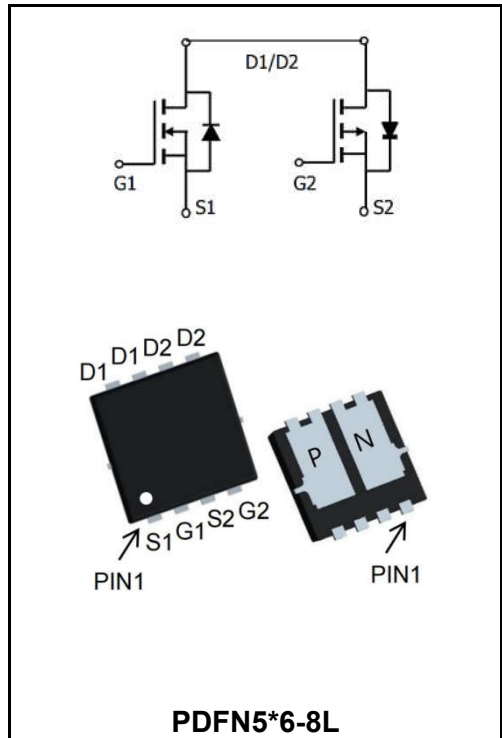


30V N+P-CHANNEL ENHANCEMENT MODE MOSFET
MAIN CHARACTERISTICS

I_D	80A
V_{DSS}	30V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 6.5mΩ (Type:4.5 mΩ)
I_D	-72A
V_{DSS}	-30V
$R_{DS(on)-typ}(@V_{GS}=-10V)$	< 8.0mΩ (Type:6.2 mΩ)


Application

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

Product Specification Classification

Part Number	Package	Marking	Pack
YFW80G03NF	PDFN5*6-8L	YFW 80G03NF XXXXX	5000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
		N-Ch	P-Ch	
Drain-Source Voltage	V_{DS}	30	-30	V
Gate - Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_c=25^\circ C$	I_D	80	-72	A
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_c=100^\circ C$	I_D	52.5	-57.5	A
Pulsed Drain Current ²	I_{DM}	243	-210	A
Single Pulse Avalanche Energy ³	E_{AS}	389	478	mJ
Avalanche Current	I_{AS}	80	72	A
Total Power Dissipation ⁴ @ $T_c=25^\circ C$	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	$R_{\theta JA}$	25		°C/W
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	1.3		°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	V(BR)DSS	30	32	-	V
Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	I_{DSS}	-	-	1.0	uA
Gate to Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	V_{GS(th)}	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	V _{GS} =10V, I _D =30A	R_{DS(ON)}	-	4.5	6.5	mΩ
	V _{GS} =4.5V, I _D =20A		-	6.1	8.5	
Input Capacitance	V _{DS} =15V V _{GS} =0V f=1.0MHz	C_{iss}	-	1614	-	pF
Output Capacitance		C_{oss}	-	245	-	
Reverse Transfer Capacitance		C_{rss}	-	215	-	
Total Gate Charge	V _{DS} =15V V _{GS} =10V I _D =30A	Q_g	-	33.7	-	nC
Gate-Source Charge		Q_{gs}	-	8.5	-	
Gate-Drain("Miller") Charge		Q_{gd}	-	7.5	-	
Turn-on delay Time	V _{DS} =15V I _D =30A R _{GEN} = 3Ω V _{GS} =10V	t_{d(on)}	-	7.5	-	ns
Turn-on Rise Time		T_r	-	14.5	-	
Turn-Off Delay Time		t_{d(OFF)}	-	35.2	-	
Turn-Off Fall Time		t_f	-	9.6	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	70	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	280	A
Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	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=24V,VGS=10V,L=0.1mH,IAS=80A
- 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.

