

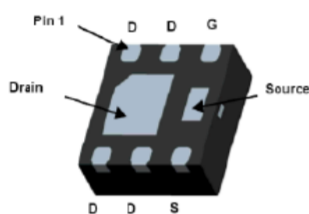
## Features

- $V_{DS}$  -17V
- $I_D$  -6.8A
- $R_{DS(ON)}$ ( at  $V_{GS}=-4.5V$ ) <35mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=-2.5V$ ) <45mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=-1.8V$ ) <72mohm

## Application

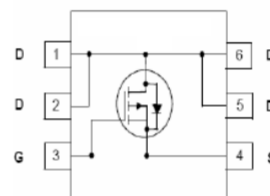
- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

## Package and Pin Configuration



DFN2X2-6L

## Circuit diagram



## Absolute Maximum Ratings ( $T_A=25^{\circ}C$ unless otherwise noted)

| Symbol     | Parameter                                   | Value    | Unit          |
|------------|---------------------------------------------|----------|---------------|
| $V_{DS}$   | Drain-source Voltage                        | -17      | V             |
| $V_{GS}$   | Gate-source Voltage                         | $\pm 10$ | V             |
| $I_D$      | Drain Current                               | -6.8     | A             |
| $P_D$      | Total Power Dissipation                     | 2.5      | W             |
| $R_{thJA}$ | Thermal Resistance From Junction To Ambient | 55       | $^{\circ}C/W$ |
| $T_J$      | Operation Junction Temperature              | -55~+150 | $^{\circ}C$   |
| $T_{STG}$  | Storage Temperature                         | -55~+150 | $^{\circ}C$   |

**Electrical Characteristics (  $T_A = 25^\circ\text{C}$  unless otherwise noted )**

| Parameter                             | Symbol              | Conditions                                                                                | Min  | Typ  | Max  | Units |
|---------------------------------------|---------------------|-------------------------------------------------------------------------------------------|------|------|------|-------|
| Static Parameter                      |                     |                                                                                           |      |      |      |       |
| Drain-Source Breakdown Voltage        | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                               |      | -17  |      |       |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V, T <sub>C</sub> =25℃                           |      |      | -1   | μA    |
| Gate-Body Leakage Current             | I <sub>GSS</sub>    | V <sub>GS</sub> = ±10V, V <sub>DS</sub> =0V                                               |      |      | ±100 | nA    |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | -0.4 | -0.7 | -1.0 | V     |
| Static Drain-Source On-Resistance     | R <sub>DS(ON)</sub> | V <sub>GS</sub> = -4.5V, I <sub>D</sub> =-6.8A                                            |      | 25   | 35   | mΩ    |
|                                       |                     | V <sub>GS</sub> = -2.5V, I <sub>D</sub> =5A                                               |      | 36   | 45   |       |
|                                       |                     | V <sub>GS</sub> = -1.8V, I <sub>D</sub> =2A                                               |      | 45   | 72   |       |
| Diode Forward Voltage                 | g <sub>FS</sub>     | V <sub>DS</sub> =-5V, I <sub>D</sub> =-7A                                                 | 6    |      |      | S     |
| Diode Forward Voltage <sup>C</sup>    | V <sub>SD</sub>     | I <sub>S</sub> =-7A, V <sub>GS</sub> =0V                                                  |      | -0.7 | -1   | V     |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                           |      |      | -8   | A     |
| Dynamic Parameters                    |                     |                                                                                           |      |      |      |       |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHZ                                        |      | 684  |      | pF    |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                           |      | 108  |      |       |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                           |      | 72   |      |       |
| Switching Parameters                  |                     |                                                                                           |      |      |      |       |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-17V, I <sub>D</sub> =-6.8A                       |      | 7.2  |      | nC    |
| Gate Source Charge                    | Q <sub>gs</sub>     |                                                                                           |      | 1.2  |      |       |
| Gate Drain Charge                     | Q <sub>gd</sub>     |                                                                                           |      | 1.6  |      |       |
| Turn-on Delay Time                    | t <sub>D(on)</sub>  | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-1A, R <sub>GEN</sub> =2.5Ω |      | 15   |      | ns    |
| Turn-on Rise Time                     | t <sub>r</sub>      |                                                                                           |      | 63   |      |       |
| Turn-off Delay Time                   | t <sub>D(off)</sub> |                                                                                           |      | 21   |      |       |
| Turn-off Fall Time                    | t <sub>f</sub>      |                                                                                           |      | 12   |      |       |

