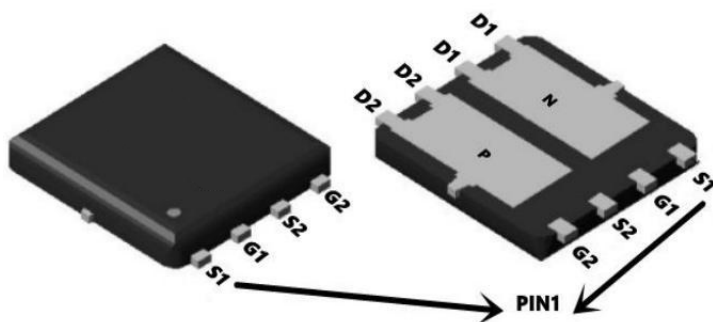
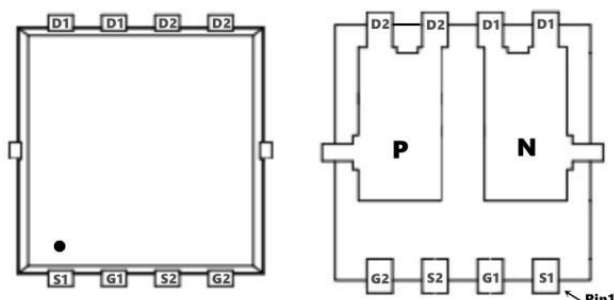


Description

The SX80G03NF 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.



General Features

$V_{DS} = 30V$ $I_D = 80A$

$R_{DS(ON)} < 6.5m\Omega$ @ $V_{GS}=10V$

$V_{DS} = -30V$ $I_D = -72A$

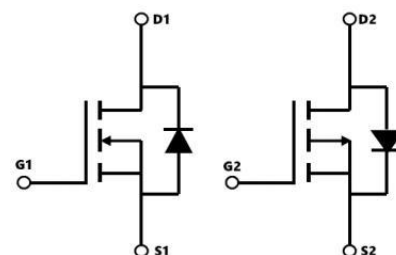
$R_{DS(ON)} < 8.0m\Omega$ @ $V_{GS}=-10V$

Application

Wireless charging

Boost driver

Brushless motor



Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	N-Ch	P-Ch	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	80	-72	A
$I_D @ T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	52.5	-57.5	A
I_{DM}	Pulsed Drain Current ²	243	-210	A
EAS	Single Pulse Avalanche Energy ³	389	478	mJ
I_{AS}	Avalanche Current	80	72	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation ⁴	46	41.3	W
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150		$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	25		$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.3		$^\circ C/W$

N-Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	32	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} = 0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	1.0	1.6	2.5	V
RDS(on)	Static Drain-Source on-Resistance	V _{GS} =10V, I _D =30A	-	4.5	6.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	6.1	8.5	
Ciss	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f = 1.0MHz	-	1614	-	pF
Coss	Output Capacitance		-	245	-	pF
Crss	Reverse Transfer Capacitance		-	215	-	pF
Qg	Total Gate Charge	V _{DS} =15V, I _D =30A, V _{GS} =10V	-	33.7	-	nC
Qgs	Gate-Source Charge		-	8.5	-	nC
Qgd	Gate-Drain("Miller") Charge		-	7.5	-	nC
td(on)	Turn-on Delay Time	V _{DS} =15V, I _D =30A, R _{GEN} =3Ω, V _{GS} =10V	-	7.5	-	ns
t _r	Turn-on Rise Time		-	14.5	-	ns
td(off)	Turn-off Delay Time		-	35.2	-	ns
t _f	Turn-off Fall Time		-	9.6	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	70	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	280	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =30A	-	-	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-Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250uA	-30	---	---	V
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =-10V , I _D =-30A	---	6.2	8.0	mΩ
		V _{GS} =-4.5V , I _D =-15A	---	11	13	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	1.6	-2.5	V
IDSS	Drain-Source Leakage Current	V _{DS} =-24V , V _{GS} =0V , T _J =25°C	---	---	-1	uA
		V _{DS} =-24V , V _{GS} =0V , T _J =55°C	---	---	-5	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =-5V , I _D =-30A	---	25	---	S
Qg	Total Gate Charge (-4.5V)	V _{DS} =-15V , V _{GS} =-4.5V , I _D =-15A	---	30	---	nC
Qgs	Gate-Source Charge		---	10	---	
Qgd	Gate-Drain Charge		---	10.4	---	
Td(on)	Turn-On Delay Time	V _{DD} =-15V , V _{GS} =-10V , R _G =3.3Ω I _D =-15A	---	9.4	---	ns
T _r	Rise Time		---	10.2	---	
Td(off)	Turn-Off Delay Time		---	117	---	
T _f	Fall Time		---	24	---	
Ciss	Input Capacitance	V _{DS} =-15V , V _{GS} =0V , f=1MHz	---	3448	---	pF
Coss	Output Capacitance		---	508	---	
Crss	Reverse Transfer Capacitance		---	421	---	
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	-50	A
ISM	Pulsed Source Current ²		---	---	-130	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-1	V
trr	Reverse Recovery Time	I _F =-15A , dI/dt=100A/μs , T _J =25°C	---	20	---	nS
Q _{rr}	Reverse Recovery Charge		---	9.5	---	nC

