

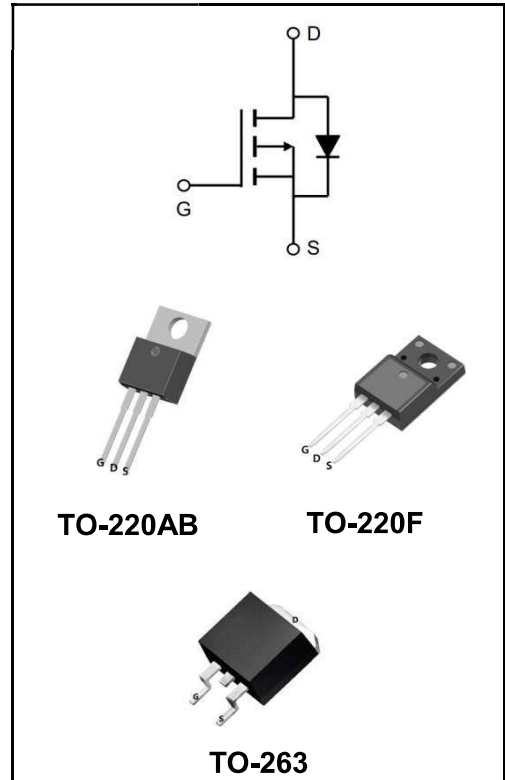
**-60V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	-50A
<b>V<sub>DSS</sub></b>	-60V
<b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>=-10V)</b>	< -18mΩ( <b>Type:13 mΩ</b> )

**Application**

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



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW50P06AT	TO-220AB	YFW 50P06AT XXXXX	1000PCS/Box
YFW50P06AF	TO-220F	YFW 50P06AF XXXXX	1000PCS/Box
YFW50P06AS	TO-263	YFW 50P06AS XXXXX	800PCS/Reel

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V <sub>DS</sub>	-60	V
Gate - Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current @T <sub>c</sub> =25°C	I <sub>D</sub>	-50	A
Continuous Drain Current @T <sub>c</sub> =100°C	I <sub>D</sub>	-34	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	-90	A
Single Pulse Avalanche Energy <sup>3</sup>	E <sub>AS</sub>	101	mJ
Avalanche Current	I <sub>AS</sub>	-45	A
Total Power Dissipation <sup>4</sup> @T <sub>c</sub> =25°C	P <sub>D</sub>	86.8	W
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C
Thermal Resistance Junction-Ambient <sup>1</sup>	R <sub>θJA</sub>	62	°C/W
Thermal Resistance Junction to Case <sup>1</sup>	R <sub>θJC</sub>	1.44	°C/W

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

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$BV_{DSS}$	-60	-	-	V
Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-18A$	$R_{DS(on)}$	-	13	18	mΩ
	$V_{GS}=-4.5V, I_D=-12A$		-	29	35	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	1.8	-3.0	V
Drain-Source Leakage Current	$V_{DS}=-48V, V_{GS}=0V, T_J=25^\circ C$	$I_{DSS}$	-	-	1	μA
	$V_{DS}=-48V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	$I_{GSS}$	-	-	±100	nA
Forward Transconductance	$V_{DS}=-10V, I_D=-18A$	$g_{fs}$	-	23	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	$R_g$	-	7	14	
Total Gate Charge(-4.5V)	$V_{DS}=-20V$ $V_{GS}=-4.5V$ $I_D=-12A$	$Q_g$	-	25	-	nC
Gate-Source Charge		$Q_{gs}$	-	6.7	-	
Gate-Drain Charge		$Q_{gd}$	-	5.5	-	
Turn-on delay time	$V_{DD}=-15V$ $V_{GS}=-10V$ $I_D=-1A$ $R_G=3.3$	$t_{d(on)}$	-	38	-	ns
Rise Time		$T_r$	-	23.6	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	100	-	
Fall Time		$t_f$	-	6.8	-	
Input Capacitance	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1MHz$	$C_{iss}$	-	3635	-	pF
Output Capacitance		$C_{oss}$	-	224	-	
Reverse Transfer Capacitance		$C_{rss}$	-	141	-	
Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V, \text{Force Current}$	$I_S$	-	-	-20	A
Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	$V_{SD}$	-	-	-1	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\cong 300\mu s$  , duty cycle  $\cong 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-45A$
- 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

