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

| Characteristic | | | Symbol | Value | Units |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | -40 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±20 | |
| Continuous Drain Current | $V_{GS}$ = -10V | (Notes 6) | $I_D$ | -8.0 | A |
| | | $T_A$ = 70°C (Notes 6) | | -6.9 | |
| | | (Notes 5) | | -6.0 | |
| Pulsed Drain Current | $V_{GS}$ = -10V | (Notes 7) | $I_{DM}$ | -30 | |
| Continuous Source Current (Body diode) | | (Notes 7) | $I_S$ | -8.0 | |
| Pulsed Source Current (Body diode) | | (Notes 7) | $I_{SM}$ | -30 | |

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

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Power Dissipation | (Notes 5) | $P_D$ | 1.52 | W |
| | (Notes 6) | | 2.4 | |
| Thermal Resistance, Junction to Ambient | (Notes 5) | $R_{\theta JA}$ | 82 | °C/W |
| | (Notes 6) | | 52 | |
| Thermal Resistance, Junction to Lead | (Notes 8) | $R_{\theta JL}$ | 48.85 | |
| Operating and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to +150 | °C |

Notes:
5. For a device surface mounted on minimum recommended FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
6. Same as note (2), except the device is surface mounted on 25mm X 25mm X 1.6mm FR4 PCB.
7. Repetitive rating on 25mm X 25mm FR4 PCB, D=0.02, pulse width 300µs – pulse width by maximum junction temperature.
8. Thermal resistance from junction to solder-point (at the end of the drain lead).

