

## Dual N-Ch 30V Fast Switching MOSFETs

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

### Product Summary

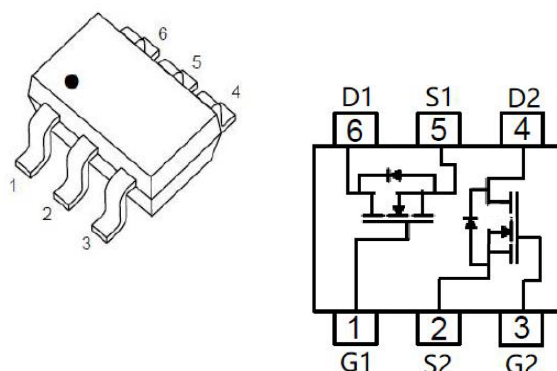


| BVDSS | RDSON | ID   |
|-------|-------|------|
| 30V   | 29mΩ  | 4.5A |

### Description

The UD6800B uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

### Dual SOT23-6L Pin Configuration



### Absolute Maximum Ratings

| Symbol                     | Parameter                                   | Rating     | Units            |
|----------------------------|---------------------------------------------|------------|------------------|
| $V_{DS}$                   | Drain-Source Voltage                        | 30         | V                |
| $V_{GS}$                   | Gate-Source Voltage                         | $\pm 12$   | V                |
| $I_D@T_A=25^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 4.5V^1$ | 4.5        | A                |
| $I_D@T_A=70^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 4.5V^1$ | 2.8        | A                |
| $I_{DM}$                   | Pulsed Drain Current <sup>2</sup>           | 15         | A                |
| $P_D@T_A=25^\circ\text{C}$ | Total Power Dissipation <sup>3</sup>        | 1.25       | W                |
| $T_{STG}$                  | Storage Temperature Range                   | -55 to 150 | $^\circ\text{C}$ |
| $T_J$                      | Operating Junction Temperature Range        | -55 to 150 | $^\circ\text{C}$ |

### Thermal Data

| Symbol          | Parameter                                        | Typ. | Max. | Unit               |
|-----------------|--------------------------------------------------|------|------|--------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient <sup>1</sup> | ---  | 125  | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case <sup>1</sup>    | --   | -    | $^\circ\text{C/W}$ |

### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

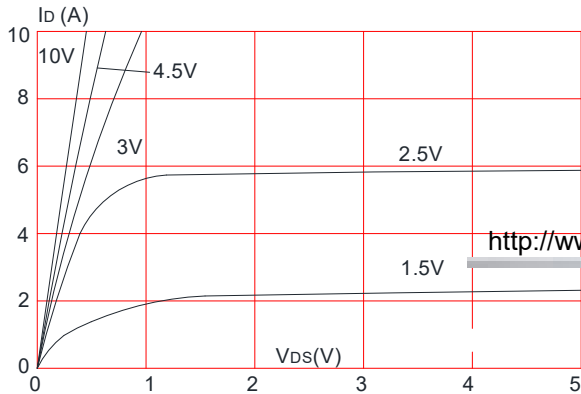
| Symbol                                                 | Parameter                                                 | Test Condition                                                                             | Min. | Typ. | Max. | Units |
|--------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------|------|------|------|-------|
| Off Characteristic                                     |                                                           |                                                                                            |      |      |      |       |
| V <sub>(BR)DSS</sub>                                   | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                 | 30   | -    | -    | V     |
| I <sub>DSS</sub>                                       | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V,                                                 | -    | -    | 1.0  | μA    |
| I <sub>GSS</sub>                                       | Gate to Body Leakage Current                              | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V                                                | -    | -    | ±100 | nA    |
| On Characteristics                                     |                                                           |                                                                                            |      |      |      |       |
| V <sub>GS(th)</sub>                                    | Gate Threshold Voltage                                    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                   | 1.0  | 1.5  | 2.5  | V     |
| R <sub>DS(on)</sub>                                    | Static Drain-Source on-Resistance<br><small>note2</small> | V <sub>GS</sub> =10V, I <sub>D</sub> =4A                                                   | -    | 29   | 38   | mΩ    |
|                                                        |                                                           | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A                                                  | -    | 45   | 65   |       |
| Dynamic Characteristics                                |                                                           |                                                                                            |      |      |      |       |
| C <sub>iss</sub>                                       | Input Capacitance                                         | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                     | -    | 233  | -    | pF    |
| C <sub>oss</sub>                                       | Output Capacitance                                        |                                                                                            | -    | 44   | -    | pF    |
| C <sub>rss</sub>                                       | Reverse Transfer Capacitance                              |                                                                                            | -    | 33   | -    | pF    |
| Q <sub>g</sub>                                         | Total Gate Charge                                         | V <sub>DS</sub> =15V, I <sub>D</sub> =2A,<br>V <sub>GS</sub> =10V                          | -    | 3    | -    | nC    |
| Q <sub>gs</sub>                                        | Gate-Source Charge                                        |                                                                                            | -    | 0.5  | -    | nC    |
| Q <sub>gd</sub>                                        | Gate-Drain(“Miller”) Charge                               |                                                                                            | -    | 0.8  | -    | nC    |
| Switching Characteristics                              |                                                           |                                                                                            |      |      |      |       |
| t <sub>d(on)</sub>                                     | Turn-on Delay Time                                        | V <sub>DS</sub> =15V,<br>I <sub>D</sub> =4A, R <sub>GEN</sub> =3Ω,<br>V <sub>GS</sub> =10V | -    | 4    | -    | ns    |
| t <sub>r</sub>                                         | Turn-on Rise Time                                         |                                                                                            | -    | 2.1  | -    | ns    |
| t <sub>d(off)</sub>                                    | Turn-off Delay Time                                       |                                                                                            | -    | 15   | -    | ns    |
| t <sub>f</sub>                                         | Turn-off Fall Time                                        |                                                                                            | -    | 3.2  | -    | ns    |
| Drain-Source Diode Characteristics and Maximum Ratings |                                                           |                                                                                            |      |      |      |       |
| I <sub>S</sub>                                         | Maximum Continuous Drain to Source Diode Forward Current  |                                                                                            | -    | -    | 4.5  | A     |
| I <sub>SM</sub>                                        | Maximum Pulsed Drain to Source Diode Forward Current      |                                                                                            | -    | -    | 16   | A     |
| V <sub>SD</sub>                                        | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> =4A                                                    | -    | -    | 1.2  | V     |

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

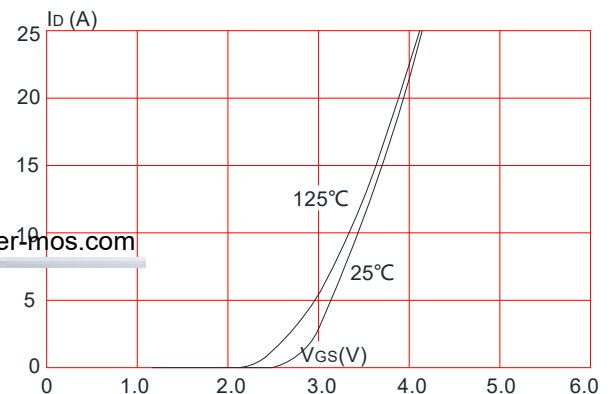
2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