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 20Z 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 ID and IDM , in real applications , should be limited by total power dissipation.

N-Typical Characteristics

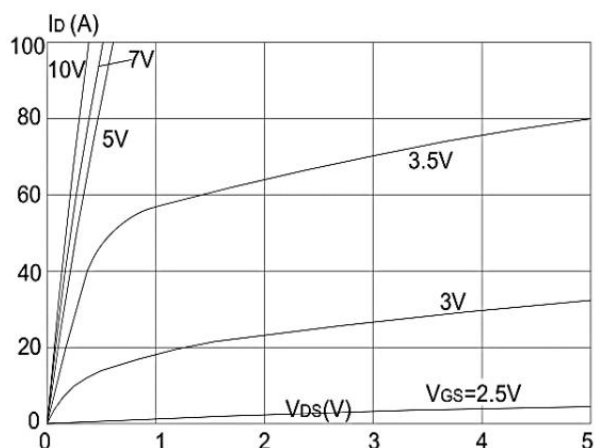


Figure1: Output Characteristics

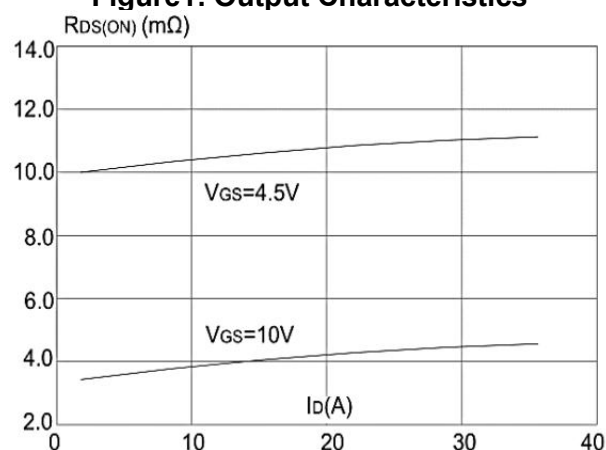


Figure 3: On-resistance vs. Drain Current

