

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

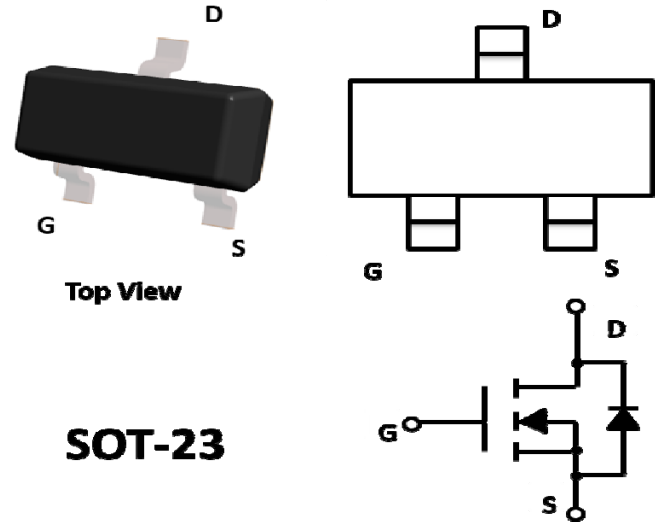
- V_{DS} 20V
- I_D 4.3A
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <27 mohm
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) <37 mohm

General Description

- Trench Power LV MOSFET technology
- High Power and current handling capability
- Marking : A2SHB

Applications

- PWM application
- Load switch



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

| Parameter | Symbol | Limit | Unit |
|--|-----------------|---------------------------------------|---------------------------|
| Drain-source Voltage | V_{DS} | 20 | V |
| Gate-source Voltage | V_{GS} | ± 10 | V |
| Drain Current | I_D | $T_A=25^\circ\text{C}$ @ Steady State | 4.3 |
| | | $T_A=70^\circ\text{C}$ @ Steady State | 3.5 |
| Pulsed Drain Current ^A | I_{DM} | 18 | A |
| Total Power Dissipation @ $T_A=25^\circ\text{C}$ | P_D | 1.0 | W |
| Thermal Resistance Junction-to-Ambient @ Steady State ^B | $R_{\theta JA}$ | 125 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55~+150 | $^\circ\text{C}$ |

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

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---------------------------------------|--------------|---|------|------|-----------|------------|
| Static Parameter | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20V, V_{GS}=0V, T_C=25^\circ\text{C}$ | | | 1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 10V, V_{DS}=0V$ | | | ± 100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.55 | 0.85 | 1.25 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=4.3A$ | | 21 | 27 | m Ω |
| | | $V_{GS}=2.5V, I_D=3.0A$ | | 29 | 37 | |
| Diode Forward Voltage | V_{SD} | $I_S=4.3A, V_{GS}=0V$ | | | 1.2 | V |
| Maximum Body-Diode Continuous Current | I_S | | | | 4.3 | A |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$ | | 595 | | pF |
| Output Capacitance | C_{oss} | | | 106 | | |
| Reverse Transfer Capacitance | C_{riss} | | | 59 | | |
| Switching Parameters | | | | | | |
| Total Gate Charge | Q_g | $V_{GS}=4.5V, V_{DS}=10V, I_D=4.3A$ | | 6.6 | | nC |
| Gate Source Charge | Q_{gs} | | | 0.9 | | |
| Gate Drain Charge | Q_{gd} | | | 1.4 | | |
| Turn-on Delay Time | $t_{D(on)}$ | $V_{GS}=4.5V, V_{DD}=10V, R_L=1.5\Omega, R_{GEN}=3\Omega$ | | 13 | | ns |
| Turn-on Rise Time | t_r | | | 54 | | |
| Turn-off Delay Time | $t_{D(off)}$ | | | 18 | | |
| Turn-off Fall Time | t_f | | | 11 | | |

 A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Performance Characteristics