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	-	-	V
Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-30A	R_{DS(ON)}	-	6.2	8.0	mΩ
	V _{GS} =-4.5V, I _D =-15A		-	11	13	
Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	V_{GS(th)}	-1.2	-1.6	-2.5	V
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}	-	25	-	S
Total Gate Charge(-4.5V)	V _{DS} =-15V V _{GS} =-4.5V I _D =-15A	Q_g	-	30	-	nC
Gate-Source Charge		Q_{gs}	-	10	-	
Gate-Drain Charge		Q_{gd}	-	10.4	-	
Turn-on delay time	V _{DD} =-15V V _{GS} =-10V R _G = 3.3Ω I _D =-15A	t_{d(on)}	-	9.4	-	ns
Rise Time		T_r	-	10.2	-	
Turn-Off Delay Time		t_{d(OFF)}	-	117	-	
Fall Time		t_f	-	24	-	
Input Capacitance	V _{DS} =-15V V _{GS} =0V f=1MHz	C_{iss}	-	3448	-	pF
Output Capacitance		C_{oss}	-	508	-	
Reverse Transfer Capacitance		C_{rss}	-	421	-	
Continuous Source Current ^{1.5}	V _G =V _D =0V, Force Current	I_S	-	-	-50	A
Pulsed Source Current ²		I_{SM}	-	-	-130	A
Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	V_{SD}	-	-	-1	A
Reverse Recovery Time	I _F =-15A, dI/dt=100A/μs, T _J =25°C	t_{rr}	-	20	-	nS
Reverse Recovery Charge		Q_{rr}	-	9.5	-	nC

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、 The power dissipation is limited by 175°C junction temperature
- 4、 EAS condition: T_J=25°C, V_{DD}= -24V, V_G= -10V, R_G=7Ω, L=0.1mH, I_{AS}= -72A
- 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

