

Description

The SX70N10D 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

$V_{DS} = 100V$ $I_D = 70A$

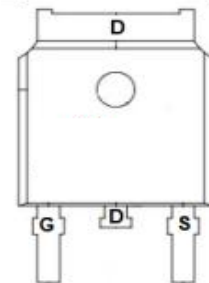
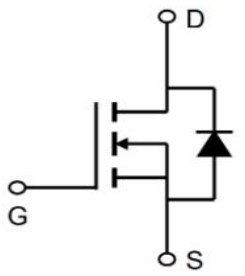
$R_{DS(ON)} < 25m\Omega @ V_{GS}=10V$

Application

Automotive lighting

Load switch

Uninterruptible power supply



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, $V_{GS} @ 10V$	70	A
$I_D @ T_C=100^\circ C$	Drain Current, $V_{GS} @ 10V$	56	A
I_{DM}	Pulsed Drain Current ¹	210	A
E_{AS}	Single Pulse Avalanche Energy	110	mJ
$P_D @ T_C=25^\circ C$	Total Power Dissipation	90	W
T_{STG}	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	1.4	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	100	107	---	V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.08	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =7A	---	18	25	mΩ
		V _{GS} =4.5V , I _D =5A	---	22	30	mΩ
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.5	2.5	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-5.5	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =80V , V _{GS} =0V , T _J =25°C	---	---	10	uA
		V _{DS} =80V , V _{GS} =0V , T _J =55°C	---	---	100	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =5V , I _D =7A	---	24	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	1.6	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =80V , V _{GS} =10V , I _D =7A	---	36	---	nC
Q _{gs}	Gate-Source Charge		---	5	---	
Q _{gd}	Gate-Drain Charge		---	10	---	
Td(on)	Turn-On Delay Time	V _{DD} =50V , V _{GS} =10V , R _G =3.3Ω I _D =7A	---	11.5	---	ns
T _r	Rise Time		---	29	---	
Td(off)	Turn-Off Delay Time		---	42	---	
T _f	Fall Time		---	18	---	
C _{iss}	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	1930	---	pF
C _{oss}	Output Capacitance		---	245	---	
Crss	Reverse Transfer Capacitance		---	125	---	
I _S	Continuous Source Current ^{1,6}	V _G =V _D =0V , Force Current	---	---	70	A
I _{SM}	Pulsed Source Current ^{2,6}		---	---	210	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =7A , dI/dt=100A/μs , T _J =25°C	---	48	---	nS
Q _{rr}	Reverse Recovery Charge		---	29	---	nC

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 20Z 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=72V,VGS=10V,L=0.1mH,IAS=40A
- 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

