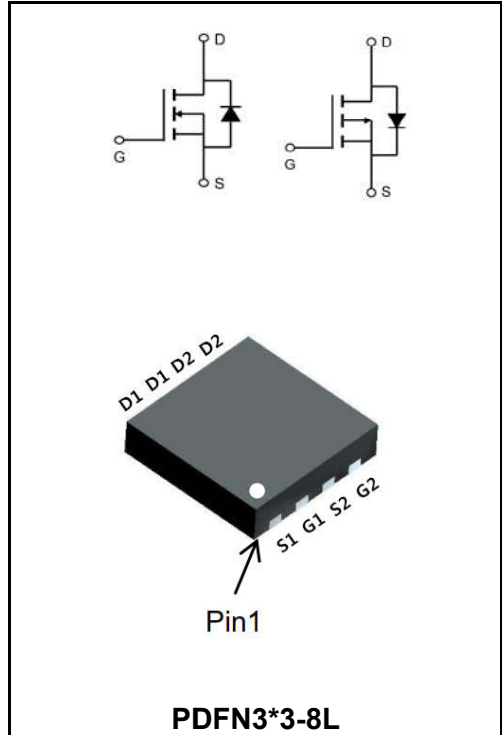


30V N+P-CHANNEL ENHANCEMENT MODE MOSFET
MAIN CHARACTERISTICS

I_D	19.3A
V_{DSS}	30V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 13mΩ (Type:10 mΩ)
I_D	-16.5A
V_{DSS}	-30V
$R_{DS(on)-typ}(@V_{GS}=-10V)$	< 25mΩ (Type:21 mΩ)


Application

- ◆ Wireless charging
- ◆ Boost driver
- ◆ Brushless motor

Product Specification Classification

Part Number	Package	Marking	Pack
YFW15G03DF	PDFN3*3-8L	YFW 15G03DF XXXX	5000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
		N-Ch	P-Ch	
Drain-Source Voltage	VDS	30	-30	V
Gate - Source Voltage	VGS	±20	±20	V
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=25^\circ C$	I_D	28	-19.7	A
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=100^\circ C$	I_D	22.5	-17.5	A
Pulsed Drain Current ²	I_{DM}	84	-59.1	A
Single Pulse Avalanche Energy ³	E_{AS}	89	78	mJ
Avalanche Current	I_{AS}	34	33.1	A
Total Power Dissipation ⁴ @ T _C =25°C	P_D	46	41.3	W
Storage Temperature Range	T_{STG}	-55 to +150		°C
Operating Junction Temperature Range	T_J	-55 to +150		°C
Thermal Resistance Junction-Ambient ¹	R_{θJA}	62		°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	5		°C/W

N-Channel 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}	30	32.5	-	V
BVDSS Temperature Coefficient	Reference to 25 °C, I _D =1mA	ΔBV_{DSS}/ΔT_J	-	0.0193	-	V/°C
Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =15A	R_{DS(ON)}	-	9	12	mΩ
	V _{GS} =4.5V, I _D =10A		-	13	16	mΩ
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)}	-	-3.97	-	mV/°C
Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V, T _J =25°C	I_{DSS}	-	-	1	uA
	V _{DS} =24V, V _{GS} =0V, T _J =55°C		-	-	5	
Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V _{DS} = 5V, I _D = 30A	g_{fs}	-	34	-	S
Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	R_g	-	1.8	-	Ω
Total Gate Charge(4.5V)	V _{DS} =15V V _{GS} =4.5V I _D =15A	Q_g	-	9.8	-	nC
Gate-Source Charge		Q_{gs}	-	4.2	-	
Gate-Drain Charge		Q_{gd}	-	3.6	-	
Turn-on delay time	V _{DD} = 15V V _{GS} = 10V R _G = 3.3Ω I _D = 15A	t_{d(on)}	-	4	-	ns
Rise Time		T_r	-	8	-	
Turn-Off Delay Time		t_{d(OFF)}	-	31	-	
Fall Time		t_f	-	4	-	
Input Capacitance	V _{DS} =15V V _{GS} =0V f=1MHz	C_{iss}	-	940	-	pF
Output Capacitance		C_{oss}	-	131	-	
Reverse Transfer Capacitance		C_{rss}	-	109	-	
Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	I_S	-	-	43	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	112	A
Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	V_{SD}	-	-	1	V
Reverse Recovery Time	I _F =30A, dI/dt=100A/μs, T _J =25°C	t_{rr}	-	8.5	-	ns
Reverse Recovery Charge		Q_{rr}	-	2.2	-	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 ≦ 300us , duty cycle ≦ 2%
- 3、 The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=10A
- 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.