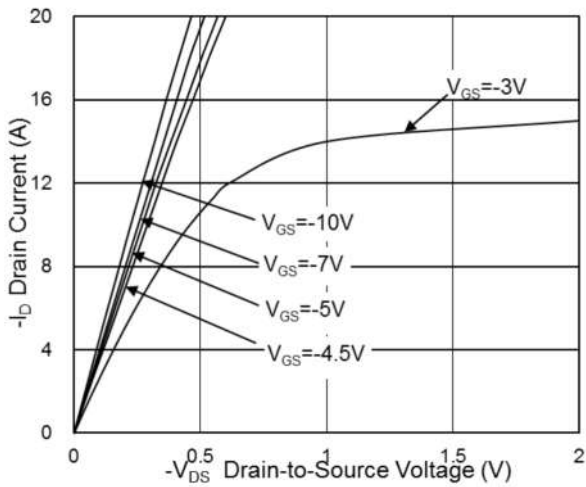


Fig.1 Typical Output Characteristics

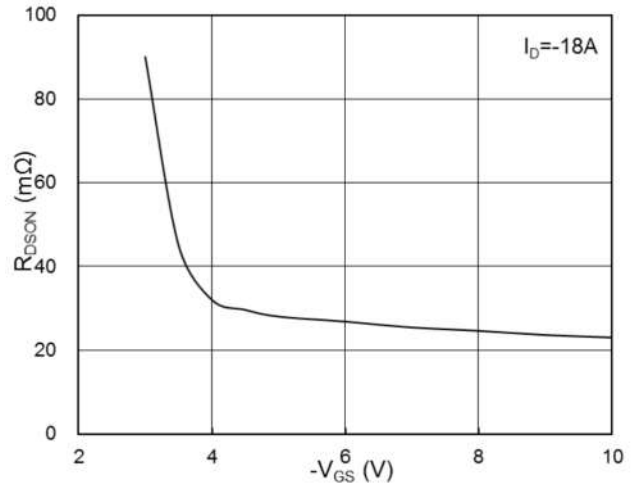


Fig.2 On-Resistance vs. G-S Voltage

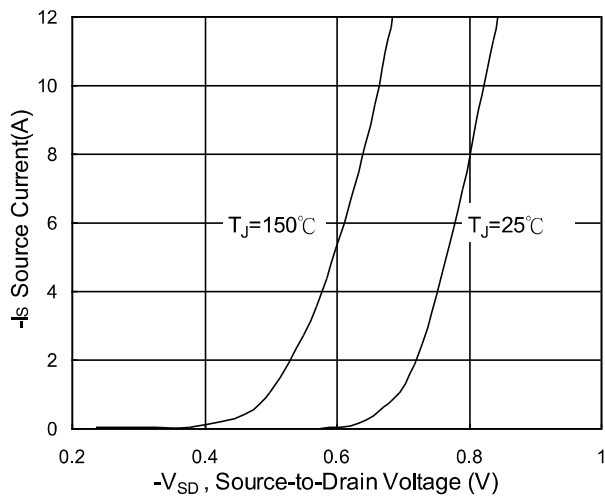


Fig.3 Source Drain Forward Characteristics

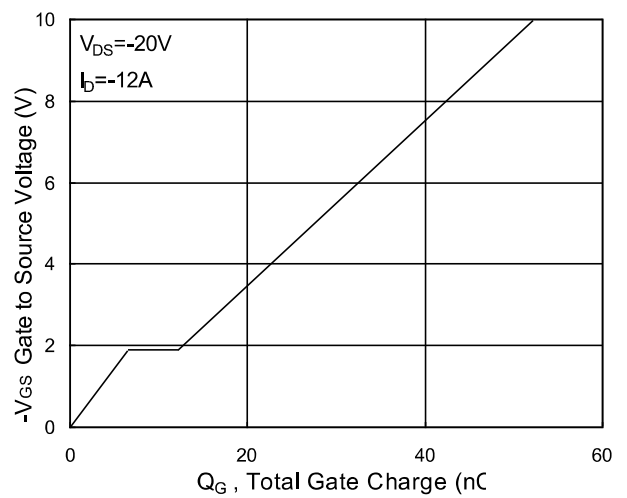


