

Description

The SX10N10D 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

$V_{DS} = 100V$ $I_D = 10A$

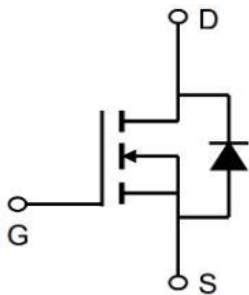
$R_{DS(ON)} < 280m\Omega @ V_{GS}=10V$

Application

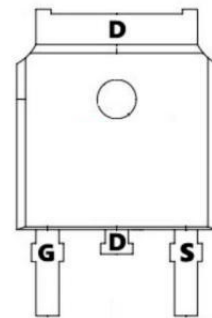
Automotive lighting

Load switch

Uninterruptible power supply



TO-252-3L



Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Drain Current, $V_{GS} @ 10V$	10	A
$I_D @ T_C = 100^\circ C$	Drain Current, $V_{GS} @ 10V$	6.5	A
IDM	Pulsed Drain Current ¹	24	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	30	W
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	2.7	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Maximum Thermal Resistance, Junction-ambient	62.5	$^\circ C/W$
$R_{\theta JC}$	Maximum Thermal Resistance, Junction-case	80	$^\circ C/W$

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	100	120	-	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V, VGS=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	VDS=0V, VGS=±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1.2	1.85	2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	VGS=10V, ID=5A		240	280	mΩ
		VGS=4.5V, ID=3A	-	260	300	mΩ
g fs	Forward Transconductance	V DS =5V , I D =5A		14		S
RG	Gate Resistance	VDS = 0V, VGS =0V,f=1MHz		3		Ω
Ciss	Input Capacitance	VDS=15V, VGS=0V, f=1.0MHz	-	508	-	pF
Coss	Output Capacitance		-	29	-	pF
Crss	Reverse Transfer Capacitance		-	16.4	-	pF
Qg	Total Gate Charge	VDS=50V, ID=5A, VGS=10V	-	9.7	-	nC
Qgs	Gate-Source Charge		-	1.6	-	nC
Qgd	Gate-Drain("Miller") Charge		-	1.7	-	nC
td(on)	Turn-on Delay Time	VDS=30V, ID=5A, RG=1.8Ω, VGS=10V	-	1.6	-	ns
tr	Turn-on Rise Time		-	19	-	ns
td(off)	Turn-off Delay Time		-	13.6	-	ns
tf	Turn-off Fall Time		-	19	-	ns
IS	Continuous Source Current1,5	VG=VD=0V , Force Current	-	-	7.2	A
ISM	Pulsed Source Current2,5		-	-	21	A
VSD	Diode Forward Voltage2	VGS=0V, IS=10A	-	-	1.3	V

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 ≤ 300us , duty cycle ≤ 2%
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Typical Characteristics

