

### Description

The SX80P10NF uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

### General Features

$V_{DS} = -100V$   $I_D = -80A$

$R_{DS(ON)} < 25m\Omega$  @  $V_{GS} = 10V$

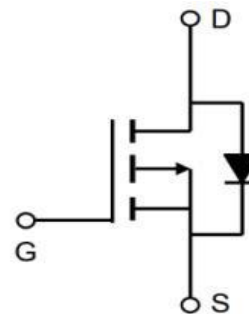
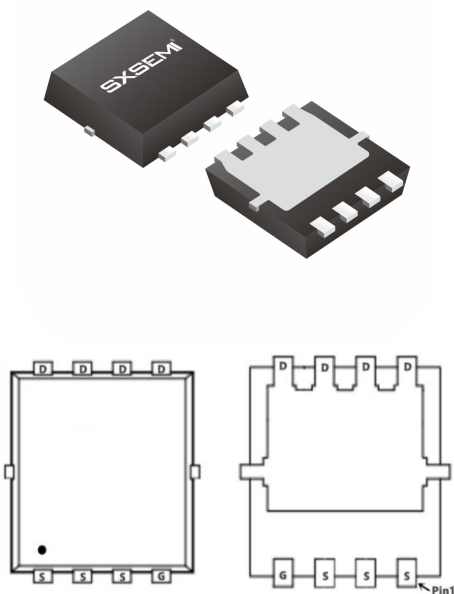
### Application

Brushless motor

Load switch

Uninterruptible power supply

PDFN5\*6-8L



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

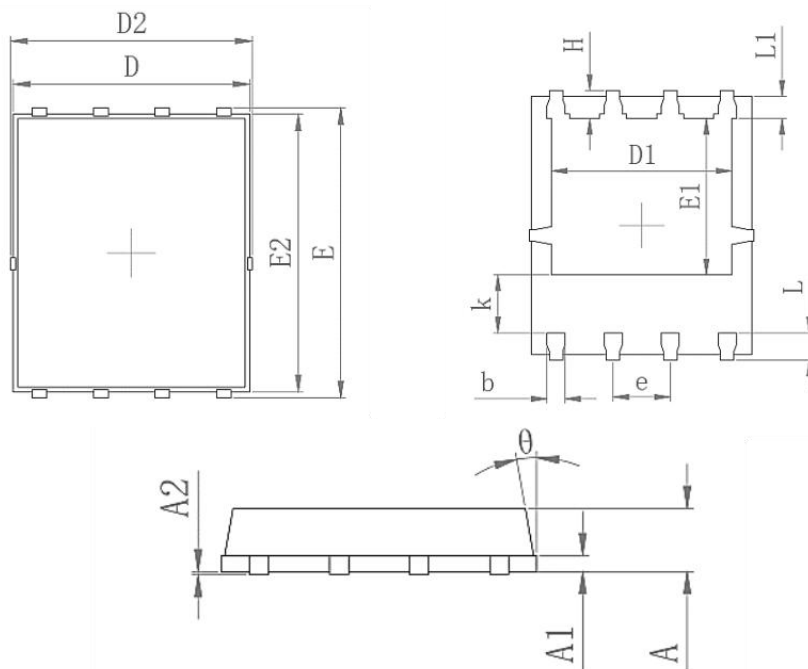
| Symbol                    | Parameter                                        | Rating     | Units        |
|---------------------------|--------------------------------------------------|------------|--------------|
| $V_{DS}$                  | Drain-Source Voltage                             | -100       | V            |
| $V_{GS}$                  | Gate-Source Voltage                              | $\pm 20$   | V            |
| $I_D @ T_c = 25^\circ C$  | Continuous Drain Current, $V_{GS} @ -10V^1$      | -80        | A            |
| $I_D @ T_c = 100^\circ C$ | Continuous Drain Current, $V_{GS} @ -10V^1$      | -56        | A            |
| $I_{DM}$                  | Pulsed Drain Current <sup>2</sup>                | -300       | A            |
| EAS                       | Single Pulse Avalanche Energy <sup>3</sup>       | 174        | mJ           |
| $I_{AS}$                  | Avalanche Current                                | -50        | A            |
| $P_D @ T_c = 25^\circ C$  | Total Power Dissipation <sup>4</sup>             | 280        | W            |
| $T_{STG}$                 | Storage Temperature Range                        | -55 to 150 | $^\circ C$   |
| $T_J$                     | Operating Junction Temperature Range             | -55 to 150 | $^\circ C$   |
| $R_{\theta JA}$           | Thermal Resistance Junction-Ambient <sup>1</sup> | 25         | $^\circ C/W$ |
| $R_{\theta JC}$           | Thermal Resistance Junction-Case <sup>1</sup>    | 0.65       | $^\circ C/W$ |

