

Features

- Low $R_{DS(ON)}$:
 - 40 m Ω @ $V_{GS} = -4.5V$
 - 70 m Ω @ $V_{GS} = -2.5V$
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **"Green" Device (Note 4)**

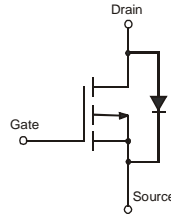
Mechanical Data

- Case: SC-59
- Case Material – Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 4
- Ordering Information: See page 4
- Weight: 0.014 grams (approximate)

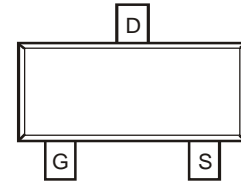
SC-59



TOP VIEW



Internal Schematic



Pin Configuration

Maximum Ratings @ $T_A = 25^\circ C$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------|--|------|
| Drain-Source Voltage | V_{DSS} | -20 | V |
| Gate-Source Voltage | V_{GSS} | ± 12 | V |
| Drain Current (Note 1) Continuous | I_D | -4.6 -3.7 | A |
| | | $T_A = 25^\circ C$ $T_A = 70^\circ C$ | |
| Pulsed Drain Current (Note 2) | I_{DM} | -18 | A |
| Body-Diode Continuous Current (Note 1) | I_S | 2.0 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|--------------|
| Total Power Dissipation (Note 1) | P_D | 1.25 | W |
| Thermal Resistance, Junction to Ambient (Note 1); Steady-State | $R_{\theta JA}$ | 100 | $^\circ C/W$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ C$ |

- Notes:
1. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width $t \leq 10s$.
 2. Repetitive Rating, pulse width limited by junction temperature.
 3. No purposefully added lead.
 4. Diodes Inc's "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|--------------|------|----------|-----------|------------------|--|
| STATIC PARAMETERS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -20 | — | — | V | $I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | -1 | μA | $T_J = 25^\circ\text{C}$ $V_{DS} = -20\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Body Leakage Current | I_{GSS} | — | — | ± 100 | nA | $V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$ |
| Gate Threshold Voltage | $V_{GS(th)}$ | -0.6 | -0.96 | -1.2 | V | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$ |
| On State Drain Current (Note 5) | $I_{D(ON)}$ | -15 | — | — | A | $V_{GS} = -4.5\text{V}, V_{DS} = -5\text{V}$ |
| Static Drain-Source On-Resistance (Note 5) | $R_{DS(ON)}$ | — | 29 55 | 40 70 | $\text{m}\Omega$ | $V_{GS} = -4.5\text{V}, I_D = -4.6\text{A}$ $V_{GS} = -2.5\text{V}, I_D = -3.8\text{A}$ |
| Forward Transconductance (Note 5) | g_{FS} | — | 9 | — | S | $V_{DS} = -10\text{V}, I_D = -4.5\text{A}$ |
| Diode Forward Voltage (Note 5) | V_{SD} | -0.5 | -0.72 | -1.4 | V | $I_S = -2.1\text{A}, V_{GS} = 0\text{V}$ |
| Maximum Body-Diode Continuous Current (Note 1) | I_S | — | — | 1.7 | A | — |
| DYNAMIC PARAMETERS (Note 6) | | | | | | |
| Input Capacitance | C_{iss} | — | 820 | — | pF | $V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 200 | — | pF | |
| Reverse Transfer Capacitance | C_{rss} | — | 160 | — | pF | |
| Gate Resistance | R_G | — | 2.5 | — | Ω | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$ |
| SWITCHING CHARACTERISTICS | | | | | | |
| Total Gate Charge | Q_G | — | 10.1 | — | nC | $V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V},$ $I_D = -4.5\text{A}$ |
| Gate-Source Charge | Q_{GS} | — | 1.5 | — | | |
| Gate-Drain Charge | Q_{GD} | — | 4.3 | — | | |
| Turn-On Delay Time | $t_{d(on)}$ | — | 4.4 | — | ns | $V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V},$ $I_D = -1\text{A}, R_G = 6.0\Omega$ |
| Rise Time | t_r | — | 9.9 | — | | |
| Turn-Off Delay Time | $t_{d(off)}$ | — | 28.0 | — | | |
| Fall Time | t_f | — | 23.4 | — | | |

Notes: 5. Test pulse width $t = 300\mu\text{s}$.
6. Guaranteed by design. Not subject to production testing.

