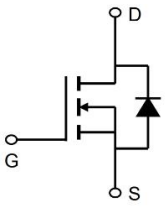
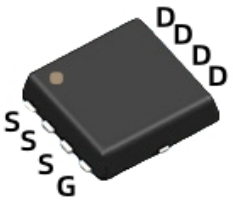
40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	60A
V_{DSS}	40V
R_{DSON}-typ(@V_{GS}=10V)	＜7.5mΩ(Typ:5.5 mΩ)
R_{DSON}-typ(@V_{GS}=4.5V)	＜12mΩ(Typ:9.0 mΩ)





PDFN3*3-8L

Description

The YFW60N04DF 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℃unless otherwise noted)

Characteristics		Symbols	Value	Units
Drain-Source Voltage		V_{DS}	40	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	@T_C=25℃	I_D	60	A
Continuous Drain Current [1]	@T_C=100℃	I_D	35	A
Pulsed Drain Current [2]		I_{DM}	90	A
Single Pulse Avalanche Energy [3]		E_{AS}	76.1	mJ
Avalanche Current		I_{AS}	39	A
Power dissipation [4]	T_C=25 ℃	P_D	28	W
Thermal Resistance Junction-Ambient (Steady State)[1]		$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-Case[1]		$R_{\theta JC}$	4.5	°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 ℃, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	BV_{DSS}	40	45	-	V
BVDSS Temperature Coefficient [2]	Reference to 25℃, I_D=1mA	$\triangle BV_{DSS}/\triangle T_J$	-	0.034	-	V/°C
Drain-Source Leakage Current	V_{DS}=32V ,V_{GS}=0V ,T_J=25℃	I_{DSS}	-	-	1.0	μA
	V_{DS}=32V , V_{GS}=0V , T_J=55℃		-	-	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	$V_{GS(th)}$	1.0	1.7	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\triangle V_{GS(th)}$	-	4.96	-	mV/°C
Drain-source on-state resistance[2]	V_{GS}=10V, I_D=30A	$R_{DS(ON)}$	-	5.5	7.5	mΩ
	V_{GS}=4.5V, I_D=20A		-	9.0	12	
Forward Transconductance	V_{DS}=5V,I_D=12A	gfs	-	39	-	S
Gate Resistance	V_{DS}=0V,V_{GS}=0V,f=1MHz	Rg		1.6	-	Ω
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1MHz	C_{iss}	-	2332	-	pF
Output Capacitance		C_{oss}	-	193	-	
Reverse Transfer Capacitance		C_{rss}	-	138	-	
Total Gate Charge	V_{DS}=20V I_D=12A V_{GS}=4.5V	Q_g	-	18.8	-	nC
Gate-Source Charge		Q_{gs}	-	4.7	-	
Gate Drain Charge		Q_{gd}	-	8.2	-	
Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V R_G=3.3Ω I_D=1A	$t_{d(on)}$	-	14.3	-	ns
Rise Time		T_r	-	2.6	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	77	-	
Fall Time		t_f	-	4.8	-	
ContinuousSourceCurrent [1.5]	V_G=V_D=0V,Force Current	I_S	-	-	60	A
Pulsed Source Current [2.5]		I_{SM}	-	-	90	A
Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	-	-	1	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 V_{DD}=25V,V_{GS}=10V,L=0.1mH,IAS=39A
4 .The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

