

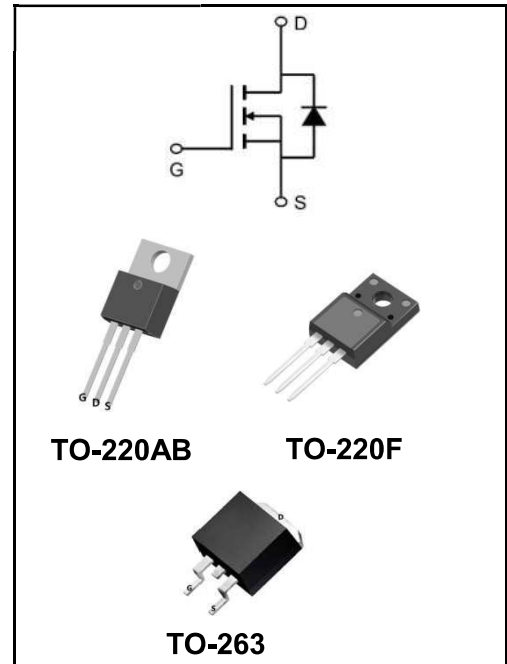
200V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

$I_D$	75A
$V_{DSS}$	200V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 20mΩ (Type:17 mΩ)

Application

- ◆ Load Switch
- ◆ PWM Application
- ◆ Power management



Product Specification Classification

Part Number	Package	Marking	Pack
YFW75N20AT	TO-220AB	YFW 75N20AT XXXXX	1000PCS/Box
YFW75N20AF	TO-220F	YFW 75N20AF XXXXX	1000PCS/Box
YFW75N20AS	TO-263	YFW 75N20AS XXXXX	800PCS/Reel

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	$V_{DS}$	200	V
Continuous Drain Current $V_{GS}$ @ 10V @ $T_A=25^\circ C$	$I_D$	75	A
Continuous Drain Current $V_{GS}$ @ 10V @ $T_A=70^\circ C$	$I_D$	52	A
Pulsed Drain Current (pulse width limited by TJM)	$IDM^{a1}$	300	A
Gate -to- Source Voltage	$V_{GS}$	±30	V
Single pulse avalanche energy	$E_{AS}$	300	mJ
Avalanche Energy, Repetitive	$E_{Ara1}$	75	mJ
Avalanche Current	$I_{AR a1}$	45	A
Peak Diode Recovery dv/dt	$dv/dt^{a2}$	5.0	V/ns
Power Dissipation	$P_D$	375	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	150,-55 to 150	°C
Maximum Temperature for Soldering	$T_L$	300	°C
Thermal Resistance, Junction-to-case	$R_{\theta JC}$	0.45	°C/W
Thermal Resistance, Junction -to-ambient	$R_{\theta JA}$	60	°C/W

