

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| 50V | 2.5Ω@10V | 0.34A |
| | 3Ω@4.5V | |

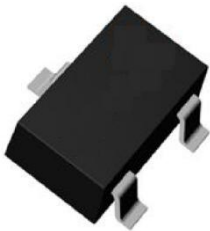
Feature

- Trench power LV MOSFET technology
- Voltage controlled small signal switch
- Low input capacitance
- Fast switching speed
- Low input / output leakage

Application

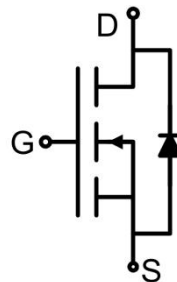
- Battery operated systems
- Solid-state relays
- Direct logic-level interface :TTL / CMOS

Package

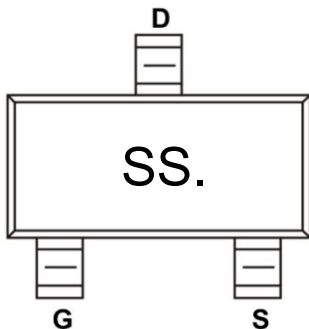


SOT-23

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-------------------------|------------|--------------------|
| Drain-Source Voltage | V_{DS} | 50 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | 0.34 | A |
| Continuous Drain Current ($T_A=70^\circ\text{C}$) | $I_D(70^\circ\text{C})$ | 0.272 | A |
| Pulsed Drain Current ¹⁾ | I_{DM} | 1.5 | A |
| Power Dissipation | P_D | 0.35 | W |
| Thermal Resistance Junction-to-Ambient ²⁾ | $R_{\theta JA}$ | 357 | $^\circ\text{C/W}$ |
| Operating Junction Temperature | T_J | -55 ~ +150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -55 ~ +150 | $^\circ\text{C}$ |

Electrical characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---------------|---|------|------|-----------|---------------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu\text{A}$ | 50 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 50V, V_{GS} = 0V$ | | | 0.5 | μA |
| Gate-body leakage current | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 20V$ | | | ± 100 | nA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ | 0.8 | 1.2 | 1.6 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 0.3A$ | | 1.1 | 2.5 | Ω |
| | | $V_{GS} = 4.5V, I_D = 0.2A$ | | 1.2 | 3 | |
| Dynamic characteristics³⁾ | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 25V, V_{GS} = 0V, f = 1\text{MHz}$ | | 28.5 | | pF |
| Output Capacitance | C_{oss} | | | 2.7 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 1.78 | | |
| Total Gate Charge | Q_g | $V_{DS} = 25V, V_{GS} = 10V, I_D = 0.3A$ | | 1.7 | | nC |
| Gate-Source Charge | Q_{gs} | | | 0.4 | | |
| Gate-Drain Charge | Q_{gd} | | | 0.24 | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DS} = 25V, V_{GS} = 10V, I_D = 0.3A$ $R_G = 6\Omega$ | | 2.6 | | nS |
| Turn-on rise time | t_r | | | 18.8 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 9.7 | | |
| Turn-off fall time | t_f | | | 47 | | |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward Current | I_S | | | | 0.34 | A |
| Diode Forward voltage | V_{SD} | $V_{GS} = 0V, I_S = 0.3A$ | | | 1.2 | V |
| Reverse Recovery Time | T_{rr} | $I_F = 0.3A, di/dt = -100A/\mu\text{s}$ | | 12.2 | | nS |
| Reverse Recovery Charge | Q_{rr} | | | 2.65 | | nC |

Notes:

- 1) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- 2) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