P-Channel 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}	-30	32.5	-	V
BVDSS Temperature Coefficient	Reference to 25 °C , I _D =-1mA	ΔBV_{DSS}/ΔT_J	-	-0.022	-	V/°C
Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-15A	R_{DS(ON)}	-	21	25	mΩ
	V _{GS} =-4.5V, I _D =-10A		-	33	38	mΩ
Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	V_{GS(th)}	-1.0	-1.6	-2.5	V
V _{GS(th)} Temperature Coefficient		ΔV_{GS(th)}	-	4.6	-	mV/°C
Drain-Source Leakage Current	V _{DS} =-24V, V _{GS} =0V T _J =25 °C	I_{DSS}	-	-	-1	uA
	V _{DS} =-24V, V _{GS} =0V, T _J =55 °C		-	-	-5	
Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V _{DS} = -5V, I _D = -6A	g_{fs}	-	17	-	S
Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	R_g	-	13	-	Ω
Total Gate Charge(-4.5V)	V _{DS} =-15V V _{GS} =-4.5V I _D =-6A	Q_g	-	12.6	-	nC
Gate-Source Charge		Q_{gs}	-	4.8	-	
Gate-Drain Charge		Q_{gd}	-	4.8	-	
Turn-on delay time	V _{DD} =-15V V _{GS} =-10V R _G = 3.3Ω I _D =-6A	t_{d(on)}	-	4.6	-	ns
Rise Time		T_r	-	14.8	-	
Turn-Off Delay Time		t_{d(OFF)}	-	41	-	
Fall Time		t_f	-	19.6	-	
Input Capacitance	V _{DS} =-15V V _{GS} =0V f=1MHz	C_{iss}	-	1345	-	pF
Output Capacitance		C_{oss}	-	194	-	
Reverse Transfer Capacitance		C_{rss}	-	158	-	
Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	I_S	-	-	-6.5	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	-26	A
Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25 °C	V_{SD}	-	-	-1.2	V
Reverse Recovery Time	I _F =-6A, dI/dt=100A/μs, T _J =25 °C	t_{rr}	-	16.3	-	ns
Reverse Recovery Charge		Q_{rr}	-	5.9	-	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 ≦ 300us , duty cycle ≦ 2%
- 3、 The EAS data sh.The power dissipation is limited by ows Max. rating .
- 4、 The test condition is 150 °C junction temperature V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-10A
- 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

