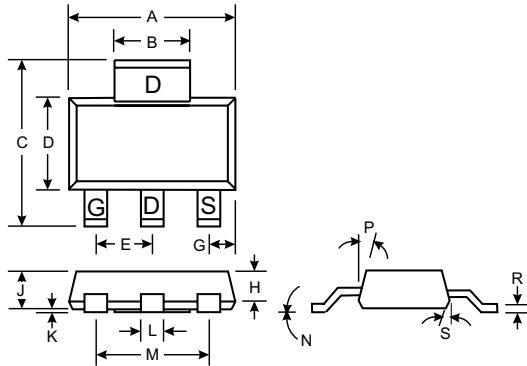


Features

- High Cell Density DMOS Technology
- Low On-State Resistance
- High Power and Current Capability
- Fast Switching Speed
- High Transient Tolerance



| SOT-223 | | |
|----------------------|-------|-------|
| Dim | Min | Max |
| A | 6.30 | 6.71 |
| B | 2.90 | 3.10 |
| C | 6.71 | 7.29 |
| D | 3.30 | 3.71 |
| E | 2.22 | 2.35 |
| G | 0.92 | 1.00 |
| H | 1.10 | 1.30 |
| J | 1.55 | 1.80 |
| K | 0.025 | 0.102 |
| L | 0.66 | 0.79 |
| M | 4.55 | 4.70 |
| N | — | 10° |
| P | 10° | 16° |
| R | 0.254 | 0.356 |
| S | 10° | 16° |
| All Dimensions in mm | | |

Mechanical Data

- SOT-223 Plastic Case
- Terminal Connections: See Outline Drawing and Internal Circuit Diagram Above

Maximum Ratings 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|----------------|-----------------------|------|
| Drain-Source Voltage | V_{DSS} | -30 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Drain Current | I_D | ± 5.9 ± 15 | A |
| Maximum Power Dissipation | P_d | 3.0 1.3 1.1 | W |
| Operating and Storage Temperature Range | T_j, T_{STG} | -65 to +150 | °C |

