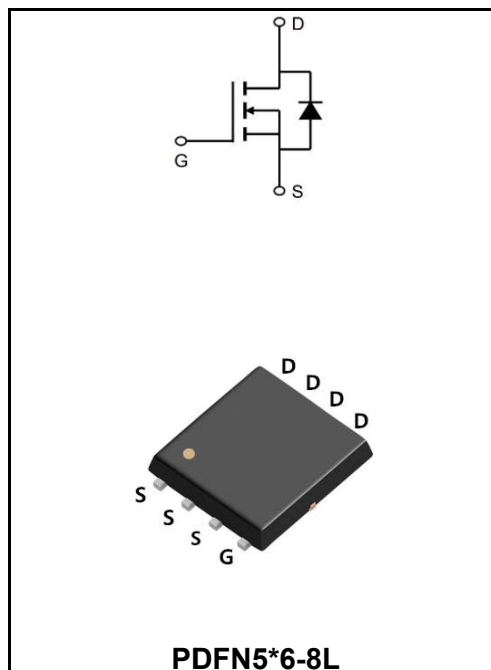


**30V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

|                               |                                         |
|-------------------------------|-----------------------------------------|
| $I_D$                         | 135A                                    |
| $V_{DSS}$                     | 30V                                     |
| $R_{DS(on)-typ}(@V_{GS}=10V)$ | < 1.6m $\Omega$ (Type: 1.3 m $\Omega$ ) |



**Application**

- ◆Lithium battery protection
- ◆Wireless impact
- ◆Mobile phone fast charging

**Product Specification Classification**

| Part Number | Package    | Marking            | Pack         |
|-------------|------------|--------------------|--------------|
| YFW135N03NF | PDFN5*6-8L | YFW 135N03NF XXXXX | 5000PCS/Tape |

**Maximum Ratings at Tc=25°C unless otherwise specified**

| Characteristics                                                  | Symbols         | Value       | Units |
|------------------------------------------------------------------|-----------------|-------------|-------|
| Drain-Source Voltage                                             | $V_{DS}$        | 30          | V     |
| Gate - Source Voltage                                            | $V_{GS}$        | $\pm 20$    | V     |
| Continuous Drain Current, $V_{GS} @ 10V^{1.6} @ T_C=25^\circ C$  | $I_D$           | 135         | A     |
| Continuous Drain Current, $V_{GS} @ 10V^{1.6} @ T_C=100^\circ C$ | $I_D$           | 97          | A     |
| Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=25^\circ C$      | $I_D$           | 31          | A     |
| Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=70^\circ C$      | $I_D$           | 25          | A     |
| Pulsed Drain Current <sup>2</sup>                                | $I_{DM}$        | 350         | A     |
| Single Pulsed Avalanche Energy <sup>3</sup>                      | $E_{AS}$        | 151         | mJ    |
| Avalanche Current                                                | $I_{AS}$        | 55          | A     |
| Total Power Dissipation <sup>4</sup> @Tc=25°C                    | $P_D$           | 62.5        | W     |
| Total Power Dissipation <sup>4</sup> @Ta=25°C                    | $P_D$           | 2.5         | W     |
| Storage Temperature Range                                        | $T_{STG}$       | -55 to +150 | °C    |
| Operating Junction Temperature Range                             | $T_J$           | -55 to +150 | °C    |
| Thermal Resistance Junction-ambient <sup>1</sup>                 | $R_{\theta JA}$ | 50          | °C/W  |
| Thermal Resistance, Junction - Case <sup>1</sup>                 | $R_{\theta JC}$ | 2.0         | °C/W  |

