

**N-Ch 60V Fast Switching MOSFETs**

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

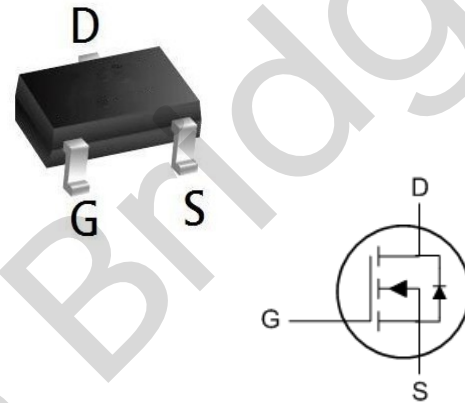
**Product Summary**

| BVDSS | RDSON | ID |
|-------|-------|----|
| 60V   | 65 mΩ | 5A |

**Description**

The UCB2310 is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The UCB2310 meet the RoHS and Green Product requirement with full function reliability approved.

**SOT23 Pin Configuration**

**Absolute Maximum Ratings** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

| Symbol          | Parameter                               | Max.                      | Units                     |
|-----------------|---|---------------------------|---------------------------|
| $V_{DSS}$       | Drain-Source Voltage                    | 60                        | V                         |
| $V_{GSS}$       | Gate-Source Voltage                     | $\pm 20$                  | V                         |
| $I_D$           | Continuous Drain Current                | $T_A = 25^\circ\text{C}$  | 5                         |
|                 |   | $T_A = 100^\circ\text{C}$ | 3                         |
| $I_{DM}$        | Pulsed Drain Current <sup>note1</sup>   | 15                        | A                         |
| $P_D$           | Power Dissipation                       | $T_A = 25^\circ\text{C}$  | 1.5                       |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 83                        | $^\circ\text{C}/\text{W}$ |
| $T_J, T_{STG}$  | Operating and Storage Temperature Range | -55 to +150               | $^\circ\text{C}$          |

**N-Ch 60V Fast Switching MOSFETs**
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

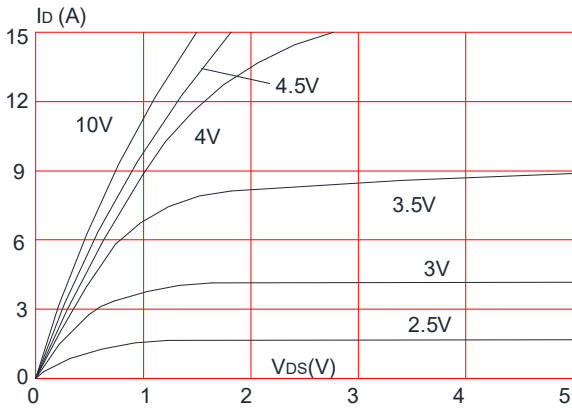
| Symbol  | Parameter   | Test Condition   | Min. | Typ. | Max.      | Units      |
|---|---|--|------|------|-----------|------------|
| <b>Off Characteristic</b>                                     |   |  |      |      |           |            |
| $V_{(BR)DSS}$   | Drain-Source Breakdown Voltage                            | $V_{GS}=0V, I_D=250\mu A$                              | 60   | -    | -         | V          |
| $I_{DSS}$   | Zero Gate Voltage Drain Current                           | $V_{DS}=60V, V_{GS}=0V,$                               | -    | -    | 1.0       | $\mu A$    |
| $I_{GSS}$   | Gate to Body Leakage Current                              | $V_{DS}=0V, V_{GS}=\pm 20V$                            | -    | -    | $\pm 100$ | nA         |
| <b>On Characteristics</b>                                     |   |  |      |      |           |            |
| $V_{GS(th)}$  | Gate Threshold Voltage                                    | $V_{DS}=V_{GS}, I_D=250\mu A$                          | 1.0  | 1.4  | 2.0       | V          |
| $R_{DS(on)}$  | Static Drain-Source on-Resistance<br><small>note2</small> | $V_{GS}=10V, I_D=3A$                                   | -    | 65   | 75        | m $\Omega$ |
|   |   | $V_{GS}=4.5V, I_D=2A$                                  | -    | 85   | 100       |            |
| <b>Dynamic Characteristics</b>                                |   |  |      |      |           |            |
| $C_{iss}$   | Input Capacitance   | $V_{DS}=25V, V_{GS}=0V,$<br>$f=1.0\text{MHz}$          | -    | 350  | -         | pF         |
| $C_{oss}$   | Output Capacitance  |  | -    | 29   | -         | pF         |
| $C_{riss}$  | Reverse Transfer Capacitance                              |  | -    | 23   | -         | pF         |
| $Q_g$   | Total Gate Charge   | $V_{DS}=30V, I_D=3A,$<br>$V_{GS}=10V$                  | -    | 9    | -         | nC         |
| $Q_{gs}$  | Gate-Source Charge  |  | -    | 1.5  | -         | nC         |
| $Q_{gd}$  | Gate-Drain("Miller") Charge                               |  | -    | 2    | -         | nC         |
| <b>Switching Characteristics</b>                              |   |  |      |      |           |            |
| $t_{d(on)}$   | Turn-on Delay Time  | $V_{DD}=30V, I_D=2A,$<br>$R_{GEN}=3\Omega, V_{GS}=10V$ | -    | 5    | -         | ns         |
| $t_r$   | Turn-on Rise Time   |  | -    | 7    | -         | ns         |
| $t_{d(off)}$  | Turn-off Delay Time                                       |  | -    | 37   | -         | ns         |
| $t_f$   | Turn-off Fall Time  |  | -    | 22   | -         | ns         |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |  |      |      |           |            |
| $I_S$   | Maximum Continuous Drain to Source Diode Forward Current  |  | -    | -    | 3         | A          |
| $I_{SM}$  | Maximum Pulsed Drain to Source Diode Forward Current      |  | -    | -    | 12        | A          |
| $V_{SD}$  | Drain to Source Diode Forward Voltage                     | $V_{GS} = 0V, I_S=3A$                                  | -    | -    | 1.2       | V          |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

