

60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	220A
V_{DSS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$< 3m\Omega$ (Type: 2.4 m Ω)

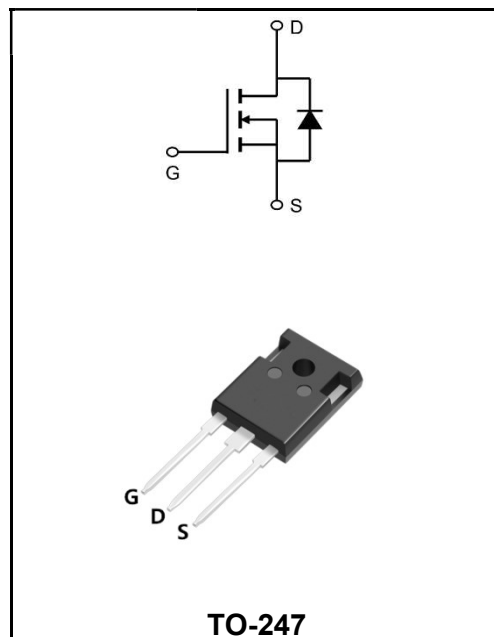
Features

◆ YFW-SGT technology



Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW220N06AP	TO-247	YFW 220N06AP XXXXX	600PCS/Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current 10V ^{1.6} @T _C =25°C	I_D	220	A
Continuous Drain Current, 10V ^{1.6} @T _C =100°C	I_D	136	A
Pulsed Drain Current ²	I_{DM}	660	A
Single Pulse Avalanche Energy ³	E_{AS}	101	mJ
Avalanche Current	I_{AS}	130	A
Total Power Dissipation ⁴ @T _C =25°C	P_D	168	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating and Storage Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	40	°C/W
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	1.5	°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	67	-	V
Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate-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	2.6	4.0	V
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	-	2.4	3.0	m Ω
	$V_{GS}=6V, I_D=15A$		-	4.2	5.0	
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=100KHz$	C_{iss}	-	5950	-	μF
Output Capacitance		C_{oss}	-	1250	-	
Reverse Transfer Capacitance		C_{rss}	-	85	-	
Total Gate Charge	$V_{DS}=50V$ $V_{GS}=10V$ $I_D=50A$	Q_g	-	93	-	nC
Gate-Source Charge		Q_{gs}	-	17	-	
Gate-Drain Charge		Q_{gd}	-	14	-	
Reverse Recovery Charge	$I_F=25A, dI/dt=100A/\mu s$	Q_{rr}	-	73	-	nC
Reverse Recovery Time		t_{rr}	-	68	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DD}=30V$ $I_D=25A$ $R_{GEN}=2\Omega$	$t_{d(on)}$	-	22.5	-	ns
Turn-on Rise Time		T_r	-	6.7	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	80.3	-	
Turn-Off Fall Time		t_f	-	26.9	-	
Diode Forward Voltage	$I_S=20A, V_{GS}=0V$	V_{SD}	-	-	1.2	V
Maximum Body-Diode Continuous Current		I_S	-	-	200	A

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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is $V_{DD}=48V, V_{GS}=10V, L=0.1mH, I_{AS}=130A$
- 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

