

**80V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

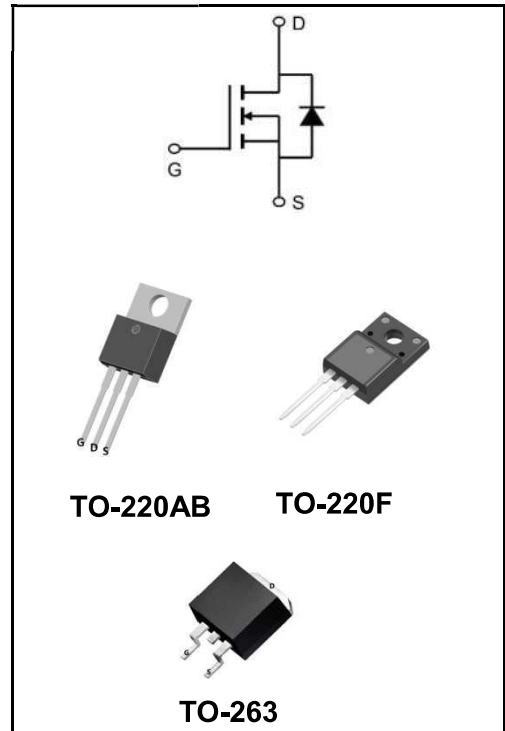
<b>I<sub>D</sub></b>	120A
<b>V<sub>DSS</sub></b>	85V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=10V)</sub></b>	< 5.2mΩ ( <b>Type:4.2 mΩ</b> )

**Features**

◆ **YFW-SGT technology**

**Application**

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



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFWG120N08AT	TO-220AB	YFW 120N08AT XXXXX	1000PCS/Box
YFWG120N08AF	TO-220F	YFW 120N08AF XXXXX	1000PCS/Box
YFWG120N08AS	TO-263	YFW 120N08AS XXXXX	800PCS/Reel

**Maximum Ratings at T<sub>c</sub>=25°C unless otherwise specified**

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	85	<b>V</b>
Gate-Source Voltage	<b>V<sub>GS</sub></b>	±20	<b>V</b>
Continuous Drain Current, V <sub>GS</sub> @ 10V @T <sub>c</sub> =25°C	<b>I<sub>D</sub></b>	120	<b>A</b>
Continuous Drain Current, V <sub>GS</sub> @ 10V @T <sub>c</sub> =100°C	<b>I<sub>D</sub></b>	100	<b>A</b>
Pulsed Drain Current	<b>I<sub>DM</sub></b>	480	<b>A</b>
Single Pulse Avalanche Energy	<b>E<sub>AS</sub></b>	560	<b>mJ</b>
Avalanche Current	<b>I<sub>AS</sub></b>	53	<b>A</b>
Total Power Dissipation <sup>4</sup> @T <sub>c</sub> =25°C	<b>P<sub>D</sub></b>	220	<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	<b>R<sub>θJA</sub></b>	0.70	<b>°C/W</b>
Thermal Resistance Junction-Case	<b>R<sub>θJC</sub></b>	60	<b>°C/W</b>

