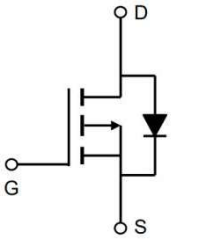
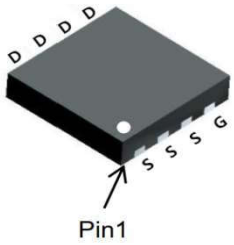
-20V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-40A
V_{DSS}	-20V
R_{DSON}-typ(@V_{GS}=-4.5V)	< 12mΩ(Type:8 mΩ)





PDFN3*3-8L

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW40P02DF	PDFN3*3-8L	YFW 40P02DF XXXXX	5000PCS/Tape

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	-40	A
Continuous Drain Current, V_{GS} @ -4.5V[1] @T_C=70℃	I_D	-20	A
Pulsed Drain Current [2]	I_{DM}	-160	A
Total Power Dissipation[3] @T_C=25℃	P_D	60	W
Total Power Dissipation[3] @T_C=70℃	P_D	30	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]	$R_{\theta JA}$	83	°C/W
Thermal Resistance Junction-Ambient [1] (t ≤10s)	$R_{\theta JA}$	52	°C/W
Thermal Resistance Junction to Case[1]	$R_{\theta JC}$	4.5	°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=-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=-10A	$R_{DS(ON)}$	-	8	12	mΩ
	V_{GS}=-2.5V, I_D=-5.0A		-	11	116	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	$V_{GS(th)}$	-0.4	-0.65	-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}=-10V , I_D=-10A	g_{fs}	12	-	-	S
Total Gate Charge(-4.5V)	V_{DS}=-10V 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= -1A R_G=6.0Ω	$t_{d(on)}$	-	10	-	ns
Rise Time		T_r	-	15	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	110	-	
Fall Time		t_f	-	70	-	
Input Capacitance	V_{DS}=-15V V_{GS}=0V f=1MHz	C_{iss}	-	1600	-	pF
Output Capacitance		C_{oss}	-	350	-	
Reverse Transfer Capacitance		C_{rss}	-	300	-	
Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	I_S	-	-	-50	A
Diode Forward Voltage[2]	V_{GS}=0V , I_S=-15A , T_J=25℃	V_{SD}	-	-	-1.2	V

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 EAS data shows Max. rating . The test condition is VDD=-16V,VGS=-10V,L=0.1mH,IAS=12A
4、The power dissipation is limited by 150℃ 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

