

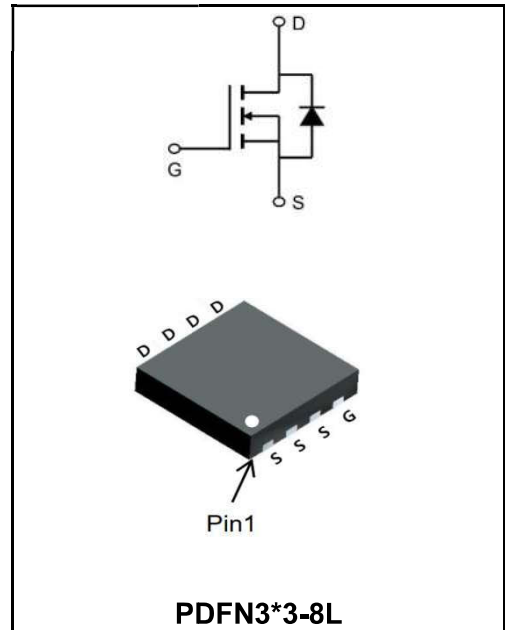
60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	30A
V_{DSS}	60V
R_{DS(on)-typ(@V_{GS}=10V)}	< 36mΩ (Type:28 mΩ)

Application

- ◆ LED lamp
- ◆ Load switch
- ◆ Uninterruptible power supply



Product Specification Classification

Part Number	Package	Marking	Pack
YFW30N06DF	PDFN3*3-8L	YFW 30N06DF XXXXX	5000PCS/Tape

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V _{GS} @ 10V ¹ @T _C =25°C	I_D	30	A
Continuous Drain Current, V _{GS} @ 10V ¹ @T _C =100°C	I_D	16	A
Pulsed Drain Current	I_{DM}	74	A
Avalanche Current	I_{AS}	13	A
Single Pulse Avalanche Energy	E_{AS}	22	mJ
Power Dissipation @T _C =25°C	P_D	31.3	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	°C
Thermal Resistance, Junction-to-Ambient ¹	R_{θJA}	62.5	°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	4	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	60	65	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	0.044	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=15A$	$R_{DS(ON)}$	-	28	36	mΩ
	$V_{GS}=4.5V, I_D=7A$		-	38	45	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.8	-	mV/°C
Drain -Source Leakage Current	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=48V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=5V, I_D=15A$	g_{FS}	-	25.3	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	R_g	-	2.5	-	Ω
Total Gate Charge(10V)	$V_{DS}=48V$ $V_{GS}=10V$ $I_D=15A$	Q_g	-	19	-	nC
Gate-Source Charge		Q_{gs}	-	2.5	-	
Gate-Drain Charge		Q_{gd}	-	5	-	
Turn-on delay time	$V_{DD}=30V$ $V_{GS}=10V$ $R_G=3.3\Omega$ $I_D=15A$	$t_{d(on)}$	-	2.8	-	ns
Rise Time		T_r	-	16.6	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	21.2	-	
Fall Time		t_f	-	5.6	-	
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	1027	-	pF
Output Capacitance		C_{oss}	-	65	-	
Reverse Transfer Capacitance		C_{rss}	-	46	-	
Continuous Source Current ^{1,6}	$V_G=V_D=0V, \text{Force Current}$	I_S	-	-	20	A
Pulsed Source Current ^{2,6}		I_{SM}	-	-	40	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_F=15A, di/dt=100A/\mu s, T_J=25^\circ C$	t_{rr}	-	12.2	-	nS
Reverse Recovery Charge		Q_{rr}	-	7.3	-	nC

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 .The EAS data shows Max. rating .
- 3、 The test cond $\cong 300\mu s$ duty cycle $\cong 2\%$, duty cycle ition is $T_J=25^\circ C, V_{DD}=48V, V_G=10V, R_G=25\Omega, L=0.1mH, I_{AS}=13A$
- 4、 The power dissipation is limited by 175°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

Typical Characteristics

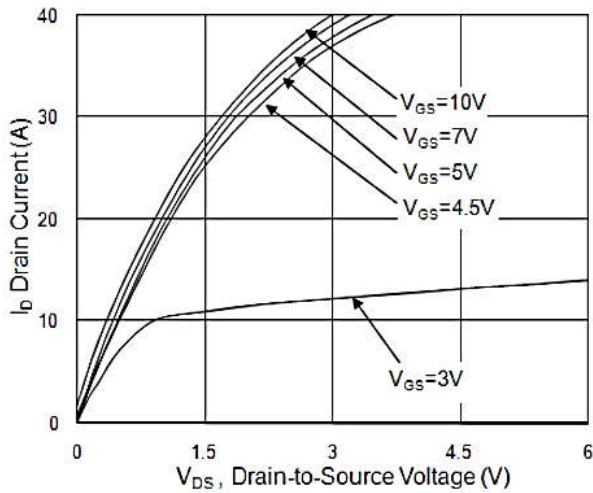


Fig.1 Typical Output Characteristics

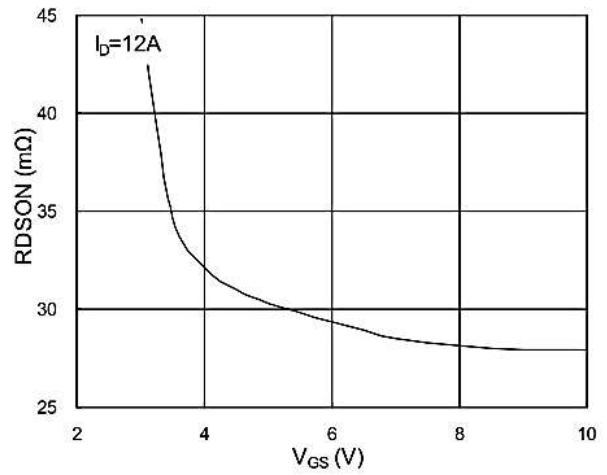


Fig.2 On-Resistance vs. Gate-Source

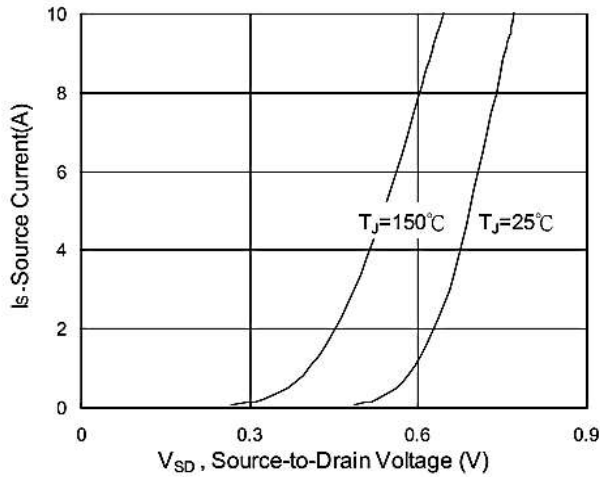


Fig.3 Forward Characteristics Of Reverse

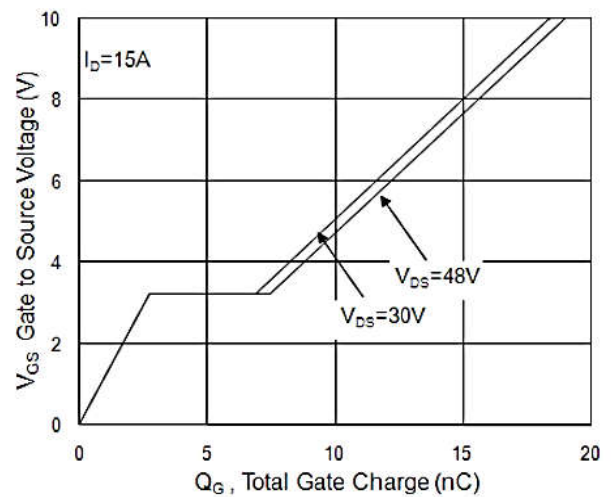


Fig.4 Gate-Charge Characteristics