N-Typical Characteristics

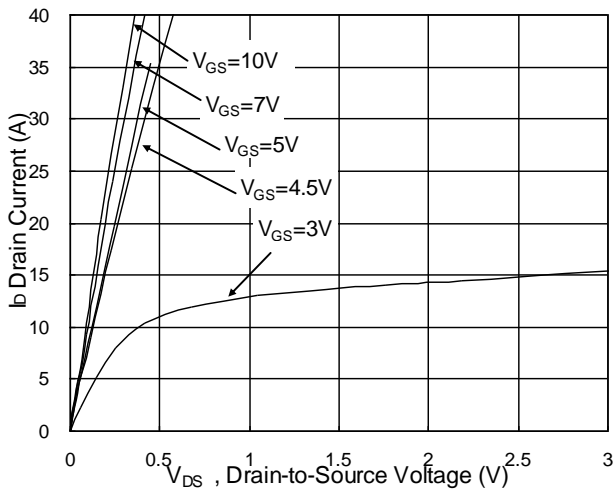


Fig.1 Typical Output Characteristics

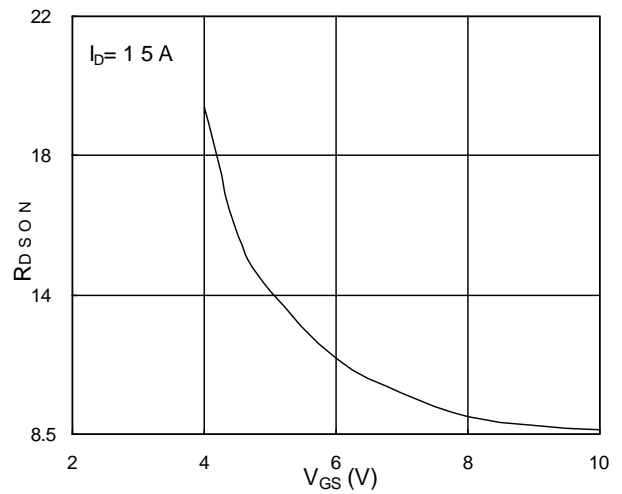


Fig.2 On-Resistance vs. G-S Voltage

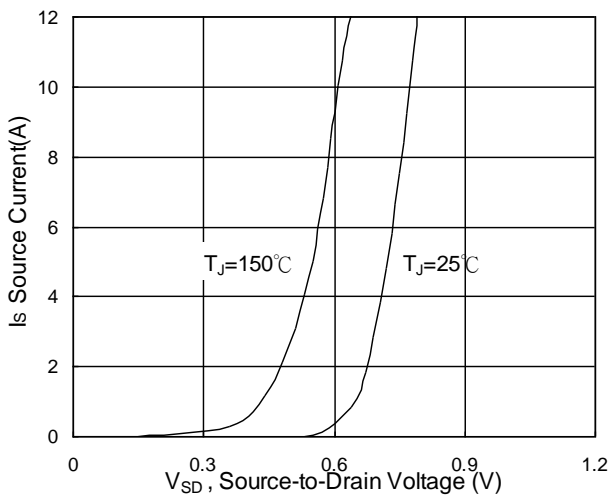


Fig.3 Forward Characteristics of Reverse

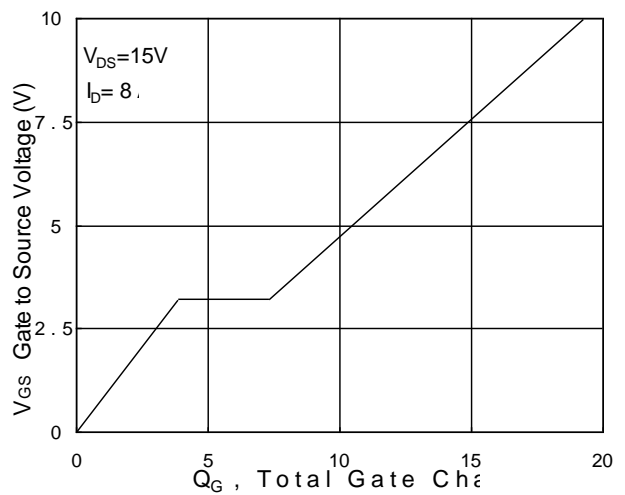


Fig.4 Gate-Charge Characteristics

