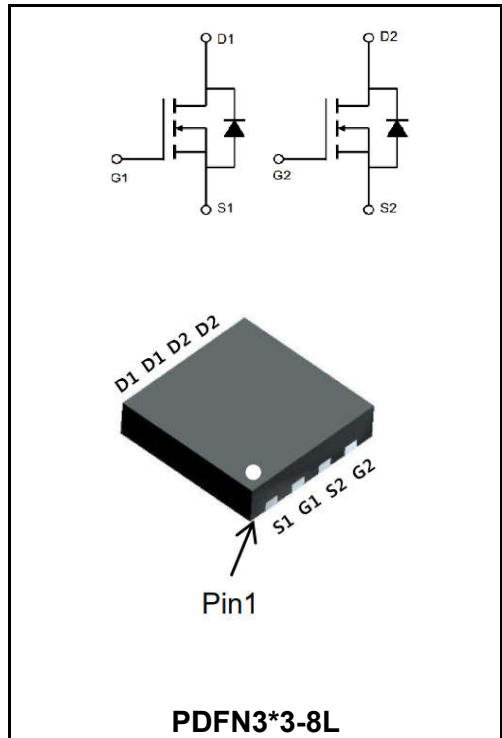


40V N+N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	12.5A
V_{DSS}	40V
R_{DS(on)-typ(@V_{GS}=10V)}	< 8.5mΩ (Type:6.9 mΩ)



Application

- ◆Lithium battery protection
- ◆Wireless impact
- ◆Mobile phone fast charging

Product Specification Classification

Part Number	Package	Marking	Pack
YFW10H04DF	PDFN3*3-8L	YFW 10H04DF XXXXX	5000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

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°C	I_D	12.5	A
Continuous Drain Current ¹ @T _c =100°C	I_D	8.5	A
Pulsed Drain Current ²	I_{DM}	60	A
Single Pulse Avalanche Energy ³	E_{AS}	48	mJ
Avalanche Current	I_{AS}	31	A
Total Power Dissipation ⁴ @T _c =25°C	P_D	27.8	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-ambient (Steady State) ¹	R_{θJA}	60	°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	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	$V_{GS}=0V, I_D=250\mu A$	B_{VDSS}	40	47	-	V
Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=12A$	R_{DS(ON)}	-	6.9	8.5	mΩ
	$V_{GS}=4.5V, I_D=10A$		-	10.5	15	
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	1.2	1.5	2.5	V
Drain-Source Leakage Current	$V_{DS}=32V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=32V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1.0MHz$	R_g		1.7		Ω
Total Gate Charge(4.5V)	$V_{DS}=20V, I_D=4.5V, V_{GS}=12A$	Q_g	-	5.8	-	nC
Gate-Source Charge		Q_{gs}	-	3	-	
Gate-Drain Charge		Q_{gd}	-	1.2	-	
Turn-on delay time	$V_{DS}=15V, V_{GS}=10V, R_{GEN}=3.3\Omega, I_D=1A$	t_{d(on)}	-	14.3	-	ns
Rise Time		T_r	-	5.6	-	
Turn-Off Delay Time		t_{d(OFF)}	-	20	-	
Fall Time		t_f	-	11	-	
Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	C_{iss}	-	690	-	μF
Output Capacitance		C_{oss}	-	193	-	
Reverse Transfer Capacitance		C_{rss}	-	38	-	
Continuous Source Current ^{1,5}	$V_G=V_D=0V, \text{Force Current}$	I_S	-		20	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=31A$
- 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.