**Maximum Ratings at Tc=25°C unless otherwise specified**

| Characteristics                          | Test Condition                                               | Symbols      | Min | Typ  | Max  | Units |
|------------------------------------------|--------------------------------------------------------------|--------------|-----|------|------|-------|
| Drain-Source Breakdown Voltage           | $V_{GS}=0V, I_D=250\mu A$                                    | $BV_{DSS}$   | 30  | -    | -    | V     |
| Static Drain-Source On-Resistance        | $V_{GS}=10V, I_D=20A$                                        | $R_{DS(ON)}$ | -   | 1.3  | 1.6  | mΩ    |
|                                          | $V_{GS}=4.5V, I_D=20A$                                       |              | -   | 1.9  | 2.5  |       |
| Gate -Threshold Voltage                  | $V_{DS}=V_{GS}, I_D=250\mu A$                                | $V_{GS(th)}$ | 1.2 | 1.6  | 2.2  | V     |
| Drain-Source Leakage Current             | $V_{DS}=24V, V_{GS}=0V, T_J=25^{\circ}C$                     | $I_{DSS}$    | -   | -    | 1    | μA    |
|                                          | $V_{DS}=24V, V_{GS}=0V, T_J=55^{\circ}C$                     |              | -   | -    | 5    |       |
| Gate -Source Leakage Current             | $V_{GS}=\pm 20V, V_{DS}=0V$                                  | $I_{GSS}$    | -   | -    | ±100 | nA    |
| Forward Transconductance                 | $V_{DS}=5V, I_D=20A$                                         | $g_{fs}$     | -   | 35   | -    | S     |
| Gate Resistance                          | $V_{DS}=0V, V_{GS}=0V, f=1MHz$                               | $R_g$        | -   | 1.0  | -    | Ω     |
| Total Gate Charge(4.5V)                  | $V_{DS}=15V$<br>$I_D=20A$<br>$V_{GS}=10V$                    | $Q_g$        | -   | 45   | -    | nC    |
| Gate-Source Charge                       |                                                              | $Q_{gs}$     | -   | 9.8  | -    |       |
| Gate-Drain Charge                        |                                                              | $Q_{gd}$     | -   | 6.5  | -    |       |
| Turn-on delay time                       | $V_{DD}=15V$<br>$V_{GS}=10V$<br>$I_D=20A$<br>$R_G=3.3\Omega$ | $t_{d(on)}$  | -   | 10.3 | -    | ns    |
| Rise Time                                |                                                              | $T_r$        | -   | 6.2  | -    |       |
| Turn-Off Delay Time                      |                                                              | $t_{d(OFF)}$ | -   | 56   | -    |       |
| Fall Time                                |                                                              | $t_f$        | -   | 8.4  | -    |       |
| Input Capacitance                        | $V_{DS}=15V$<br>$V_{GS}=0V$<br>$f=1.0MHz$                    | $C_{iss}$    | -   | 3420 | -    | pF    |
| Output Capacitance                       |                                                              | $C_{oss}$    | -   | 1916 | -    |       |
| Reverse Transfer Capacitance             |                                                              | $C_{rss}$    | -   | 196  | -    |       |
| Continuous Source Current <sup>1,6</sup> | $V_G=V_D=0V$ , Force Current                                 | $I_S$        | -   | -    | 100  | A     |
| Diode Forward Voltage <sup>2</sup>       | $V_{GS}=0V, I_S=1A, T_J=25^{\circ}C$                         | $V_{SD}$     | -   | -    | 1.2  | V     |

Note :

1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$

3.The EAS data shows Max. rating . The test condition is  $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=55A$

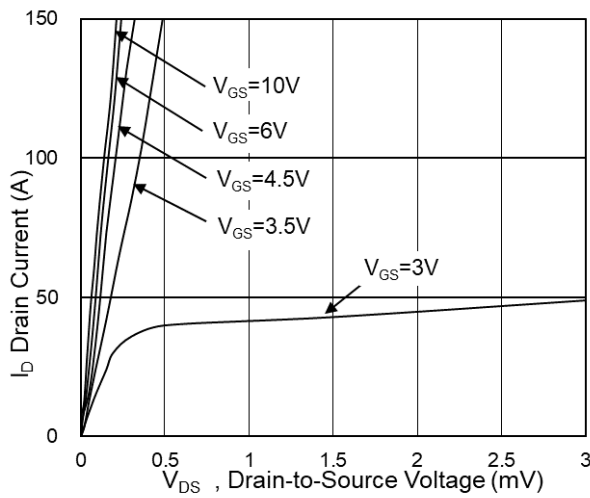
4.The power dissipation is limited by 150°C junction temperature

