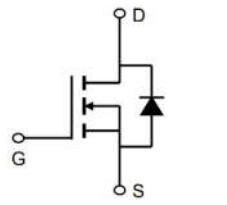
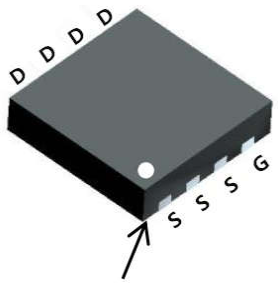
## 20V N-CHANNEL ENHANCEMENT MODE MOSFET

### MAIN CHARACTERISTICS

| | |
|---|---|
| $I_D$ | 70A |
| $V_{DSS}$ | 20V |
| $R_{DSON}$-typ(@$V_{GS}$=4.5V) | < 5.5mΩ(Type:3.8 mΩ) |




Pin1

**PDFN3*3-8L**

### Application

- Battery protection
- Load switch
- Uninterruptible power supply

### Product Specification Classification

| Part Number | Package | Marking | Pack |
|---|---|---|---|
| YFW70N02DF | PDFN3*3-8L | YFW 70N02DF XXXXX | 5000PCS/Tape |

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

| Characteristics | Symbols | Value | Units |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate - Source Voltage | $V_{GS}$ | ±12 | V |
| Continuous Drain Current, $V_{GS}$ @ 4.5V @TA=25℃ | $I_D$ | 60 | A |
| Continuous Drain Current, $V_{GS}$ @ 4.5V @TA=70℃ | $I_D$ | 42 | A |
| Pulsed Drain Current note1 | $I_{DM}$ | 210 | A |
| Single Pulse Avalanche Energy note2 | $E_{AS}$ | 56.2 | mJ |
| Power Dissipation @TA=25℃ | $P_D$ | 57 | W |
| Operating and Storage Temperature Range | $T_J$ ,$T_{STG}$ | -55 to +175 | °C |
| Thermal Resistance Junction-Ambient [1] | $R_{\theta JA}$ | 62 | °C/W |
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 2.63 | °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, $I_D$=250uA | **V(BR)DSS** | 20 | 24 | - | **V** |
| Zero Gate Voltage Drain Current | $V_{DS}$=20V, $V_{GS}$=0V | **$I_{DSS}$** | - | - | 1.0 | **μA** |
| Gate to Body Leakage Current | $V_{GS}$=±12V, $V_{DS}$=0V | **$I_{GSS}$** | - | - | ±100 | **nA** |
| Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250uA | **$V_{GS(th)}$** | 0.5 | 0.7 | 1.2 | **V** |
| Static Drain-Source on-Resistance note3 | $V_{GS}$=4.5V, $I_D$=30A | **$R_{DS(ON)}$** | - | 3.8 | 5.5 | **mΩ** |
| | $V_{GS}$=2.5V, $I_D$=20A | | - | 7.4 | 9.0 | |
| Input Capacitance | $V_{DS}$=10V<br>$V_{GS}$=0V<br>f=1.0MHz | **$C_{iss}$** | - | 2500 | - | **pF** |
| Output Capacitance | | **$C_{oss}$** | - | 407 | - | |
| Reverse Transfer Capacitance | | **$C_{rss}$** | - | 386 | - | |
| Total Gate Charge | $V_{DS}$=10V<br>$I_D$=30A<br>$V_{GS}$=4.5V | **$Q_g$** | - | 32 | - | **nC** |
| Gate-Source Charge | | **$Q_{gs}$** | - | 3 | - | |
| Gate-Drain(“Miller”) Charge | | **$Q_{gd}$** | - | 11 | - | |
| Turn-on delay time | $V_{DS}$ =10V<br>$I_D$= 30A<br>$V_{GS}$=4.5V<br>$R_{GEN}$ = 3Ω | **$t_{d(on)}$** | - | 17 | - | **ns** |
| Turn-on Rise Time | | **$T_r$** | - | 49 | - | |
| Turn-Off Delay Time | | **$t_{d(OFF)}$** | - | 74 | - | |
| Turn- Off Fall Time | | **$t_f$** | - | 26 | - | |
| Maximum Continuous Drain to Source Diode Forward Current | | **$I_S$** | - | - | 75 | **A** |
| Maximum Pulsed Drain to Source Diode Forward Current | | **$I_{SM}$** | - | - | 300 | **A** |
| Drain to Source Diode Forward Voltage | $V_{GS}$=0V , $I_S$=30A | **$V_{SD}$** | - | - | 1.2 | **V** |

