

Description

The SX50N10D 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

$V_{DS} = 100V$ $I_D = 50A$

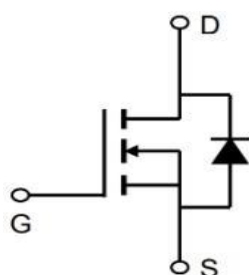
$R_{DS(ON)} < 28m\Omega @ V_{GS}=10V$

Application

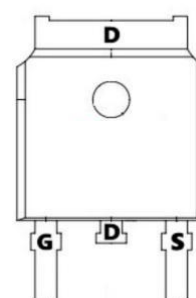
Battery protection

Load switch

Uninterruptible power supply



TO-252-3L



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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current-Continuous	50	A
$I_D (100^\circ C)$	Drain Current-Continuous($T_C=100^\circ C$)	21	A
I_{DM}	Pulsed Drain Current	70	A
P_D	Maximum Power Dissipation	85	W
	Derating factor	0.57	W/ $^\circ C$
E_{AS}	Single pulse avalanche energy ^(Note 5)	256	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ C$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case ^(Note 2)	1.8	$^\circ C/W$

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

Symbol	Parameter	Condition	Min	Typ	Max	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100		-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1		3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	-	24	28	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =10A	-	28	30	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =10A	-	15	-	S
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=1.0MHz	-	2000	-	PF
C _{oss}	Output Capacitance		-	300	-	PF
C _{rss}	Reverse Transfer Capacitance		-	250	-	PF
t _{d(on)}	Turn-on Delay Time	V _{DD} =50V, R _L =5Ω V _{GS} =10V, R _{GEN} =3Ω	-	7	-	nS
t _r	Turn-on Rise Time		-	7	-	nS
t _{d(off)}	Turn-Off Delay Time		-	29	-	nS
t _f	Turn-Off Fall Time		-	7	-	nS
Q _g	Total Gate Charge	V _{DS} =50V, I _D =10A, V _{GS} =10V	-	39	-	nC
Q _{gs}	Gate-Source Charge		-	8	-	nC
Q _{gd}	Gate-Drain Charge		-	12	-	nC
V _{SD}	Diode Forward Voltage ^(Note 3)	V _{GS} =0V, I _S =20A	-	-	1.2	V
I _S	Diode Forward Current ^(Note 2)	-	-	-	30	A
t _{rr}	Reverse Recovery Time	T _J = 25°C, I _F = 10A di/dt = 100A/μs ^(Note3)	-	32	-	nS
Q _{rr}	Reverse Recovery Charge		-	53	-	nC
ton	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

- 1、Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2、Surface Mounted on FR4 Board, t ≤ 10 sec.
- 3、Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4、Guaranteed by design, not subject to production
- 5、EAS Condition : T_J=25°C, V_{DD}=50V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=32A

