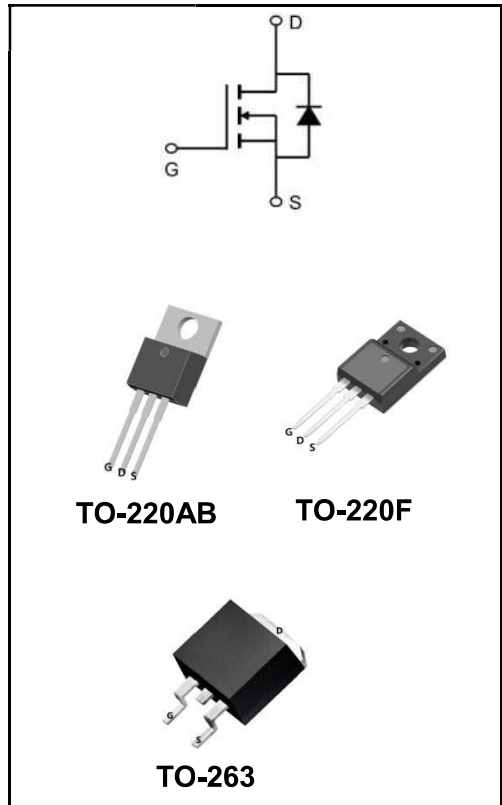


40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	120A
V_{DSS}	40V
R_{DS(on)-typ(@V_{GS}=10V)}	< 4.0mΩ (Type:2.8 mΩ)



Application

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

Product Specification Classification

Part Number	Package	Marking	Pack
YFW120N04AT	TO-220AB	YFW 120N04AT XXXXX	1000PCS/box
YFW120N04AF	TO-220F	YFW 120N04AF XXXXX	1000PCS/box
YFW120N04AS	TO-263	YFW 120N04AS XXXXX	800PCS/Reel

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V _{GS} @ 10V ^{1,6} @T _C =25°C	I_D	120	A
Continuous Drain Current, V _{GS} @ 10V ^{1,6} @T _C =100°C	I_D	98	A
Pulsed Drain Current ²	I_{DM}	600	A
Single Pulse Avalanche Energy ³	E_{AS}	272	mJ
Avalanche Current	I_{AS}	33	A
Total Power Dissipation ⁴ @T _C =25°C	P_D	180	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-ambient ¹	R_{θJA}	50	°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	0.7	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	V(BR)DSS	40	44	-	V
Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	I_{DSS}	-	-	1.0	μA
Gate to Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	2.0	2.8	4.0	V
Static Drain-Source on-Resistance note3	$V_{GS}=10V, I_D=30A$	R_{DS(ON)}	-	3.0	4.0	mΩ
Input Capacitance	$V_{DS}=20V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	4900	-	pF
Output Capacitance		C_{oss}	-	528	-	
Reverse Transfer Capacitance		C_{rss}	-	317	-	
Total Gate Charge	$V_{DS}=20V$ $V_{GS}=10V$ $I_D=30A$	Q_g	-	80	-	nC
Gate-Source Charge		Q_{gs}	-	17	-	
Gate-Drain("Miller") Charge		Q_{gd}	-	21	-	
Turn-on delay time	$V_{DD}=20V$ $I_D=30A$ $R_L=1\Omega$ $R_{GEN}=3\Omega$ $V_{GS}=10V$	t_{d(on)}	-	21	-	ns
Turn-on Rise Time		T_r	-	32	-	
Turn-Off Delay Time		t_{d(OFF)}	-	71	-	
Turn-Off Fall Time		t_f	-	40	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	150	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	600	A
Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time	$T_J=25^\circ C, I_F=20A, dI/dt=100A/\mu s$	t_{rr}	-	27		ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	46		nC

Note :

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、The EAS data shows Max. rating . The test condition is $T_J=25^\circ C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=33A$
- 3、The data tested by pulsed , pulse width $\cong 300\mu s$, duty cycle $\cong 2\%$
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.
- 6、Package limitation current is 180A