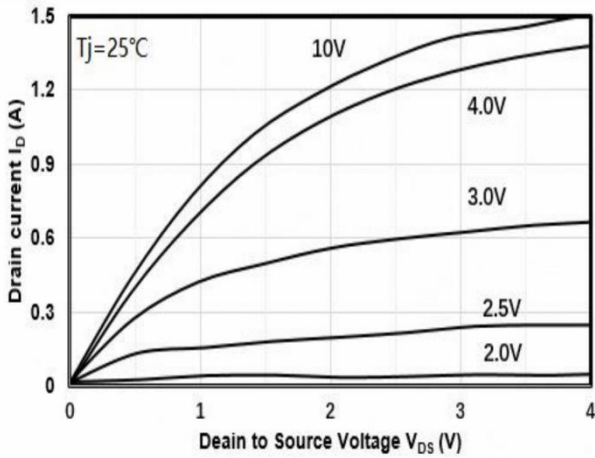


Figure1. Output Characteristics

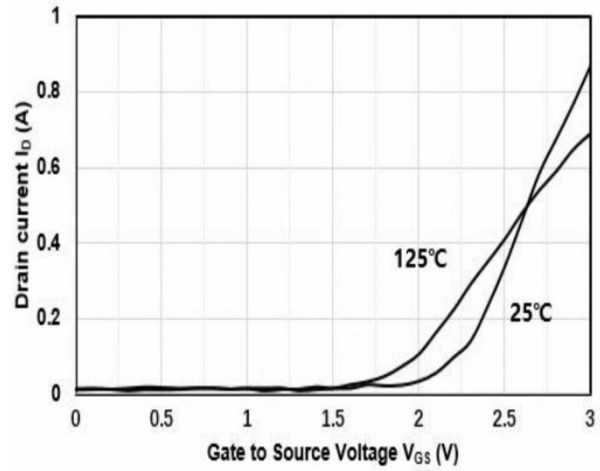


Figure2. Transfer Characteristics

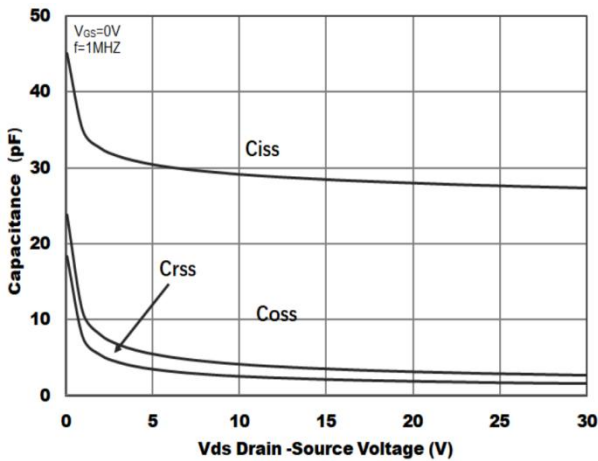


Figure3. Capacitance Characteristics

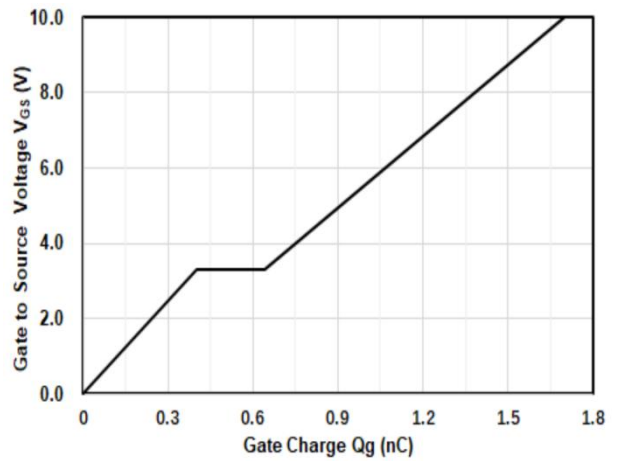


Figure4. Gate Charge

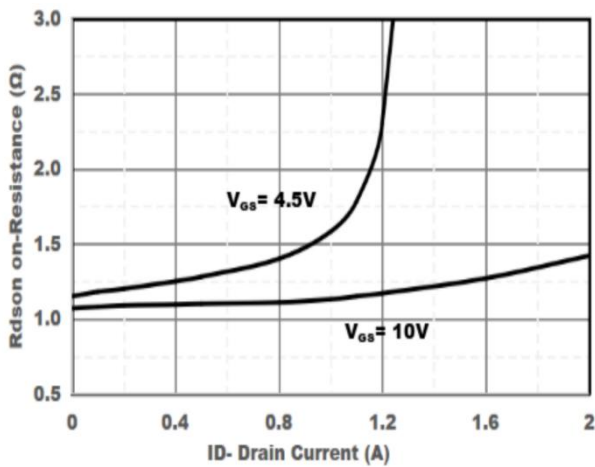