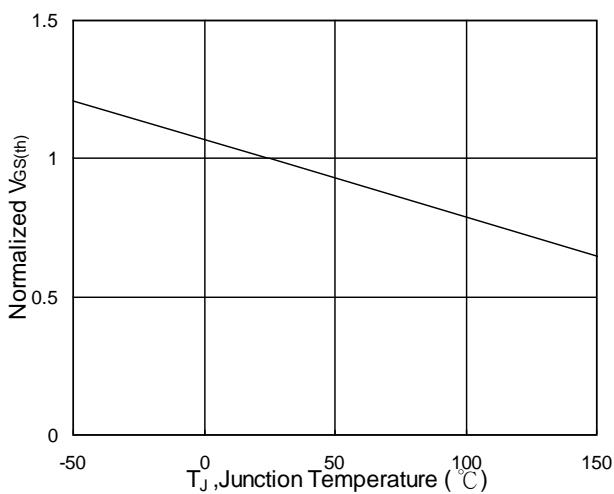


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

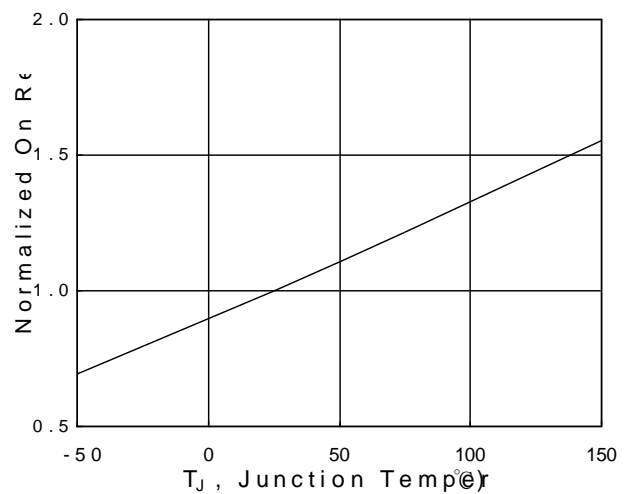


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

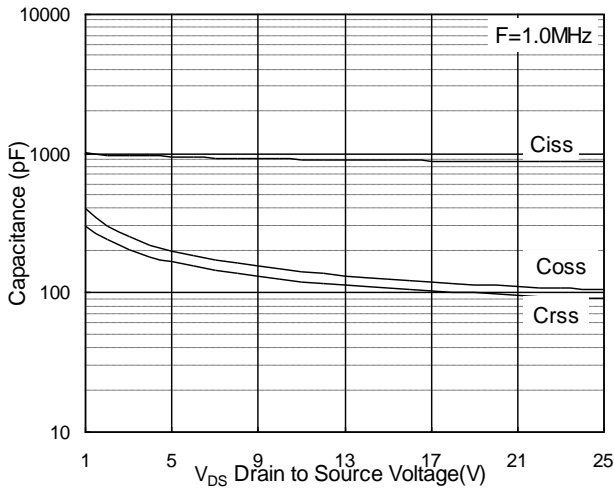


Fig.7 Capacitance

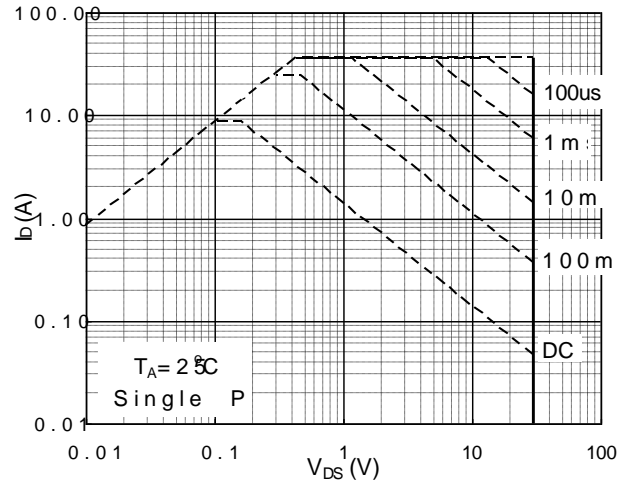


Fig.8 Safe Operating Area

