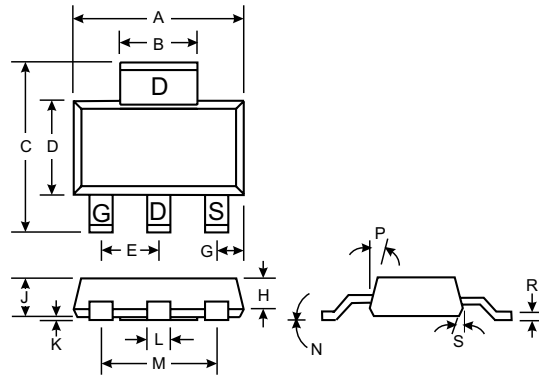


N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

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_{DS} | 60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current | I_D | ± 2.6 ± 10 | 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

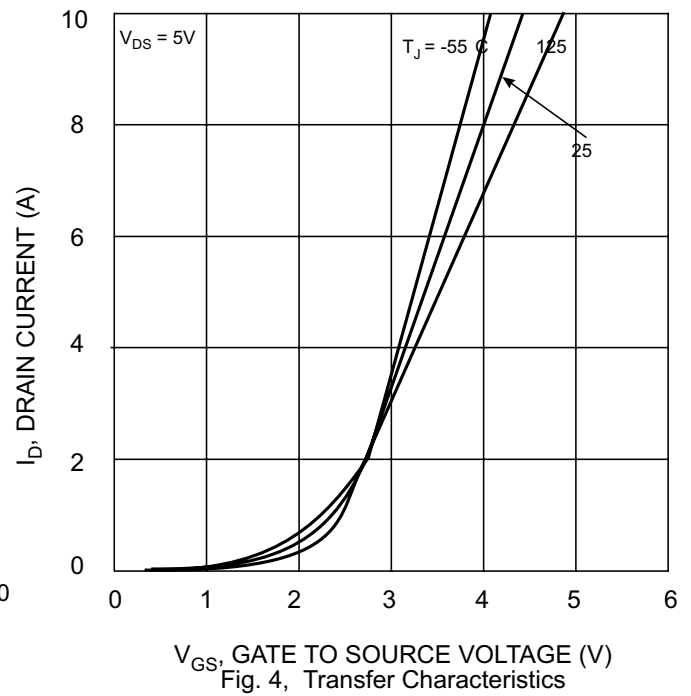