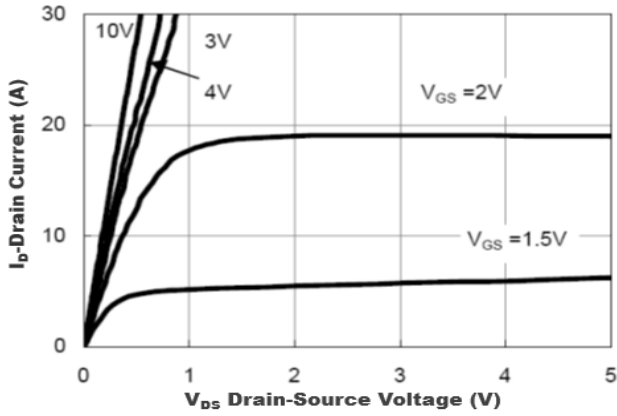


Figure1. Output Characteristics

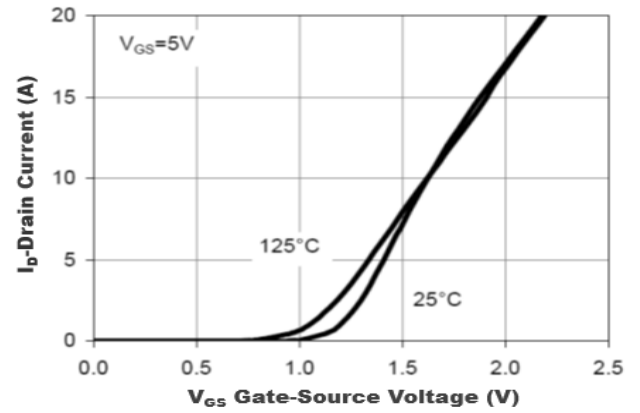


Figure2. Transfer Characteristics

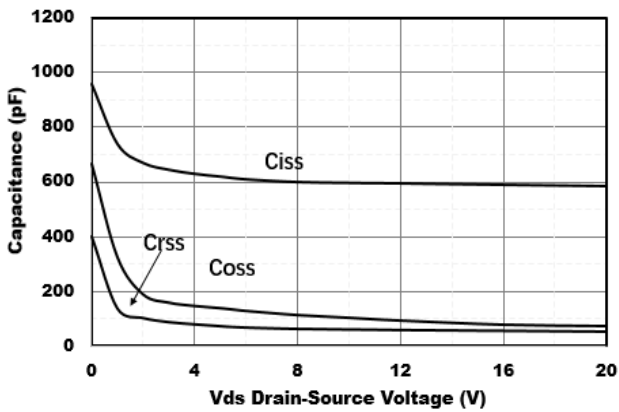


Figure3. Capacitance Characteristics

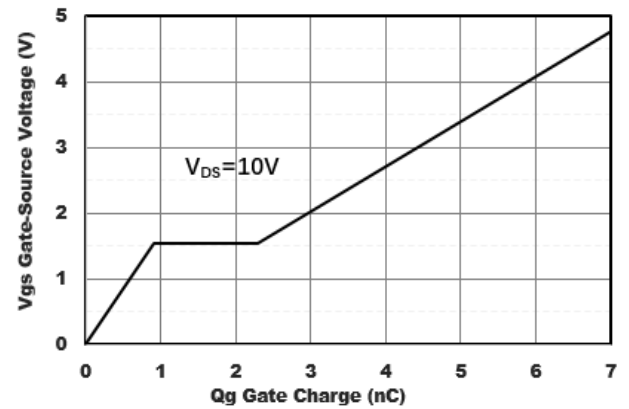


Figure4. Gate Charge

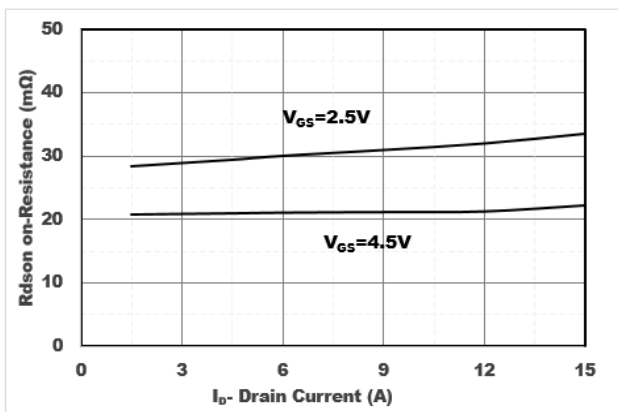


