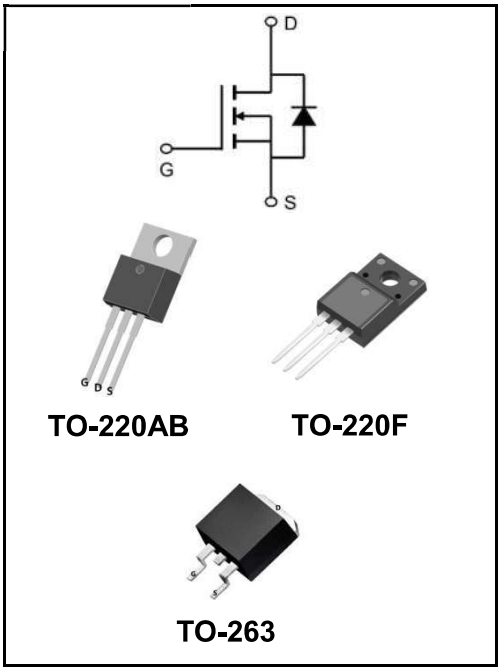
100V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	50A
V_{DSS}	100V
R_{DSON}-typ(@V_{GS}=10V)	< 22mΩ



Application

- Battery protection
- Load switch
- Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW50N10AT	TO-220AB	YFW 50N10AT XXXXX	1000PCS/Box
YFW50N10AF	TO-220F	YFW 50N10AF XXXXX	1000PCS/Box
YFW50N10AS	TO-263	YFW 50N10AS XXXXX	800PCS/Reel

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V[1] @T_C=25℃	I_D	50	A
Continuous Drain Current, V_{GS} @ 10V[1]@T_C=100℃	I_D	37	A
Pulsed Drain Current[2]	I_{DM}	130	A
Single Pulse Avalanche Energy[3]	E_{AS}	84	mJ
Avalanche Current	I_{AS}	41	A
Total Power Dissipation[4] @T_C=25℃	P_D	149	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	$T_{J,}$	-55 to +150	°C
Thermal Resistance, Junction-to-Ambient [1]	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	0.84	°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=250uA	BV_{DSS}	100	-	-	V
Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=30A	$R_{DS(ON)}$	-	-	22	mΩ
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	2.5	-	4.5	V
Drain -Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	1	μA
	V_{DS}=80V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=5V, I_D=30A	g_{FS}	-	31	-	S
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	-	1.9	3.8	Ω
Total Gate Charge (10V)	V_{DS}=80V V_{GS}=10V I_D=30A	Q_g	-	27.6	-	nC
Gate-Source Charge		Q_{gs}	-	11.4	-	
Gate-Drain Charge		Q_{gd}	-	7.9	-	
Turn-on delay time	V_{DD}=50V V_{GS}=10V R_G=3.3 I_D=30A	$t_{d(on)}$	-	16.5	-	ns
Rise Time		T_r	-	35	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	17.5	-	
Fall Time		t_f	-	12	-	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1MHz	C_{iss}	-	1890	-	pF
Output Capacitance		C_{oss}	-	268	-	
Reverse Transfer Capacitance		C_{rss}	-	67	-	
Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	I_S	-	-	58	A
Pulsed Source Current[2,5]		I_{SM}	-	-	130	A
Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	-	-	1.2	V
Reverse Recovery Time	I_F=30A , dI/dt=100A/μs , T_J=25℃	t_{rr}	-	22		ns
Reverse Recovery Charge		Q_{rr}	-	20	-	nC

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 ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is VDS=25V,VGS=10V,L=0.1mH,IAS=41A
4.The power dissipation is limited by 150℃ 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

