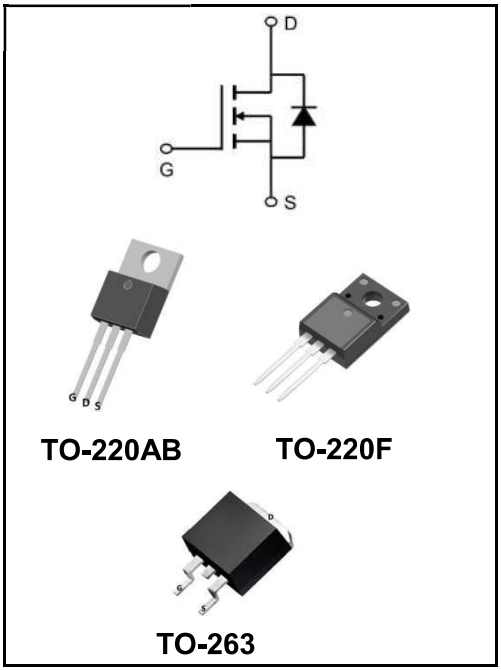
120V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	200A
V_{DSS}	120V(Type:135V)
R_{DSON}-typ(@V_{GS}=10V)	< 4.2mΩ(Type:3.7 mΩ)



Features

♦YFW-SGT technology

Application

♦BMS
♦UPS
♦Power Management Switches

Product Specification Classification

Part Number	Package	Marking	Pack
YFWG200N12AT	TO-220AB	YFW 200N12AT XXXXX	1000PCS/Box
YFWG200N12AF	TO-220F	YFW 200N12AF XXXXX	1000PCS/Box
YFWG200N12AS	TO-263	YFW 200N12AS XXXXX	800PCS/Reel

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	120	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V @T_C=25℃	I_D	200	A
Continuous Drain Current, V_{GS} @ 10V @T_C=100℃	I_D	150	A
Pulsed Drain Current	I_{DM}	600	A
Single Pulse Avalanche Energy	E_{AS}	530	mJ
Avalanche Current	I_{AS}	45	A
Total Power Dissipation[4] @T_C=25℃	P_D	240	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	0.75	°C/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	62	°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	**VDSS**	120	135	-	**V**
Gate-body Leakage current	V_{GS}=±20V ,V_{DS}=0V	**I_{GSS}**	-	-	±100	**nA**
Zero Gate Voltage Drain Current	V_{DS}=120V , V_{GS}=0V , T_J=25℃	**I_{DSS}**	-	-	1	**μA**
	V_{DS}=120V , V_{GS}=0V , T_J=100℃		-	-	100	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	**$V_{GS(th)}$**	2.0	2.9	4.0	**V**
Drain-Source On-Resistance[4]	V_{GS}=10V, I_D=20A	**$R_{DS(ON)}$**	-	3.7	4.2	**mΩ**
	V_{GS}=6V, I_D=20A		-	4.3	5.8	
Input Capacitance	V_{GS}=0V V_{DS}=60V f=250KHz	**C_{iss}**	-	5240	-	**pF**
Output Capacitance		**C_{oss}**	-	739	-	
Reverse Transfer Capacitance		**C_{rss}**	-	12	-	**Ω**
Gate Resistance	V_{GS}=0V, V_{DS}=0V,f=1MHz	**R_g**	-	1.7	-	**nC**
Total Gate Charge	V_{DD}=60V I_D=45A V_{GS}=0 to10V	**Q_g**	-	19	-	
Gate-Source Charge		**Q_{gs}**	-	11	-	
Gate-Drain Charge		**Q_{gd}**	-	75	-	
Turn-on delay time	V_{DD}=60V V_{GS}=10V R_G=10Ω I_D=45A	**$t_{d(on)}$**	-	59	-	**ns**
Rise Time		**T_r**	-	41	-	
Turn-Off Delay Time		**$t_{d(OFF)}$**	-	96	-	
Fall Time		**t_f**	-	33	-	
Diode Forward Voltage [2]	I_F=20A , V_{GS}=0V	**V_{SD}**	-	0.8	1.2	**V**
Continuous Source Current [1.5]	V_G=V_D=0V , Force Current	**I_S**	-	-	200	**A**
Body Diode Reverse Recovery Time	V_R=60V I_F=35A, dI/dt=100A/μs	**t_{rr}**	-	70	-	**ns**
Body Diode Reverse Recovery Charge		**Q_{rr}**	-	200	-	**nC**

Notes:
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 ≤ 300us , duty cycle ≤ 2%
3、The EAS data shows Max. rating . The test condition is VDD=50V, VGS=10V, L=0.5mH, IAS=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