Ratings and Characteristic Curves

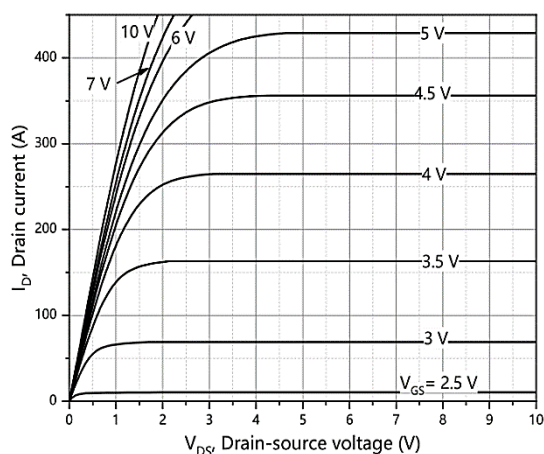


Figure 1. Typ. output characteristics

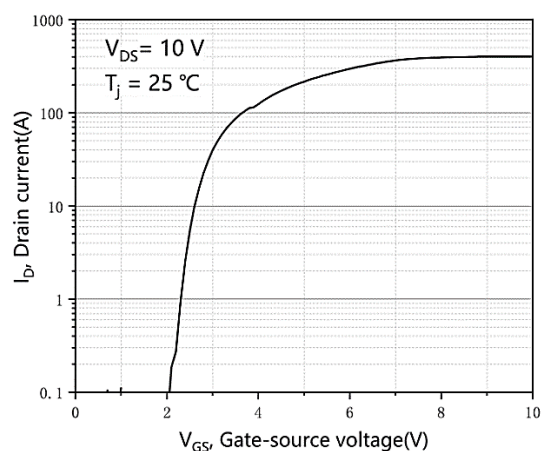


Figure 2. Typ. transfer characteristics

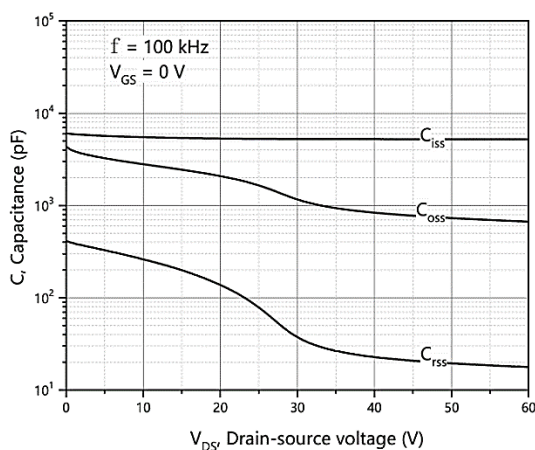


Figure 3. Typ. capacitances

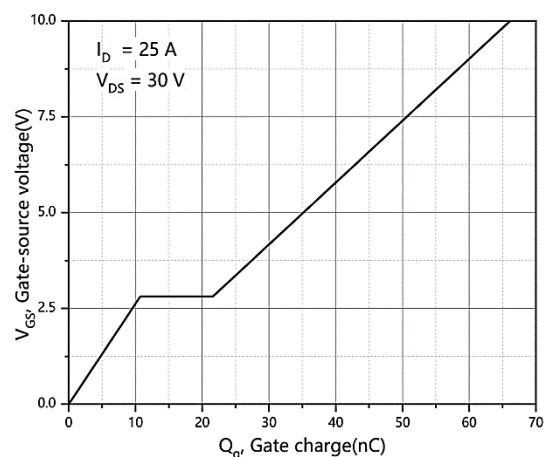


Figure 4. Typ. gate charge

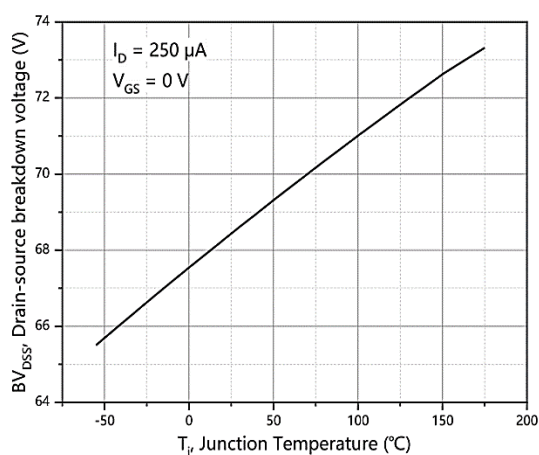


Figure 5. Drain-source breakdown voltage