## Thermal Characteristics

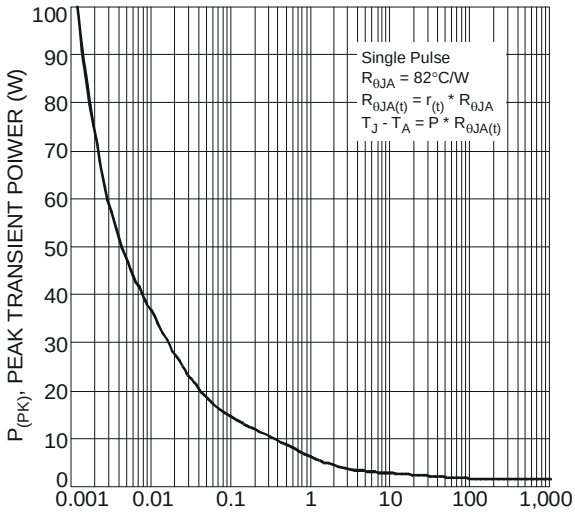



Fig. 1 Single Pulse Maximum Power Dissipation

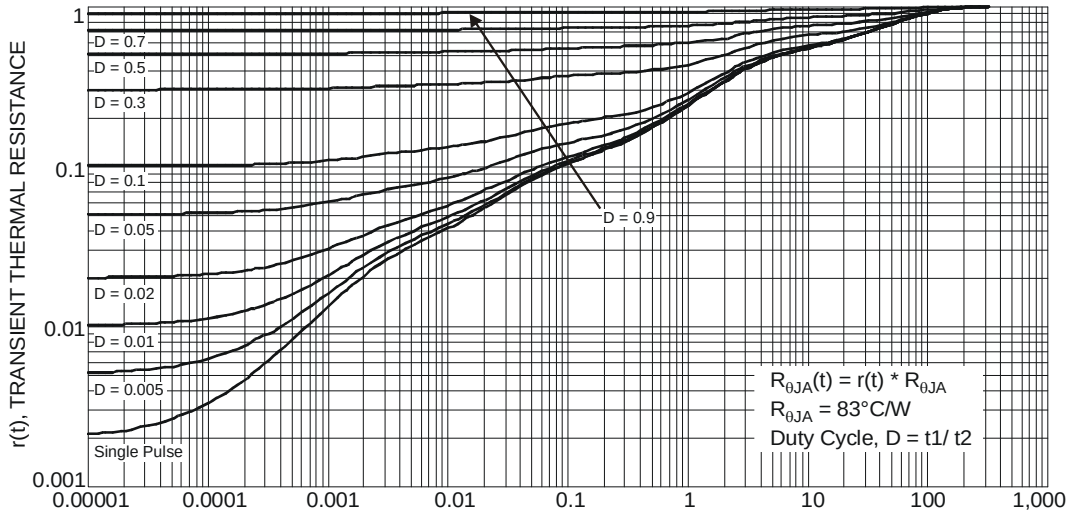



Fig. 2 Transient Thermal Resistance

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | -40 | — | — | V | $I_D$ = -250μA, $V_{GS}$ = 0V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | — | — | -1.0 | μA | $V_{DS}$ = -40V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±20V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -0.8 | -1.3 | -1.8 | V | $I_D$ = -250μA, $V_{DS}$ = $V_{GS}$ |
| Static Drain-Source On-Resistance (Note 9) | $R_{DS\ (ON)}$ | — | 18 | 25 | mΩ | $V_{GS}$ = -10V, $I_D$ = -3A |
| | | | 30 | 45 | | $V_{GS}$ = -4.5V, $I_D$ = -3A |
| Forward Transconductance (Notes 9 & 10) | $g_{fs}$ | — | 16.6 | — | S | $V_{DS}$ = -5V, $I_D$ = -3A |
| Diode Forward Voltage (Note 9) | $V_{SD}$ | — | -0.7 | -1.0 | V | $I_S$ = -1A, $V_{GS}$ = 0V |
| **DYNAMIC CHARACTERISTICS (Note 10)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 1640 | — | pF | $V_{DS}$ = -20V, $V_{GS}$ = 0V<br>f = 1MHz |
| Output Capacitance | $C_{oss}$ | — | 179 | — | | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 128 | — | | |
| Gate Resistance | $R_g$ | — | 6.43 | — | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz |
| Total Gate Charge (Note 11) | $Q_g$ | — | 14.0 | — | nC | $V_{GS}$ = -4.5V; $V_{DS}$ = -20V, $I_D$ = -3A |
| Total Gate Charge (Note 11) | $Q_g$ | — | 33.7 | — | | $V_{GS}$ = -10V; $V_{DS}$ = -20V, $I_D$ = -3A |
| Gate-Source Charge (Note 11) | $Q_{gs}$ | — | 5.5 | — | | |
| Gate-Drain Charge (Note 11) | $Q_{gd}$ | — | 7.3 | — | | |
| Turn-On Delay Time (Note 11) | $t_{D(on)}$ | — | 6.9 | — | ns | $V_{DD}$ = -20V, $V_{GS}$ = -10V<br>$I_D$ = -3A |
| Turn-On Rise Time (Note 11) | $t_r$ | — | 14.7 | — | | |
| Turn-Off Delay Time (Note 11) | $t_{D(off)}$ | — | 53.7 | — | | |
| Turn-Off Fall Time (Note 11) | $t_f$ | — | 30.9 | — | | |

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
10. For design aid only, not subject to production testing.
11. Switching characteristics are independent of operating junction temperatures.

