

## Dual N-Channel MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ Max |
|---------------|-----------------|-----------|
| 20V           | 5.1mΩ @ 4.5V    | 15A       |
|               | 6.2mΩ @ 2.5V    |           |

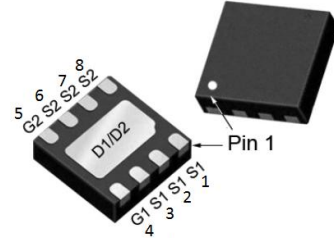
## FEATURE

- TrenchFET Power MOSFET
- Excellent  $R_{DS(on)}$
- Low Gate Charge
- High Power and Current Handling Capability
- Surface Mount Package

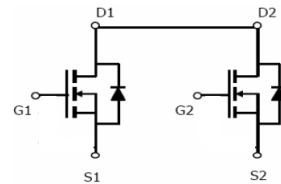
## APPLICATION

- Battery Protection
- Load Switch
- Power Management

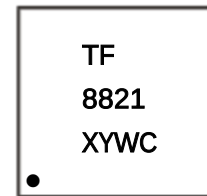
## DFN3030-8L



## Equivalent Circuit



## MARKING



Y :year code W :week code

## ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter                                                        | Symbol          | Value    | Unit               |
|------------------------------------------------------------------|-----------------|----------|--------------------|
| Drain-Source Voltage                                             | $V_{DS}$        | 20       | V                  |
| Gate-Source Voltage                                              | $V_{GS}$        | $\pm 12$ | V                  |
| Continuous Drain Current                                         | $I_D$           | 15       | A                  |
| Pulsed Drain Current (note 1)                                    | $I_{DM}$        | 45       | A                  |
| Thermal Resistance from Junction to Ambient (note 2)             | $R_{\theta JA}$ | 38       | $^\circ\text{C/W}$ |
| Junction Temperature                                             | $T_J$           | 150      | $^\circ\text{C}$   |
| Storage Temperature                                              | $T_{STG}$       | -55~+150 | $^\circ\text{C}$   |
| Lead Temperature for Soldering Purposes(1/8" from case for 10 s) | $T_L$           | 260      | $^\circ\text{C}$   |

## MOSFET ELECTRICAL CHARACTERISTICS

T<sub>j</sub>=25 °C unless otherwise specified

| Parameter                           | Symbol               | Test Condition                                                                          | Min  | Typ  | Max  | Unit |
|-------------------------------------|----------------------|-----------------------------------------------------------------------------------------|------|------|------|------|
| STATIC CHARACTERICTISCS             |                      |                                                                                         |      |      |      |      |
| Drain-source breakdown voltage      | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                             | 20   |      |      | V    |
| Zero gate voltage drain current     | I <sub>DSS</sub>     | V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V                                              |      |      | 1    | uA   |
| Gate-body leakage current           | I <sub>GSS</sub>     | V <sub>GS</sub> =±12V, 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                                | 0.45 | 0.65 | 1.00 | V    |
| Drain-source on-resistance (note 3) | R <sub>DS(on)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =8.0A                                             | 4.5  | 5.1  | 7.0  | mΩ   |
|                                     |                      | V <sub>GS</sub> =3.5V, I <sub>D</sub> =7.0A                                             | 5.0  | 5.4  | 8.0  | mΩ   |
|                                     |                      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =6.0A                                             | 5.5  | 6.2  | 9.0  | mΩ   |
| Forward tranconductance (note 3)    | g <sub>FS</sub>      | V <sub>DS</sub> =5V, I <sub>D</sub> =4A                                                 |      | 10   |      | S    |
| Diode forward voltage (note 3)      | V <sub>SD</sub>      | I <sub>S</sub> =1.50A, V <sub>GS</sub> = 0V                                             |      |      | 1.0  | V    |
| DYNAMIC CHARACTERICTISCS (note4)    |                      |                                                                                         |      |      |      |      |
| Input Capacitance                   | C <sub>iss</sub>     | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f =1MHz                                      |      | 911  |      | pF   |
| Output Capacitance                  | C <sub>oss</sub>     |                                                                                         |      | 234  |      | pF   |
| Reverse Transfer Capacitance        | C <sub>rss</sub>     |                                                                                         |      | 219  |      | pF   |
| SWITCHING CHARACTERICTISCS (note 4) |                      |                                                                                         |      |      |      |      |
| Turn-on delay time                  | t <sub>d(on)</sub>   | V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =6A<br>R <sub>GEN</sub> =3Ω |      | 6.8  |      | ns   |
| Turn-on rise time                   | t <sub>r</sub>       |                                                                                         |      | 17.8 |      | ns   |
| Turn-off delay time                 | t <sub>d(off)</sub>  |                                                                                         |      | 43.5 |      | ns   |
| Turn-off fall time                  | t <sub>f</sub>       |                                                                                         |      | 14.2 |      | ns   |
| Total Gate Charge                   | Q <sub>g</sub>       | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A                         |      | 17.3 |      | nC   |
| Gate-Source Charge                  | Q <sub>gs</sub>      |                                                                                         |      | 3.8  |      | nC   |
| Gate-Drain Charge                   | Q <sub>gd</sub>      |                                                                                         |      | 5.9  |      | nC   |

