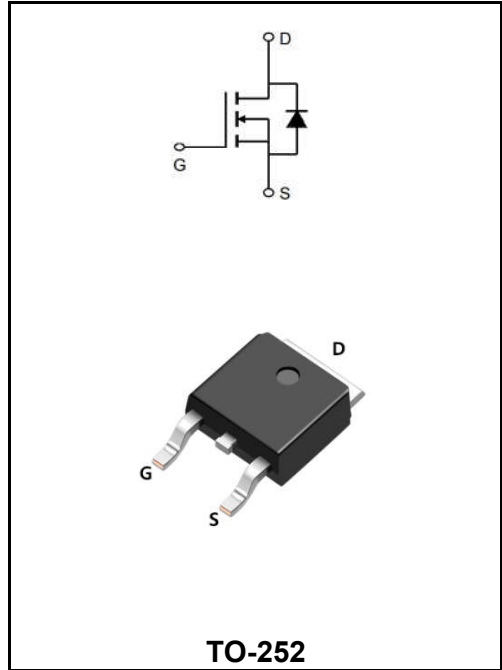


20V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	120A
V_{DSS}	20V
R_{DS(on)-typ(@V_{GS}=4.5V)}	< 3.0mΩ (Type:2.1 mΩ)



Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW120N02AD	TO-252	YFW 120N02AD XXXXX	2500PCS/Tape

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	20	V
Gate - Source Voltage	V_{GS}	± 12	V
Continuous Drain Current, V _{GS} @ 10V ¹ @T _c =25°C	I_D	120	A
Continuous Drain Current, V _{GS} @ 10V ¹ @T _c =100°C	I_D	69	A
Pulsed Drain Current ^{note1}	I_{DM}	360	A
Single Pulse Avalanche Energy ^{note2}	E_{AS}	110	mJ
Power Dissipation	P_D	83	W
Thermal Resistance Junction-ambient	R_{θJA}	62.5	°C/W
Thermal Resistance Junction to Case	R_{θJC}	1.85	°C/W
Operating and Storage Temperature Range	T_J , T_{STG}	-55 to +175	°C

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	20	22	-	V
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate - Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	0.5	0.68	1.0	V
Static Drain-Source on-Resistance note3	$V_{GS}=4.5V, I_D=30A$	R_{DS(ON)}	-	2.1	3.5	mΩ
	$V_{GS}=2.5V, I_D=20A$		-	3.2	4.0	
Input Capacitance	$V_{DS}=10V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	4307	-	μF
Output Capacitance		C_{oss}	-	501	-	
Reverse Transfer Capacitance		C_{rss}	-	321	-	
Total Gate Charge	$V_{DS}=10V$ $I_D=30A$ $V_{GS}=4.5V$	Q_g	-	48	-	nC
Gate-Source Charge		Q_{gs}	-	3.6	-	
Gate-Drain("Miller") Charge		Q_{gd}	-	19	-	
Turn-on delay time	$V_{DS}=10V$ $I_D=30A$ $R_{GEN}=1.8\Omega$ $V_{GS}=4.5V$	t_{D(on)}	-	9.7	-	ns
Turn-on Rise Time		T_r	-	37	-	
Turn-Off Delay Time		t_{d(OFF)}	-	63	-	
Turn- Off Fall Time		t_f	-	52	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	120	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	360	A
Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_{SD}=30A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$T_J=25^\circ C, I_F=30A, di/dt=100A/\mu s$	t_{rr}	-	23	-	ns
Reverse Recovery Charge		Q_{rr}	-	10	-	nC

Note :

- 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 .The EAS data shows Max. rating .
- 3、 The EAS condition: $T_J=25^\circ C, V_{DD}=16V, V_G=4.5V, R_G=25\Omega, L=0.1mH, I_{AS}=55A$
- 4、 The power dissipation is limited by 175°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