Figure5. Drain-Source on Resistance

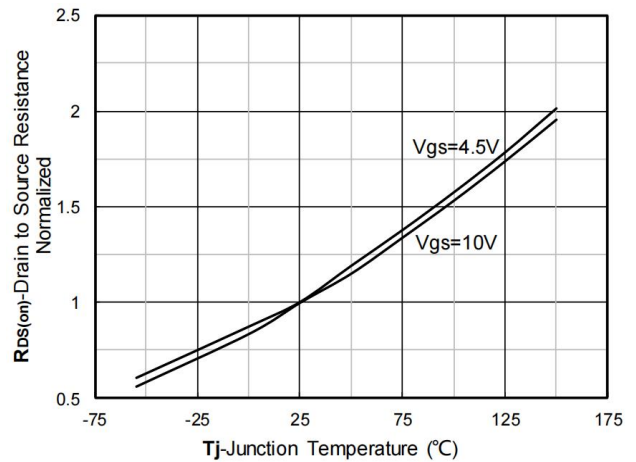


Figure6. Drain-Source on Resistance

Typical Characteristics

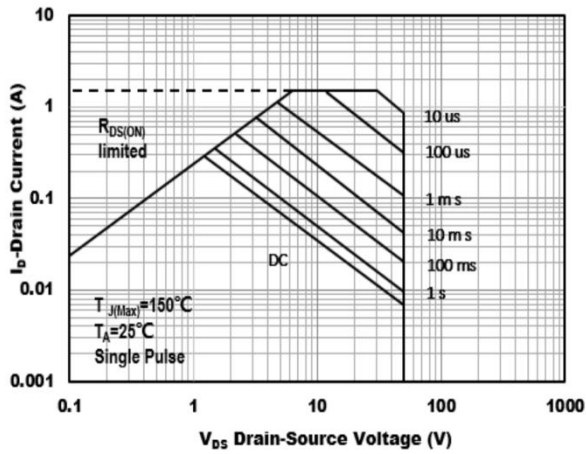


Figure 7. Safe Operation Area

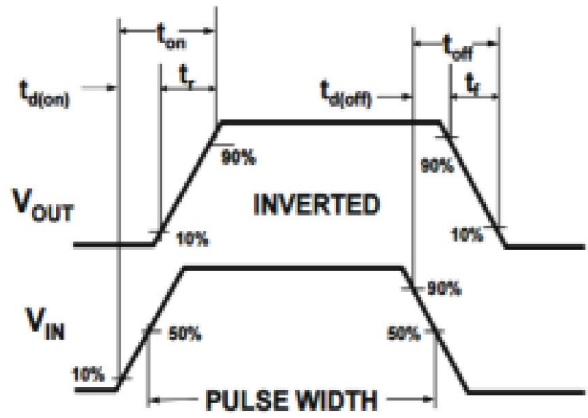


Figure 8. Switching wave

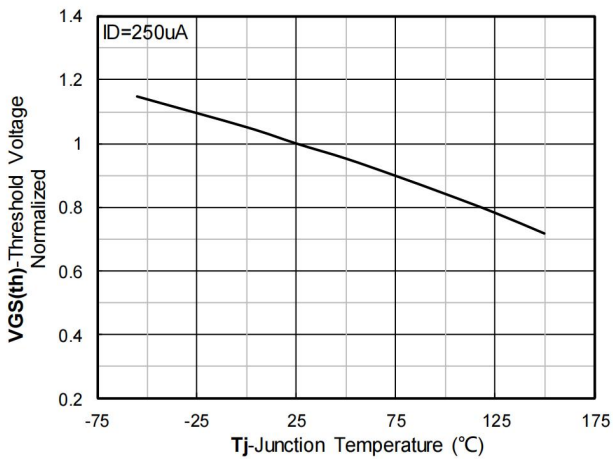