Thermal Characteristics

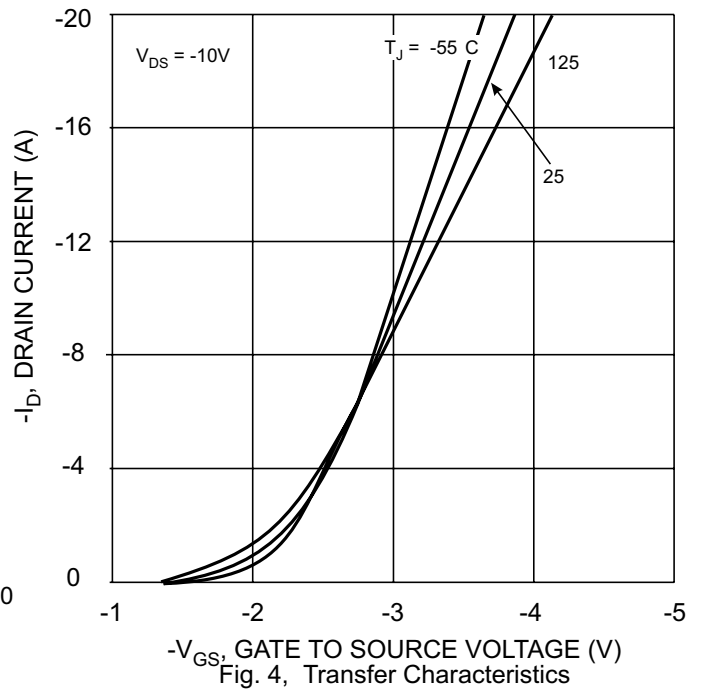
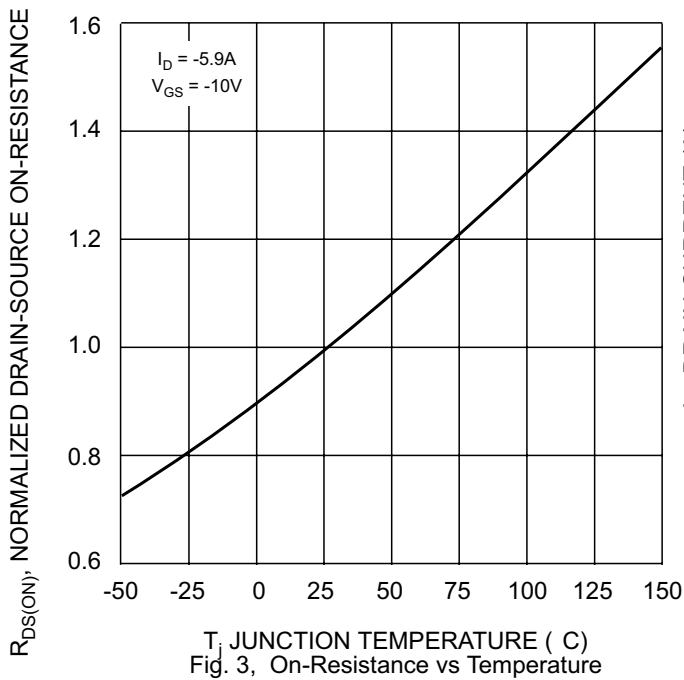
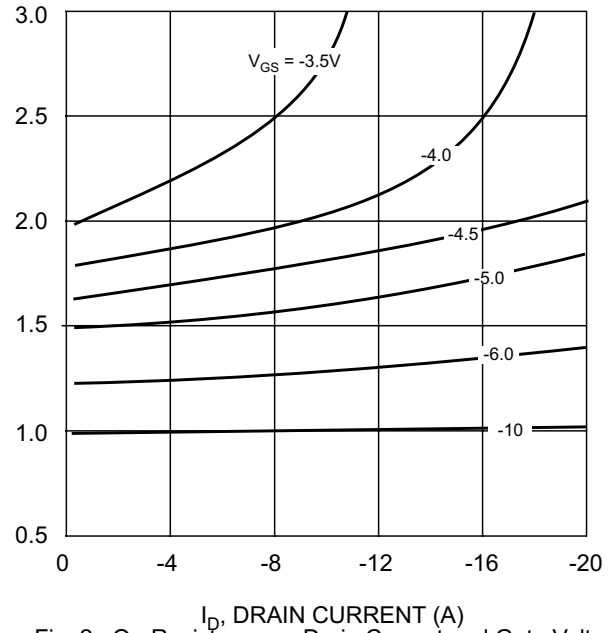
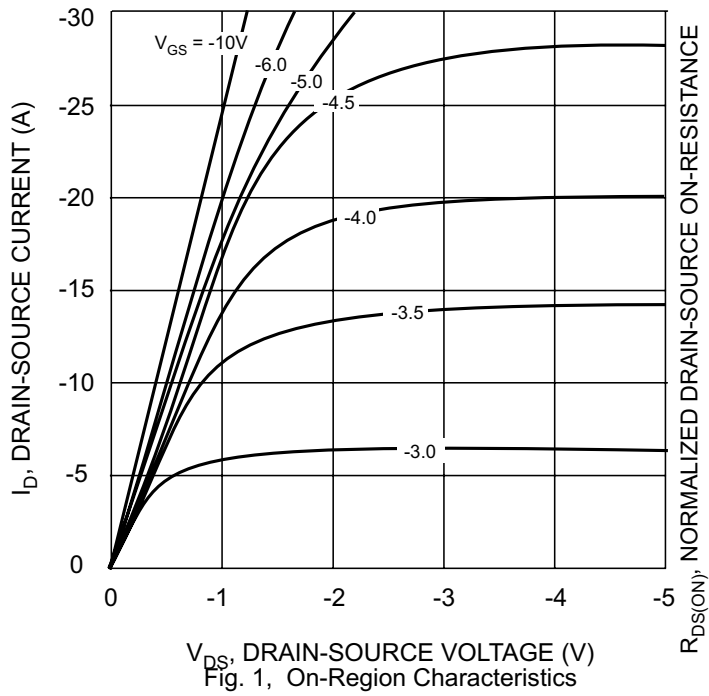
| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------|------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 42 | °C/W |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 12 | °C/W |