### Typical Performance Characteristics

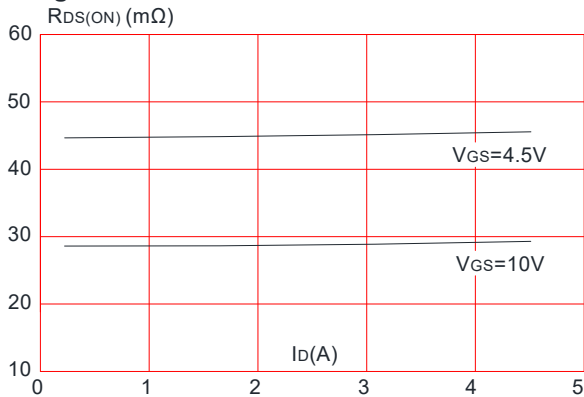
**Figure 1: Output Characteristics**



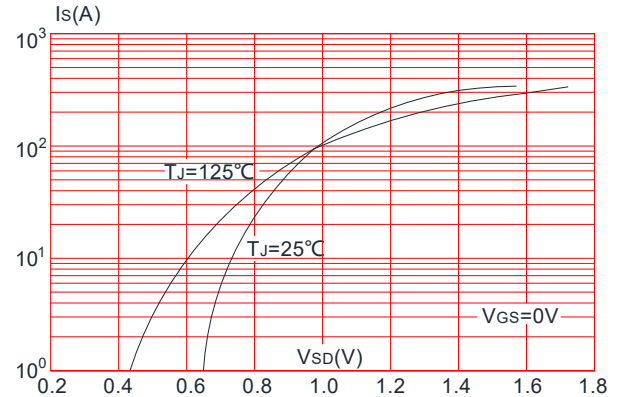
**Figure 2: Typical Transfer Characteristics**



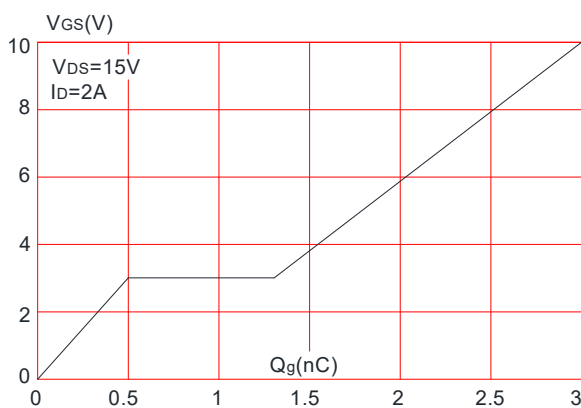
**Figure 3: On-resistance vs. Drain Current**



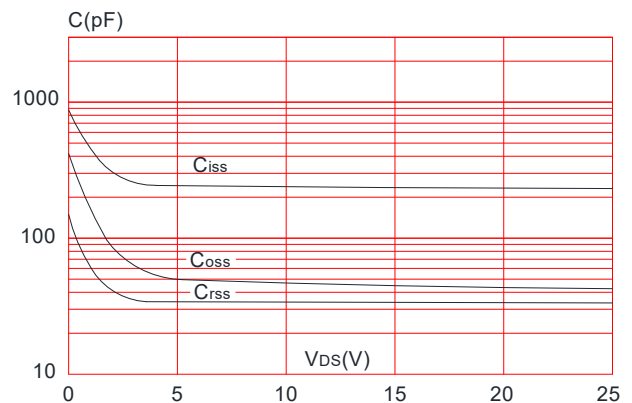
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