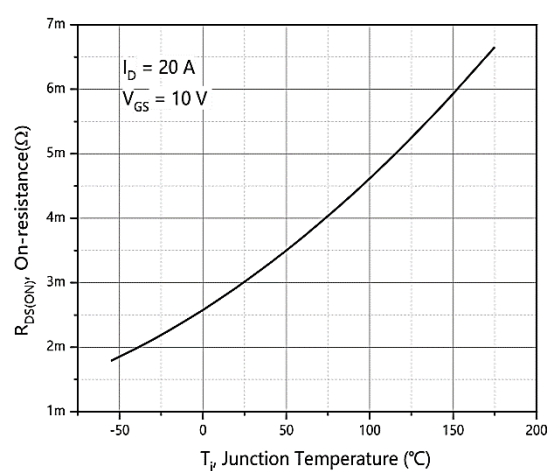


Figure 6. Drain-source on-state resistance

Ratings and Characteristic Curves

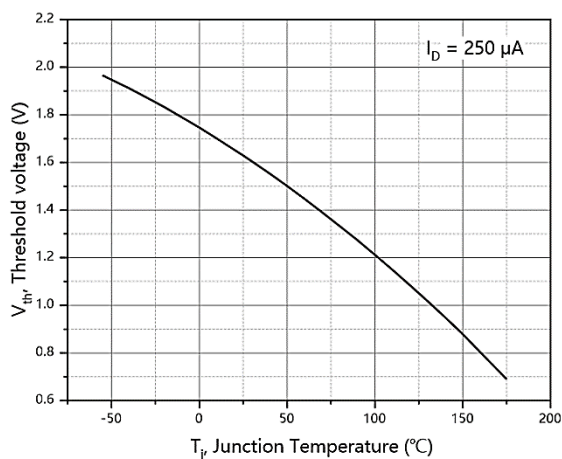


Figure 7. Threshold voltage

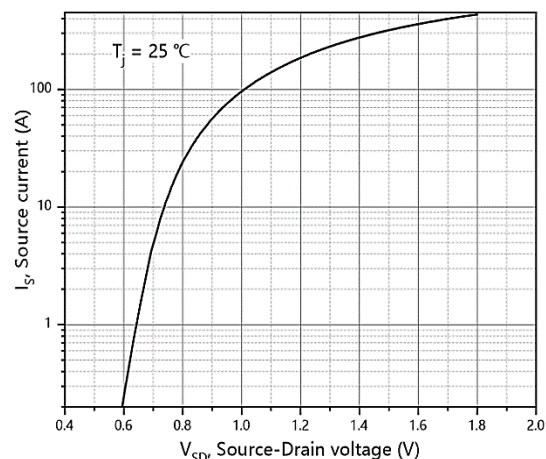


Figure 8. Forward characteristic of body diode

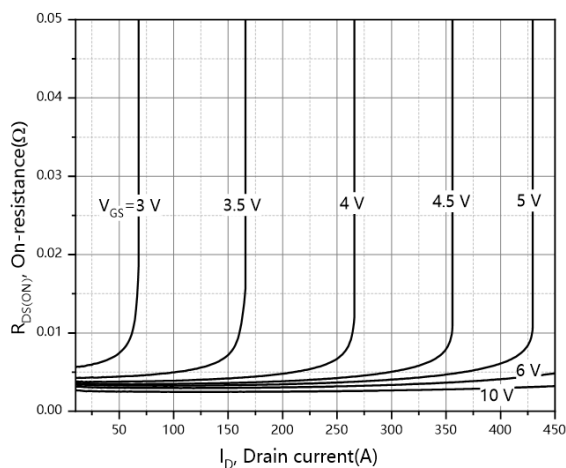


Figure 9. Drain-source on-state resistance

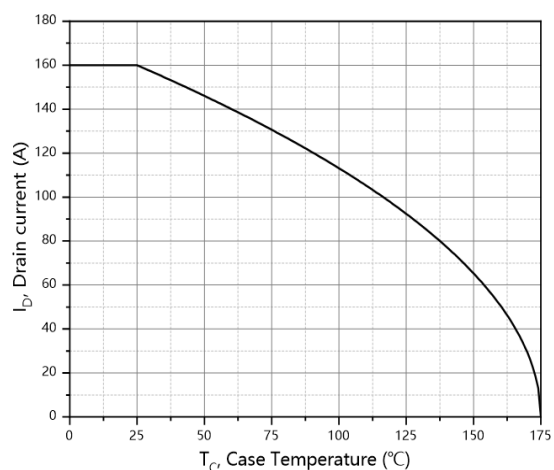


Figure 10. Drain current