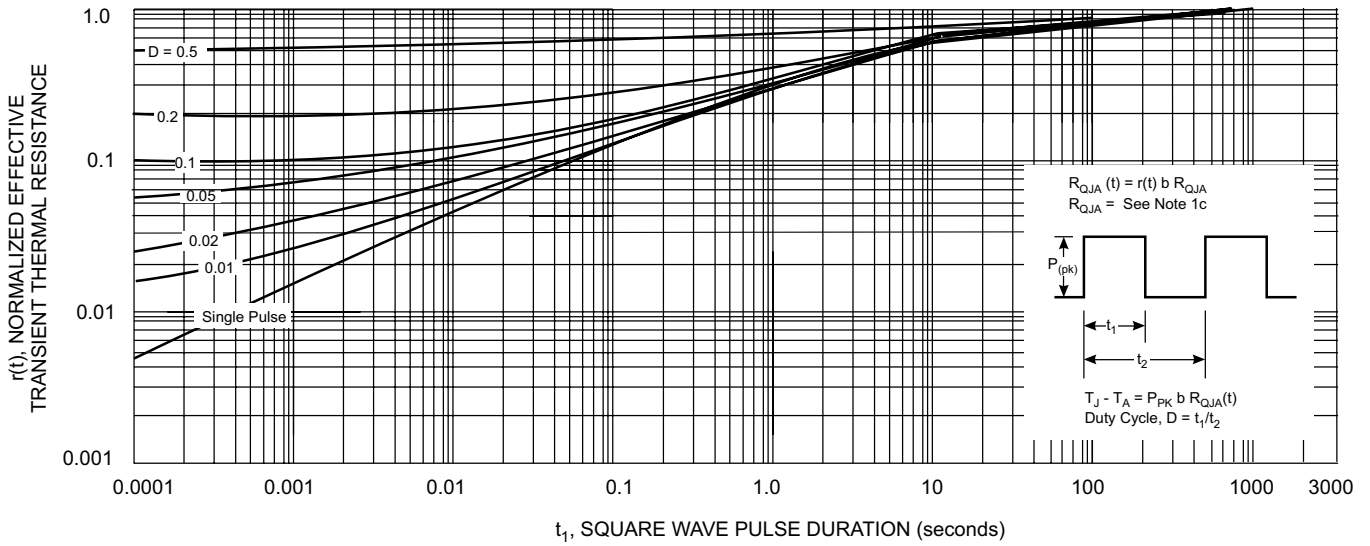
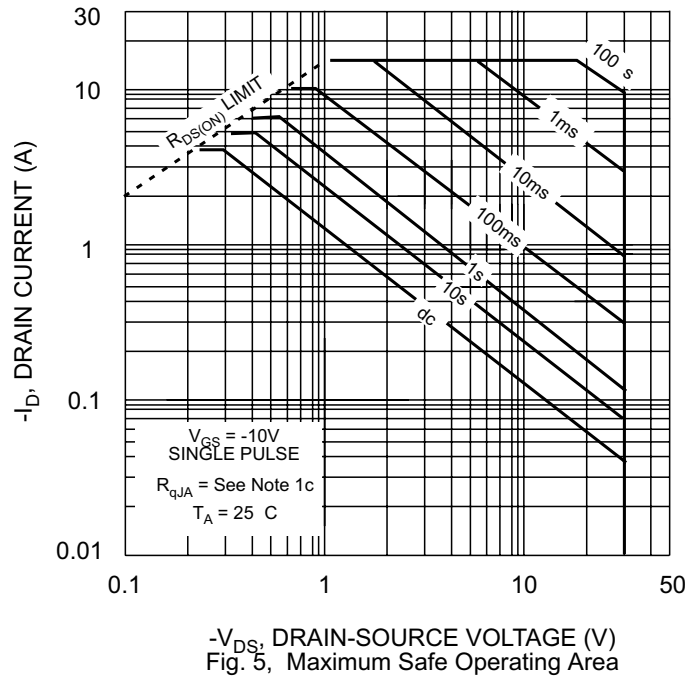
- Notes: 1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.
- 1a. With 1 in² oz 2 oz. copper mounting pad $R_{\theta JA} = 42^\circ\text{C/W}$.
 - 1b. With 0.0066 in² oz 2 oz. copper mounting pad $R_{\theta JA} = 95^\circ\text{C/W}$.
 - 1c. With 0.0123 in² oz 2 oz. copper mounting pad $R_{\theta JA} = 110^\circ\text{C/W}$.

