# 20V/2.5A N-Channel MOSFET

## Features

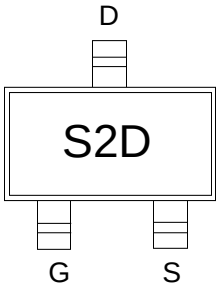
- Trench Power LV MOSFET technology
- High Power and current handing capability

## Product Summary

| $V_{DS}$ | $R_{DS(ON)}$ MAX | $I_D$ MAX |
|---|---|---|
| 20V | 65mΩ@4.5V | 2.5A |
| | 85mΩ@2.5V | |

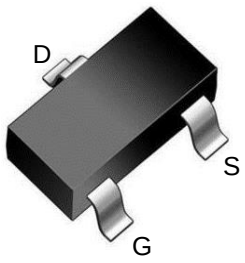
## Application

- PWM application
- Load switch

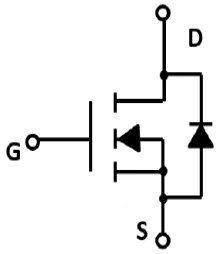



S2D: Device code

Marking and pin assignment




SOT-23 top view




Schematic diagram

| Absolute Maximum Ratings (TA=25℃unless otherwise noted) | | | | |
|---|---|---|---|---|
| **Symbol** | **Parameter** | | **Rating** | **Unit** |
| **Common Ratings (TC=25°C Unless Otherwise Noted)** | | | | |
| $V_{DS}$ | Drain-Source Breakdown Voltage | | 20 | V |
| $V_{GS}$ | Gate-Source Voltage | | ±10 | V |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -50 to 155 | °C |
| $I_S$ | Diode Continuous Forward Current | Tc=25°C | 2.5 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_{DM}$ | Pulse Drain Current Tested | Tc=25°C | 14 | A |
| $I_D$ | Continuous Drain Current@GS=10V | Tc=25°C | 2.5 | A |
| $P_D$ | Maximum Power Dissipation | Tc=25°C | 0.7 | W |
| $R_{\theta JA}$ | Thermal Resistance Junction-to-Ambient @ Steady State | | 178 | °C/ W |

| Electrical Characteristics (TJ=25℃ unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Parameter** | **Condition** | **Min** | **Typ** | **Max** | **Unit** |
| **Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)** | | | | | | |
| $BV_{(BR)DSS}$ | Drain-Source Breakdown Voltage | VGS=0V，ID=250μA | 20 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | VDS=20V，VGS=0V | -- | -- | 1 | uA |
| $I_{GSS}$ | Gate-Body Leakage Current | VGS=±10V，VDS=0V | -- | -- | ±100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage | VDS=VGS，ID=250μA | 0.45 | 0.7 | 0.9 | V |
| $R_{DS(on)}$ | Drain-Source On-State Resistance | VGS=4.5V，ID=2.5A | -- | 50 | 65 | mΩ |
| | | VGS=2.5V，ID=2.0A | -- | 69 | 85 | mΩ |
| **Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)** | | | | | | |
| $C_{ISS}$ | Input Capacitance | VDS=10V，VGS=0V，f=1MHz | -- | 120 | -- | pF |
| $C_{OSS}$ | Output Capacitance | | -- | 30 | -- | pF |
| $C_{RSS}$ | Reverse Transfer Capacitance | | -- | 25 | -- | pF |
| **Switching Characteristics** | | | | | | |
| $Q_g$ | Total Gate Charge | VDS=10V，ID=2.5A，VGS=10V | -- | 4.5 | -- | nC |
| $Q_{gs}$ | Gate Source Charge | | -- | 0.8 | -- | nC |
| $Q_{gd}$ | Gate Drain Charge | | -- | 0.5 | -- | nC |
| $t_{d(on)}$ | Turn-on Delay Time | VDD=10V，ID=2.5A，VGS=10V，RG=3Ω | -- | 3 | -- | nS |
| $t_r$ | Turn-on Rise Time | | -- | 29 | -- | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 6 | -- | nS |
| $t_f$ | Turn-Off Fall Time | | -- | 22 | -- | nS |
| **Source- Drain Diode Characteristics** | | | | | | |
| $V_{SD}$ | Forward on voltage | Tj=25℃，Is=2.5A， | -- | -- | 1.2 | V |