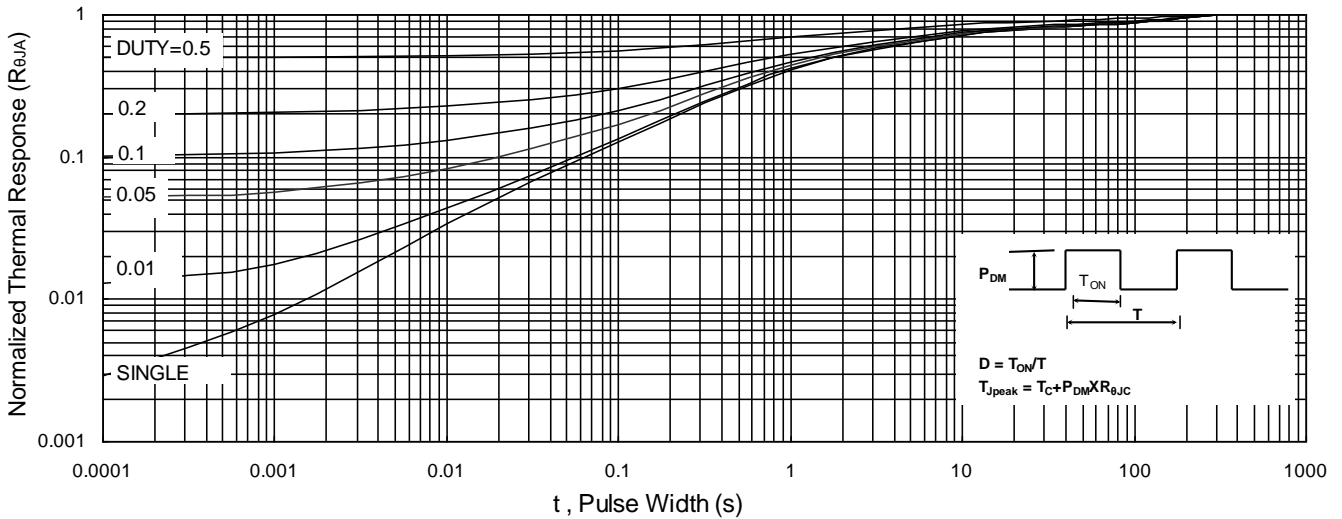


Fig.9 Normalized Maximum Transient Thermal Impedance

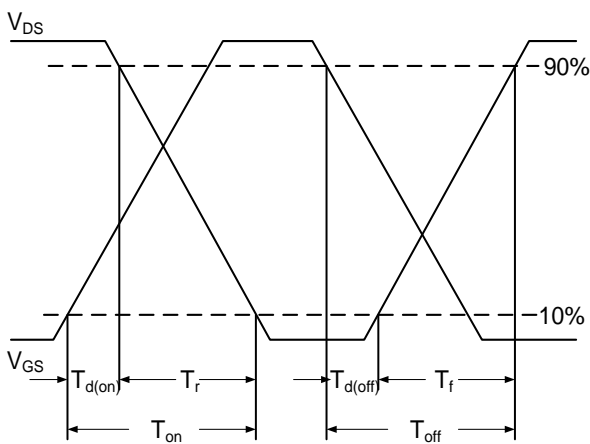


Fig.10 Switching Time Waveform

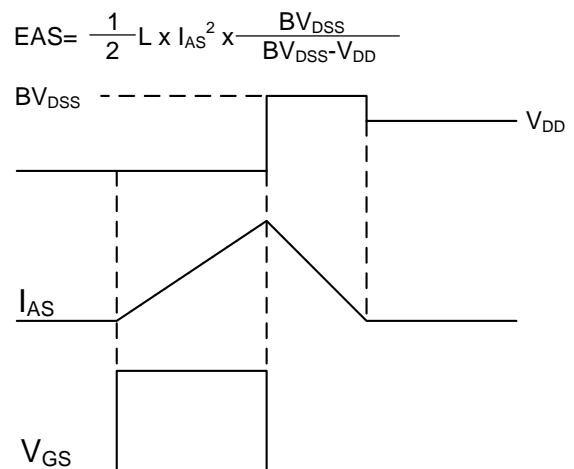


Fig.11 Unclamped Inductive Switching Waveform

Ratings and Characteristic Curves

P-Typical Characteristics

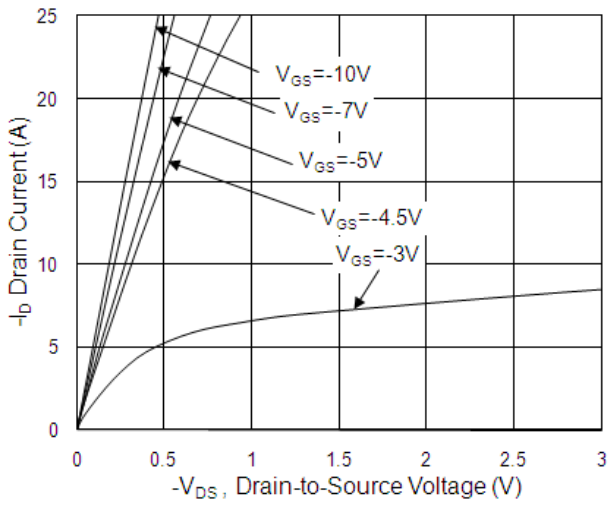


