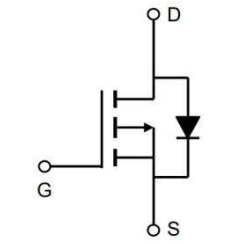
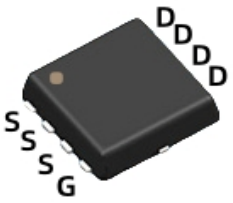
-60V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-40A
V_{DS}	-60V
R_{DSON}-typ(@V_{GS}=-10V)	＜25mΩ(Typ:21mΩ)
R_{DSON}-typ(@V_{GS}=-4.5V)	＜35mΩ(Typ:26mΩ)





PDFN3*3-8L

DESCRIPTION

The YFW40P06DF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

APPLICATION

- Lithium batteryprotection
- Wireless impact
- Mobile phone fast charging

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	-60	V
Gate - Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (note1) @T_C=25℃	I_D	-40	A
Continuous Drain Current (note1) @T_C=100℃	I_D	-19	A
Pulsed Drain Current (note2)	I_{DM}	-110	A
Single Pulsed Avalanche Energy(note3)	E_{AS}	182	mJ
Power Dissipation @T_C=25℃	P_D	39	W
Power Dissipation @T_C=100℃		15	
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	65	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	3.2	°C/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	BV_{DSS}	-60	-	-	V
Zero Gate Voltage Drain Current	V_{DS}= -60V, V_{GS}=0V,	I_{DSS}	-	-	-1.0	μA
Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	I_{GSS}	-	-	±100	nA
Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	$V_{GS(th)}$	-1.0	1.6	-2.5	V
Static Drain-Source on-Resistance	V_{GS}= -10V, I_D= -20A	$R_{DS(ON)}$	-	21	25	mΩ
	V_{GS}= -4.5V, I_D= -15A		-	26	35	mΩ
Forward Transconductance	V_{DS} = -5V, I_D = -20A	g_{FS}	-	35	-	S
Input Capacitance(NoteS5)	V_{DS}=-30V V_{GS}=0V f=1.0MHz	C_{iss}	-	1713	-	pF
Output Capacitance(NoteS5)		C_{oss}	-	302	-	
Reverse Transfer Capacitance(NoteS5)		C_{rss}	-	13.5	-	
Gate Resistance	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz	R_g	-	4.5	-	Ω
Turn-on Delay Time(Notes5)	V_{DD}= -10V V_{GS}= -20V R_L=1.5Ω R_{GEN}=3.0Ω	$t_{d(on)}$	-	6.9	-	ns
Turn-on Rise Time(Notes5)		T_r	-	2.3	-	ns
Turn-off Delay Time(Notes5)		$t_{d(OFF)}$	-	32	-	ns
Turn-off Fall Time(Notes5)		t_f	-	5.5	-	ns
Total Gate Charge(4.5V）	V_{DS}= -30V I_D= -20A V_{GS}= -10V	Q_g	-	12.1	-	nC
Gate to Source Charge		Q_{gs}	-	6.4	-	nC
Gate to Drain Charge		Q_{gd}	-	3.1	-	nC
Maximun Body-Diode Continuous Current		I_S	-	-	-46	A
Drain to Source Diode Forward Voltage	I_S = -1A, V_{GS} = 0V	V_{SD}	-	-0.75	-1.0	V
Reverse Recovery Time	I_F = - 20A dI$_F$/ dt = 100 A/μs	t_{rr}	-	33	-	ns
Reverse Recovery Charge		Q_{rr}	-	35	-	nC

Notes:

1.Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro- mechanical application board design.

2.This single-pulse measurement was taken under T_{J_Max} = 150°C.

3.E_{AS} of 182 mJ is based on starting T_J = 25°C, L = 3.0mH, I_{AS} = -11A, V_{GS} = -10V, V_{DD} = -30V; 100% test at L = 0.1mH, I_{AS} = -40A. T_{J_Max} = 150°C.

4.The power dissipation P_D is based on T_{J_Max} = 150°C.

5.This value is guaranteed by design hence it is not included in the production test.