Typical Characteristics

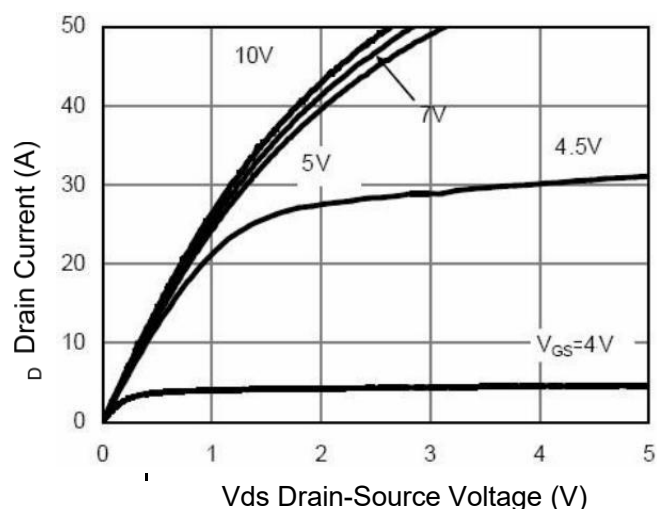


Figure 1 Output Characteristics

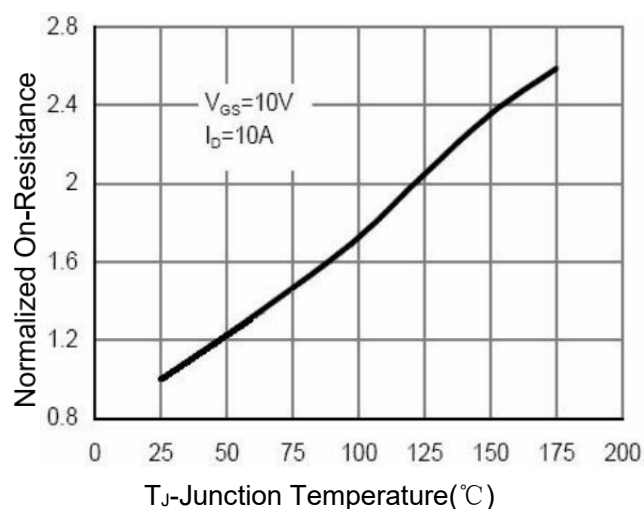


Figure 4 Rdson-Junction Temperature

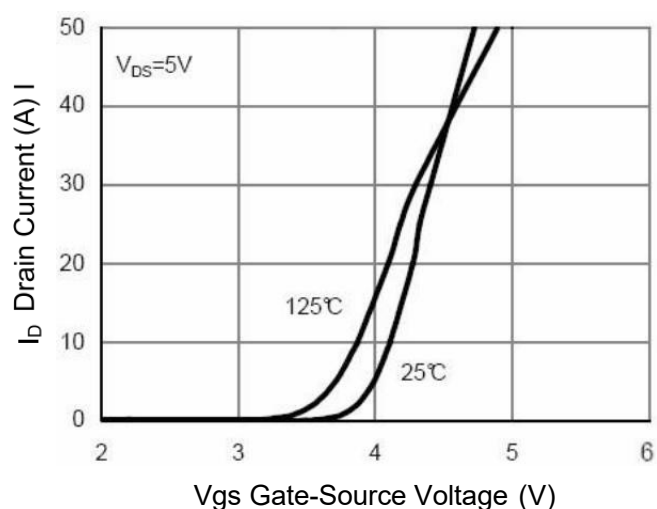


Figure 2 Transfer Characteristics

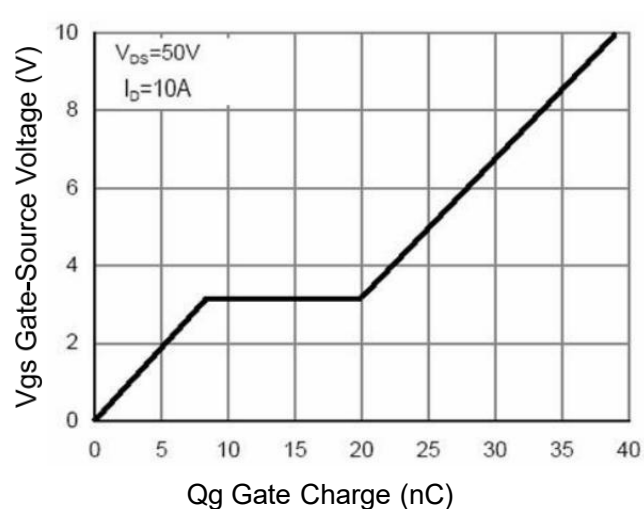


Figure 5 Gate Charge

