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## Contact us

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# DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

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## Features

- Dual P-Channel MOSFET
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **ESD Protected up to 3kV**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

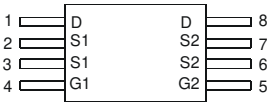
## Mechanical Data

- Case: TSSOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Page 5
- Ordering Information: See Page 5
- Weight: 0.039 grams (approximate)

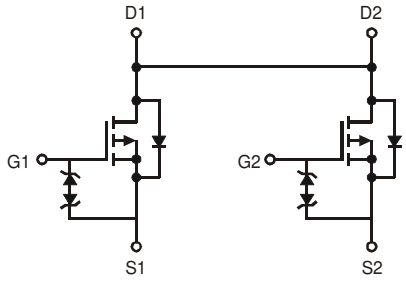
ESD PROTECTED TO 3kV

TOP VIEW

BOTTOM VIEW




Top View
Pin Configuration




Internal Schematic

## Maximum Ratings @$T_A$ = 25°C unless otherwise specified

| Characteristic | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | -20 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±8 | V |
| Continuous Drain Current (Note 3) | Steady State | $T_A$ = 25°C<br>$T_A$ = 85°C | $I_D$ | 6.04<br>3.96 | A |
| Pulsed Drain Current (Note 4) | | | $I_{DM}$ | 22 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 3) | $P_D$ | 0.89 | W |
| Thermal Resistance, Junction to Ambient @$T_A$ = 25°C | $R_{\theta JA}$ | 142.7 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to +150 | °C |

Notes:
1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
3. Device mounted on FR-4 substrate PC board with minimum recommended pad layout.
4. Repetitive rating, pulse width limited by junction temperature.

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## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 5)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | -20 | - | - | V | $V_{GS}$ = 0V, $I_D$ = -250µA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | - | - | -1.0 | µA | $V_{DS}$ = -20V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | - | - | ±10 | µA | $V_{GS}$ = ±8V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 5)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -0.4 | -0.7 | -1.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -250µA |
| Static Drain-Source On-Resistance | $R_{DS\ (ON)}$ | - | 23<br>30<br>41 | 35<br>45<br>62 | mΩ | $V_{GS}$ = -4.5V, $I_D$ = -4.0A<br>$V_{GS}$ = -2.5V, $I_D$ = -4.0A<br>$V_{GS}$ = -1.8V, $I_D$ = -2.0A |
| Forward Transfer Admittance | $\|Y_{fs}\|$ | - | 14 | - | S | $V_{DS}$ = -5V, $I_D$ = -4A |
| Diodes Forward Voltage | $V_{SD}$ | - | -0.7 | -1.0 | V | Is = -1A, $V_{GS}$ = 0V |
| **DYNAMIC CHARACTERISTICS (Note 6)** | | | | | | |
| Input Capacitance | $C_{iss}$ | - | 1610 | - | pF | $V_{DS}$ = -10V, $V_{GS}$ = 0V, f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | - | 157 | - | pF | |
| Reverse Transfer Capacitance | $C_{rss}$ | - | 145 | - | pF | |
| Gate Resistance | $R_g$ | - | 9.45 | - | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz |
| **SWITCHING CHARACTERISTICS** | | | | | | |
| Total Gate Charge | $Q_g$ | - | 15.4 | - | nC | $V_{GS}$ = -4.5V, $V_{DS}$ = -10V, $I_D$ = -4A |
| Gate-Source Charge | $Q_{gs}$ | - | 2.5 | - | nC | |
| Gate-Drain Charge | $Q_{gd}$ | - | 3.3 | - | nC | |
| Turn-On Delay Time | $t_{D(on)}$ | - | 16.8 | - | ns | $V_{DS}$ = -10V, $V_{GS}$ = -4.5V, $R_L$ = 10Ω, $R_G$ = 6.0Ω, $I_D$ = -1A |
| Turn-On Rise Time | $t_r$ | - | 12.4 | - | ns | |
| Turn-Off Delay Time | $t_{D(off)}$ | - | 94.1 | - | ns | |
| Turn-Off Fall Time | $t_f$ | - | 42.4 | - | ns | |

Notes: 5. Short duration pulse test used to minimize self-heating effects.
6. Guaranteed by design. Not subject to production testing.

