

### 30V N-Channel MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)}$ Typ | $I_D$ Max |
|---------------|------------------|-----------|
| 60V           | 105mΩ@10V        | 3A        |
|               | 125mΩ@4.5V       |           |

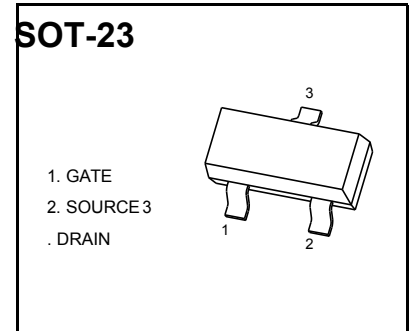
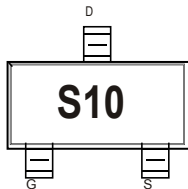
### DESCRIPTION

The SI2310 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltage as low as 2.5V. This device is suitable for use as a battery protection or in other switching application.

### FEATURE

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

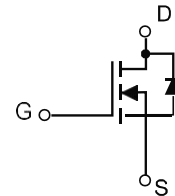
### MARKING



### APPLICATION

- Battery Switch
- DC/DC Converter

### Equivalent circuit



### PACKAGE SPECIFICATIONS

| Package | Reel Size | Reel DIA.<br>(mm) | Q'TY/Reel<br>(pcs) | Box Size<br>(mm) | QTY/Box<br>(pcs) | Carton Size<br>(mm) | Q'TY/Carton<br>(pcs) |
|---------|-----------|-------------------|--------------------|------------------|------------------|---------------------|----------------------|
| SOT-23  | 7'        | 178               | 3000               | 203×203×195      | 45000            | 438×438×220         | 180000               |

### Maximum Ratings and Thermal Characteristics (TA = 25°C unless otherwise noted)

| Parameter                                          | Symbol    | Limit      | Unit |
|----------------------------------------------------|-----------|------------|------|
| Drain-Source Voltage                               | $V_{DS}$  | 60         | V    |
| Gate-Source Voltage                                | $V_{GS}$  | ±20        |      |
| Continuous Drain Current                           | $I_D$     | 3          | A    |
| Pulsed Drain Current <sup>1)</sup>                 | $I_{DM}$  | 10         | A    |
| Maximum Power Dissipation <sup>1), 2)</sup>        | $P_D$     | 0.35       | W    |
| Maximum Junction Temperature                       | $T_J$     | 150        | °C   |
| Storage Temperature                                | $T_{stg}$ | -55 to 150 | °C   |
| Thermal Resistance from Junction-to-Ambient (t≤5s) | $R_{θJA}$ | 357        | °C/W |

Notes

<sup>1)</sup> Pulse width limited by maximum junction temperature.

<sup>2)</sup> Surface Mounted on FR4 Board, t ≤ 5 sec.

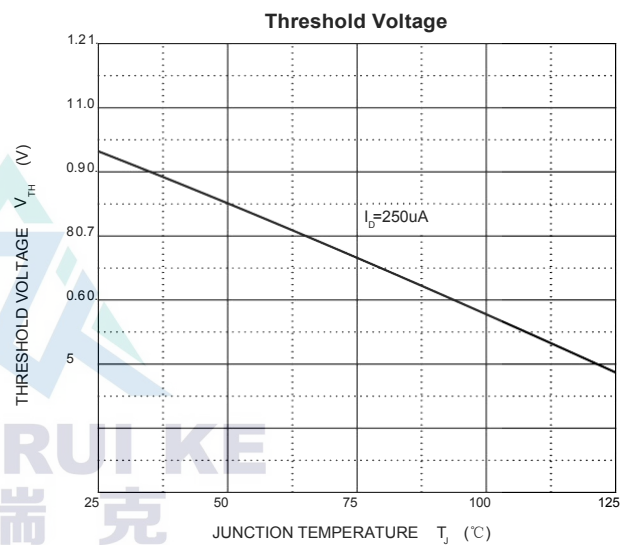
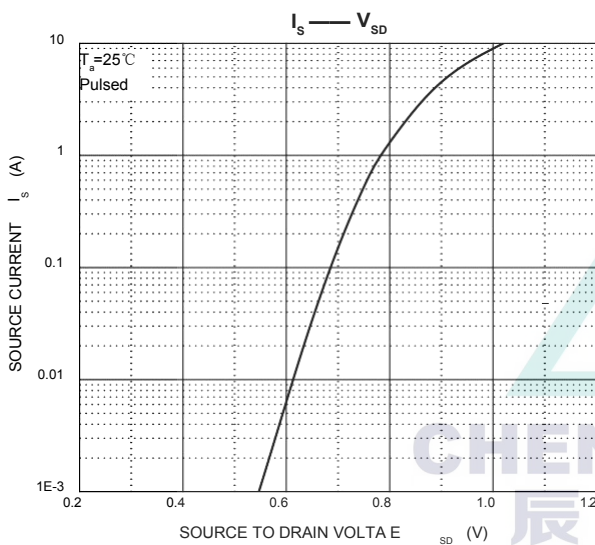
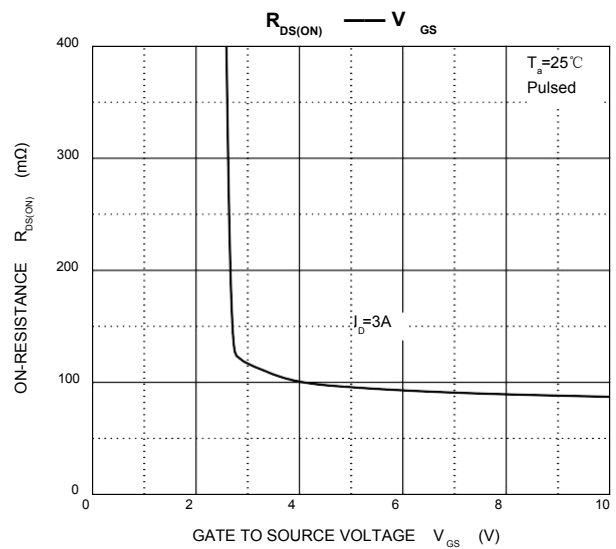
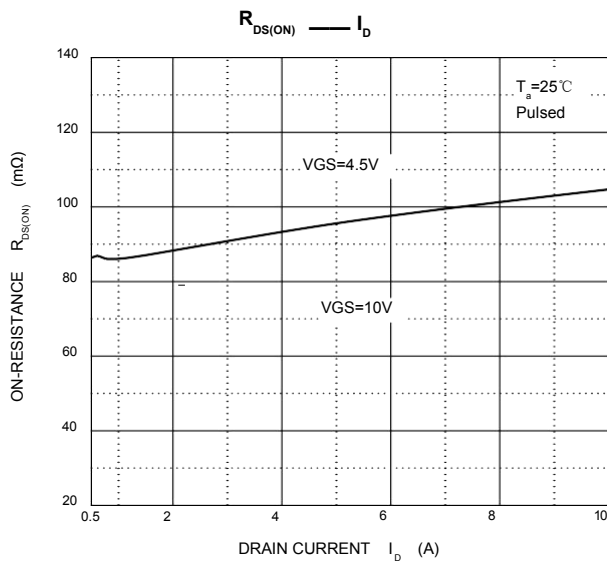
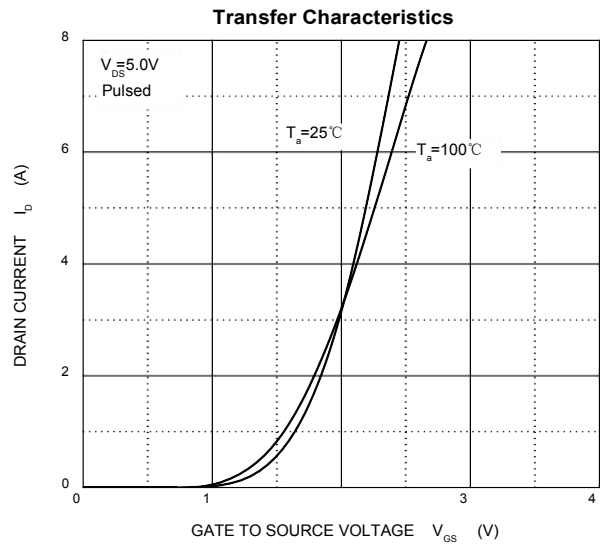
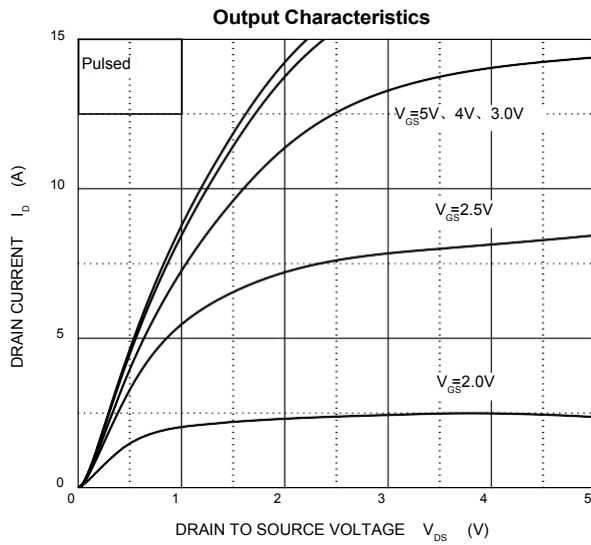
$T_a=25^{\circ}\text{C}$  unless otherwise specified

