

**100V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

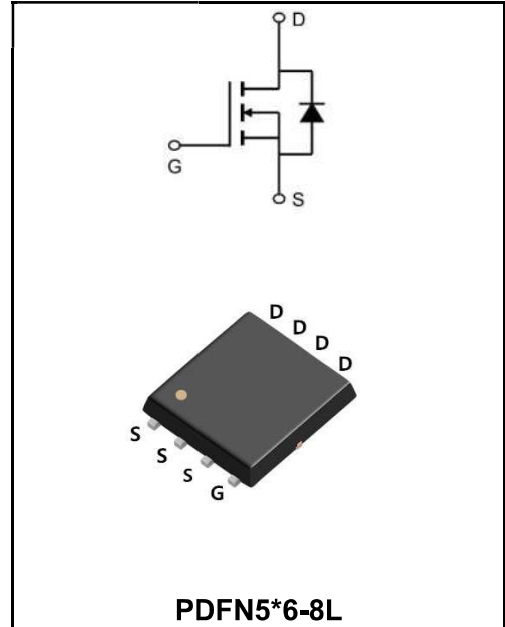
<b>I<sub>D</sub></b>	120A
<b>V<sub>DSS</sub></b>	100V
<b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>=10V)</b>	< 4.5mΩ ( <b>Type:3.8 mΩ</b> )

**Features**

◆ **YFW-SGT technology**

**Application**

- ◆ Isolated DC
- ◆ Motor control
- ◆ Synchronous-rectification



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFWG120N10NF	PDFN5*6-8L	YFW 120N10NF XXXXX	5000PCS/Tape

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	100	<b>V</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±20	<b>V</b>
Continuous Drain Current <sup>1</sup> @T <sub>A</sub> =25°C	<b>I<sub>D</sub></b>	120	<b>A</b>
Continuous Drain Current <sup>1</sup> @T <sub>A</sub> =70°C	<b>I<sub>D</sub></b>	76	<b>A</b>
Pulsed Drain Current <sup>2</sup>	<b>I<sub>DM</sub></b>	480	<b>A</b>
Single Pulse Avalanche Energy <sup>3</sup>	<b>E<sub>AS</sub></b>	320	<b>mJ</b>
Avalanche Current	<b>I<sub>AS</sub></b>	40	<b>A</b>
Total Power Dissipation <sup>4</sup> @T <sub>A</sub> =25°C	<b>P<sub>D</sub></b>	131.6	<b>W</b>
Storage Temperature Range	<b>T<sub>STG</sub></b>	-55 to +150	<b>°C</b>
Operating Junction Temperature Range	<b>T<sub>J</sub></b>	-55 to +150	<b>°C</b>
Thermal Resistance, Junction ambient <sup>1</sup>	<b>R<sub>θJA</sub></b>	25	<b>°C/W</b>
Thermal Resistance, Junction-case <sup>1</sup>	<b>R<sub>θJC</sub></b>	0.95	<b>°C/W</b>