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

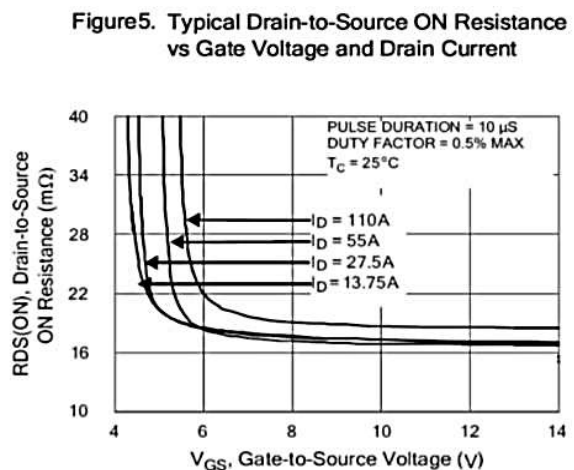
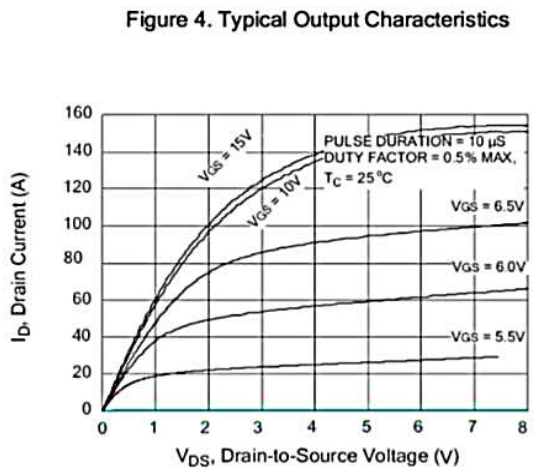
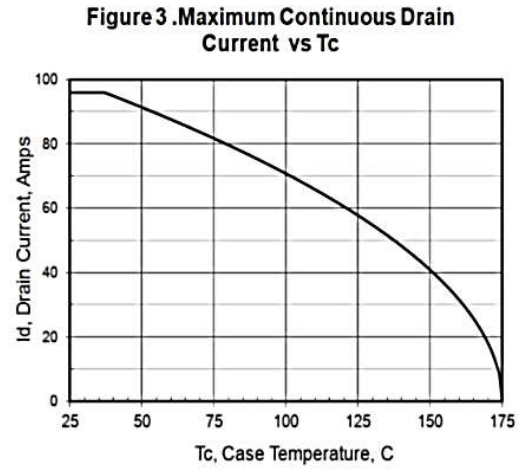
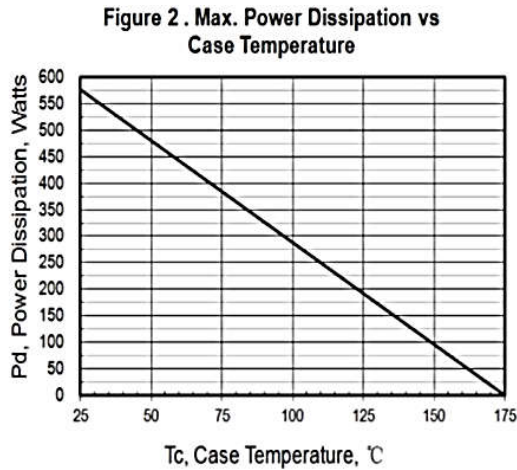
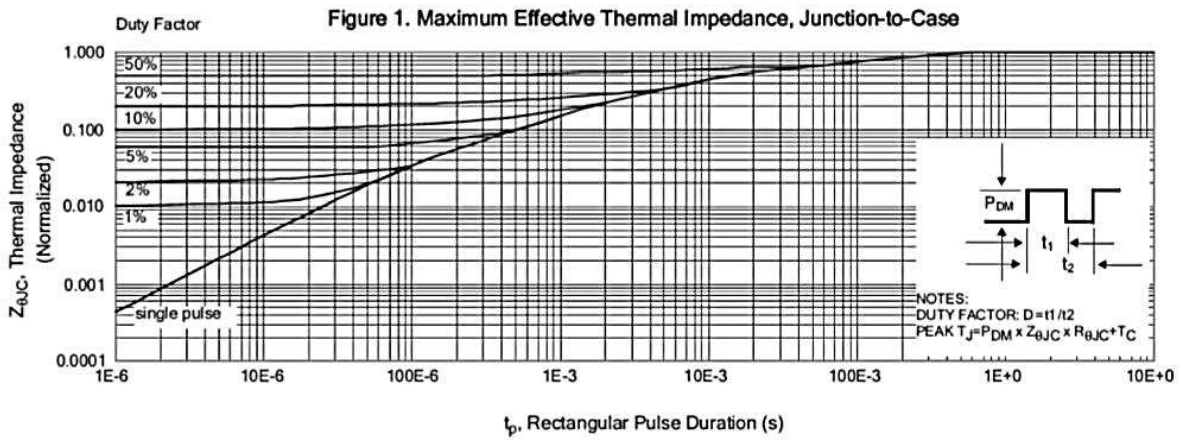
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	<b>VDSS</b>	200	220	-	<b>V</b>
Drain to Source Leakage Current	$V_{DS}=200V, V_{GS}=0V, T_a=25^\circ C$	<b>IBSS</b>	-	-	1	<b>μA</b>
	$V_{DS}=200V, V_{GS}=0V, T_a=125^\circ C$		-	-	100	
Gate to Source Forward Leakage	$V_{GS}=+20V$	<b>IGSS(F)</b>	-	-	100	<b>nA</b>
Gate to Source Reverse Leakage	$V_{GS}=-20V$	<b>IGSS(R)</b>	-	-	-100	
Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=40A$	<b>RDS(ON)</b>	-	17	20	<b>mΩ</b>
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	<b>VGS(th)</b>	3.6	-	5.0	<b>V</b>
Forward Transconductance	$V_{DS}=25V, I_D=40A$	<b>gfs</b>	50	65	-	<b>S</b>
Gate Resistance	$V_{GS}=0V, V_{DS}$ open $f=1.0MHz$	<b>RG</b>	-	1.3	-	<b>Ω</b>
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$	<b>Ciss</b>	-	7500	-	<b>pF</b>
Output Capacitance		<b>Coss</b>	-	500	-	
Reverse Transfer Capacitance		<b>Crss</b>	-	210	-	
Turn-on delay time	$I_D=40A$ $V_{DS}=50V$ $V_{GS}=10V$ $R_G=2.5\Omega$	<b>td(on)</b>	-	45	-	<b>ns</b>
Rise Time		<b>Tr</b>	-	70	-	
Turn-Off Delay Time		<b>td(OFF)</b>	-	110	-	
Fall Time		<b>tf</b>	-	90	-	
Total Gate Charge	$I_D=40A$ $V_{DD}=100V$ $V_{GS}=10V$	<b>Qg</b>	-	85	-	<b>nC</b>
Gate to Source Charge		<b>Qgs</b>	-	15	-	
Gate to Drain ("Miller") Charge		<b>Qgd</b>	-	25	-	
Continuous Source Current (Body Diode)		<b>ISD</b>	-	-	75	<b>A</b>
Maximum Pulsed Current (Body Diode)		<b>ISM</b>	-	-	300	<b>A</b>
Diode Forward Voltage	$I_S=40A, V_{GS}=0V$	<b>VSD</b>	-	-	1.2	<b>V</b>
Reverse Recovery Time	$I_S=30A, V_{DD}=50V$ $V_{GS}=0V, di/dt=100A/\mu s,$ $T_J=25^\circ C$	<b>trr</b>	-	110	-	<b>ns</b>
Reverse Recovery Charge		<b>Qrr</b>	-	0.55	-	<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  $T_J = 25^\circ C, L = 0.3mH, R_G = 25\Omega, V_{DD}=50V, V_{GS}=10V$  a2
- 4、 The  $I_{SD}=40A, di/dt \leq 100A/\mu s, V_{DD} \leq BV_{DS}$ , Start  $T_J=25^\circ C$
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

