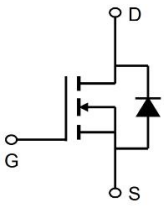
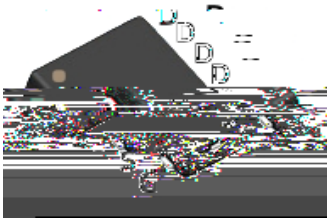
60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	30A
V_{DSS}	60V
R_{DSON}-typ(@V_{GS}=10V)	30mΩ(Typ:21 mΩ)
R_{DSON}-typ(@V_{GS}=4.5V)	40mΩ(Typ:28 mΩ)





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 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	I_D	30	A
Continuous Drain Current	@T_C=100	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	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 , 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 , I_D=1mA	BV_{DSS}/ T_J	-	0.063	-	V/°C
Drain-Source Leakage Current	V_{DS}=48V ,V_{GS}=0V ,T_J=25	I_{DSS}	-	-	1.0	μA
	V_{DS}=48V , 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	$V_{GS(th)}$	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$V_{GS(th)}$	-	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	gfs	-	17	-	S
Gate Resistance	V_{DS}=0V,V_{GS}=0V,f=1MHz	Rg		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	-	
ContinuousSourceCurrent [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 :

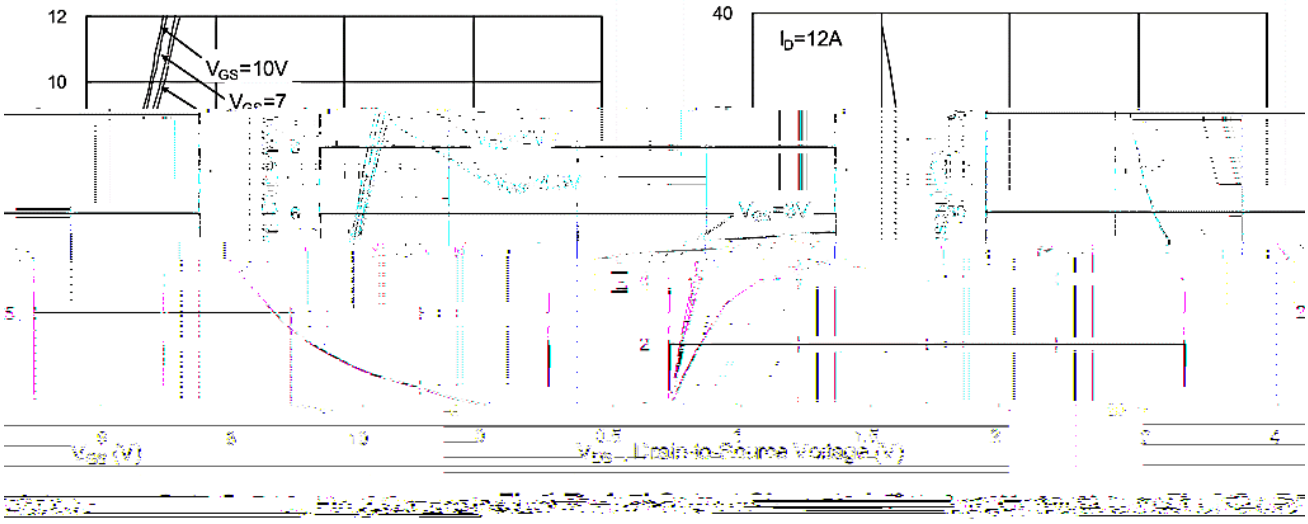
1 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

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 junction temperature

5 The data is theoretically the same as ID and IDM , in reaa n)iD ㇔ I p o


12
10
V_{GS}=10V
40
I_D=12A
V_{GS}=4V
V_{GS} (V)
V_{DS}, Drain-to-Source Voltage (V)

