

Description

The SX150N03D 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

$V_{DS}=30V$ $I_D=150A$

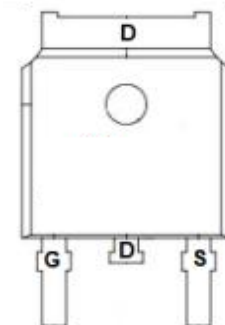
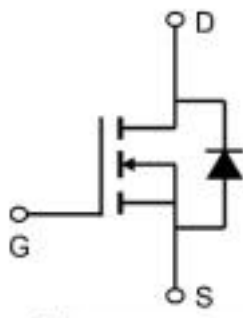
$R_{DS(ON)} < 3.0m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V ^{1,6}	155	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V ^{1,6}	110	A
I_{DM}	Pulsed Drain Current ²	310	A
E_{AS}	Single Pulse Avalanche Energy ³	246	mJ
I_{AS}	Avalanche Current	48	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	89.3	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.4	°C/W

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	36	---	V
ΔBVDSS/ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.022	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =30A	---	2.2	3.0	mΩ
		V _{GS} =4.5V , I _D =15A	---	3.2	4.0	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.7	2.5	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-6.1	---	mV/°C
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	---	---	10	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =5V , I _D =30A	---	60	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	0.9	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V , V _{GS} =10V , I _D =15A	---	56.9	---	nC
Q _{gs}	Gate-Source Charge		---	13.8	---	
Q _{gd}	Gate-Drain Charge		---	23.5	---	
Td(on)	Turn-On Delay Time	V _{DD} =15V , V _{GS} =10V , R _G =3.3Ω, I _D =1A	---	20.1	---	ns
T _r	Rise Time		---	6.3	---	
Td(off)	Turn-Off Delay Time		---	124.6	---	
T _f	Fall Time		---	15.8	---	
Ciss	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	5935	---	pF
Coss	Output Capacitance		---	725	---	
Crss	Reverse Transfer Capacitance		---	538	---	
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	155	A
ISM	Pulsed Source Current ^{2,5}		---	---	310	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =A , T _J =25°C	---	---	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=25V,VGS=10V,L=0.1Mh,IAS=48A
- 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.

