

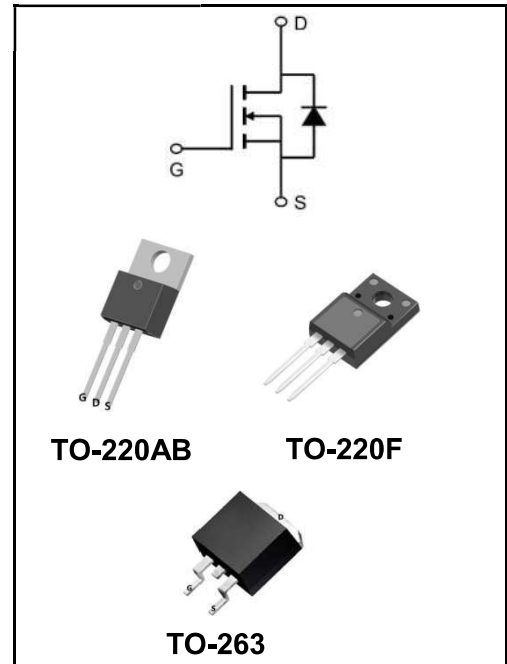
**200V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	40A
<b>V<sub>DSS</sub></b>	200V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=10V)</sub></b>	< 65mΩ ( <b>Type:50 mΩ</b> )

**Application**

- ◆Uninterruptible Power Supply(UPS)
- ◆Power Factor Correction (PFC)



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW40N20AT	TO-220AB	YFW 40N20AT XXXXX	1000PCS/Box
YFW40N20AF	TO-220F	YFW 40N20AF XXXXX	1000PCS/Box
YFW40N20AS	TO-263	YFW 40N20AS 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>	200	<b>V</b>
Drain Current- Continuous	<b>I<sub>D</sub></b>	40	<b>A</b>
Drain Current- Pulsed	<b>I<sub>DM</sub></b>	112	<b>A</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±30	<b>V</b>
Single pulse avalanche energy	<b>E<sub>AS</sub></b>	588	<b>mJ</b>
Avalanche Current	<b>I<sub>AR</sub></b>	28	<b>A</b>
Repetitive Avalanche Current	<b>E<sub>AR</sub></b>	15.8	<b>mJ</b>
Peak Diode Recovery dv/dt	<b>dv/dt</b>	5.5	<b>V/ns</b>
Power Dissipation T <sub>c</sub> =25°C	<b>P<sub>D</sub></b>	158	<b>W</b>
Operating Junction and Storage Temperature Range	<b>T<sub>J</sub> ,T<sub>STG</sub></b>	-55 to 150	<b>°C</b>
Maximum Lead Temperature for Soldering Purposes	<b>T<sub>L</sub></b>	300	<b>°C</b>
Thermal Resistance, Junction-to-case	<b>R<sub>th(j-c)</sub></b>	0.79	<b>°C/W</b>
Thermal Resistance, Junction –to-ambient	<b>R<sub>th(j-A)</sub></b>	62.5	<b>°C/W</b>

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

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$BV_{DSS}$	200	-	-	V
Zero Gate Voltage Drain Current	$V_{DS}=200V, V_{GS}=0V, T_C=25^\circ C$	$I_{DSS}$	-	-	1	$\mu A$
Gate-body leakage current, forward	$V_{DS}=0V, V_{GS}=30V$	$I_{GSS(F)}$	-	-	100	nA
Gate-body leakage current, reverse	$V_{DS}=0V, V_{GS}=-30V$	$I_{GSS(R)}$	-	-	-100	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=14A$	$R_{DS(ON)}$	-	50	65	m $\Omega$
Forward Transconductance	$V_{DS}=40V, I_D=14A$	$g_{fs}$	-	24	-	S
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$	$C_{iss}$	-	2879	3742	pF
Output Capacitance		$C_{oss}$	-	362	470	
Reverse Transfer Capacitance		$C_{rss}$	-	81	105	
Turn-on delay time	$V_{DD}=100V$ $I_D=28A$ $R_G=25\Omega$ $V_{GS}=10V$ (note 4, 5)	$t_{d(on)}$	-	28	69	ns
Turn-on Rise Time		$T_r$	-	251	494	
Turn-Off Delay Time		$t_{d(OFF)}$	-	309	617	
Turn-Off Fall Time		$t_f$	-	220	412	
Total Gate Charge	$V_{DS}=160V$ $I_D=28A$ $V_{GS}=10V$ (note 4, 5)	$Q_g$	-	103	136	nC
Gate-Source Charge		$Q_{gs}$	-	16	-	
Gate-Drain Charge		$Q_{gd}$	-	53	-	
Maximum Continuous Drain-Source Diode Forward Current	$T_C=25^\circ C$	$I_S$	-	-	28	A
Maximum Pulsed Drain-Source Diode Forward Current		$I_{SP}$	-	-	112	A
Maximum Continuous Drain-Source Diode Forward Current	$I_S=28A, V_{GS}=0V$	$V_{SD}$	-	-	1.4	V
Reverse Recovery Time	$I_S=28A, V_{GS}=0V$ $dI/dt=100A/\mu s$ (note 4)	$t_{rr}$	-	218	-	ns
Reverse Recovery Charge		$Q_{rr}$	-	1.91	-	nC