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

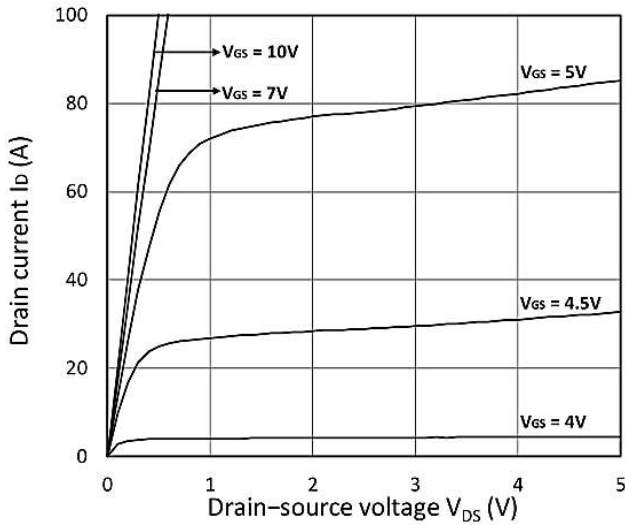
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	<b>V(BR)DSS</b>	100	107	-	<b>V</b>
Gate Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	<b>I<sub>GSS</sub></b>	-	-	$\pm 100$	<b>nA</b>
Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ C$	<b>I<sub>DSS</sub></b>	-	-	1	<b><math>\mu</math>A</b>
	$V_{DS}=100V, V_{GS}=0V, T_J=100^\circ C$		-	-	100	
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	<b>V<sub>GS(th)</sub></b>	2.0	3.0	4.0	<b>V</b>
Drain-Source on-Resistance <sup>4</sup>	$V_{GS}=10V, I_D=20A$	<b>R<sub>DS(ON)</sub></b>	-	3.8	4.5	<b>m<math>\Omega</math></b>
Forward Transconductance <sup>4</sup>	$V_{DS}=10V, I_D=20A$	<b>g<sub>fs</sub></b>	-	62	-	<b>S</b>
Input Capacitance	$V_{DS}=50V$ $V_{GS}=0V$ $f=1MHz$	<b>C<sub>iss</sub></b>	-	6865	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	740	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	21	-	
Gate Resistance	$f=1MHz$	<b>R<sub>g</sub></b>	-	1.3	-	<b><math>\Omega</math></b>
Total Gate Charge	$V_{GS}=10V$ $V_{DS}=50V$ $I_D=20A$	<b>Q<sub>g</sub></b>	-	111.2	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	30.5	-	
Gate-Drain Charge		<b>Q<sub>gd</sub></b>	-	27.3	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DD}=50V$ $R_G=3\Omega$ $I_D=20A$	<b>t<sub>d(on)</sub></b>	-	33	-	<b>ns</b>
Rise Time		<b>T<sub>r</sub></b>	-	39	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	67.1	-	
Fall Time		<b>t<sub>f</sub></b>	-	32	-	
Body Diode Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$	<b>t<sub>rr</sub></b>	-	58.7	-	<b>ns</b>
Body Diode Reverse Recovery Charge		<b>Q<sub>rr</sub></b>	-	97.3	-	<b>nC</b>
Diode Forward Voltage <sup>4</sup>	$V_{GS}=0V, I_S=20A$	<b>V<sub>SD</sub></b>	-	-	1.2	<b>V</b>
Continuous Source Current T <sub>C</sub> =25°C		<b>I<sub>S</sub></b>	-	-	120	<b>A</b>

Note :

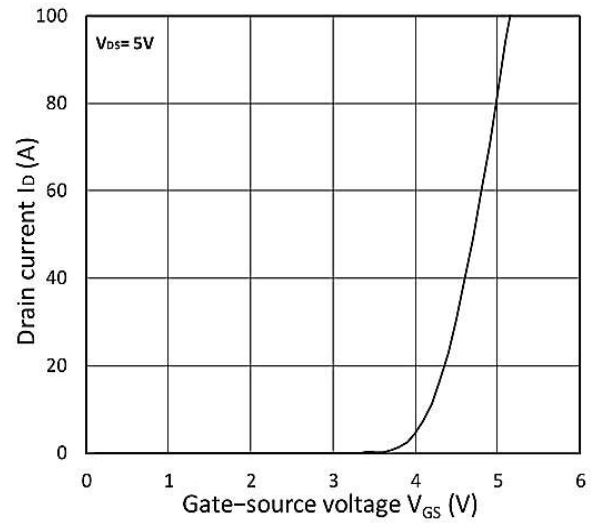
- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is VDD=72V,VGS=10V, L=0.1mH IAS=40A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation

**Ratings and Characteristic Curves**

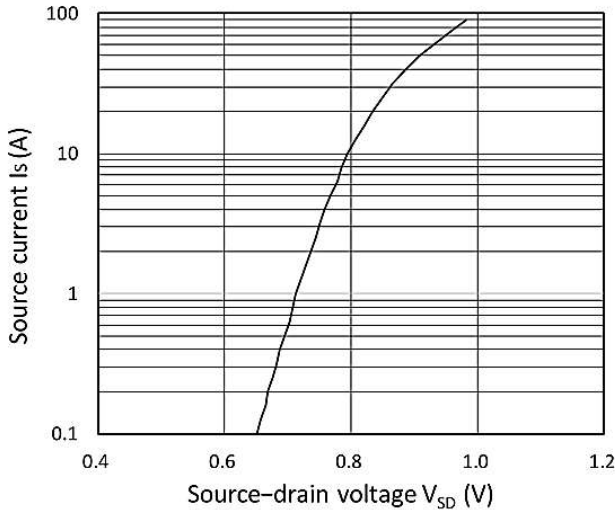
**Typical Characteristics**



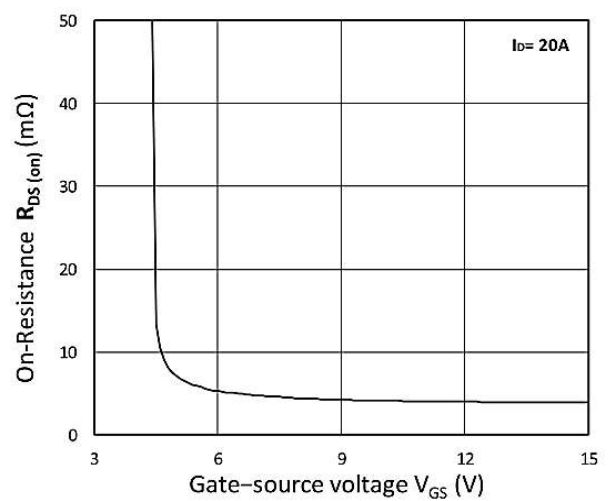
**Figure 1. Output Characteristics**



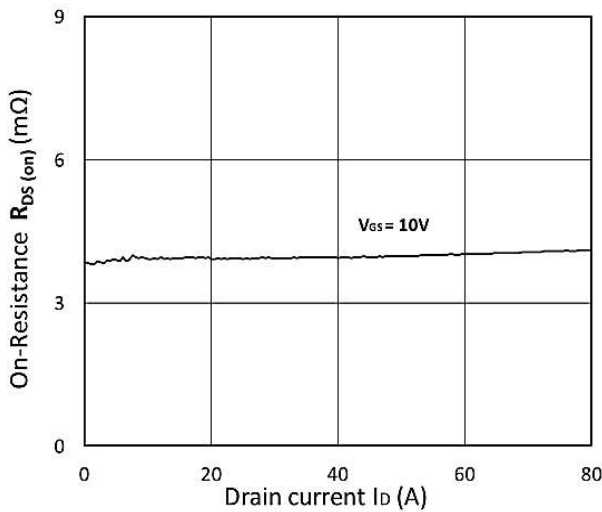
**Figure 2. Transfer Characteristics**



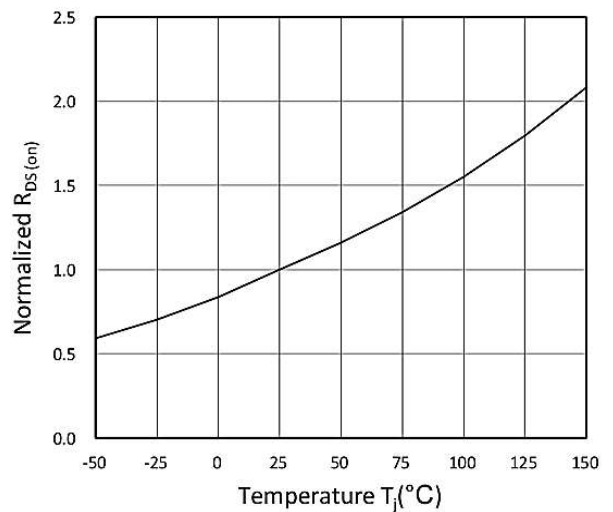
**Figure 3. Forward Characteristics of Reverse**