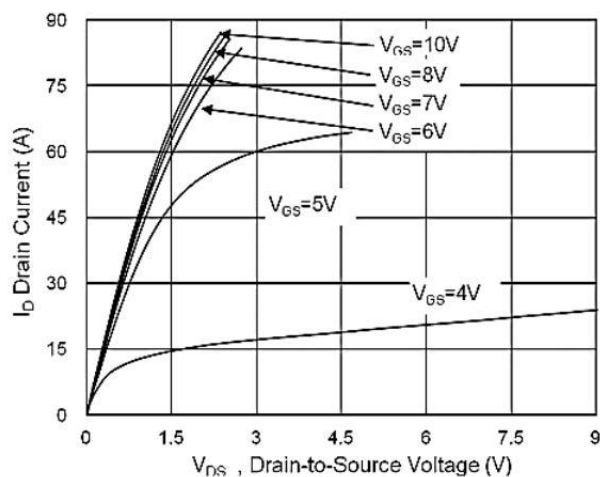


Fig.1 Typical Output Characteristics

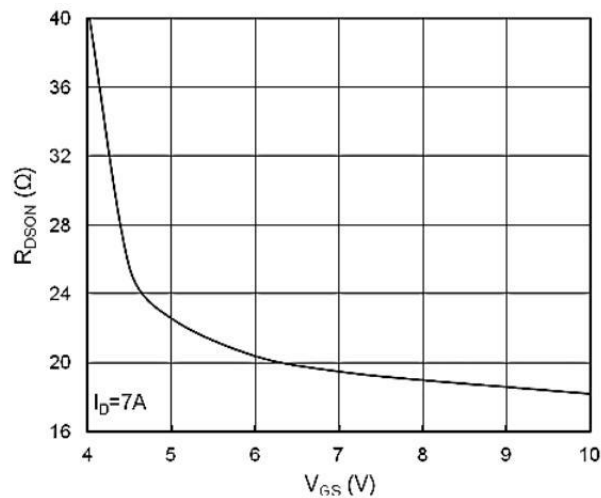


Fig.2 On-Resistance vs. Gate-Source

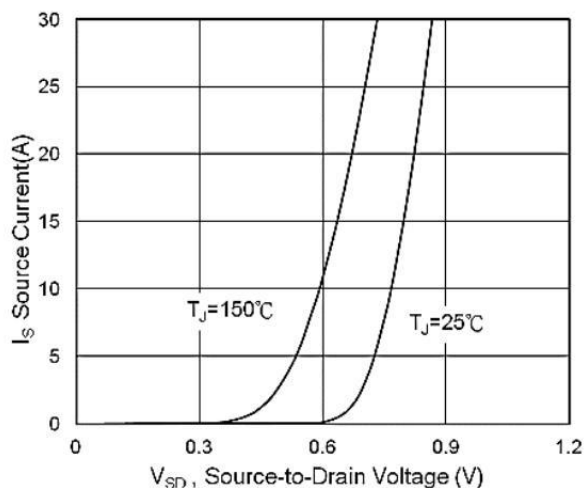


Fig.3 Forward Characteristics Of Reverse

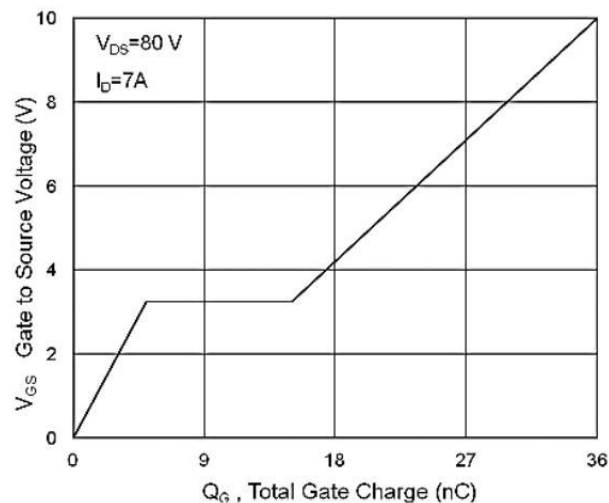


Fig.4 Gate-Charge Characteristics