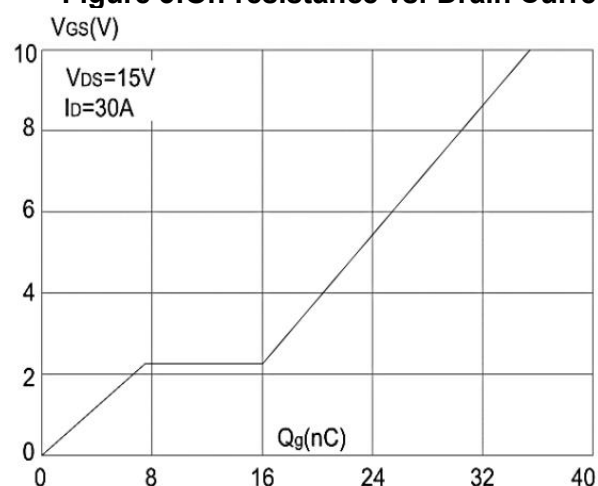


Figure 5: Gate Charge Characteristics

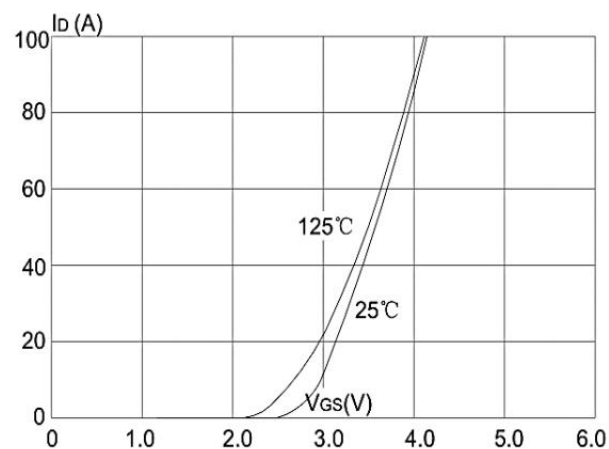


Figure 2: Typical Transfer Characteristics

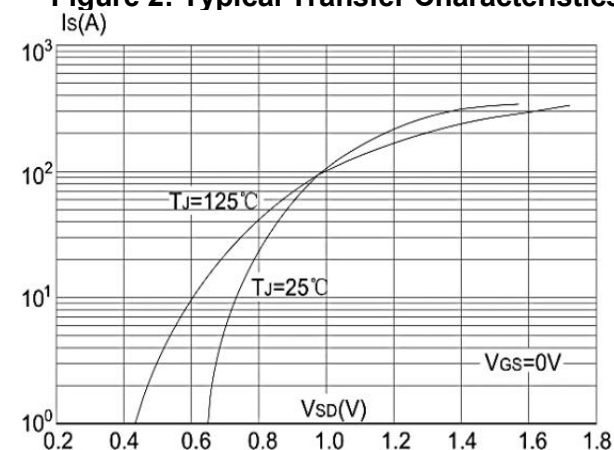


Figure 4: Body Diode Characteristics

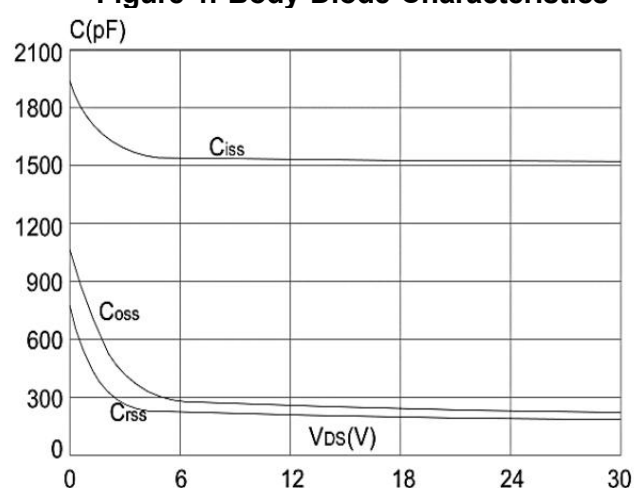


Figure 6: Capacitance Characteristics

N-Typical Characteristics

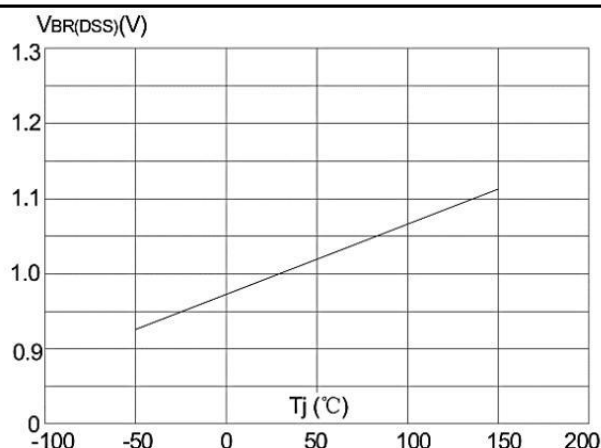