Typical Characteristics

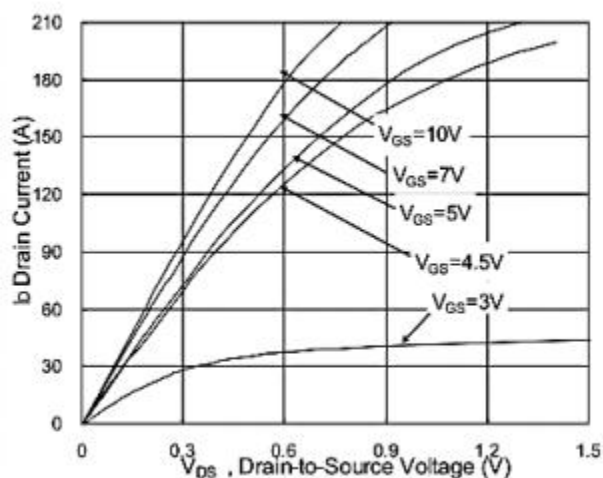


Fig.1 Typical Output Characteristics

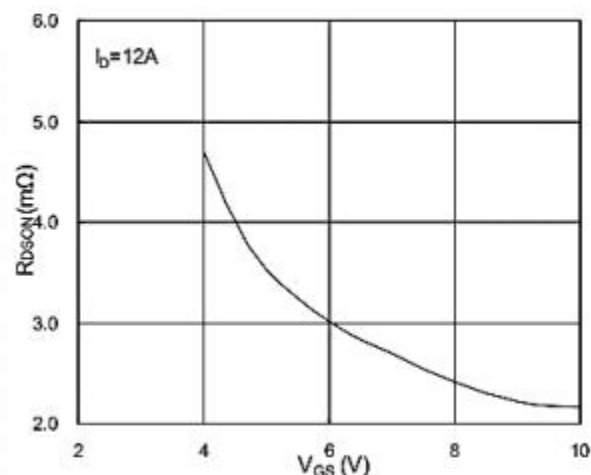


Fig.2 On-Resistance vs. G-S Voltage

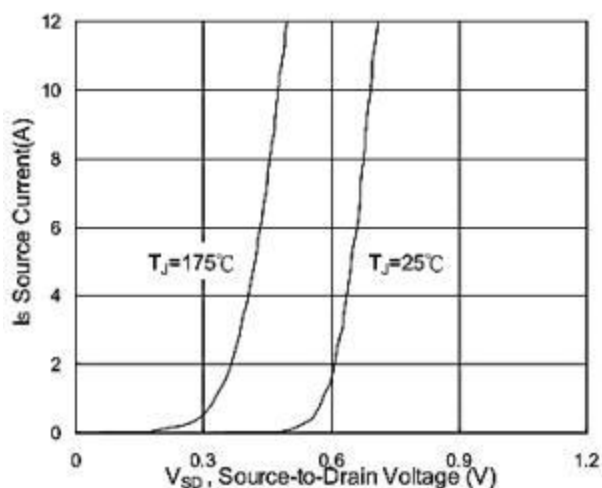


Fig.3 Forward Characteristics of Reverse