## Typical Characteristics

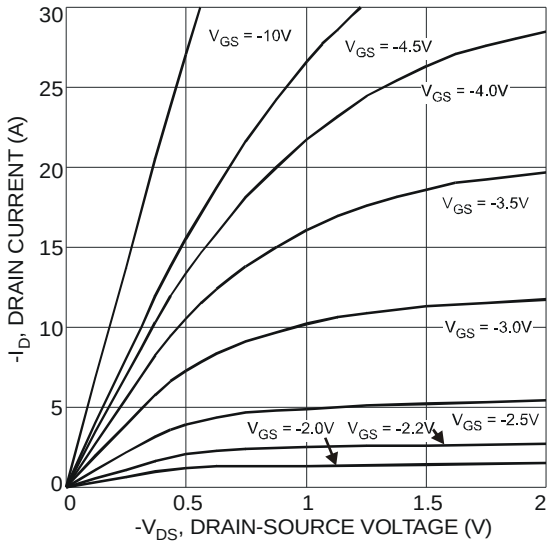


Fig. 3 Typical Output Characteristic

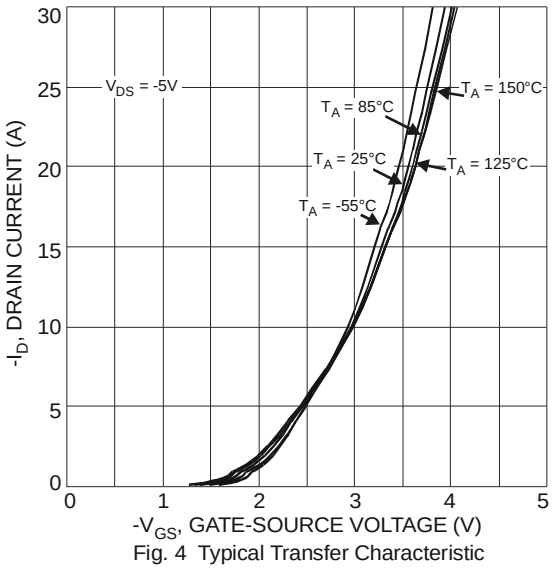


Fig. 4 Typical Transfer Characteristic

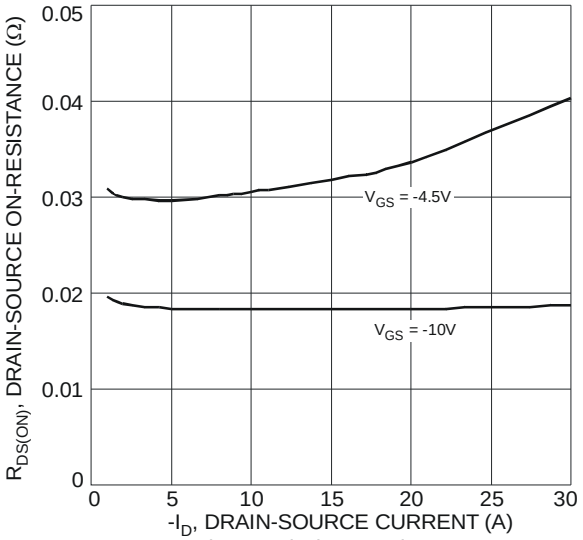



Fig. 5 Typical On-Resistance
vs. Drain Current and Gate Voltage

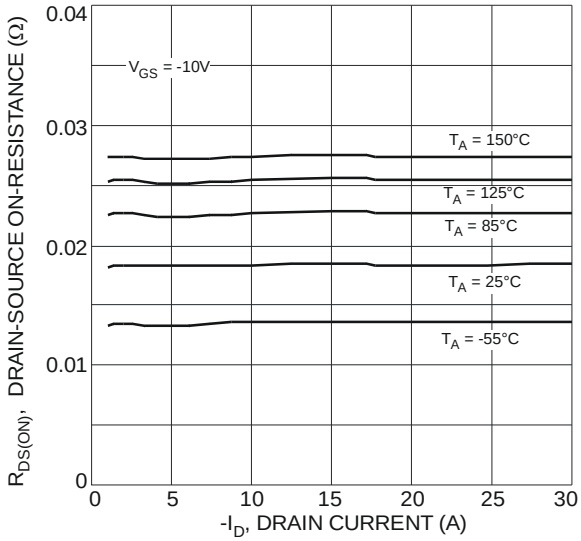



Fig. 6 Typical On-Resistance
vs. Drain Current and Temperature

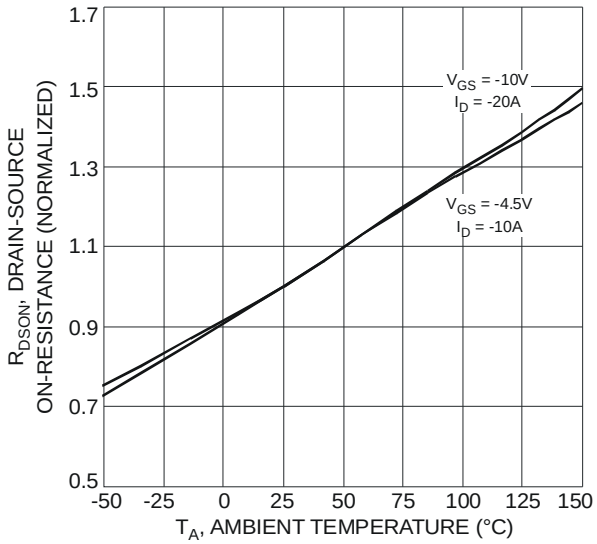



Fig. 7 On-Resistance Variation with Temperature

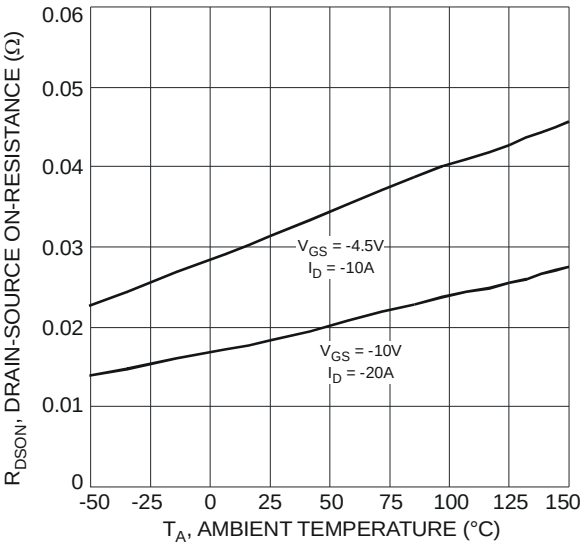



Fig. 8 On-Resistance Variation with Temperature