Figure5. Drain-Source on Resistance

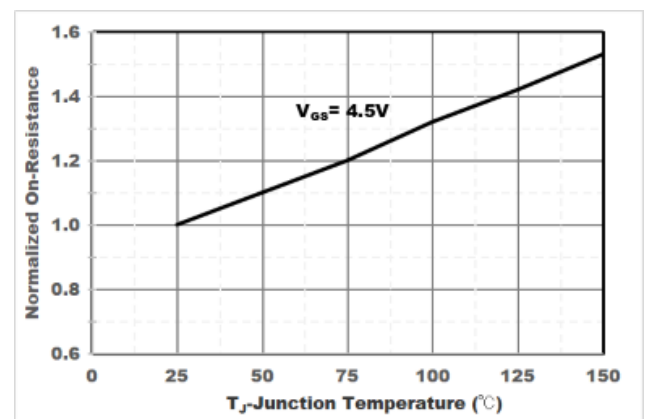


Figure6. Drain-Source on Resistance

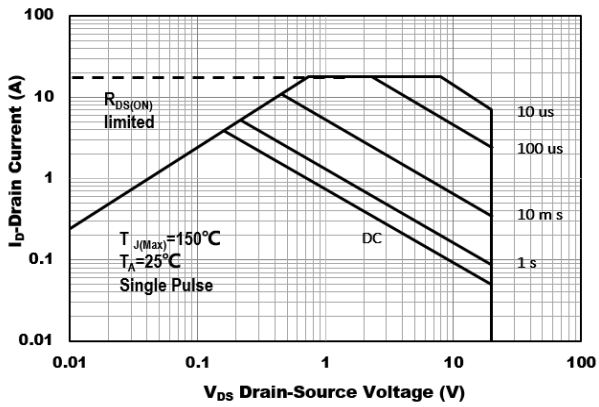


Figure7. Safe Operation Area

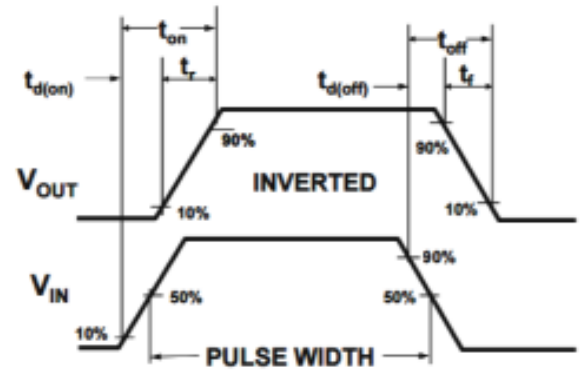
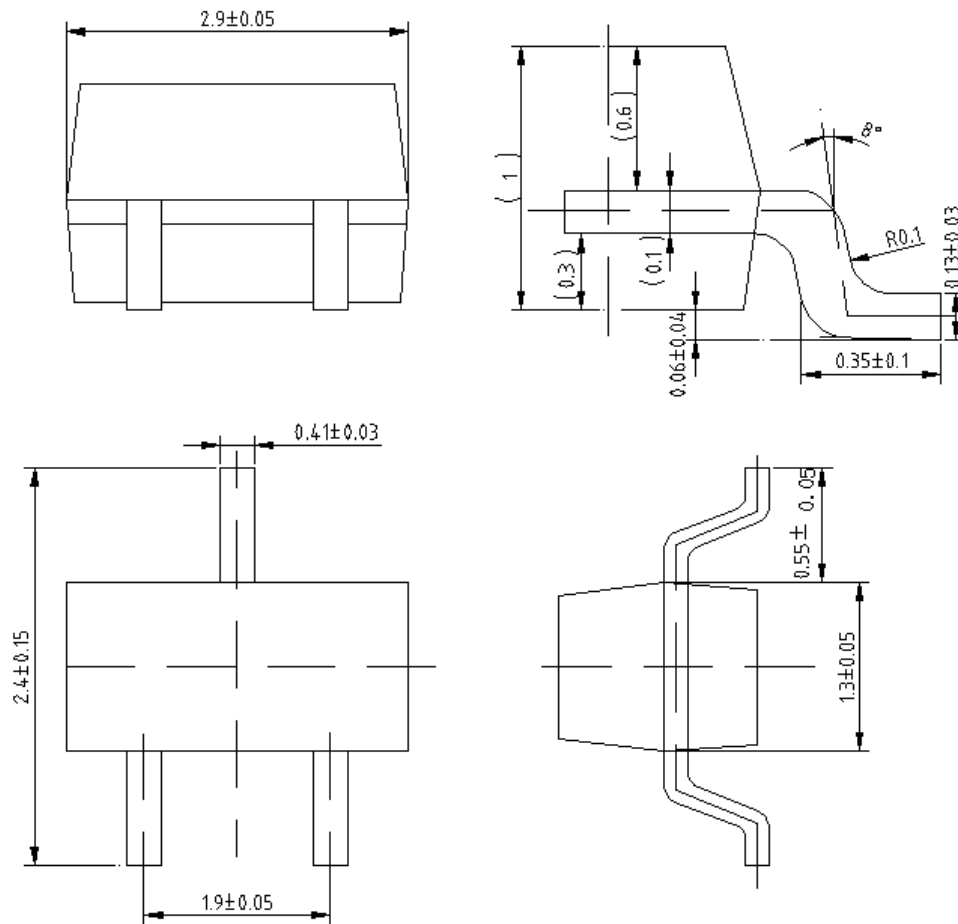


Figure8. Switching wave



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