

### Product Summary

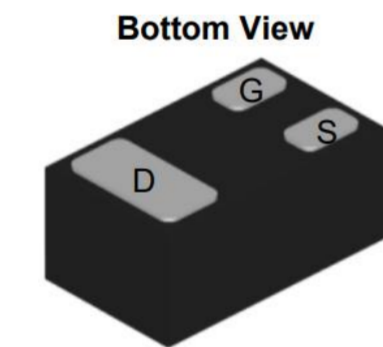
- $V_{DS}$  -30 V
- $I_{DS}$  (at  $V_{GS}=-4.5V$ ) -800m A
- $R_{DS(ON)}$  (at  $V_{GS}=-4.5V$ )  $\leq 400m\Omega$

### Application

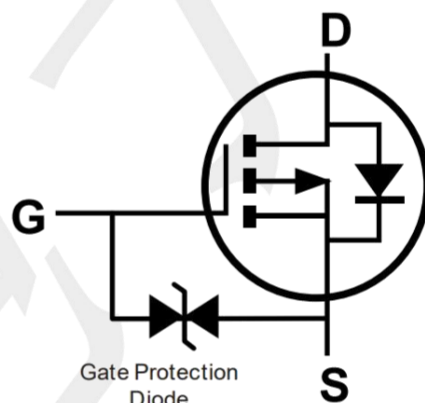
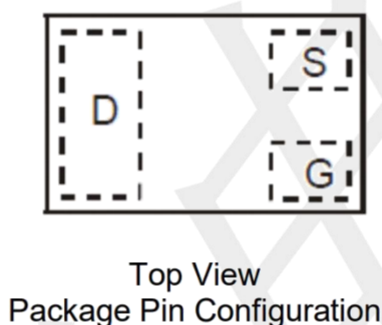
- Interfacing Switching
- Portable equipment and battery
- Load Switch

### Package and Pin Configuration

### Circuit diagram



DFN1006-3



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

| PARAMETER                                | SYMBOL    | LIMIT       | UNIT        |
|------------------------------------------|-----------|-------------|-------------|
| Drain-Source Voltage                     | $V_{DS}$  | -30         | V           |
| Gate-Source Voltage                      | $V_{GS}$  | $\pm 8$     | V           |
| Continuous Drain Current                 | $I_D$     | -800        | mA          |
| Pulsed Drain Current ( $t = 100 \mu s$ ) | $I_{DM}$  | -2100       | mA          |
| Maximum Power Dissipation                | $P_D$     | 100         | mW          |
| Operating Junction Temperature Range     | $T_J$     | -55 to +150 | $^{\circ}C$ |
| Storage Temperature Range                | $T_{stg}$ | -55 to +150 | $^{\circ}C$ |

### Thermal Characteristic

| PARAMETER                                                   |                      | Symbol          | Value | Unit          |
|-------------------------------------------------------------|----------------------|-----------------|-------|---------------|
| Thermal Resistance from Junction to Ambient( $t \leq 10s$ ) | PCB Mount<br>(Note ) | $R_{\theta JA}$ | 1250  | $^{\circ}C/W$ |

notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2 . When mounted on 1" square PCB (FR4 material).