Note :

- 1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、 The EAS data shows Max. rating . L=1.5mH, IAS=28A, VDD=50V, RG=25  $\Omega$ , Starting TJ=25°C
- 3、 The test condition is Pulse Test: Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 1\%$
- 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

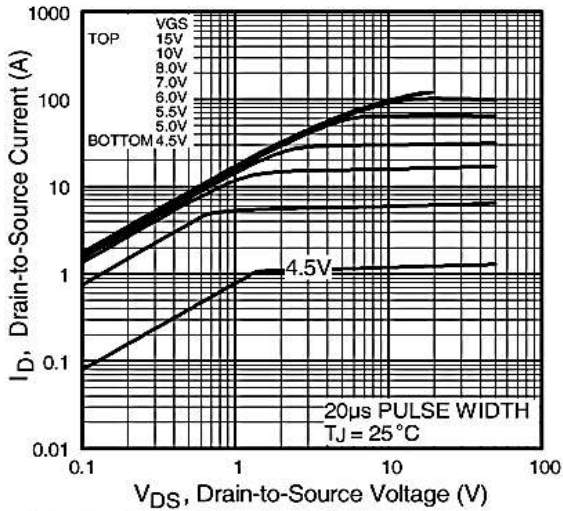


Fig 1. Typical Output Characteristics

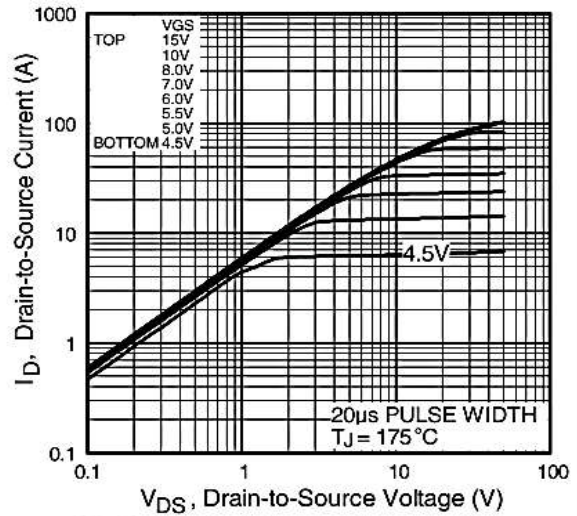


Fig 2. Typical Output Characteristics