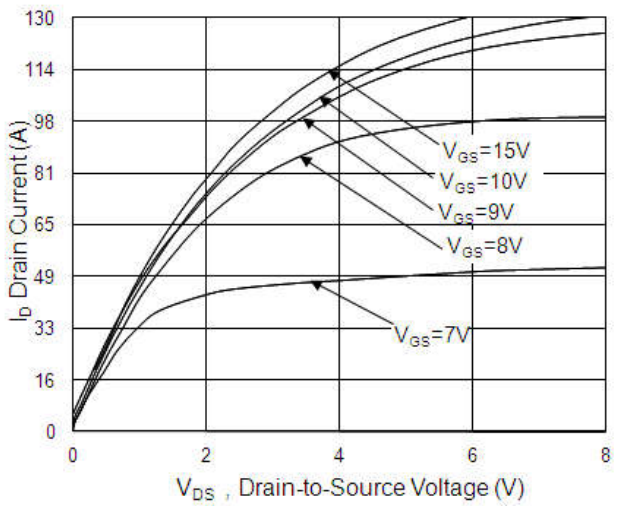


Fig.1 Typical Output Characteristics

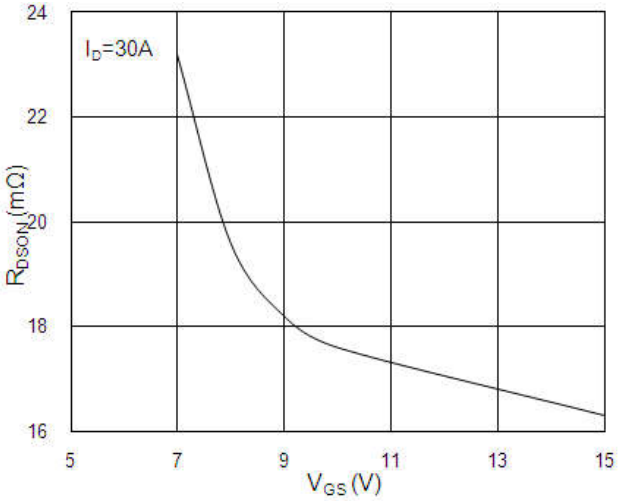


Fig.2 On-Resistance v.s Gate-Source

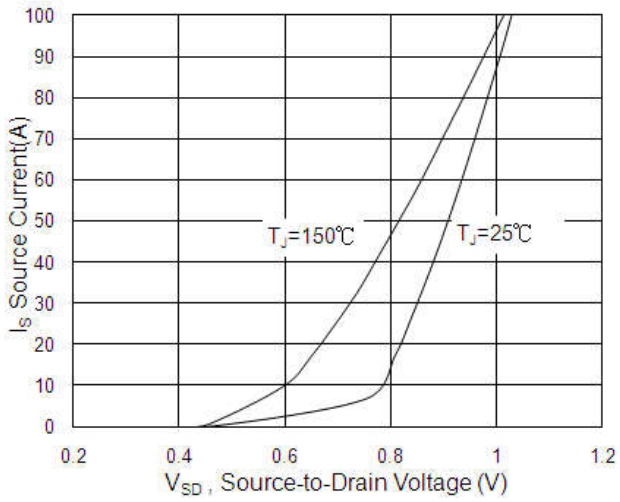


Fig.3 Forward Characteristics of Reverse

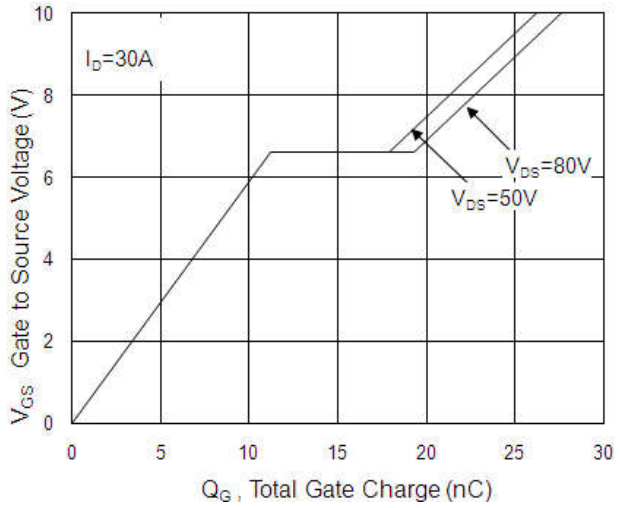


Fig.4 Gate-Charge Characteristics