Typical Characteristics

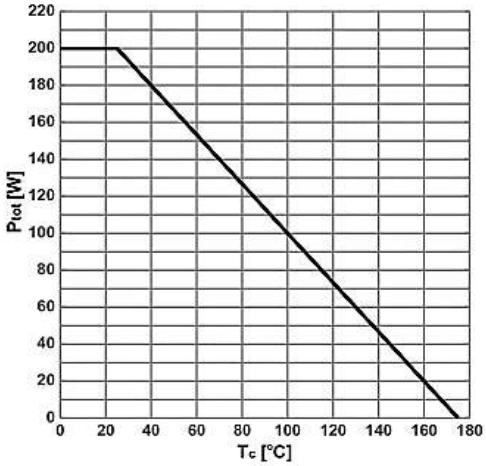


Figure 1. Power dissipation

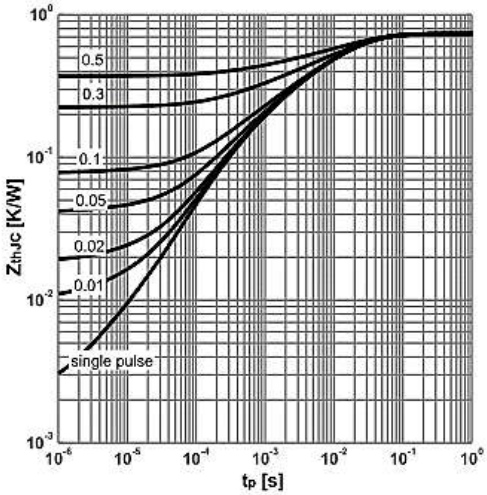


Figure 2. Max. transient thermal impedance

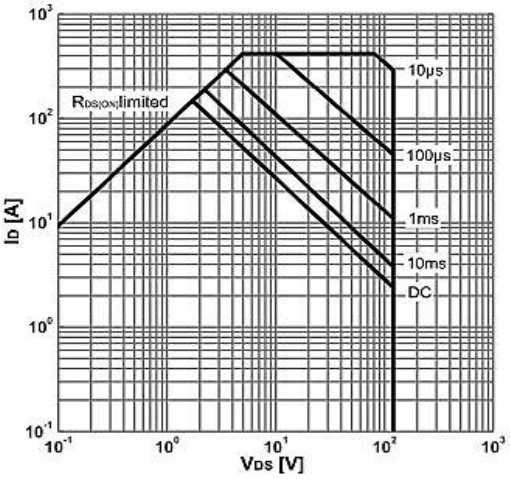


Figure 3. Safe operating area

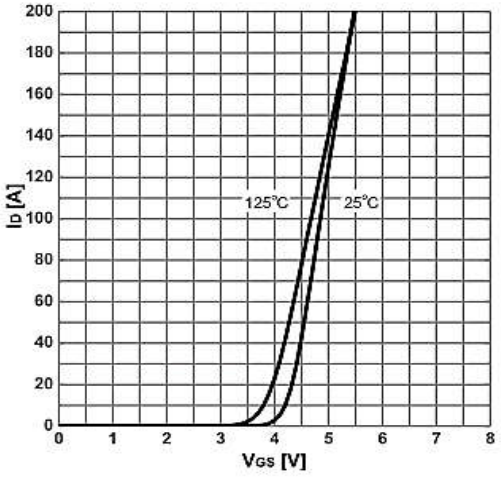


Figure 4. Type. transfer characteristics

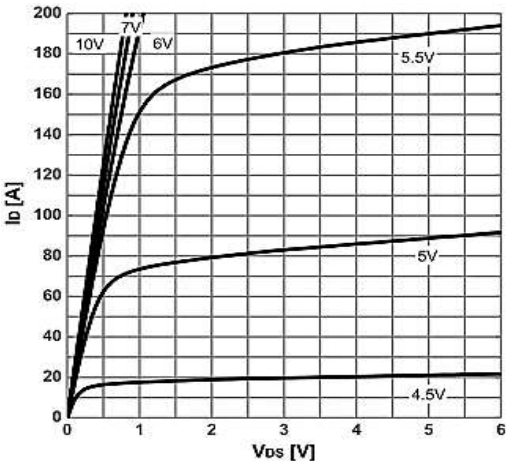


Figure 5. Typ. output characteristics(Tj 25℃)

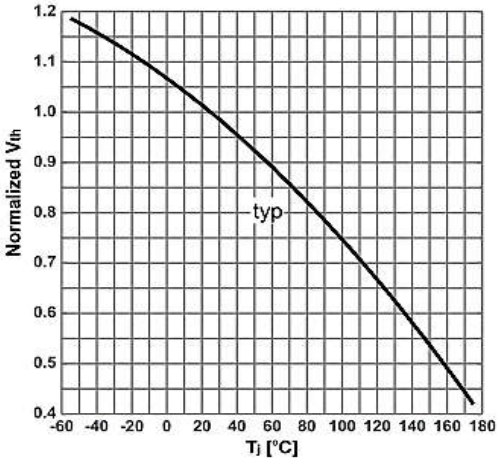


Figure 6. Typ. output characteristics(Tj 125℃)

Ratings and Characteristic Curves

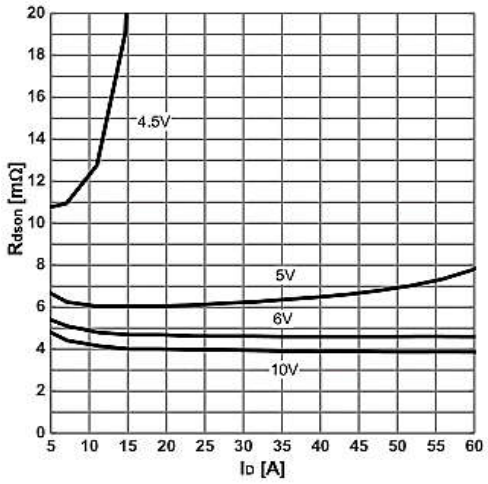


Figure 7. On-state resistance vs. Drain current

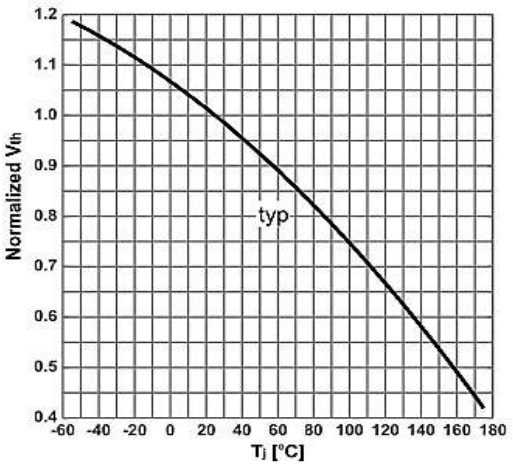


Figure 6. Gate threshold voltage vs. Junction Temperature

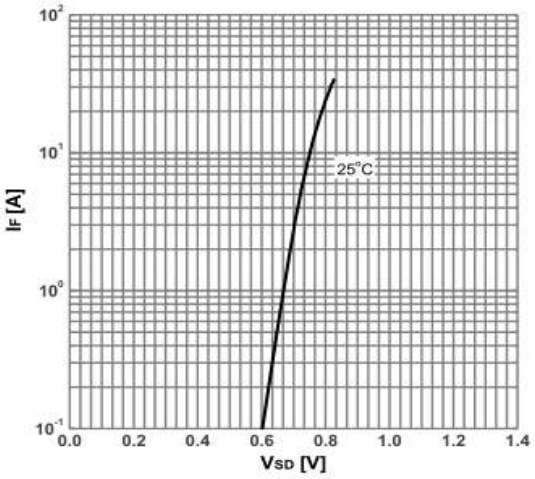


Figure 9. Forward characteristics of reverse diode

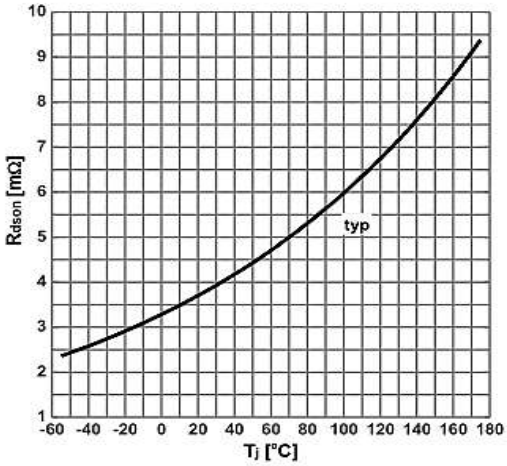


Figure 8. On-state resistance vs. Junctiontemperature

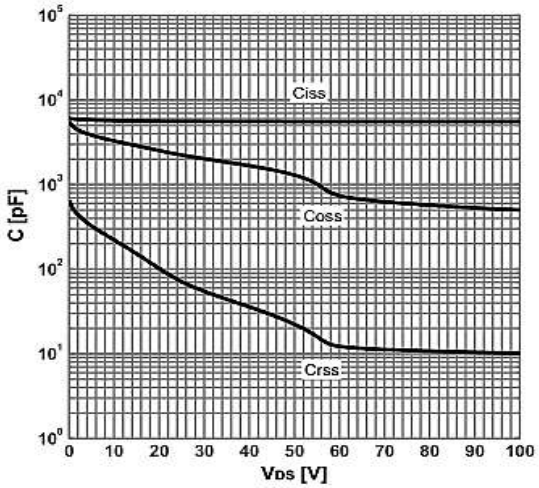


Figure9 Typ. capacitances

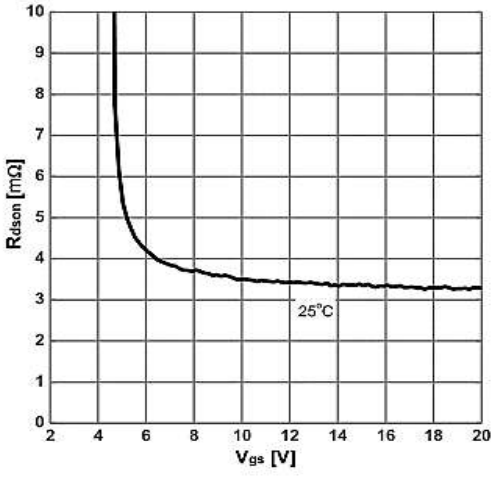


Figure11. On-state resistance vs. Vgs characteristics

Ratings and Characteristic Curves

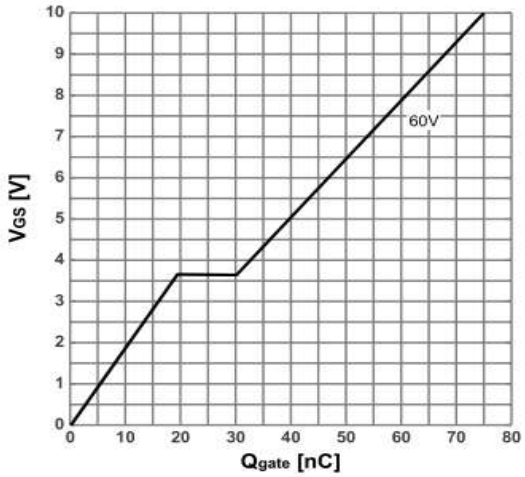
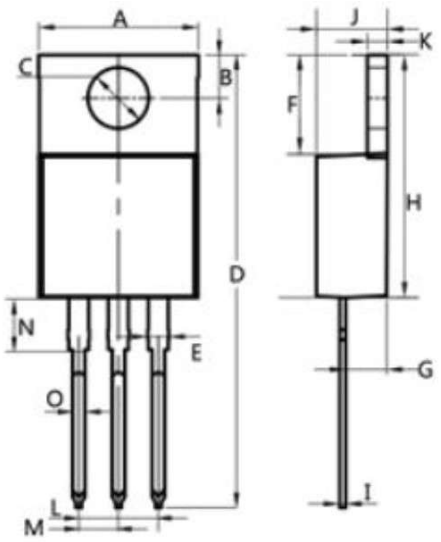


Figure 13: Typ. gate charge

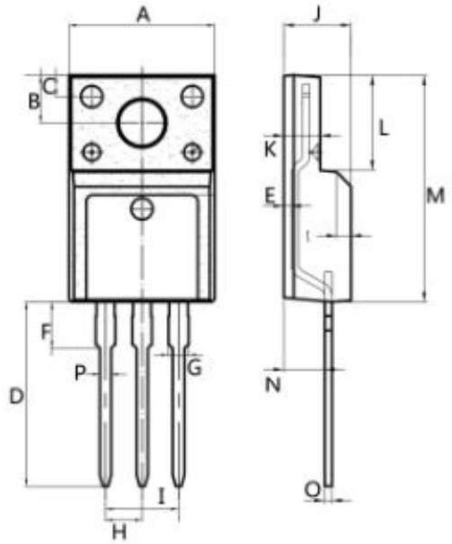
Package Outline Dimensions Millimeters

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		

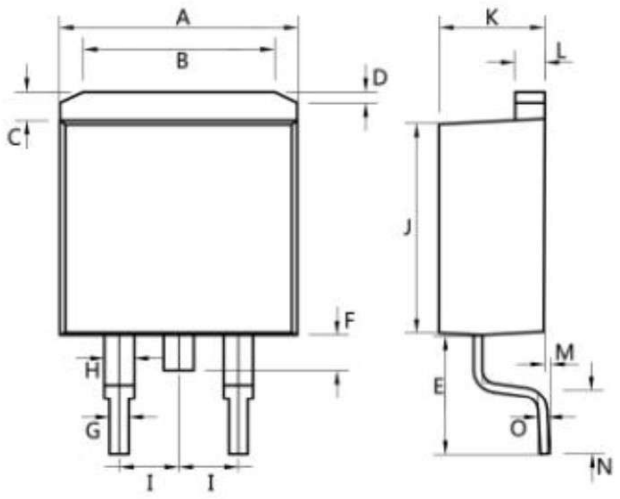
TO-220F



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		