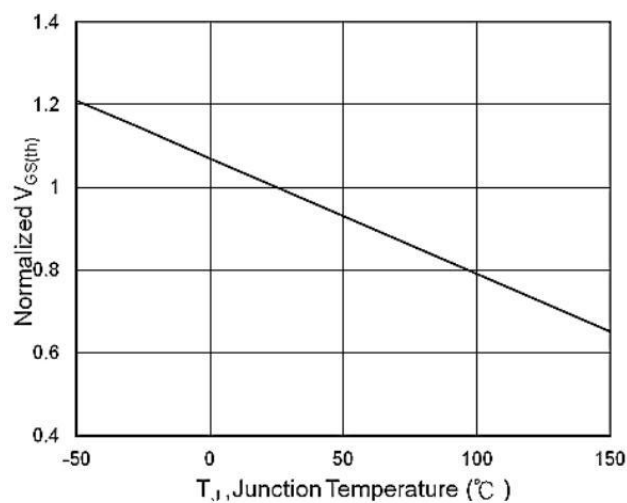


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

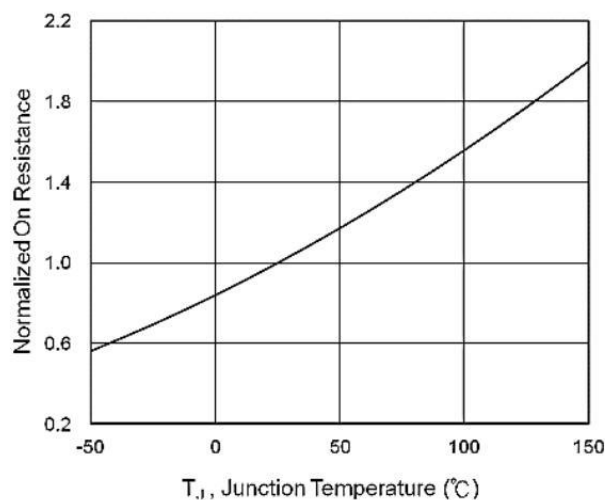


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

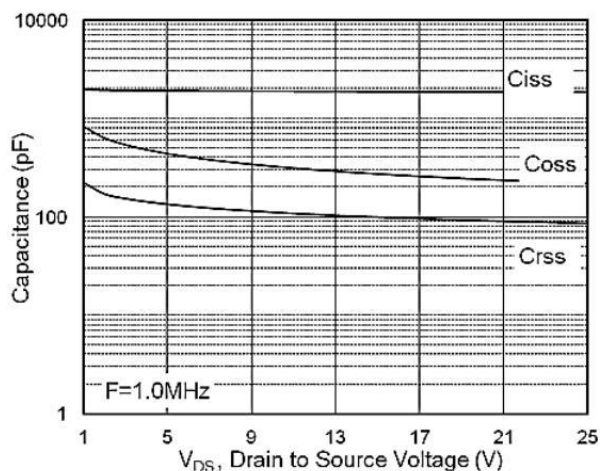


Fig.7 Capacitance

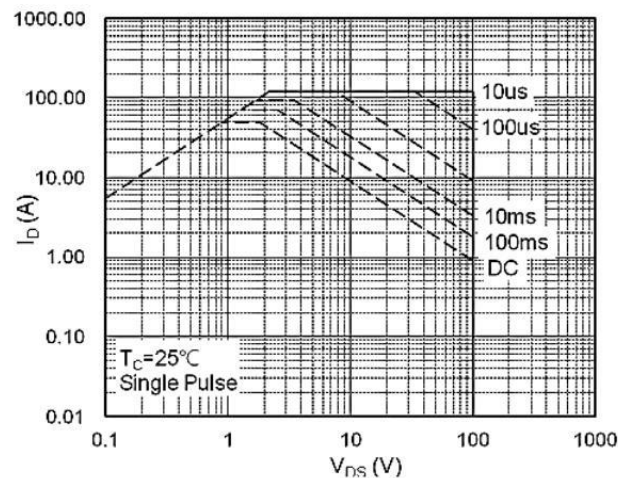


Fig.8 Safe Operating Area

