# 2310

## N-Channel 60V(D-S) Mosfet

| | |
|---|---|
| VDS | 60V |
| RDSON(@VGS=10V) | ＜105mΩ |
| RDSON(@VGS=4.5V) | ＜125mΩ |

### Features

- Excellent Rds(on)
- TrenchFET Power MOSFET
- High Power and Current Handing Capability
- Halogen-free Package
- Surface Mount Package

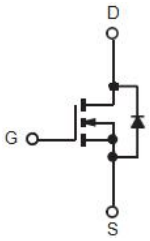
### Applications

- Battery Switching
- DC/DC Converter

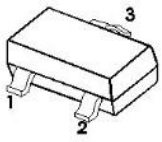
**Marking: According to customer requirement**

**SOT-23**

**Equivalent circuit**




**Pin Definition**




1. Gate
2. Source
3. Drain

### Maximum Ratings & Thermal Characteristics (Ratings at 25℃ ambient temperature unless otherwise specified.)

| Parameters | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $I_D$ | 3 | A |
| Pulsed Drain Current (note 1) | $I_{DM}$ | 10 | A |
| Maximum Power Dissipation | $P_D$ | 0.35 | W |
| Thermal Resistance from Junction to Ambient (note 2) | $R_{\theta JA}$ | 357 | ℃/W |
| Junction and Storage Temperature | $T_J$、$T_{STG}$ | -55~+150 | ℃ |

### Electrical Characteristics (Ratings at 25℃ ambient temperature unless otherwise specified).

| Parameters | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 60 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =60V,$V_{GS}$ = 0V | | | 1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{GS}$ =±20V, $V_{DS}$ = 0V | | | ±100 | nA |
| Gate threshold voltage (note 3) | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 0.5 | | 2 | V |
| Drain-source on-resistance (note 3) | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =3A | | | 105 | mΩ |
| | | $V_{GS}$ =4.5V, $I_D$ =3A | | | 125 | mΩ |
| Forward transconductance (note 3) | $g_{FS}$ | $V_{DS}$ =15V, $I_D$ =2A | 1.4 | | | S |
| Diode forward voltage (note 3) | $V_{SD}$ | $I_S$=3A, $V_{GS}$ = 0V | | | 1.2 | V |

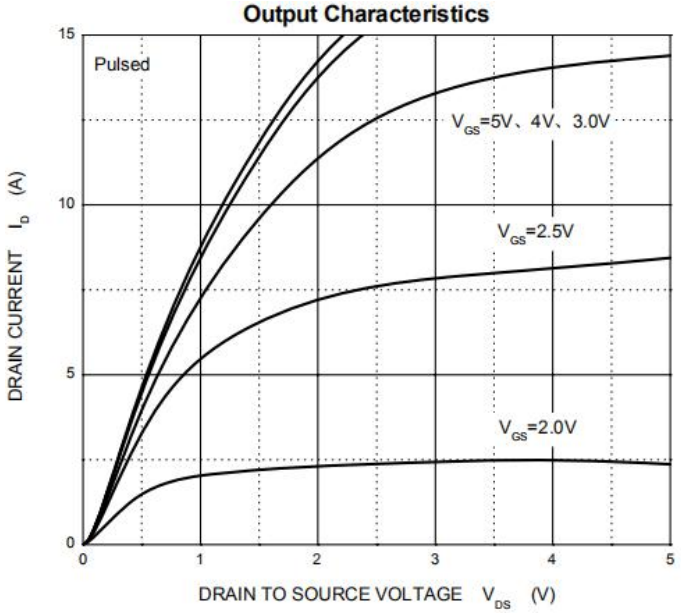
| | | | | | | |
|---|---|---|---|---|---|---|
| **Dynamic Characteristics** (note4) | | | | | | |
| Input Capacitance | Ciss | $V_{DS}$=30V,$V_{GS}$=0V,f=1MHz | | 247 | | pF |
| Output Capacitance | Coss | | | 34 | | pF |
| Reverse Transfer Capacitance | Crss | | | 19.5 | | pF |
| **Switching Characteristics** (note 4) | | | | | | |
| Turn-on delay time | td(on) | $V_{DS}$= 30 V,$I_D$=1.5A, $V_{GS}$=10V, $R_{GEN}$ =1 Ω | | 6 | | ns |
| Turn-on rise time | tr | | | 15 | | ns |
| Turn-off delay time | td(off) | | | 15 | | ns |
| Turn-off fall time | tf | | | 10 | | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =30V, $V_{GS}$ = 4.5 V, $I_D$ = 3A | | 6 | | nC |
| Gate-Source Charge | Qgs | | | 1 | | nC |
| Gate-Drain Charge | Qgd | | | 1.3 | | nC |