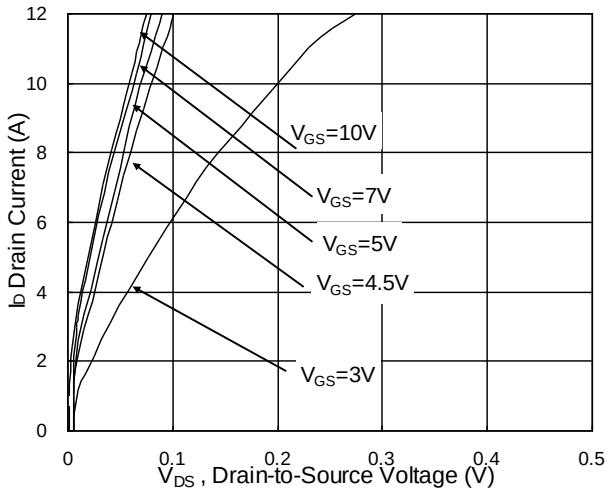


Fig.1 Typical Output Characteristics

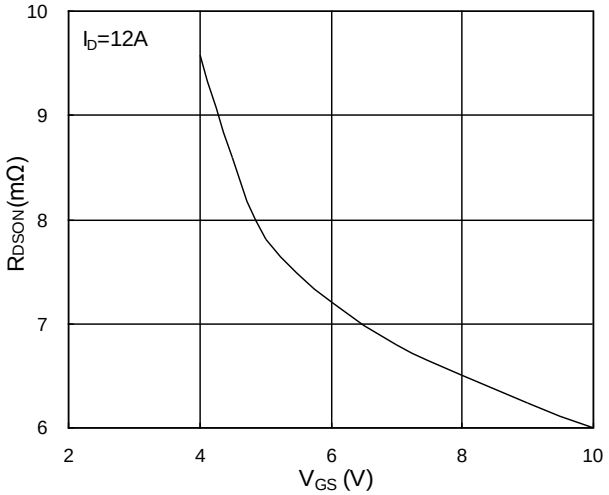


Fig.2 On-Resistance vs. G-S Voltage

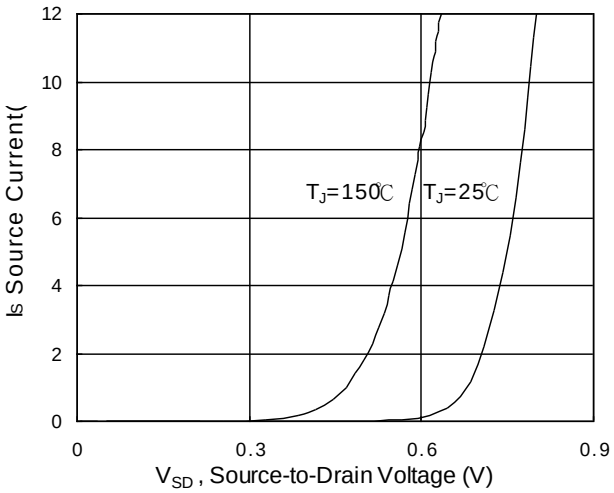


Fig.3 Forward Characteristics of Reverse

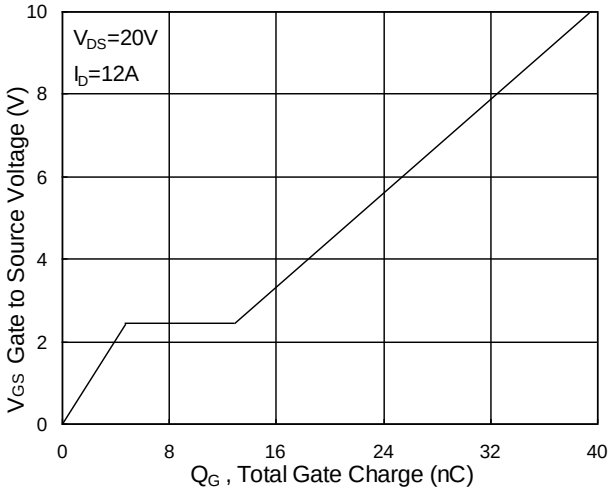


Fig.4 Gate-Charge Characteristics

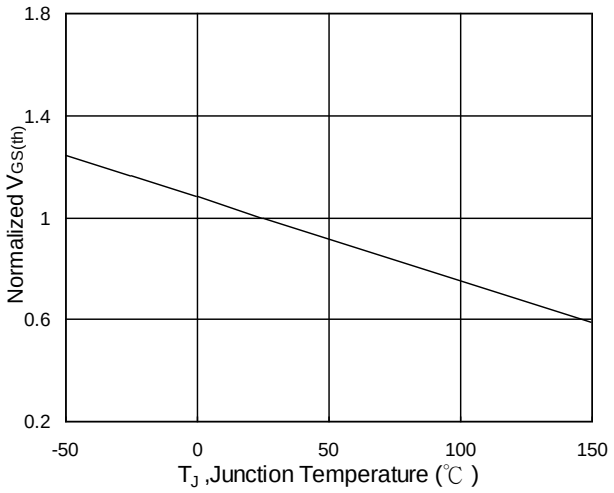


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

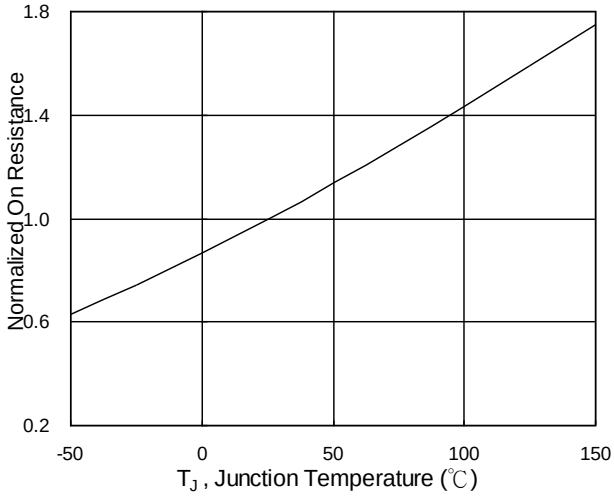


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

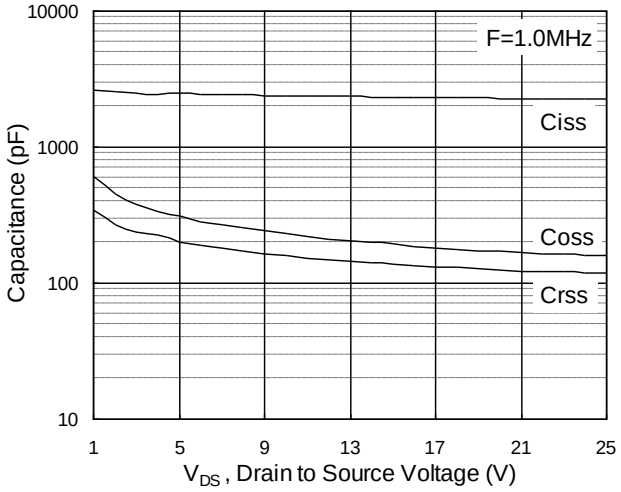