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

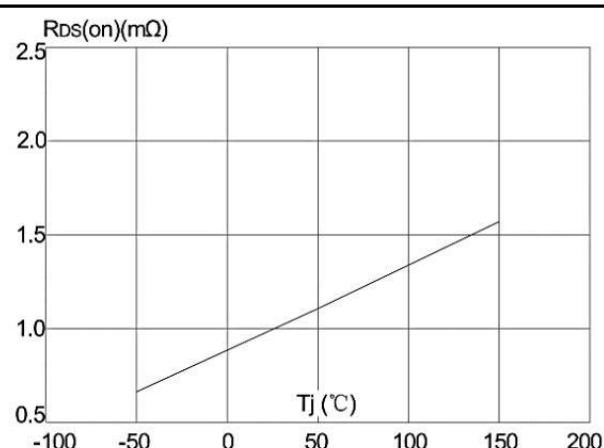


Figure 8: Normalized on Resistance vs. Junction Temperature

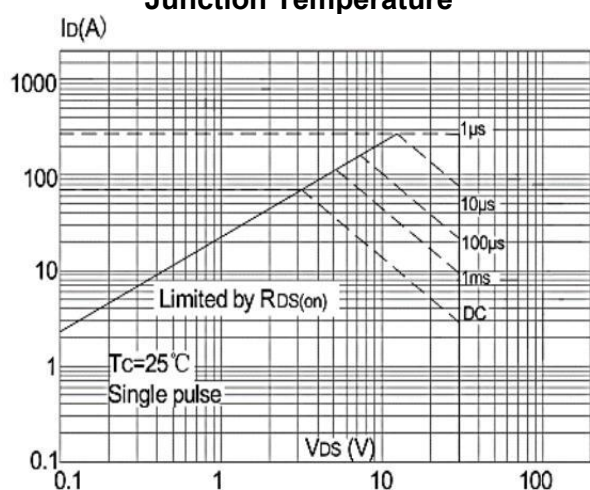


Figure 9: Maximum Safe Operating Area vs. Case Temperature

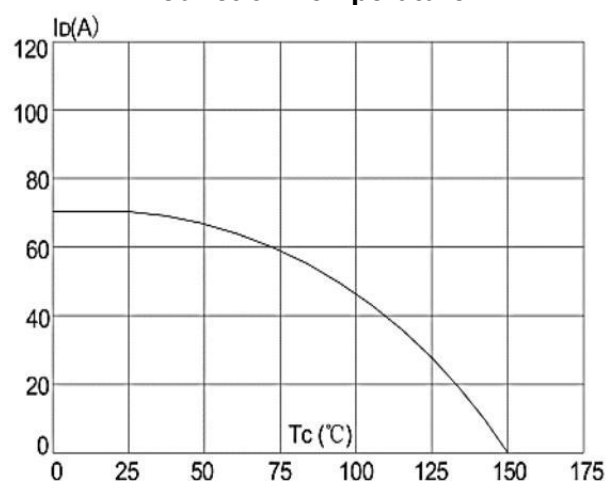


Figure 10: Maximum Continuous Drain Current

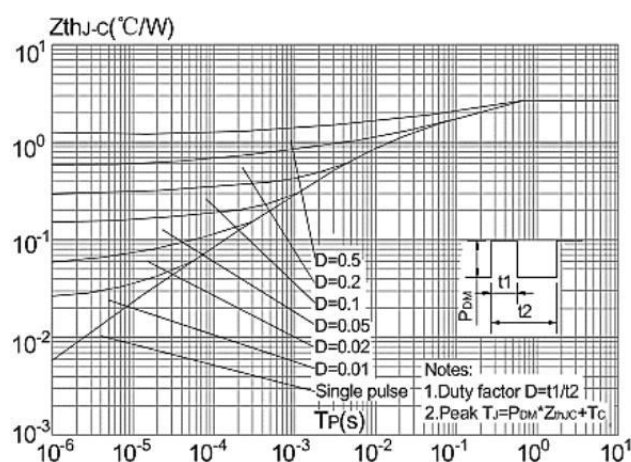


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ca