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

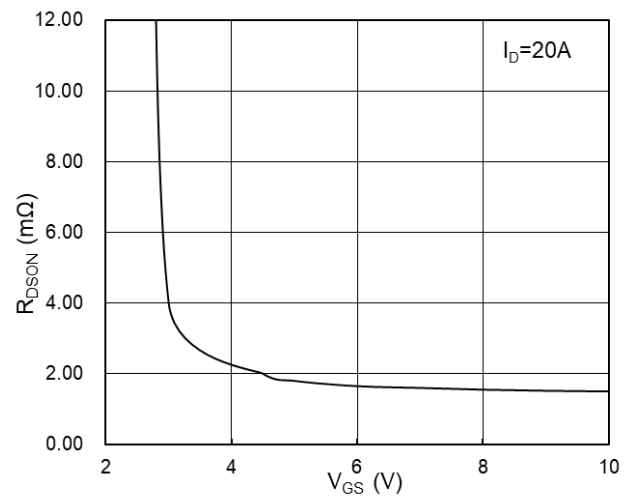
6.Package limitation current is 85A.

**Ratings and Characteristic Curves**

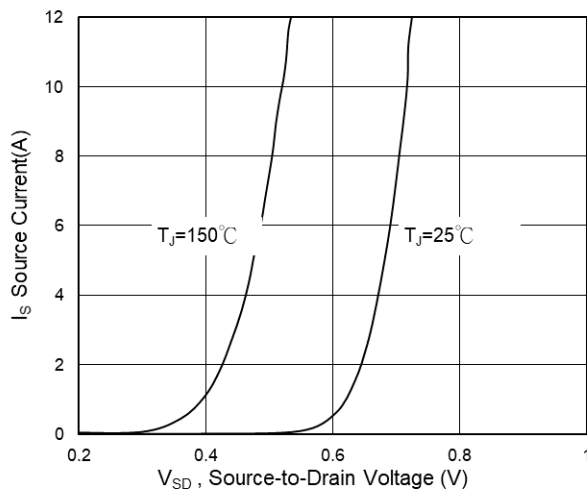
**Typical Characteristics**



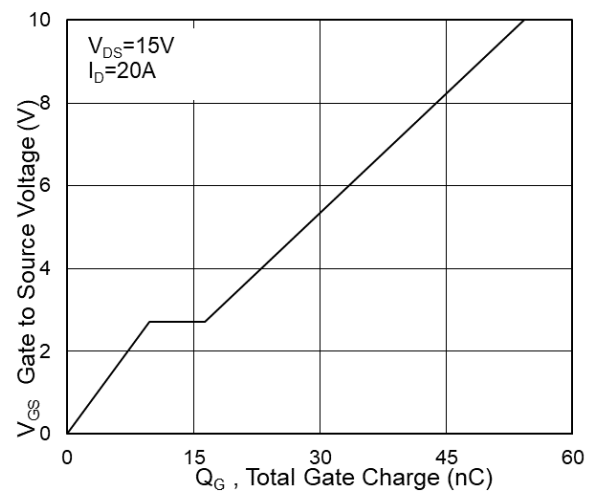
**Fig.1 Typical Output Characteristics**