### Notes :

- 1.Repetitive rating: Pluse width limited by maximum junction temperature
- 2.Surface Mounted on FR4 board, t≤10 sec.
3. Pulse test : Pulse width≤300μs, duty cycle≤2%.
4. Guaranteed by design, not subject to production.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

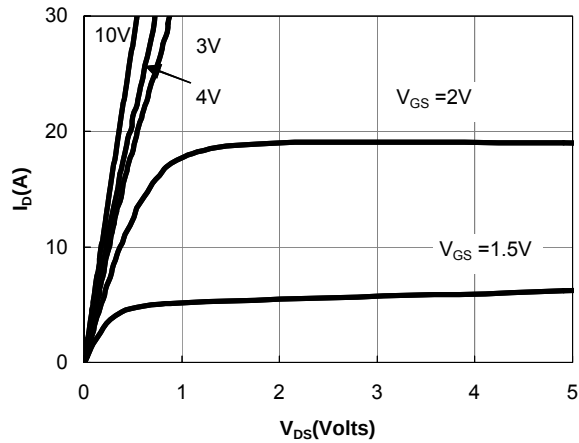


Figure 1: On-Regions Characteristic CS

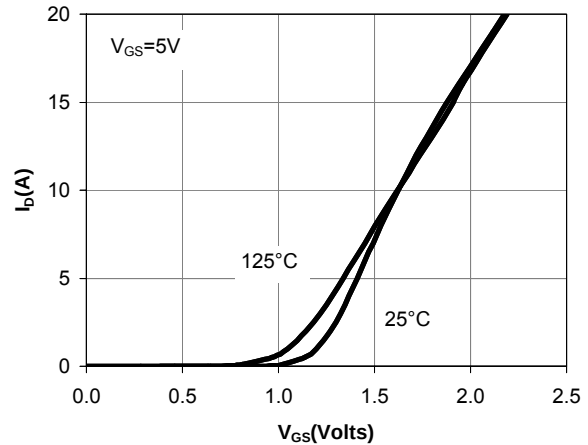


Figure 2: Transfer Characteristics

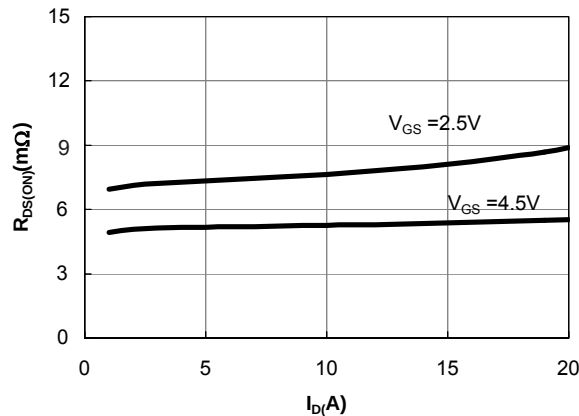


