

Description

The SXG40N10DF 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

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

$R_{DS(ON)} < 25m\Omega$ @ $V_{GS}=10V$

Application

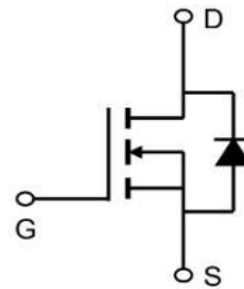
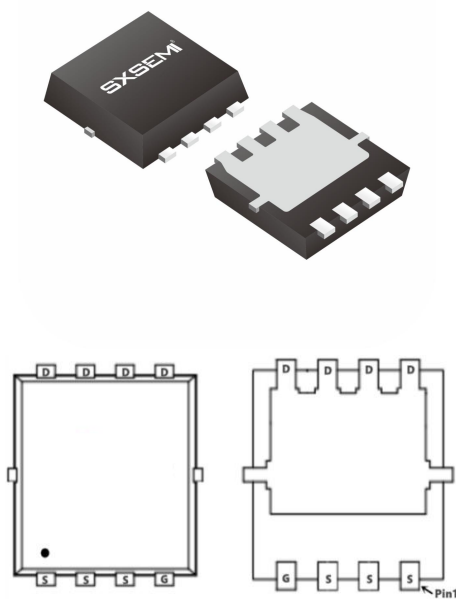
Consumer electronic power supply

Motor control

Synchronous-rectification

Isolated DC

PDFN3*3-8L



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	Continuous drain current ¹⁾ , $T_C=25^{\circ}C$	40	A
I_D , pulse	Pulsed drain current ²⁾ , $T_C=25^{\circ}C$	120	A
P_D	Power dissipation ³⁾ , $T_C=25^{\circ}C$	71	W
EAS	Single pulsed avalanche energy ⁵⁾	57	mJ
T_{stg} , T_J	Operation and storage temperature	-55 to 150	$^{\circ}C$
$R_{\theta JC}$	Thermal resistance, junction-case	1.76	$^{\circ}C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	62	$^{\circ}C/W$

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V _{GS} =0 V, I _D =250 μA	100	107		V
V _{GS(th)}	Gate threshold voltage	V _{DS} =V _{GS} , I _D =250 μA	1.2	1.5	2.5	V
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =10 V, I _D =10 A		14	25.0	mΩ
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =4.5 V, I _D =7 A		18	30.0	mΩ
I _{GSS}	Gate-source leakage current	V _{GS} =±20 V			±100	nA
I _{DSS}	Drain-source leakage current	V _{DS} =100 V, V _{GS} =0 V			1	uA
C _{iss}	Input capacitance	V _{GS} =0 V, V _{DS} =50 V, f=100 kHz		1003.9		pF
C _{oss}	Output capacitance			185.4		pF
C _{rss}	Reverse transfer capacitance			9.8		pF
t _{d(on)}	Turn-on delay time	V _{GS} =10 V, V _{DS} =50 V, R _G =10 Ω, I _D =5 A		16.6		ns
t _r	Rise time			3.8		ns
t _{d(off)}	Turn-off delay time			75.5		ns
t _f	Fall time			46		ns
Q _g	Total gate charge	I _D =5 A, V _{DS} =50V, V _{GS} =10V		16.2		nc
Q _{gs}	Gate-source charge			2.8		nc
Q _{gd}	Gate-drain charge			4.1		nc
V _{plateau}	Gate plateau voltage			3		V
I _S	Diode forward current	V _{GS} <V _{th}		30		A
I _{SP}	Pulsed source current			90		A
t _{rr}	Reverse recovery time	I _S =1A, di/dt=100 A/μs	49			ns
Q _{rr}	Reverse recovery charge		61.8			nc
I _{rrm}	Peak reverse recovery current		2.4			A

Note :

- 1、Calculated continuous current based on maximum allowable junction temperature.
- 2、Repetitive rating; pulse width limited by max. junction temperature.
- 3、P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4、The value of R_{θja} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
- 5、V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_J=25 °C.