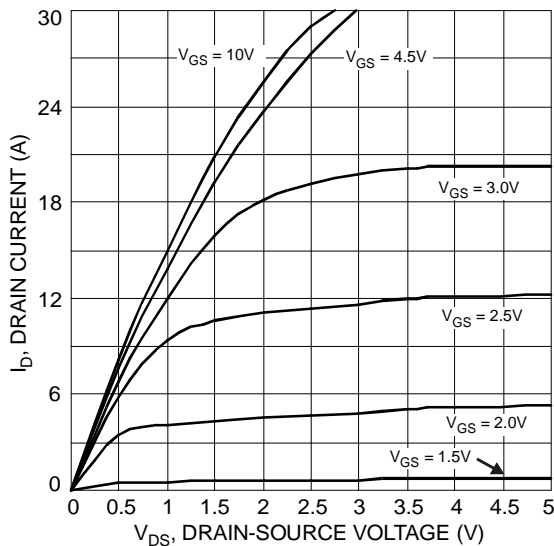


Fig. 1 Typical Output Characteristic

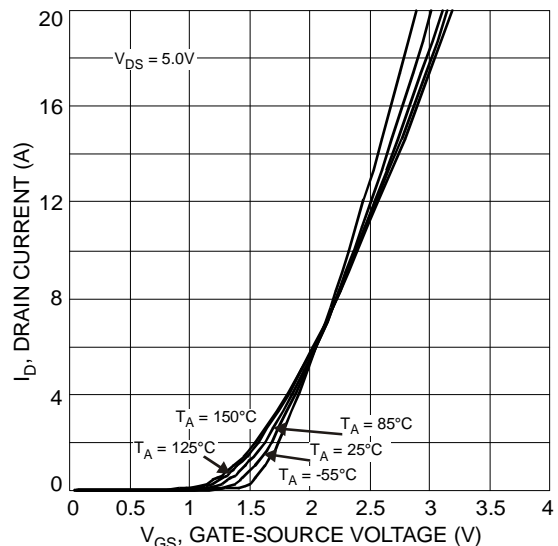


Fig. 2 Typical Transfer Characteristic

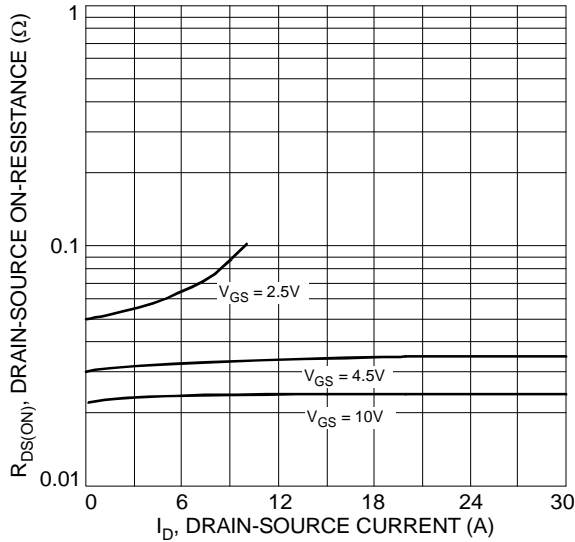


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

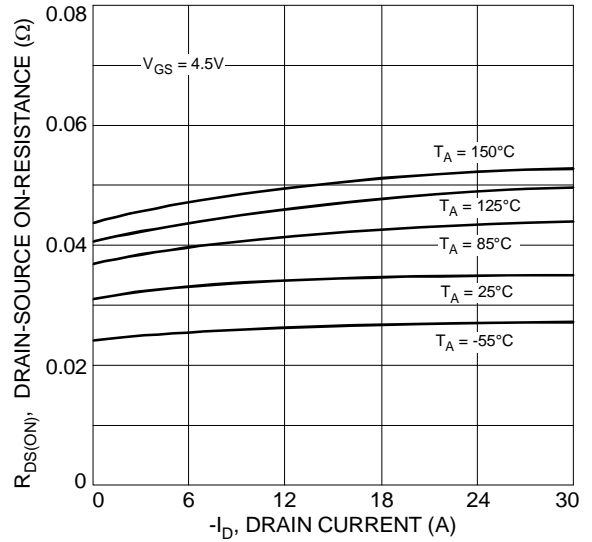


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

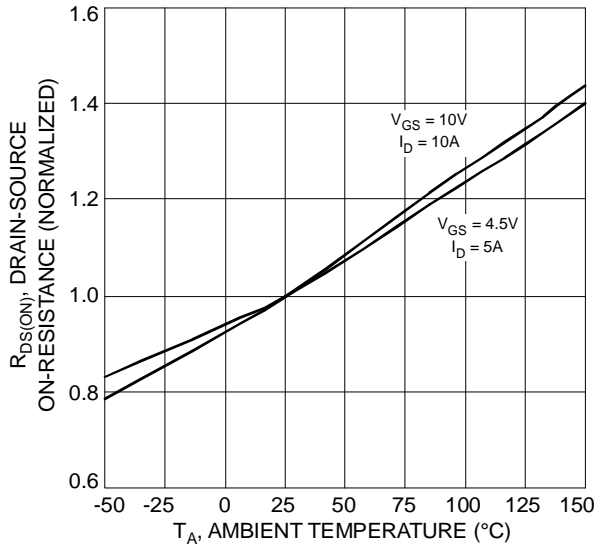


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

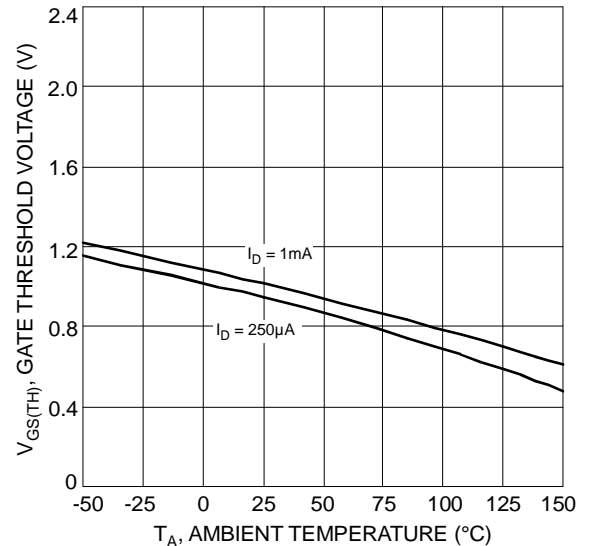


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

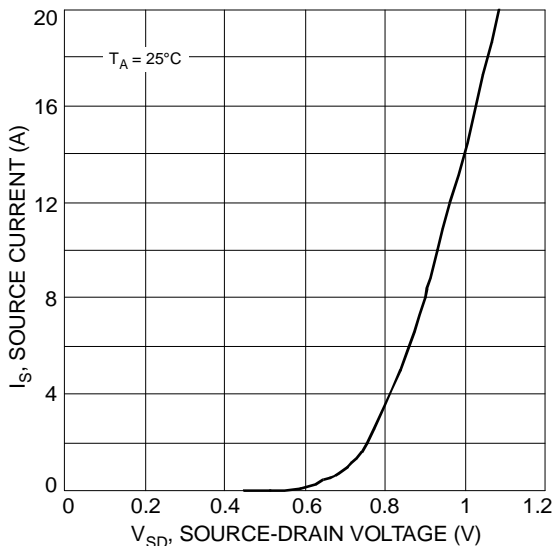


Fig. 7 Diode Forward Voltage vs. Current

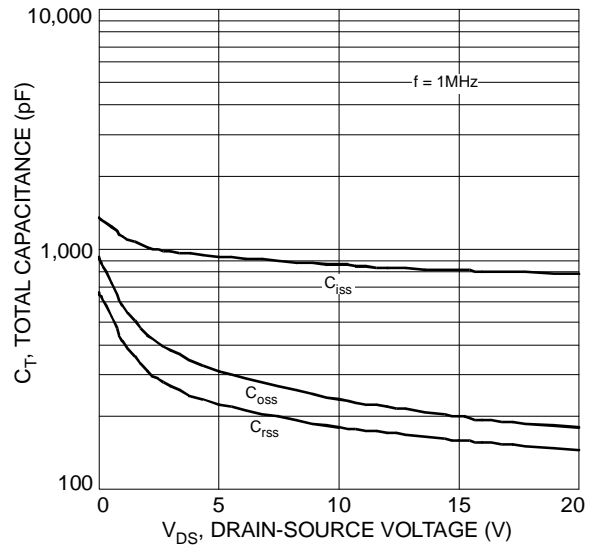


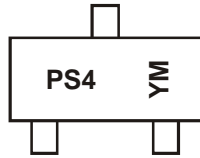
Fig. 8 Typical Total Capacitance

Ordering Information (Note 7)

| Part Number | Case | Packaging |