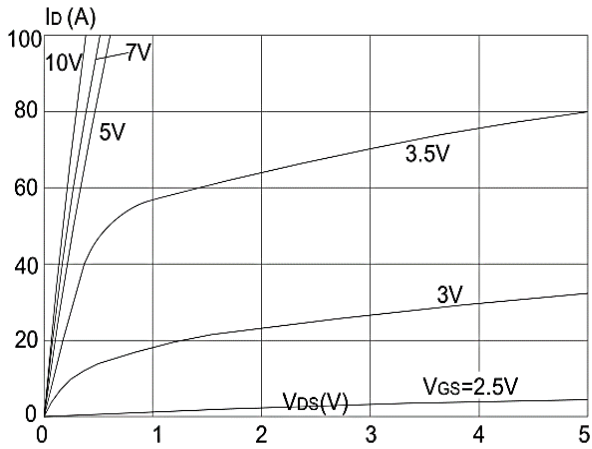


Figure 1: Output Characteristics

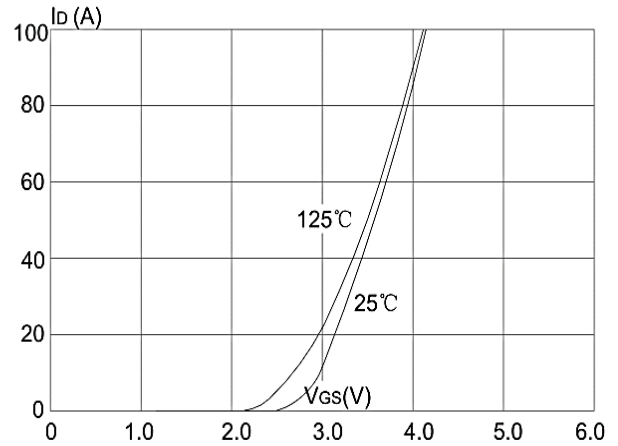


Figure 2: Typical Transfer Characteristics

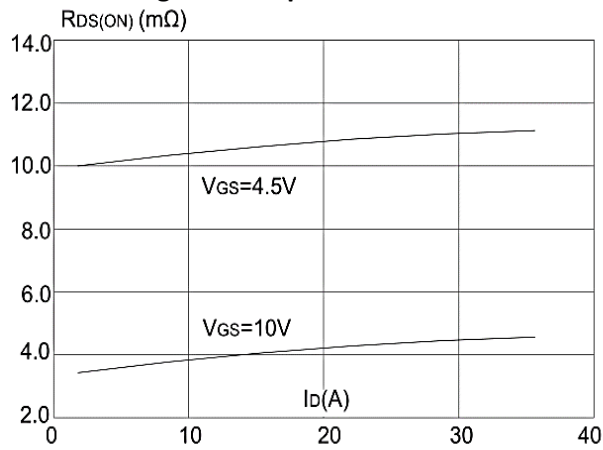


Figure 3: On-resistance vs. Drain Current

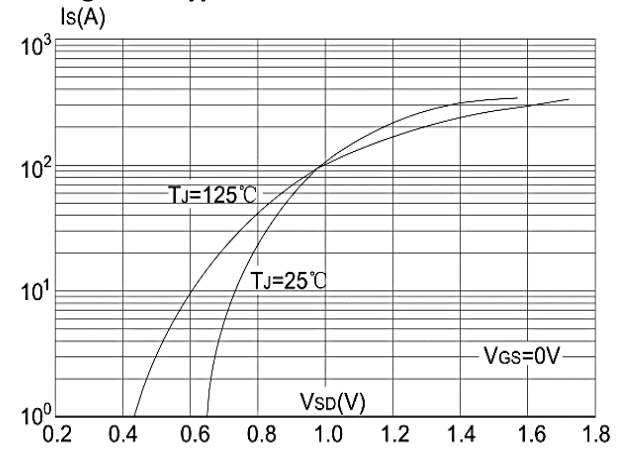


Figure 4: Body Diode Characteristics

