## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | -30 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±12 | V |
| Continuous Drain Current (Note 6) $V_{GS}$ = -4.5V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | -3.5<br>-2.6 | A |
| | t<10s | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | -4.1<br>-3.2 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | | | $I_S$ | -1.6 | A |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | | | $I_{DM}$ | -20 | A |

## Thermal Characteristics

| Characteristic | | Symbol | Value | Units |
|---|---|---|---|---|
| Total Power Dissipation (Note 6) | $T_A$ = +25°C | $P_D$ | 0.7 | W |
| | $T_A$ = +70°C | | 0.4 | |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | $R_{\theta JA}$ | 184 | °C/W |
| | t<10s | | 115 | |
| Total Power Dissipation (Note 7) | $T_A$ = +25°C | $P_D$ | 1.3 | W |
| | $T_A$ = +70°C | | 0.8 | |
| Thermal Resistance, Junction to Ambient (Note 7) | Steady State | $R_{\theta JA}$ | 94 | °C/W |
| | t<10s | | 61 | |
| Thermal Resistance, Junction to Case | | $R_{\theta JC}$ | 25 | |
| Operating and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 8)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | -30 | — | — | V | $V_{GS}$ = 0V, $I_D$ = -250µA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | — | — | -1 | µA | $V_{DS}$ = -30V, $V_{GS}$ = 0V |
| Gate-Body Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±12V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 8)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | -0.6 | — | -1.3 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -250µA |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 59 | 77 | mΩ | $V_{GS}$ = -10V, $I_D$ = -4.2A |
| | | — | 73 | 95 | | $V_{GS}$ = -4.5V, $I_D$ = -4A |
| | | — | 115 | 150 | | $V_{GS}$ = -2.5V, $I_D$ = -3A |
| Forward Transconductance | $g_{fs}$ | — | 8 | — | S | $V_{DS}$ = -5V, $I_D$ = -4A |
| Source-Drain Diode Forward Voltage | $V_{SD}$ | — | -0.8 | -1.25 | V | $V_{GS}$ = 0V, $I_S$ = -3.0A |
| **DYNAMIC CHARACTERISTICS (Note 9)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 432 | 864 | pF | $V_{DS}$ = -15V, $V_{GS}$ = 0V<br>f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | — | 87 | 174 | pF | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 62 | 124 | pF | |
| Gate Resistance | $R_G$ | — | 4.04 | — | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1.0MHz |
| **SWITCHING CHARACTERISTICS (Note 9)** | | | | | | |
| Total Gate Charge | $Q_G$ | — | 5.9 | 11.8 | nC | $V_{DS}$ = -15V, $V_{GS}$ = -4.5V, $I_D$ = -4.0A |
| | | — | 12 | 24 | | $V_{DS}$ = -15V, $V_{GS}$ = -10V, $I_D$ = -4.0A |
| Gate-Source Charge | $Q_{GS}$ | — | 1.0 | 2.0 | | $V_{DS}$ = -15V, $V_{GS}$ = -4.5V, $I_D$ = -4.0A |
| Gate-Drain Charge | $Q_{GD}$ | — | 3.1 | 6.2 | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 4.6 | 9.2 | ns | $V_{DS}$ = -15V, $V_{GS}$ = -10V,<br>$I_D$ = -1A, $R_G$ = 6.0Ω |
| Rise Time | $t_R$ | — | 6.5 | 13.0 | | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 27.8 | 55.6 | | |
| Fall Time | $t_F$ | — | 15.0 | 30.0 | | |

