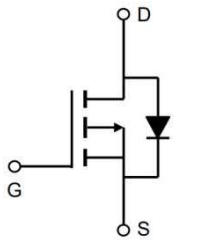
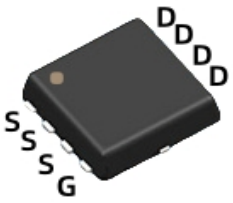
-20V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-50A
V_{DSS}	-20V
R_{DSON}-typ(@V_{GS}=-4.5V)	< 9mΩ(Type:6.8 mΩ)





PDFN3*3-8L

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Maximum Ratings at Tc=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} @ -4.5V[1] @T_C=25℃	I_D	-50	A
Continuous Drain Current, V_{GS} @ -4.5V[1] @T_C=70℃	I_D	-18	A
Pulsed Drain Current [2]	I_{DM}	-100	A
Total Power Dissipation[3] @T_C=25℃	P_D	29	W
Total Power Dissipation[3] @T_C=70℃	P_D	19	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]	$R_{\theta JA}$	75	°C/W
Thermal Resistance Junction-Ambient [1] (t ≤10s)	$R_{\theta JA}$	40	°C/W
Thermal Resistance Junction to Case[1]	$R_{\theta JC}$	4.2	°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	BV_{DSS}	-20	-22	-	V
BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	$\Delta BV_{DSS/\Delta TJ}$	-	-0.012	-	V/°C
Static Drain-Source On-Resistance [2]	V_{GS}=-4.5V, I_D=-15A	$R_{DS(ON)}$	-	6.8	9	mΩ
	V_{GS}=-2.5V, I_D=-10A		-	8.2	11	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	$V_{GS(th)}$	-0.3	-0.6	-1.0	V
V_{GS}(th) Temperature Coefficient		$\Delta V_{GS(th)}$	-	2.94	-	mV/°C
Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	1	μA
Gate –Source Leakage Current	V_{GS}=±12V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=-5V , I_D=-10A	g_{fs}	-	43	-	S
Total Gate Charge(-4.5V)	V_{DS}=-15V V_{GS}=-4.5V I_D=-10A	Q_g	-	63	-	nC
Gate-Source Charge		Q_{gs}	-	9.1	-	
Gate-Drain Charge		Q_{gd}	-	13	-	
Turn-on delay time	V_{DD} =-10V V_{GS}=-4.5V I_D= -10A R_G=3.3Ω	$t_{d(on)}$	-	15.8	-	ns
Rise Time		T_r	-	76.8	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	193	-	
Fall Time		t_f	-	186.4	-	
Input Capacitance	V_{DS}=-15V V_{GS}=0V f=1MHz	C_{iss}	-	5783	-	pF
Output Capacitance		C_{oss}	-	509	-	
Reverse Transfer Capacitance		C_{rss}	-	431	-	
Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	I_S	-	-	-10.7	A
Pulsed Source Current[2,4]		I_{SM}	-	-	-60	A
Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	V_{SD}	-	-	-1.2	V
Reverse Recovery Time	I_F=-10A, dI/dt=100A/μs, T_J=25℃	t_{rr}	-	27	-	ns
Reverse Recovery Charge		Q_{rr}	-	17.8	-	nC

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 ≦ 300us , duty cycle ≦ 2%
3、The power dissipation is limited by 150℃ junction temperature
4、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

