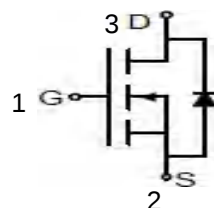




## MT2310-Plastic-Encapsulate MOSFETS

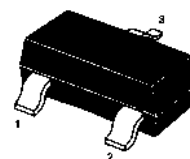
### N-Channel MOSFET

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



### DESCRIPTION

The MT2310 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.



### SOT-23

### FEATURE

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

### APPLICATION

- Battery Switch
- DC/DC Converter

**MARKING** : S10

### Maximum ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

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



## MOSFET ELECTRICAL CHARACTERISTICS

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

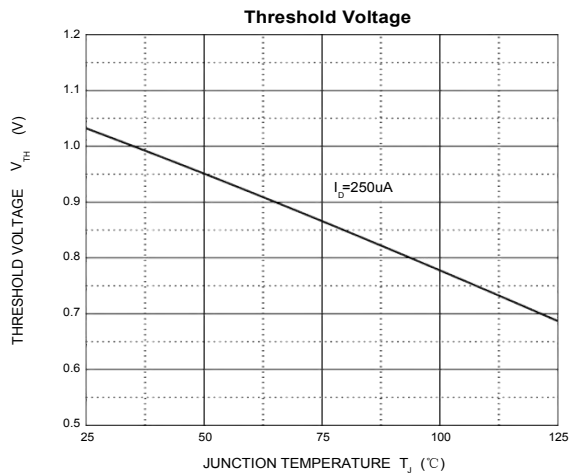
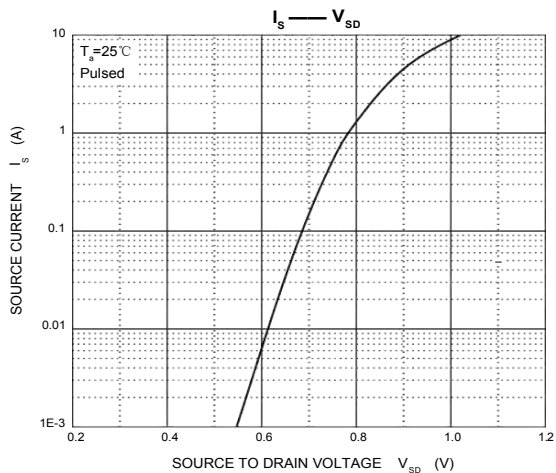
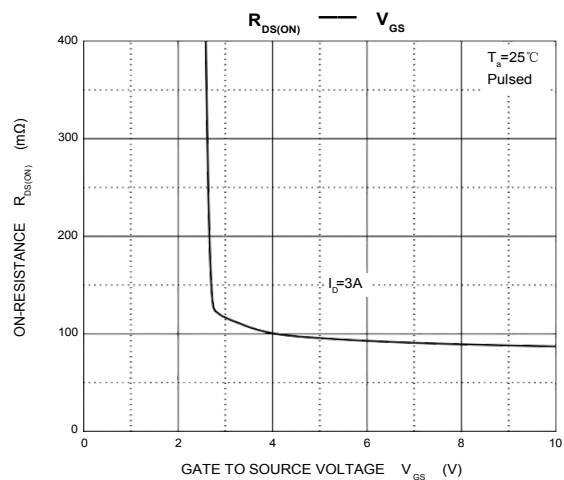
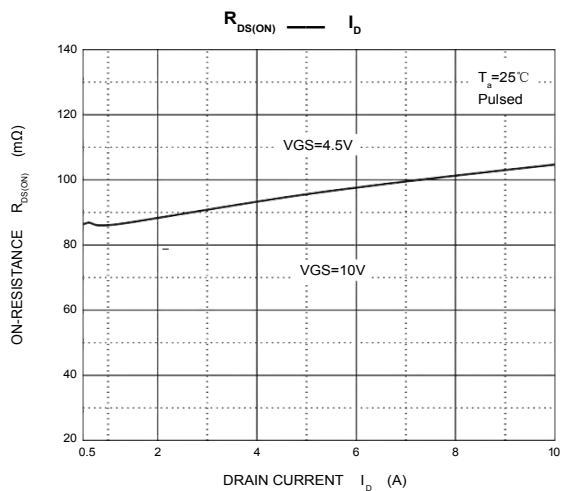
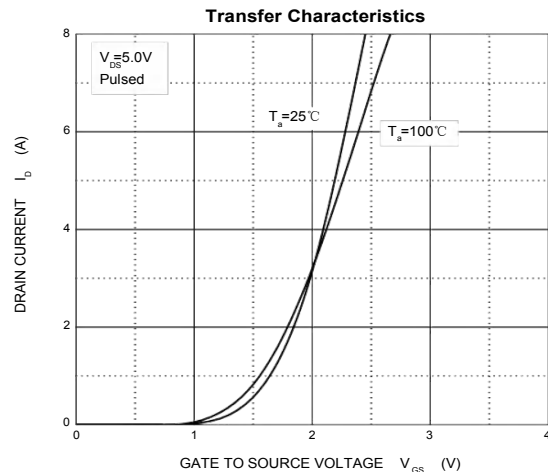
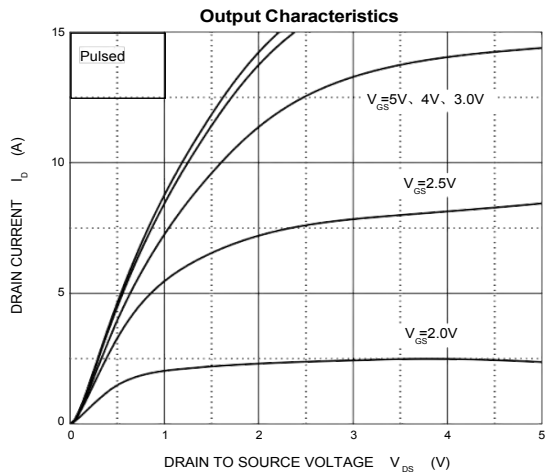
| Parameter                           | Symbol               | Test Condition                                                                          | Min | Typ  | Max  | Unit |
|-------------------------------------|----------------------|-----------------------------------------------------------------------------------------|-----|------|------|------|
| STATIC CHARACTERISTICS              |                      |                                                                                         |     |      |      |      |
| Drain-source breakdown voltage      | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                             | 60  |      |      | V    |
| Zero gate voltage drain current     | I <sub>DSS</sub>     | V <sub>DS</sub> =60V,V <sub>GS</sub> = 0V                                               |     |      | 1    | μA   |
| Gate-body leakage current           | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V                                             |     |      | ±100 | nA   |
| Gate threshold voltage (note 3)     | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                | 0.5 |      | 2    | V    |
| Drain-source on-resistance (note 3) | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =3A                                                |     |      | 105  | mΩ   |
|                                     |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A                                               |     |      | 125  | mΩ   |