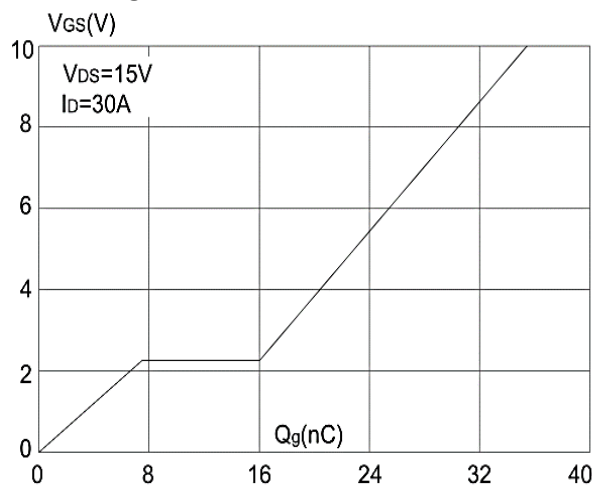


Figure 5: Gate Charge Characteristics

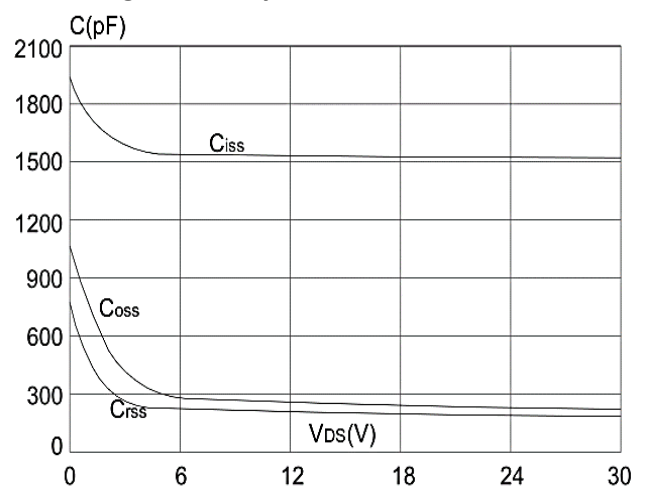


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

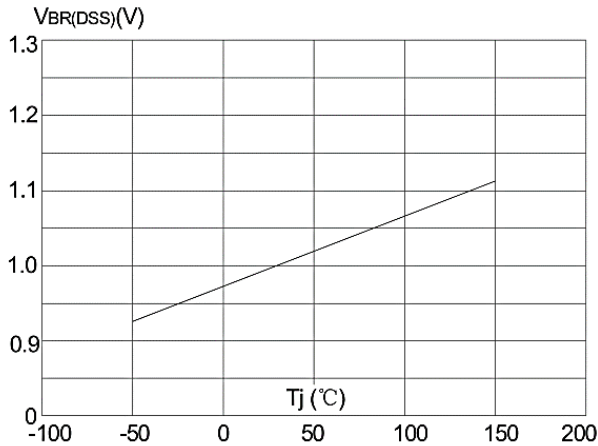


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

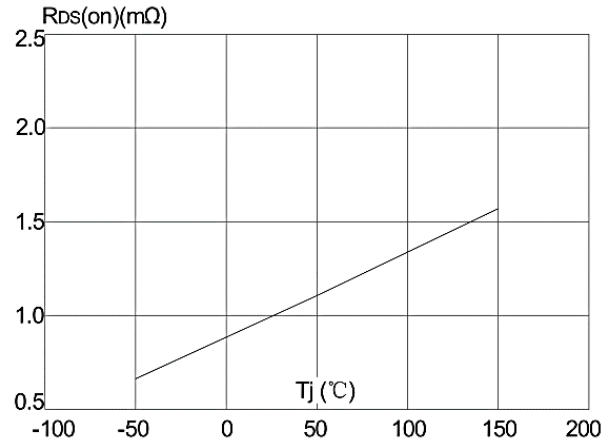


Figure 8: Normalized on Resistance vs. Junction Temperature