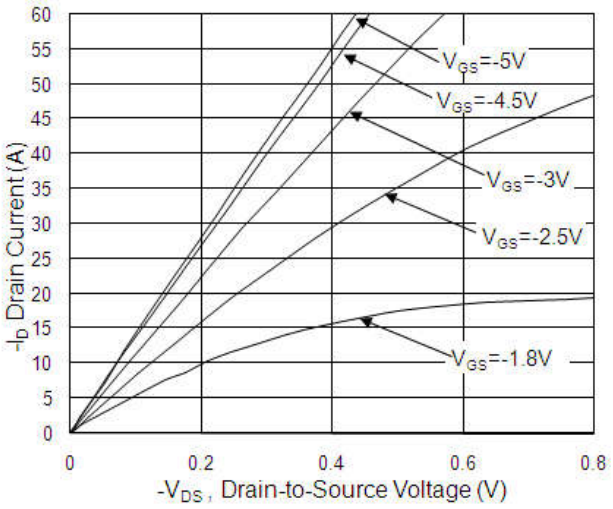


Fig.1 Typical Output Characteristics

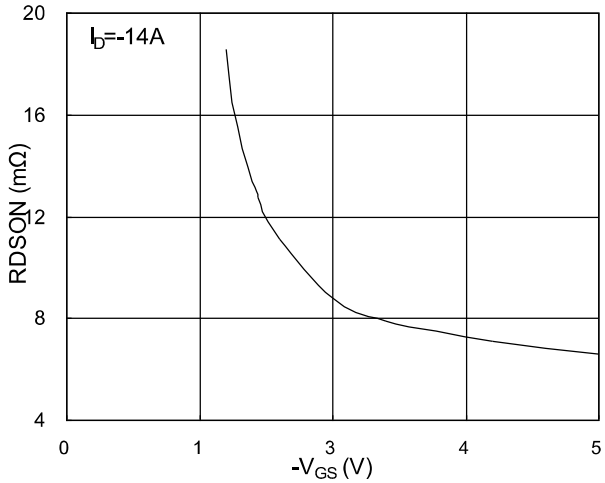


Fig.2 On-Resistance vs. G-S Voltage

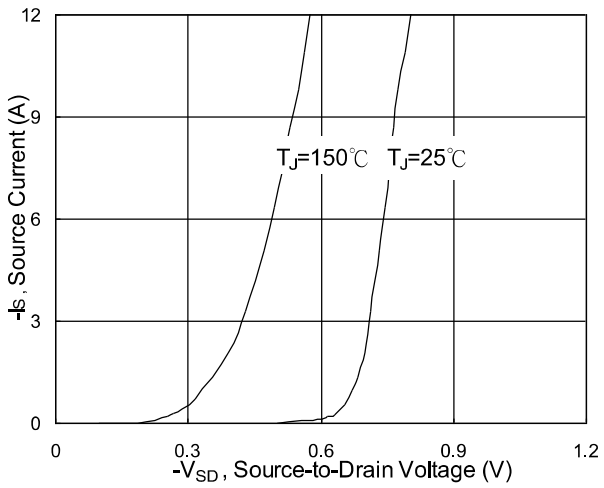


Fig.3 Forward Characteristics of Reverse

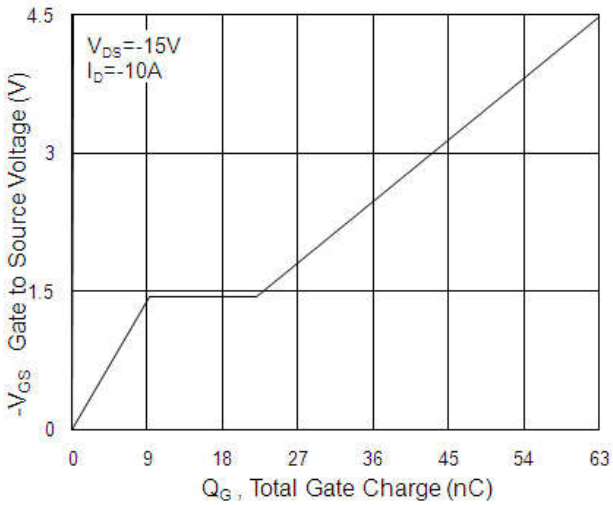


Fig.4 Gate-charge Characteristics

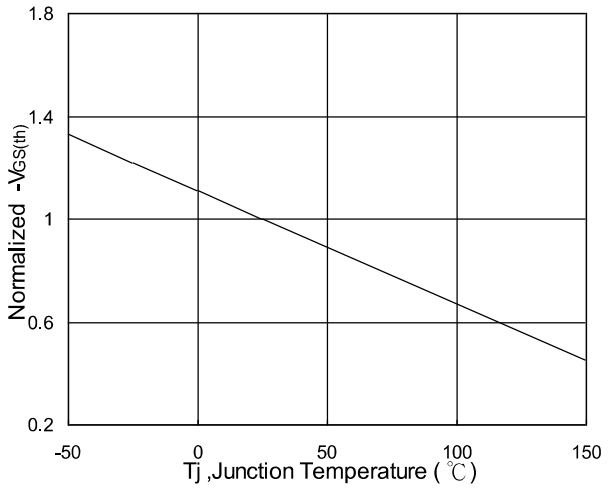


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