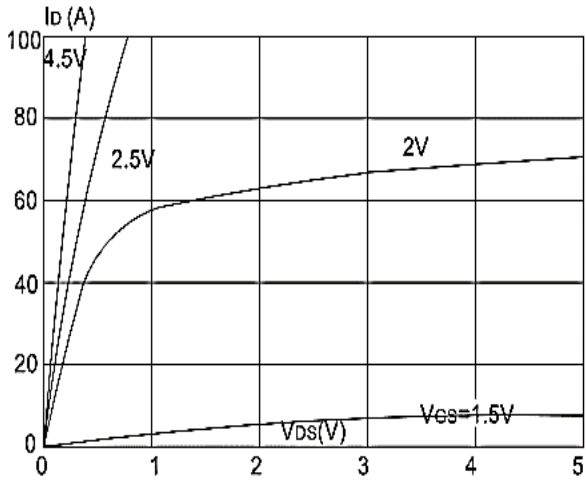


Figure1: Output Characteristics

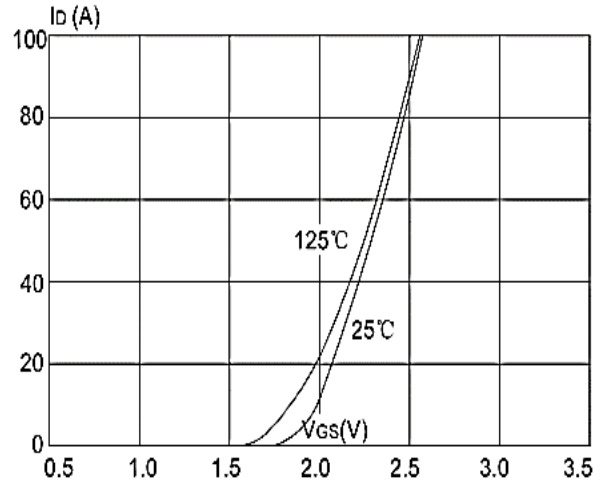


Figure 2: Typical Transfer Characteristics

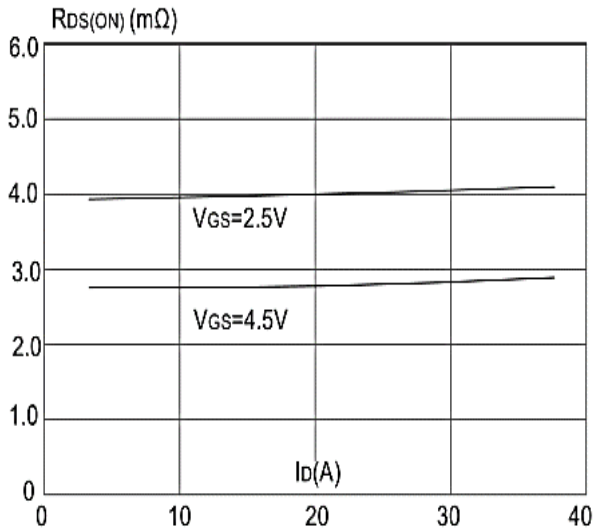