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

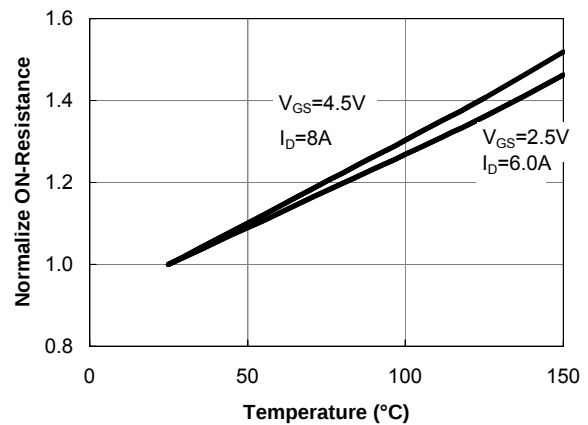


Figure 4: On-Resistance vs. Junction Temperature

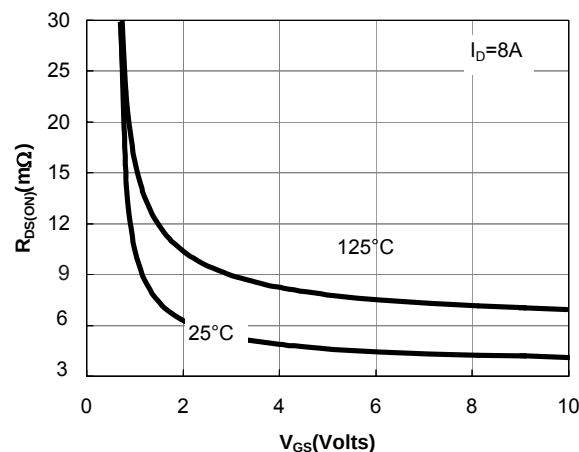


Figure 5: On-Resistance vs. Gate-Source Voltage

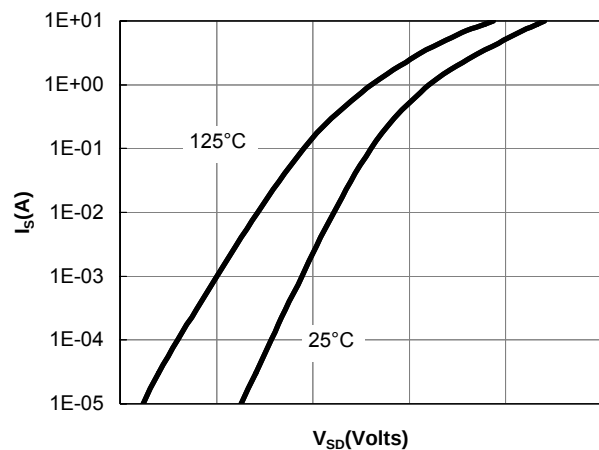
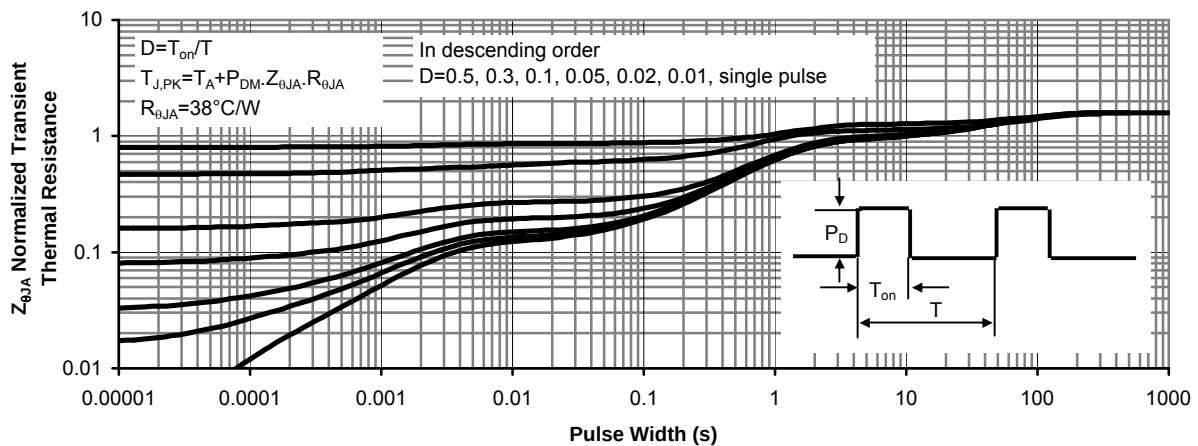
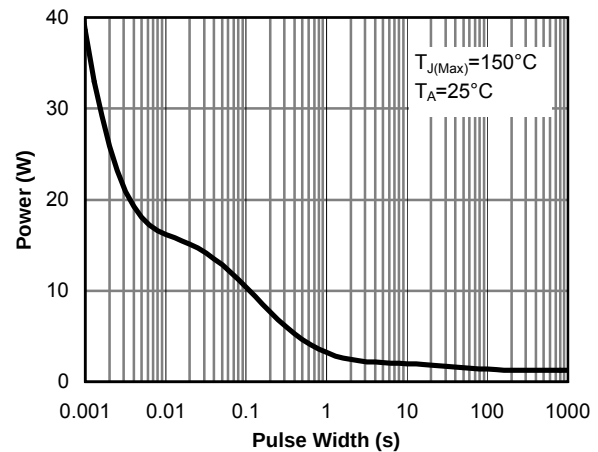
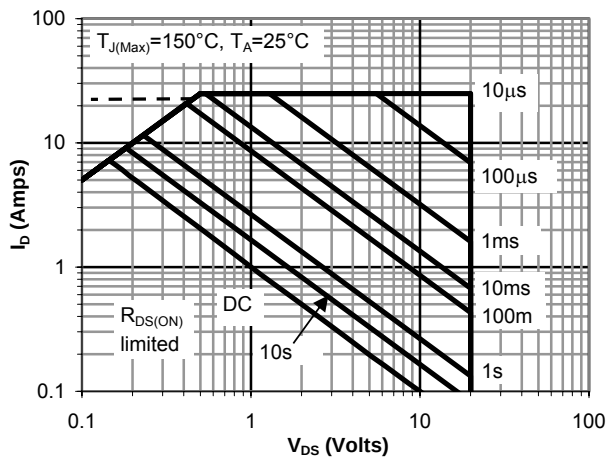
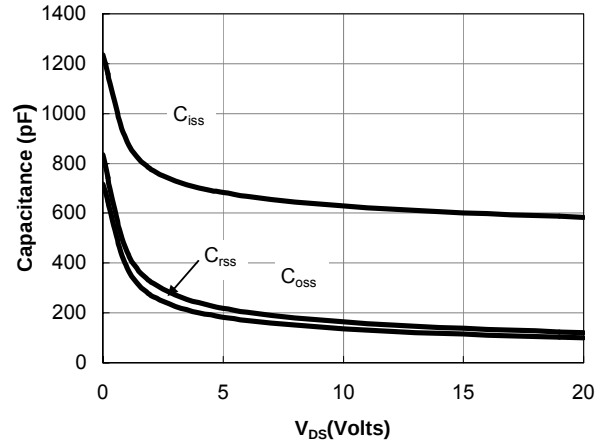