P-Typical Characteristics

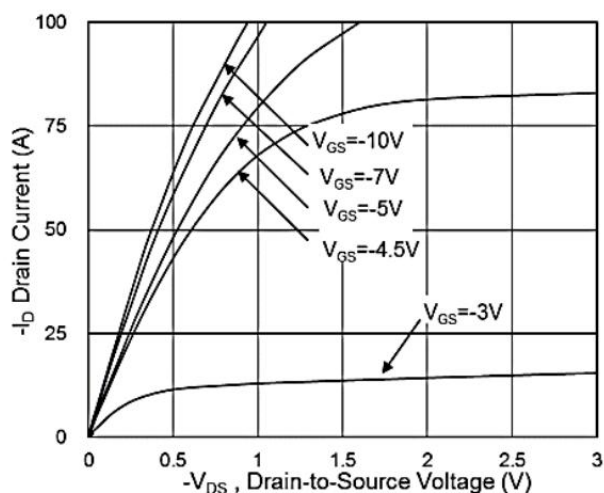


Fig.1 Typical Output Characteristics

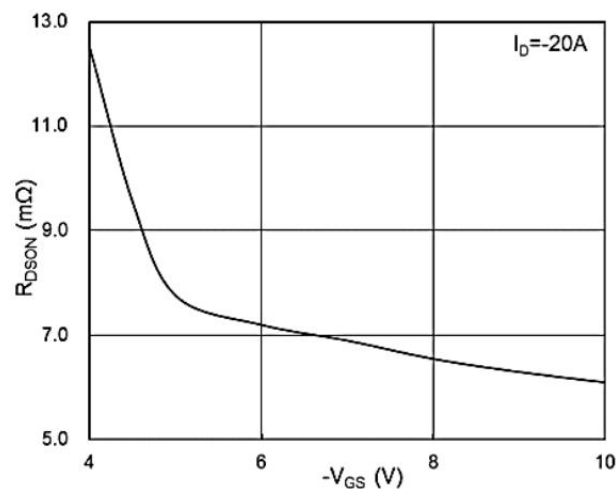


Fig.2 On-Resistance vs. Gate-Source Voltage

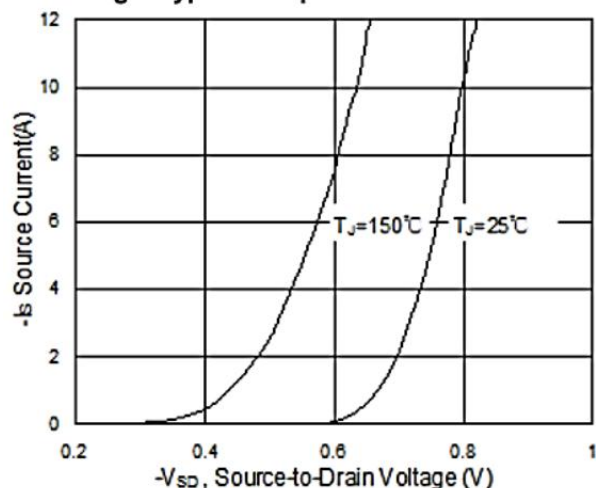


Fig.3 Forward Characteristics of Reverse

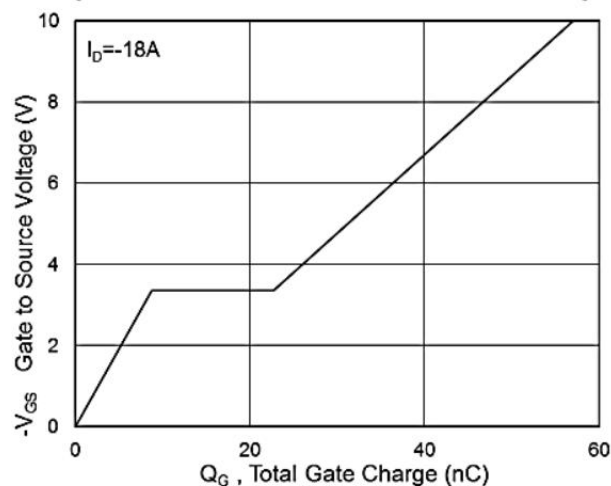


Fig.4 Gate-Charge Characteristics

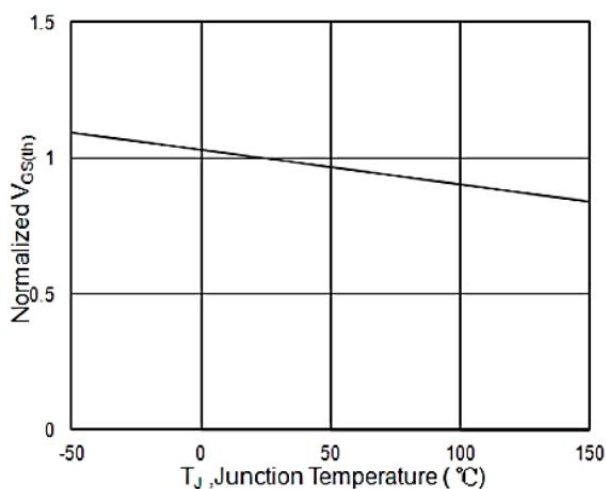