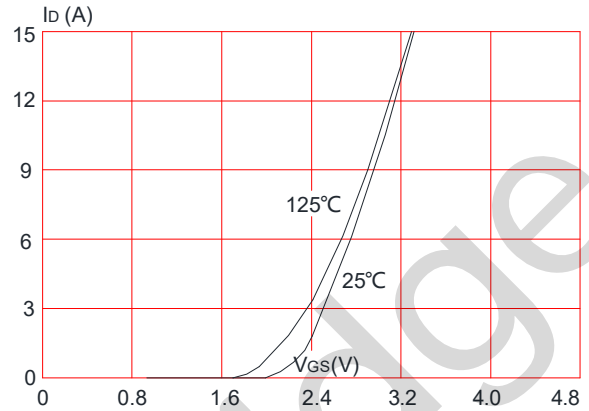
 2. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

### Typical Performance Characteristics

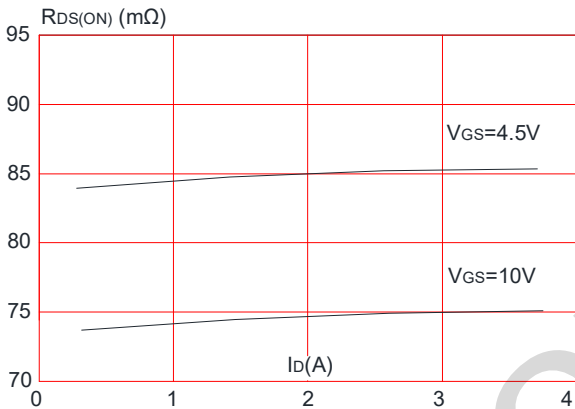
**Figure 1: Output Characteristics**



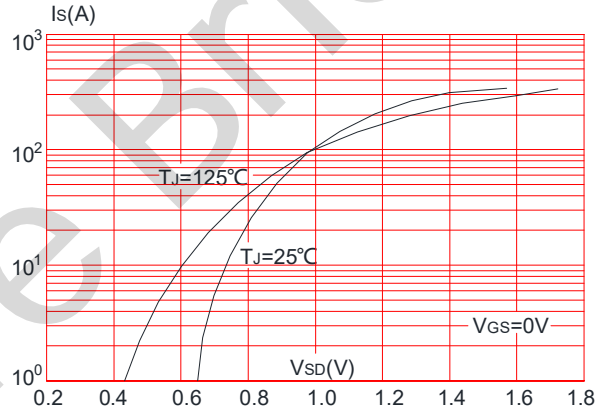
**Figure 2: Typical Transfer Characteristics**



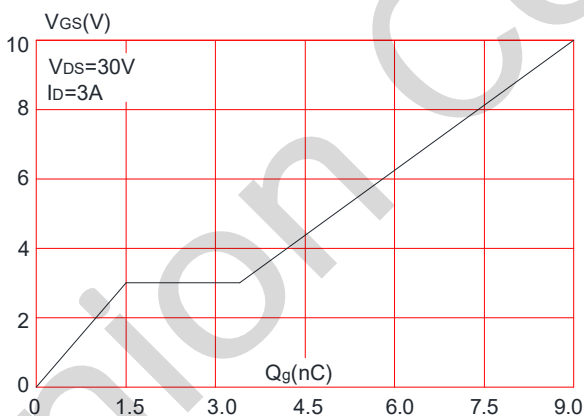
**Figure 3: On-resistance vs. Drain Current**