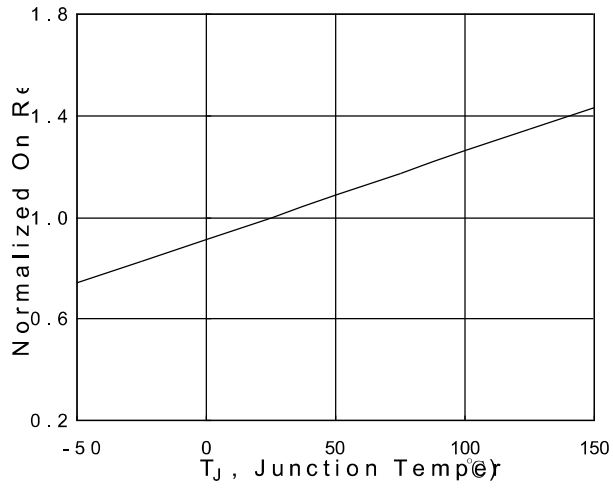


Fig.6 Normalized R_{DSON} vs. T_J

Ratings and Characteristic Curves

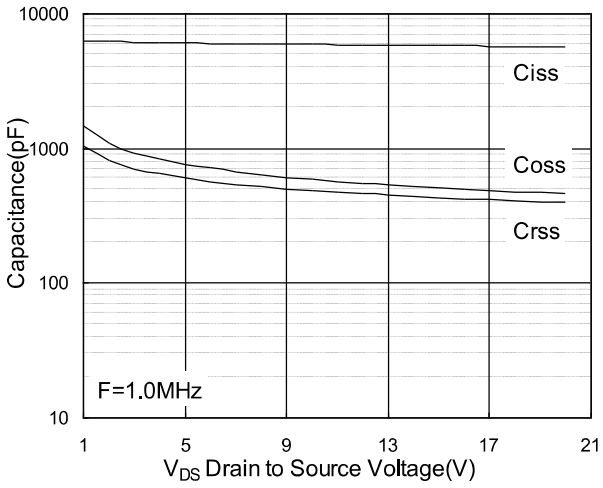


Fig.7 Capacitance

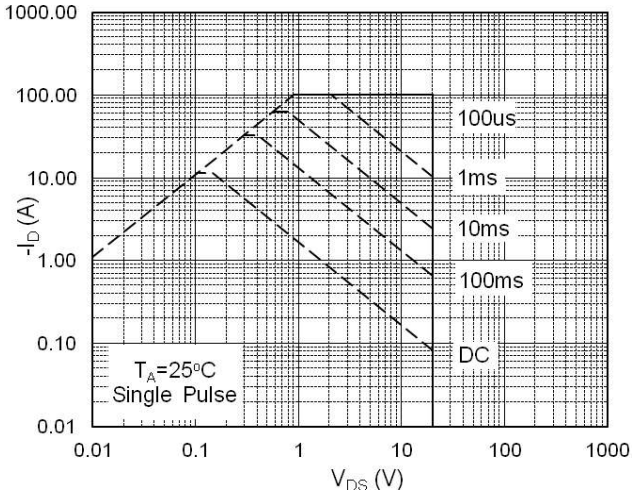


Fig.8 Safe Operating Area

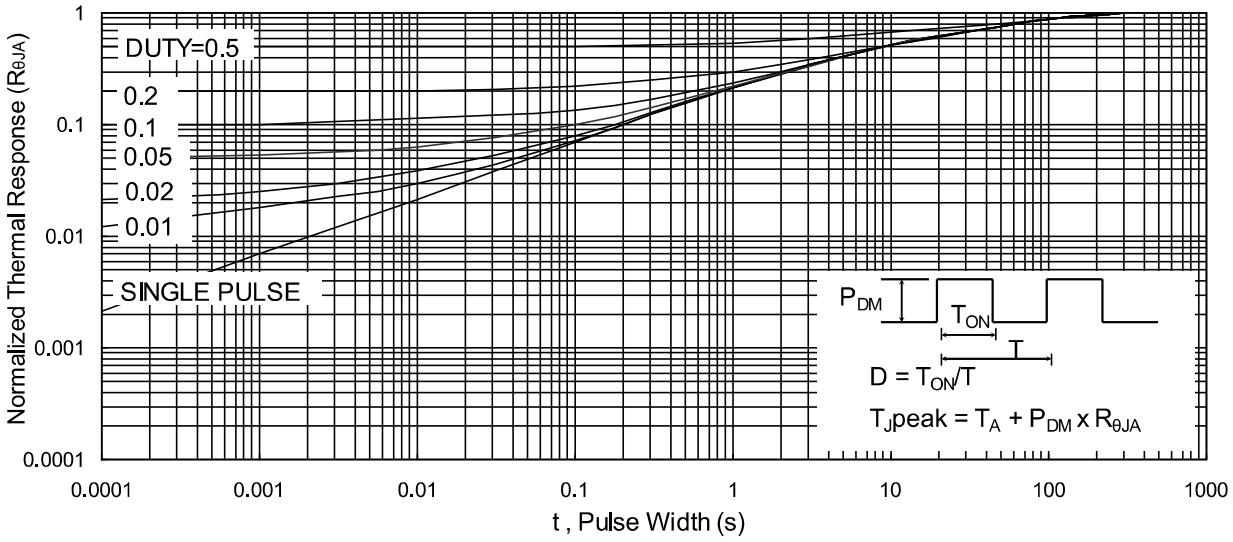


Fig.9 Normalized Maximum Transient Thermal Impedance

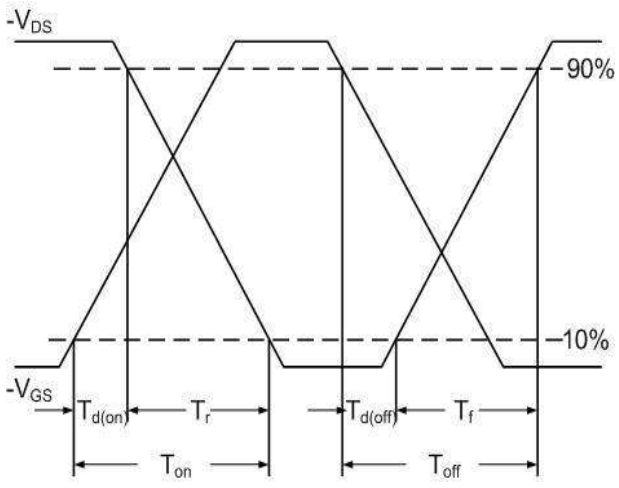


Fig.10 Switching Time Waveform

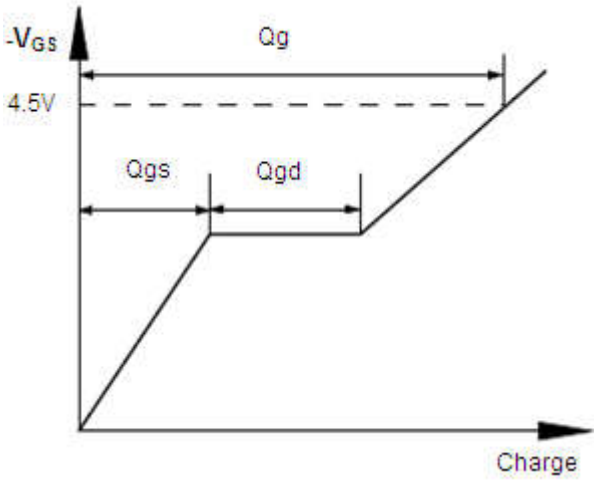