Fig.5 Normalized $-V_{GS(th)}$ vs. T_J

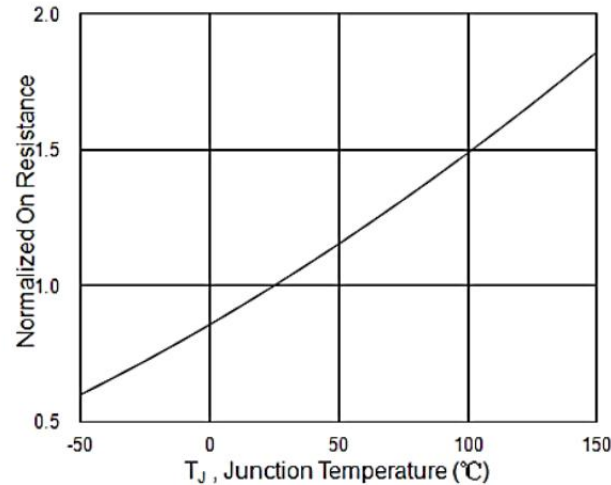


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

P-Typical Characteristics

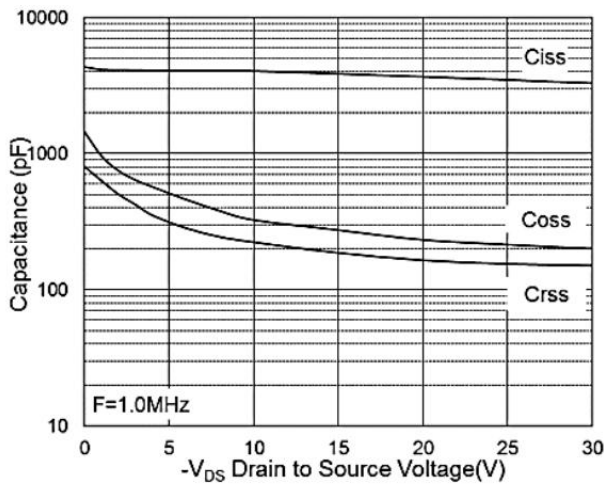


Fig.7 Capacitance

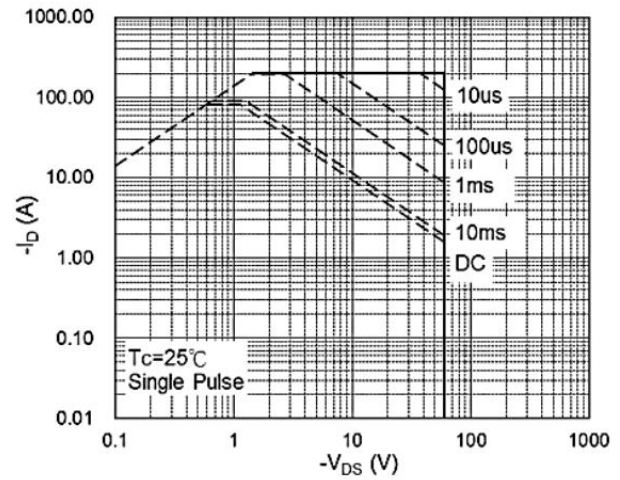


Fig.8 Safe Operating Area

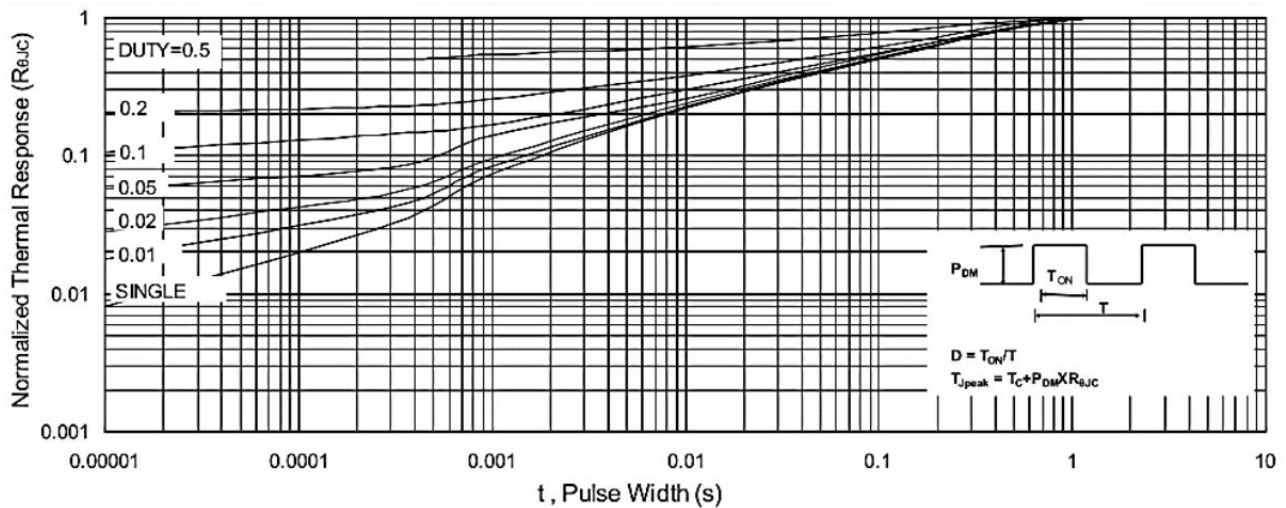


Fig.9 Normalized Maximum Transient Thermal Impedance

