

Description

The SX40P10NF 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

$V_{DS} = -100V$ $I_D = -40A$

$R_{DS(ON)} < 50m\Omega$ @ $V_{GS}=10V$

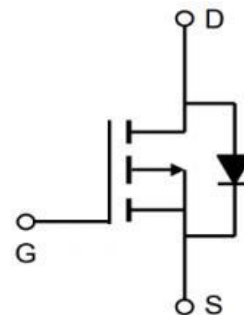
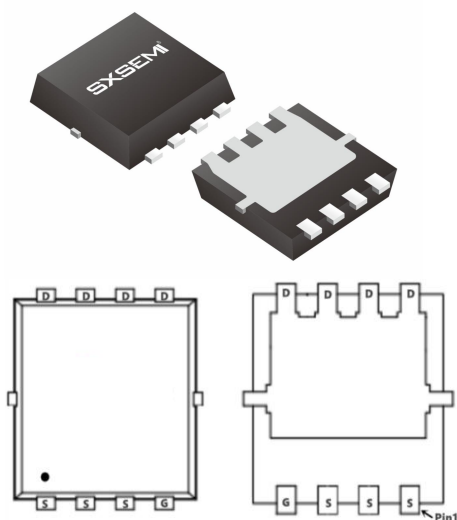
Application

Brushless motor

Load switch

Uninterruptible power supply

PDFN5*6-8L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-40	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-29	A
IDM	Pulsed Drain Current ²	-120	A
EAS	Single Pulse Avalanche Energy ³	560	mJ
IAS	Avalanche Current	-29	A
$P_D @ T_c=25^\circ C$	Total Power Dissipation ⁴	104	W
TSTG	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	1.22	$^\circ C/W$

P-Channel 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	-100	-110	---	V
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =-10V , I _D =-10A	---	40	50	mΩ
		V _{GS} =-4.5V , I _D =-8A	---	42	58	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.8	-2.5	V
IDSS	Drain-Source Leakage Current	V _{DS} =-100V , V _{GS} =0V , T _J =25°C	---	---	-1	uA
IGSS	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =-10V , I _D =-10A	---	32	---	S
Qg	Total Gate Charge	V _{DS} =-80V V _{GS} =-10V I _D =-14A	---	92	---	nC
Qgs	Gate-Source Charge		---	17.5	---	
Qgd	Gate-Drain Charge		---	14	---	
Td(on)	Turn-On Delay Time	V _{DD} =-50V , V _{GS} =-10V ,R _G =3.3Ω, I _D =-14A	---	20.5	---	ns
T _r	Rise Time		---	32.2	---	
Td(off)	Turn-Off Delay Time		---	123	---	
T _f	Fall Time		---	63.7	---	
Ciss	Input Capacitance	V _{DS} =-25V , V _{GS} =0V , f=1MHz	---	6516	---	pF
Coss	Output Capacitance		---	223	---	
Crss	Reverse Transfer Capacitance		---	125	---	
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	-40	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-1.2	V
trr	Reverse Recovery Time	I _F =-14A , di/dt=-100A/μs , T _J =25°C	---	31.2	---	nS
Q _{rr}	Reverse Recovery Charge		---	31.97	---	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 $\leq 300\mu s$, 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} =-29A
- 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.