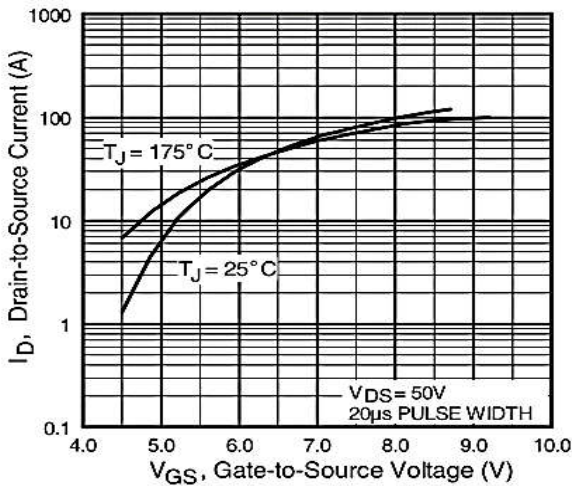


Fig 3. Typical Transfer Characteristics

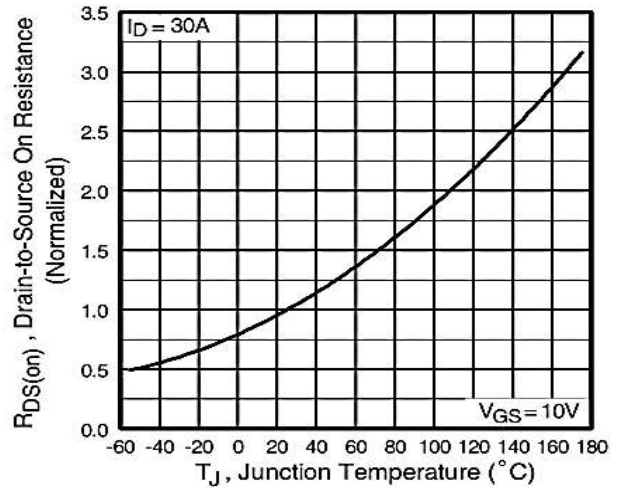


Fig 4. Normalized On-Resistance Vs. Temperature

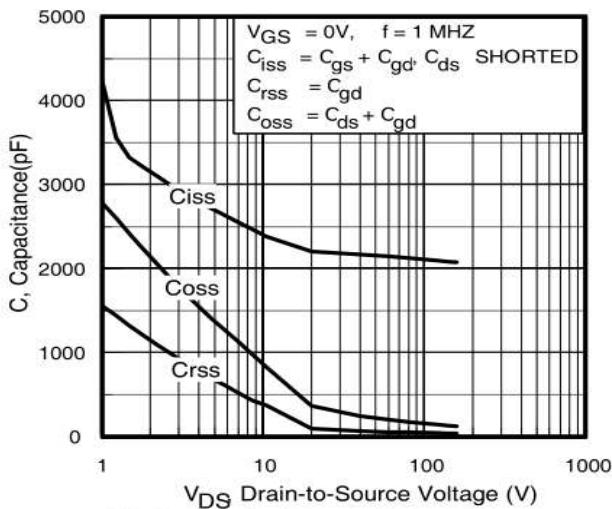


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

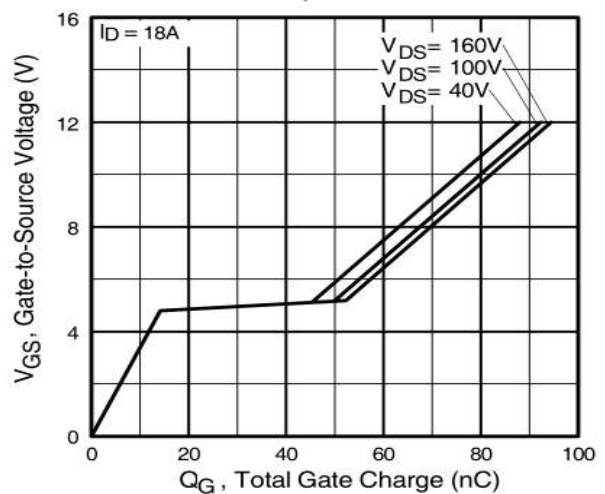


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

Ratings and Characteristic Curves

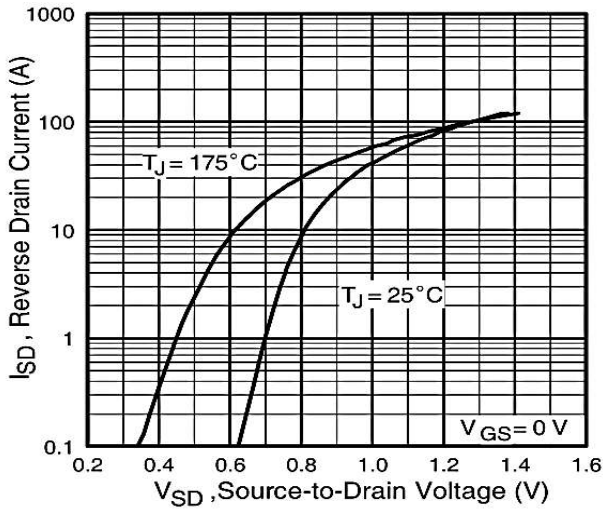