| Forward tranconductance (note 3)    | g <sub>FS</sub>      | V <sub>DS</sub> =15V, I <sub>D</sub> =2A                                                | 1.4 |      |      | S    |
| Diode forward voltage (note 3)      | V <sub>SD</sub>      | I <sub>S</sub> =3A, V <sub>GS</sub> = 0V                                                |     |      | 1.2  | V    |
| DYNAMIC CHARACTERISTICS (note 4)    |                      |                                                                                         |     |      |      |      |
| Input Capacitance                   | C <sub>iss</sub>     | V <sub>DS</sub> =30V,V <sub>GS</sub> =0V,f =1MHz                                        |     | 247  |      | pF   |
| Output Capacitance                  | C <sub>oss</sub>     |                                                                                         |     | 34   |      | pF   |
| Reverse Transfer Capacitance        | C <sub>rss</sub>     |                                                                                         |     | 19.5 |      | pF   |
| SWITCHING CHARACTERISTICS (note 4)  |                      |                                                                                         |     |      |      |      |
| Turn-on delay time                  | t <sub>d(on)</sub>   | V <sub>GS</sub> =10V,V <sub>DD</sub> =30V,<br>I <sub>D</sub> =1.5A,R <sub>GEN</sub> =1Ω |     | 6    |      | ns   |
| Turn-on rise time                   | t <sub>r</sub>       |                                                                                         |     | 15   |      | ns   |
| Turn-off delay time                 | t <sub>d(off)</sub>  |                                                                                         |     | 15   |      | ns   |
| Turn-off fall time                  | t <sub>f</sub>       |                                                                                         |     | 10   |      | ns   |
| Total Gate Charge                   | Q <sub>g</sub>       | V <sub>DS</sub> =30V,V <sub>GS</sub> =4.5V,I <sub>D</sub> =3A                           |     | 6    |      | nC   |
| Gate-Source Charge                  | Q <sub>gs</sub>      |                                                                                         |     | 1    |      | nC   |
| Gate-Drain Charge                   | Q <sub>gd</sub>      |                                                                                         |     | 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