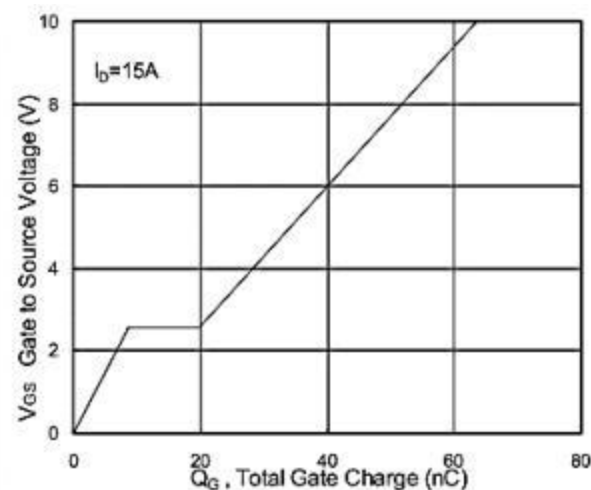


Fig.4 Gate-Charge Characteristics

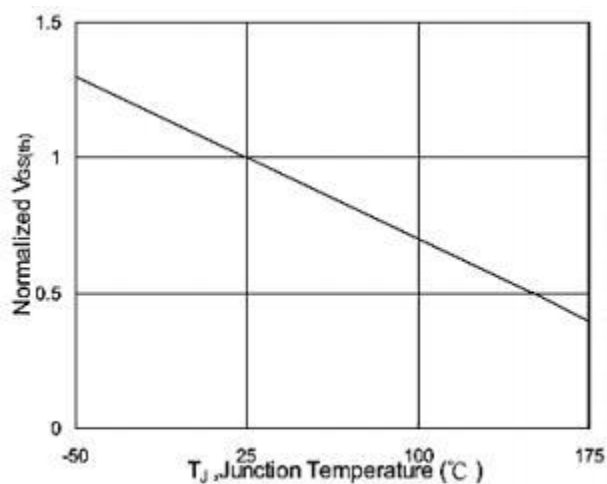


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

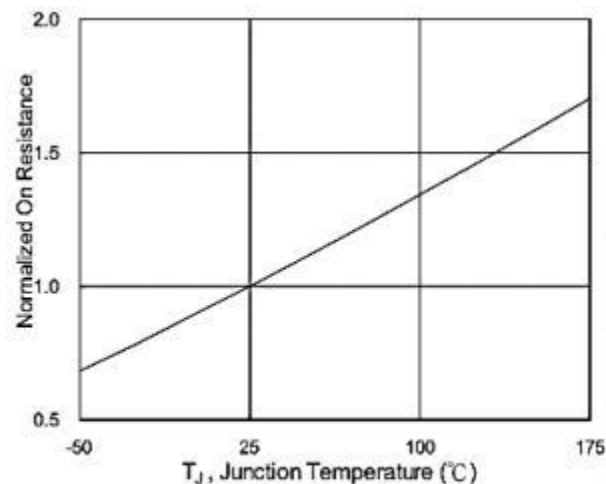
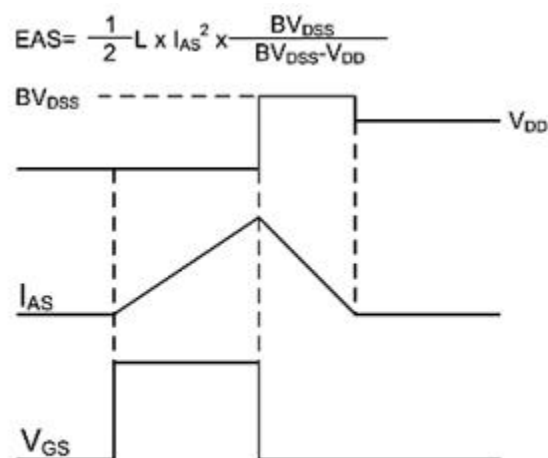
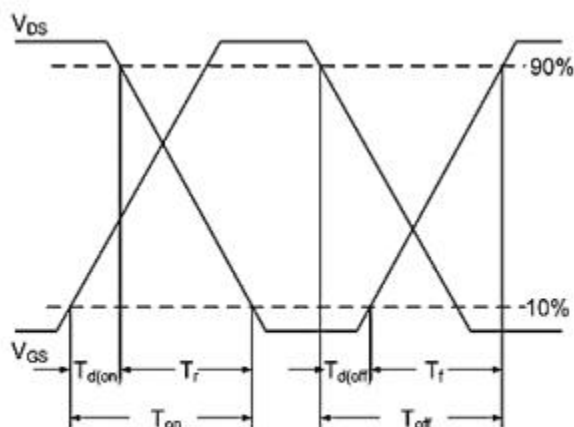