Fig.7 Capacitance

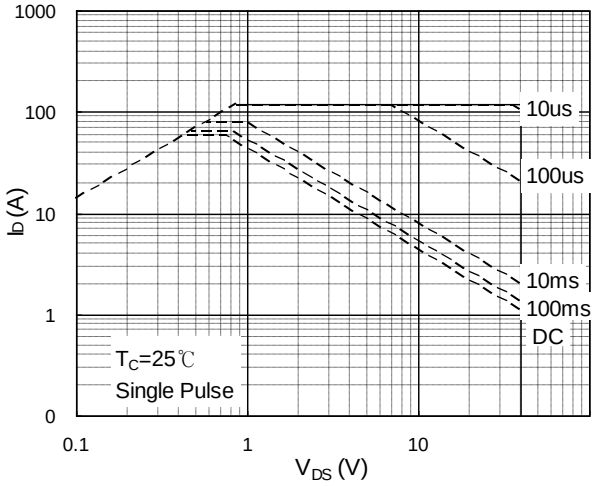


Fig.8 Safe Operating Area

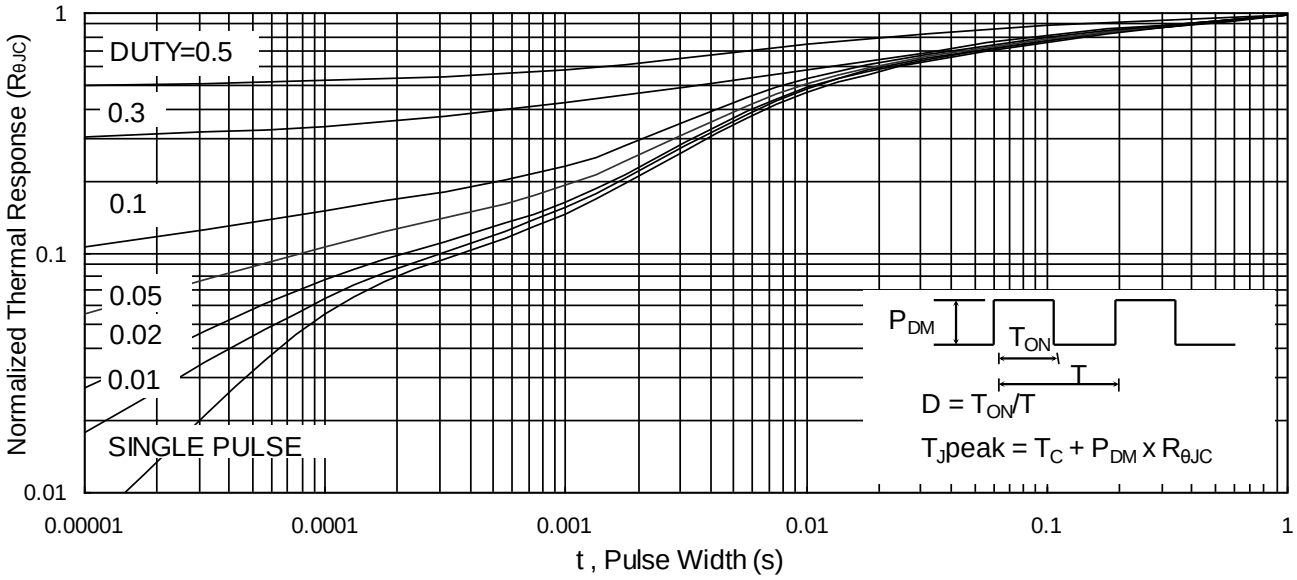


Fig.9 Normalized Maximum Transient Thermal Impedance

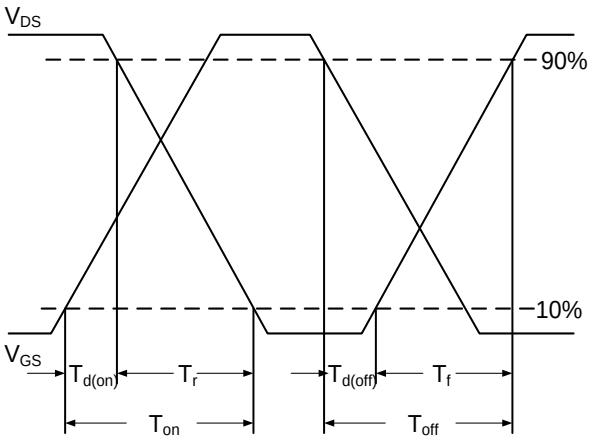


Fig.10 Switching Time Waveform

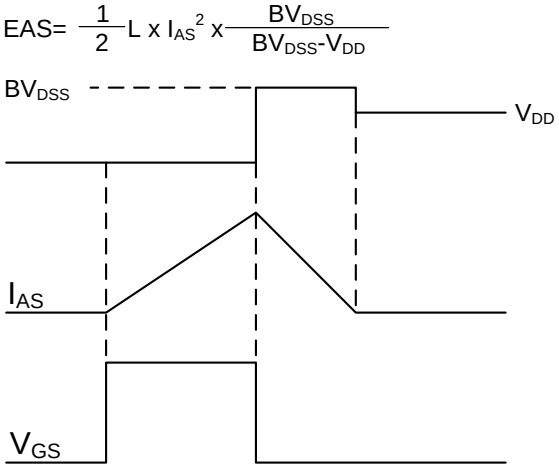
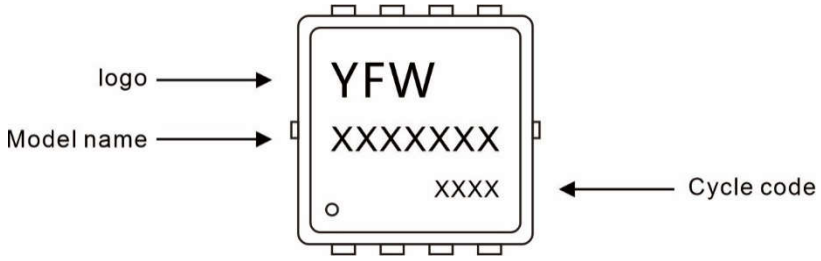


Fig.11 Unclamped Inductive Waveform

Marking Diagram

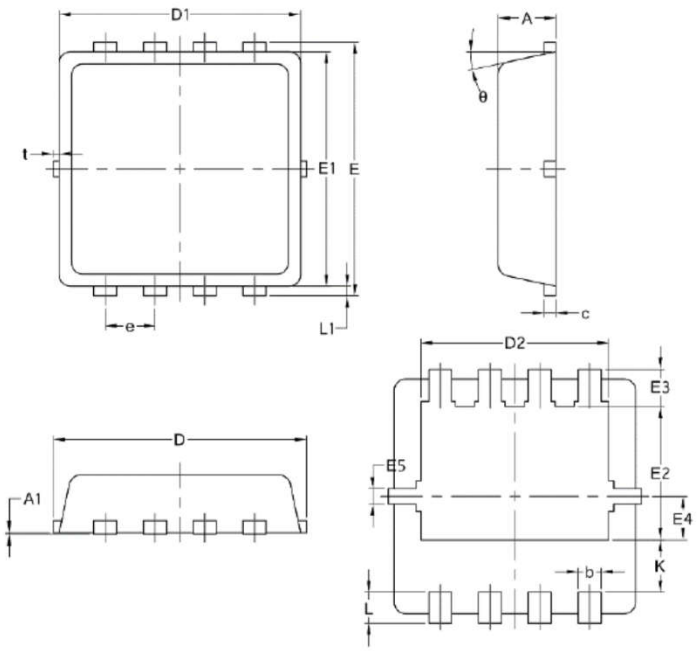


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW60N04DF	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℃

Disclaimer

The information presented in this document is for reference only. GuangDong Youfeng Microelectronics Co.,Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise. The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices),YFW or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale. This publication supersedes & replaces all information previously supplied. For additional information, please visit our website https://www.yfwdiode.com, or consult YFW sales office for further assistance.