RATINGS AND CHARACTERISTIC CURVES

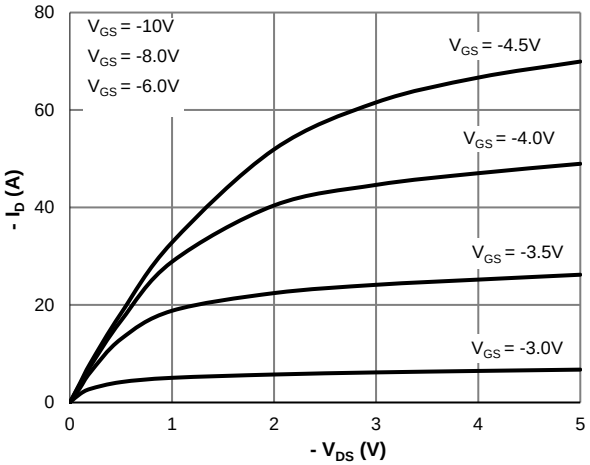


Figure 1: Saturation Characteristics

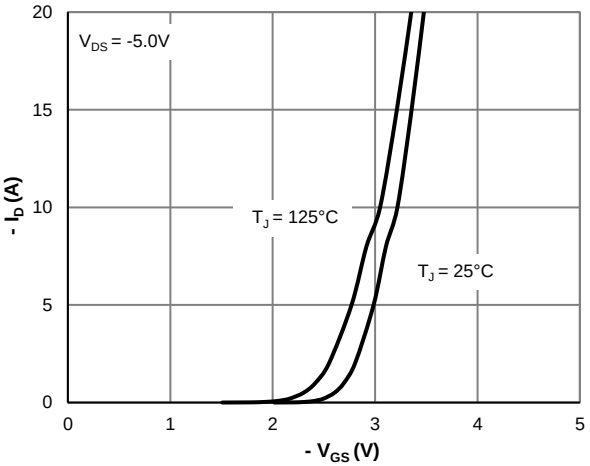


Figure 2: Transfer Characteristics

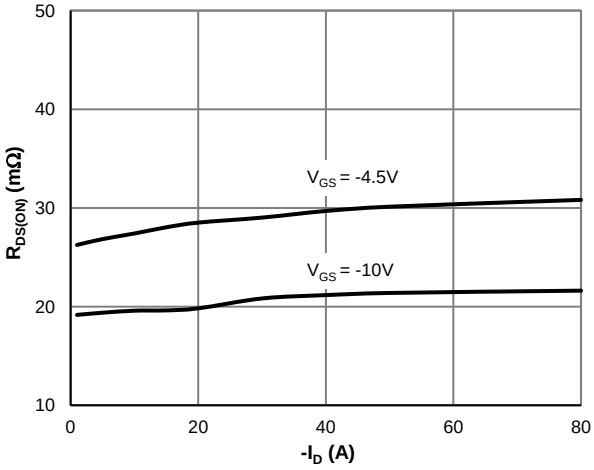


Figure 3: $R_{DS(ON)}$ vs. Drain Current

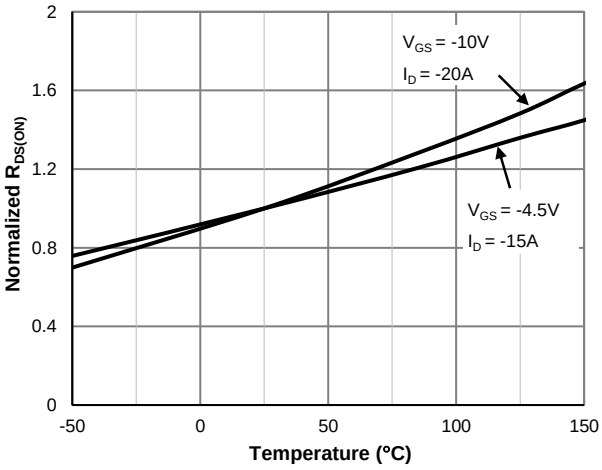


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

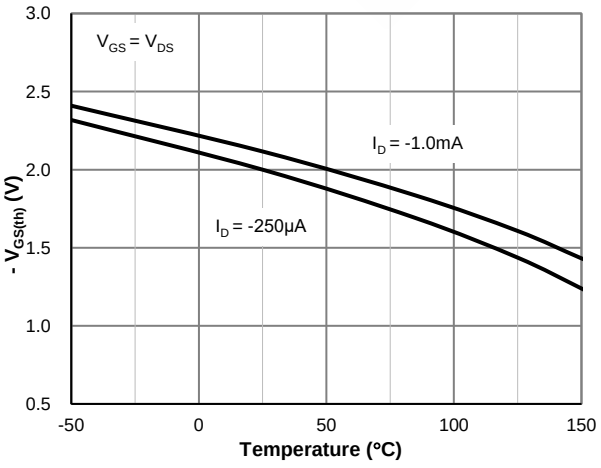