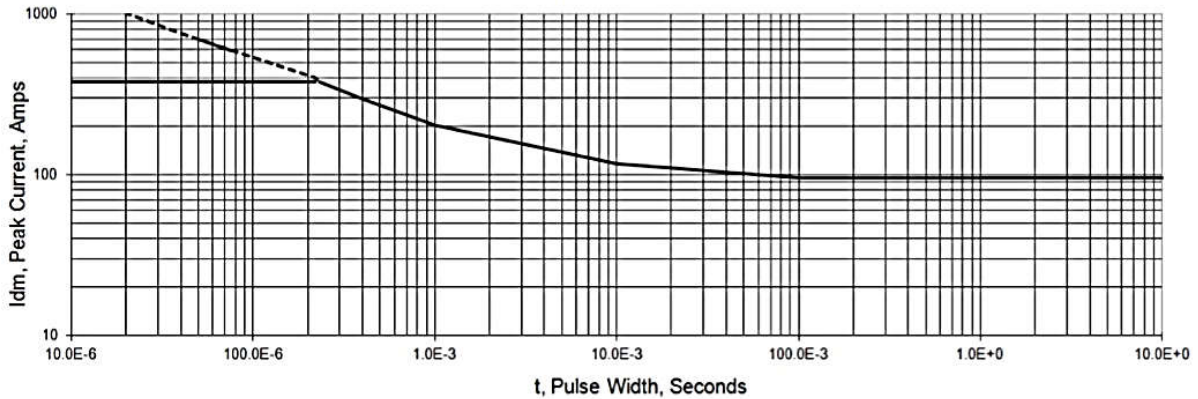
Ratings and Characteristic Curves

Characteristics Curve:

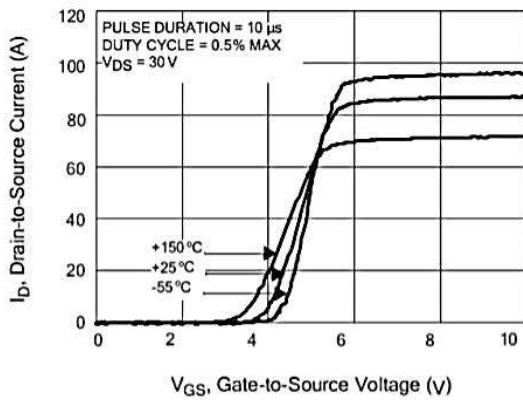


Ratings and Characteristic Curves

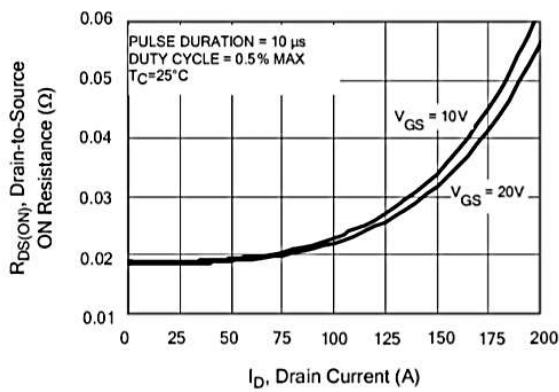
**Figure 6. Peak Current Capability**



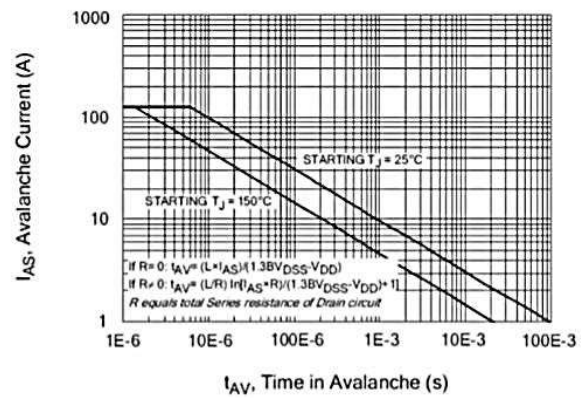
**Figure 7. Typical Transfer Characteristics**



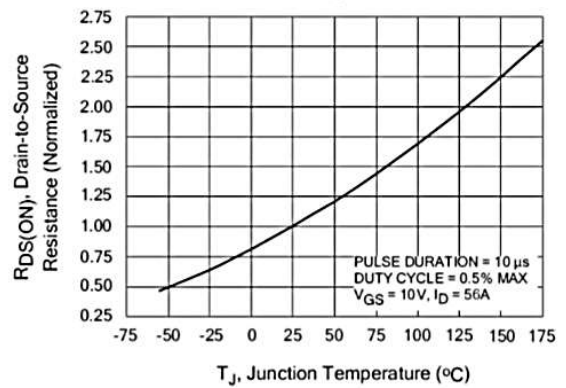
**Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current**