Figure 3: On-resistance vs. Drain Current

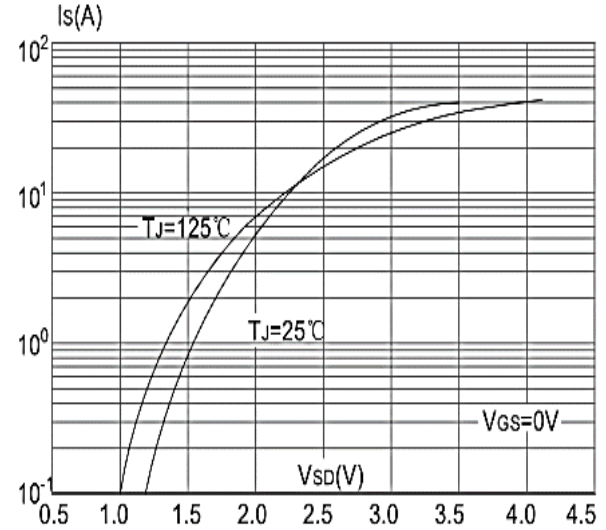
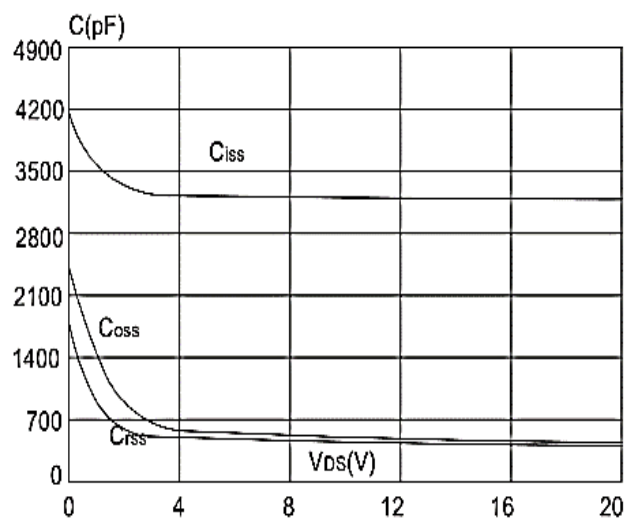
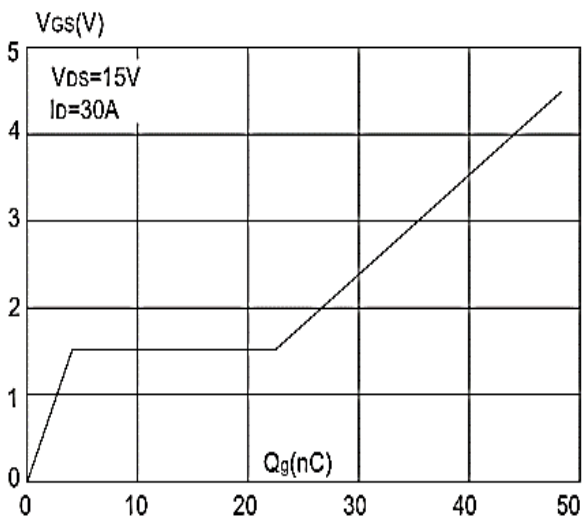