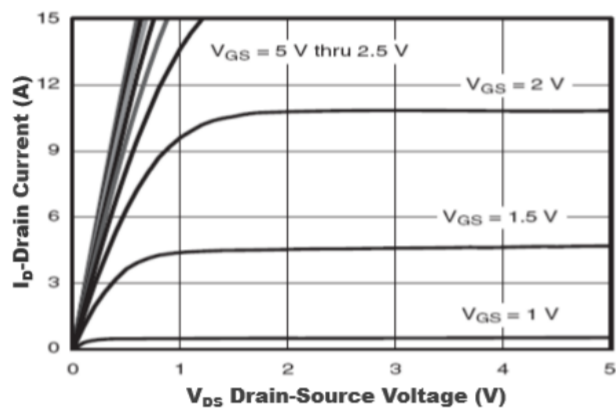


Figure1. Output Characteristics

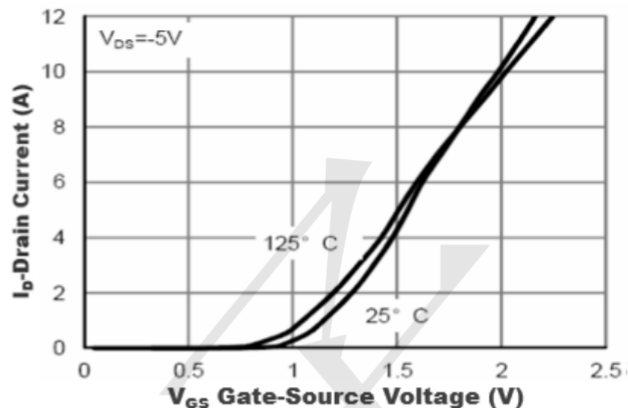


Figure2. Transfer Characteristics

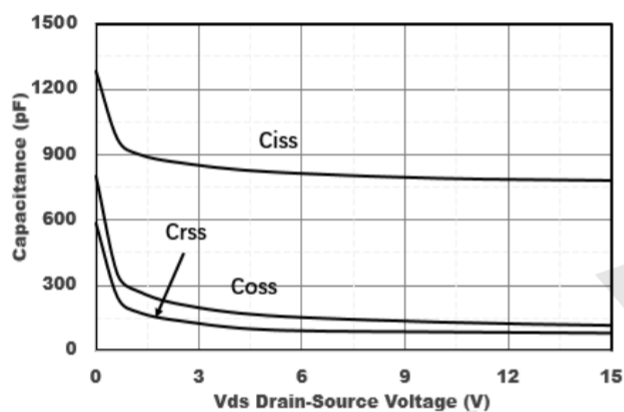


Figure3. Capacitance Characteristics

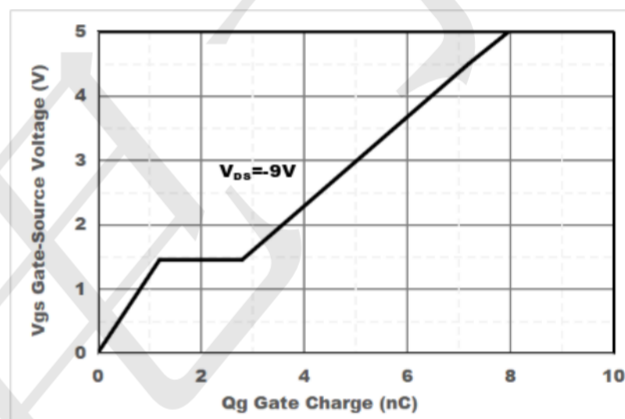


Figure4. Gate Charge