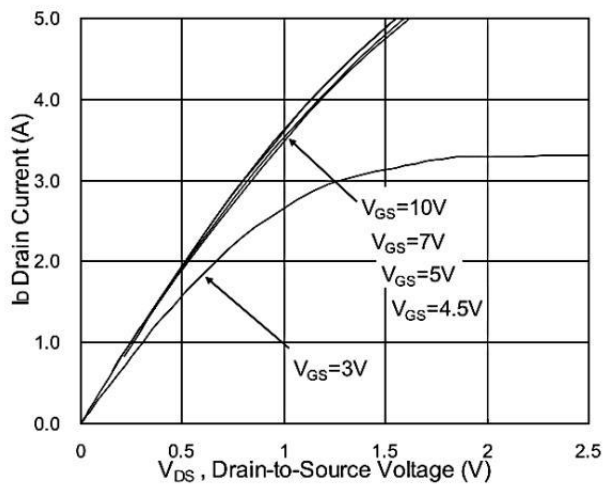


Fig.1 Typical Output Characteristics

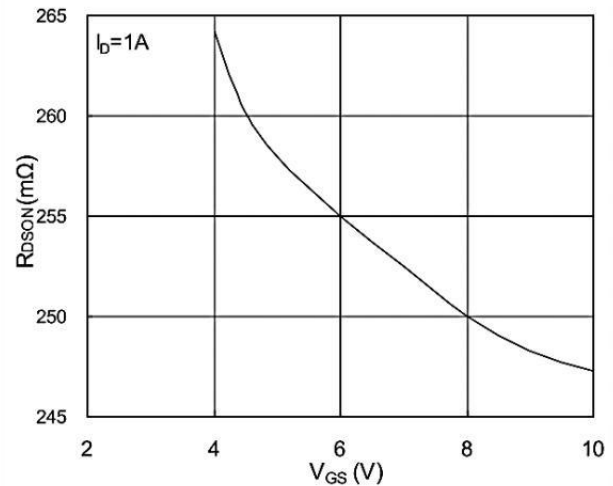


Fig.2 On-Resistance vs. Gate-Source

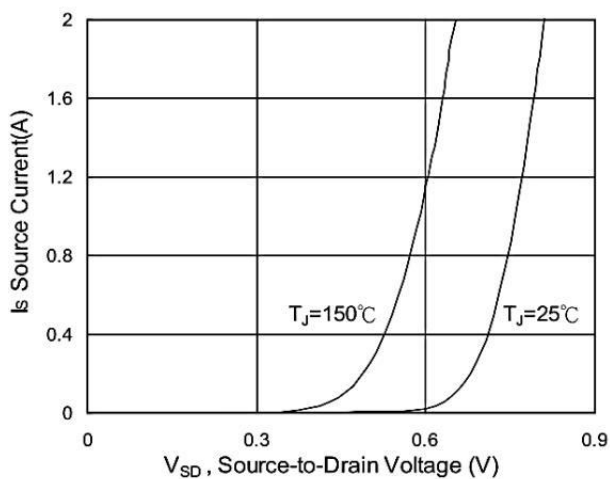


Fig.3 Forward Characteristics of Reverse

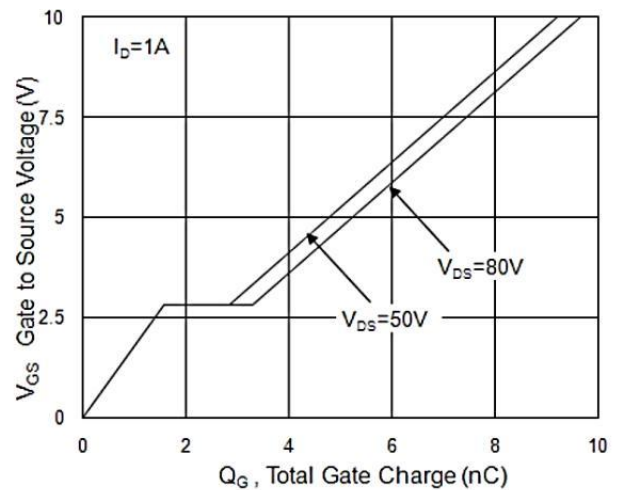


Fig.4 Gate-Charge Characteristics