***Notes :**

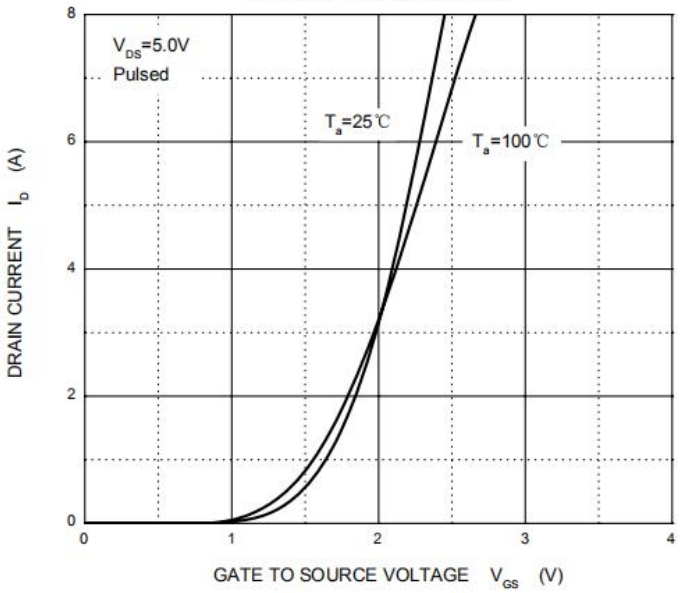
1. Repetitive rating：Pluse width limited by maximum junction temperature
2. Surface Mounted on FR4 board，t≤10 sec.
3. Pulse test : Pulse width≤300μs, duty cycle≤2%.
4. Guaranteed by design, not subject to production.