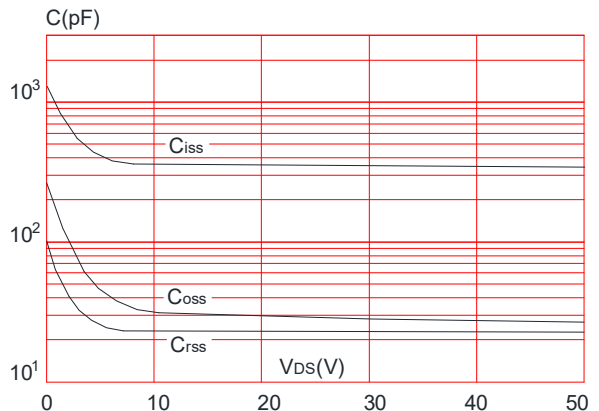
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

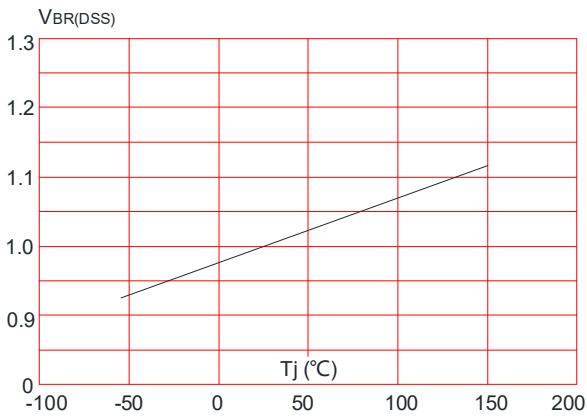


**Figure 6: Capacitance Characteristics**

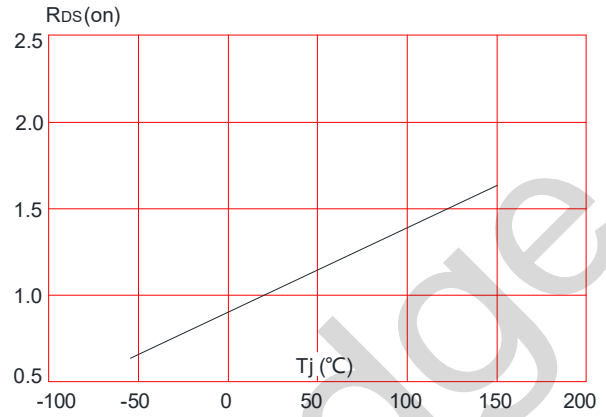


N-Ch 60V Fast Switching MOSFETs

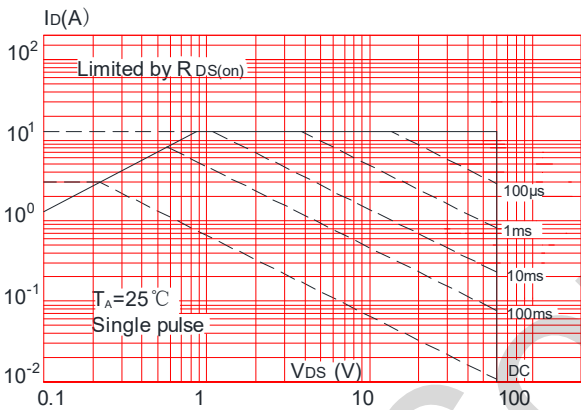
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



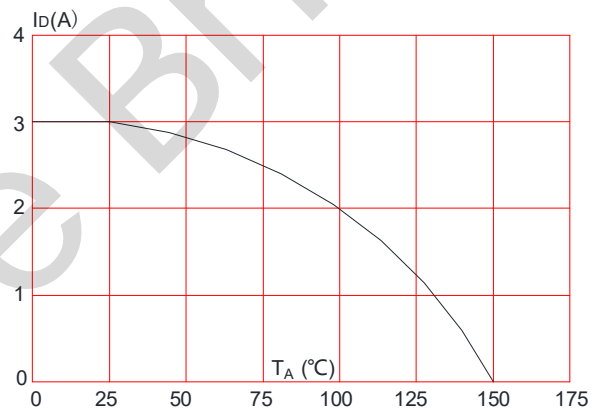
**Figure 8:** Normalized on Resistance vs. Junction Temperature