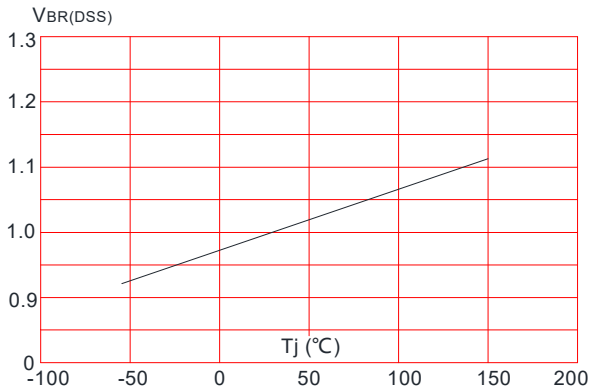


**Figure 6: Capacitance Characteristics**

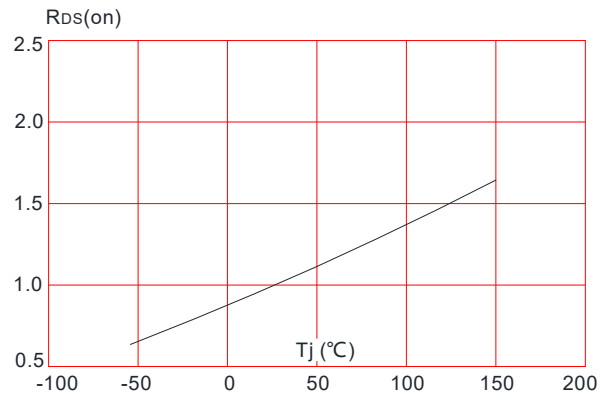


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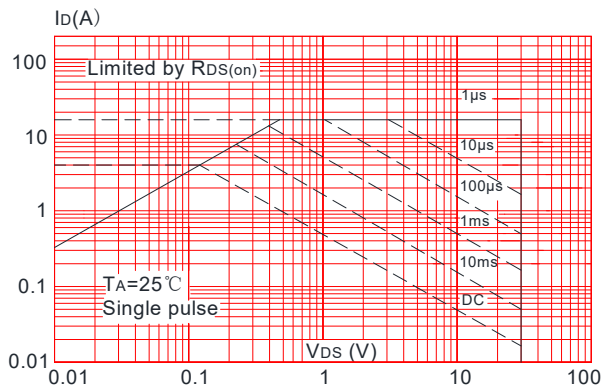
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



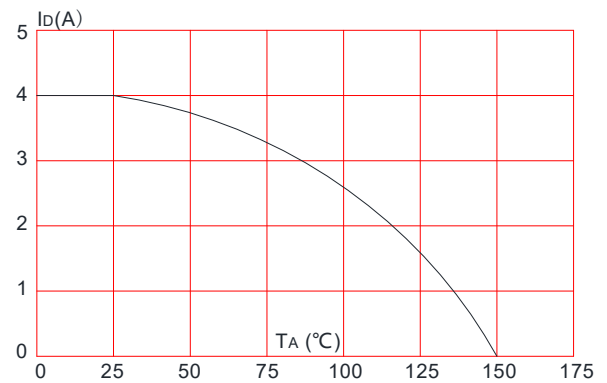
**Figure 8:** Normalized on Resistance vs. Junction Temperature



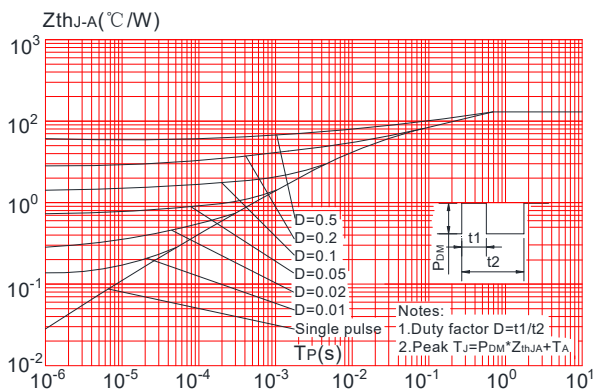
**Figure 9:** Maximum Safe Operating Area



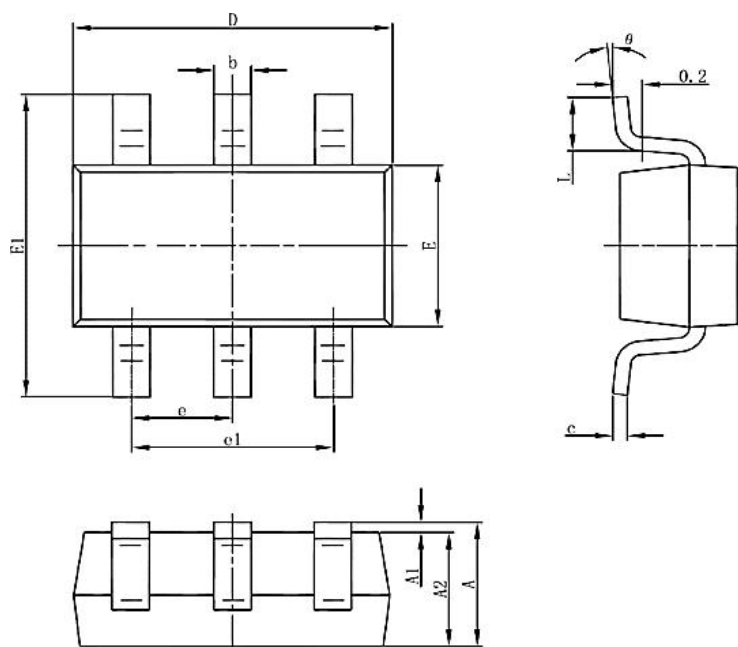
**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature



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



### Package Mechanical Data-SOT23-6-Double



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| C      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1     | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950 (BSC)               |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0                         | 8     | 0                    | 8     |