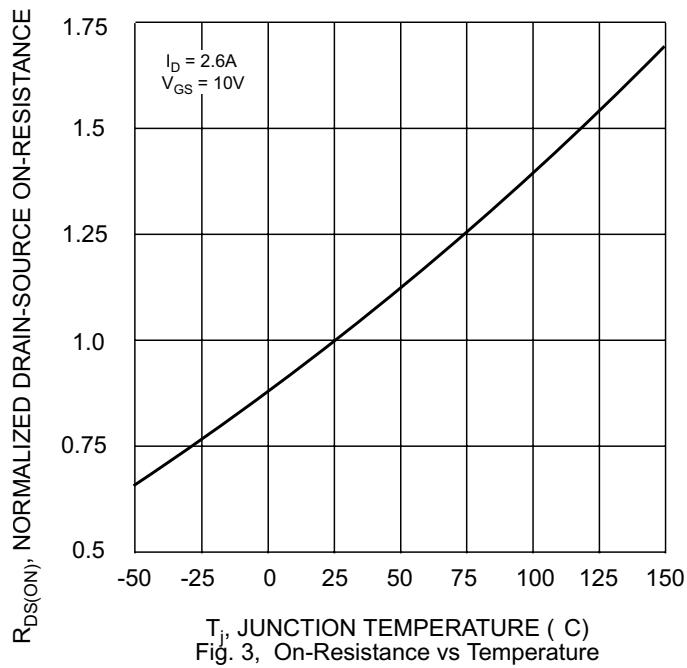
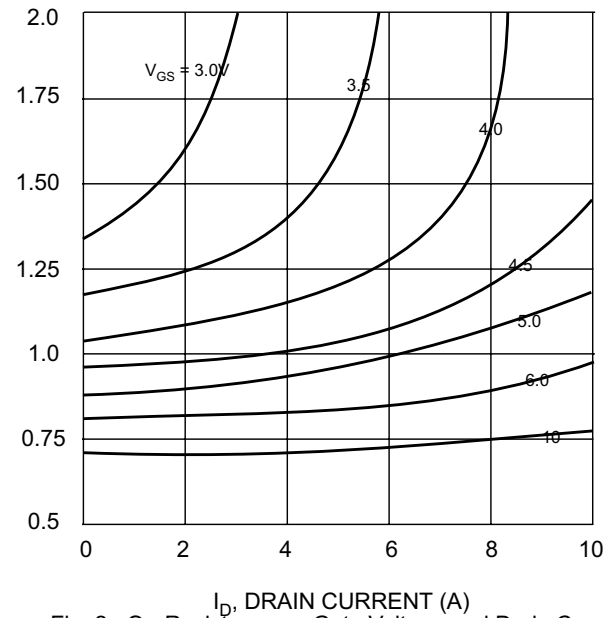
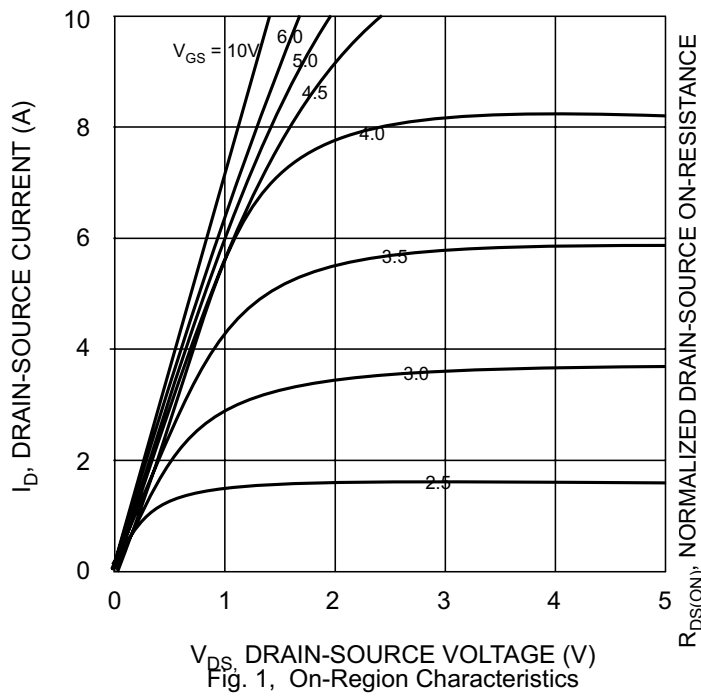
| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------|------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 42 | °C/W |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 12 | °C/W |