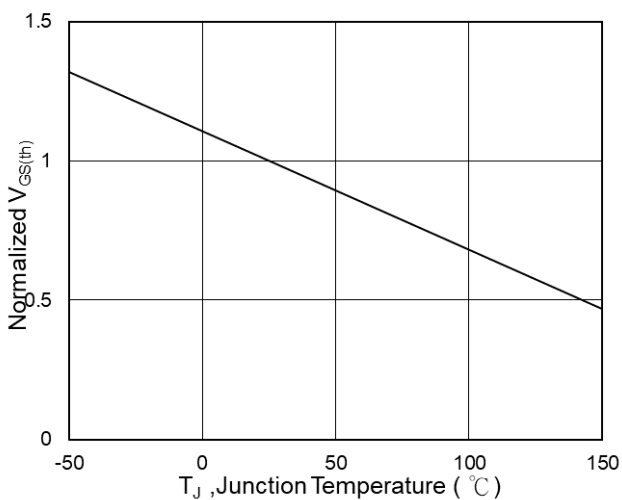
**Fig.2 On-Resistance vs G-S Voltage**



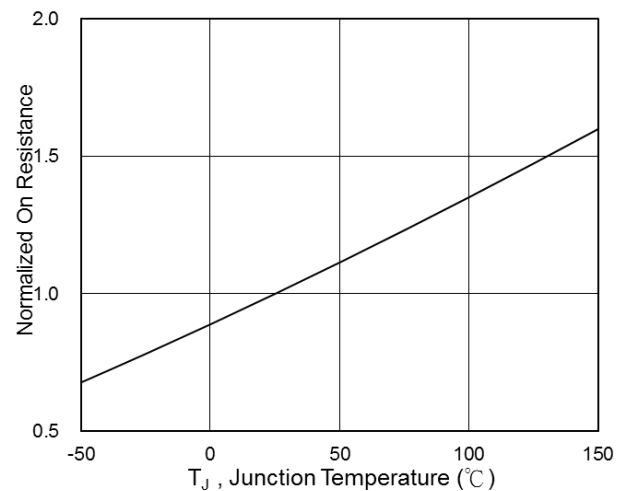
**Fig.3 Source Drain Forward Characteristics**