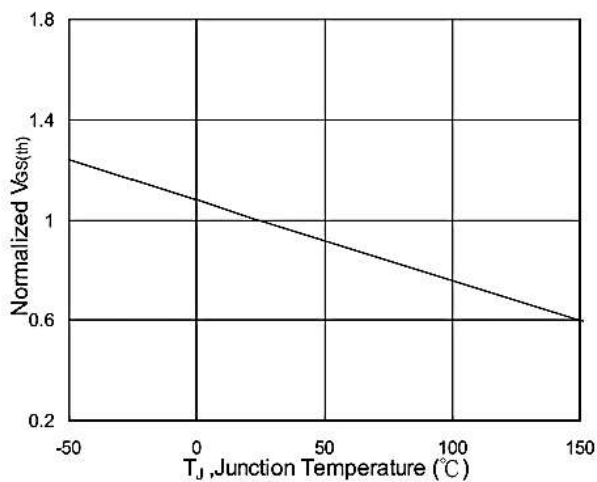


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

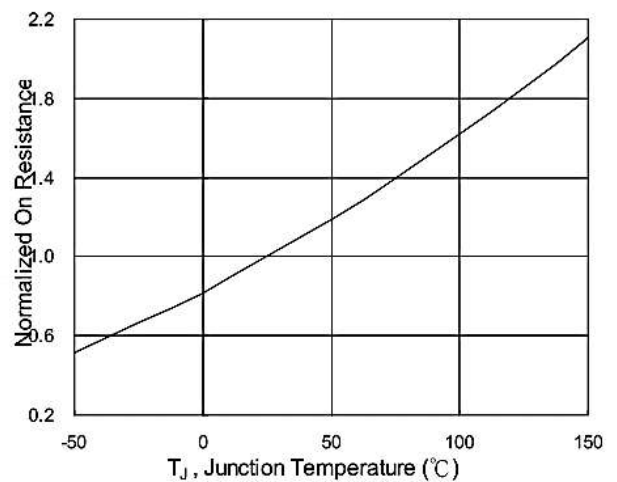


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

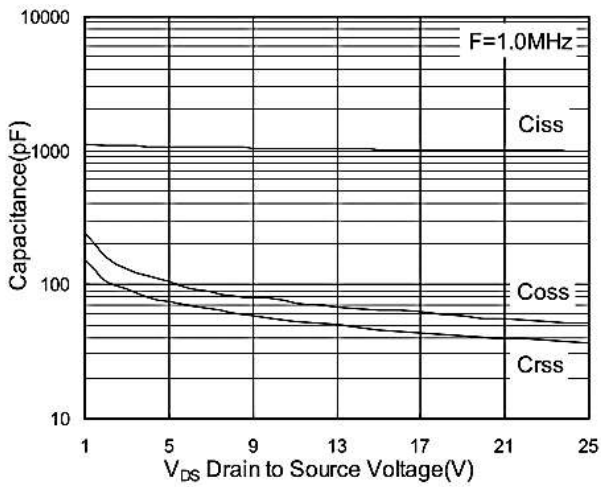


Fig.7 Capacitance

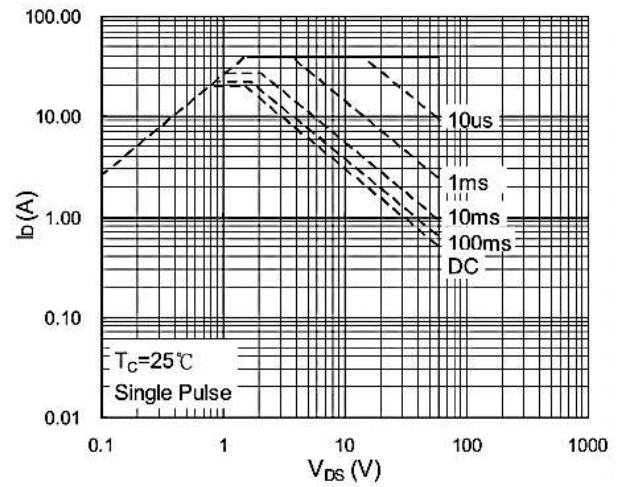


Fig.8 Safe Operating Area

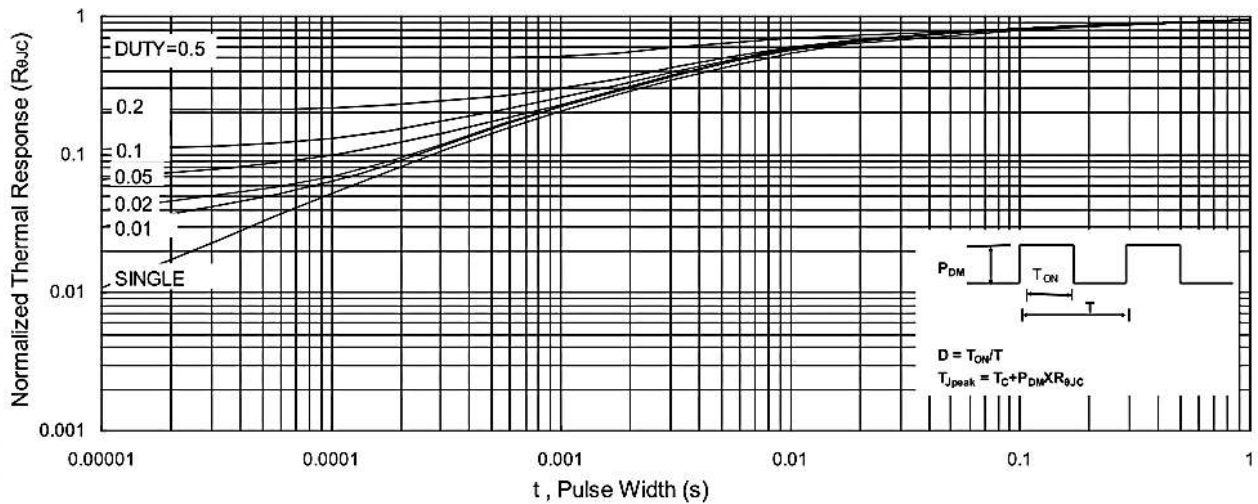


Fig.9 Normalized Maximum Transient Thermal Impedance

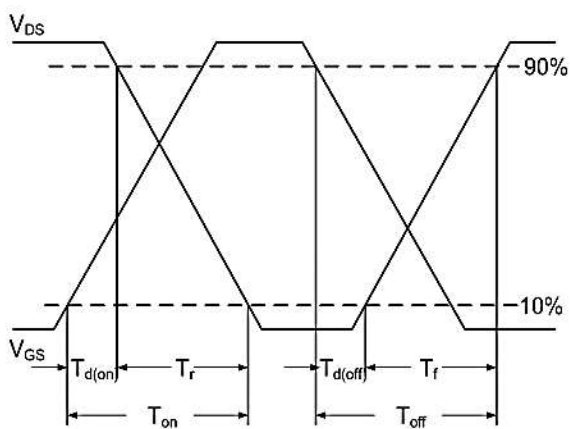


Fig.10 Switching Time Waveform

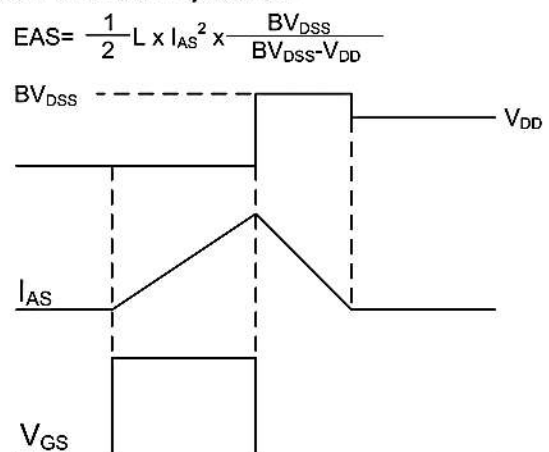
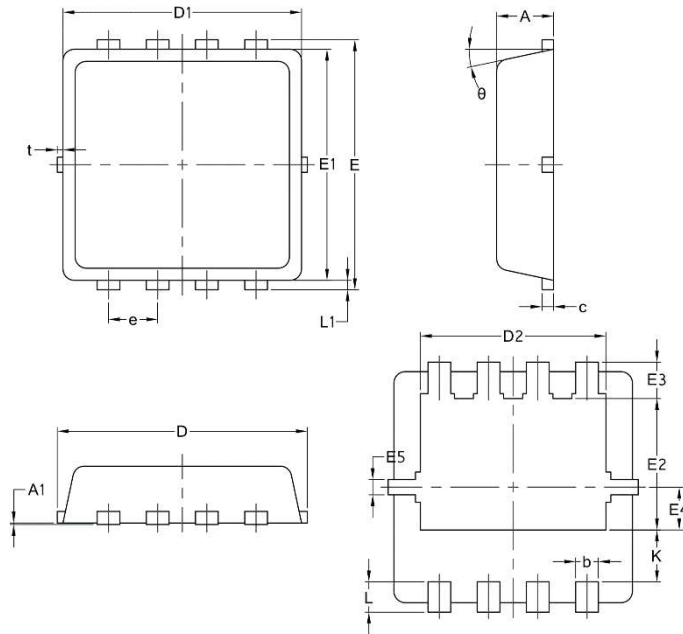


Fig.11 Unclamped Inductive Switching Waveform

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