## Typical characteristics

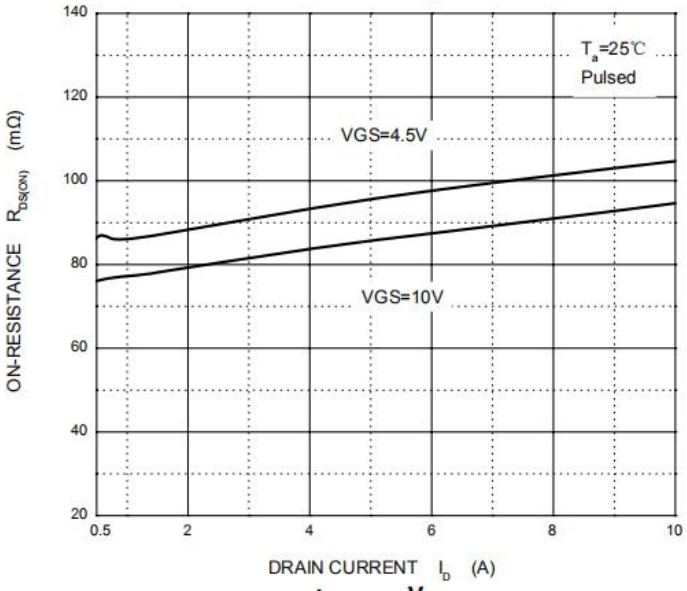
### Output Characteristics



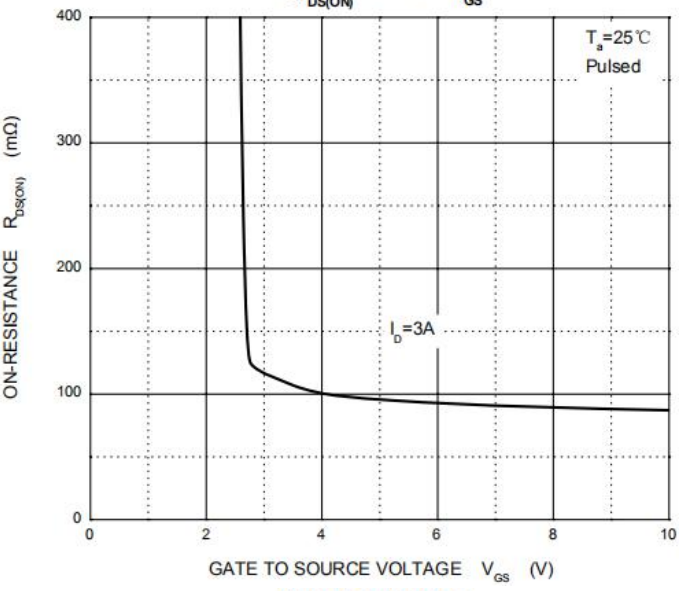

### Transfer Characteristics



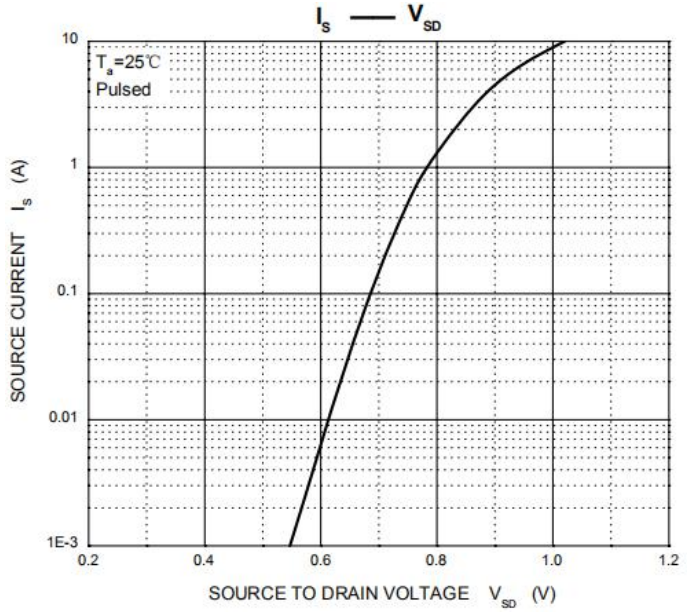

### $R_{DS(ON)}$ — $I_D$



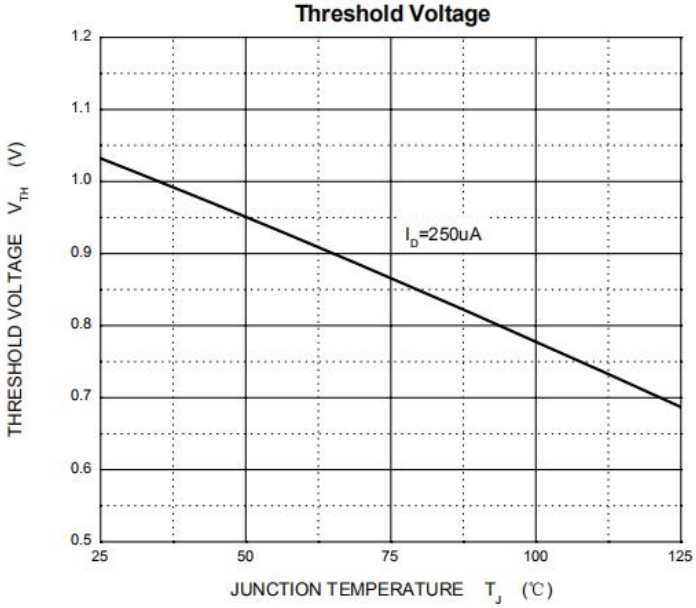

### $R_{DS(ON)}$ — $V_{GS}$



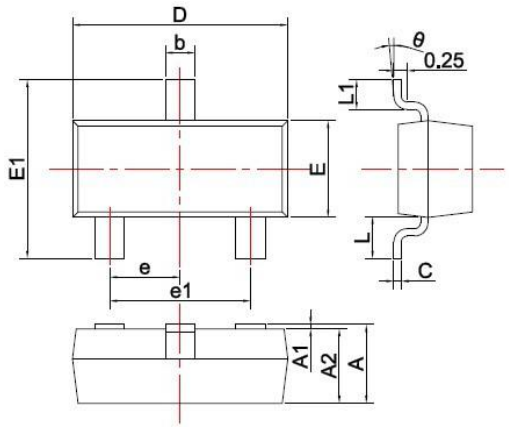

### $I_S$ — $V_{SD}$




### Threshold Voltage



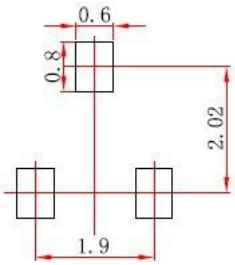
## Package Outline Dimensions




| SYMBOL | DIMENSIONS | |
|---|---|---|
| | MIN. | MAX. |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |

Unit: mm

## Precautions: PCB Design




Note:
1.Controlling dimension:In millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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