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

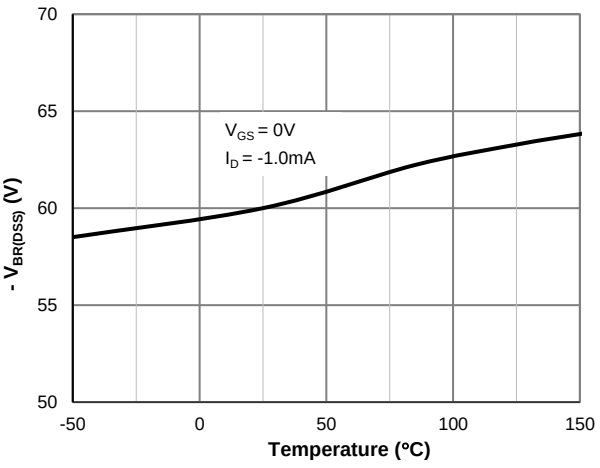


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

RATINGS AND CHARACTERISTIC CURVES

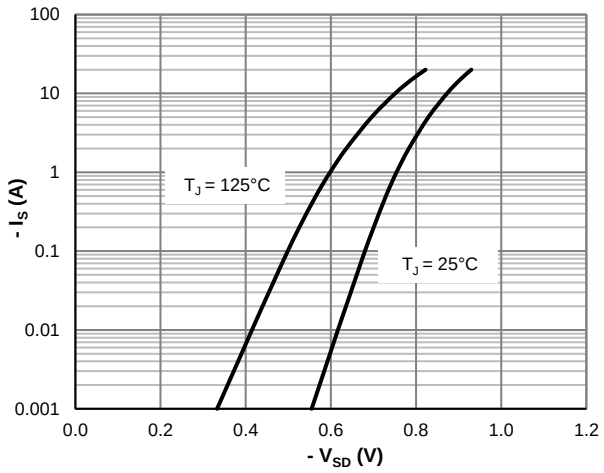


Figure 7: Body-Diode Characteristics

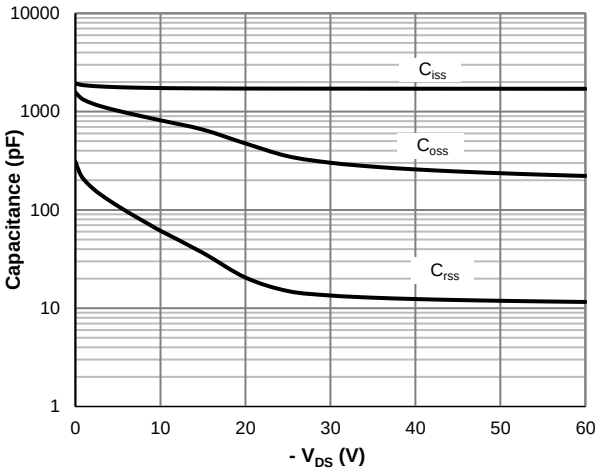


Figure 8: Capacitance Characteristics

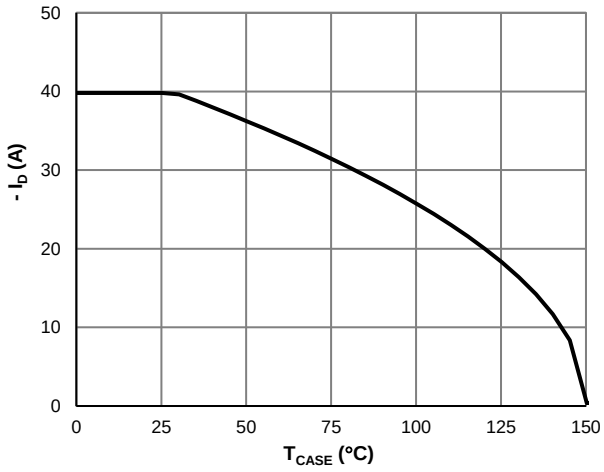


Figure 9: Current De-rating

