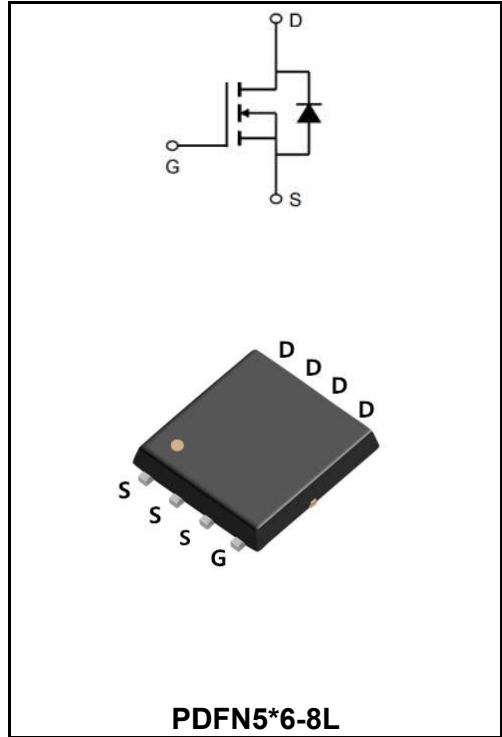


**40V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

$I_D$	70A
$V_{DSS}$	40V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 7mΩ (Type: 5.5 mΩ)



**Application**

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW70N04NF	PDFN5*6-8L	YFW 70N04NF XXXXX	5000PCS/Tape

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	$V_{DS}$	40	V
Gate - Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> @T <sub>C</sub> =25°C	$I_D$	70	A
Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> @T <sub>C</sub> =100°C	$I_D$	39	A
Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> @T <sub>A</sub> =25°C	$I_D$	13	A
Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> @T <sub>A</sub> =70°C	$I_D$	810	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	240	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	81	mJ
Avalanche Current	$I_{AS}$	20	A
Total Power Dissipation <sup>4</sup> @T <sub>C</sub> =25°C	$P_D$	46	W
Storage Temperature Range	$T_{STG}$	-55 to +150	°C
Operating Junction Temperature Range	$T_J$	-55 to +150	°C
Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	$R_{θJA}$	62	°C/W
Thermal Resistance Junction-Case <sup>1</sup>	$R_{θJC}$	2.7	°C/W

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

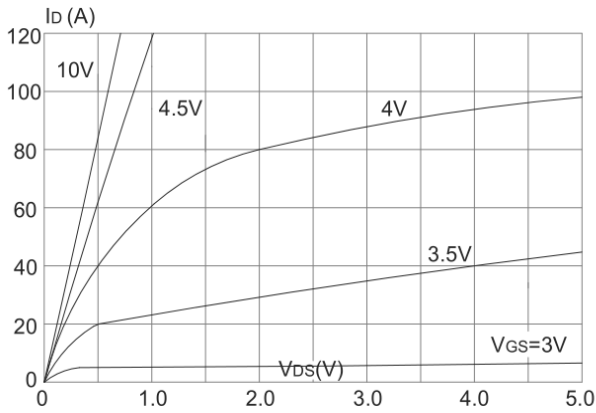
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	<b>V(BR)DSS</b>	40	-	-	<b>V</b>
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	<b>V<sub>GS(th)</sub></b>	1.0	1.7	2.5	<b>V</b>
BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1mA$	<b><math>\Delta BV_{DSS}/\Delta T_J</math></b>	-	0.034	-	<b>V/°C</b>
Static Drain-Source on-Resistance note3	$V_{GS}=10V, I_D=30A$	<b>R<sub>DS(on)</sub></b>	-	5.5	7	<b>mΩ</b>
	$V_{GS}=4.5V, I_D=20A$		-	9	12	
Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	<b>I<sub>DSS</sub></b>	-	-	1.0	<b>μA</b>
Gate to Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	<b>I<sub>GSS</sub></b>	-	-	±100	<b>nA</b>
Input Capacitance	$V_{DS}=20V$ $V_{GS}=0V$ $f=1.0MHz$	<b>C<sub>iss</sub></b>	-	2400	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	192	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	165	-	
Total Gate Charge	$V_{DS}=20V$ $V_{GS}=10V$ $I_D=30A$	<b>Q<sub>g</sub></b>	-	37	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	6	-	
Gate-Drain("Miller") Charge		<b>Q<sub>gd</sub></b>	-	7	-	
Turn-on delay time	$V_{DD}=20V$ $I_D=30A$ $R_L=1\Omega$ $R_{GEN}=3\Omega$ $V_{GS}=10V$	<b>t<sub>d(on)</sub></b>	-	12	-	<b>ns</b>
Turn-on Rise Time		<b>T<sub>r</sub></b>	-	12	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	38	-	
Turn-Off Fall Time		<b>t<sub>f</sub></b>	-	9	-	
Maximum Continuous Drain to Source Diode Forward Current		<b>I<sub>S</sub></b>	-	-	60	<b>A</b>
Maximum Pulsed Drain to Source Diode Forward Current		<b>I<sub>SM</sub></b>	-	-	240	<b>A</b>
Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	<b>V<sub>SD</sub></b>	-	-	1.2	<b>V</b>
Body Diode Reverse Recovery Time	$T_J=25^\circ C, I_F=20A, dI/dt=100A/\mu s$	<b>t<sub>rr</sub></b>	-	22		<b>ns</b>
Body Diode Reverse Recovery Charge		<b>Q<sub>rr</sub></b>	-	11		<b>nC</b>