**Figure 4. RDS(ON) vs. VGS**

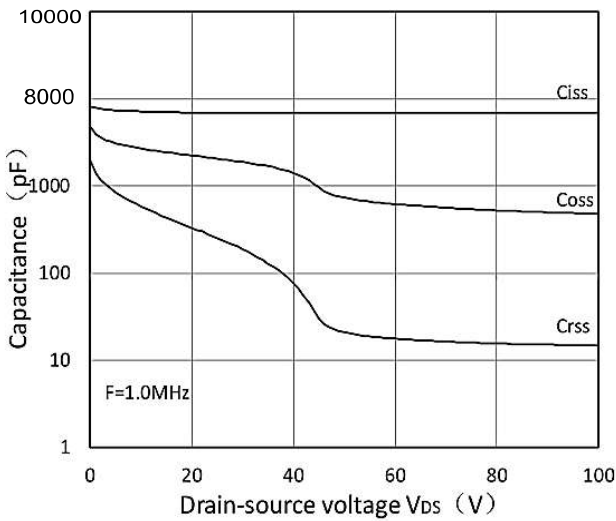


**Figure 5. RDS(ON) vs. ID**

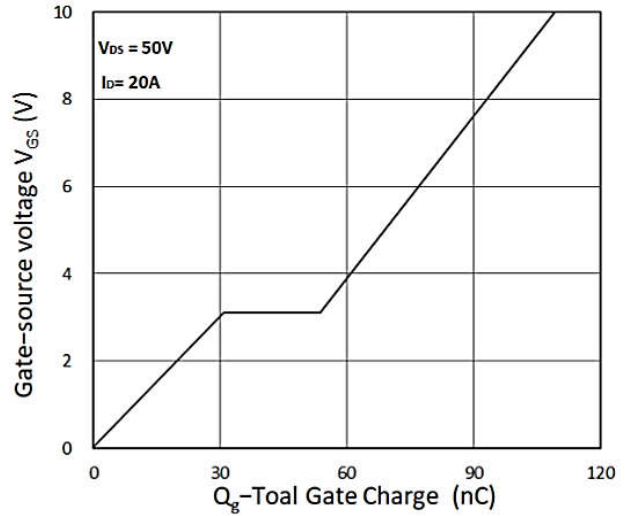


**Figure 6. Normalized RDS(on) vs. Temperature**

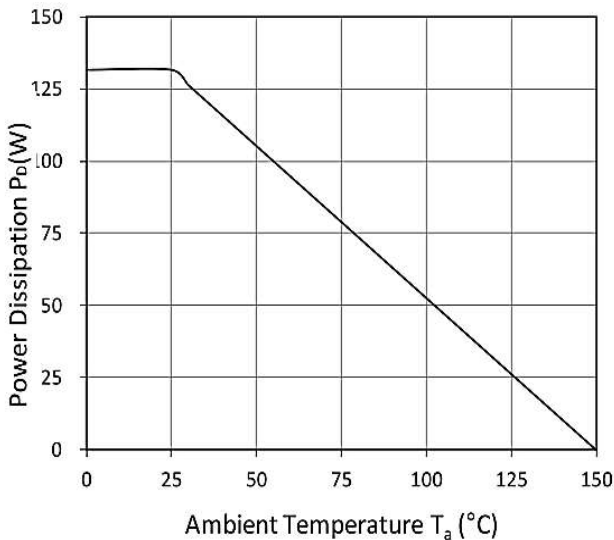
**Ratings and Characteristic Curves**



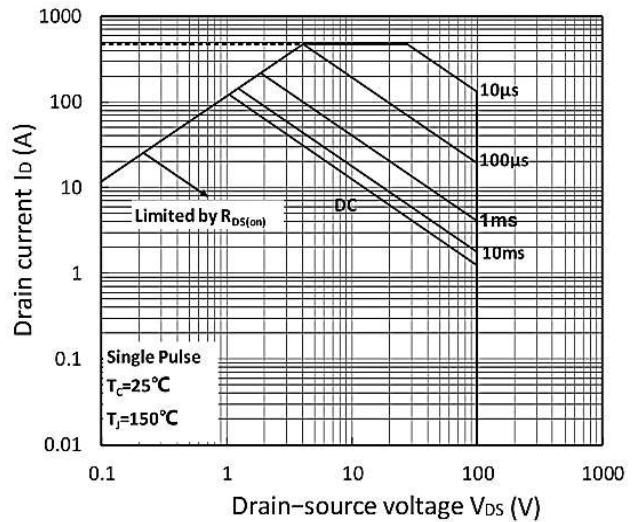
**Figure 7. Capacitance Characteristics**