Notes:
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing

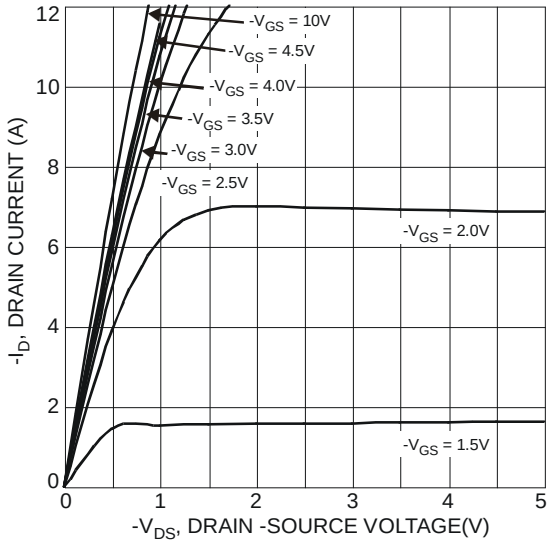



Fig. 1 Typical Output Characteristics

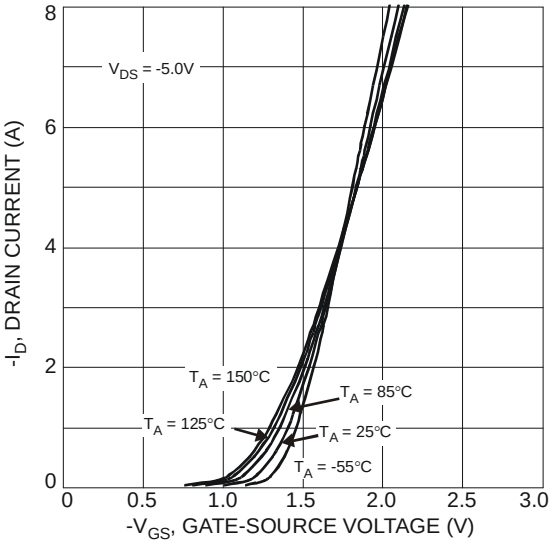



Fig. 2 Typical Transfer Characteristics

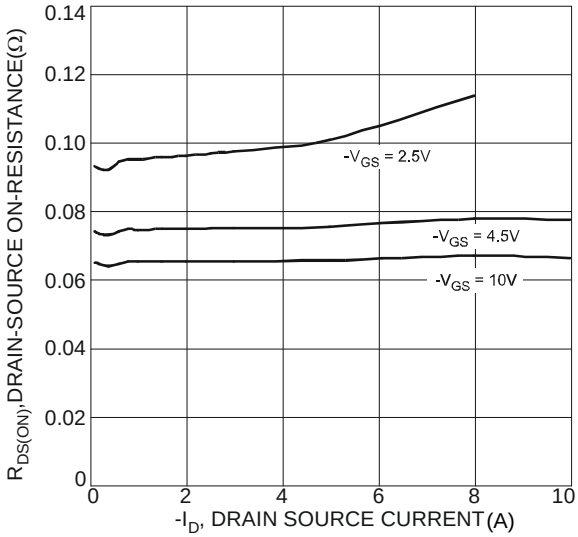



Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

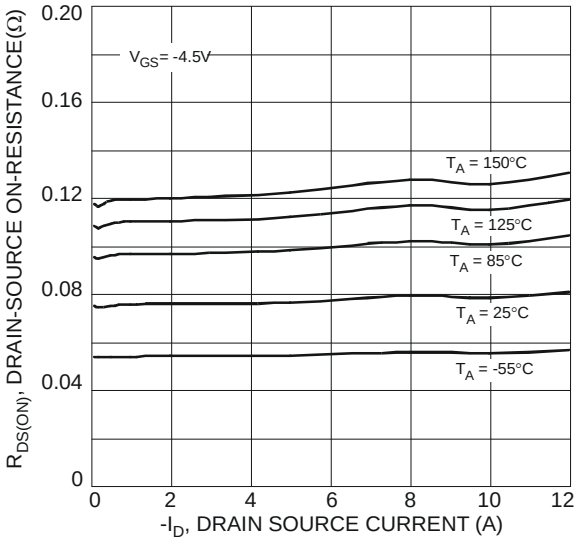



Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

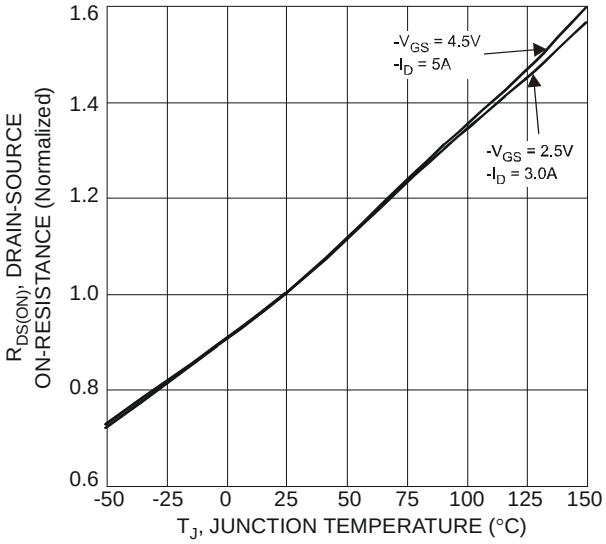



Fig. 5 On-Resistance Variation with Temperature