Typical Characteristics

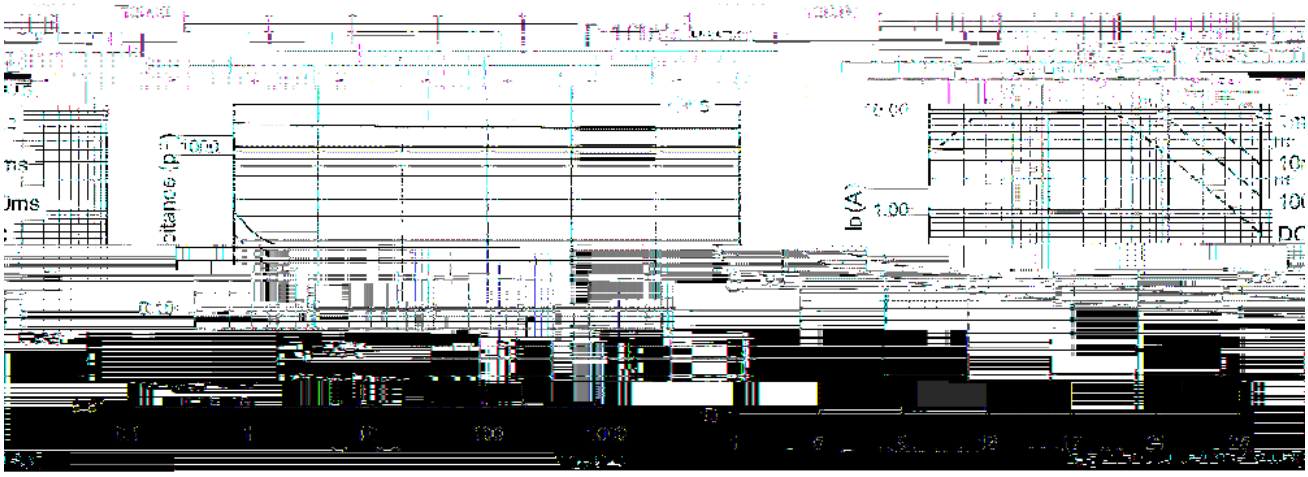
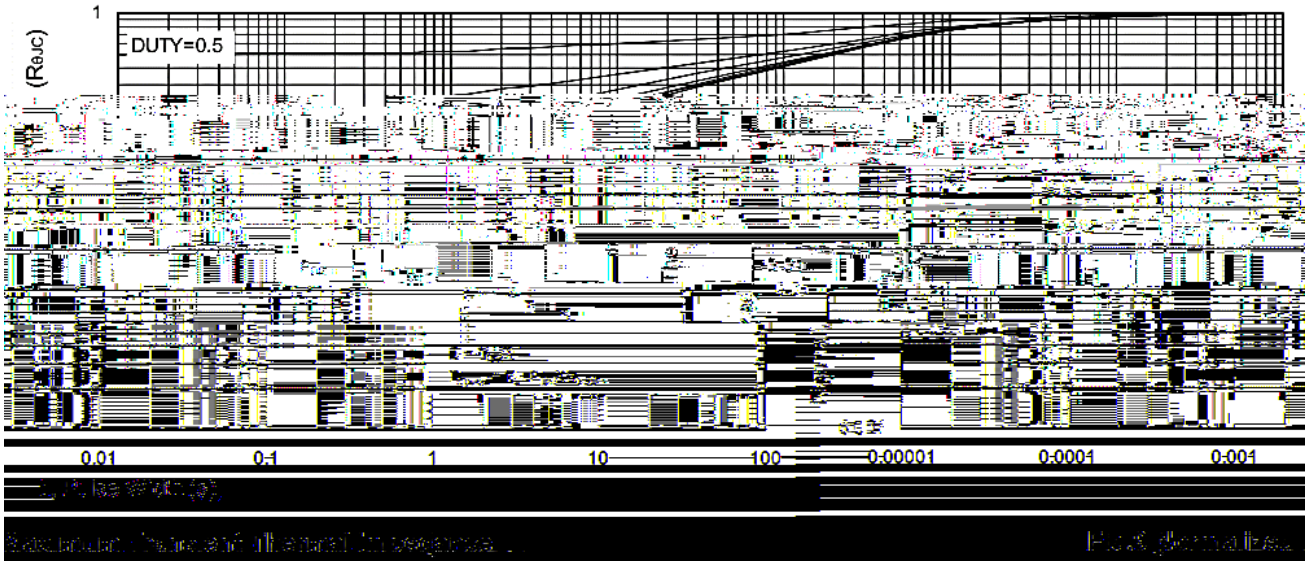
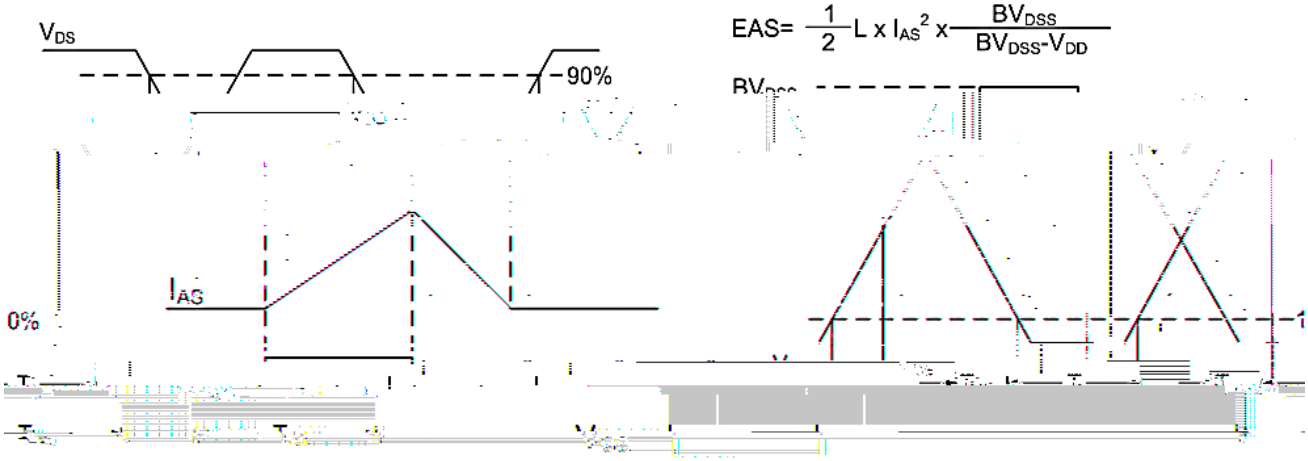