Fig.4 Gate-Charge Characteristics

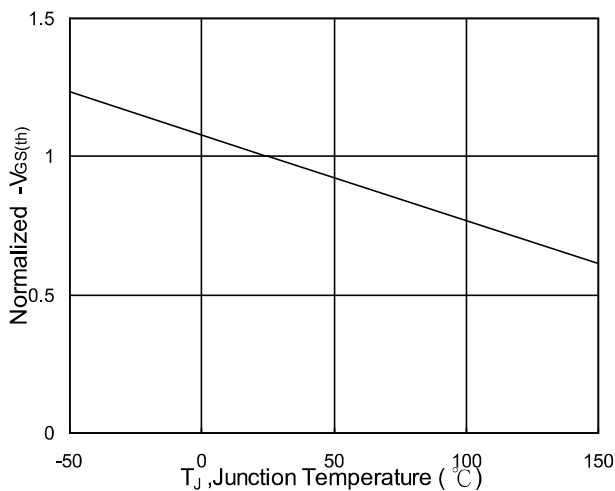


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

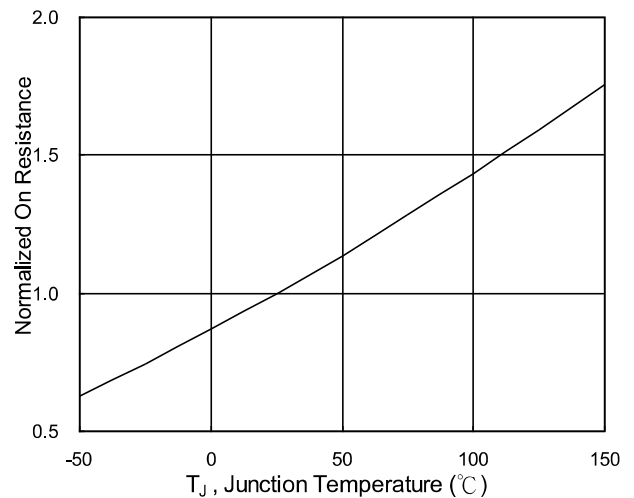
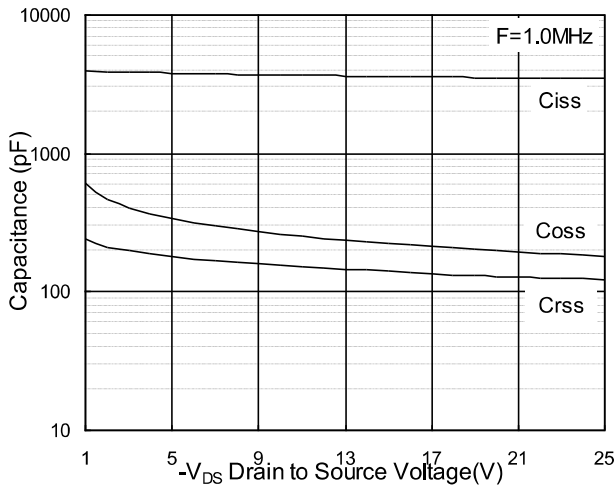
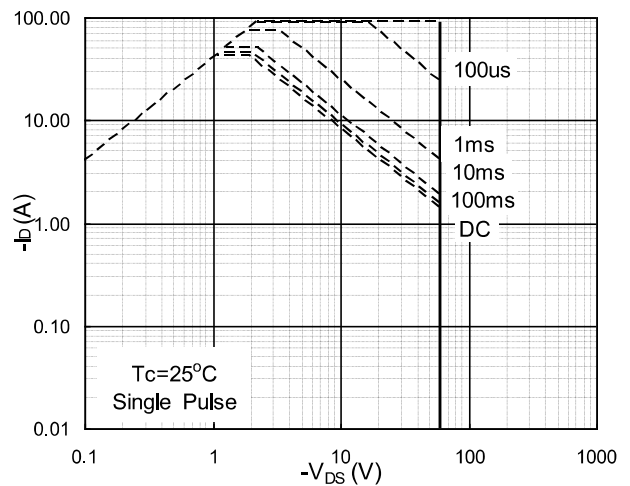