Ratings and Characteristic Curves

Typical Characteristics

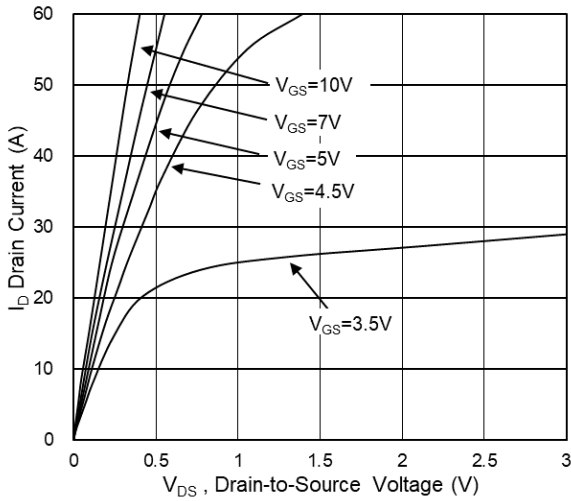


Fig.1 Typical Output Characteristics

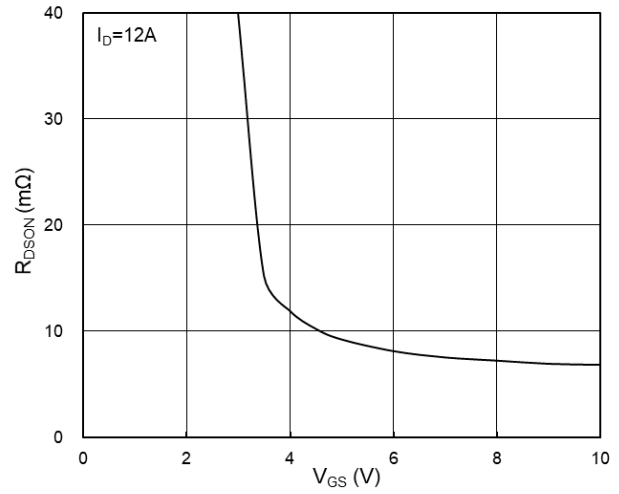


Fig.2 On-Resistance vs. G-S Voltage

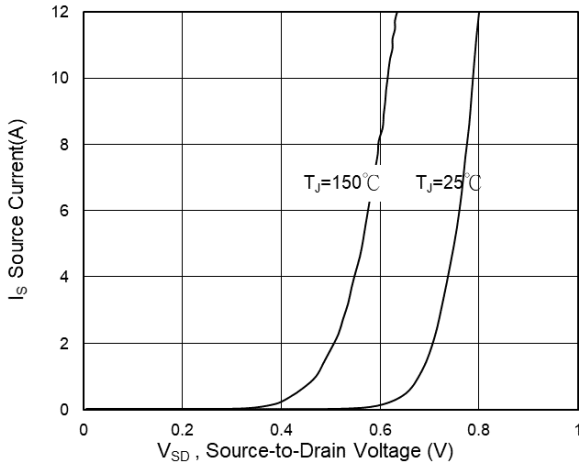


Fig.3 Source Drain Forward Characteristics

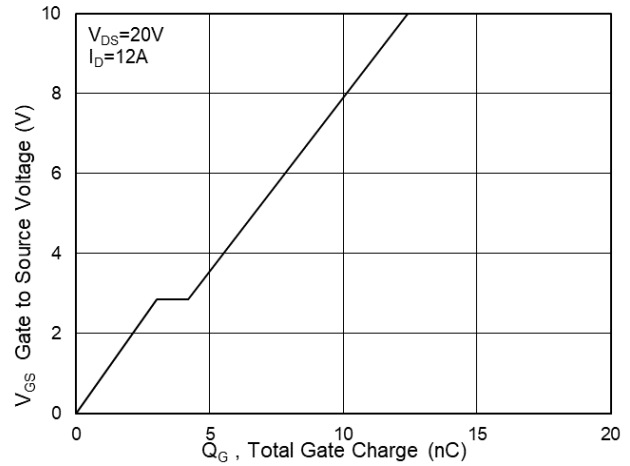


Fig.4 Gate-Charge Characteristics

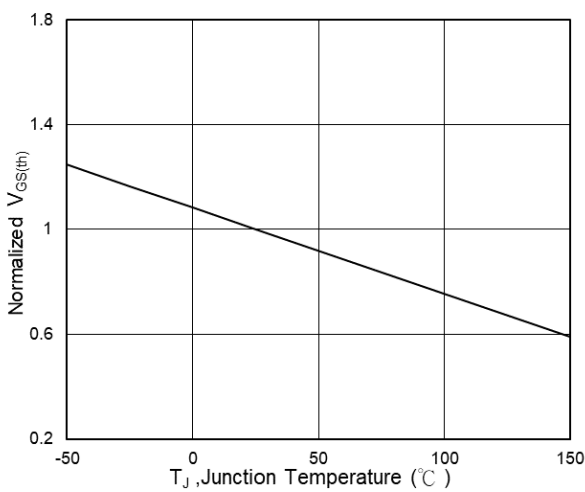


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

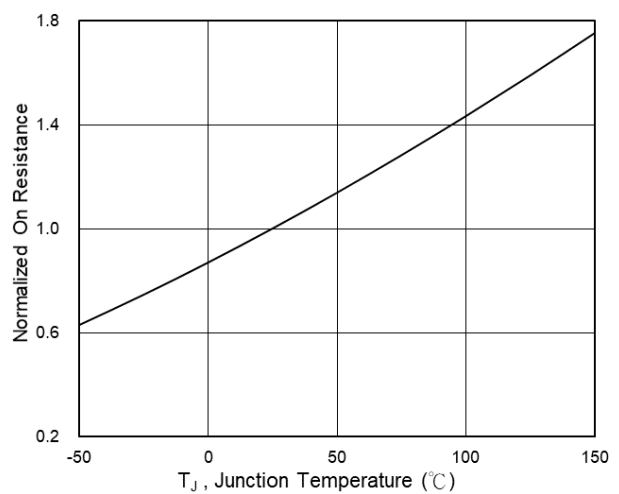


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

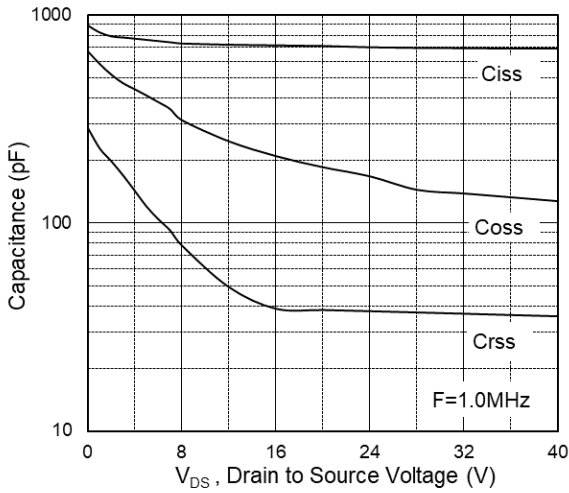


Fig.7 Capacitance

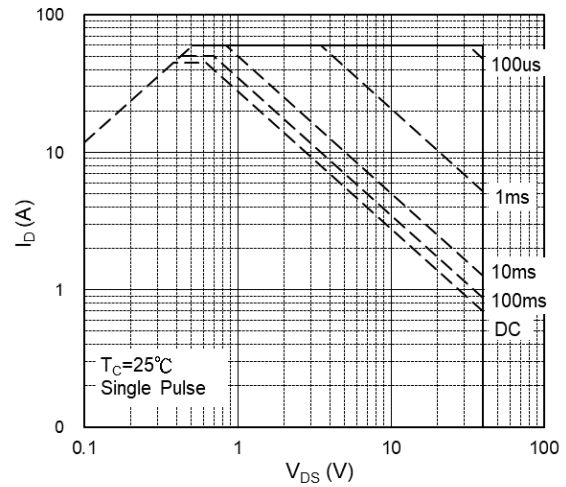


Fig.8 Safe Operating Area

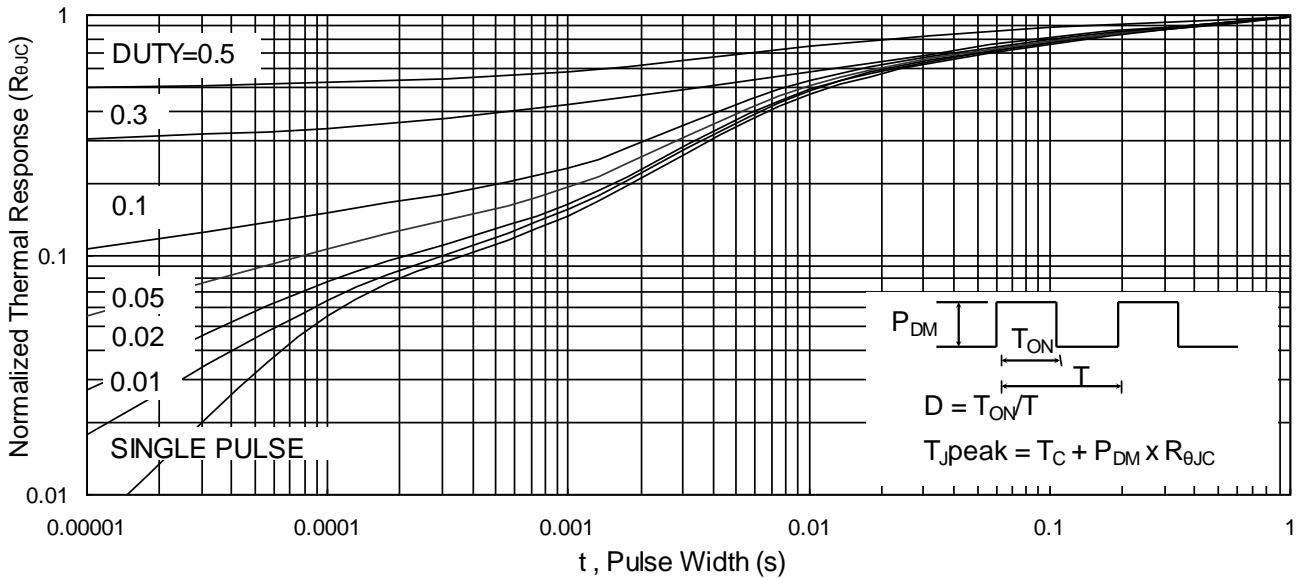


Fig.9 Normalized Maximum Transient Thermal Impedance

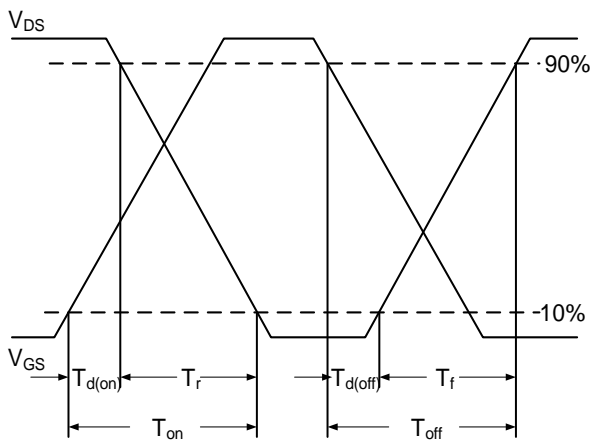


Fig.10 Switching Time Waveform

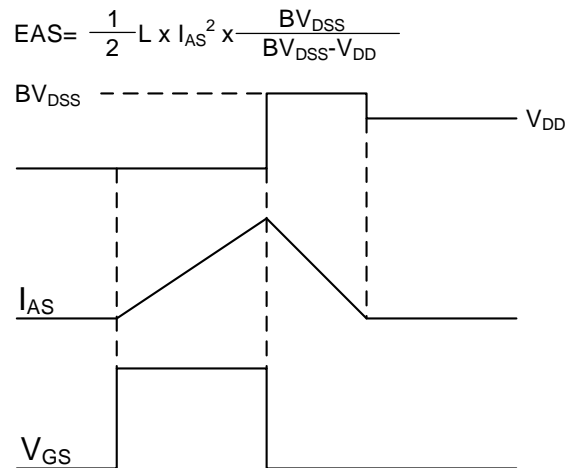
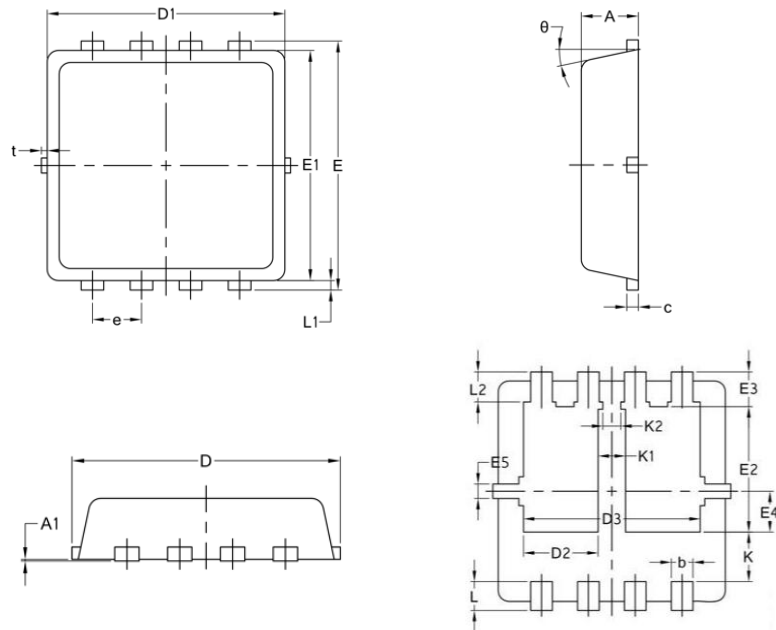


Fig.11 Unclamped Inductive Waveform

PDFN3*3-8L



Symbol	Common		
	Mm		
	Min	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.25	0.30	0.39
c	0.14	0.152	0.20
D	3.20	3.30	3.45
D1	3.05	3.15	3.25
D2	0.84	1.04	1.24
D3	2.30	2.45	2.60
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.60	1.74	1.90
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	0.50	0.69	0.80
K1	0.30	0.38	0.53
K2	0.15	0.25	0.35
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
L2	0.27	0.42	0.57
t	0	0.075	0.13
Φ	10°	12°	14°