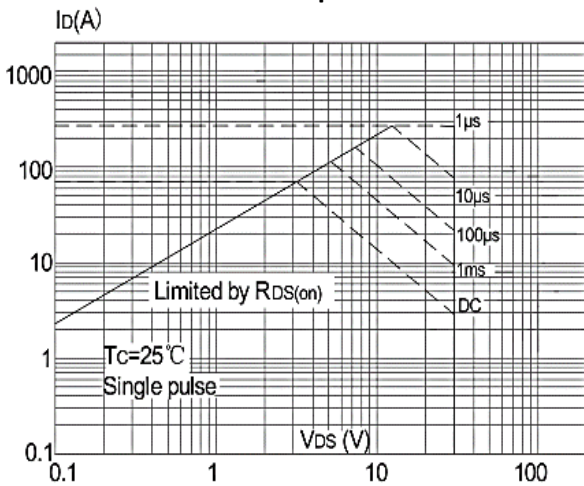


Figure 9: Maximum Safe Operating Area vs. Case Temperature

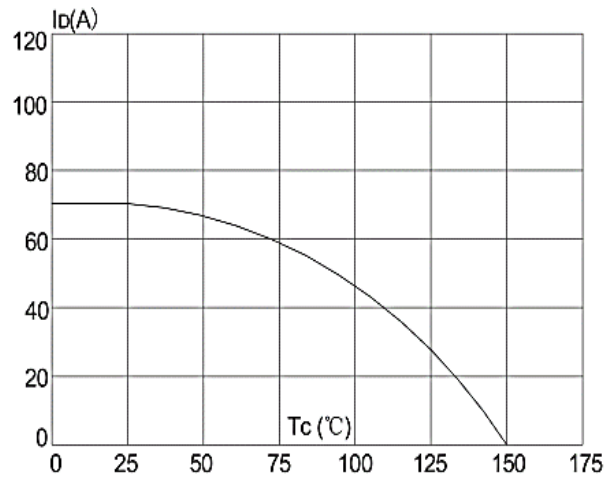


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

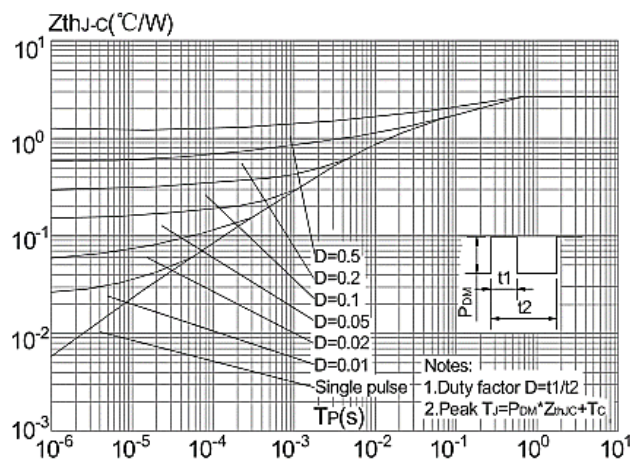


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ca

Ratings and Characteristic Curves