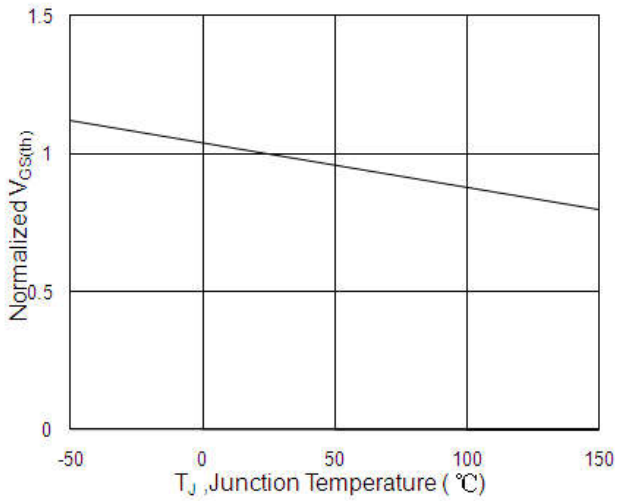


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

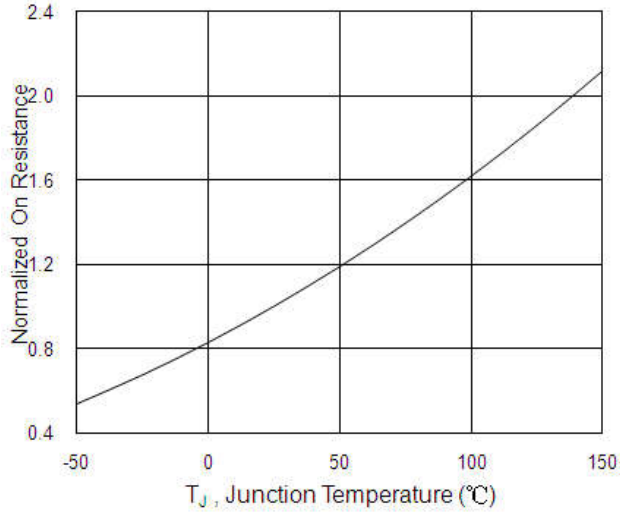


Fig.6 Normalized R_{DSON} vs. T_J

Ratings and Characteristic Curves

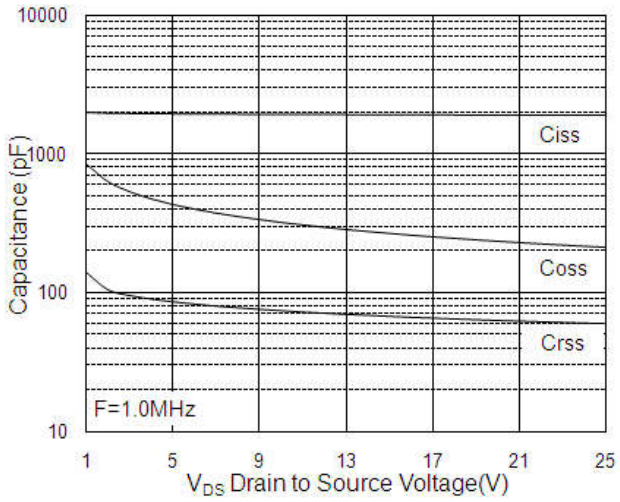


Fig.7 Capacitance

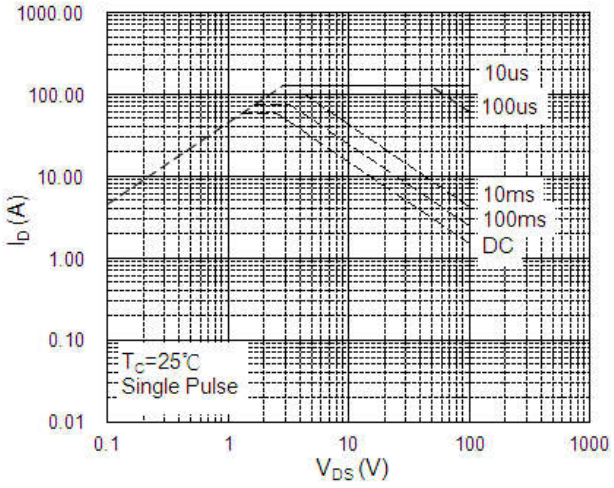