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

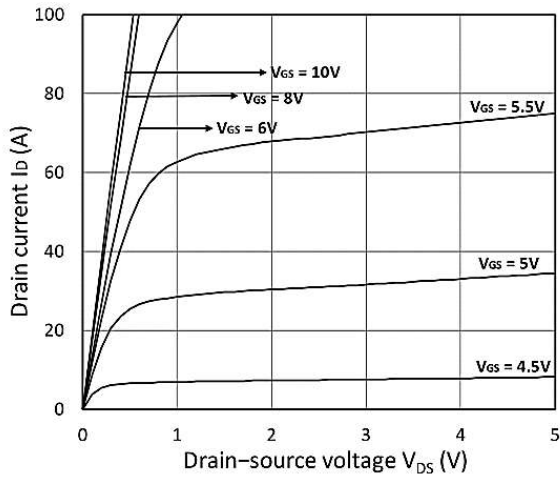
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	<b>V(BR)DSS</b>	85	95	-	<b>V</b>
Gate-body Leakage current	$V_{GS}=\pm 20V, V_{DS}=0V$	<b>I<sub>GSS</sub></b>	-	-	$\pm 100$	<b>nA</b>
Zero gate voltage drain current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ C$	<b>I<sub>DSS</sub></b>	-	-	1	<b><math>\mu</math>A</b>
	$V_{DS}=80V, V_{GS}=0V, T_J=100^\circ C$		-	-	100	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	<b>V<sub>GS(th)</sub></b>	2	3	4	<b>V</b>
Drain-source on- resistance <sup>2</sup>	$V_{GS}=10V, I_D=20A$	<b>R<sub>DS(ON)</sub></b>	-	4.2	5.2	<b>m<math>\Omega</math></b>
Forward Transconductance <sup>2</sup>	$V_{DS}=5V, I_D=20A$	<b>g<sub>fs</sub></b>	-	55	-	<b>S</b>
Input Capacitance	$V_{GS}=0V$ $V_{DS}=40V$ $f=1MHz$	<b>C<sub>iss</sub></b>	-	4645	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	673	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	41	-	
Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	<b>R<sub>G</sub></b>	-	1.8	-	<b><math>\Omega</math></b>
Gate Total Charge	$V_{GS}=10V$ $V_{DS}=40V$ $I_D=50A$	<b>Q<sub>g</sub></b>	-	61.3	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	21	-	
Gate-Drain Charge		<b>Q<sub>gd</sub></b>	-	11	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DS}=40V$ $R_G=3\Omega$ $I_D=50A$	<b>t<sub>d(on)</sub></b>	-	16.5	-	<b>ns</b>
Rise Time		<b>T<sub>r</sub></b>	-	51.8	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	37.1	-	
Fall Time		<b>t<sub>f</sub></b>	-	8.2	-	
Diode Forward Voltage <sup>2</sup>	$I_S=50A, V_{GS}=0V$	<b>V<sub>SD</sub></b>	-	-	1.2	<b>V</b>
Continuous Source Current <sup>1,5</sup>	$V_G = V_D = 0V, \text{Force Current}$	<b>I<sub>S</sub></b>	-	-	125	<b>A</b>
Reverse Recovery Time <sup>2</sup>	$I_F=20A, di/dt=100A/\mu s$	<b>t<sub>rr</sub></b>	-	69	-	<b>ns</b>
Reverse Recovery Charge <sup>2</sup>		<b>Q<sub>rr</sub></b>	-	141	-	<b>nC</b>

Note :

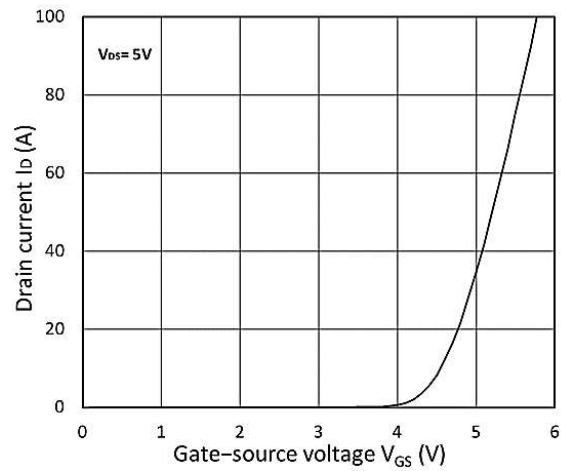
- 1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、 The test cond  $\cong$  300us duty cycle  $\cong$  2%, duty cycle ition is  $V_{DD}=64V, V_{GS}=10V, L=0.1mH, I_{AS}=53.8A$
- 4、 The power dissipation is limited by 175°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**

