

60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

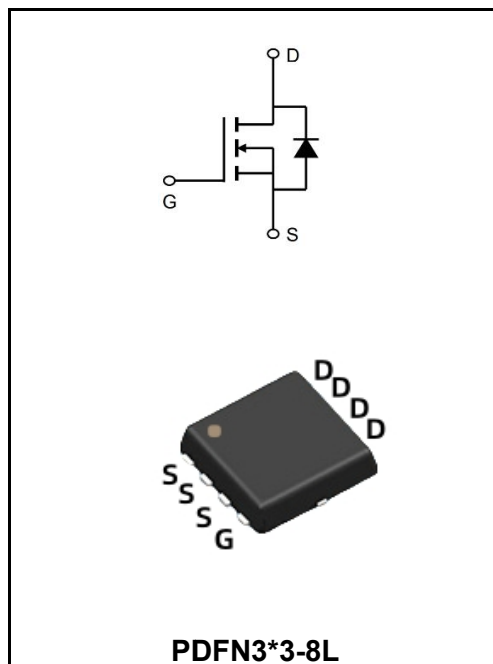
I_D	30A
V_{DSS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$< 30m\Omega$ (Typ:21 m Ω)
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	$< 40m\Omega$ (Typ:28 m Ω)

Description

The YFW30N06DF 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

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



Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Characteristics		Symbols	Value	Units
Drain-Source Voltage		V_{DS}	60	V
Gate - Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	@T _C =25°C	I_D	30	A
Continuous Drain Current	@T _C =100°C	I_D	18	A
Pulsed Drain Current ²		I_{DM}	114	A
Single Pulse Avalanche Energy ³		E_{AS}	25.5	mJ
Avalanche Current		I_{AS}	22	A
Power dissipation ⁴	T _C =25 °C	P_D	34.7	W
Thermal Resistance Junction-Ambient ¹		$R_{\theta JA}$	85	°C/W
Thermal Resistance Junction-Case ¹		$R_{\theta JC}$	3.6	°C/W
Storage Temperature Range		T_{STG}	-55 to +150	°C
Operating Junction Temperature Range		T_J	-55 to +150	°C