Fig.8 Safe Operating Area

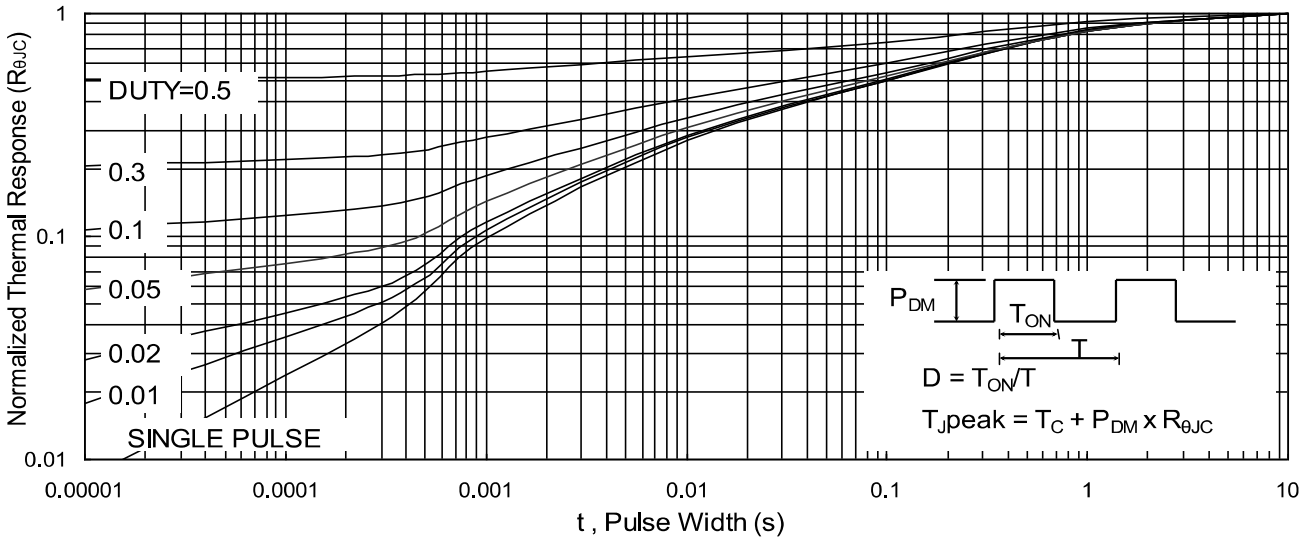


Fig.9 Normalized Maximum Transient Thermal Impedance

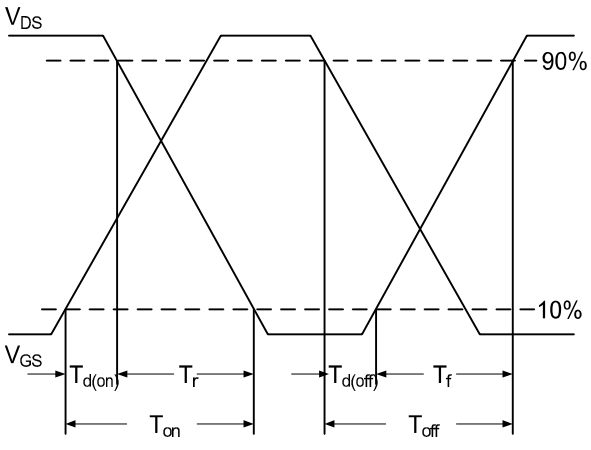


Fig.10 Switching Time Waveform

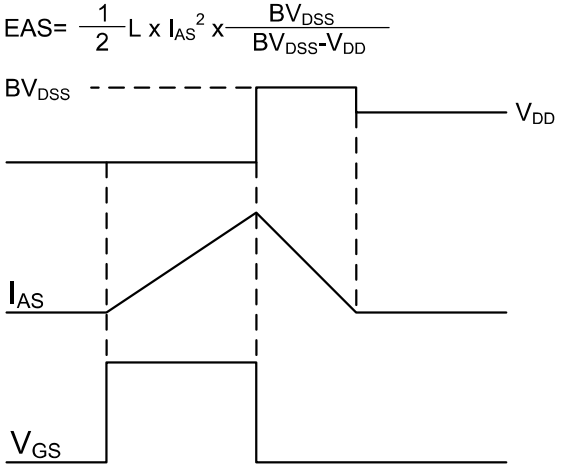
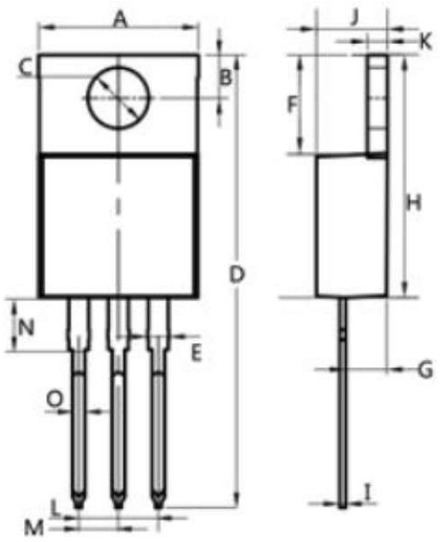


Fig.11 Unclamped Inductive Switching Waveform