## Typical Operating Characteristics

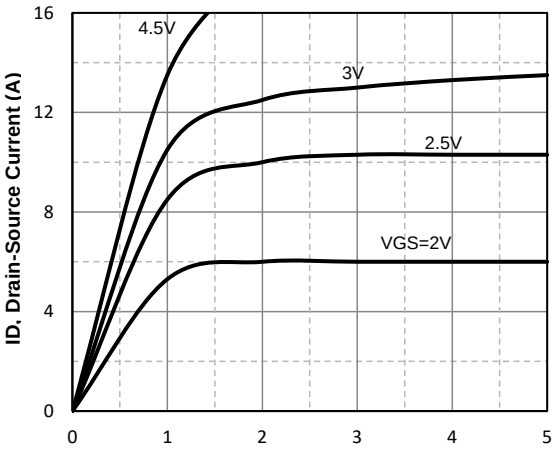



Fig1. Typical Output Characteristics

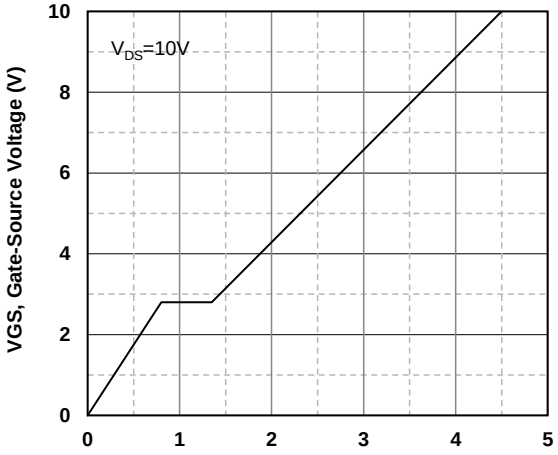



Fig2. Typical Gate Charge Vs.Gate-Source Voltage

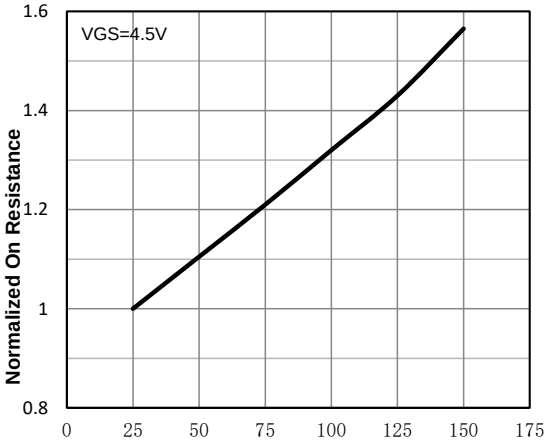



Fig3. Normalized On-Resistance Vs. Temperature

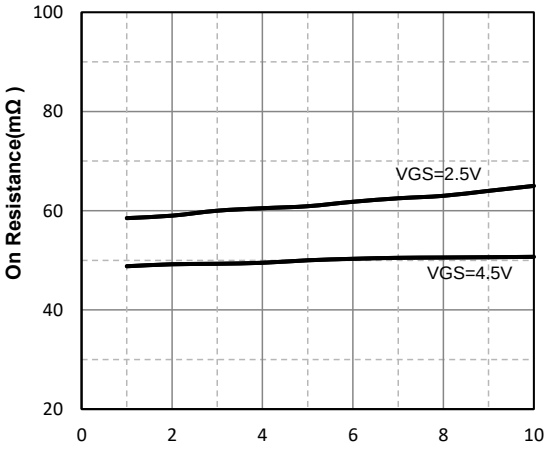



Fig4. On-Resistance Vs. Drain-Source Current

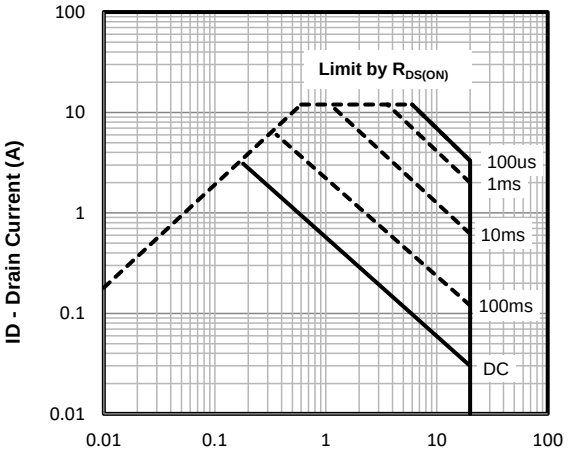



Fig5. Maximum Safe Operating Area