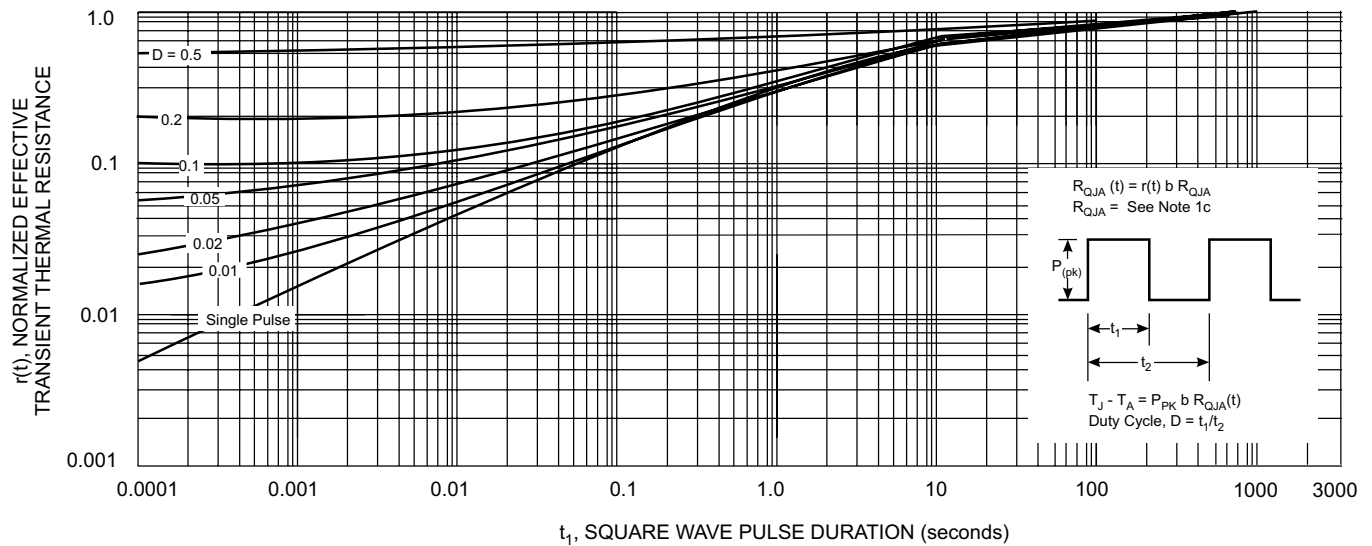
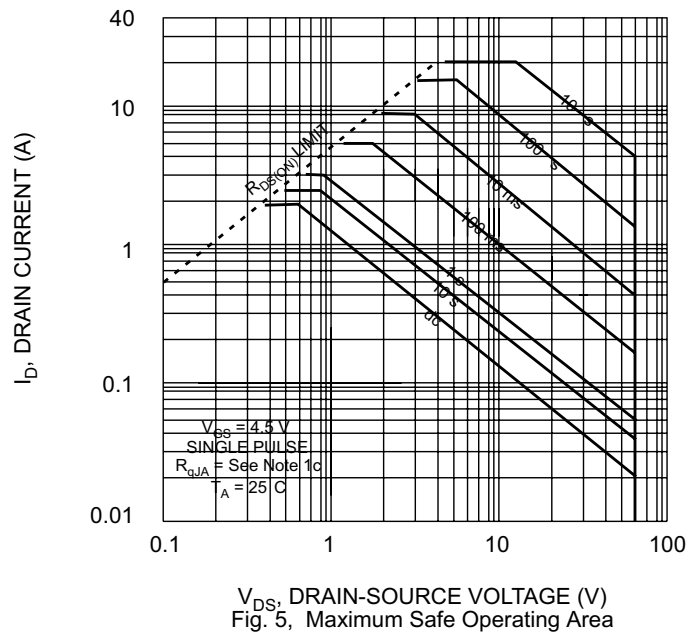
- Notes:
1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.
 - 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} | 60 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current T _j = 55°C | I _{DSS} | — | — | 25 250 | μA | V _{DS} = 60V, 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 T _j = 125°C | V _{GS(th)} | 1.0 0.8 | 1.5 1.2 | 3.0 2.0 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance T _j = 125°C | R _{DS (ON)} | — | 0.17 0.25 0.12 | 0.2 0.36 0.16 | Ω | V _{GS} = 4.5V, I _D = 2.6A V _{GS} = 4.5V, I _D = 2.6A V _{GS} = 10V, I _D = 3.4A |
| On-State Drain Current | I _{D(ON)} | 5.0 10 | — | — | A | V _{GS} = 4.5, V _{DS} = 5.0V V _{GS} = 10V, V _{DS} = 5.0V |
| Forward Transconductance | g _{FS} | — | 4.0 | — | m | V _{GS} = 5.0V, I _D = 2.6A |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C _{ISS} | — | 214 | — | pF | V _{DS} = 30V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{OSS} | — | 70 | — | pF | |
| Reverse Transfer Capacitance | C _{RSS} | — | 27 | — | pF | |
| SWITCHING CHARACTERISTICS (Note 2) | | | | | | |
| Turn-On Delay Time | t _{D(ON)} | — | 6.0 | 12 | ns | V _{DD} = 30V, I _D = 3.0A V _{GEN} = 10V, R _{GEN} = 12Ω |
| Turn-On Rise Time | t _r | — | 14 | 25 | ns | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 15 | 28 | ns | |
| Turn-Off Fall Time | t _f | — | 10 | 18 | ns | |
| Total Gate Charge | Q _g | — | 3.6 | 5.0 | nC | V _{DS} = 10V, I _D = 2.6A. V _{GS} = 4.5V |
| Gate-Source Charge | Q _{gs} | — | 0.8 | — | nC | |
| Gate-Drain Charge | Q _{gd} | — | 1.4 | — | nC | |
| DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS | | | | | | |
| Max Continuous Drain-Source Diode Forward Current | I _S | — | — | 2.3 | A | |
| Drain-Source Diode Forward Voltage (Note 2) | V _{SD} | — | 0.85 | 1.3 | V | V _{GS} = 0V, I _S = 2.3A |
| Reverse Recovery Time | t _{rr} | — | — | 140 | ns | V _{GS} = 0V, I _F = 2.3A, dI _F / dt = 100 A/μs |

Notes: 2. Pulse Test: Pulse width $\leq 300\mu s$, 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.