Figure 9. Normalized Threshold voltage

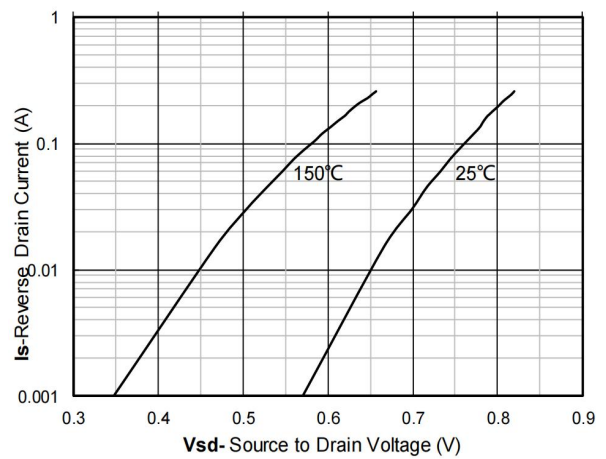
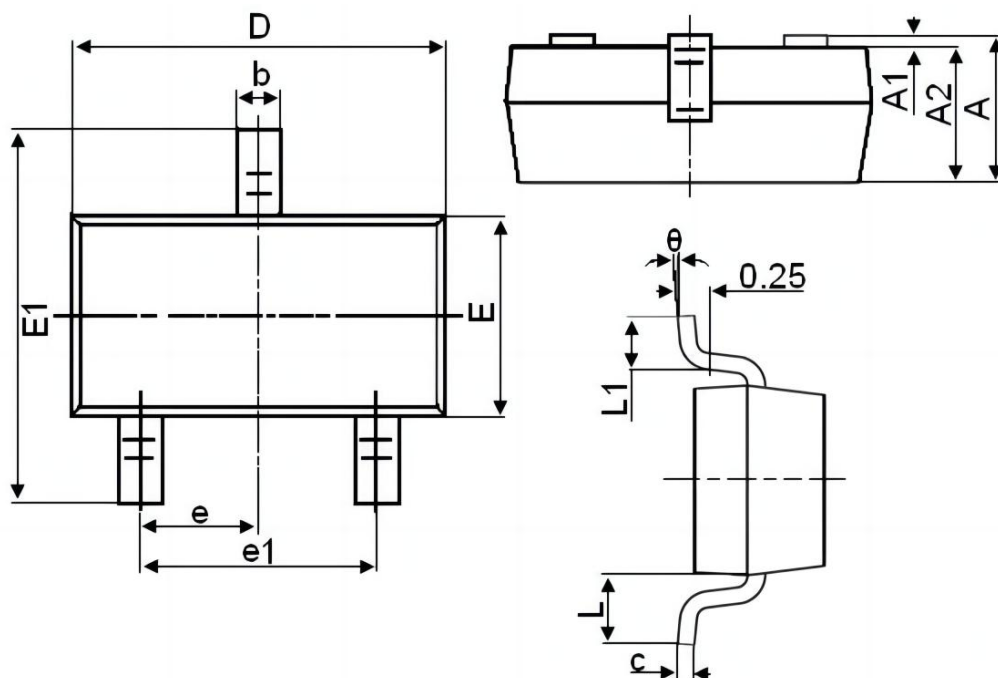


Figure 10. Forward characteristics of reverse diode

SOT-23 Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 REF. | | 0.037 REF. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |