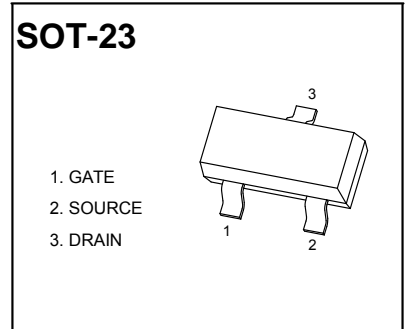


**SOT-23 Plastic-Encapsulate MOSFETS**
**30V N-Channel MOSFET**

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


**DESCRIPTION**

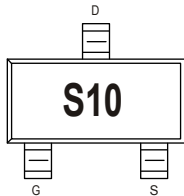
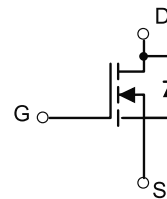
The SI2310 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltage as low as 2.5V. This device is suitable for use as a battery protection or in other switching application.

**FEATURE**

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

**APPLICATION**

- Battery Switch
- DC/DC Converter

**MARKING**

**Equivalent circuit**

**PACKAGE SPECIFICATIONS**

| Package | Reel Size | Reel DIA. (mm) | Q'TY/Reel (pcs) | Box Size (mm) | QTY/Box (pcs) | Carton Size (mm) | Q'TY/Carton (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    |
| 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.

The above data are for reference only.

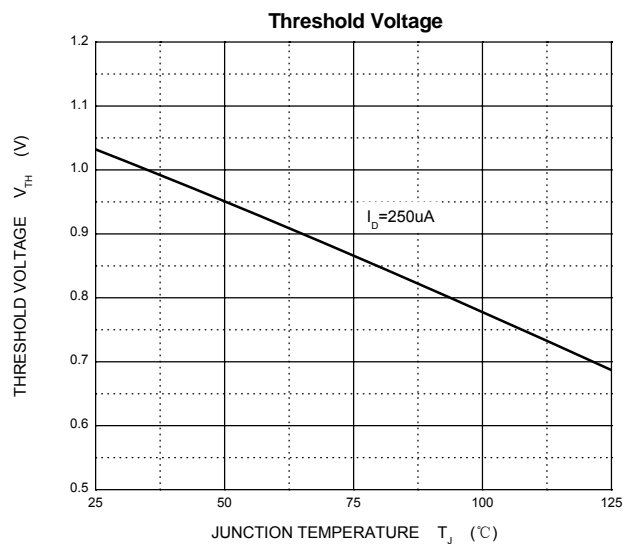
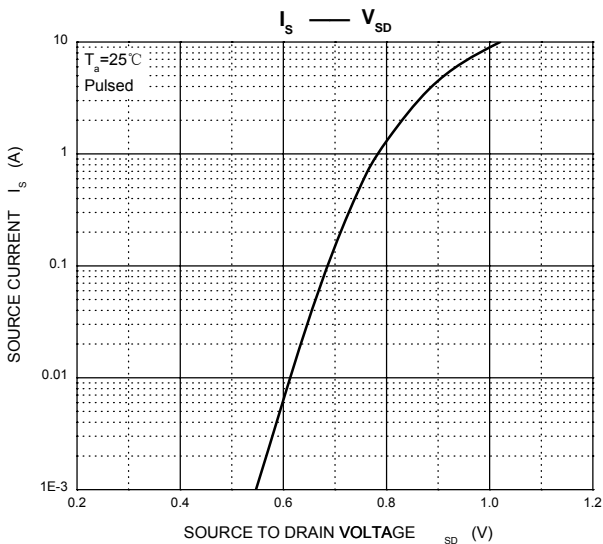
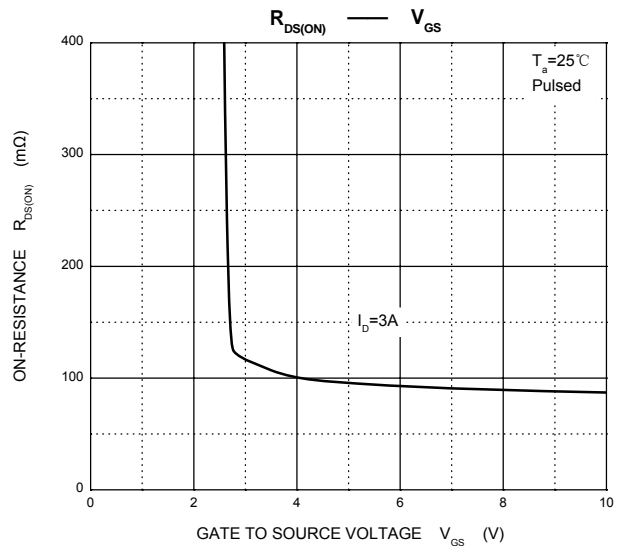
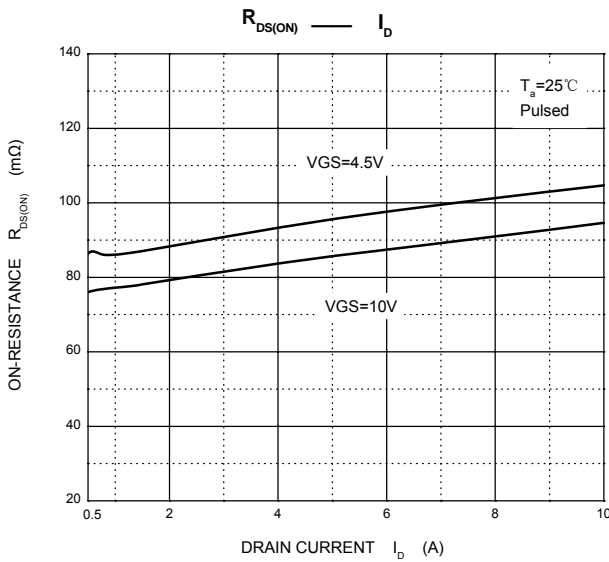
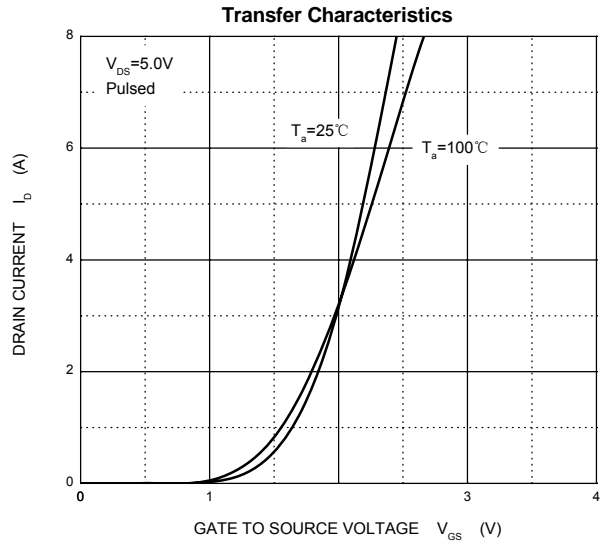
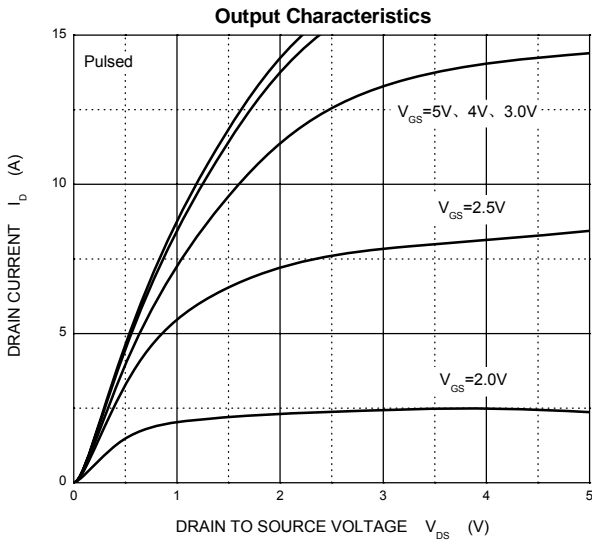
**MOSFET ELECTRICAL CHARACTERISTICS** $T_a=25\text{ }^\circ\text{C}$  unless otherwise specified