Fig.1 Typical Output Characteristics

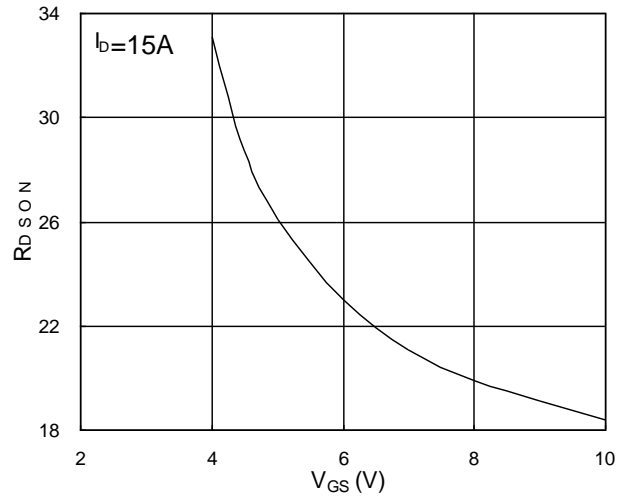


Fig.2 On-Resistance v.s Gate-Source

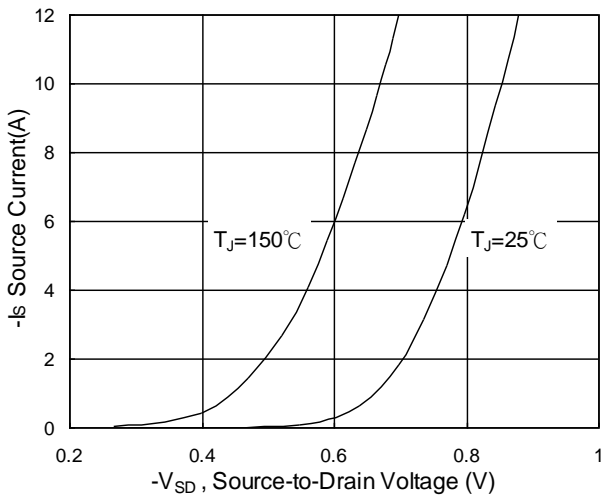


Fig.3 Forward Characteristics of Reverse

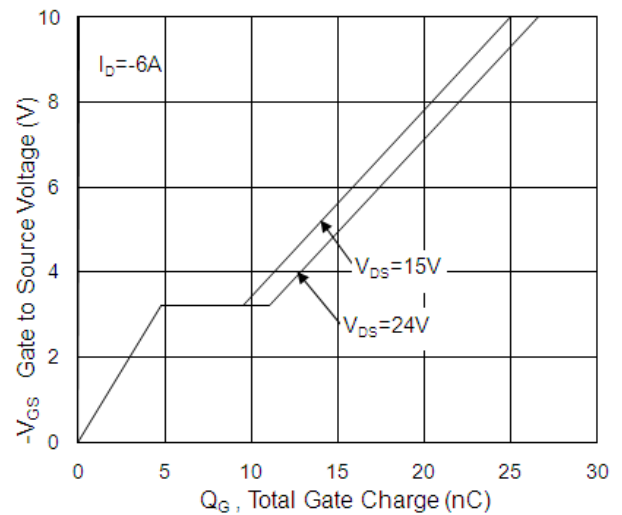


Fig.4 Gate-Charge Characteristics

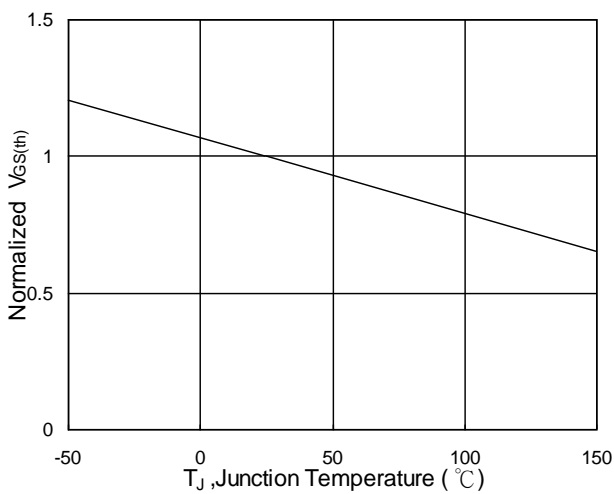