**Fig.4 Gate-Charge Characteristics**

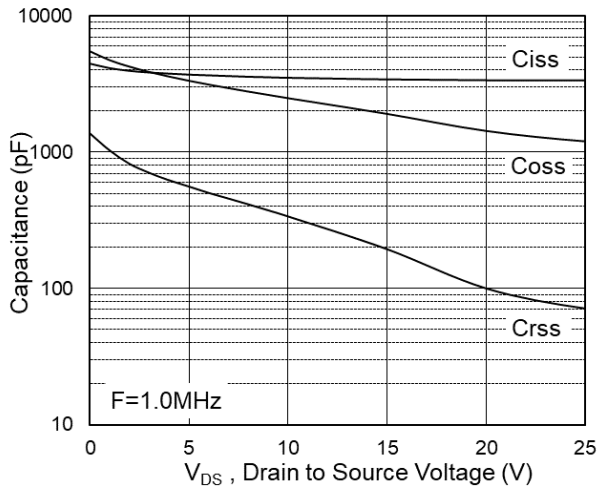


**Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$**

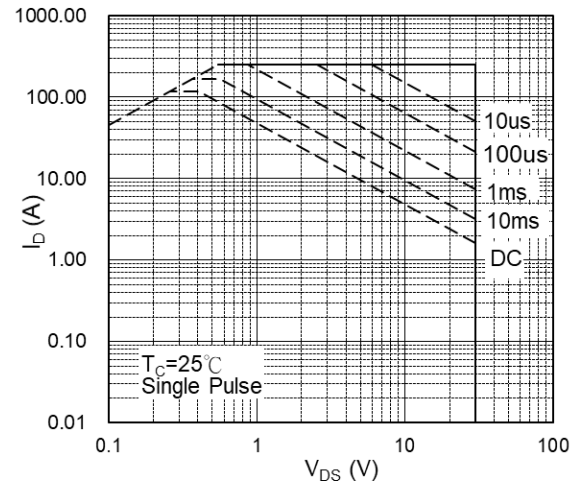


**Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$**

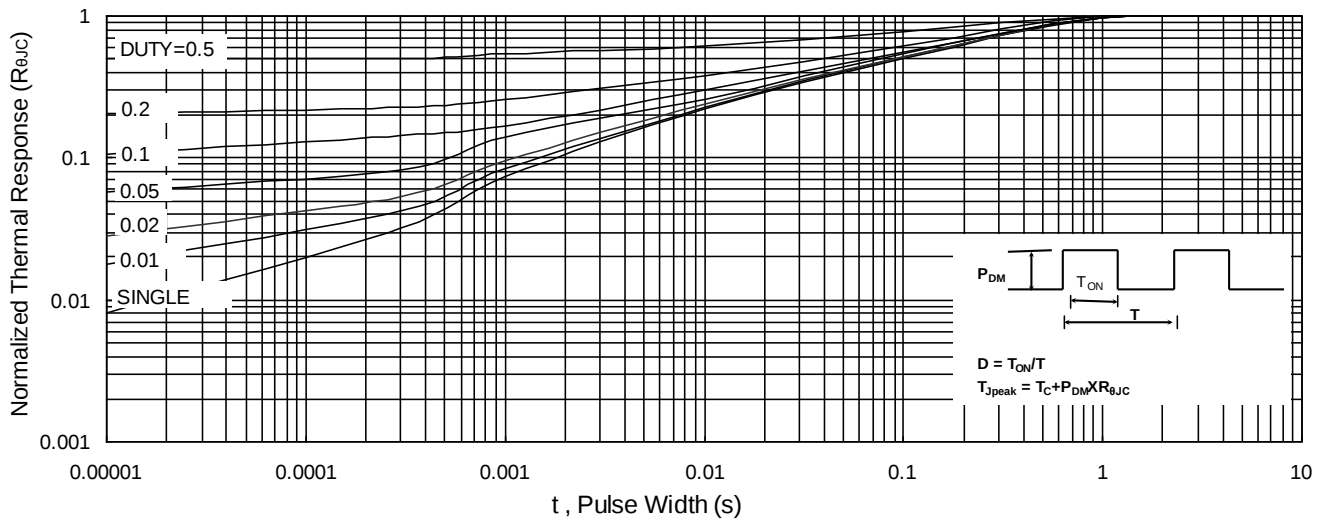
**Ratings and Characteristic Curves**



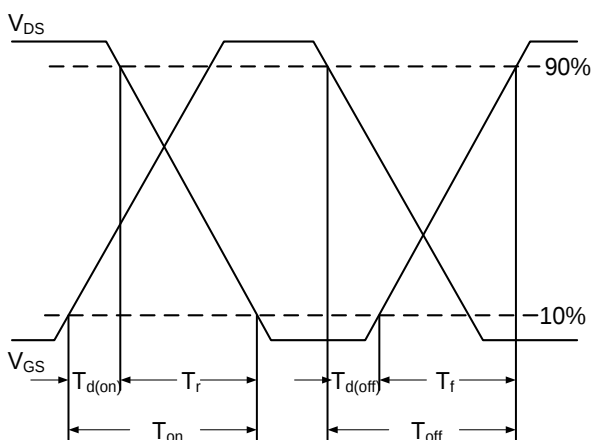
**Fig.7 Capacitance**



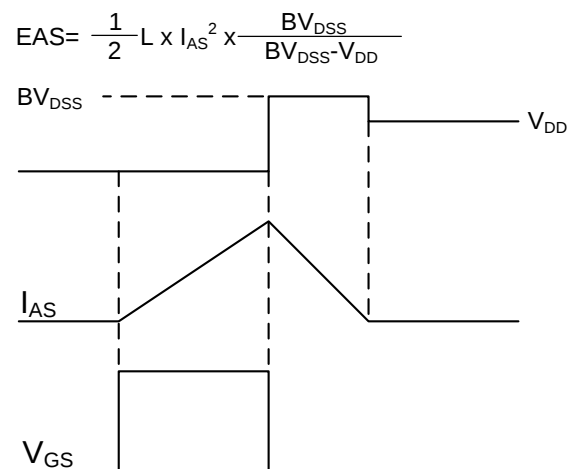
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