**Figure 8. Unclamped Inductive Switching Capability**



**Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature**



Ratings and Characteristic Curves

Figure 11. Typical Breakdown Voltage vs Junction Temperature

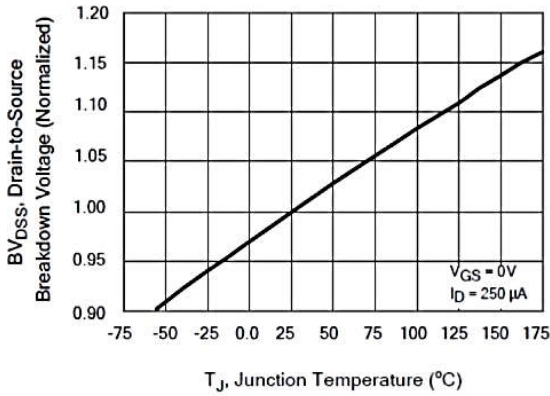


Figure 12. Typical Threshold Voltage vs Junction Temperature

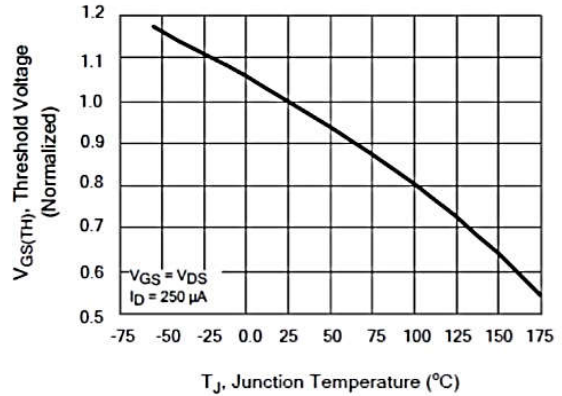


Figure 13. Maximum Safe Operating Area

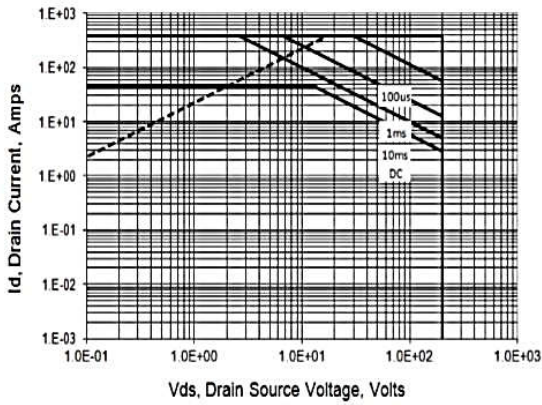


Figure 14. Capacitance vs Vds

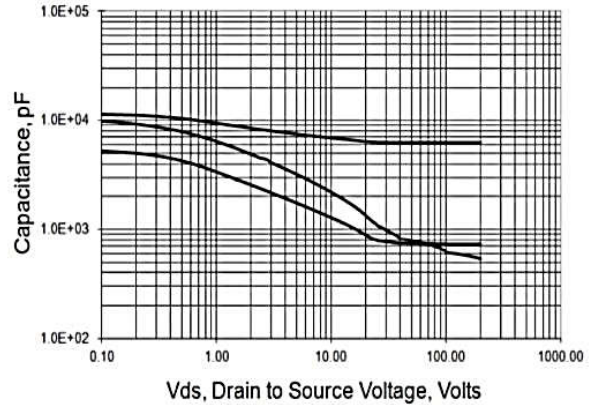


Figure 15. Typical Gate Charge

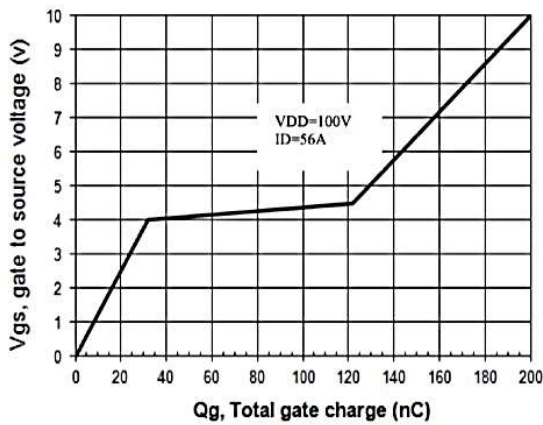
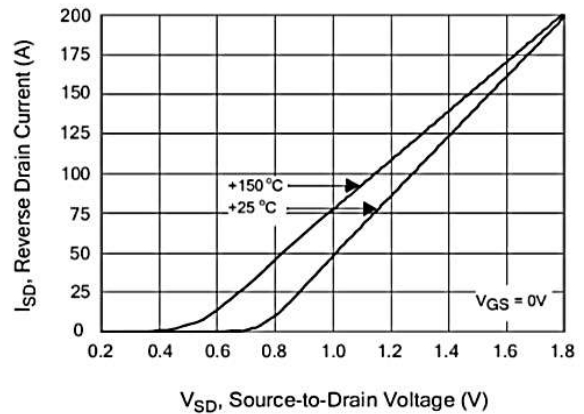


Figure 16. Typical Body Diode Transfer Characteristics



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		