Note :

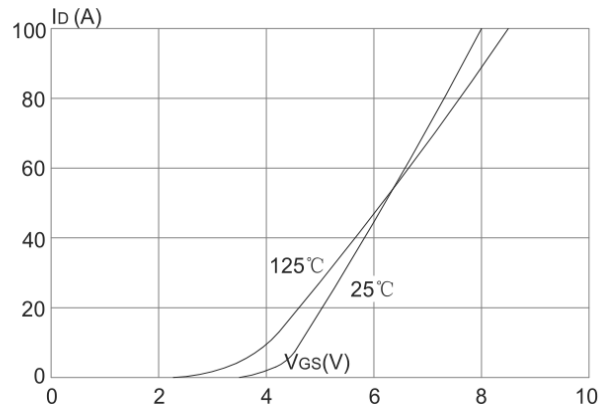
- 1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is  $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=20A$
- 4、 The power dissipation 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.

**Ratings and Characteristic Curves**

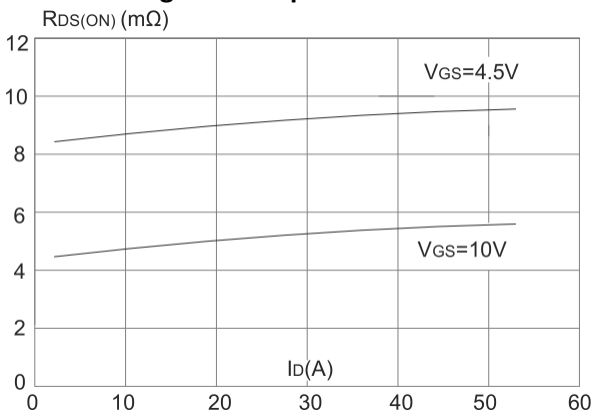
**Typical Characteristics**



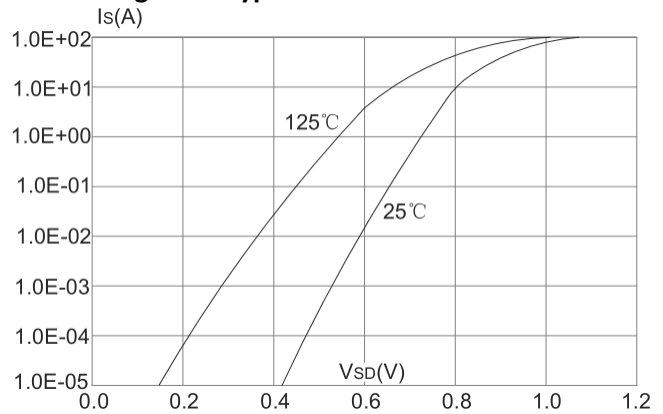
**Figure 1: Output Characteristics**



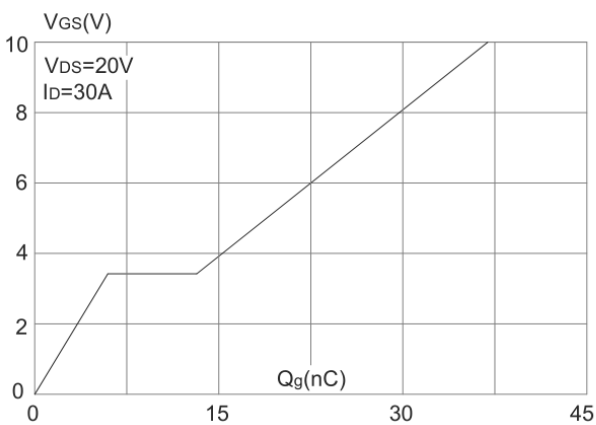
**Figure 2: Typical Transfer Characteristics**