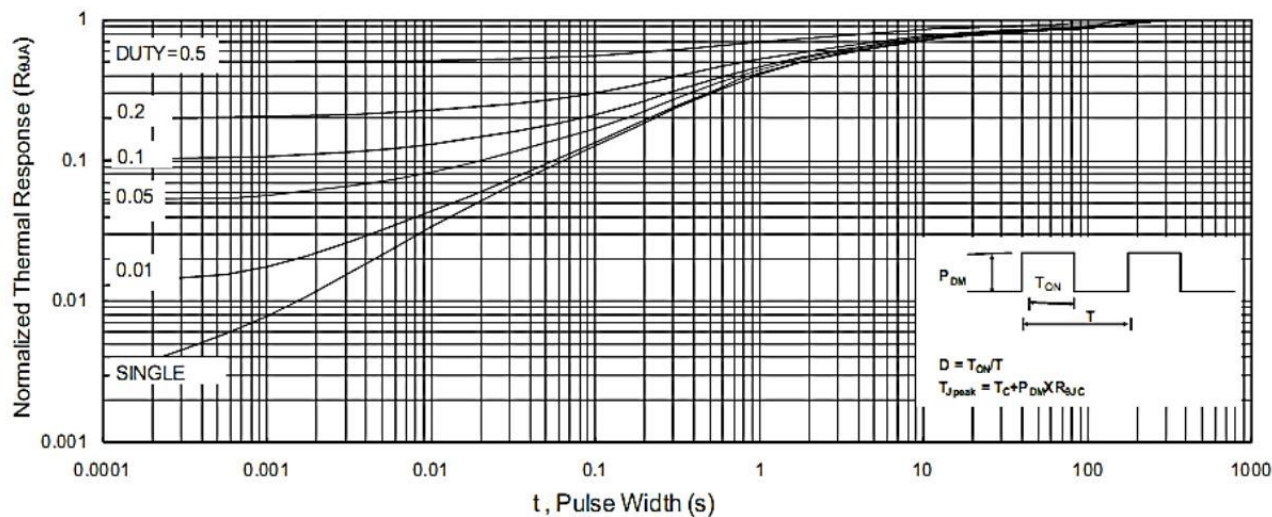


Fig.9 Normalized Maximum Transient Thermal Impedance

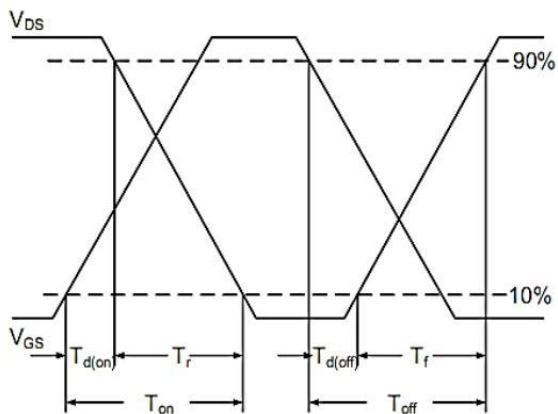


Fig.10 Switching Time Waveform

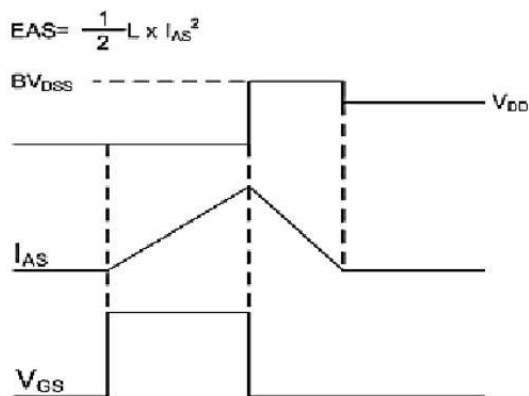
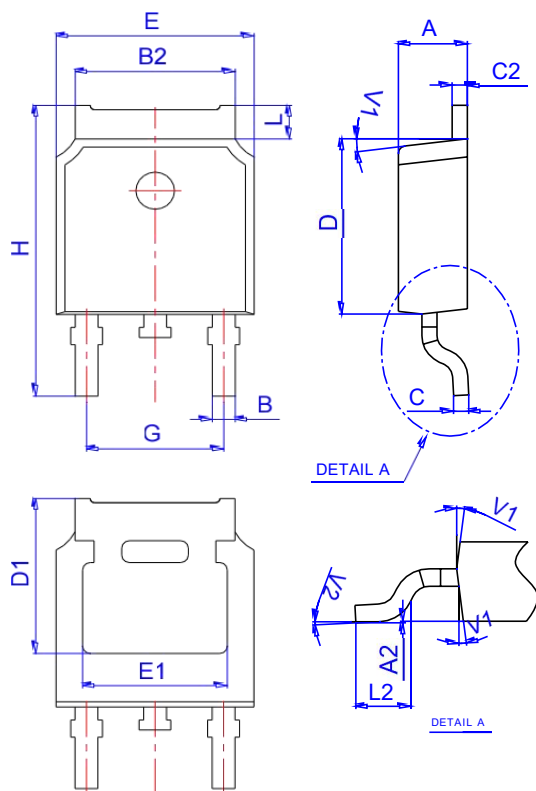


Fig.11 Unclamped Inductive Switching Waveform

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