P-Typical Characteristics

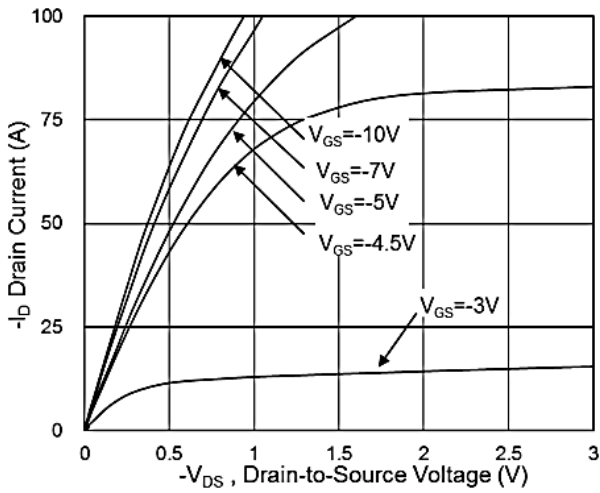


Fig.1 Typical Output Characteristics

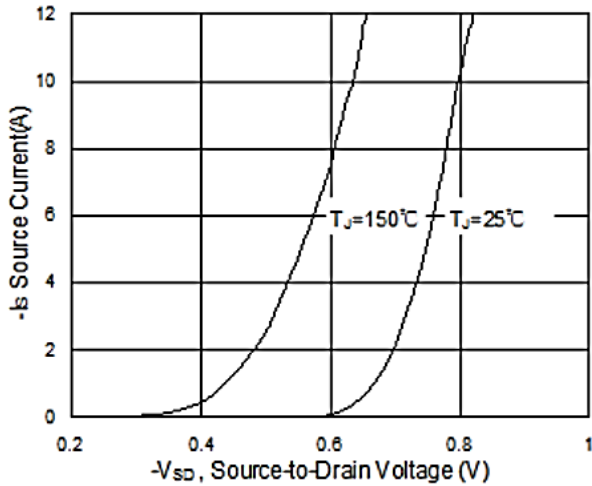


Fig.3 Forward Characteristics of Reverse

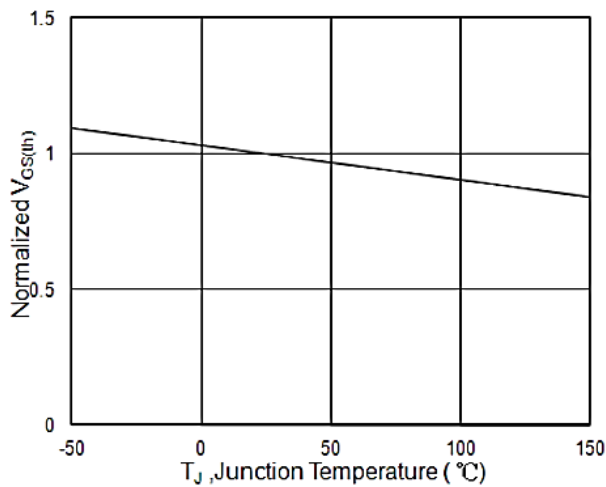


Fig.5 Normalized $-V_{GS(th)}$ vs. T_J

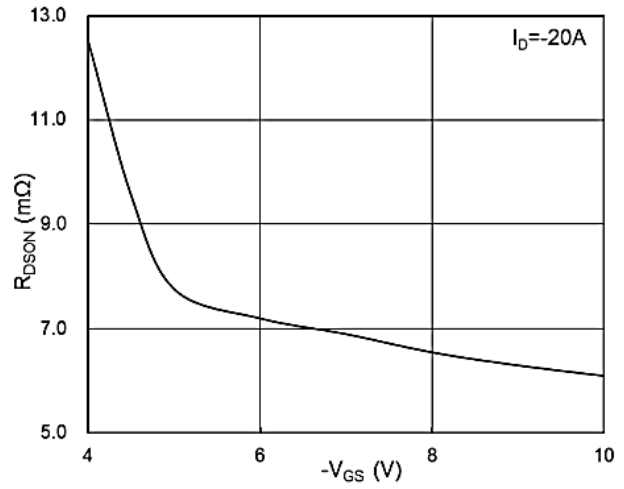


Fig.2 On-Resistance vs. Gate-Source Voltage