|--------------|-------|------------------|
| DMP2066LSN-7 | SC-59 | 3000/Tape & Reel |

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

Marking Information



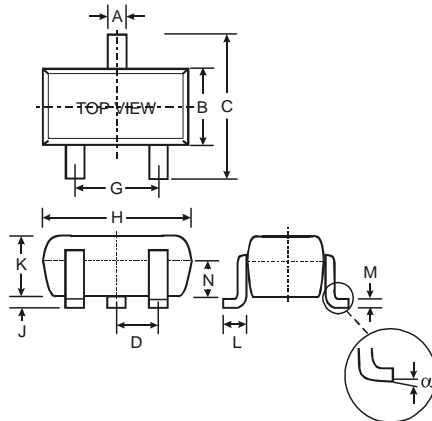
PS4 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: V = 2008
 M = Month ex: 9 = September

Date Code Key

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|
| Code | V | W | X | Y | Z | A | B | C |

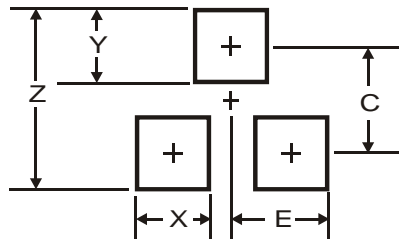
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Package Outline Dimensions



| SC-59 | | |
|----------------------|-------|------|
| Dim | Min | Max |
| A | 0.35 | 0.50 |
| B | 1.50 | 1.70 |
| C | 2.70 | 3.00 |
| D | 0.95 | |
| 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 | 3.4 |
| X | 0.8 |
| Y | 1.0 |
| C | 2.4 |
| E | 1.35 |

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