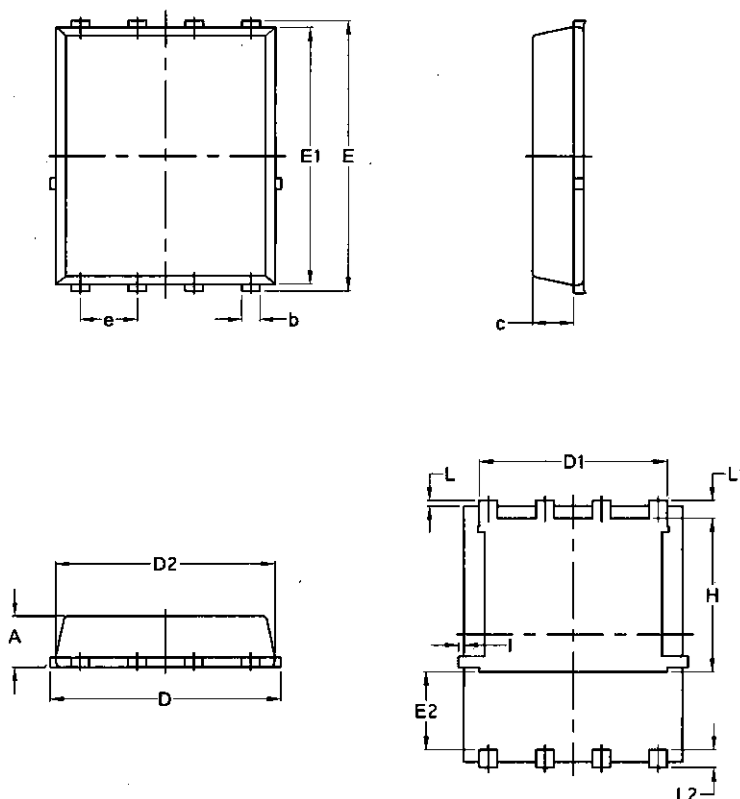


**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**

# PDFN5\*6-8L



| Symbol | Common   |        |          |        |
|--------|----------|--------|----------|--------|
|        | mm       |        | Inch     |        |
|        | Mim      | Max    | Min      | Max    |
| A      | 1.03     | 1.17   | 0.0406   | 0.0461 |
| b      | 0.34     | 0.48   | 0.0134   | 0.0189 |
| c      | 0.824    | 0.0970 | 0.0324   | 0.082  |
| D      | 4.80     | 5.40   | 0.1890   | 0.2126 |
| D1     | 4.11     | 4.31   | 0.1618   | 0.1697 |
| D2     | 4.80     | 5.00   | 0.1890   | 0.1969 |
| E      | 5.95     | 6.15   | 0.2343   | 0.2421 |
| E1     | 5.65     | 5.85   | 0.2224   | 0.2303 |
| E2     | 1.60     | /      | 0.0630   | /      |
| e      | 1.27 BSC |        | 0.05 BSC |        |
| L      | 0.05     | 0.25   | 0.0020   | 0.0098 |
| L1     | 0.38     | 0.50   | 0.0150   | 0.0197 |
| L2     | 0.38     | 0.50   | 0.0150   | 0.0197 |
| H      | 3.30     | 3.50   | 0.1299   | 0.1378 |
| I      | /        | 0.18   | /        | 0.0070 |