Typical Characteristics

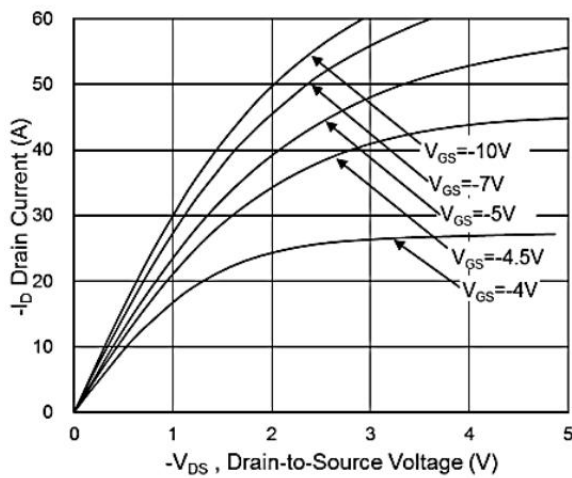


Fig.1 Typical Output Characteristics

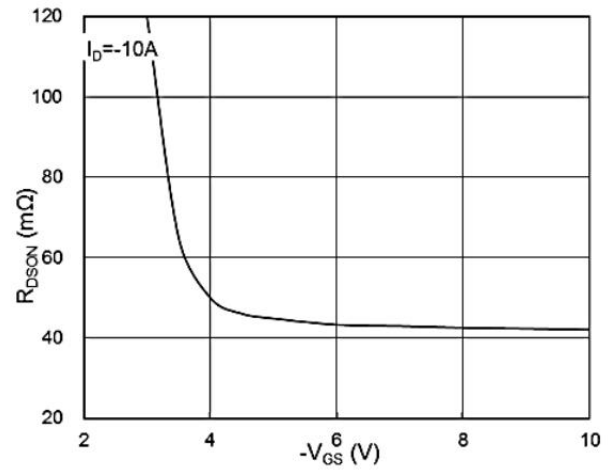


Fig.2 On-Resistance vs G-S Voltage

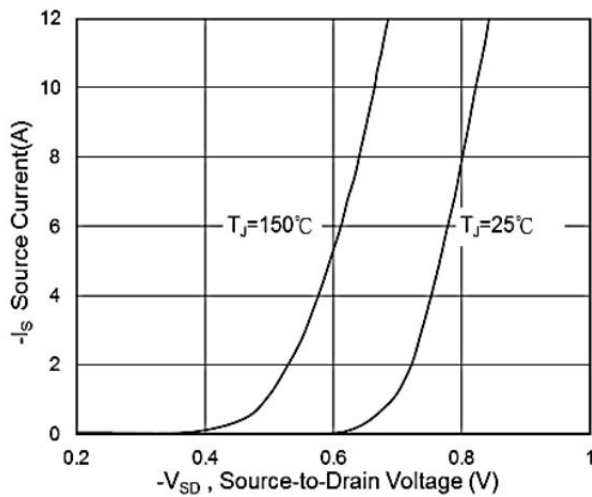


Fig.3 Typical S-D Diode Forward Voltage

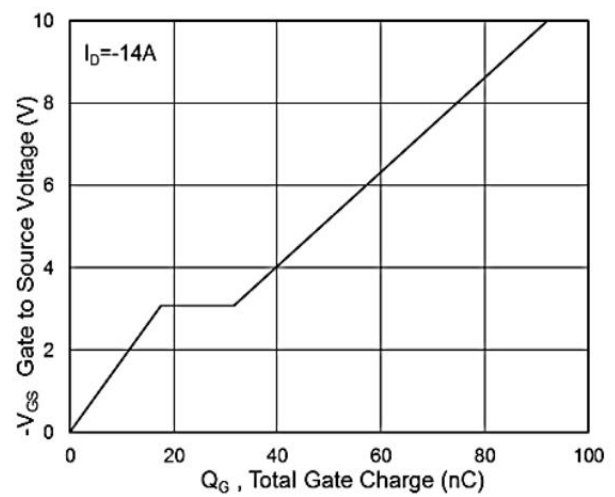


Fig.4 Gate-Charge Characteristics

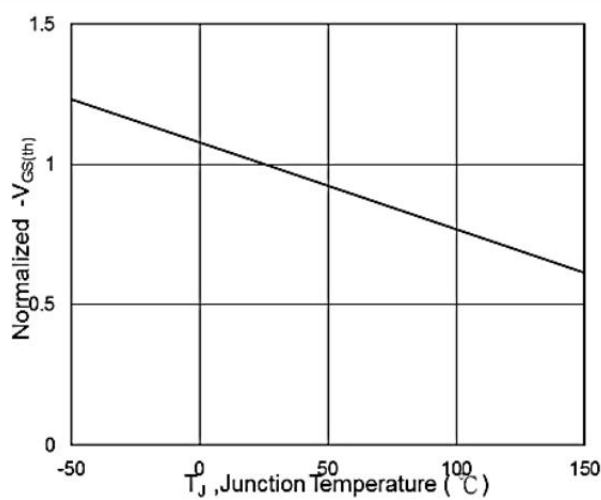