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

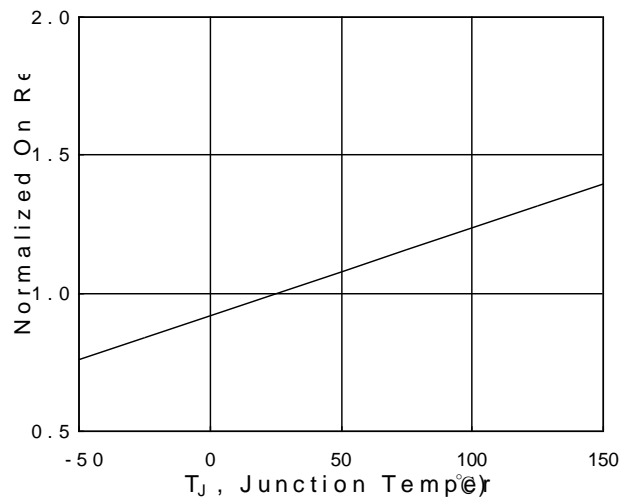


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

Ratings and Characteristic Curves

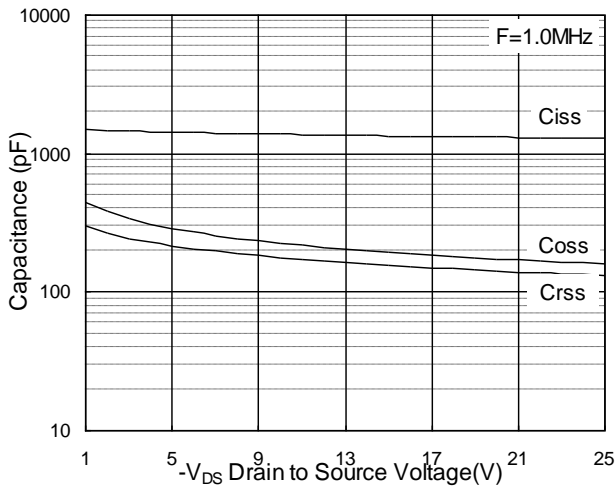


Fig.7 Capacitance

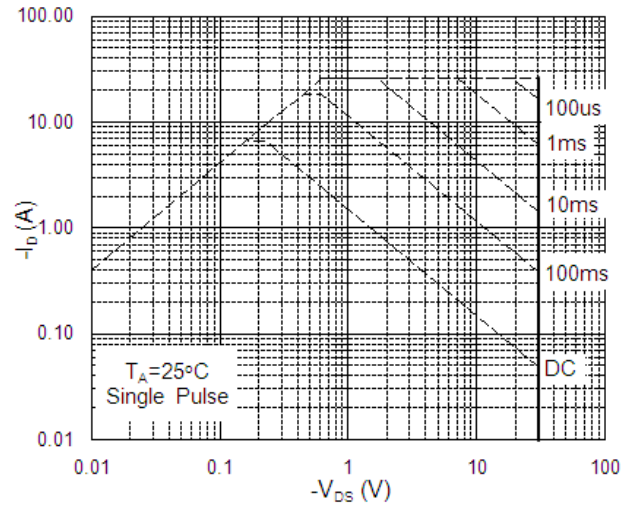


Fig.8 Safe Operating Area

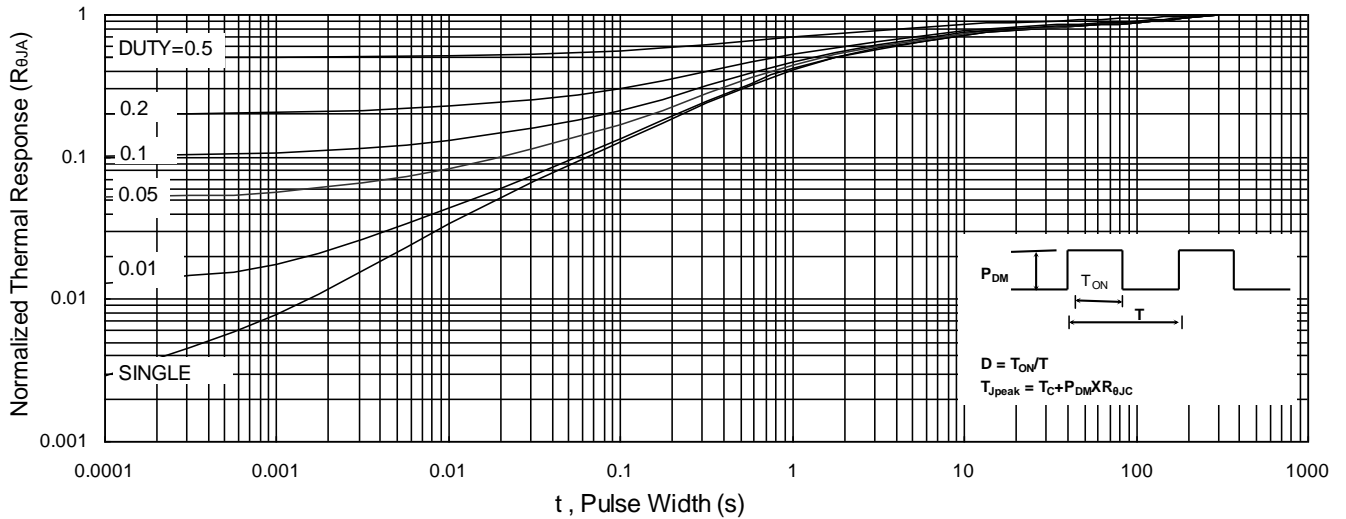