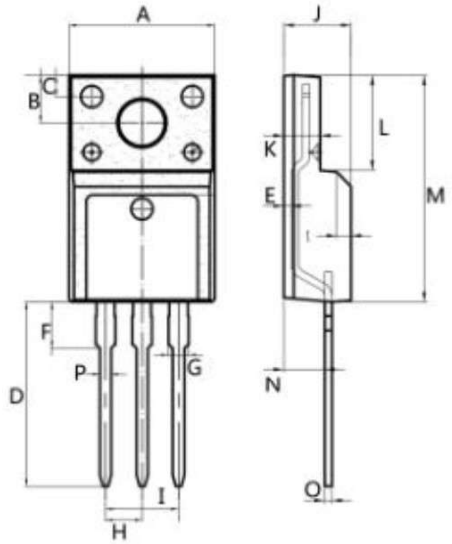
Package Outline Dimensions Millimeters

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		

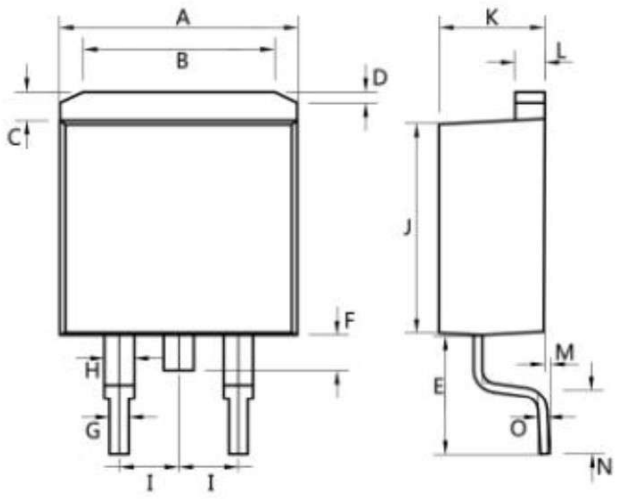
TO-220F



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



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		