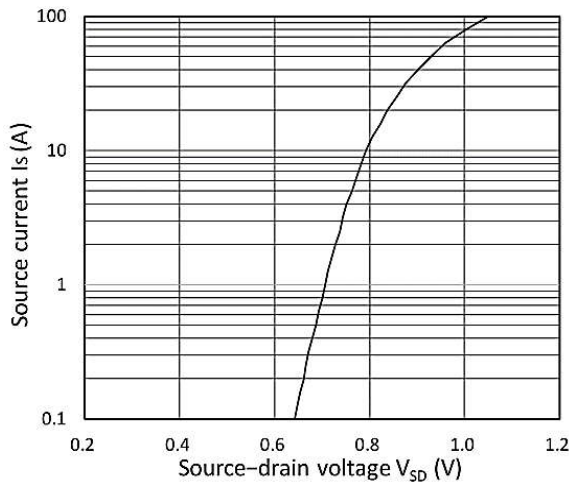
**Typical Characteristics**



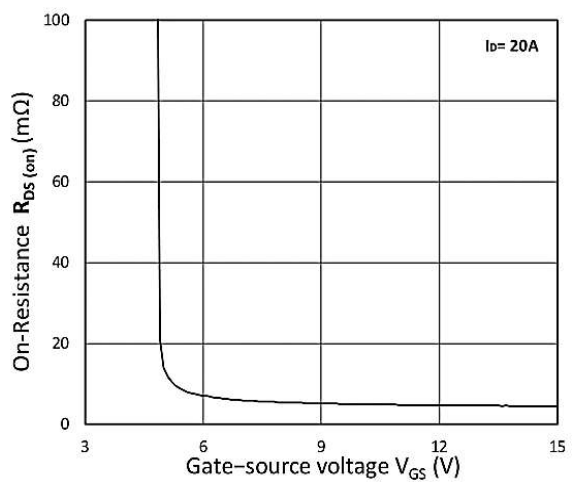
**Figure 1. Output Characteristics**



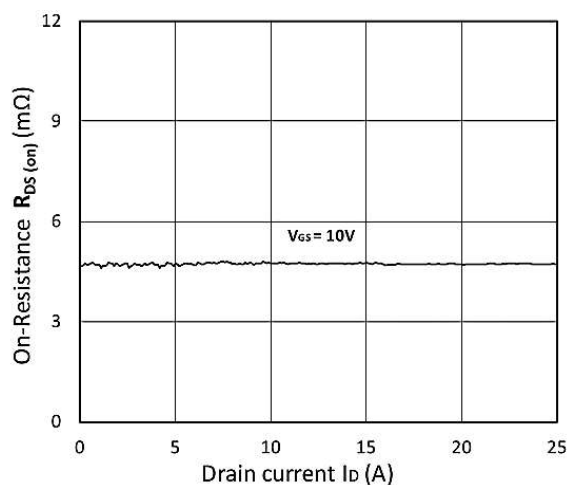
**Figure 2. Transfer Characteristics**



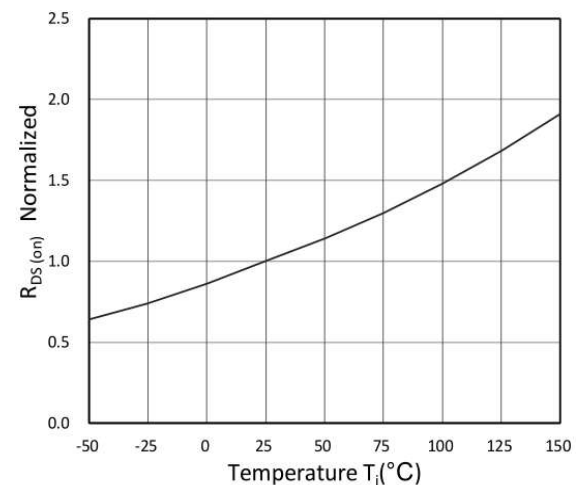
**Figure 3. Forward Characteristics of Reverse**



**Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$**

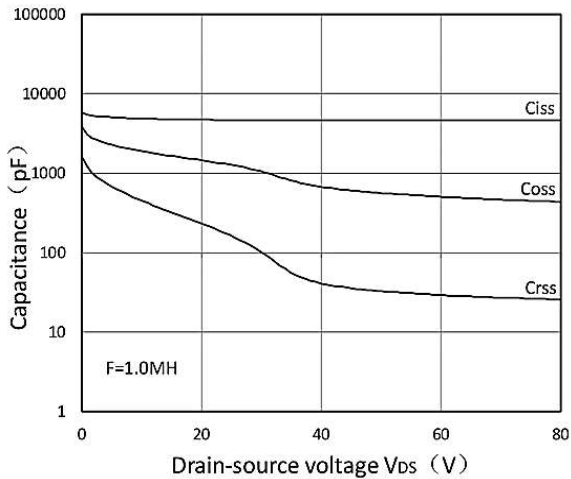


**Figure 5.  $R_{DS(ON)}$  vs.  $I_D$**

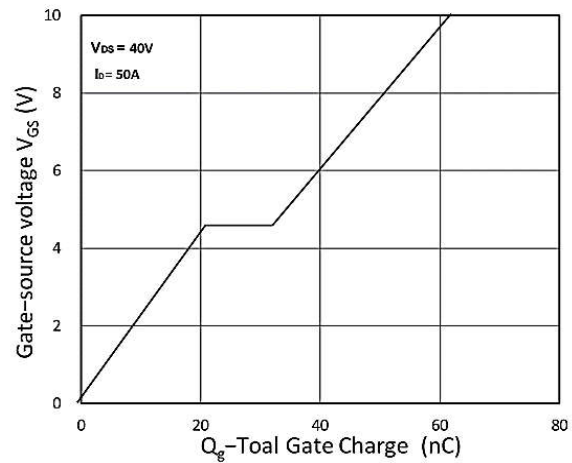


**Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature**

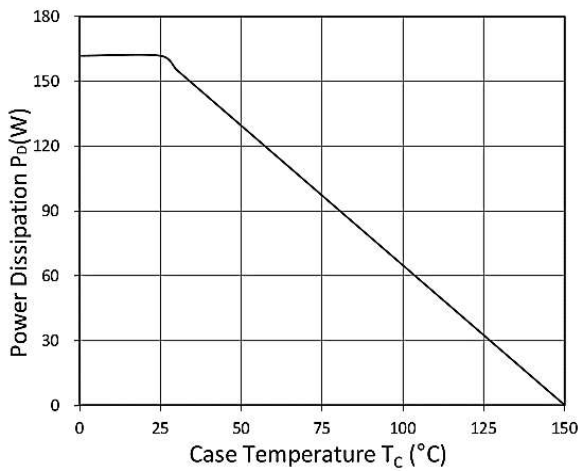
**Ratings and Characteristic Curves**



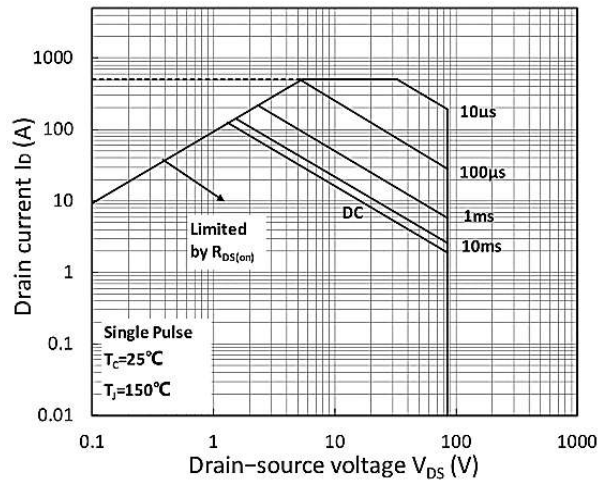
**Figure 7. Capacitance Characteristics**