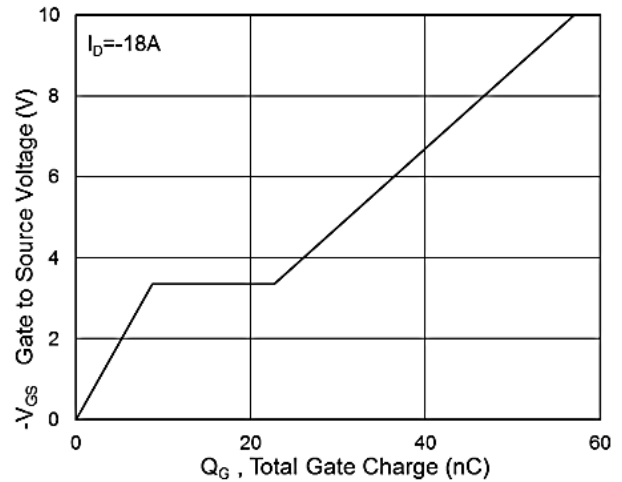


Fig.4 Gate-Charge Characteristics

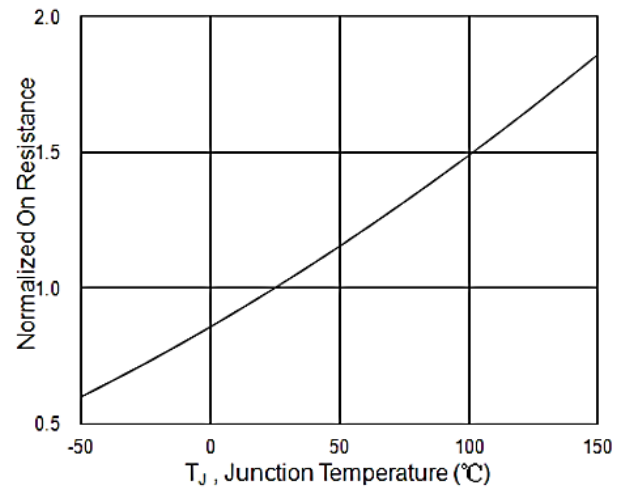


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

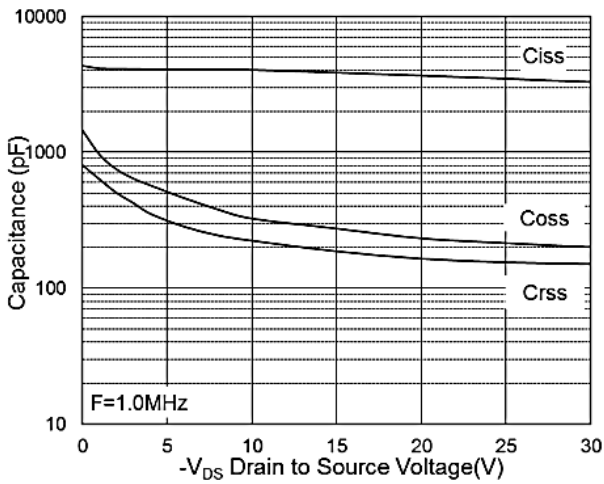


Fig.7 Capacitance

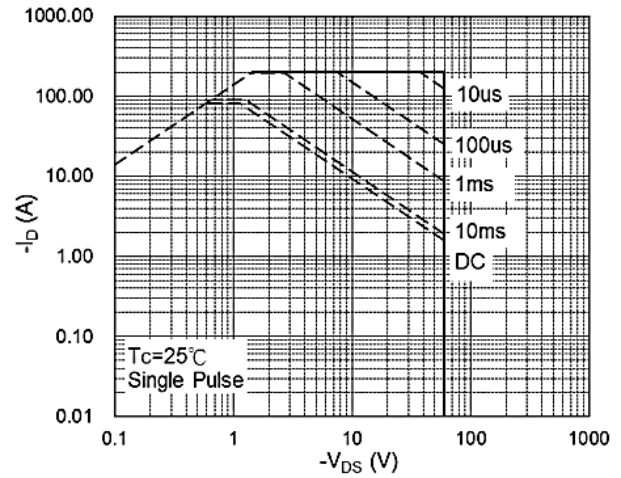


Fig.8 Safe Operating Area

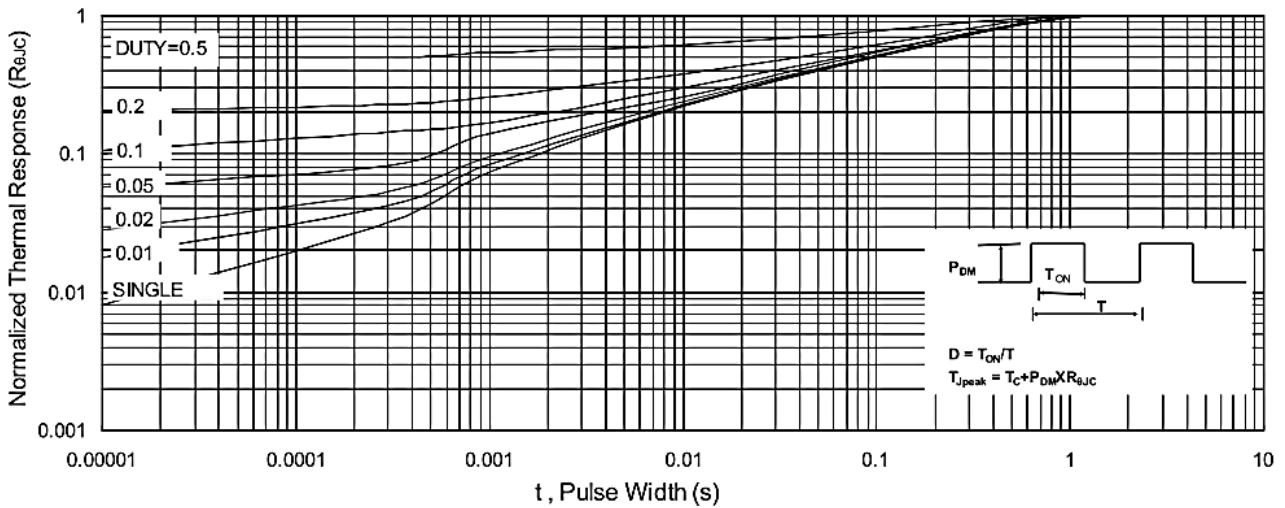