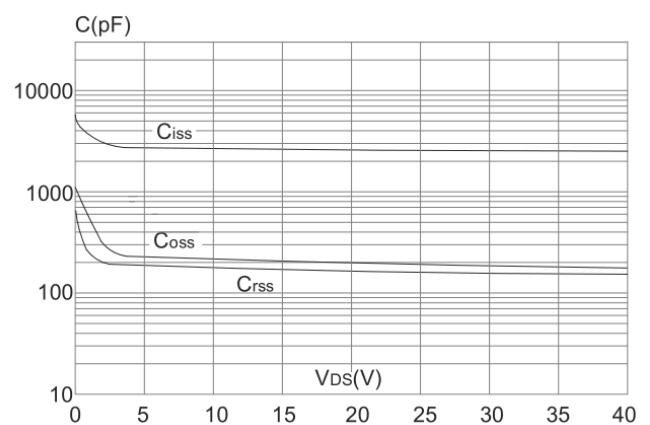
**Figure 3: On-resistance vs. Drain Current**



**Figure 4: Body Diode Characteristics**

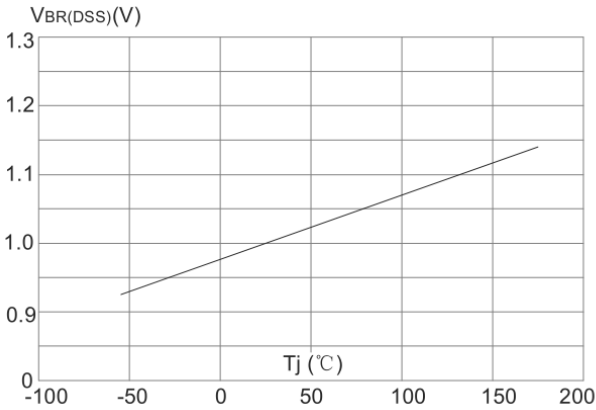


**Figure 5: Gate Charge Characteristics**

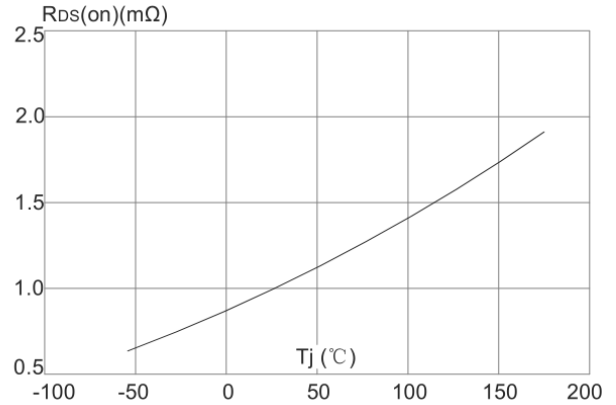


**Figure 6: Capacitance Characteristics**

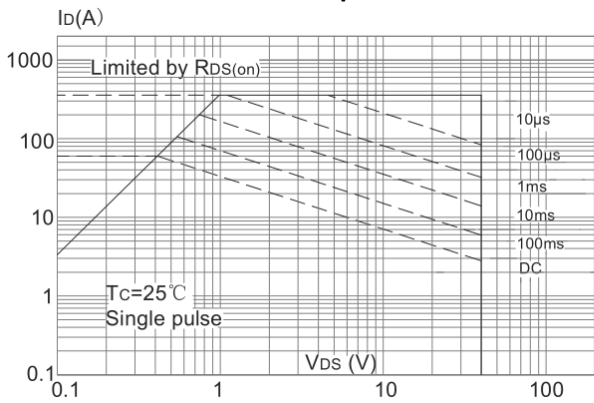
**Ratings and Characteristic Curves**



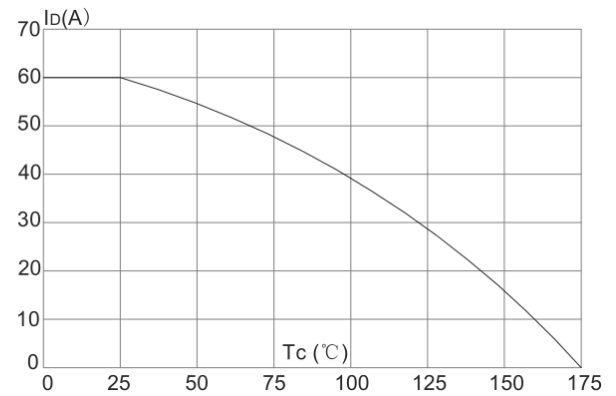
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



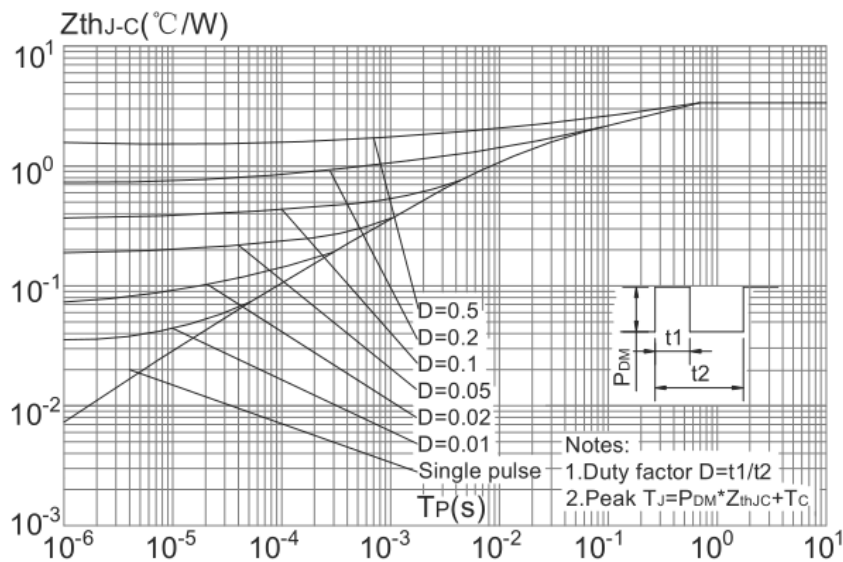
**Figure 8: Normalized on Resistance vs. Junction Temperature**



**Figure 9: Maximum Safe Operating Area**

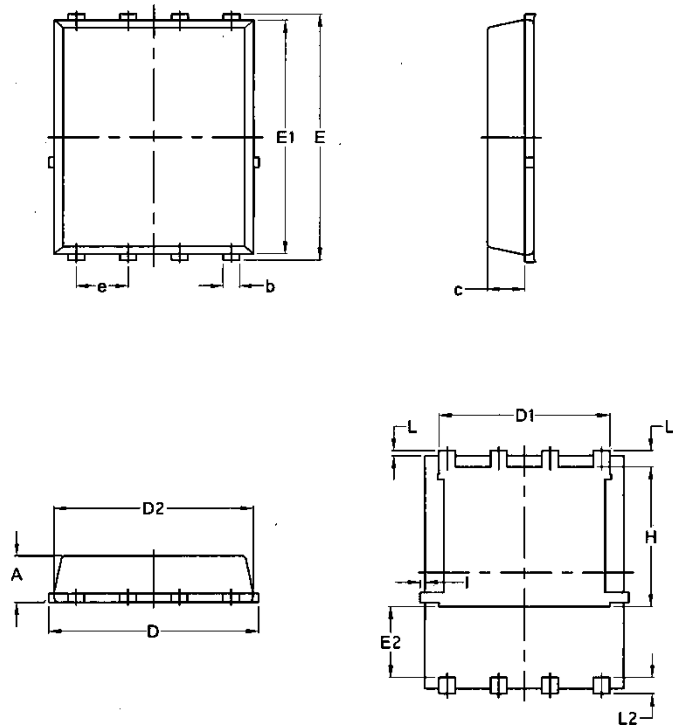


**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**



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

**PDFN5\*6-8L**



Symbol	Common			
	mm		Inch	
	Min	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