| Parameter                           | Symbol        | Test Condition                                                   | Min | Typ  | Max       | Unit     |
|-------------------------------------|---------------|------------------------------------------------------------------|-----|------|-----------|----------|
| STATIC CHARACTERISTICS              |               |                                                                  |     |      |           |          |
| Drain-source breakdown voltage      | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                                    | 60  |      |           | V        |
| Zero gate voltage drain current     | $I_{DSS}$     | $V_{DS} = 60V, V_{GS} = 0V$                                      |     |      | 1         | $\mu A$  |
| Gate-body leakage current           | $I_{GSS}$     | $V_{GS} = \pm 20V, V_{DS} = 0V$                                  |     |      | $\pm 100$ | nA       |
| Gate threshold voltage (note 3)     | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                                | 0.5 |      | 2         | V        |
| Drain-source on-resistance (note 3) | $R_{DS(on)}$  | $V_{GS} = 10V, I_D = 3A$                                         |     |      | 105       | $\Omega$ |
|                                     |               | $V_{GS} = 4.5V, I_D = 3A$                                        |     |      | 125       | $\Omega$ |
| Forward tranconductance (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 (note 4)    |               |                                                                  |     |      |           |          |
| Input Capacitance                   | $C_{iss}$     | $V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$                            |     | 247  |           | pF       |
| Output Capacitance                  | $C_{oss}$     |                                                                  |     | 34   |           | pF       |
| Reverse Transfer Capacitance        | $C_{rss}$     |                                                                  |     | 19.5 |           | pF       |
| SWITCHING CHARACTERISTICS (note 4)  |               |                                                                  |     |      |           |          |
| Turn-on delay time                  | $t_{d(on)}$   | $V_{GS} = 10V, V_{DD} = 30V,$<br>$I_D = 1.5A, R_{GEN} = 1\Omega$ |     | 6    |           | ns       |
| Turn-on rise time                   | $t_r$         |                                                                  |     | 15   |           | ns       |
| Turn-off delay time                 | $t_{d(off)}$  |                                                                  |     | 15   |           | ns       |
| Turn-off fall time                  | $t_f$         |                                                                  |     | 10   |           | ns       |
| Total Gate Charge                   | $Q_g$         | $V_{DS} = 30V, V_{GS} = 4.5V, I_D = 3A$                          |     | 6    |           | nC       |
| Gate-Source Charge                  | $Q_{gs}$      |                                                                  |     | 1    |           | nC       |
| Gate-Drain Charge                   | $Q_{gd}$      |                                                                  |     | 1.3  |           | nC       |

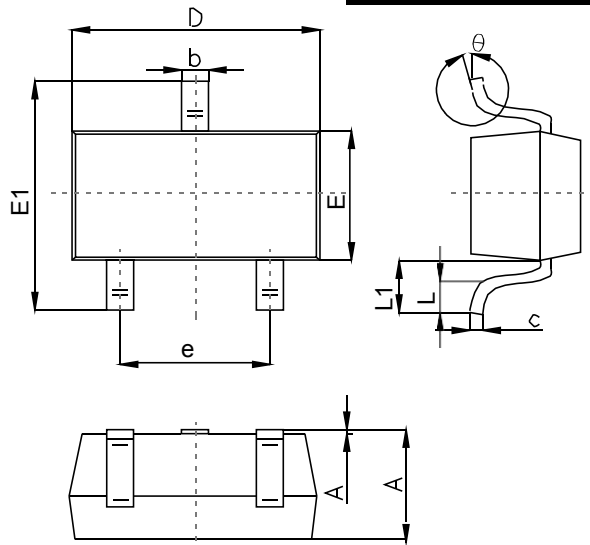
**Notes :**

1. Repetitive rating : Pulse width limited by junction temperature.2
- . Surface mounted on FR4 board ,  $t \leq 10s$ .
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$ .
4. Guaranteed by design, not subject to producing.

## Typical Characteristics

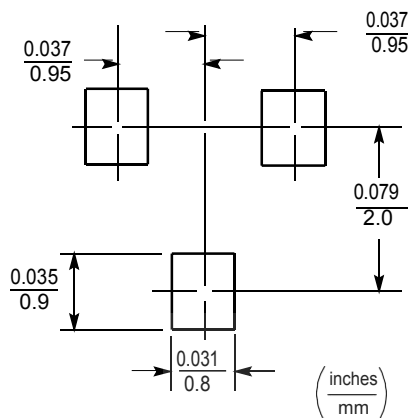


### SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |      |      |
|--------|---------------------------|------|------|
|        | Min                       | Typ  | Max  |
| A      | 1.00                      |      | 1.40 |
| A1     |                           |      | 0.10 |
| b      | 0.35                      |      | 0.50 |
| c      | 0.10                      |      | 0.20 |
| D      | 2.70                      | 2.90 | 3.10 |
| E      | 1.40                      |      | 1.60 |
| E1     | 2.4                       |      | 2.80 |
| e      |                           | 1.90 |      |
| L      | 0.10                      |      | 0.30 |
| L1     | 0.4                       |      |      |
| θ      | 0°                        |      | 10°  |

### Suggested Pad Layout



Note:1  
Controlling  
dimension:in/millimeters. 2.General  
tolerance:  $\pm 0.05\text{mm}$ .  
3.The pad layout is for reference purposes only.