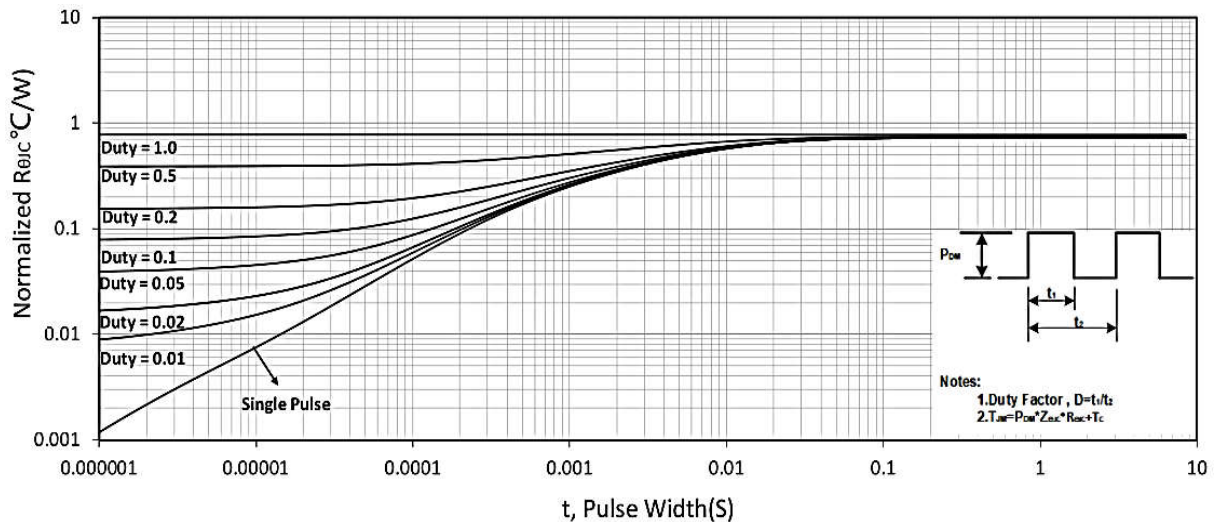
**Figure 8. Gate Charge Characteristics**



**Figure 9. Power Dissipation**



**Figure 10. Safe Operating Area**



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

Package Outline Dimensions Millimeters

TO-220AB

	Dim.	Min.	Max.
	A	10.15	10.35
	B	2.65	2.95
	C	3.70	3.90
	D	28.5	29.5
	E	1.30	1.45
	F	6.35	6.55
	G	2.9	3.3
	H	15.0	16.0
	I	0.38	0.42
	J	4.45	4.55
	K	1.25	1.35
	L	Typ 5.08	
	M	Typ 2.54	
N	3.1	3.3	
O	0.76	0.84	
All Dimensions in millimeter			

TO-220F

	Dim.	Min.	Max.
	A	9.95	10.25
	B	2.95	3.25
	C	1.25	1.45
	D	12.95	13.25
	E	0.50	0.65
	F	3.1	3.3
	G	1.30	1.45
	H	Typ 2.54	
	I	Typ 5.08	
	J	4.60	4.75
	K	2.50	2.65
	L	6.35	6.55
	M	15.4	16.0
	N	2.75	3.05
	O	0.48	0.52
P	0.76	0.84	
All Dimensions in millimeter			

Package Outline Dimensions Millimeters

TO-263

Dim.	Min.	Max.
A	10.1	10.2
B	7.4	7.6
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.78	0.86
H	1.2	1.3
I	Typ2.54	
J	8.4	8.6
K	4.45	4.55
L	1.25	1.35
M	0.02	0.1
N	2.4	2.8
O	0.36	0.40
All Dimensions in millimeter		