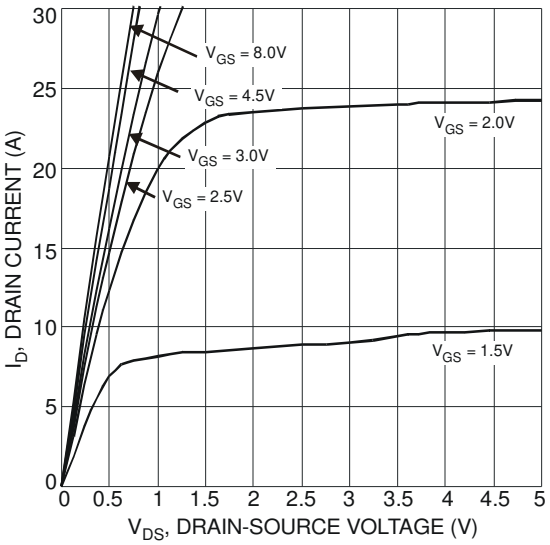

Fig. 1 Typical Output Characteristics

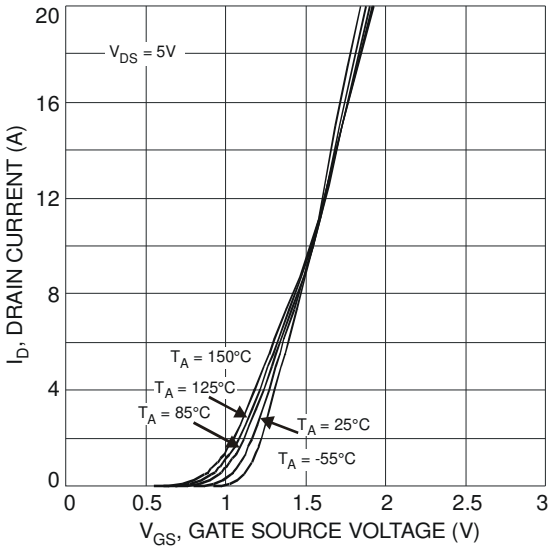

Fig. 2 Typical Transfer Characteristics

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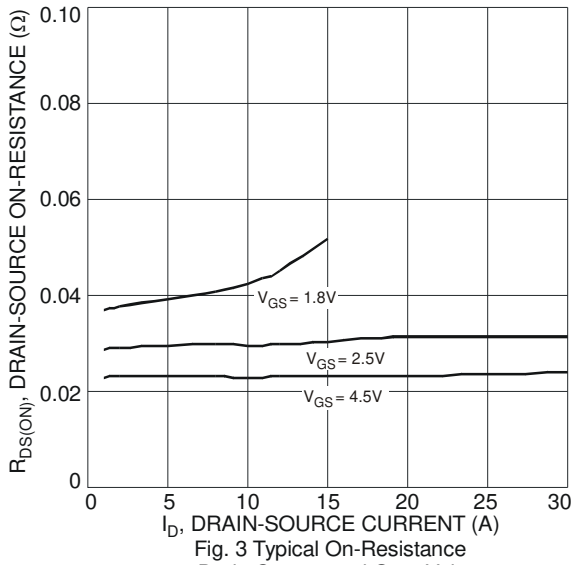