Ratings and Characteristic Curves

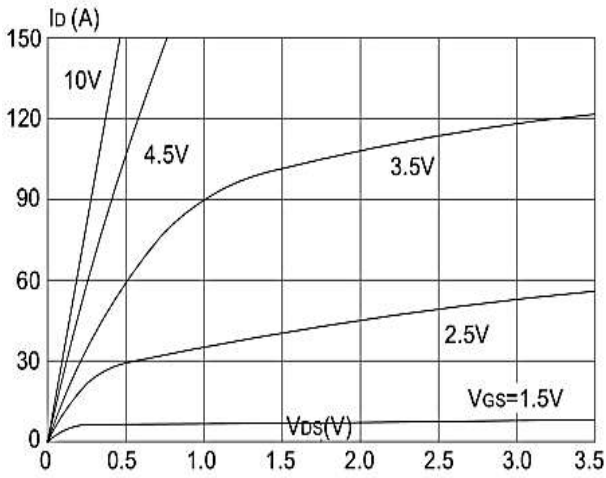


Figure1: Output Characteristics

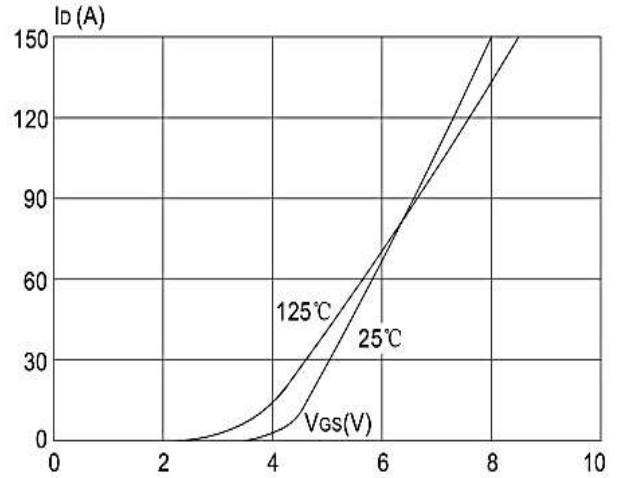


Figure 2: Typical Transfer Characteristics

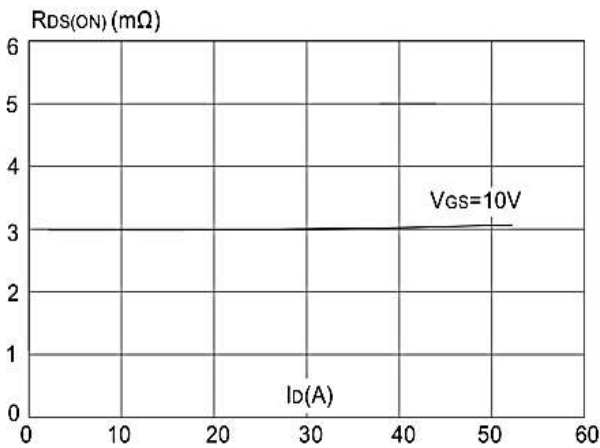


Figure 3: On-resistance vs. Drain Current

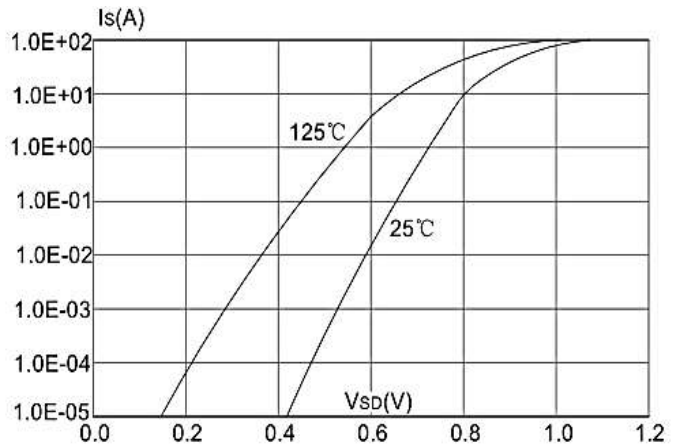


Figure 4: Body Diode Characteristics

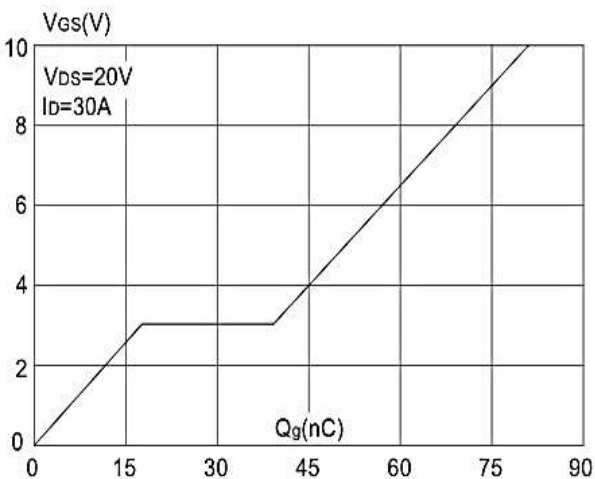


Figure 5: Gate Charge Characteristics

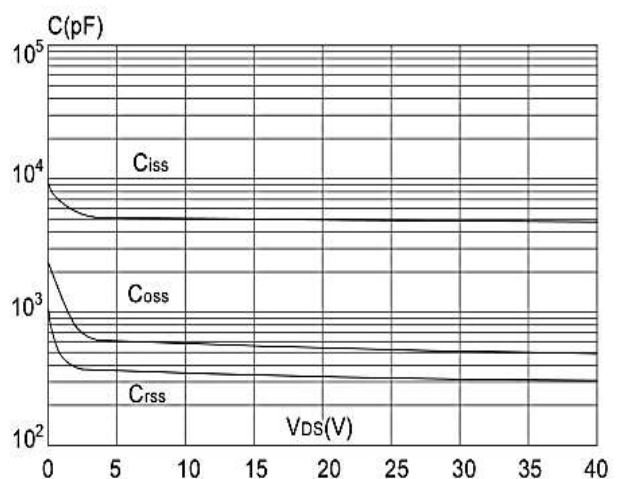


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