Typical Characteristics

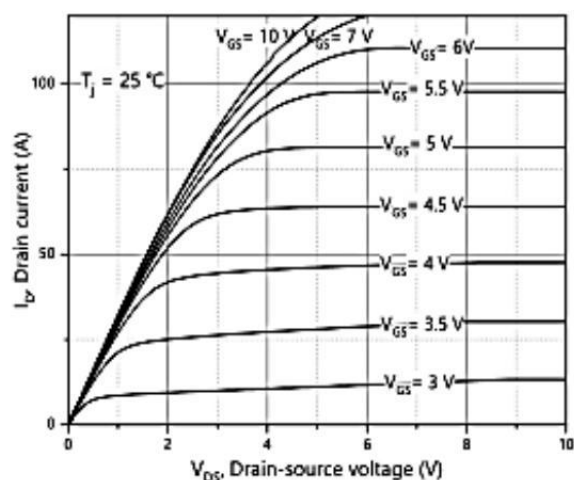


Figure 1, Typ. output characteristics

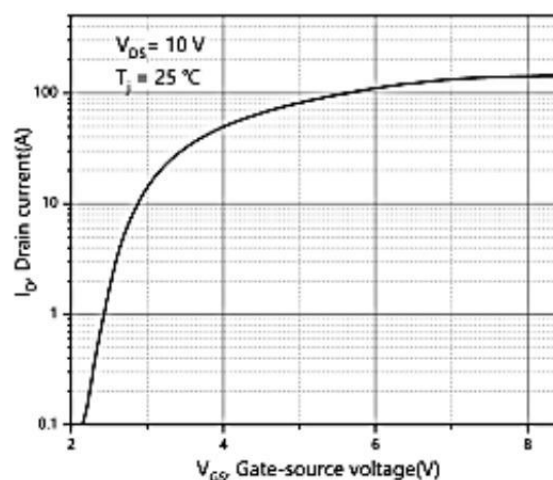


Figure 2, Typ. transfer characteristics

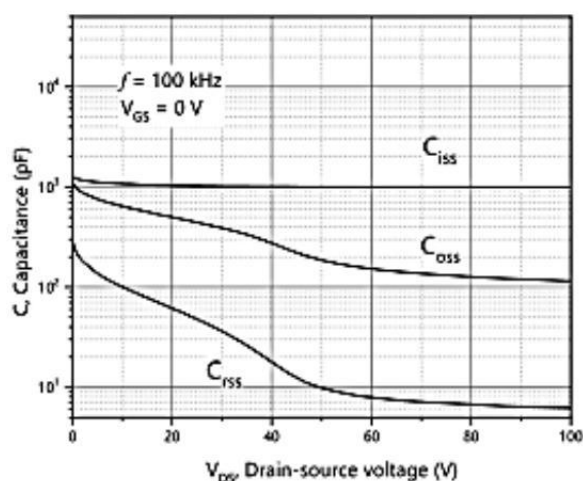


Figure 3, Typ. capacitances

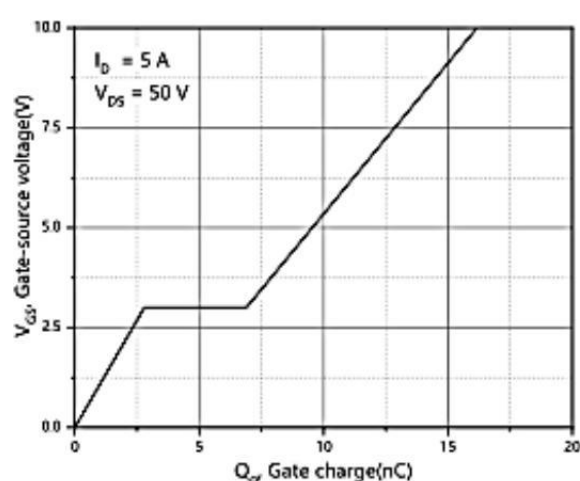


Figure 4, Typ. gate charge

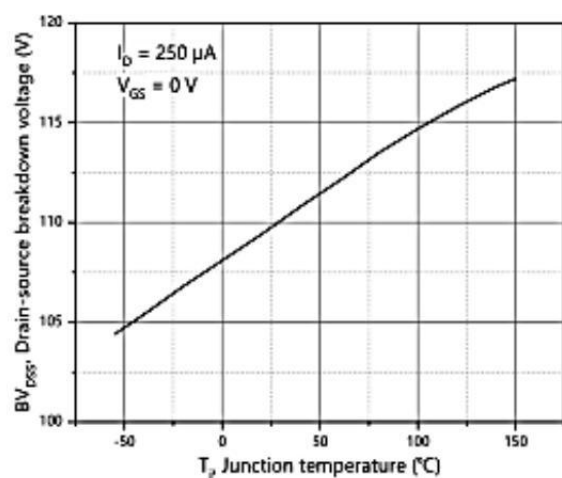


Figure 5, Drain-source breakdown voltage