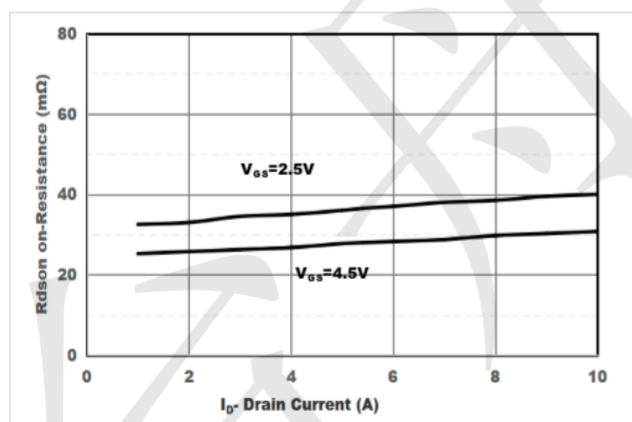


Figure5. Drain-Source on Resistance

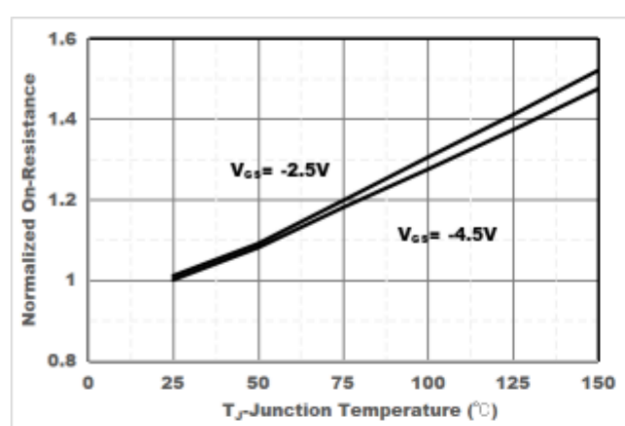


Figure6. Drain-Source on Resistance

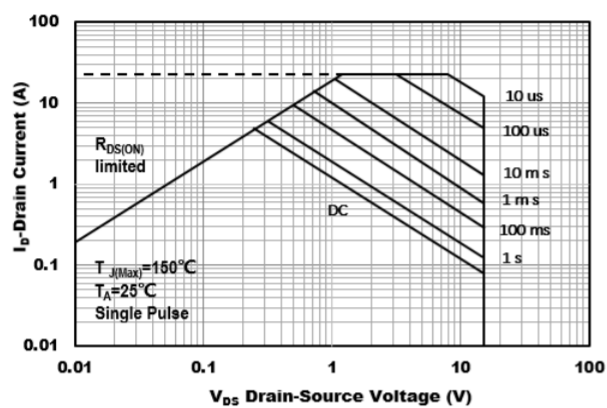


Figure7. Safe Operation Area

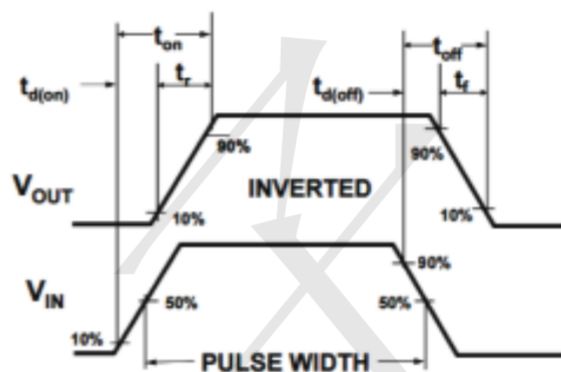
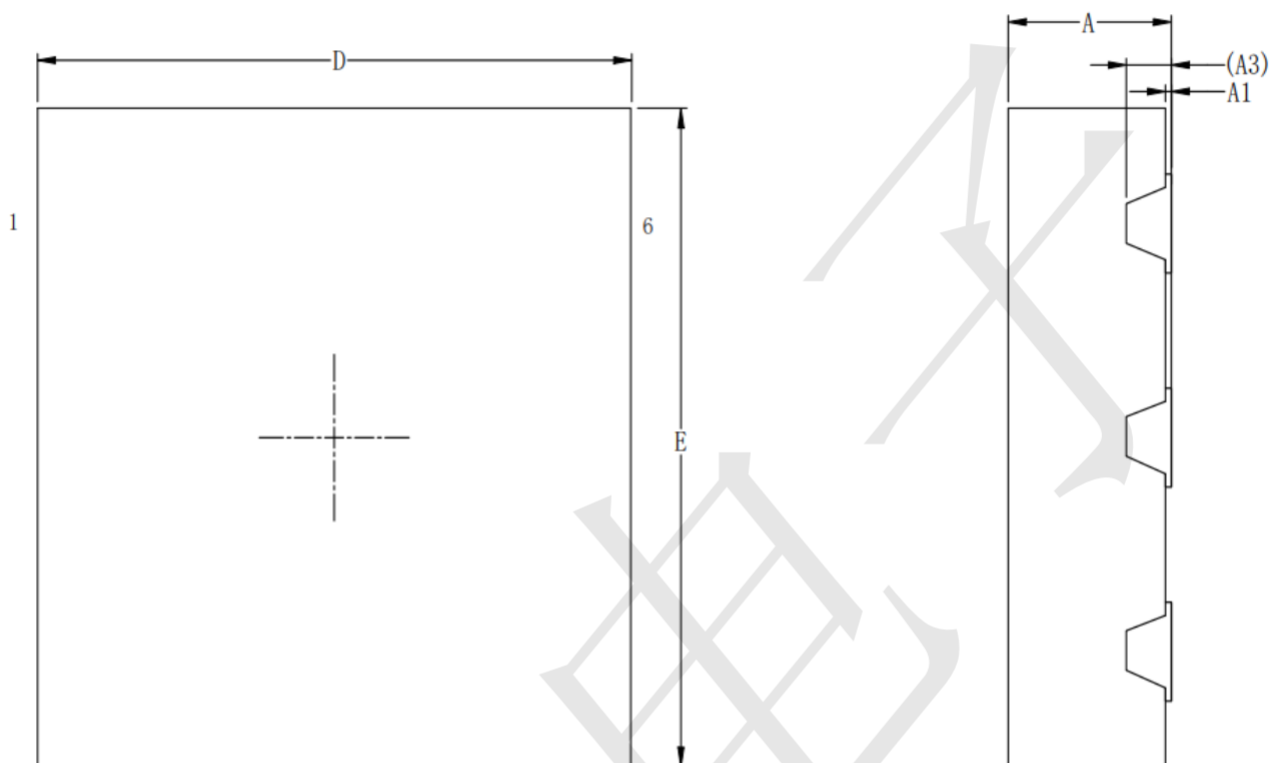