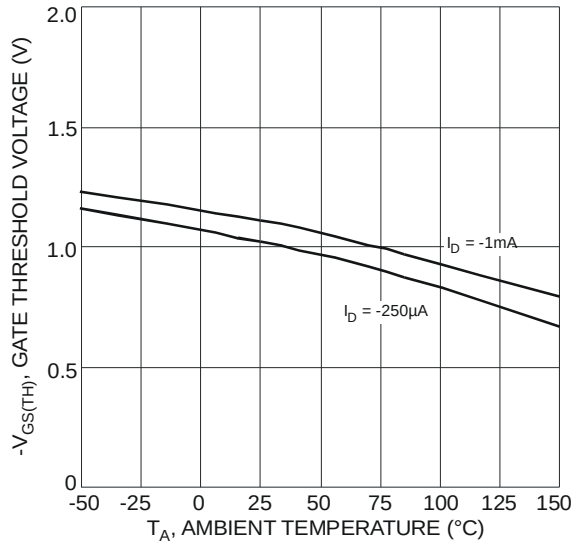



Fig. 9 Gate Threshold Variation vs. Ambient Temperature

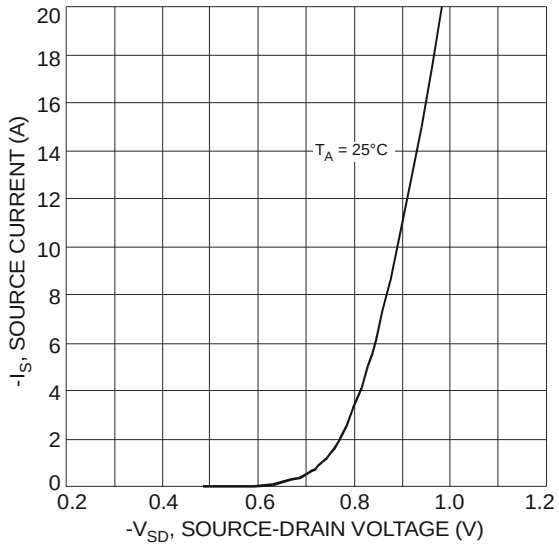



Fig. 10 Diode Forward Voltage vs. Current

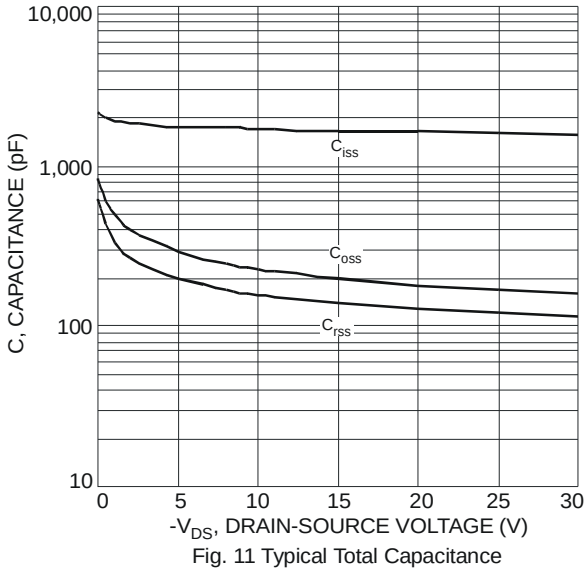



Fig. 11 Typical Total Capacitance

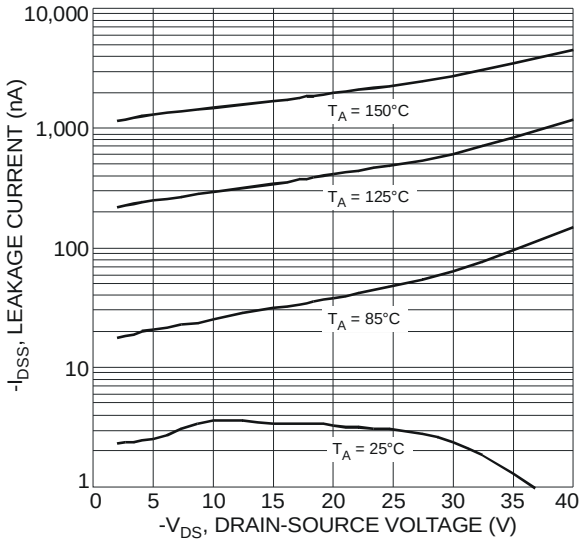



Fig. 12 Typical Leakage Current
vs. Drain-Source Voltage

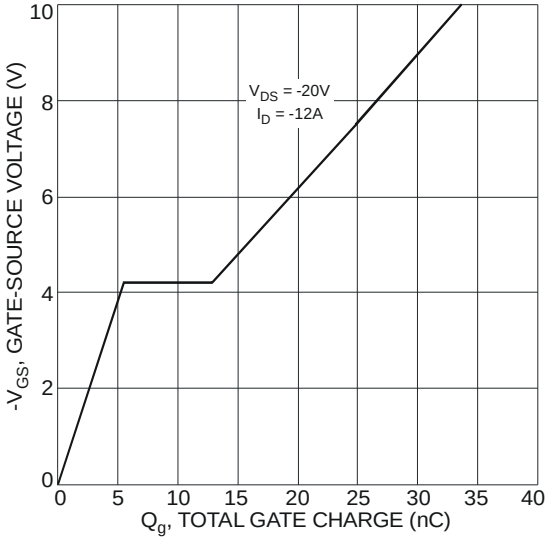
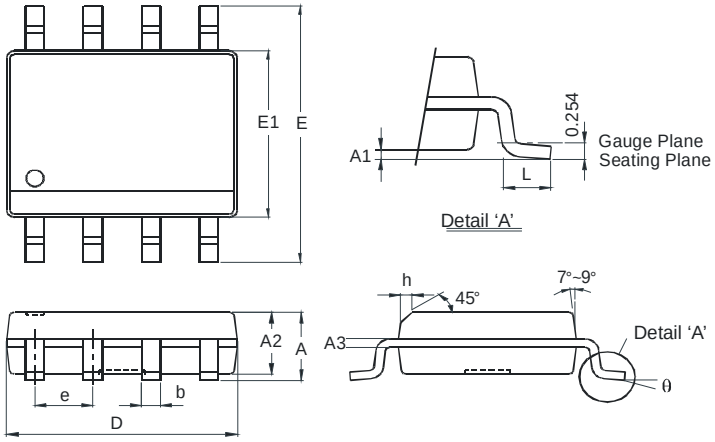


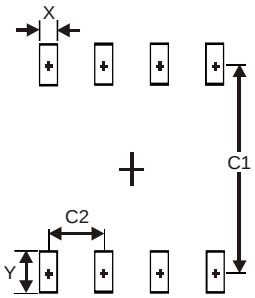

Fig. 13 Gate-Charge Characteristics

## Package Outline Dimensions




| SO-8 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | - | 1.75 |
| **A1** | 0.10 | 0.20 |
| **A2** | 1.30 | 1.50 |
| **A3** | 0.15 | 0.25 |
| **b** | 0.3 | 0.5 |
| **D** | 4.85 | 4.95 |
| **E** | 5.90 | 6.10 |
| **E1** | 3.85 | 3.95 |
| **e** | 1.27 Typ | |
| **h** | - | 0.35 |
| **L** | 0.62 | 0.82 |
| **θ** | 0° | 8° |
| All Dimensions in mm | | |

## Suggested Pad Layout




| Dimensions | Value (in mm) |
|---|---|
| **X** | 0.60 |
| **Y** | 1.55 |
| **C1** | 5.4 |
| **C2** | 1.27 |

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