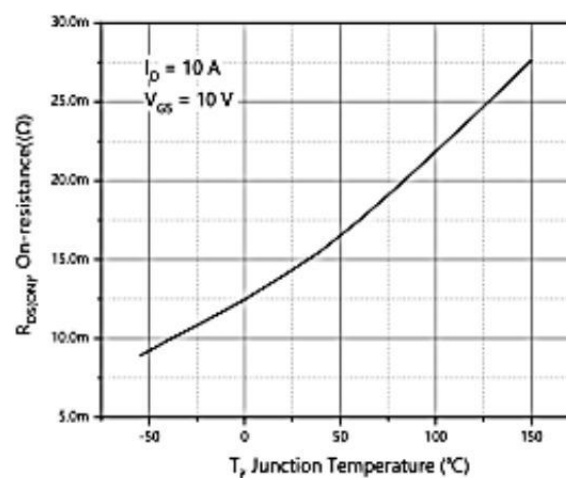


Figure 6, Drain-source on-state resistance

Typical Characteristics

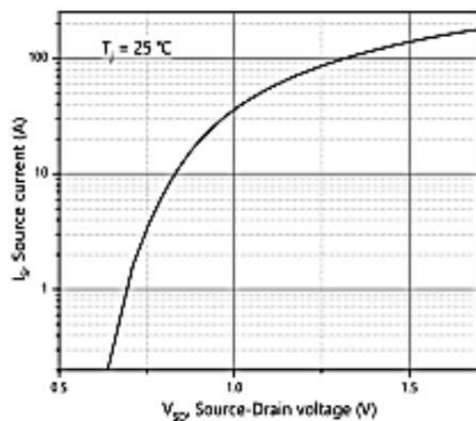


Figure 7, Forward characteristic of body diode

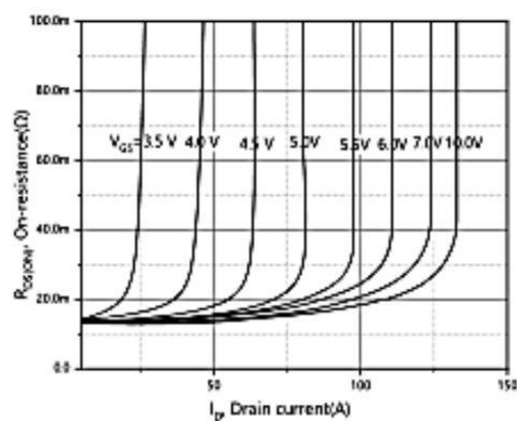


Figure 8, Drain-source on-state resistance

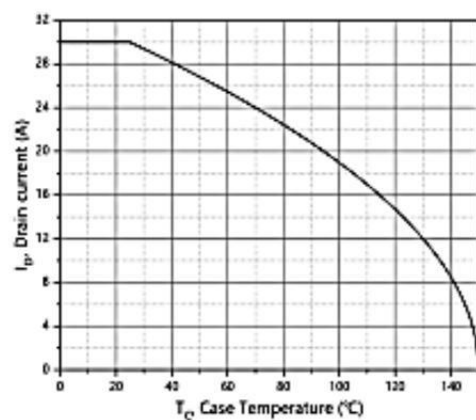


Figure 9, Drain current

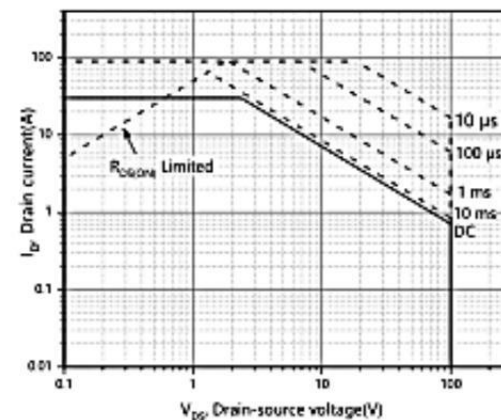