Fig.9 Normalized Maximum Transient Thermal Impedance

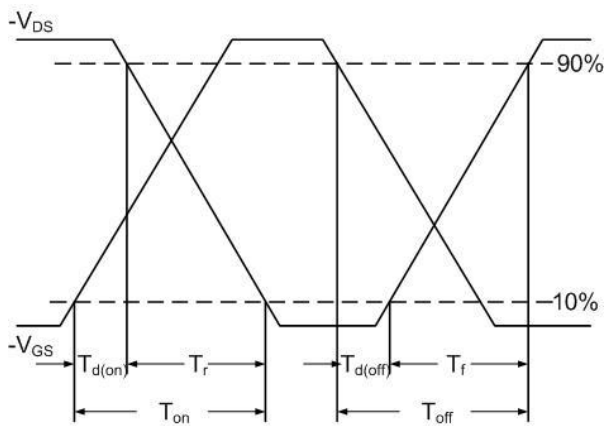


Fig.10 Switching Time Waveform

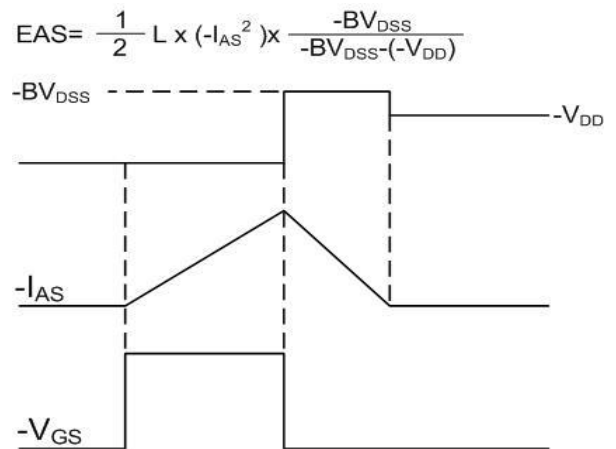
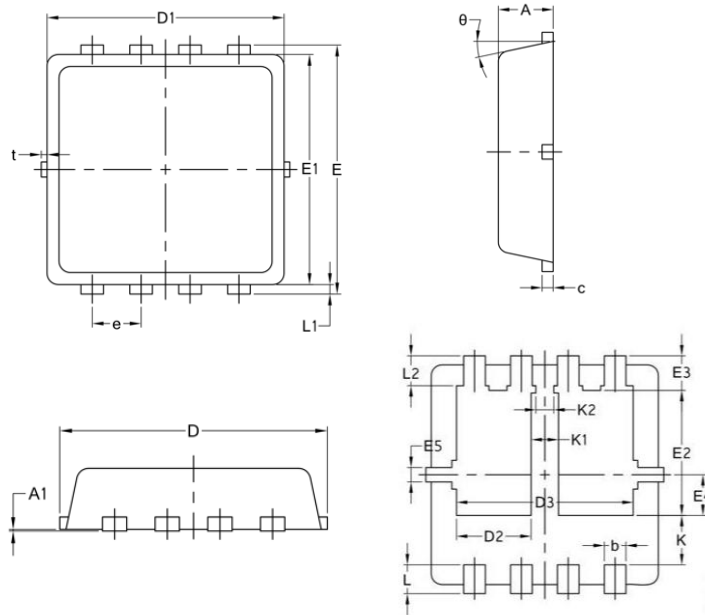


Fig.11 Unclamped Inductive Switching Waveform

PDFN3*3-8L



Symbol	Common		
	Mm		
	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°