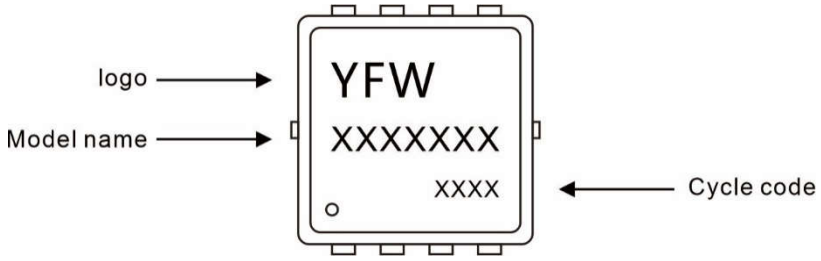


Fig.11 Gate Charge Waveform

Marking Diagram

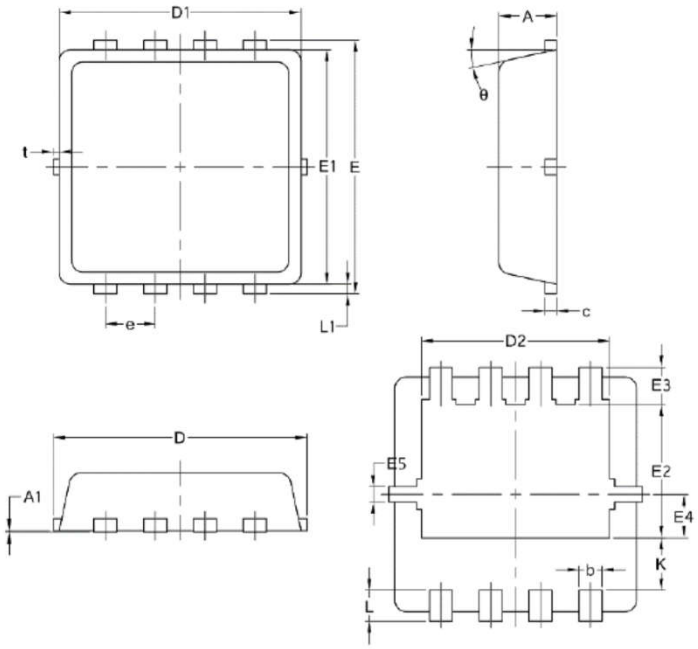


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW50P02DF	PDFN3*3-8L	0.0023oz(0.065g)	5000pcs/reel	10000pcs/box 50000pcs/Carton

Package Dimensions

PDFN3*3-8L



Dim	Millimeter		mil	
	Min.	Max.	Min.	Max.
A	0.70	0.85	0.0276	0.0335
A1	-	0.05	-	0.002
b	0.20	0.40	0.008	0.016
c	0.10	0.25	0.004	0.010
D	3.15	3.45	0.124	0.136
D1	3.00	3.25	0.118	0.128
D2	2.29	2.65	0.09	0.104
E	3.15	3.45	0.124	0.136
E1	2.90	3.20	0.114	0.126
E2	1.54	1.94	0.061	0.076
E3	0.28	0.65	0.011	0.026
E4	0.37	0.77	0.015	0.030
E5	0.10	0.30	0.004	0.012
e	0.60	0.70	0.024	0.028
K	0.59	0.89	0.023	0.035
L	0.30	0.50	0.012	0.020
L1	0.06	0.20	0.002	0.008
t	-	0.13	-	0.005
Φ	10℃	14℃	10℃	14℃

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