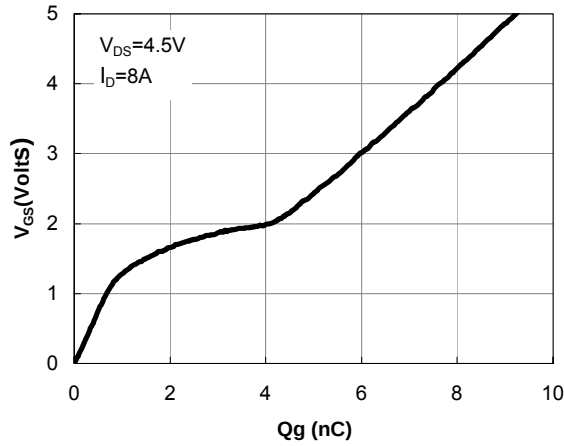
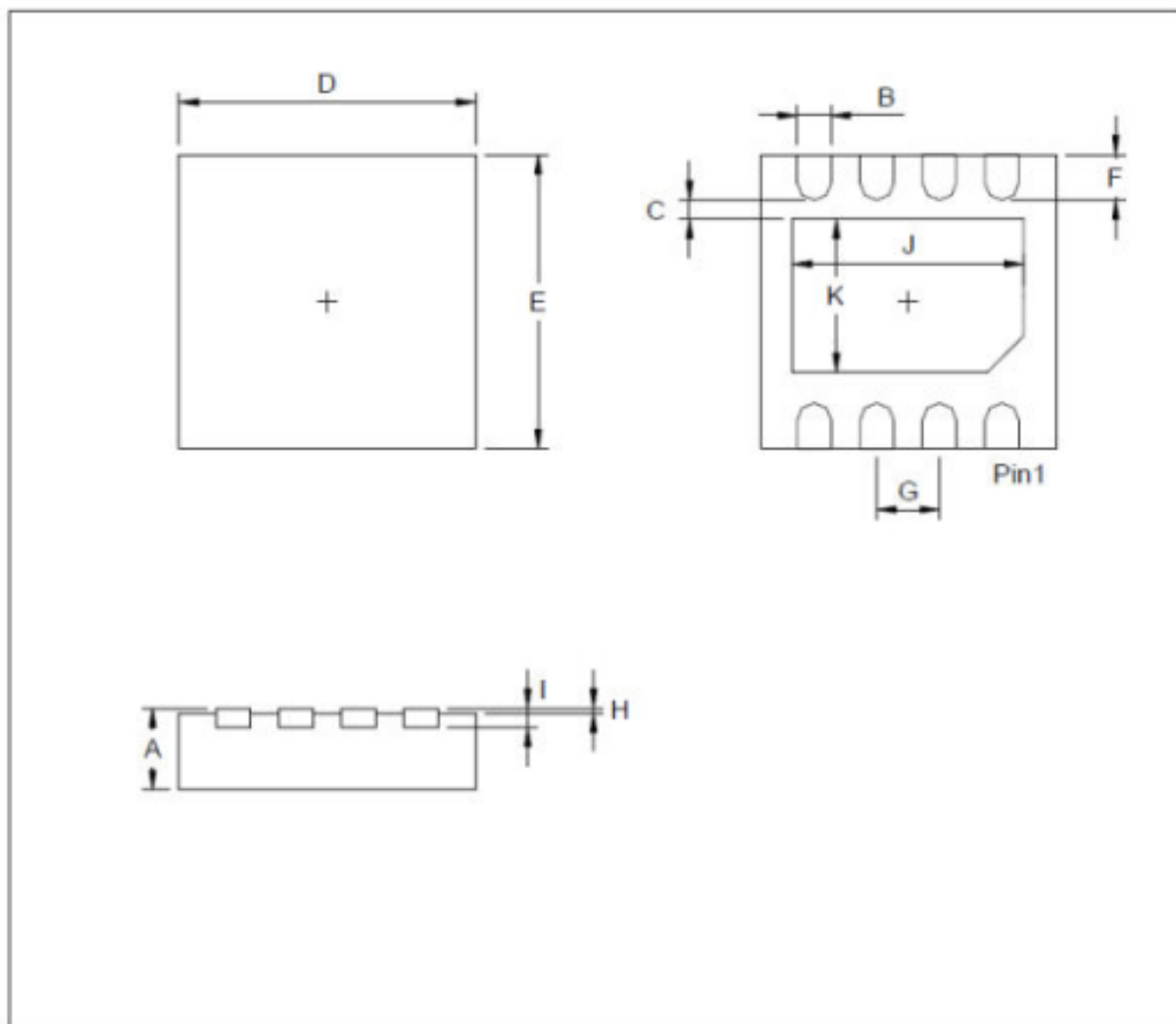


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



## DFN3030-8L Package Outline Data



| Dimension | mm    |      |       | Dimension | mm   |       |      |
|-----------|-------|------|-------|-----------|------|-------|------|
|           | Min.  | Typ. | Max.  |           | Min. | Typ.  | Max. |
| A         | 0.7   |      | 0.8   | I         |      | 0.203 |      |
| B         | 0.25  |      | 0.35  | J         | 2.2  |       | 2.4  |
| C         | 0.2   |      |       | K         | 1.4  |       | 1.6  |
| D         | 2.924 |      | 3.076 |           |      |       |      |
| E         | 2.924 |      | 3.076 |           |      |       |      |
| F         | 0.324 |      | 0.476 |           |      |       |      |
| G         |       | 0.65 |       |           |      |       |      |
| H         | 0     |      | 0.05  |           |      |       |      |