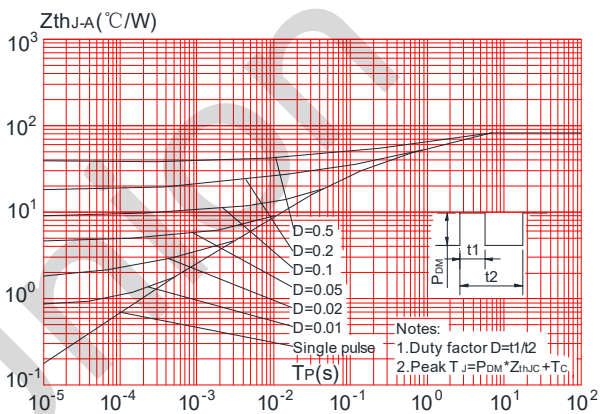
**Figure 9:** Maximum Safe Operating Area



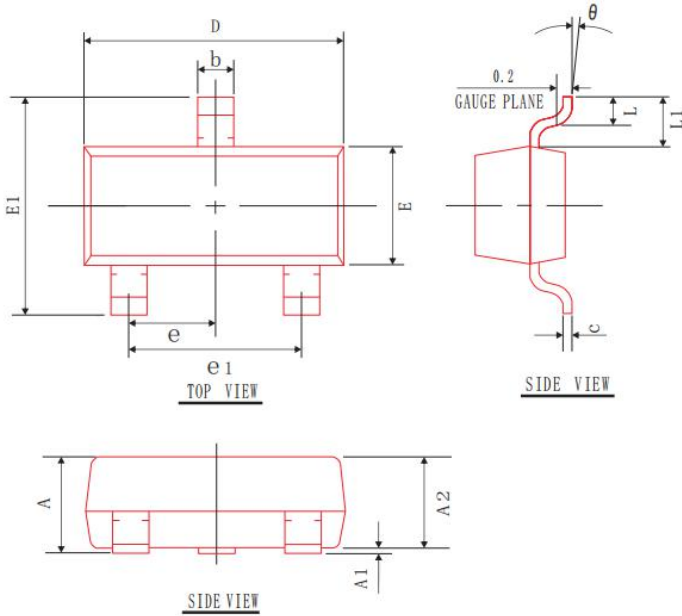
**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Package Mechanical Data-SOT-23



COMMON DIMENSIONS  
(UNITS OF MEASURE=mm)

| SYMBOL   | MIN  | NOM      | MAX  |
|----------|------|----------|------|
| A        | 0.90 | 1.05     | 1.20 |
| A1       | 0.00 | 0.05     | 0.10 |
| A2       | 0.90 | 1.00     | 1.10 |
| b        | 0.30 | 0.40     | 0.50 |
| c        | 0.08 | 0.10     | 0.15 |
| D        | 2.80 | 2.90     | 3.00 |
| E        | 1.20 | 1.30     | 1.40 |
| E1       | 2.30 | 2.40     | 2.50 |
| L        | 0.30 | 0.40     | 0.50 |
| $\theta$ | 0°   | 5°       | 10°  |
| L1       |      | 0.55 REF |      |
| e        |      | 0.95 BSC |      |
| e1       |      | 1.90 REF |      |

**Shenzhen Lianxinqiao Technology Co., Ltd**  
**The following statement is made:**

- \* The information described herein is subject to change without notice
- \* Shenzhen Lianxinqiao Technology Co., Ltd. is not responsible for issues related to industry standards, patents or third-party rights caused by circuit or diagram descriptions. Application circuit diagrams are intended as examples of typical applications only and do not guarantee their usefulness for specialized mass production
- \* In the event of a conflict between the Products and derivatives and the Wassenaar Agreement or other international agreements, their export may require authorization from the relevant government
- \* Any reproduction or copying of the information described herein for other purposes without the permission of Shenzhen Lianxinqiao Technology Co., Ltd. is strictly prohibited
- \* The information described herein cannot be used for any human body-related equipment, such as sports equipment, medical equipment, security systems, gas equipment, or any installation on aircraft or other means of transportation without written permission
- \* Although Shenzhen Lianxinqiao Technology Co., Ltd. tries its best to improve the quality and reliability of products, the failure and failure of semiconductor products are still inevitable. Therefore, customers using this product must carry out careful safety design, including redundancy design, fire protection design, failure protection to prevent any secondary accident, fire or related damage
- \* Thank you for choosing our series of products, before using this product, please read this specification carefully, our company will not bear all losses caused by not using in accordance with the specification