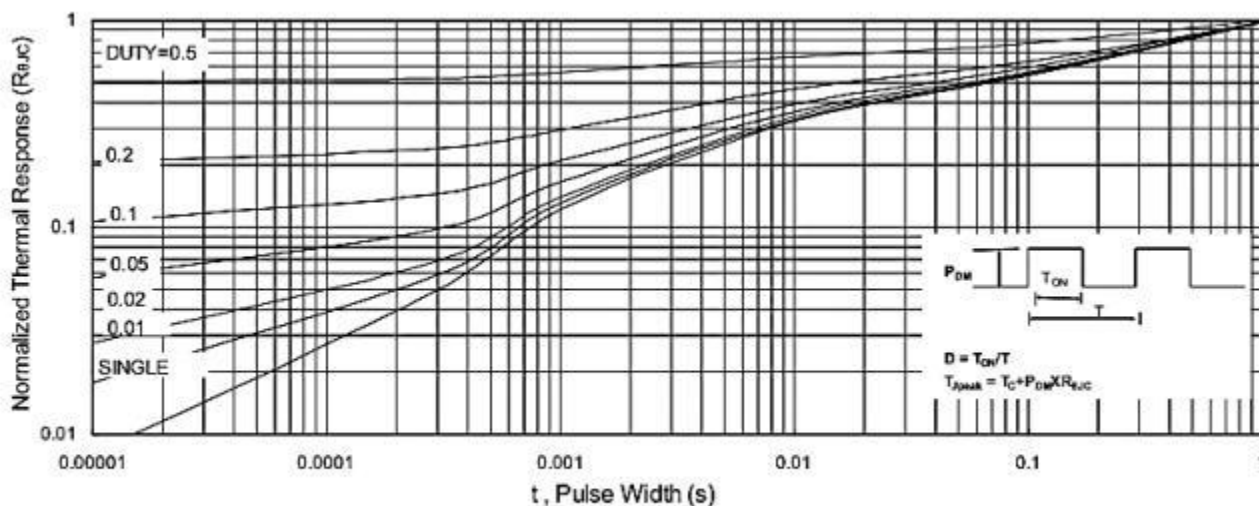
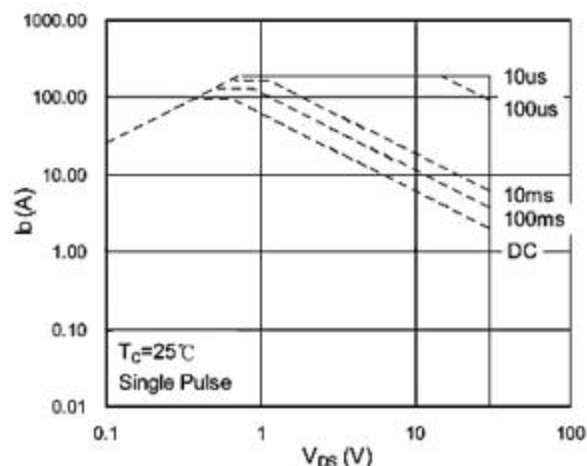
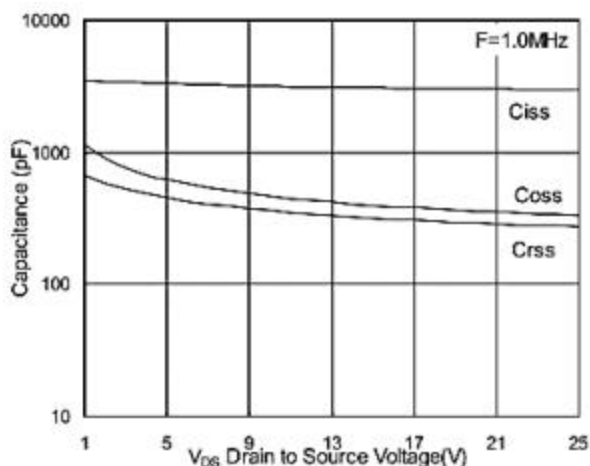
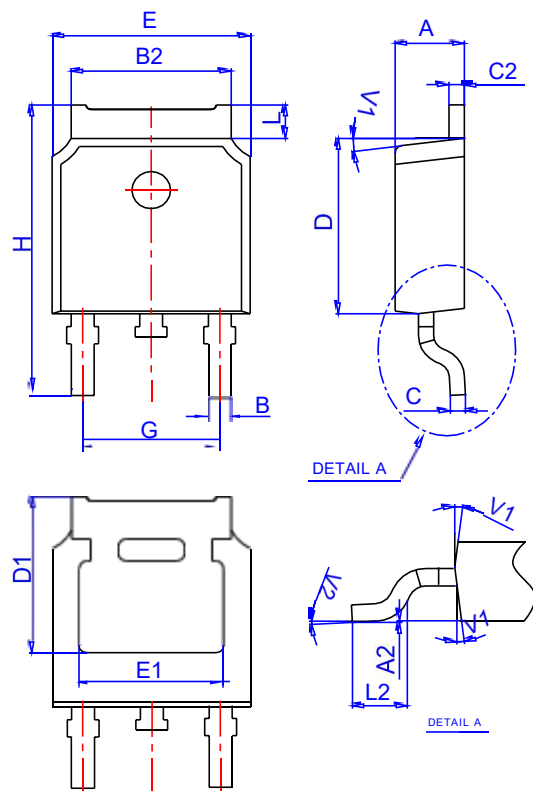


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics



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