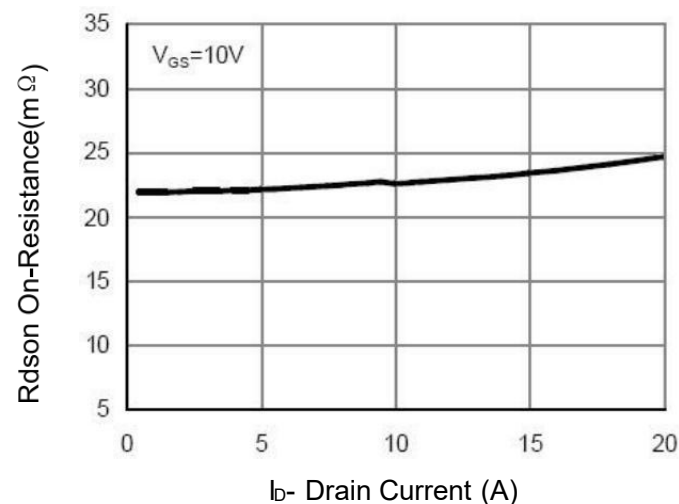


Figure 3 Rdson- Drain Current

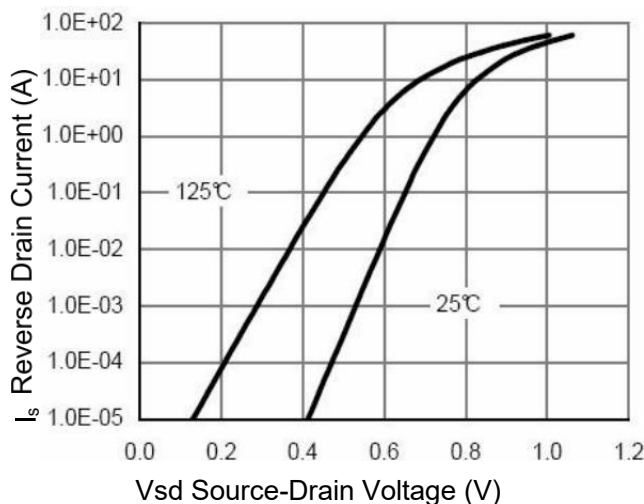


Figure 6 Source- Drain Diode Forward

Typical Characteristics

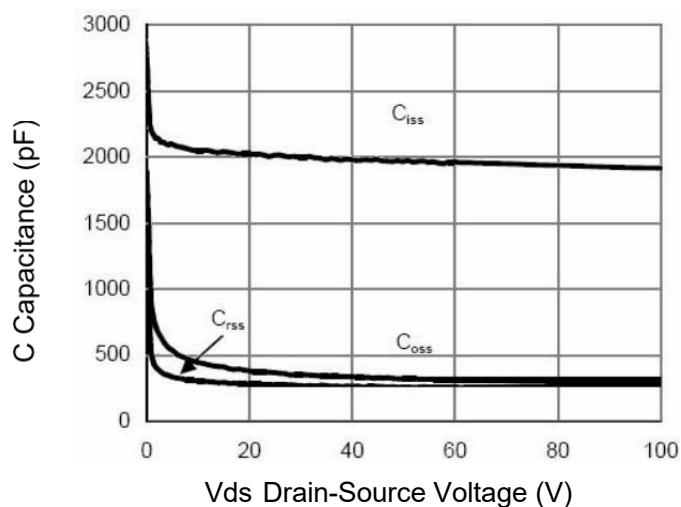


Figure 7 Capacitance vs Vds

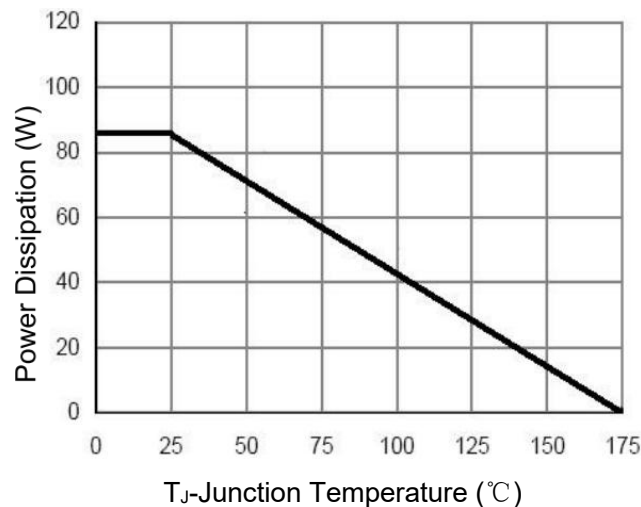


Figure 9 Power De-rating

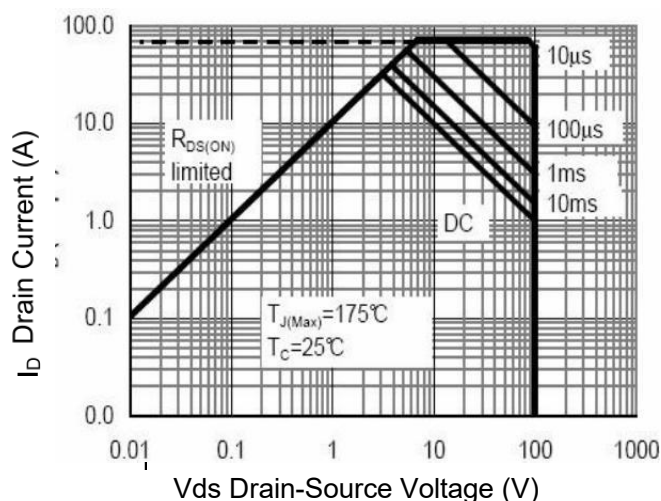