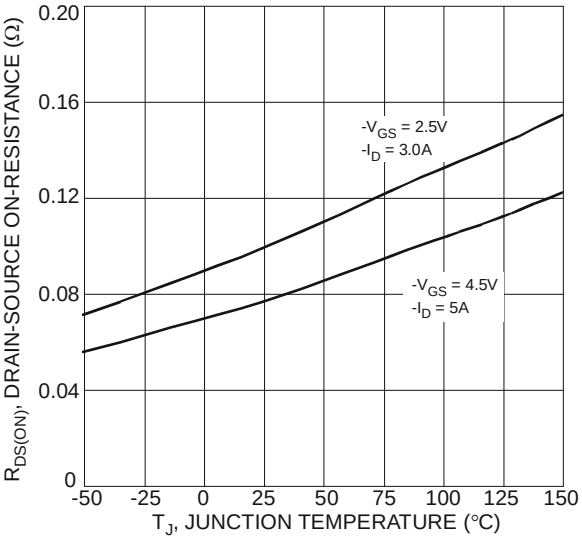



Fig. 6 On-Resistance Variation with Temperature

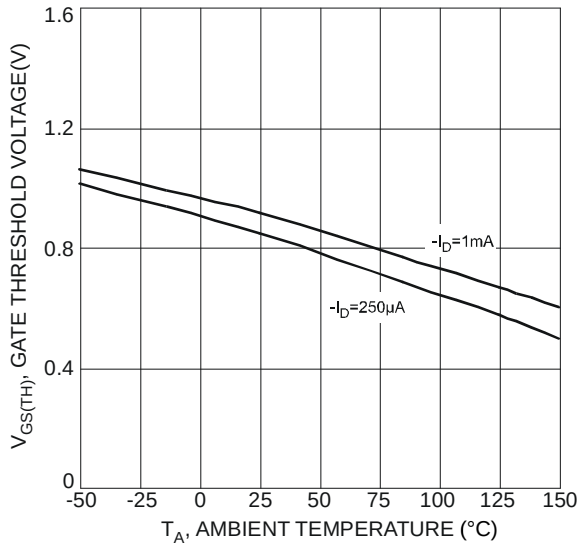



Fig. 7 Gate Threshold Variation vs. Ambient Temperature

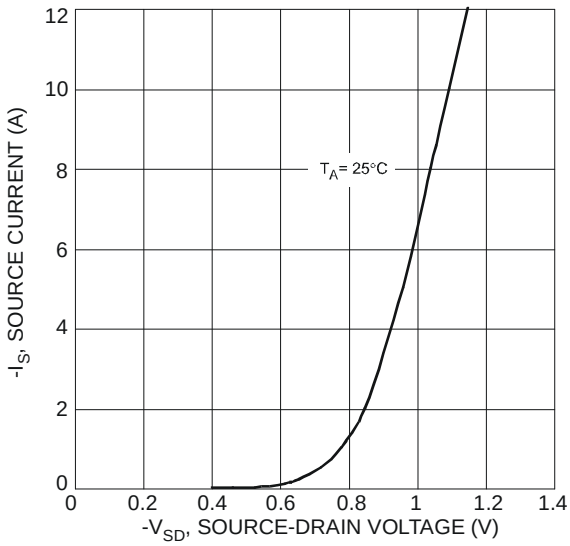



Fig. 8 Diode Forward Voltage vs. Current

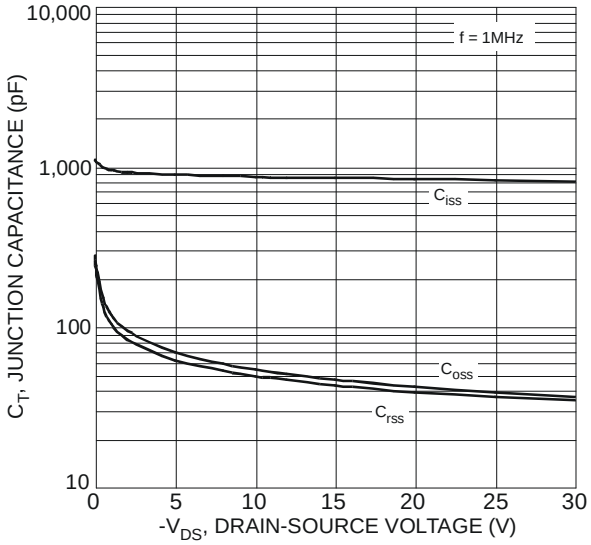



Fig. 9 Typical Junction Capacitance

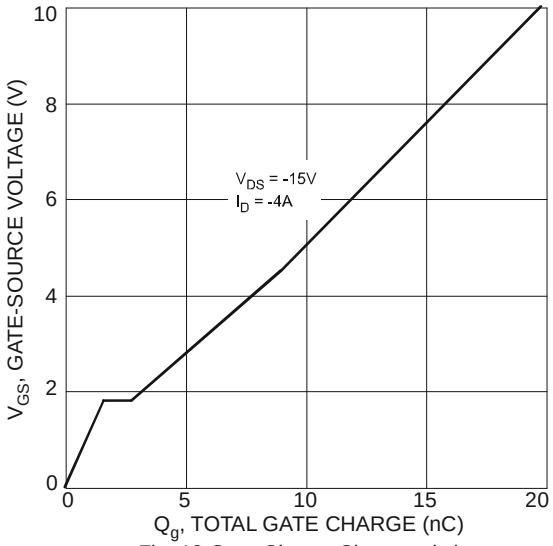



Fig. 10 Gate-Charge Characteristics

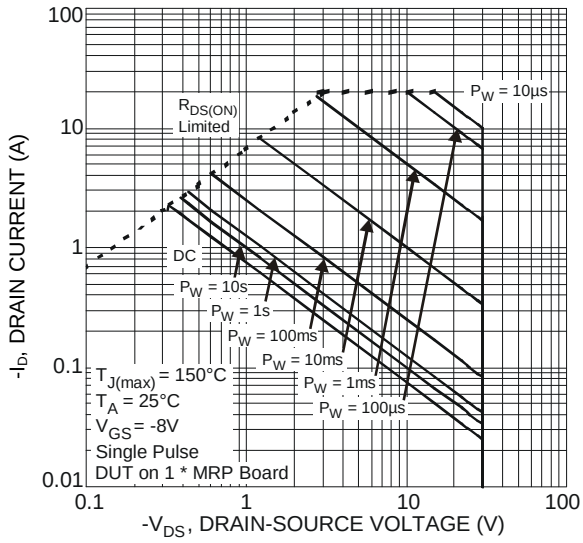