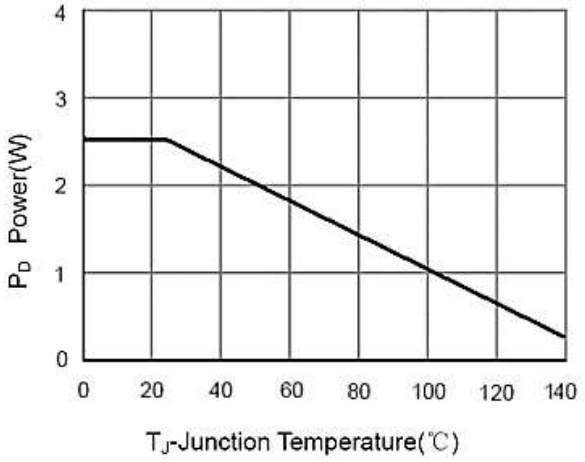


Figure 1：Power Dissipation

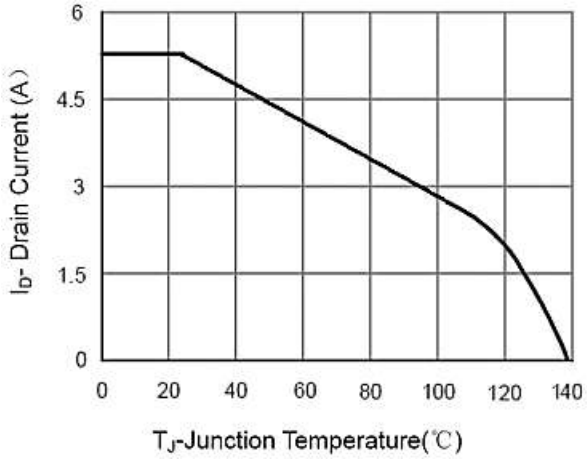


Figure 2：Drain Current

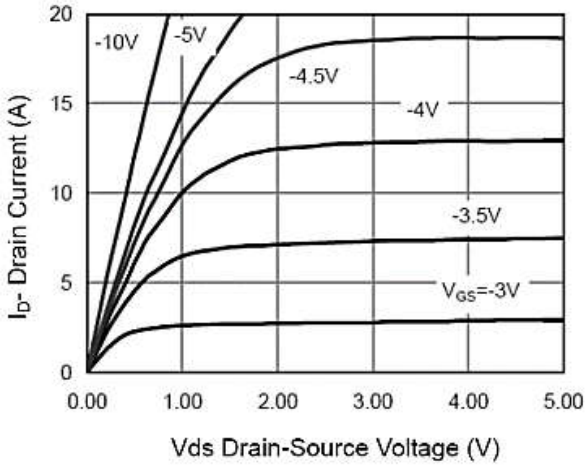


Figure 3：Output Characteristics

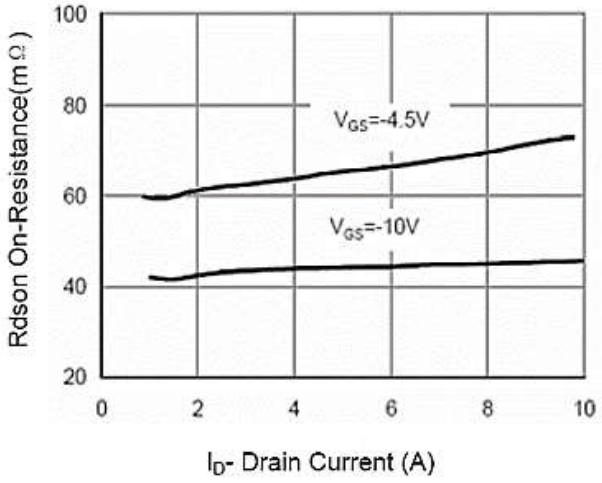


Figure 4：Drain-Source On-Resistance

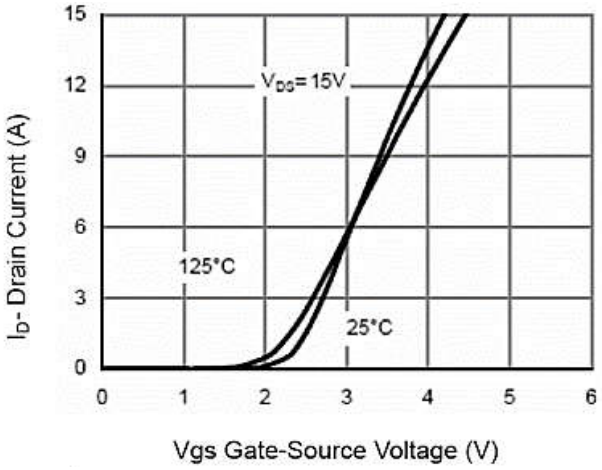