Fig 7. Typical Source-Drain Diode Forward Voltage

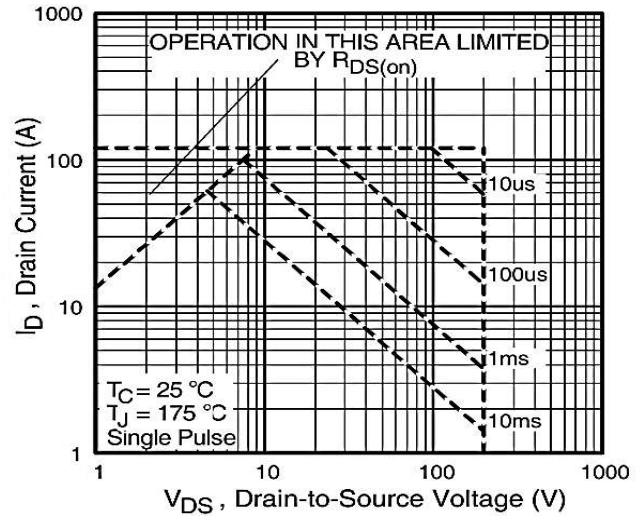


Fig 8. Maximum Safe Operating Area

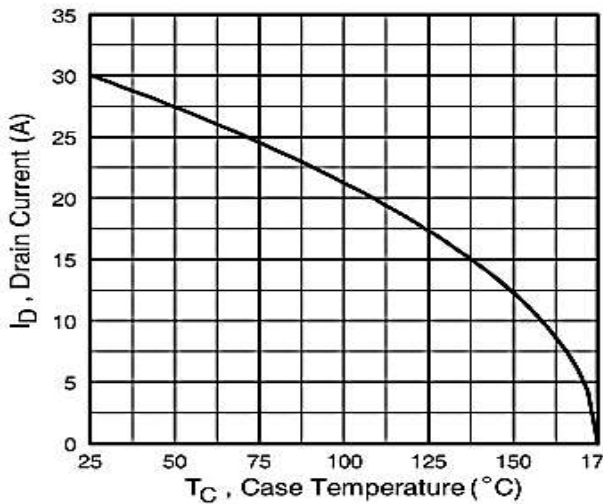


Fig 9. Maximum Drain Current Vs. Case Temperature

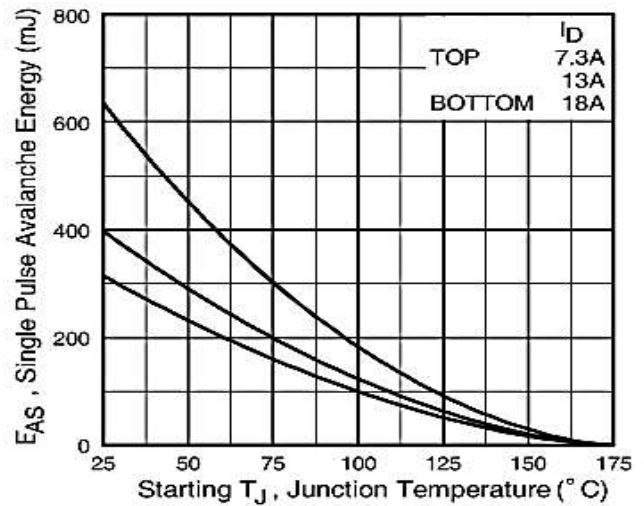


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

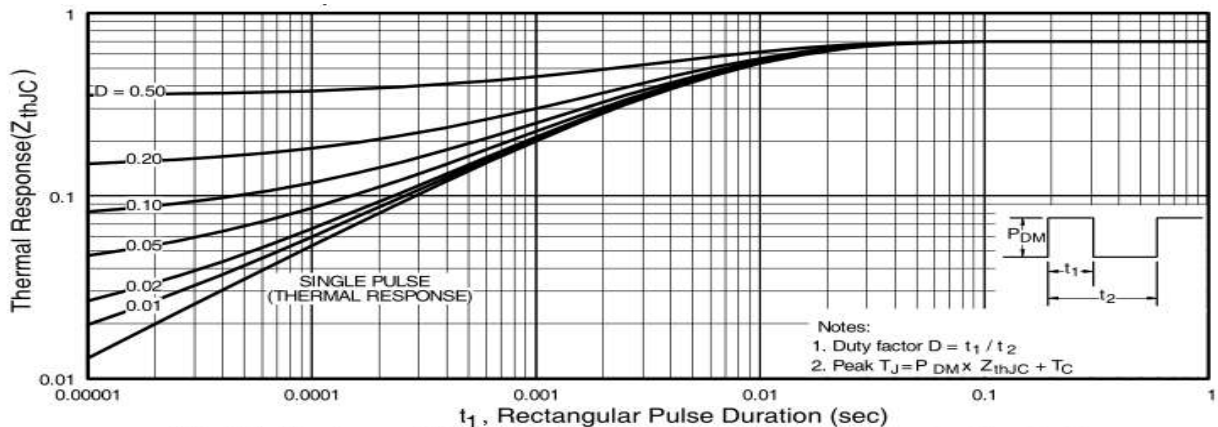


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

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		