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

| PARAMETER                                               | CONDITIONS                                                                                             | SYMBOL              | MIN  | TYP  | MAX  | UNIT |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------|------|------|------|------|
| Static                                                  |                                                                                                        |                     |      |      |      |      |
| Drain-Source Breakdown Voltage                          | V <sub>GS</sub> =0V, I <sub>D</sub> = -250μA                                                           | BV <sub>DSS</sub>   | -30  | --   | --   | V    |
| Gate-Source Threshold Voltage                           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = -250μA                                             | V <sub>GS(th)</sub> | -0.4 | -0.7 | -1.3 | V    |
| Gate-Source Leakage                                     | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±8V                                                             | I <sub>GSS</sub>    | --   | --   | ±10  | uA   |
| Zero Gate Voltage Drain Current                         | V <sub>DS</sub> = -30V, V <sub>GS</sub> =0V                                                            | I <sub>DSS</sub>    | --   | -0.1 | -1   | μA   |
|                                                         | V <sub>DS</sub> = -30V, T <sub>J</sub> =85°C                                                           |                     | --   | --   | -30  | μA   |
| Drain-Source On-State Resistance (Note 1)               | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.5A                                                        | R <sub>DS(on)</sub> | --   | 300  | 500  | mΩ   |
|                                                         | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -0.5A                                                        |                     | --   | 400  | 600  |      |
| Forward Transconductance (Note 2)                       | V <sub>DS</sub> = -5V, I <sub>D</sub> = -0.5A                                                          | g <sub>fs</sub>     | --   | 10   | --   | S    |
| Dynamic (Note 2)                                        |                                                                                                        |                     |      |      |      |      |
| Total Gate Charge (Note 3)                              | V <sub>DS</sub> = -20V,<br>I <sub>D</sub> = - 0.5A,<br>V <sub>GS</sub> = -4.5V                         | Q <sub>g</sub>      | --   | 6.0  | --   | nC   |
| Gate-Source Charge (Note 3)                             |                                                                                                        | Q <sub>gs</sub>     | --   | 1.1  | --   |      |
| Gate-Drain Charge (Note 3)                              |                                                                                                        | Q <sub>gd</sub>     | --   | 1.7  | --   |      |
| Input Capacitance                                       | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V,<br>F= 1.0MHz                                             | C <sub>iss</sub>    | --   | 200  | --   | pF   |
| Output Capacitance                                      |                                                                                                        | C <sub>oss</sub>    | --   | 80   | --   |      |
| Reverse Transfer Capacitance                            |                                                                                                        | C <sub>rss</sub>    | --   | 50   | --   |      |
| Switching                                               |                                                                                                        |                     |      |      |      |      |
| Turn-On Delay Time (Note 3)                             | V <sub>DS</sub> = -20V,<br>I <sub>D</sub> = - 0.5A,<br>V <sub>GS</sub> = -4.5V,<br>R <sub>G</sub> = 3Ω | t <sub>d(on)</sub>  | --   | 5.2  | --   | nS   |
| Rise Time (Note 3)                                      |                                                                                                        | t <sub>r</sub>      | --   | 12   | --   |      |
| Turn-Off Delay Time (Note 3)                            |                                                                                                        | t <sub>d(off)</sub> | --   | 19   | --   |      |
| Fall Time (Note 3)                                      |                                                                                                        | t <sub>f</sub>      | --   | 18   | --   |      |
| Source-Drain Diode Ratings and Characteristics (Note 2) |                                                                                                        |                     |      |      |      |      |
| Forward Voltage                                         | V <sub>GS</sub> = 0V, I <sub>F</sub> = -0.5A                                                           | V <sub>SD</sub>     | --   | -0.8 | -1.2 | V    |
| Continuous Source Current                               | Integral reverse diode in the MOSFET                                                                   | I <sub>S</sub>      | --   | --   | -0.8 | A    |
| Pulsed Current (Note 1)                                 |                                                                                                        | I <sub>SM</sub>     | --   | --   | -2.1 | A    |

Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

## TYPICAL CHARACTERISTICS

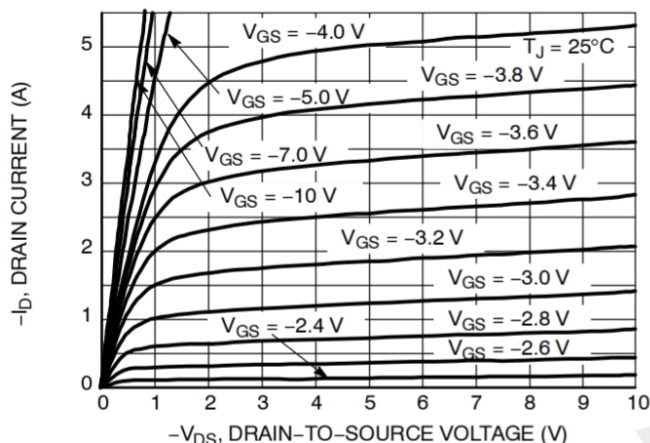


Figure 1. On-Region Characteristics

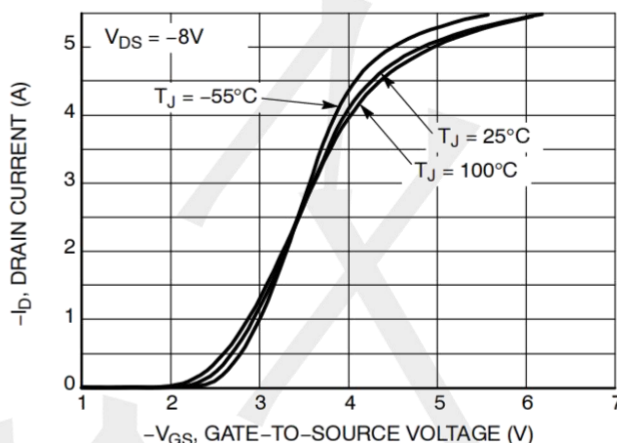


Figure 2. Transfer Characteristics

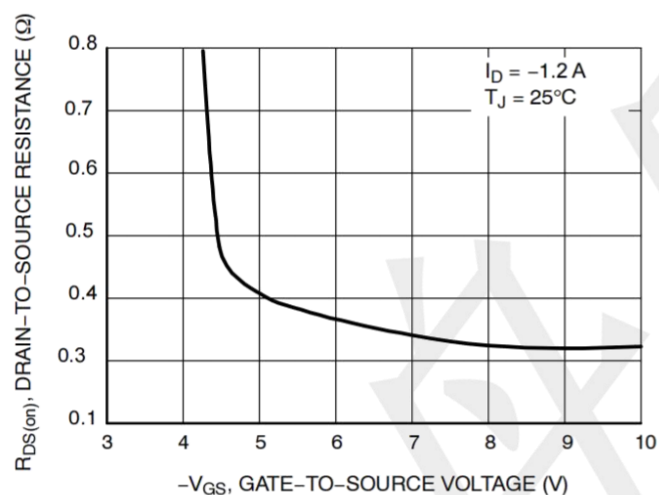


Figure 3. On-Resistance versus Gate-to-Source Voltage

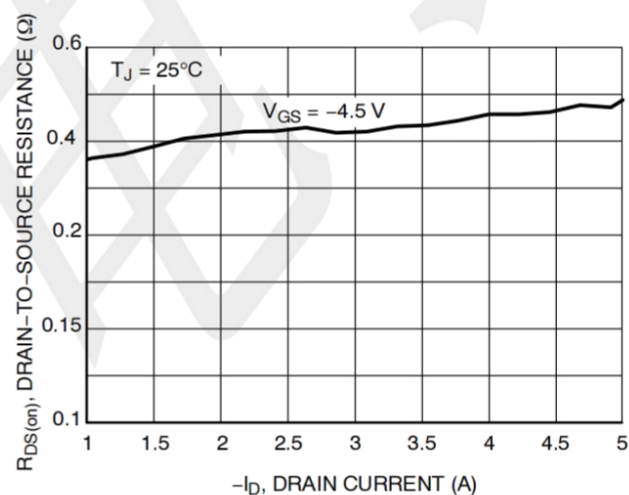