Figure 5：Transfer Characteristics

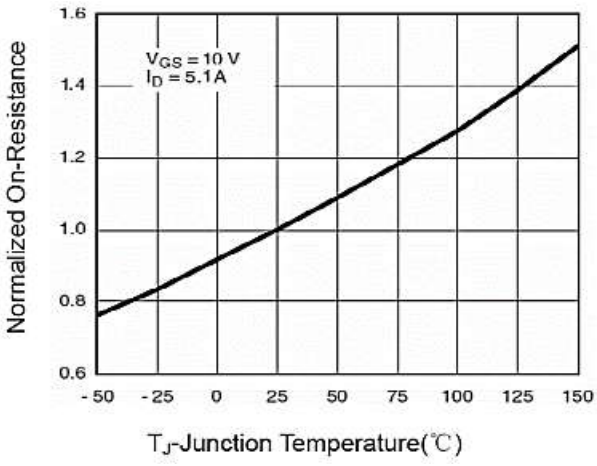


Figure 6：Drain-Source On-Resistance

Ratings and Characteristic Curves

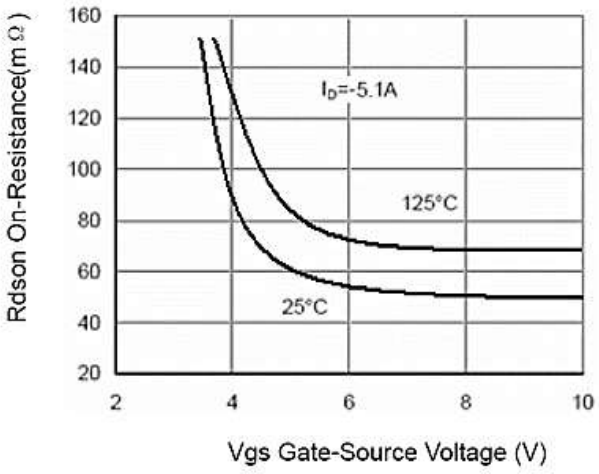


Figure 7：Rdson vs Vgs

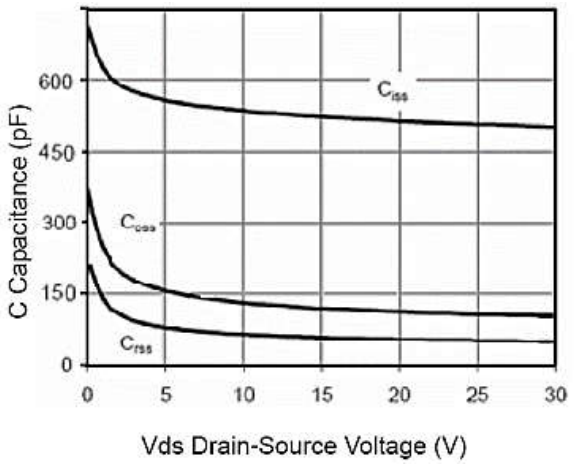


Figure 8：Capacitance vs Vds

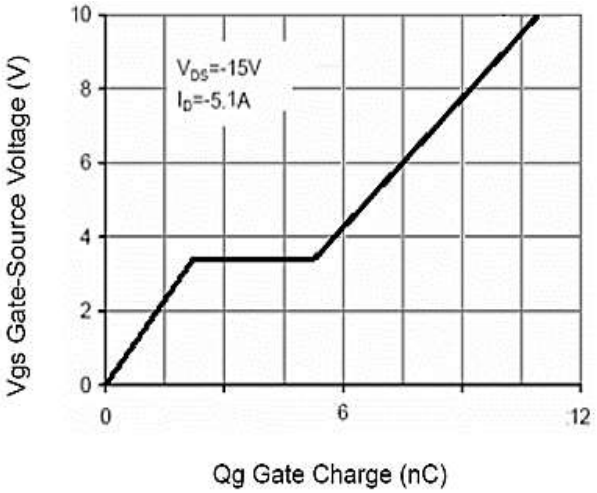