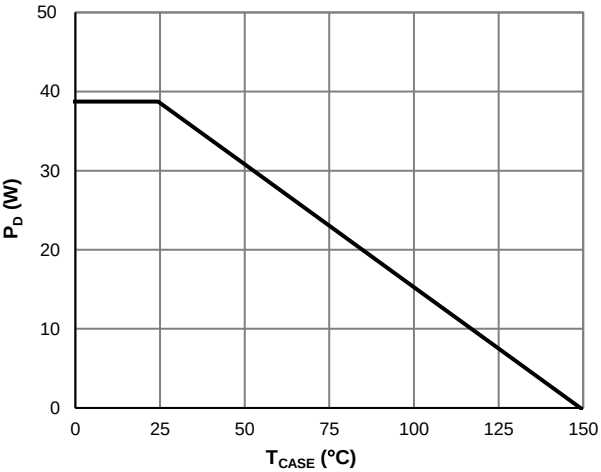


Figure 10: Power De-rating

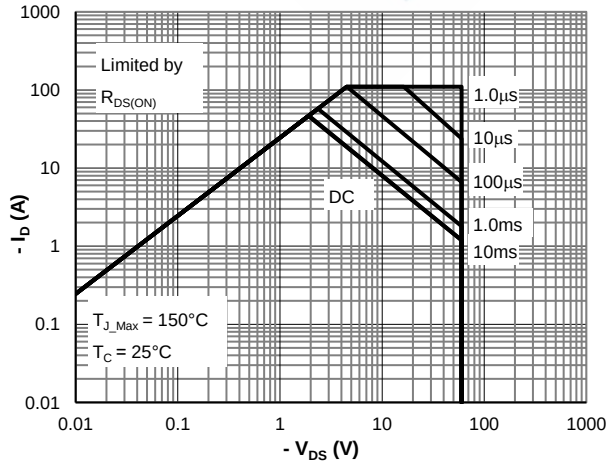
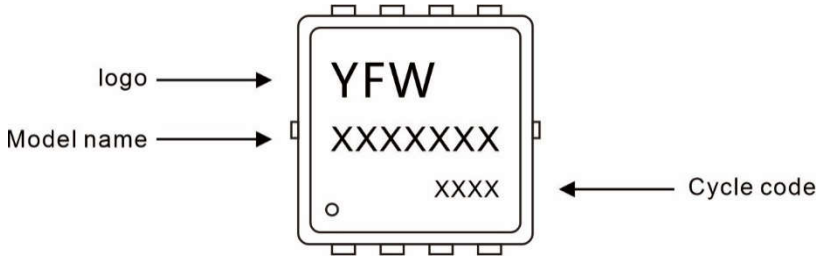


Figure 11: Maximum Safe Operating Area

Marking Diagram

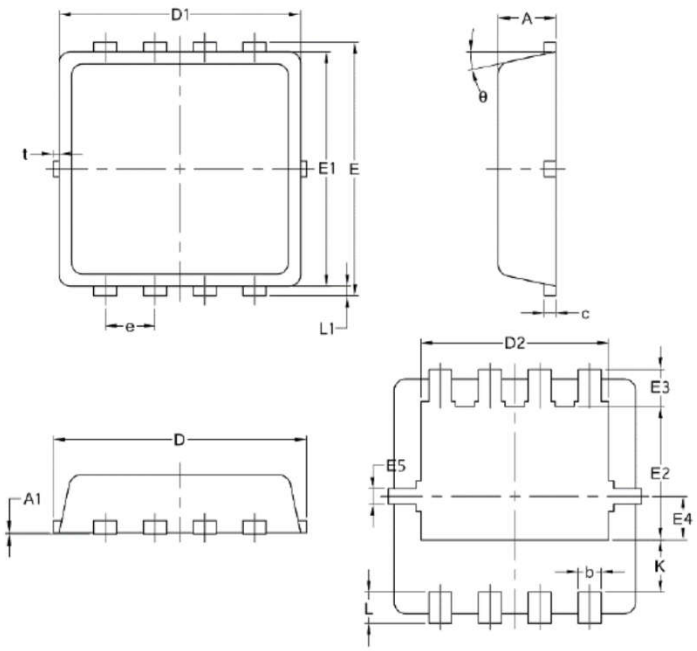


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW40P06DF	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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