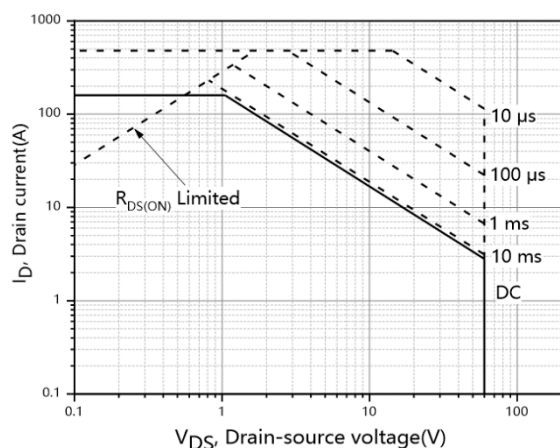


Figure 11. Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

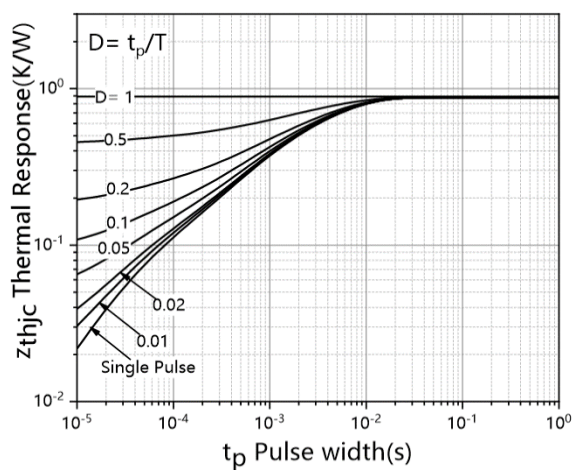
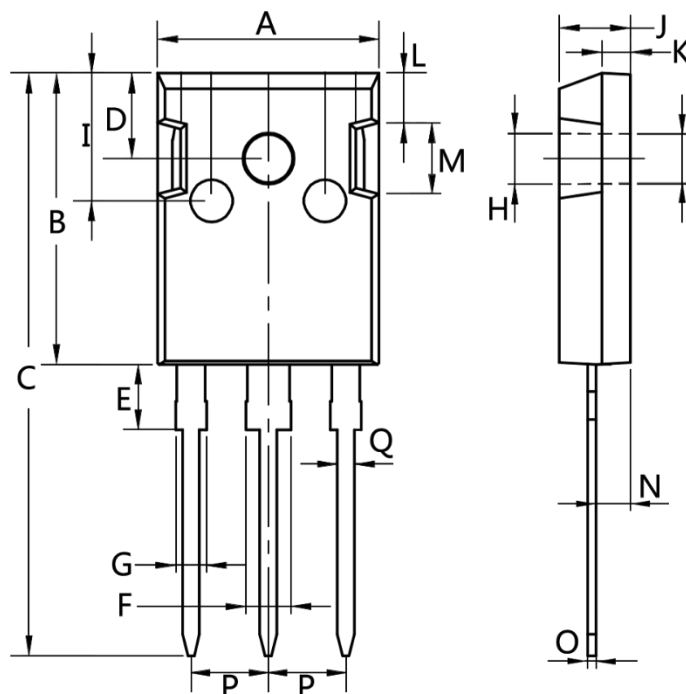


Figure 12. Max. transient thermal impedance

TO-247



Dim.	Min.	Max.
A	15.0	16.0
B	20.0	21.0
C	41.0	42.0
D	5.0	6.0
E	4.0	5.0
F	2.5	3.5
G	1.75	2.5
H	3.0	3.5
I	8.0	10.0
J	4.9	5.1
K	1.9	2.1
L	3.5	4.0
M	4.75	5.25
N	2.0	3.0
O	0.55	0.75
P	Typ 5.08	
Q	1.2	1.3