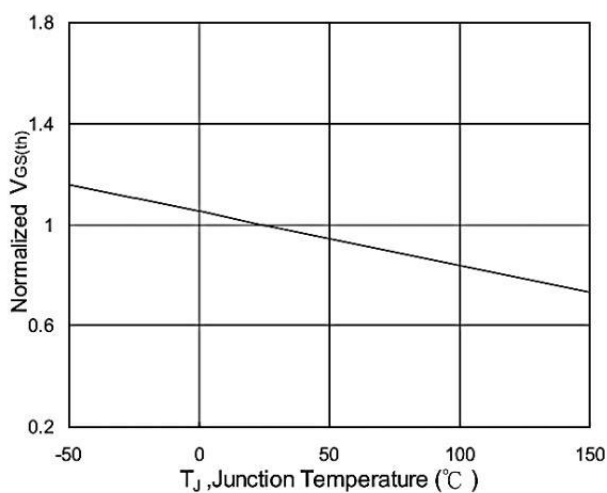


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

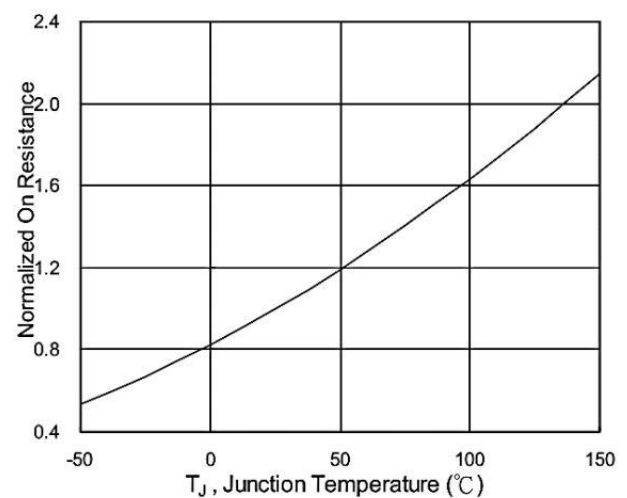


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

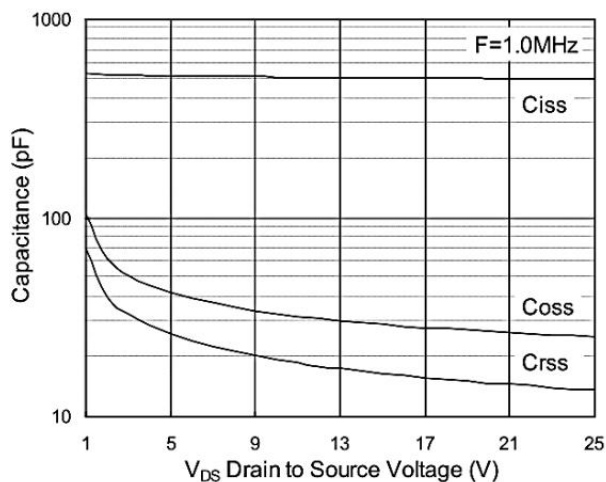


Fig.7 Capacitance

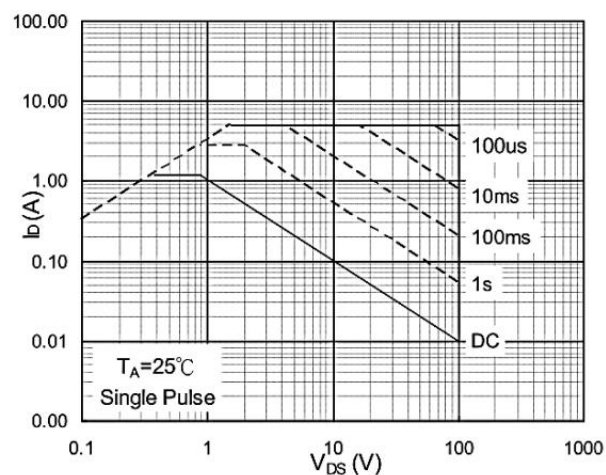


Fig.8 Safe Operating Area

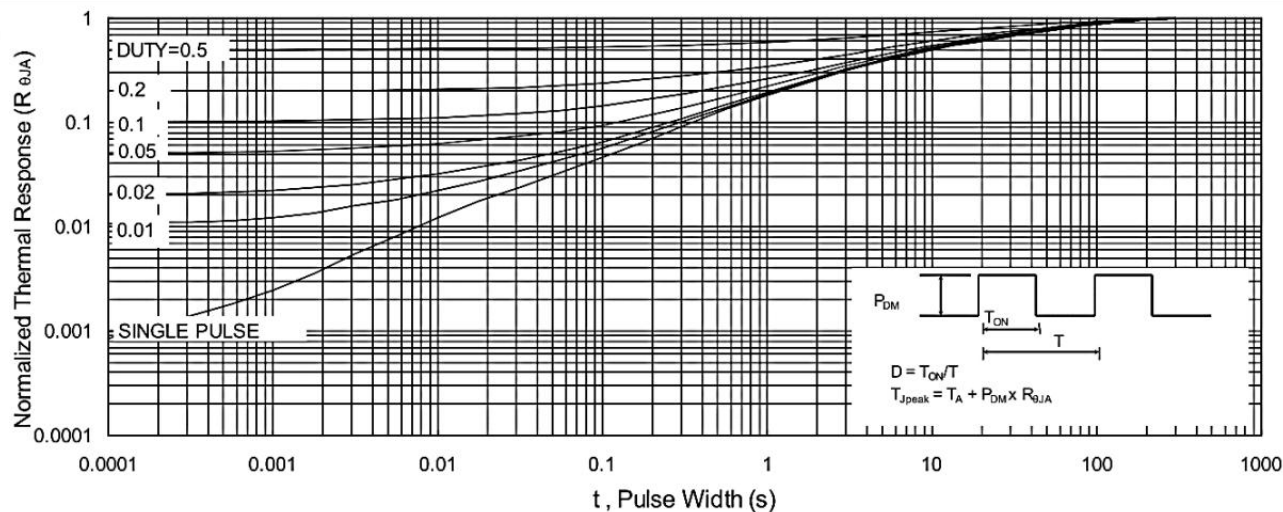