Figure 9：Gate Charge

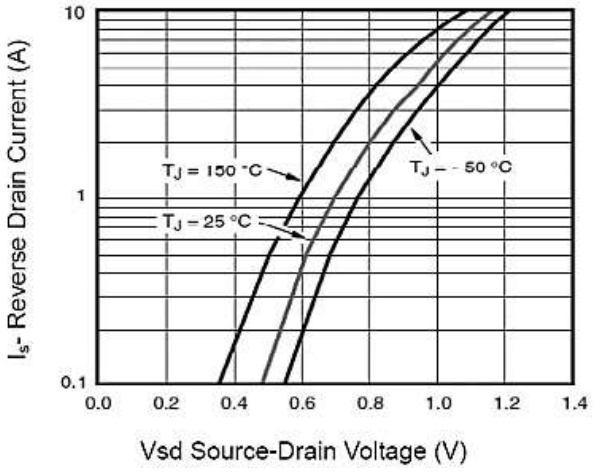


Figure 10：Sourece-Drain Diode Forward

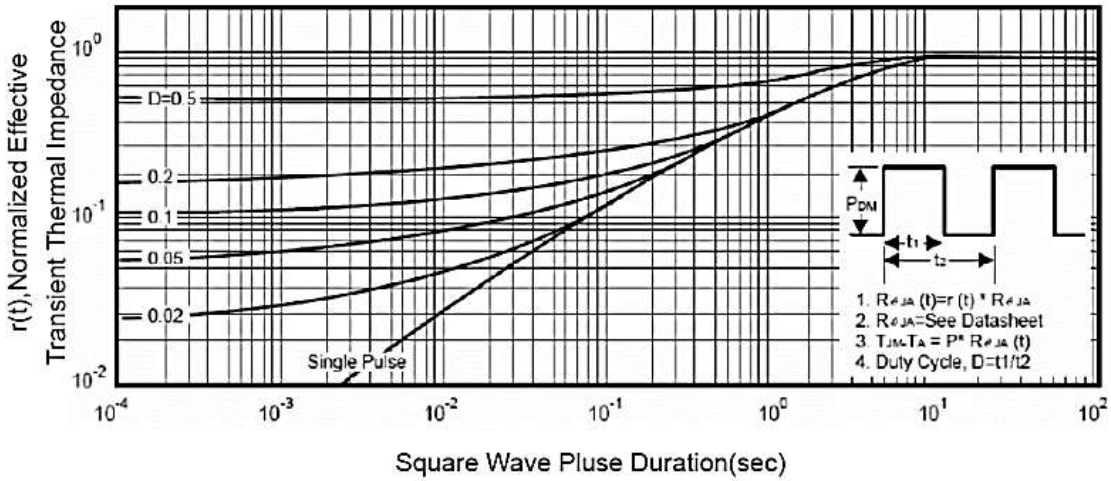
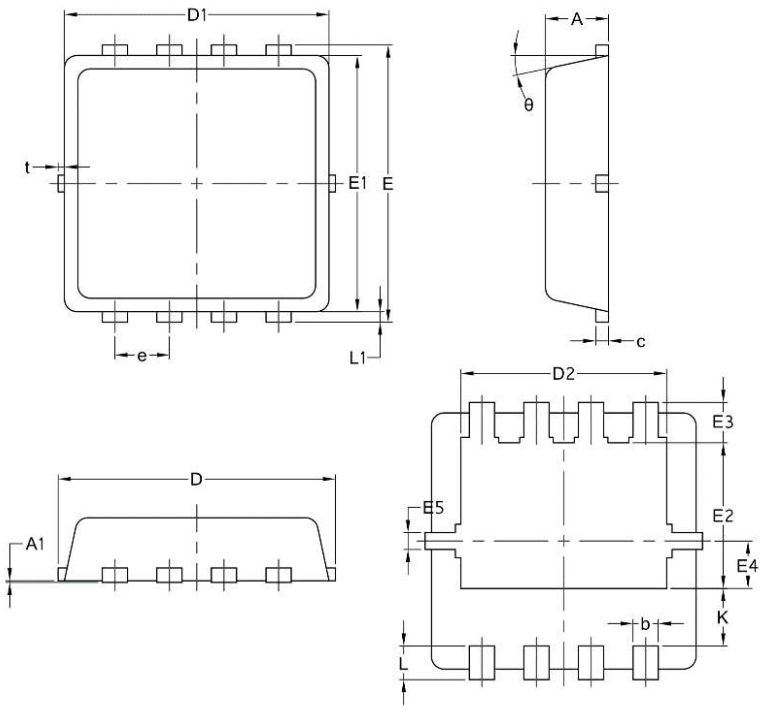


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Outline Dimensions Millimeters

PDFN3*3-8L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14