Figure 4. On-Resistance versus Drain Current and Gate Voltage

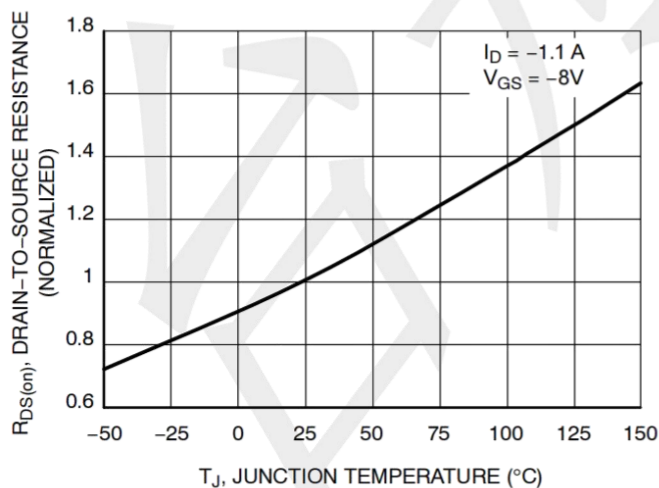


Figure 5. On-Resistance Variation with Temperature

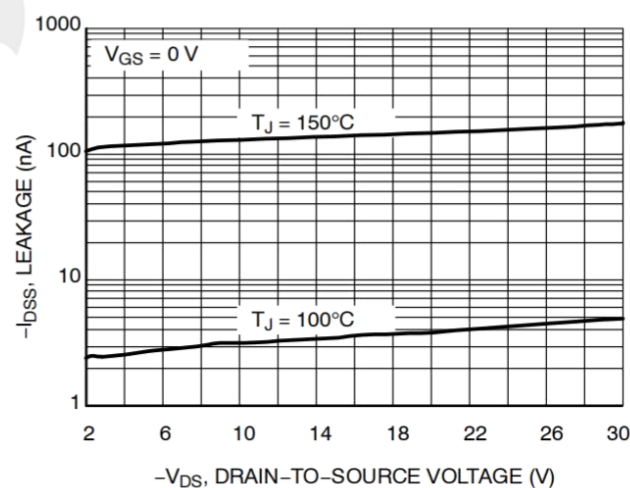
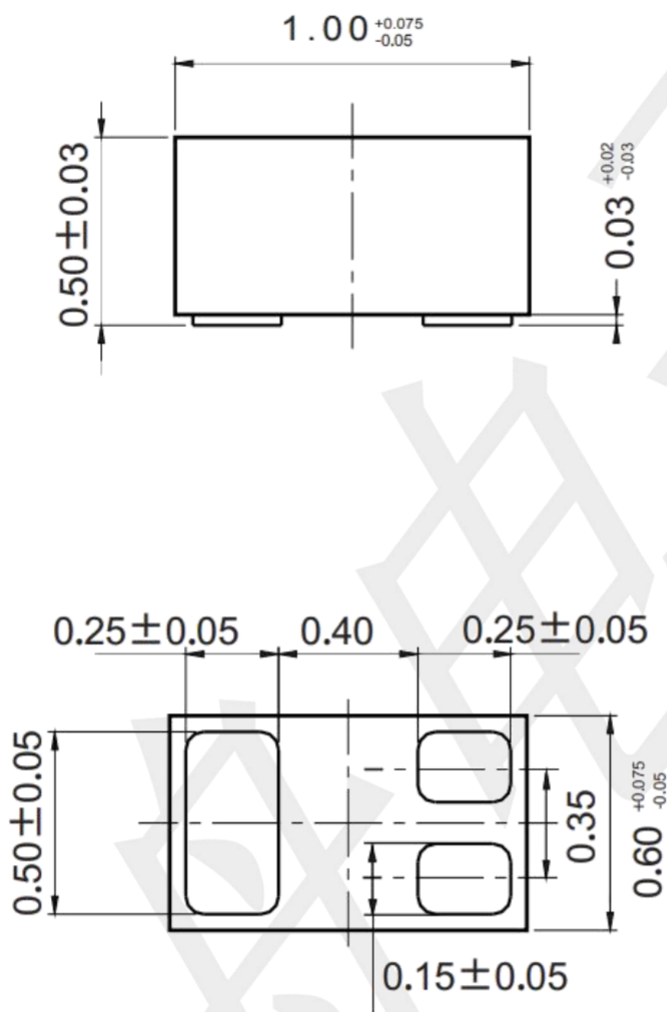


Figure 6. Drain-to-Source Leakage Current versus Voltage

**Package Outline Dimensions (unit: mm)**

DFN1006-3



**Mounting Pad Layout (unit: mm)**