Notes:
1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2、The test condition is, VDD=10V, VG=4.5V, L=0.5mH, RG=25Ω, IAS=15A
3、The data tested by pulsed Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%
4、The power dissipation is limited by 150℃ junction temperature

## Ratings and Characteristic Curves

### Typical Characteristics

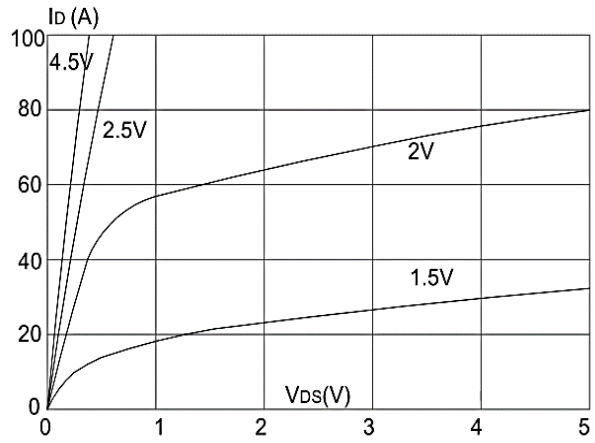



Figure1: Output Characteristics

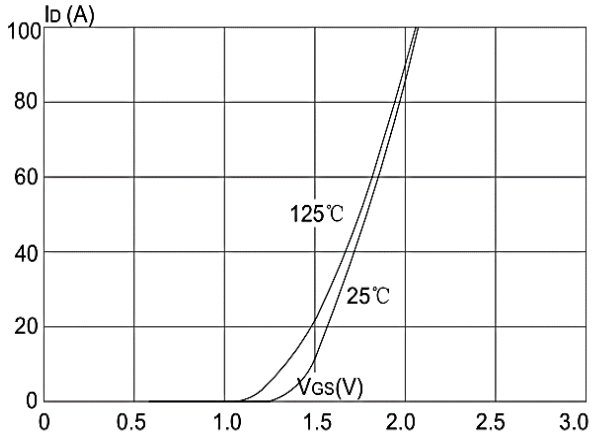



Figure 2: Typical Transfer Characteristics

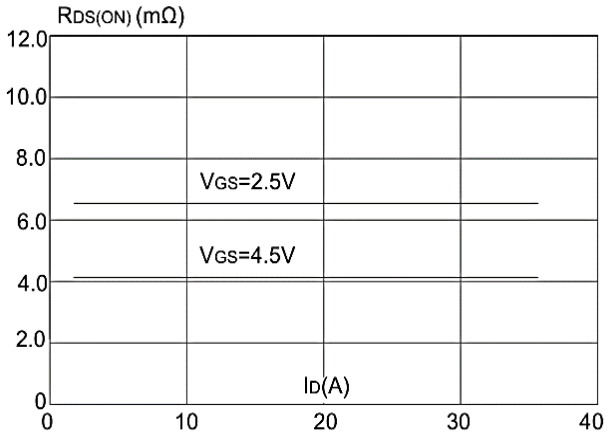



Figure 3:On-resistance vs. Drain Current

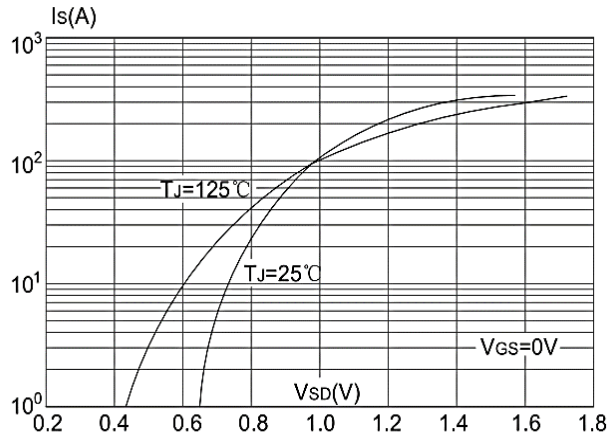



Figure 4: Body Diode Characteristics

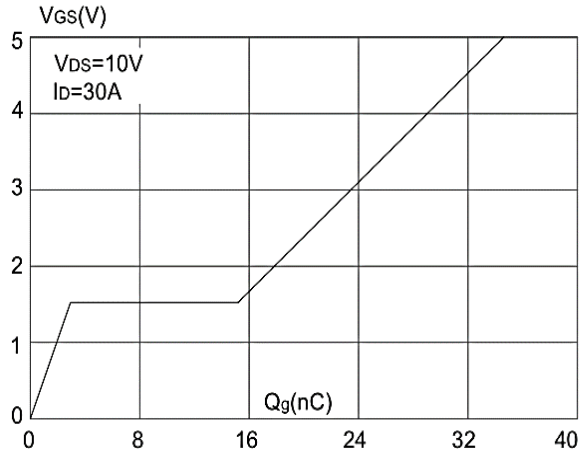