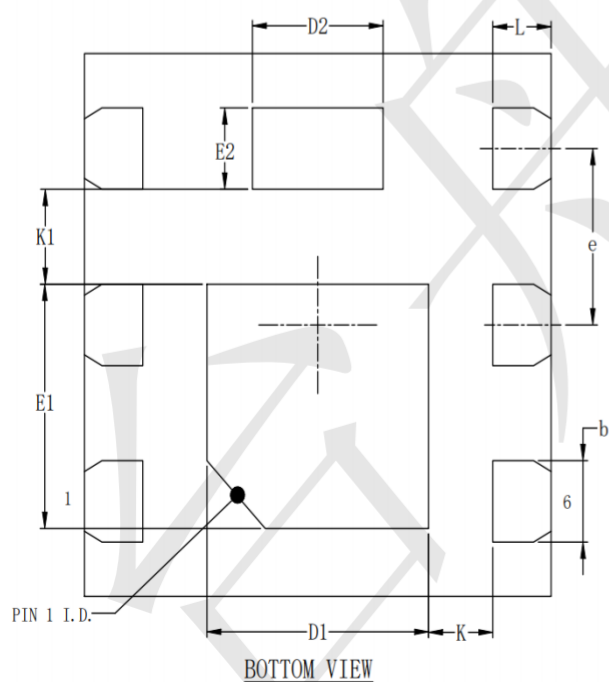
Figure8. Switching wave

**DFN2X2-6 Package Outline Drawing (mm)**



**TOP VIEW**

**SIDE VIEW**



**BOTTOM VIEW**

|                     |   | SYMBOL | MIN       | NOM  | MAX  |
|---------------------|---|--------|-----------|------|------|
| TOTAL THICKNESS     |   | A      | 0.5       | 0.65 | 0.75 |
| STAND OFF           |   | A1     | 0         | 0.02 | 0.05 |
| L/F THICKNESS       |   | A3     | 0.152 REF |      |      |
| LEAD WIDTH          |   | b      | 0.25      | 0.3  | 0.35 |
| BODY SIZE           | X | D      | 1.9       | 2    | 2.1  |
|                     | Y | E      | 1.9       | 2    | 2.1  |
| LEAD PITCH          |   | e      | 0.65 BSC  |      |      |
| EP SIZE             | X | D1     | 0.85      | 0.95 | 1.05 |
|                     |   | D2     | 0.46      | 0.56 | 0.66 |
|                     | Y | E1     | 0.8       | 0.9  | 1    |
|                     |   | E2     | 0.2       | 0.3  | 0.4  |
| LEAD LENGTH         |   | L      | 0.2       | 0.25 | 0.3  |
| LEAD TIP TO EP EDGE |   | K      | 0.275 REF |      |      |
| EP EDGE TO EP EDGE  |   | K1     | 0.35 REF  |      |      |
|                     |   |        |           |      |      |
|                     |   |        |           |      |      |