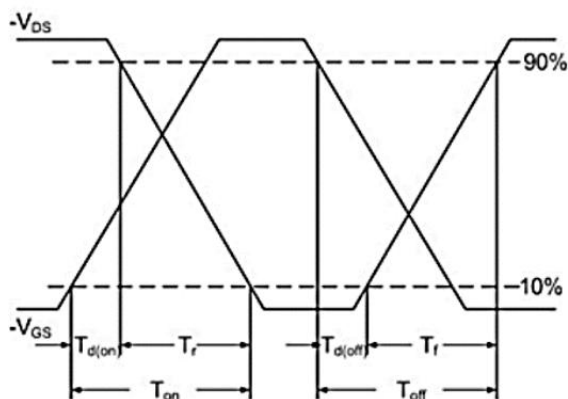


Fig.10 Switching Time Waveform

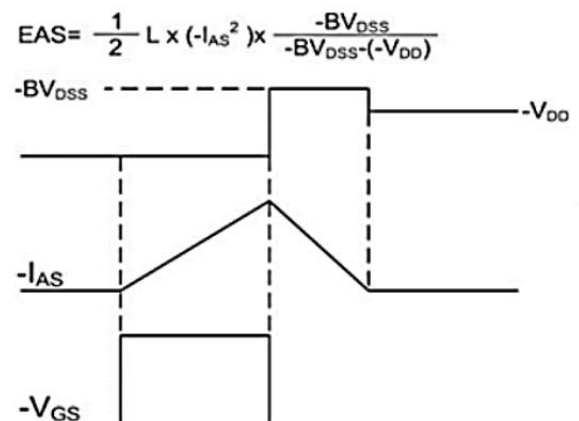
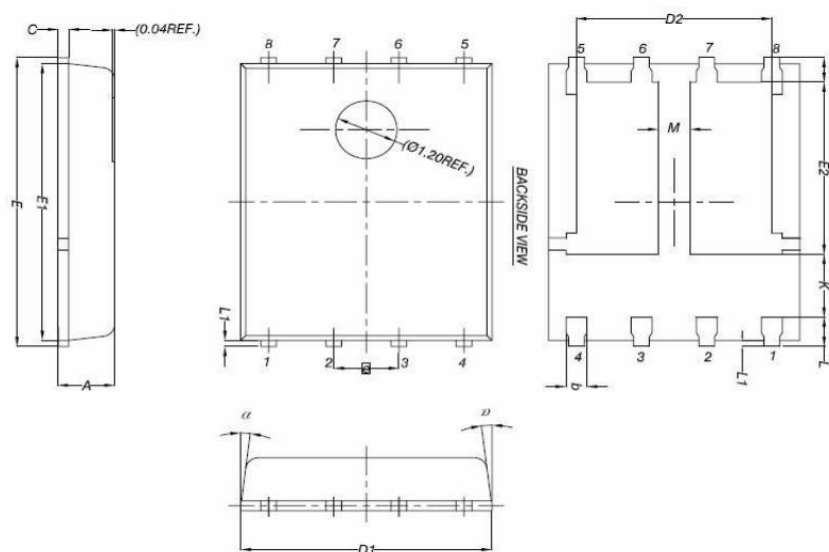


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-PDFN5*6-8L-JQ Double



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	3.30	3.45
E2	3.38	3.05	3.20
e	1.27BSC		
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	PDFN5*6-8L		5000