| Parameter                                 | Symbol        | Test Condition   | Min | Typ | Max       | Unit     |    |
|---|---------------|--|-----|-----|-----------|----------|----|
| <b>STATIC CHARACTERISTICS</b>             |               |  |     |     |           |          |    |
| 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 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        |    |
| <b>DYNAMIC CHARACTERISTICS (note 4)</b>   |               |  |     |     |           |          |    |
| 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 |
| <b>SWITCHING CHARACTERISTICS (note 4)</b> |               |  |     |     |           |          |    |
| 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 :**

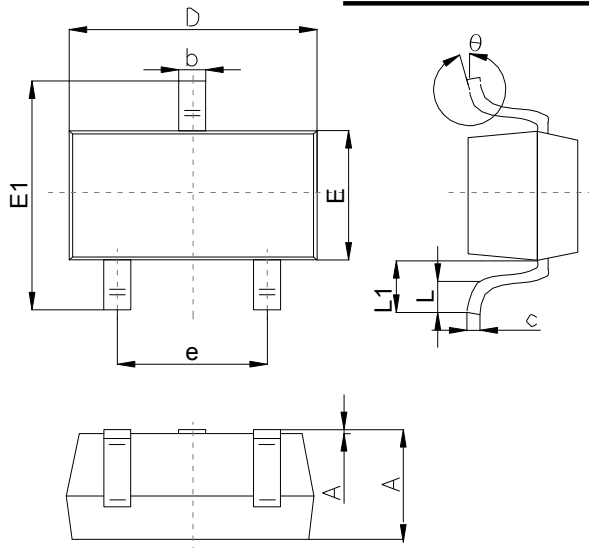
1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface mounted on FR4 board ,  $t_s \leq 10s$ .
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$ .
4. Guaranteed by design, not subject to producing.

Typical Characteristics



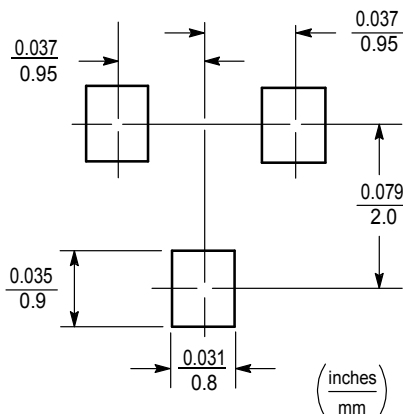
## Outlitne Drawing

### 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                       |      |      |
| $\theta$ | 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.

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