

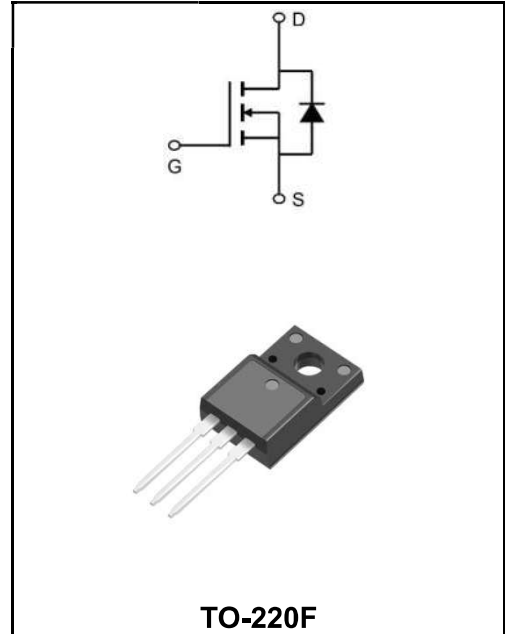
60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	60A
V_{DSS}	60V
R_{DS(on)-typ(@V_{GS}=10V)}	< 15mΩ (Type:11 mΩ)

Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW60N06AF	TO-220F	YFW 60N06AF XXXXX	1000PCS/Tape

Maximum Ratings at T_c=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, V _{GS} @ 10V ¹ @T _C =25°C	I_D	60	A
Continuous Drain Current, V _{GS} @ 10V ¹ @T _C =100°C	I_D	35	A
Pulsed Drain Current ²	I_{DM}	180	A
Single Pulse Avalanche Energy ³	E_{AS}	39.2	mJ
Avalanche Current	I_{AS}	38	A
Power Dissipation ⁴ @T _C =25°C	P_D	45	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}	62.5	°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	2.8	°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	65	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	0.057	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	-	11	15	mΩ
	$V_{GS}=4.5V, I_D=10A$		-	16	20	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-5.68	-	mV/°C
Drain -Source Leakage Current	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
			-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=5V, I_D=15A$	g_{FS}	-	45	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	R_g	-	1.7	-	Ω
Total Gate Charge(4.5V)	$V_{DS}=48V$ $V_{GS}=4.5V$ $I_D=15A$	Q_g	-	19.3	-	nC
Gate-Source Charge		Q_{gs}	-	7.1	-	
Gate-Drain Charge		Q_{gd}	-	7.6	-	
Turn-on delay time	$V_{DD}=30V$ $V_{GS}=10V$ $R_G=3.3\Omega$ $I_D=15A$	$t_{d(on)}$	-	7.2	-	ns
Rise Time		T_r	-	50	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	36.4	-	
Fall Time		t_f	-	7.6	-	
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	2423	-	pF
Output Capacitance		C_{oss}	-	145	-	
Reverse Transfer Capacitance		C_{rss}	-	97	-	
Continuous Source Current ^{1,5}	$V_G=V_D=0V, \text{Force Current}$	I_S	-	-	35	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	80	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=A, T_J=25^\circ C$	V_{SD}	-	-	1	V
Reverse Recovery Time	$I_F=15A, di/dt=100A/\mu s, T_J=25^\circ C$	t_{rr}	-	16.3	-	nS
Reverse Recovery Charge		Q_{rr}	-	11	-	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=38A$
- 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

Typical Characteristics

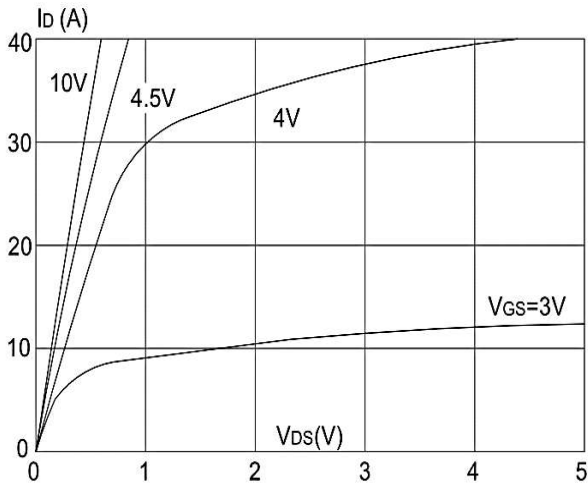


Figure 1: Output Characteristics

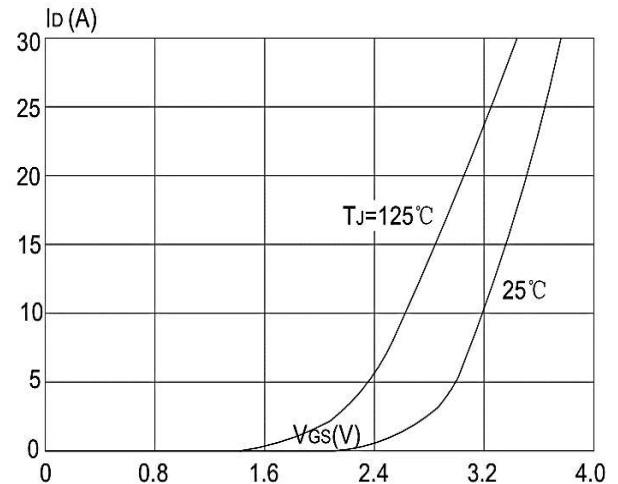


Figure 2: Typical Transfer Characteristics

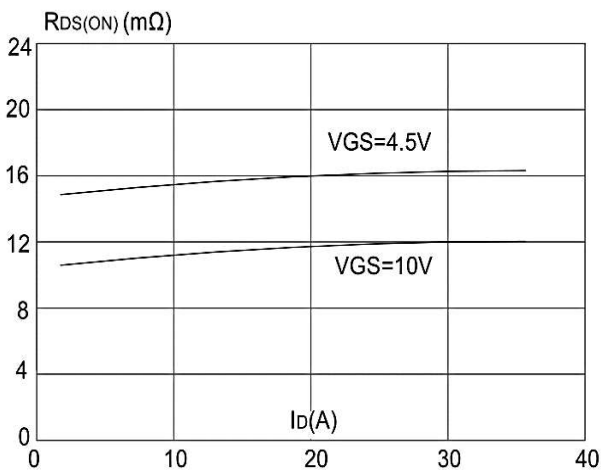


Figure 3: On-resistance vs. Drain Current

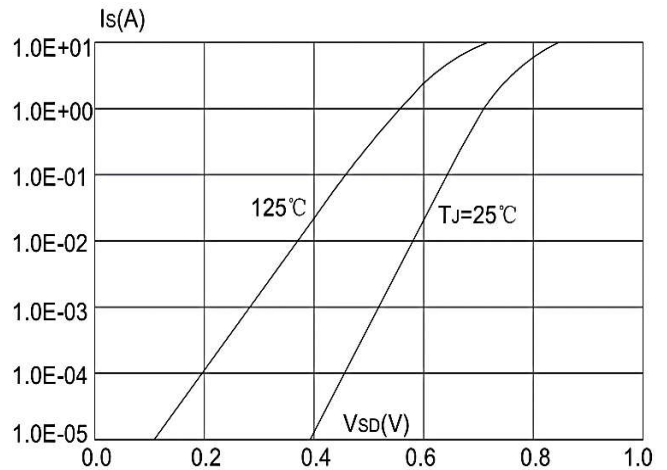


Figure 4: Body Diode Characteristics

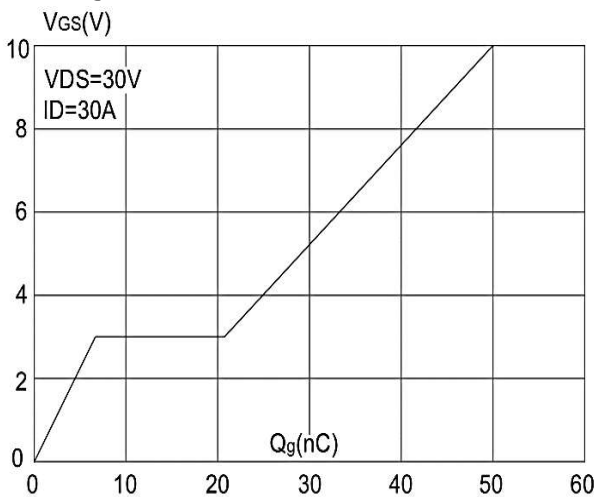


Figure 5: Gate Charge Characteristics

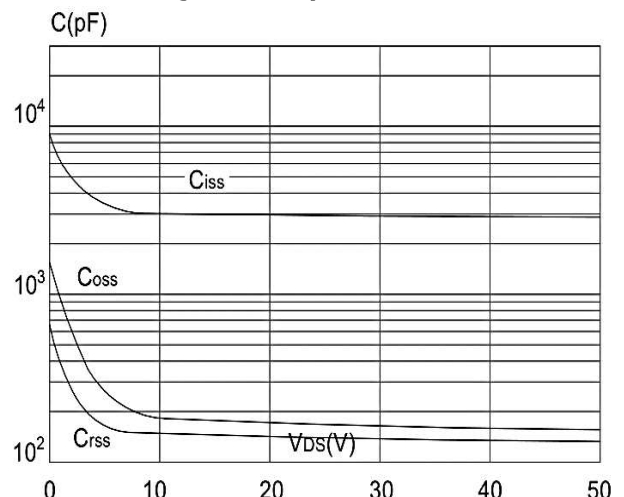


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