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

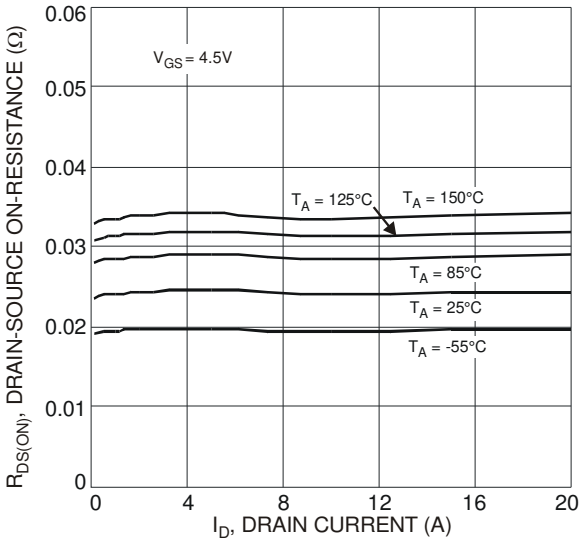


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

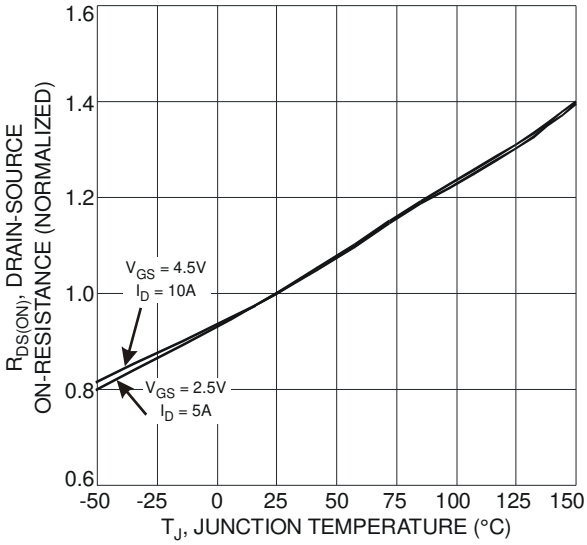


Fig. 5 On-Resistance Variation with Temperature

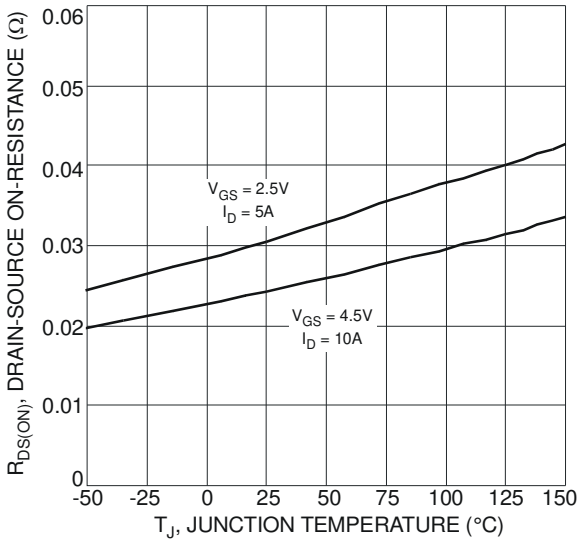


Fig. 6 On-Resistance Variation with Temperature

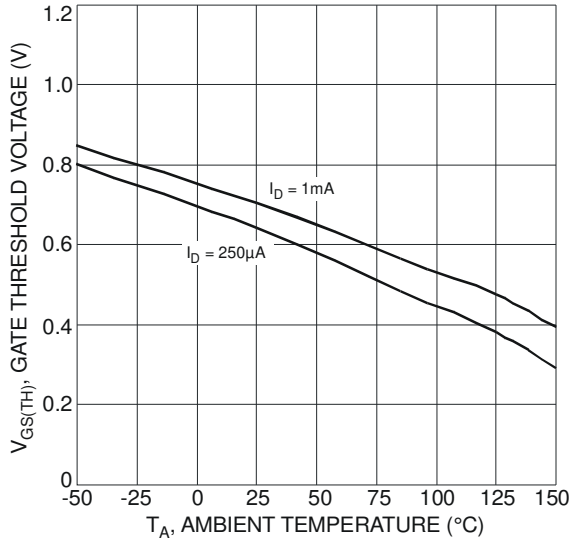


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

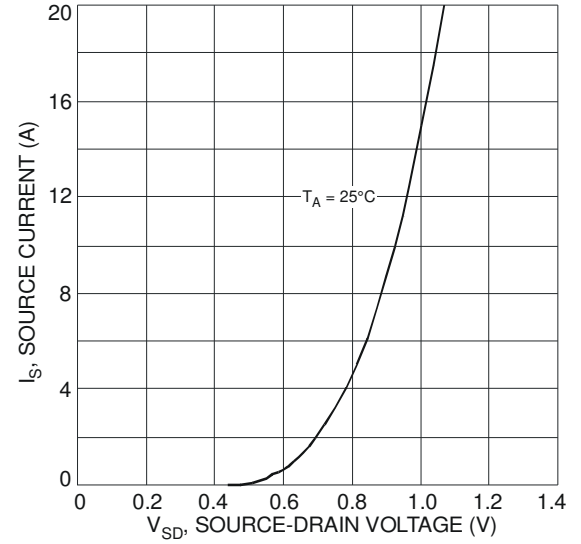


Fig. 8 Diode Forward Voltage vs. Current

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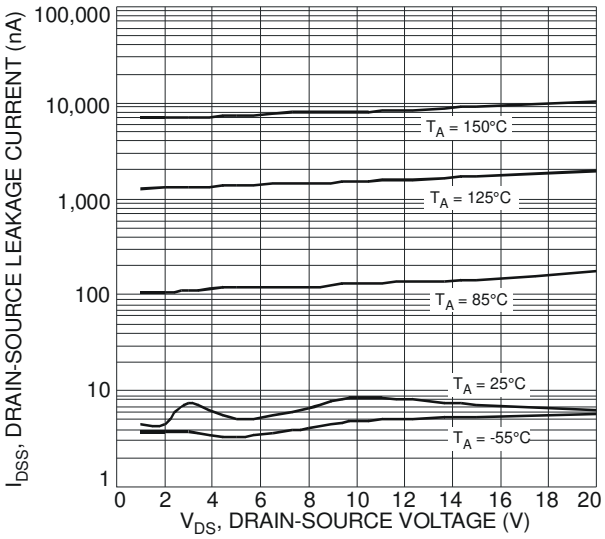