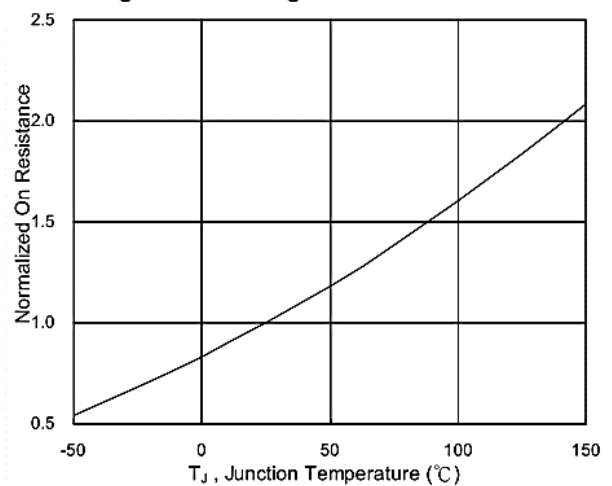
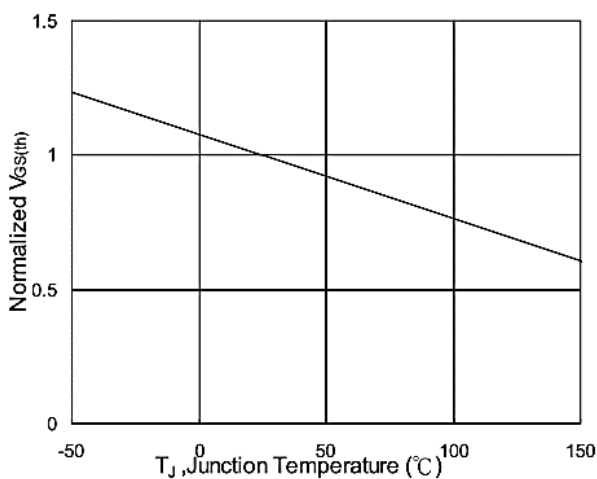
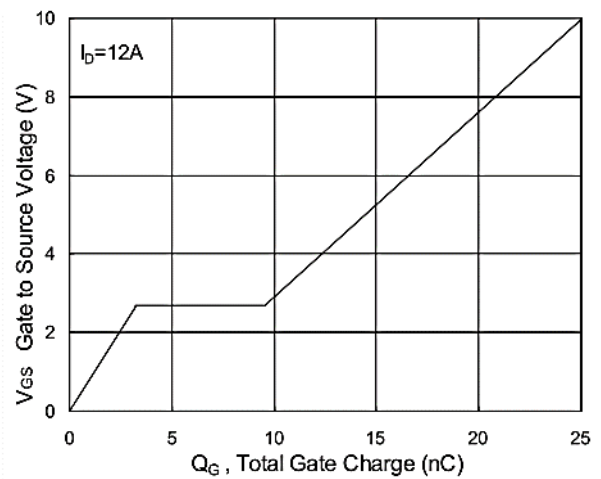
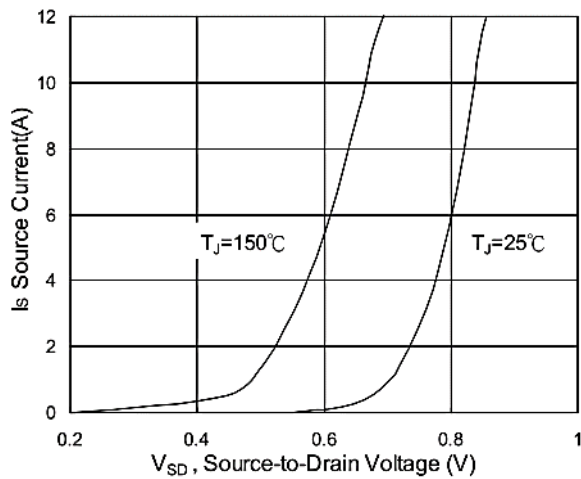
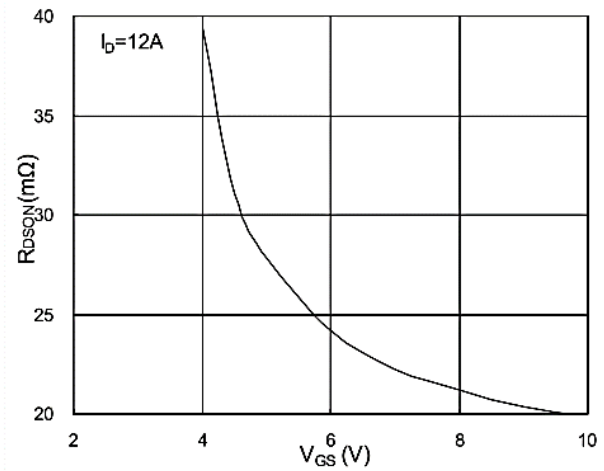
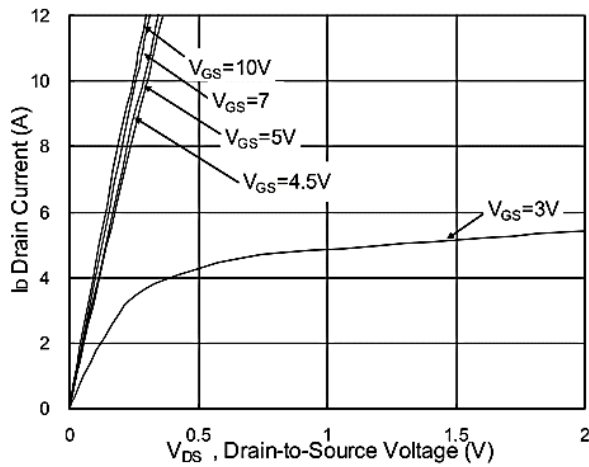
Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	BV_{DSS}	60	-	-	V
BVDSS Temperature Coefficient ²	Reference to 25°C, I _D =1mA	ΔBV_{DSS}/ΔT_J	-	0.063	-	V/°C
Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V, T _J =25°C	I_{DSS}	-	-	1.0	μA
	V _{DS} =48V, V _{GS} =0V, T _J =55°C		-	-	5.0	μA
Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	V_{GS(th)}	1.2	1.6	2.5	V
V _{GS(th)} Temperature Coefficient		ΔV_{GS(th)}	-	5.24	-	mV/°C
Drain-source on-state resistance ²	V _{GS} =10V, I _D =15A	R_{DS(on)}	-	21	30	mΩ
	V _{GS} =4.5V, I _D =10A		-	28	40	
Forward Transconductance	V _{DS} =5V, I _D =15A	g_{fs}	-	17	-	S
Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	R_g		3.2		Ω
Input Capacitance	V _{DS} =15V V _{GS} =0V f=1MHz	C_{iss}	-	1378	-	pF
Output Capacitance		C_{oss}	-	86	-	
Reverse Transfer Capacitance		C_{rss}	-	64	-	
Total Gate Charge	V _{DS} =48V I _D =12A V _{GS} =4.5V	Q_g	-	12.6	-	nC
Gate-Source Charge		Q_{gs}	-	3.2	-	
Gate Drain Charge		Q_{gd}	-	6.3	-	
Turn-On Delay Time	V _{DD} =30V, V _{GS} =10V R _G =3.3Ω I _D =10A	t_{d(on)}	-	8	-	ns
Rise Time		T_r	-	14.2	-	
Turn-Off Delay Time		t_{d(OFF)}	-	24.4	-	
Fall Time		t_f	-	4.6	-	
Continuous Source Current ^{1.5}	V _G =V _D =0V, Force Current	I_S	-	-	23	A
Pulsed Source Current ^{2.5}		I_{SM}	-	-	46	A
Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25	V_{SD}	-	-	1.2	V