Figure 4: Body Diode Characteristics



Ratings and Characteristic Curves

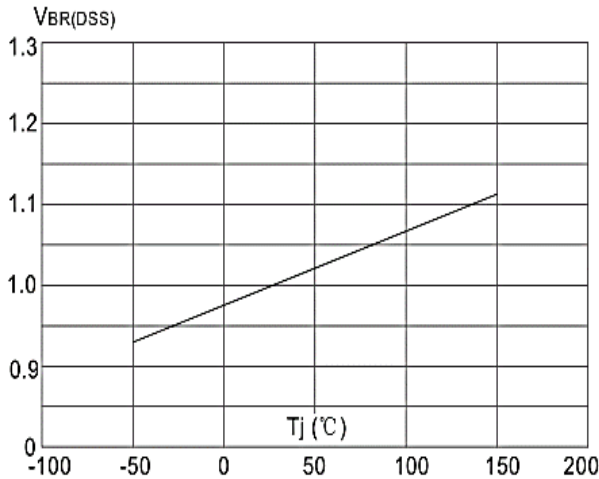


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

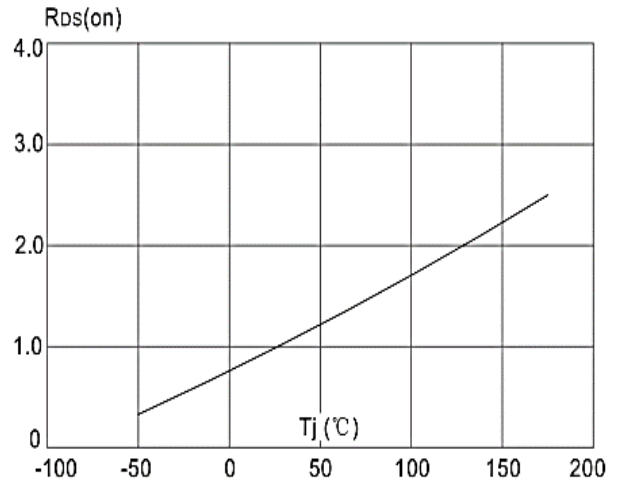


Figure 8: Normalized on Resistance vs. Junction Temperature

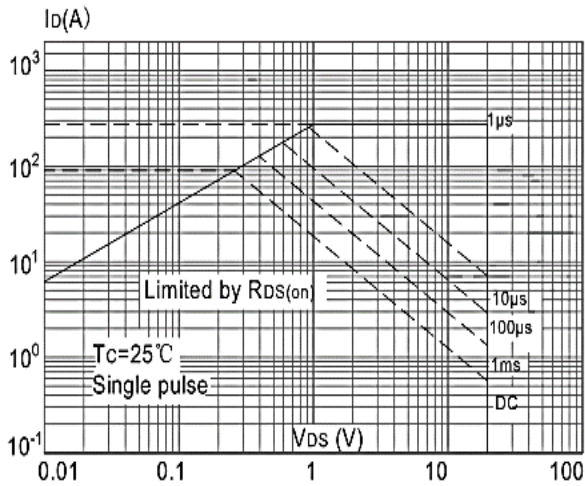


Figure 9: Maximum Safe Operating Area

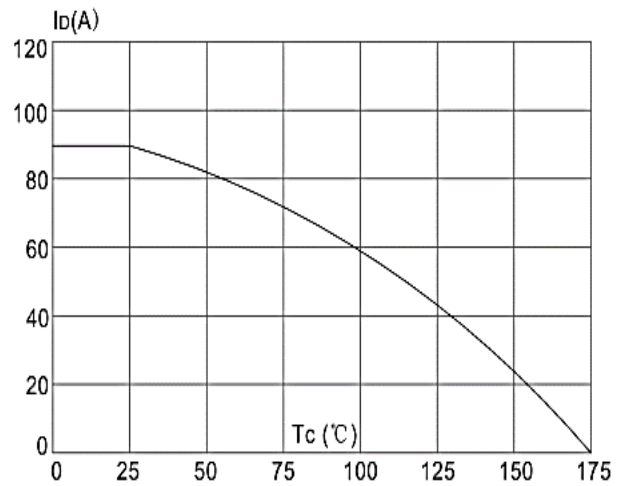


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

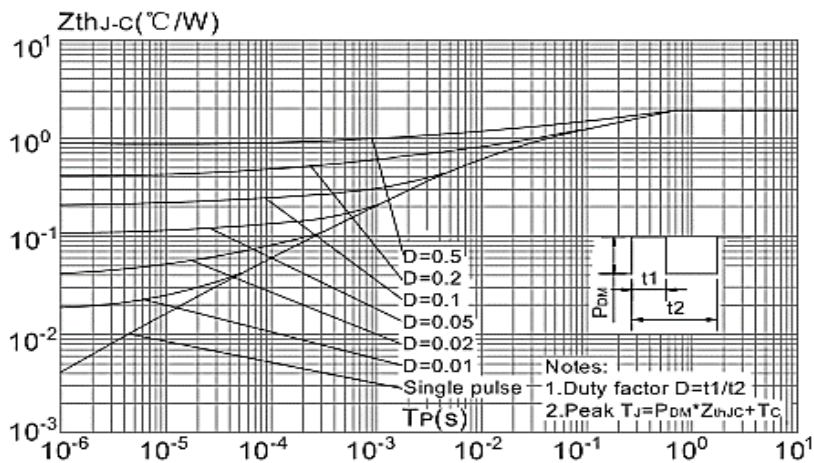


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Outline Dimensions Millimeters

TO-252

Dim.	Min.	Typ.	Max.
A	2.10	-	2.50
A2	0	-	0.10
B	0.66	-	0.86
B2	5.18	-	5.48
C	0.40	-	0.60
C2	0.44	-	0.58
D	5.90	-	6.30
D1	5.30REF		
E	6.40	-	6.80
E1	4.63	-	-
G	4.47	-	4.67
H	9.50	-	10.70
L	1.09	-	1.21
L2	1.35	-	1.65
V1	-	7°	-
V2	0°	-	6°
All Dimensions in millimeter			