**P-Channel Electrical Characteristics (T<sub>J</sub> =25 °C, unless otherwise noted)**

| Symbol          | Parameter                                                | Test Condition                                                                           | Min. | Typ. | Max. | Units |
|-----------------|----------------------------------------------------------|------------------------------------------------------------------------------------------|------|------|------|-------|
| V(BR)DSS        | Drain-Source Breakdown Voltage                           | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA                                              | -100 | 110  | -    | V     |
| IDSS            | Zero Gate Voltage Drain Current                          | V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V,                                             | -    | -    | -1.0 | μA    |
| IGSS            | Gate to Body Leakage Current                             | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V                                              | -    | -    | ±100 | nA    |
| VGS(th)         | Gate Threshold Voltage                                   | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                | -1.0 | -1.6 | -2.5 | V     |
| RDS(on)         | Static Drain-Source on-Resistance                        | V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A                                              | -    | 18   | 25   | mΩ    |
|                 |                                                          | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A                                             | -    | 21   | 30   |       |
| Ciss            | Input Capacitance                                        | V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                  | -    | 4230 | -    | pF    |
| Coss            | Output Capacitance                                       |                                                                                          | -    | 388  | -    | pF    |
| Crss            | Reverse Transfer Capacitance                             |                                                                                          | -    | 26   | -    | pF    |
| Q <sub>g</sub>  | Total Gate Charge                                        | V <sub>DS</sub> =-50V, I <sub>D</sub> =-5A,<br>V <sub>GS</sub> =-10V                     | -    | 80   | -    | nC    |
| Q <sub>gs</sub> | Gate-Source Charge                                       |                                                                                          | -    | 15.6 | -    | nC    |
| Q <sub>gd</sub> | Gate-Drain("Miller") Charge                              |                                                                                          | -    | 17.2 | -    | nC    |
| td(on)          | Turn-on Delay Time                                       | V <sub>DD</sub> =-50V, I <sub>D</sub> =-5A,<br>R <sub>G</sub> =6Ω, V <sub>GS</sub> =-10V | -    | 26   | -    | ns    |
| t <sub>r</sub>  | Turn-on Rise Time                                        |                                                                                          | -    | 78   | -    | ns    |
| td(off)         | Turn-off Delay Time                                      |                                                                                          | -    | 200  | -    | ns    |
| t <sub>f</sub>  | Turn-off Fall Time                                       |                                                                                          | -    | 210  | -    | ns    |
| IS              | Maximum Continuous Drain to Source Diode Forward Current |                                                                                          | -    | -    | -80  | A     |
| ISM             | Maximum Pulsed Drain to Source Diode Forward Current     |                                                                                          | -    | -    | -280 | A     |
| VSD             | Drain to Source Diode Forward Voltage                    | V <sub>GS</sub> =0V, I <sub>S</sub> =-30A                                                | -    | -    | -1.2 | V     |
| trr             | Body Diode Reverse Recovery Time                         | T <sub>J</sub> =25°C,<br>I <sub>F</sub> =-5A, dI/dt=100A/μs                              | -    | 208  | -    | ns    |
| Q <sub>rr</sub> | Body Diode Reverse Recovery Charge                       |                                                                                          | -    | 560  | -    | nC    |

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is V<sub>DD</sub> =-72V, V<sub>GS</sub> =-10V, L=0.1mH, I<sub>AS</sub> =-50A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

**Package Mechanical Data-PDFN5X6-8L-XZT Single**


| Symbol | Common    |       |
|--------|-----------|-------|
|        | mm        |       |
|        | Mim       | Max   |
| A      | 0.90      | 1.10  |
| A1     | 0.254 REF |       |
| A2     | 0-0.05    |       |
| D      | 4.824     | 4.976 |
| D1     | 3.910     | 4.110 |
| D2     | 4.944     | 5.076 |
| E      | 5.924     | 6.076 |
| E1     | 3.375     | 3.575 |
| E2     | 5.674     | 5.826 |
| b      | 0.350     | 0.450 |
| e      | 1.270     |       |
| L      | 0.534     | 0.686 |
| L1     | 0.424     | 0.576 |
| K      | 1.190     | 1.390 |
| H      | 0.549     | 0.701 |
| Φ      | 8°        | 12°   |

**Package Marking and Ordering Information**

| Product ID | Pack       | Marking | Qty(PCS) |
|------------|------------|---------|----------|
| TAPING     | PDFN5*6-8L |         | 5000     |