

Description

The SX30N15D 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

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

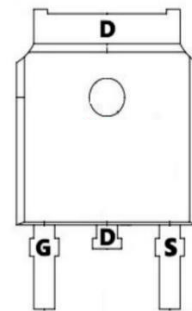
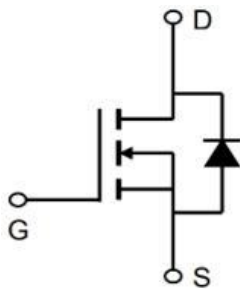
$R_{DS(ON)} < 52m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_c=25^\circ\text{C}$	Continuous Drain Current ¹	30	A
$I_D@T_c=100^\circ\text{C}$	Continuous Drain Current ¹	16	A
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current ¹	4.5	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current ¹	3.8	A
I_{DM}	Pulsed Drain Current ²	60	A
$P_D@T_c=25^\circ\text{C}$	Total Power Dissipation ³	72.6	W
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	2.7	W
TSTG	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.0	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	150	165	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =20A	---	43	52	mΩ
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V , I _D =10A	---	45	70	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.8	2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =120V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =120V , V _{GS} =0V , T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V , I _D =10A	---	25	---	S
Q _g	Total Gate Charge	V _{DS} =75V , V _{GS} =10V , I _D =10A	---	23	---	nC
Q _{gs}	Gate-Source Charge		---	5.8	---	
Q _{gd}	Gate-Drain Charge		---	4.2	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =75V , V _{GS} =10V , R _G =3.3Ω I _D =10A	---	16.2	---	ns
T _r	Rise Time		---	18.6	---	
T _{d(off)}	Turn-Off Delay Time		---	28.5	---	
T _f	Fall Time		---	6.5	---	
C _{iss}	Input Capacitance	V _{DS} =75V , V _{GS} =0V , f=1MHz	---	1190	---	pF
C _{oss}	Output Capacitance		---	73	---	
C _{rss}	Reverse Transfer Capacitance		---	4	---	
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V , Force Current	---	---	20	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 =10A , dI/dt=100A/μs , T _J =25°C	---	45	---	nS
Q _{rr}	Reverse Recovery Charge		---	138	---	nC

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z 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