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$

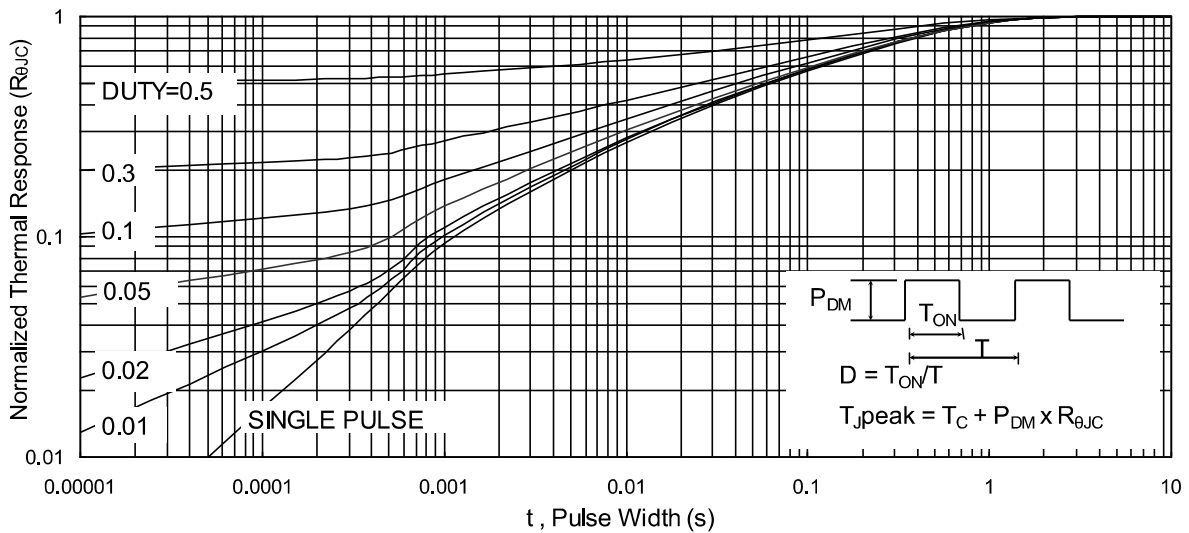
**Ratings and Characteristic Curves**



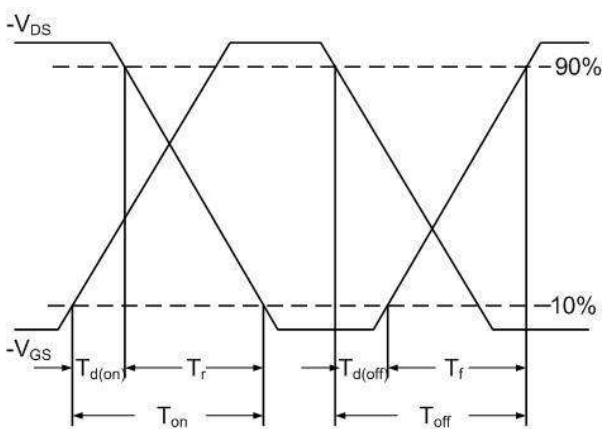
**Fig.7 Capacitance**



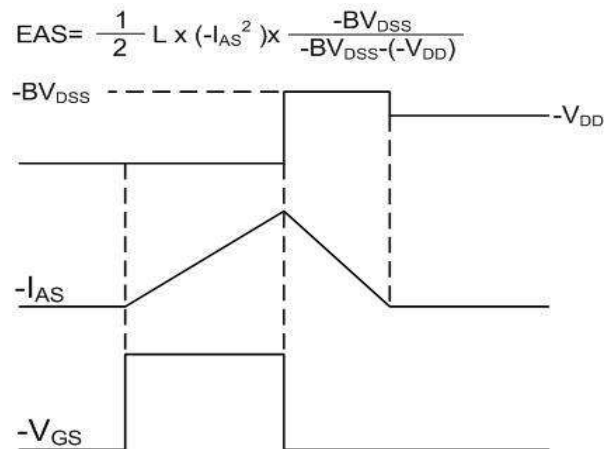
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Waveform**

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