Fig. 11 SOA, Safe Operation Area

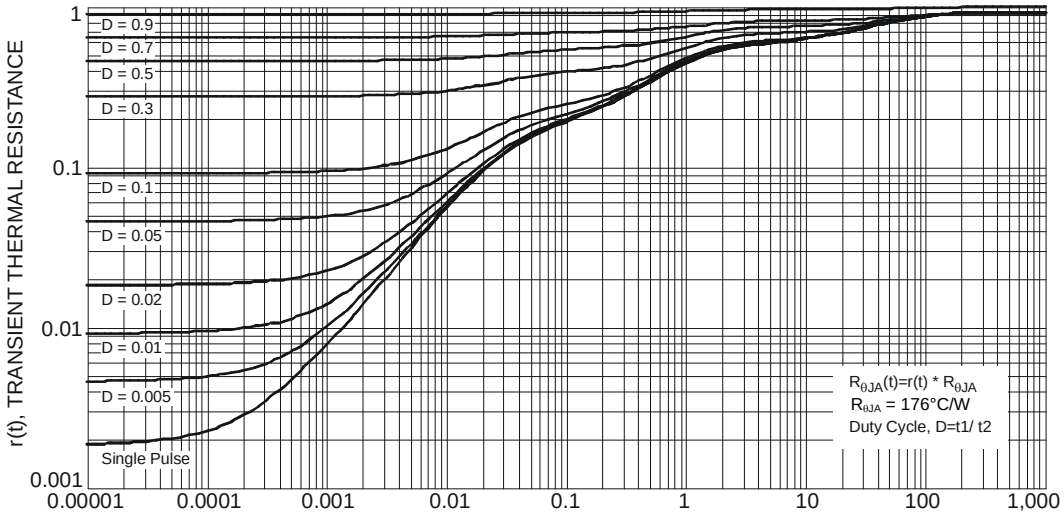
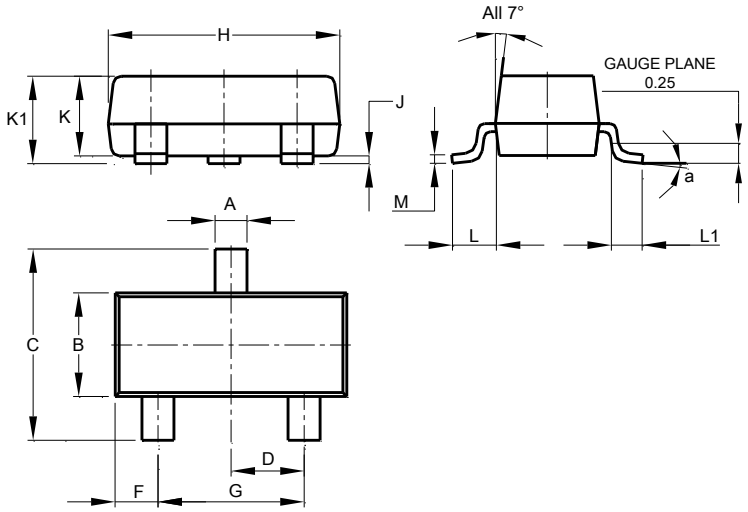



Fig. 12 Transient Thermal Resistance

## Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

**SOT23**

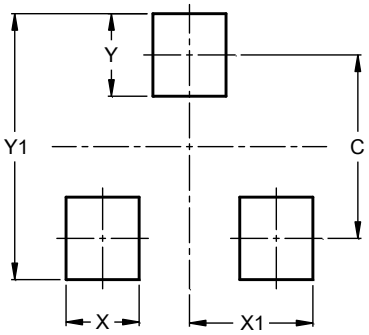



| SOT23 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.37 | 0.51 | 0.40 |
| **B** | 1.20 | 1.40 | 1.30 |
| **C** | 2.30 | 2.50 | 2.40 |
| **D** | 0.89 | 1.03 | 0.915 |
| **F** | 0.45 | 0.60 | 0.535 |
| **G** | 1.78 | 2.05 | 1.83 |
| **H** | 2.80 | 3.00 | 2.90 |
| **J** | 0.013 | 0.10 | 0.05 |
| **K** | 0.890 | 1.00 | 0.975 |
| **K1** | 0.903 | 1.10 | 1.025 |
| **L** | 0.45 | 0.61 | 0.55 |
| **L1** | 0.25 | 0.55 | 0.40 |
| **M** | 0.085 | 0.150 | 0.110 |
| **a** | 0° | 8° | -- |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

**SOT23**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 2.0 |
| **X** | 0.8 |
| **X1** | 1.35 |
| **Y** | 0.9 |
| **Y1** | 2.9 |

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