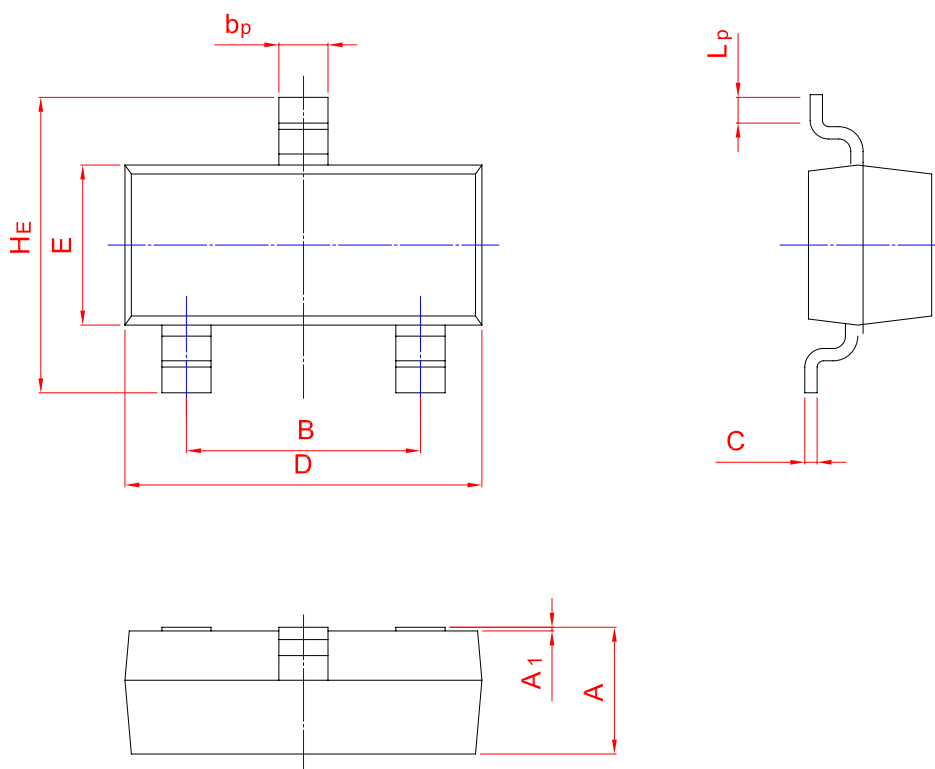
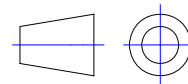




## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A            | B            | bp           | C            | D            | E            | HE           | A1             | Lp           |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|
| mm   | 1.40<br>0.95 | 2.04<br>1.78 | 0.50<br>0.35 | 0.19<br>0.08 | 3.10<br>2.70 | 1.65<br>1.20 | 3.00<br>2.20 | 0.100<br>0.013 | 0.50<br>0.20 |