Figure 8 Safe Operation Area

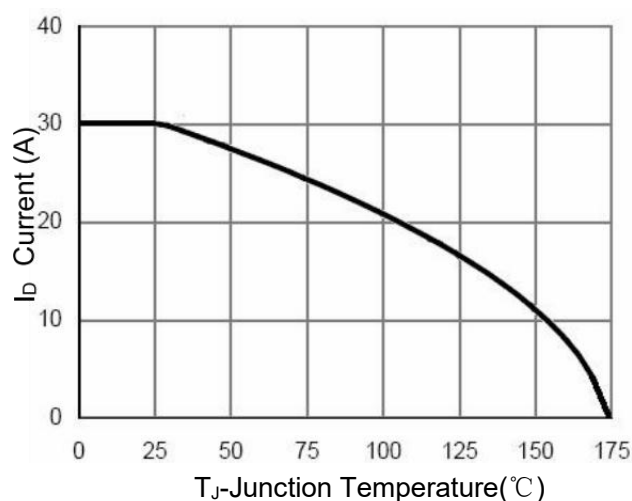


Figure 10 I_D Current- Junction Temperature

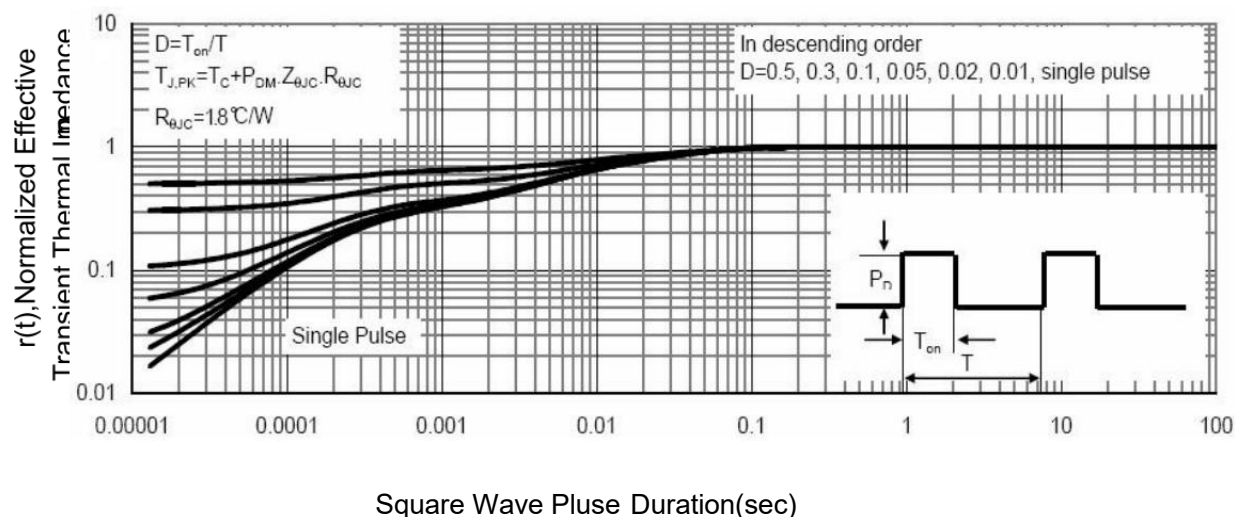
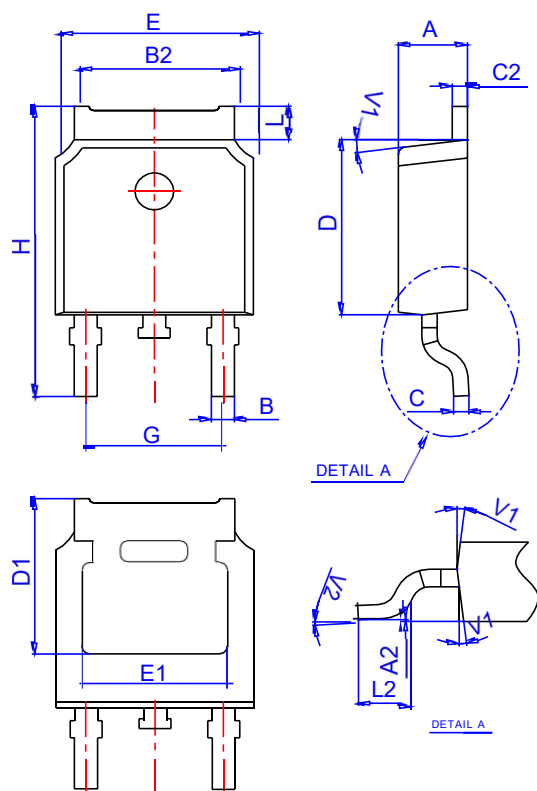


Figure 11 Normalized Maximum Transient Thermal Impedance

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