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 ≤300us , duty cycle ≤2%
- 3、The EAS data shows Max. rating . The test condition is VDD=25V, VGS=10V, L=0.1mH, IAS=22A
- 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.

Typical Characteristics



Typical Characteristics

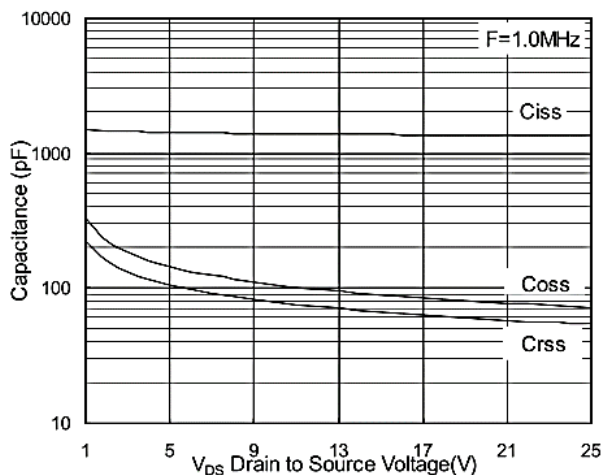


Fig.7 Capacitance

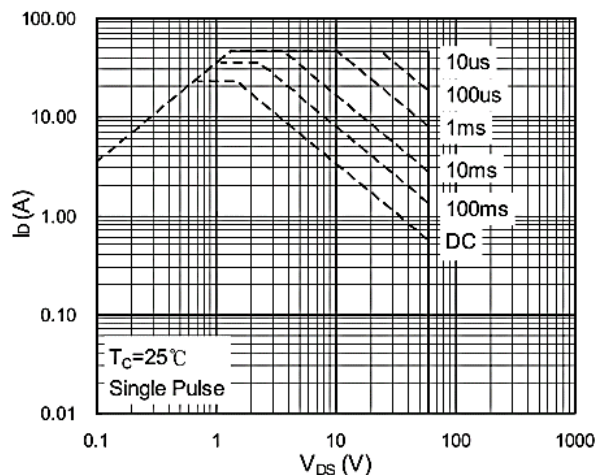


Fig.8 Safe Operating Area

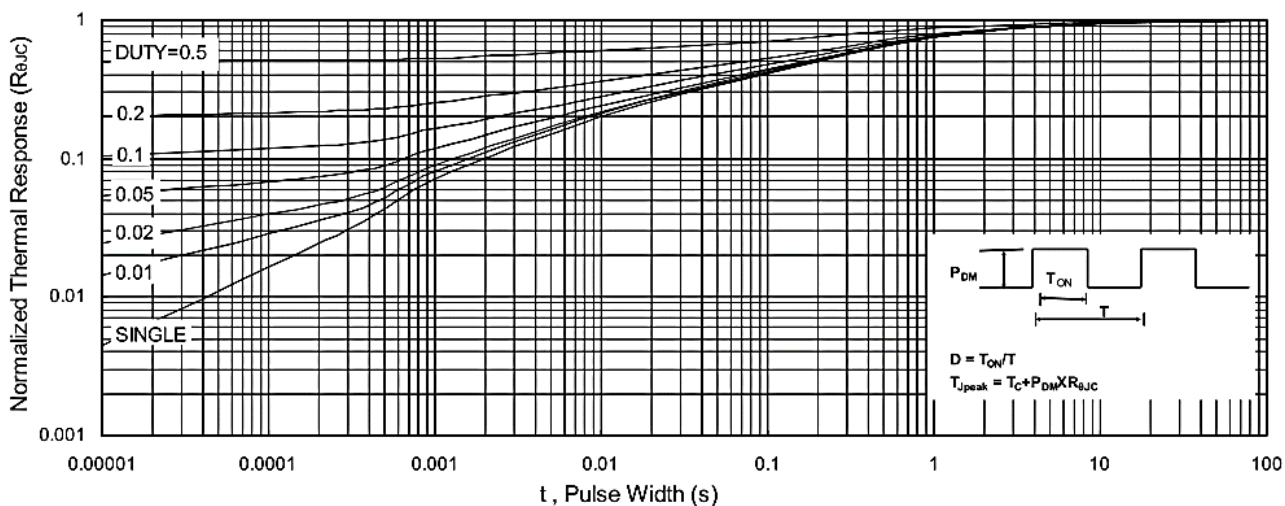


Fig.9 Normalized Maximum Transient Thermal Impedance

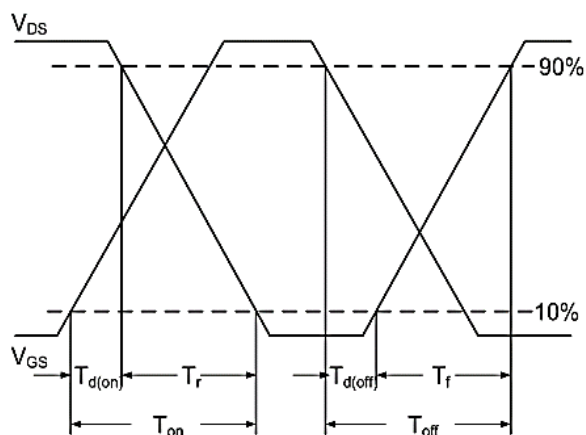


Fig.10 Switching Time Waveform

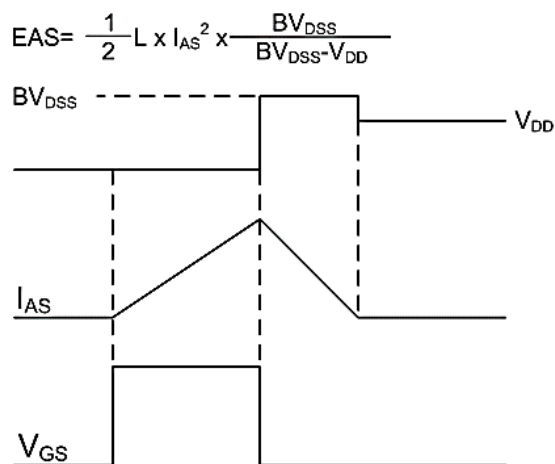
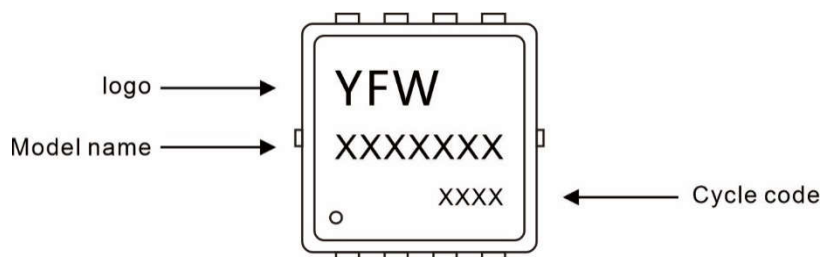


Fig.11 Unclamped Inductive Waveform

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW30N06DF	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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