Fig. 9 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

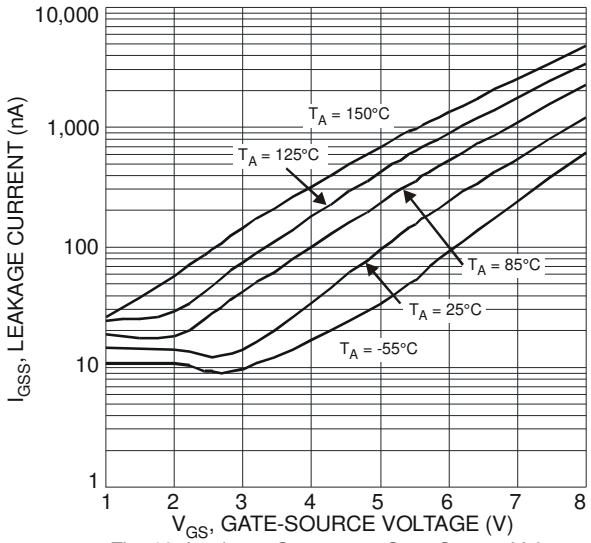


Fig. 10 Leakage Current vs. Gate-Source Voltage

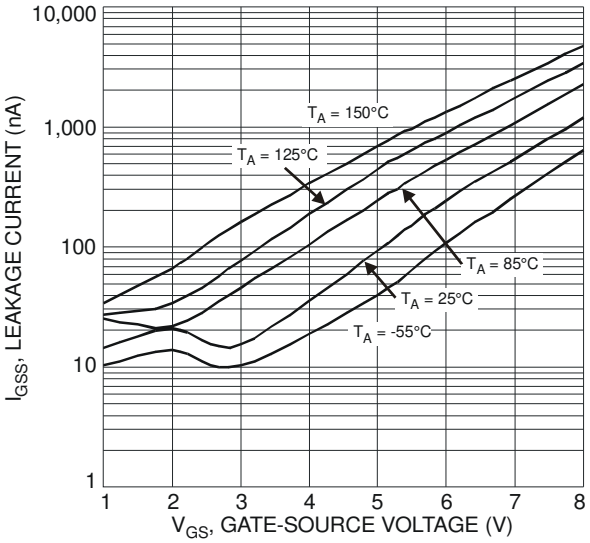


Fig. 11 Leakage Current vs. Gate-Source Voltage

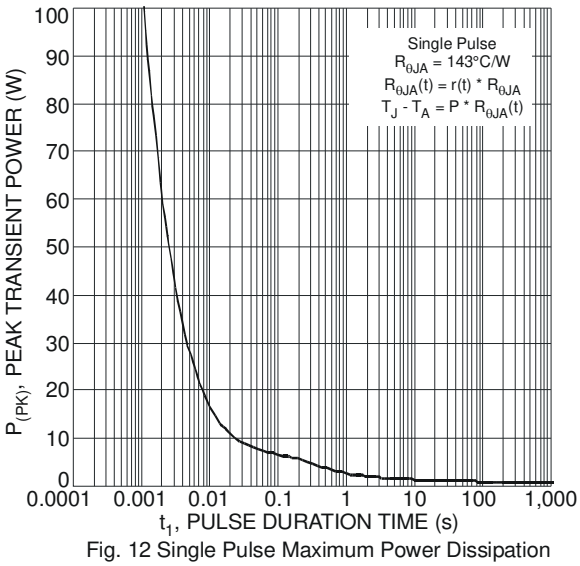


Fig. 12 Single Pulse Maximum Power Dissipation

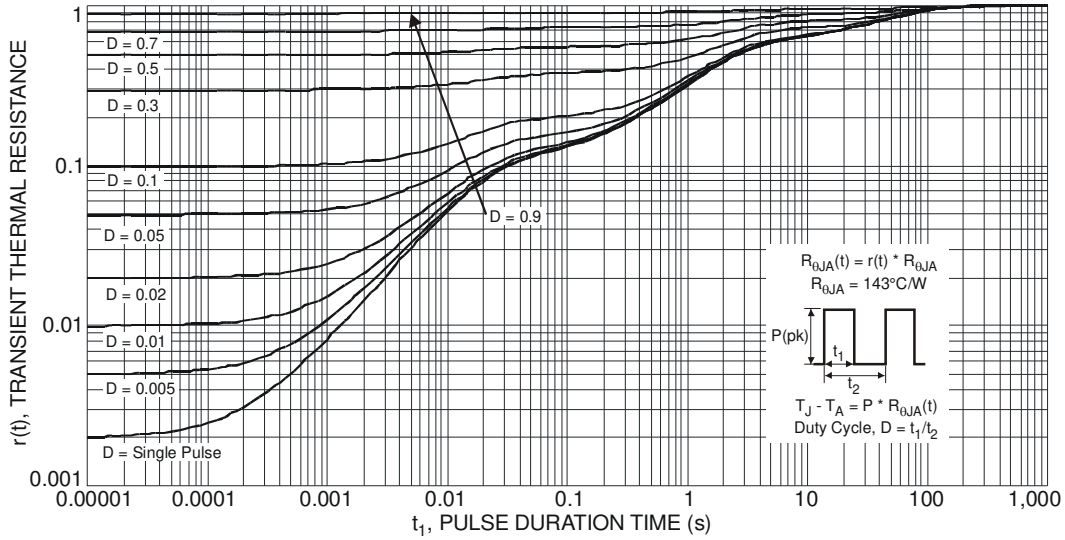


Fig. 13 Transient Thermal Response

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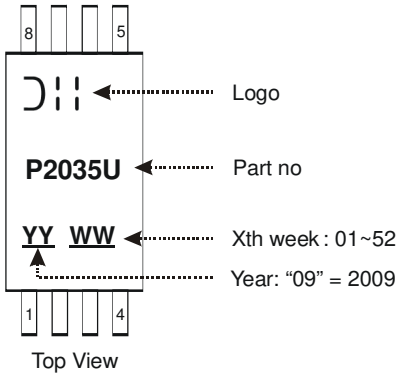
## Ordering Information (Note 7)

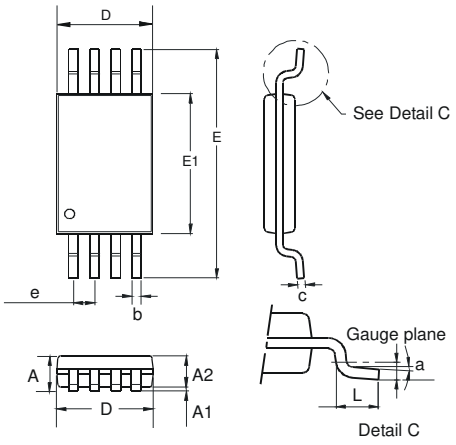
| Part Number | Case | Packaging |
|---|---|---|
| DMP2035UTS-13 | TSSOP-8L | 2500 / Tape & Reel |

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

## Marking Information

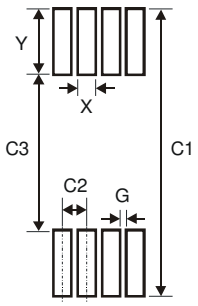



## Package Outline Dimensions




| TSSOP-8L | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **a** | 0.09 | – | – |
| **A** | – | 1.20 | – |
| **A1** | 0.05 | 0.15 | – |
| **A2** | 0.825 | 1.025 | 0.925 |
| **b** | 0.19 | 0.30 | – |
| **c** | 0.09 | 0.20 | – |
| **D** | 2.90 | 3.10 | 3.025 |
| **e** | – | – | 0.65 |
| **E** | – | – | 6.40 |
| **E1** | 4.30 | 4.50 | 4.425 |
| **L** | 0.45 | 0.75 | 0.60 |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout




| Dimensions | Value (in mm) |
|---|---|
| **X** | 0.45 |
| **Y** | 1.78 |
| **C1** | 7.72 |
| **C2** | 0.65 |
| **C3** | 4.16 |
| **G** | 0.20 |

NEW PRODUCT

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