Fig.9 Normalized Maximum Transient Thermal Impedance

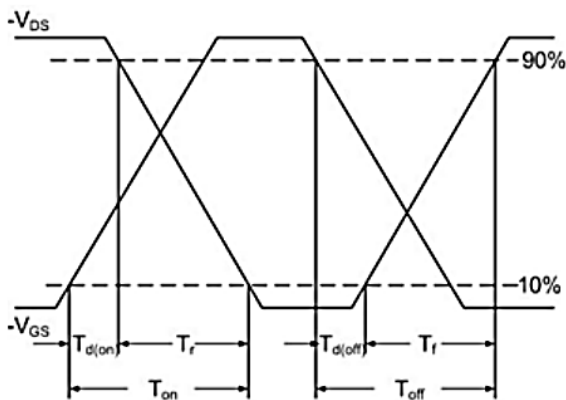


Fig.10 Switching Time Waveform

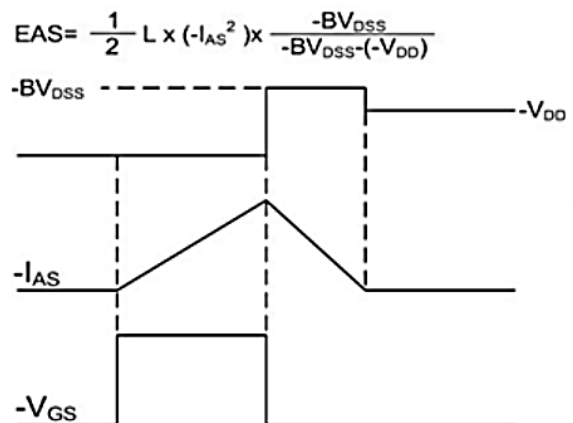
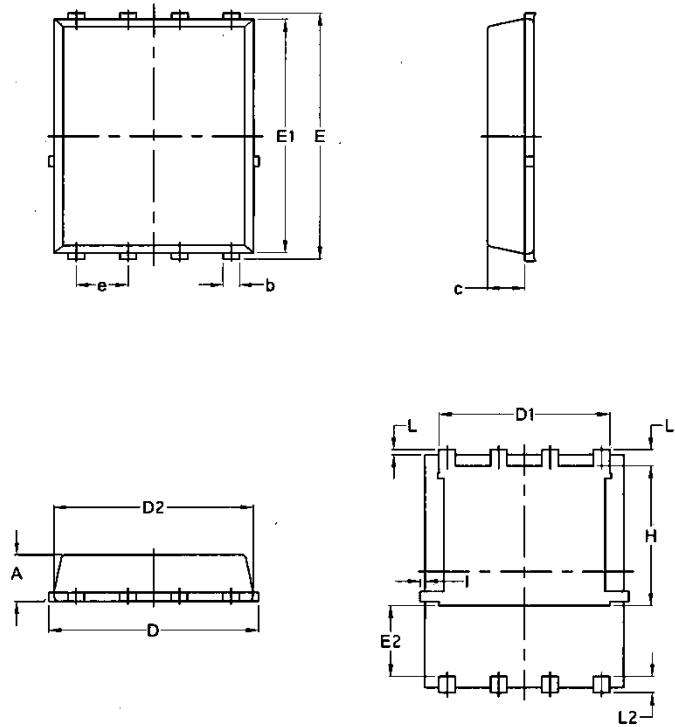


Fig.11 Unclamped Inductive Switching Waveform

PDFN5*6-8L



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070