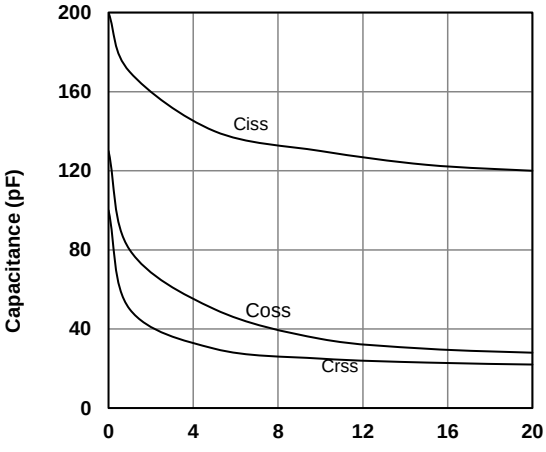
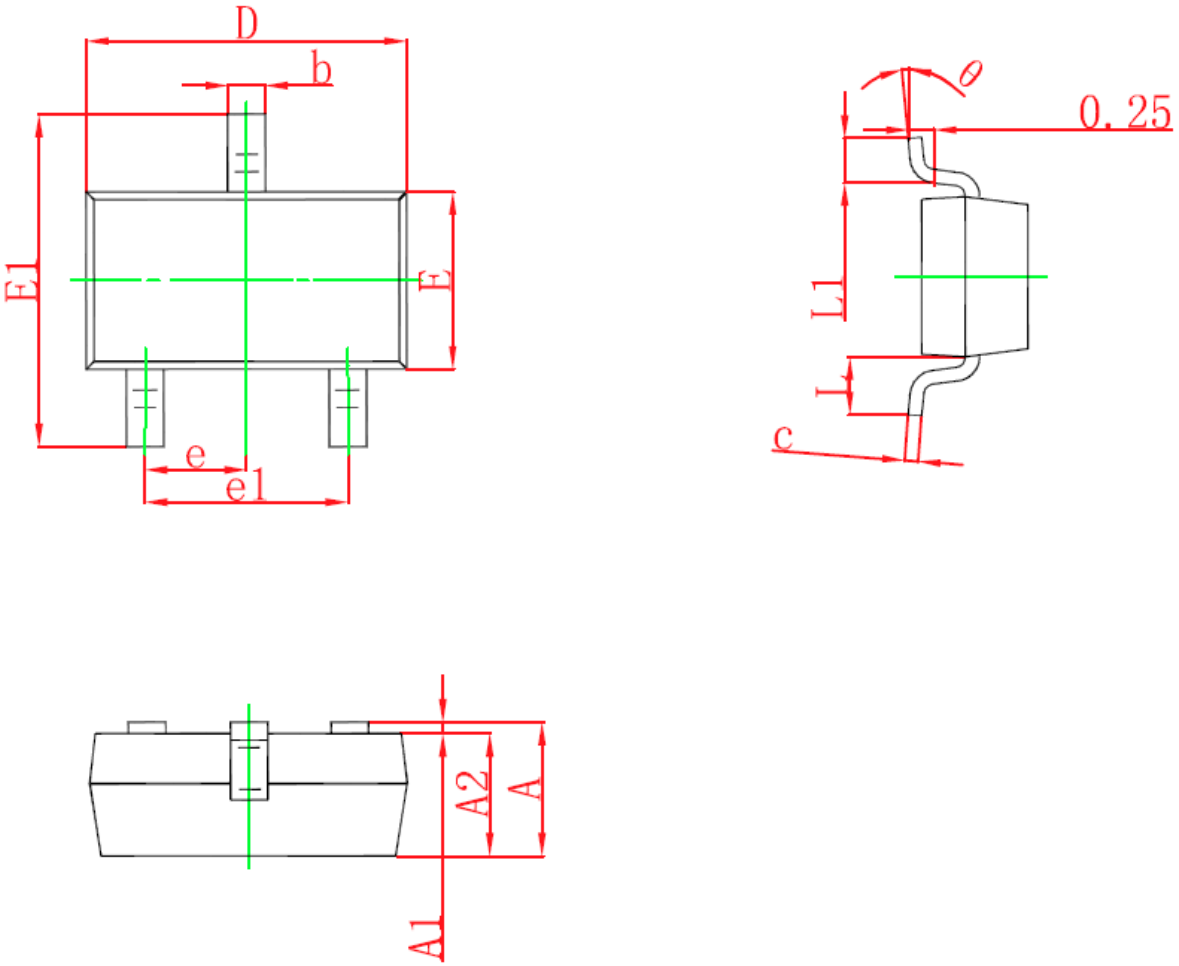



Fig6 Typical Capacitance Vs.Drain-Source Voltage

## SOT-23 Package information




| Symbol | Dimensions in Millimeters(mm) | | 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 | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E1 | 2.250 | 2.550 | 0.088 | 0.100 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| e | 0.950TYP | | 0.037TYP | |
| 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° |