Fig.9 Normalized Maximum Transient Thermal Impedance

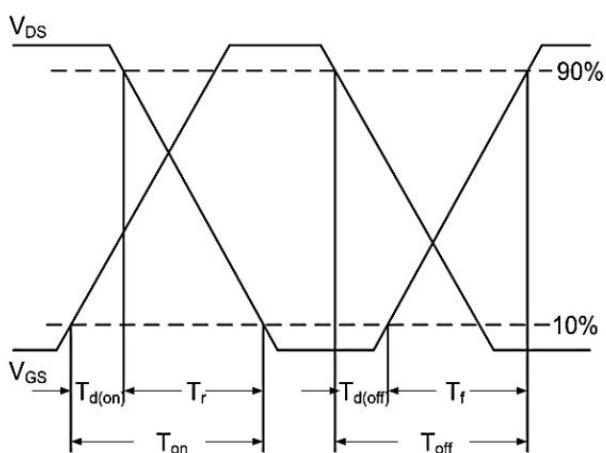


Fig.10 Switching Time Waveform

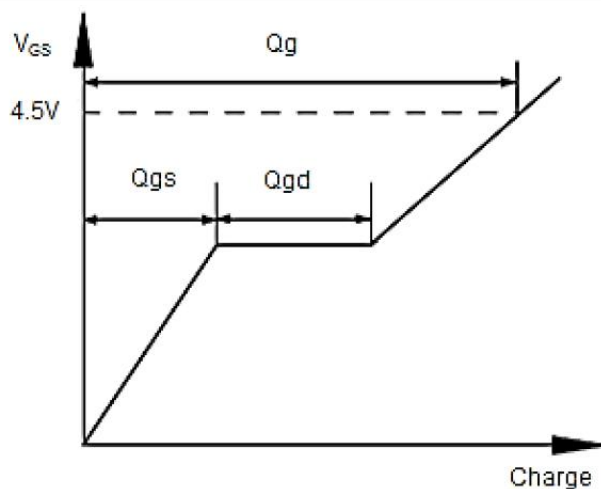
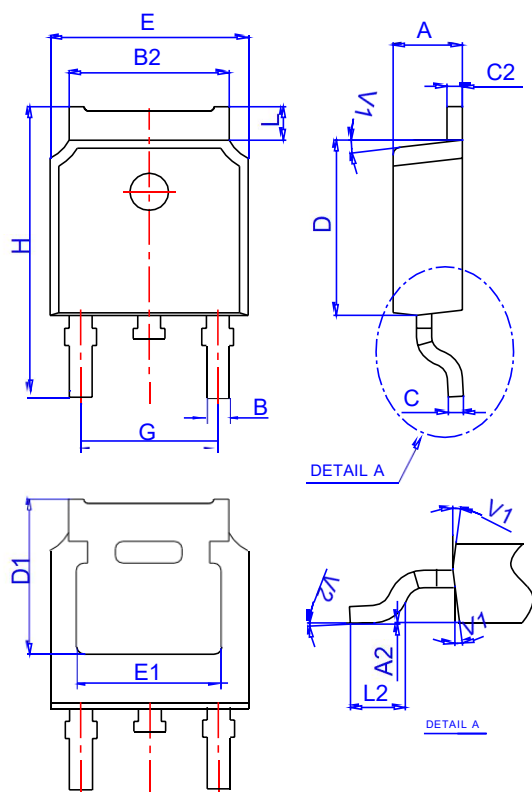


Fig.11 Gate Charge Waveform

Package Mechanical Data: TO-252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-252-3L		2500