Figure 10, Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

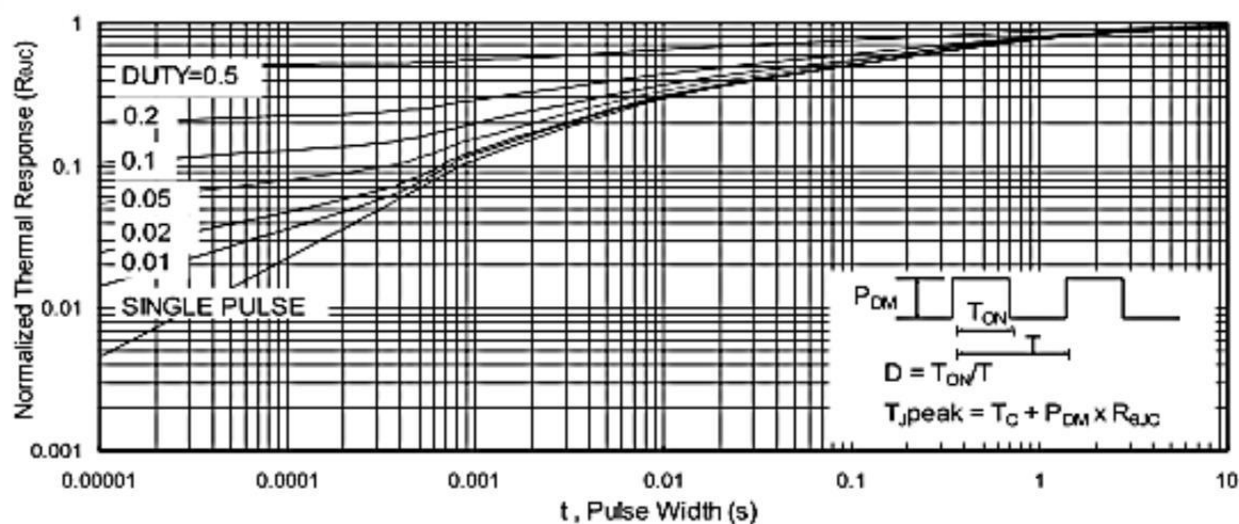
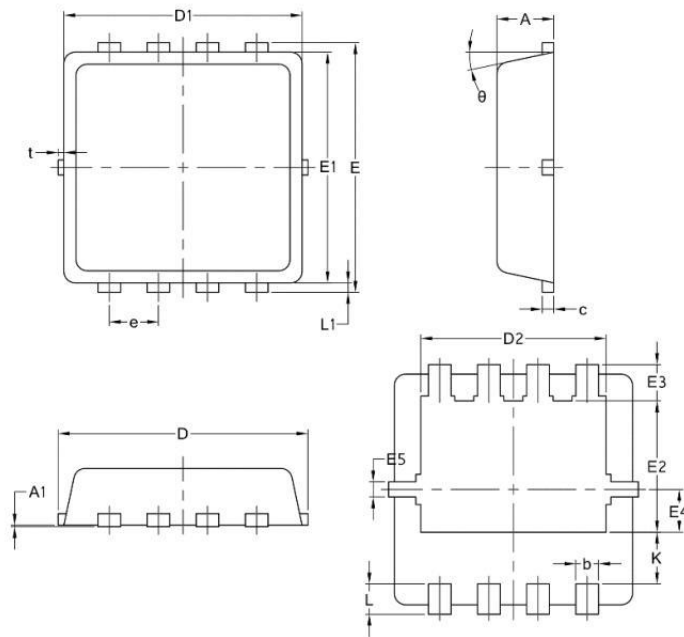


Figure 11, Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN3*3-8L-JQ Single



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
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	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	PDFN3*3-8L		5000