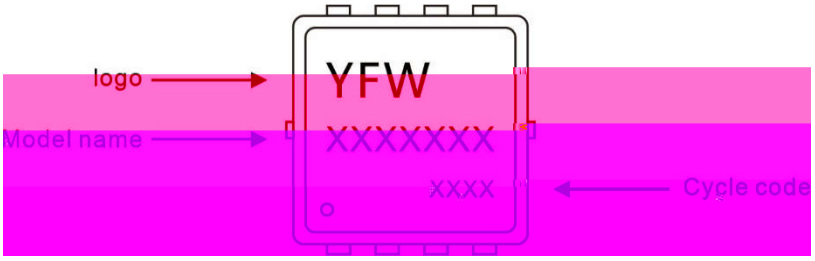
Fig.8 Safe Operating Area

Fig.7 Capacitance





Marking Diagram

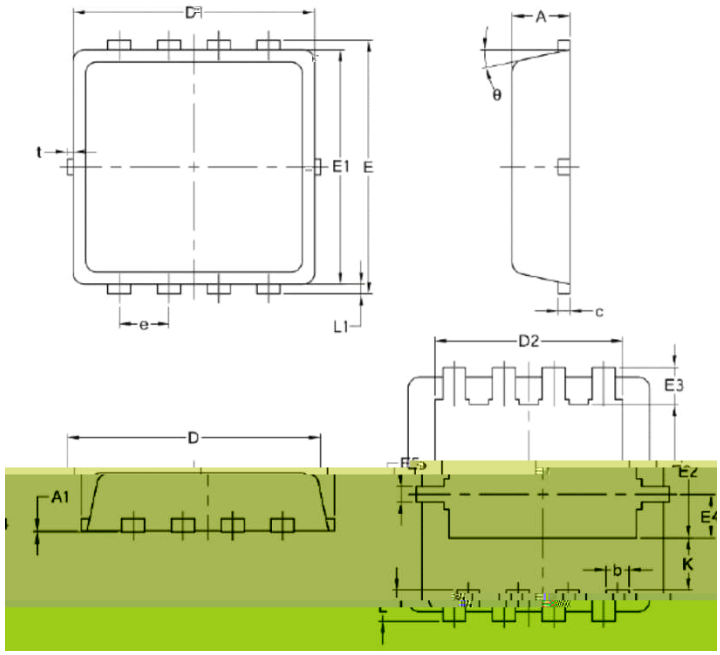


Ordering information

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