Figure 5: Gate Charge Characteristics

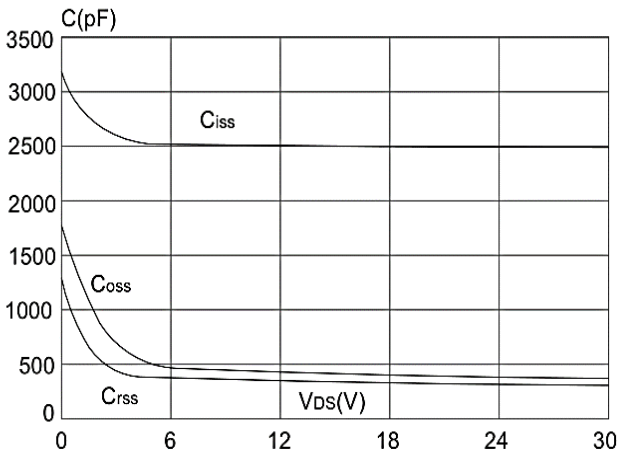



Figure 6: Capacitance Characteristics

## Ratings and Characteristic Curves

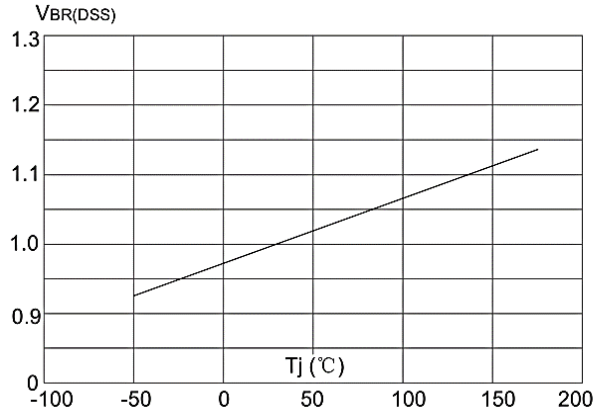



**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**

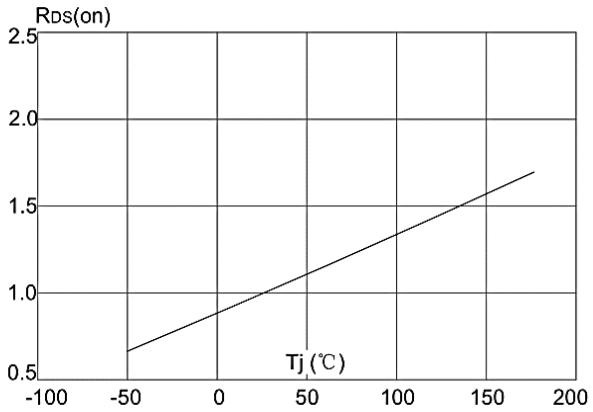



**Figure 8: Normalized on Resistance vs Junction Temperature**

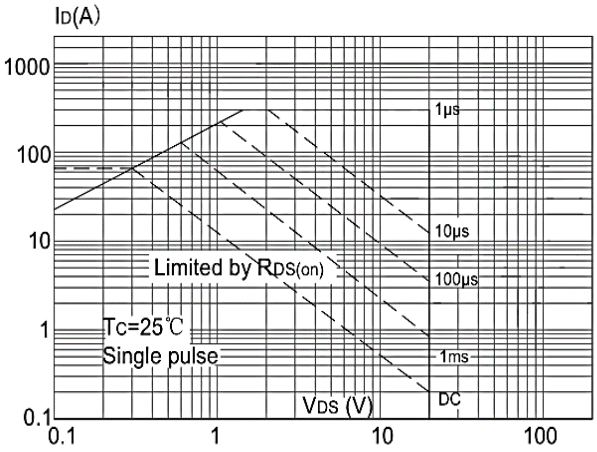



**Figure 9: Maximum Safe Operating Area Current Temperature**

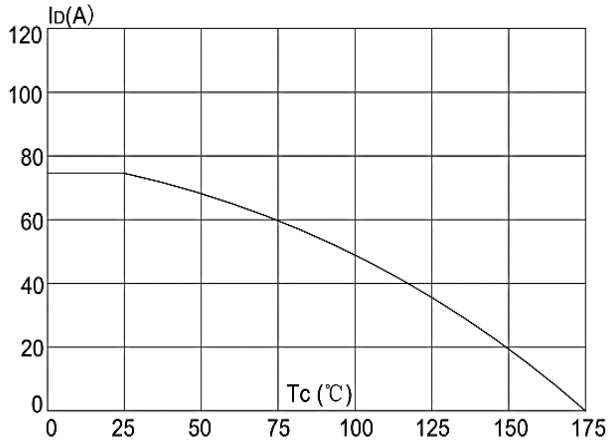



**Figure 10: Maximum Continuous Drain vs. Case**

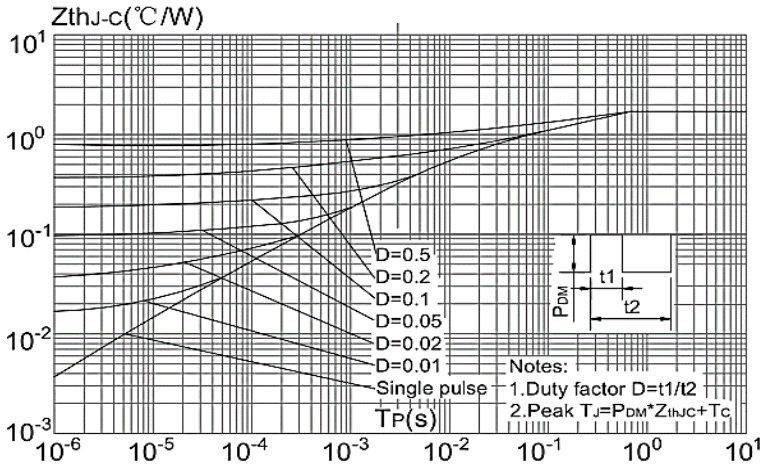
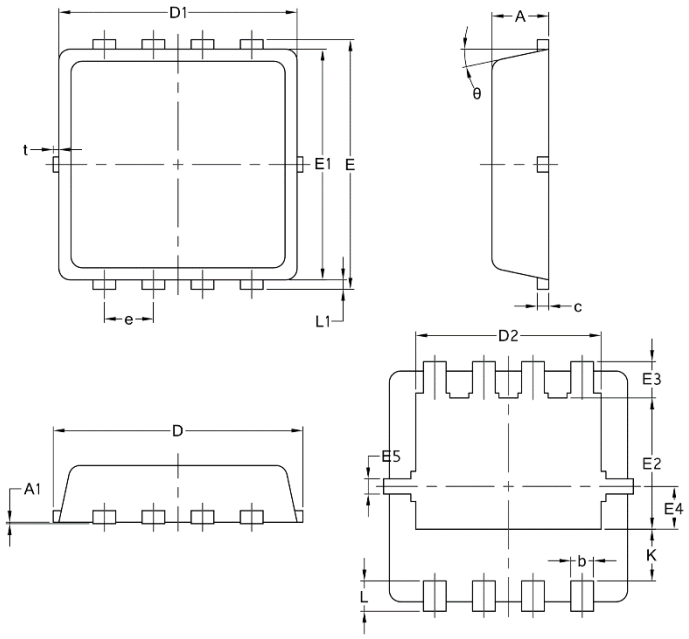



**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**

## Package Outline Dimensions Millimeters

# PDFN3*3-8L




| Symbol | Common | | |
|---|---|---|---|
| | mm | | |
| | Mim | Nom | Max |
| A | 0.70 | 0.75 | 0.85 |
| A1 | / | / | 0.05 |
| b | 0.20 | 0.30 | 0.40 |
| c | 0.10 | 0.152 | 0.25 |
| D | 3.15 | 3.30 | 3.45 |
| D1 | 3.00 | 3.15 | 3.25 |
| D2 | 2.29 | 2.45 | 2.65 |
| E | 3.15 | 3.30 | 3.45 |
| E1 | 2.90 | 3.05 | 3.20 |
| E2 | 1.54 | 1.74 | 1.94 |
| E3 | 0.28 | 0.48 | 0.65 |
| E4 | 0.37 | 0.57 | 0.77 |
| E5 | 0.10 | 0.20 | 0.30 |
| e | 0.60 | 0.65 | 0.70 |
| K | 0.59 | 0.69 | 0.89 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | 0.06 | 0.125 | 0.20 |
| t | 0 | 0.075 | 0.13 |
| Φ | 10 | 12 | 14 |