Fig.5 Normalized $V_{GS(th)}$ vs T_J

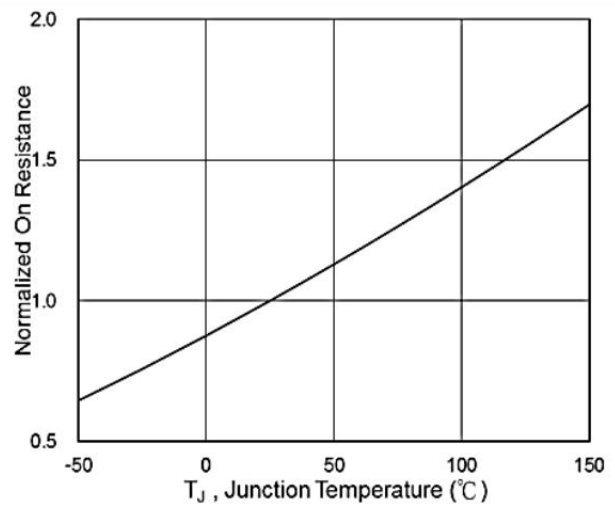
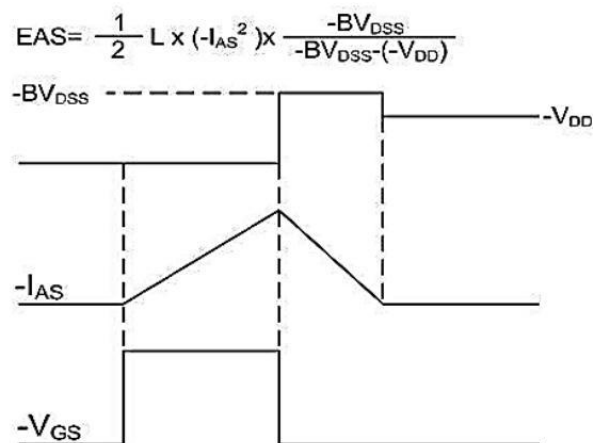
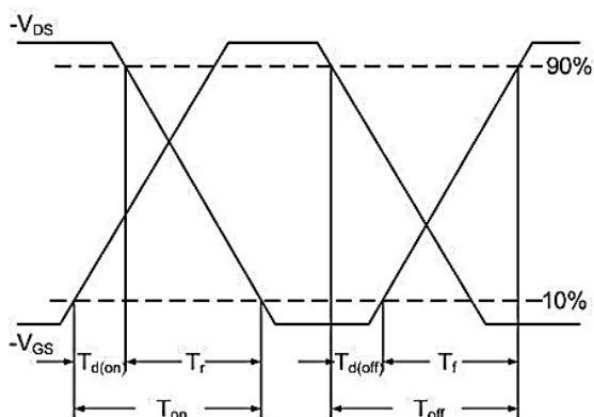
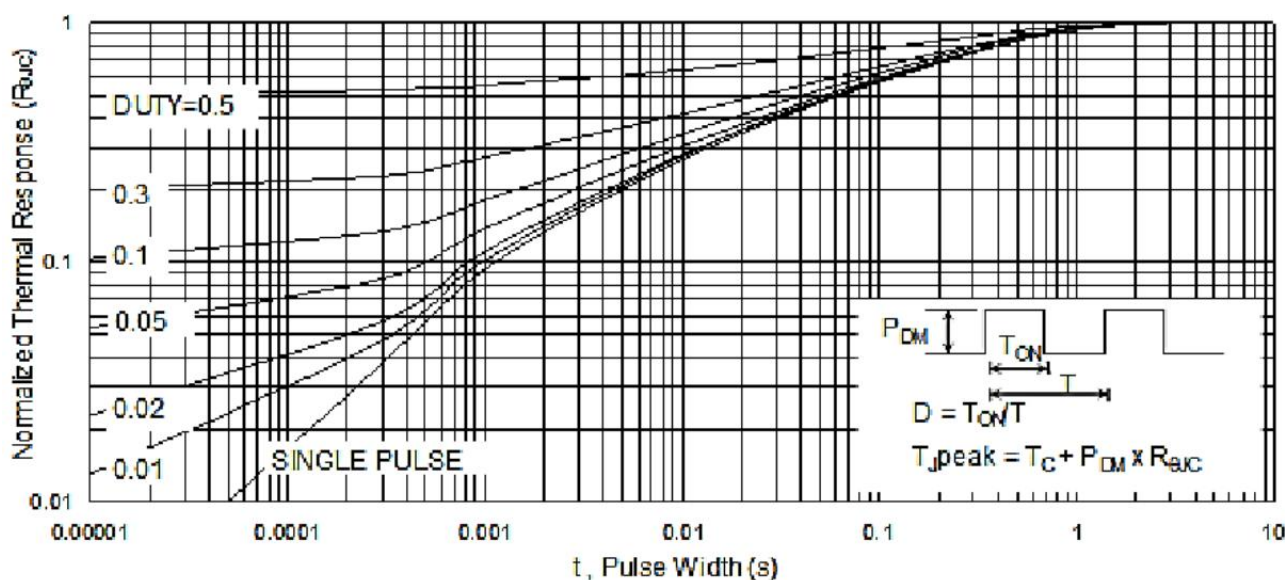
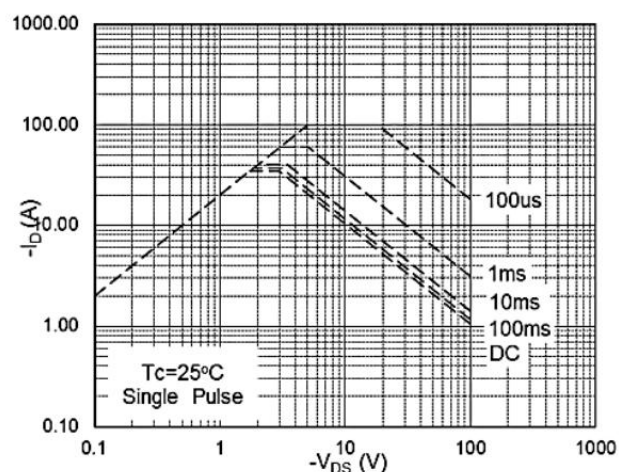
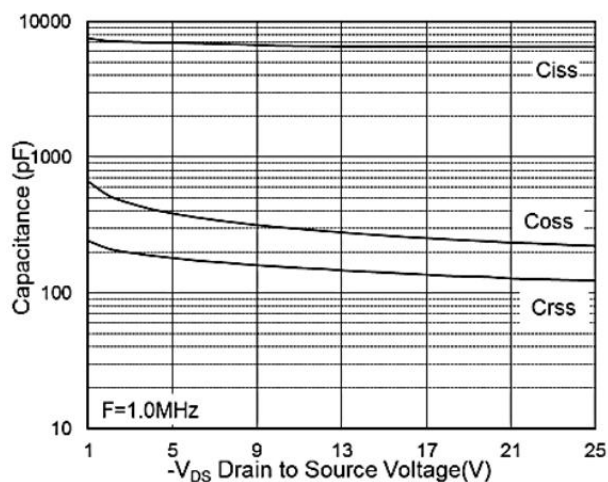
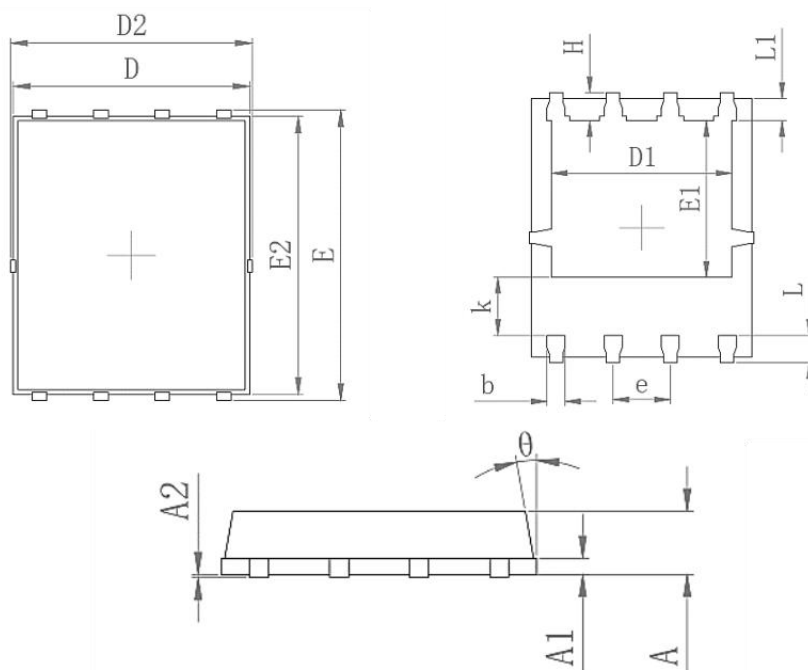


Fig.6 Normalized $R_{DS(on)}$ vs T_J

Typical Characteristics



Package Mechanical Data-PDFN5X6-8L-XZT Single


Symbol	Common	
	mm	
	Mim	Max
A	0.90	1.10
A1	0.254 REF	
A2	0-0.05	
D	4.824	4.976
D1	3.910	4.110
D2	4.944	5.076
E	5.924	6.076
E1	3.375	3.575
E2	5.674	5.826
b	0.350	0.450
e	1.270	
L	0.534	0.686
L1	0.424	0.576
K	1.190	1.390
H	0.549	0.701
Φ	8°	12°

Package Marking and Ordering Information

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