Electrical Characteristics ^{25°C unless otherwise specified}

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|--------------|-------------|-------------------------|----------------------|----------|--|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -30 | — | — | V | $V_{GS} = 0V, I_D = -250\mu A$ |
| Zero Gate Voltage Drain Current $T_j = 70^\circ C$ | I_{DSS} | — | — | -1.0 -5.0 | μA | $V_{DS} = -24V, V_{GS} = 0V$ $V_{DS} = -15V, V_{GS} = 0V$ |
| Gate-Body Leakage, Forward | I_{GSSF} | — | — | 100 | nA | $V_{GS} = 20V, V_{DS} = 0V$ |
| Gate-Body Leakage, Reverse | I_{GSSR} | — | — | -100 | nA | $V_{GS} = -20V, V_{DS} = 0V$ |
| ON CHARACTERISTICS (Note 2) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -1.0 | -2.7 | — | V | $V_{DS} = V_{GS}, I_D = -250\mu A$ |
| Static Drain-Source On-Resistance $T_j = 125^\circ C$ | $R_{DS(ON)}$ | — | 0.038 0.046 0.064 | 0.05 0.07 0.09 | Ω | $V_{GS} = -10V, I_D = -5.9A$ $V_{GS} = -6.0V, I_D = -5.2A$ $V_{GS} = -4.5V, I_D = -4.6A$ |
| On-State Drain Current | $I_{D(ON)}$ | -15 -5.0 | — | — | A | $V_{GS} = -10V, V_{DS} = -5.0V$ $V_{GS} = -4.5V, V_{DS} = -5.0V$ |
| Forward Transconductance | g_{FS} | — | 10 | — | m | $V_{DS} = -15V, I_D = -5.9A$ |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C_{ISS} | — | 950 | — | pF | $V_{DS} = -15V, V_{GS} = 0V$ $f = 1.0MHz$ |
| Output Capacitance | C_{OSS} | — | 610 | — | pF | |
| Reverse Transfer Capacitance | C_{RSS} | — | 220 | — | pF | |
| SWITCHING CHARACTERISTICS (Note 2) | | | | | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 10 | 30 | ns | $V_{DD} = -15V, I_D = -1.0A$ $V_{GEN} = -10V, R_{GEN} = 6.0\Omega$ |
| Turn-On Rise Time | t_r | — | 18 | 60 | ns | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 80 | 120 | ns | |
| Turn-Off Fall Time | t_f | — | 45 | 100 | ns | |
| Total Gate Charge | Q_g | — | 29 | 40 | nC | $V_{DS} = -15V, I_D = -5.9A$ $V_{GS} = -10V$ |
| Gate-Source Charge | Q_{gs} | — | 3.0 | — | nC | |
| Gate-Drain Charge | Q_{gd} | — | 11 | — | nC | |
| DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS | | | | | | |
| Max Continuous Drain-Source Diode Forward Current | I_S | — | — | -1.9 | A | |
| Drain-Source Diode Forward Voltage | V_{SD} | — | -0.85 | -1.3 | V | $V_{GS} = 0V, I_S = -5.9A$ (Note 2) |
| Reverse Recovery Time | t_{rr} | — | — | 100 | ns | $V_{GS} = 0V, I_F = -5.9A$ $dI_F/dt = 100 A/\mu s$ |

Notes: 2. Pulse Test: Pulse width $\geq 300\mu s$, duty cycle $\leq 2.0\%$.





Remark: Thermal characterization performed under conditions described in note 1c. Transient thermal response will change depending on the circuit board design.