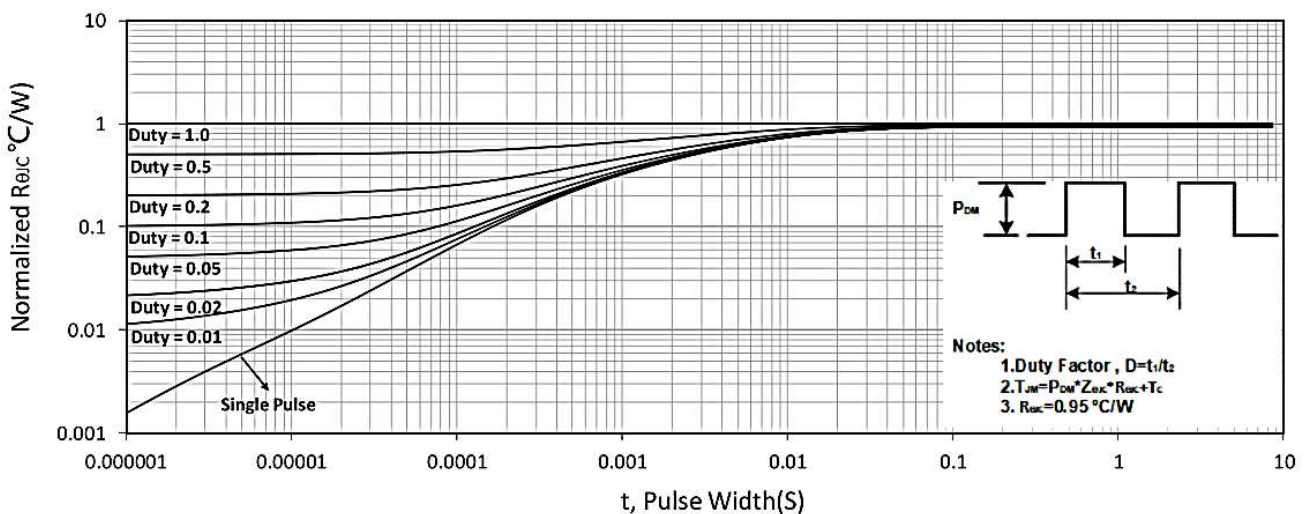
**Figure 8. Gate Charge Characteristics**



**Figure 9. Power Dissipation**

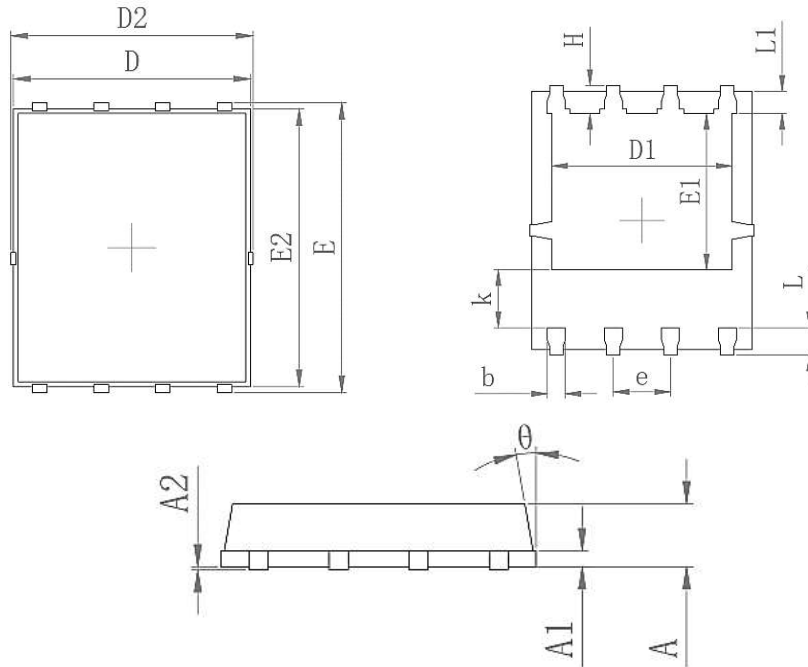


**Figure 10. Safe Operating Area**



**Figure 11. Normalized Maximum Transient Thermal Impedance**

PDFN5\*6-8L



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
$\Phi$	8°	12°