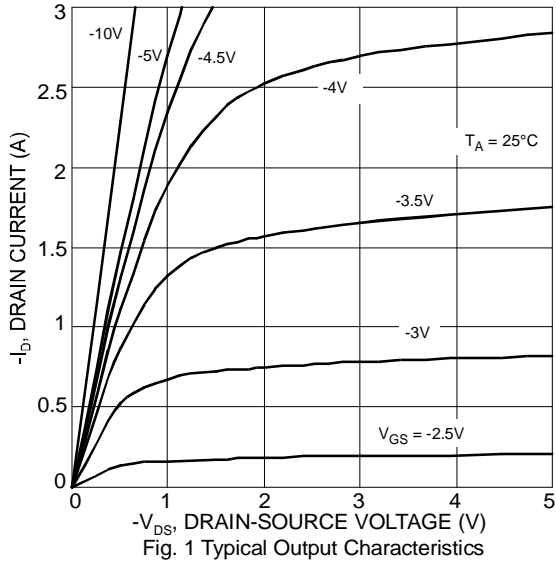
Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Total Power Dissipation (Note 1) | P_d | 500 | mW |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 250 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_j, T_{STG} | -65 to +150 | $^\circ\text{C}$ |

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------------------|--------------|------|--------------|--------------|---------------|---|
| OFF CHARACTERISTICS (Note 5) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -30 | — | — | V | $V_{GS} = 0V, I_D = -250\mu\text{A}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | -10 | μA | $V_{DS} = -30V, V_{GS} = 0V$ |
| Gate-Body Leakage | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 20V, V_{DS} = 0V$ |
| ON CHARACTERISTICS (Note 5) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -1.0 | — | -3.0 | V | $V_{DS} = -10V, I_D = -1.0\text{mA}$ |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 0.20 0.35 | 0.25 0.45 | Ω | $V_{GS} = -10V, I_D = -0.4A$ $V_{GS} = -4.5V, I_D = -0.4A$ |
| Forward Transfer Admittance | $ Y_{fs} $ | — | 1 | — | S | $V_{DS} = -10V, I_D = -0.4A$ |
| Diode Forward Voltage (Note 5) | V_{SD} | — | -0.8 | -1.1 | V | $V_{GS} = 0V, I_S = -0.7A$ |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C_{iss} | — | 160 | — | pF | $V_{DS} = -10V, V_{GS} = 0V$ $f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 120 | — | pF | |
| Reverse Transfer Capacitance | C_{rss} | — | 50 | — | pF | |
| SWITCHING CHARACTERISTICS | | | | | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 10 | — | ns | $V_{DD} = -10V, I_D = -0.4A,$ $V_{GS} = -5.0V, R_{GEN} = 50\Omega$ |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 25 | — | ns | |
| Turn-On Rise Time | t_r | — | 25 | — | ns | |
| Turn-Off Fall Time | t_f | — | 40 | — | ns | |

- Notes:
1. Device mounted on FR-4 PCB.
 2. No purposefully added lead.
 3. Pulse width $\leq 10\mu\text{s}$, 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.
 5. Short duration pulse test used to minimize self-heating effect.



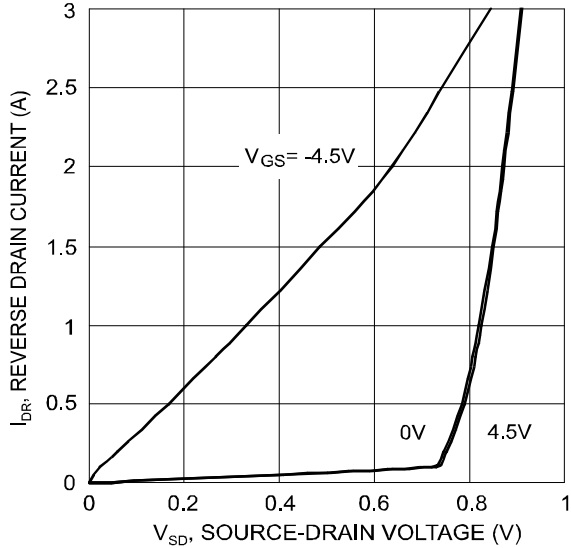


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

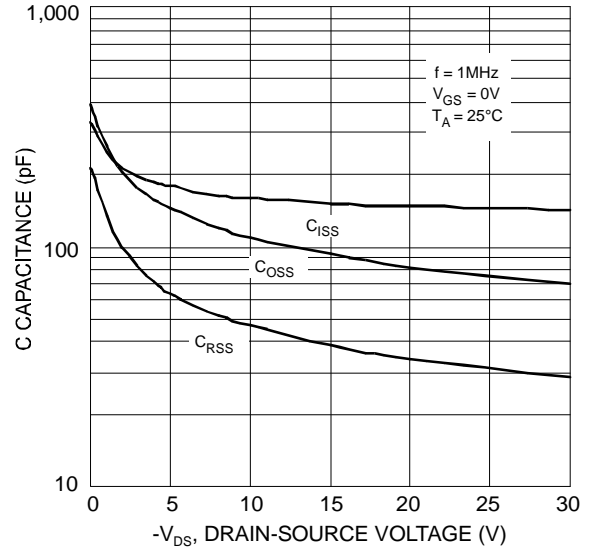


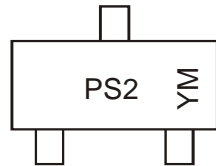
Fig. 8 Typical Total Capacitance

Ordering Information (Note 6)

| Part Number | Case | Packaging |
|-------------|------|------------------|
| DMP3030SN-7 | SC59 | 3000/Tape & Reel |

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



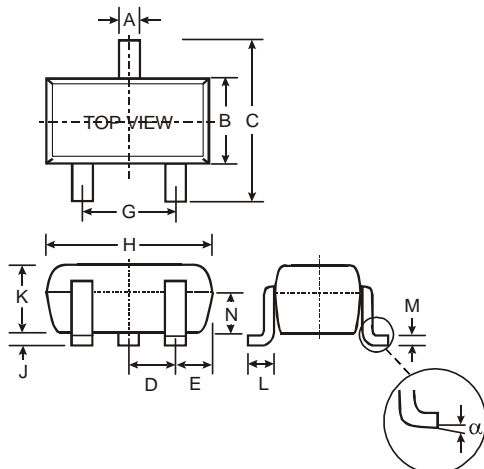
PS2 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: T = 2006
 M = Month ex: 9 = September

Date Code Key

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

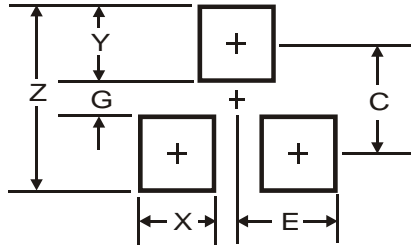
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

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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