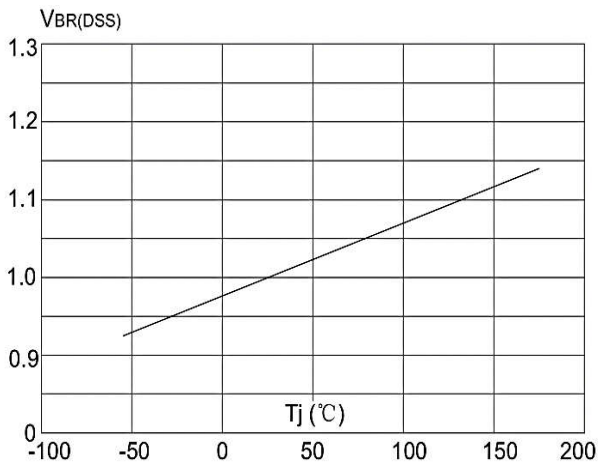


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

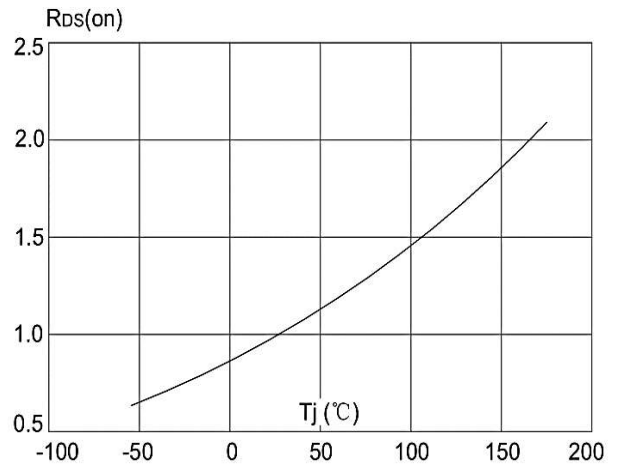


Figure 8: Normalized on Resistance vs. Junction Temperature

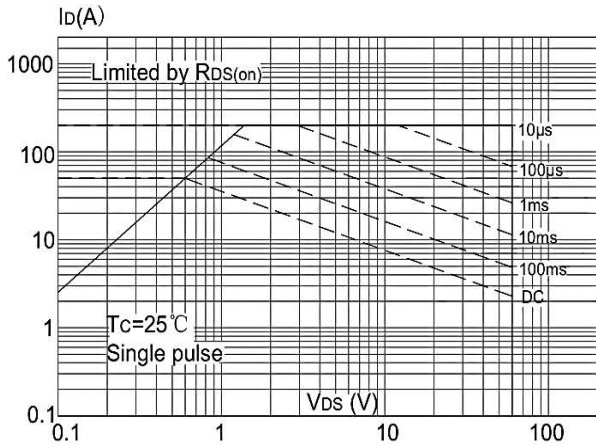


Figure 9: Maximum Safe Operating Area

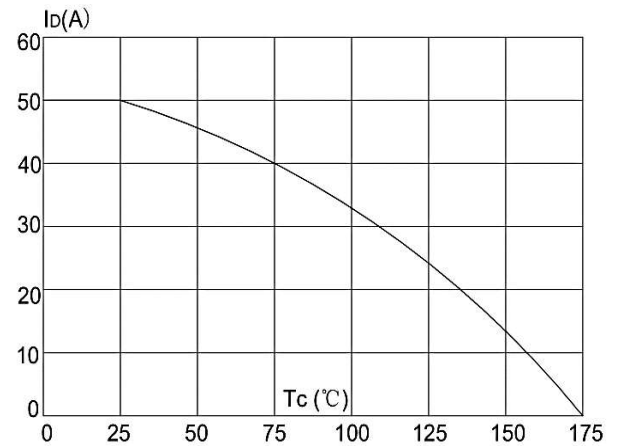


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

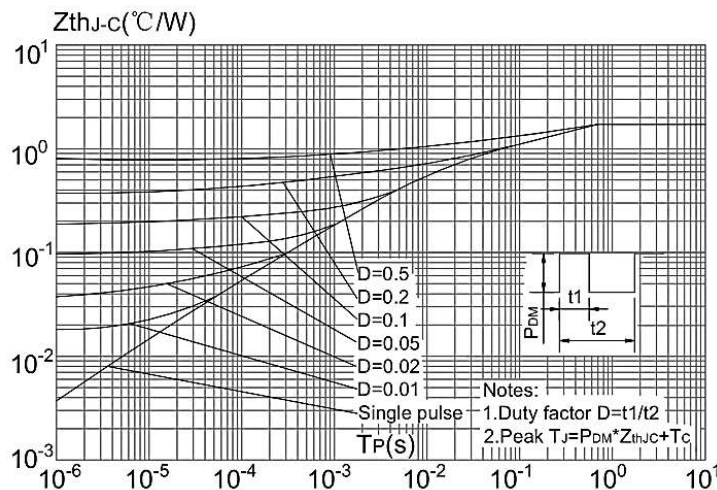


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Outline Dimensions Millimeters

TO-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			