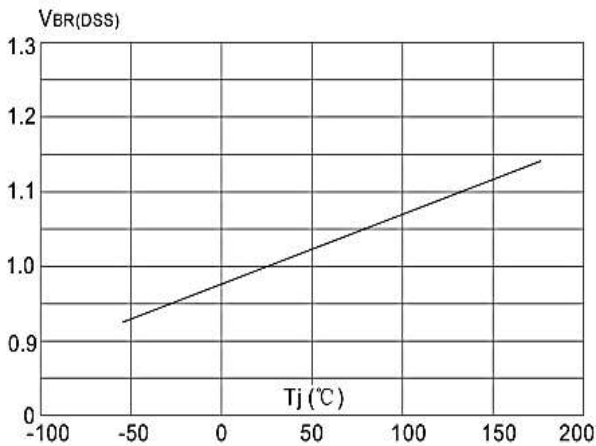


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

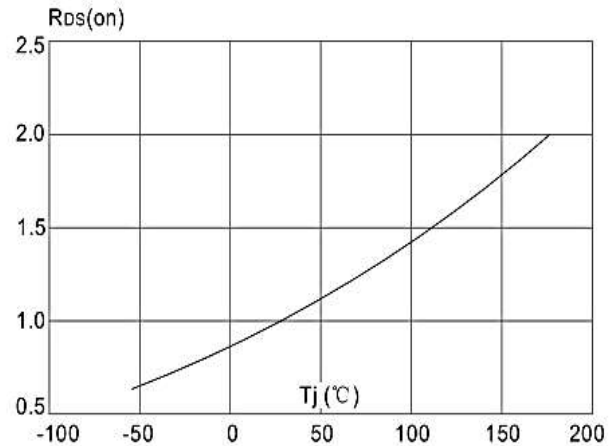


Figure 8: Normalized on Resistance vs. Junction Temperature

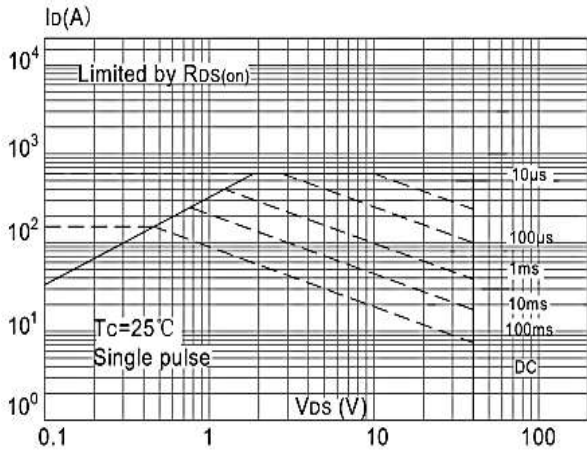


Figure 9: Maximum Safe Operating Area

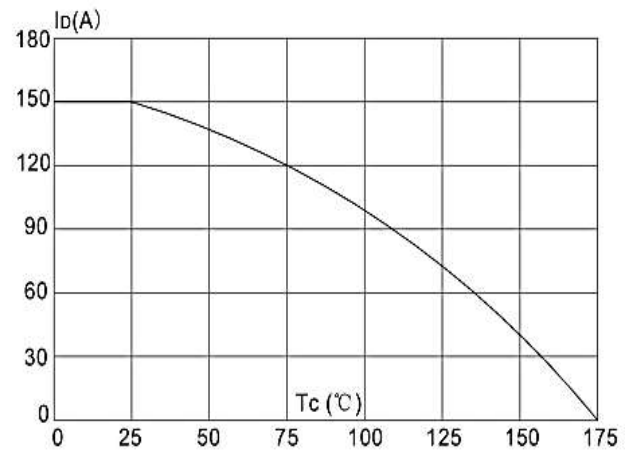


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

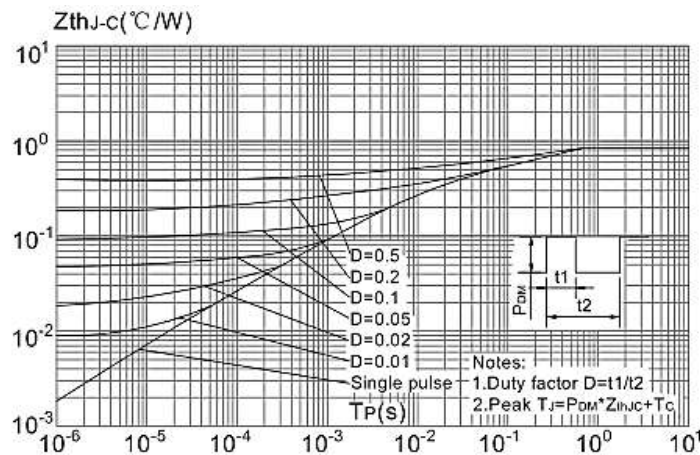


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

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			