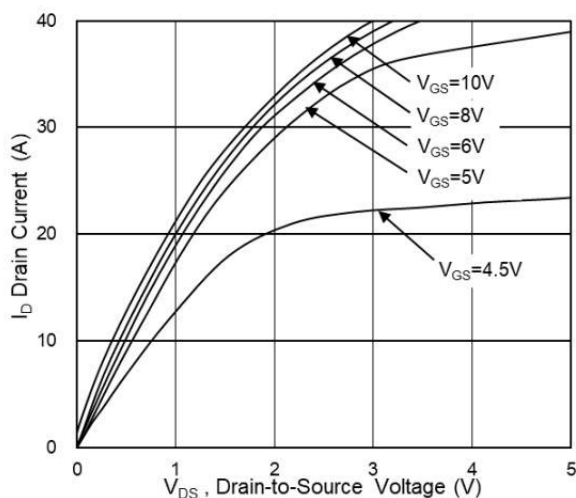


Fig.1 Typical Output Characteristics

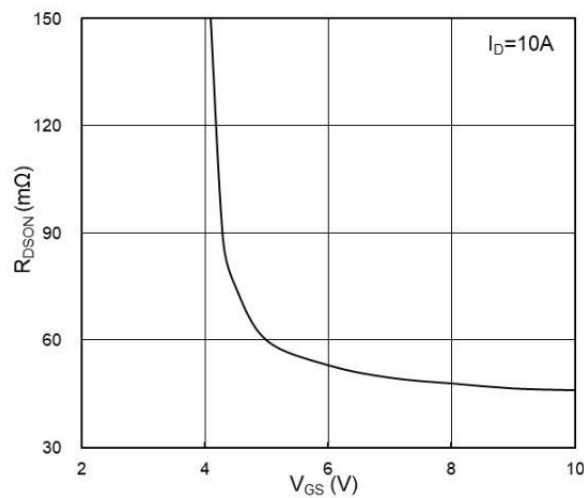


Fig.2 On-Resistance vs G-S Voltage

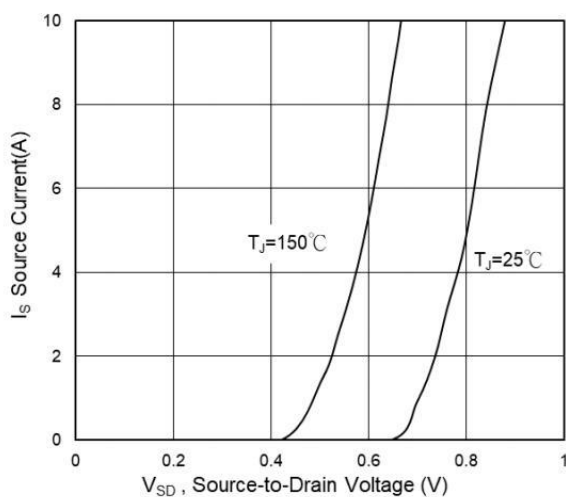


Fig.3 Source Drain Forward Characteristics

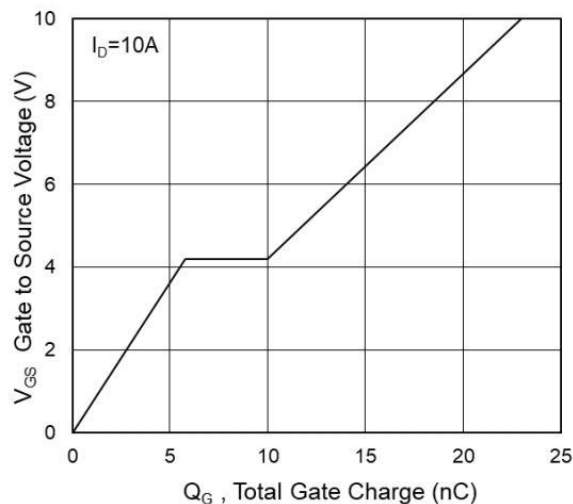


Fig.4 Gate-Charge Characteristics

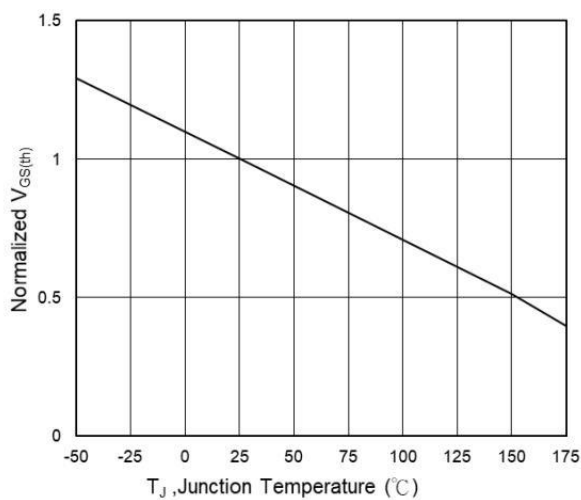


Fig.5 Normalized $V_{GS(th)}$ vs T_J

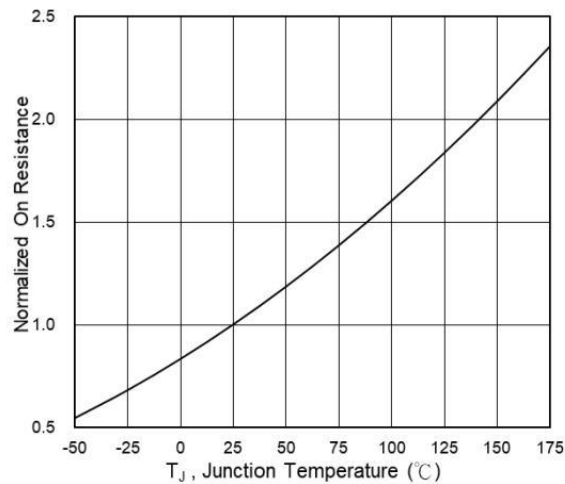


Fig.6 Normalized $R_{DS(on)}$ vs T_J

Typical Characteristics

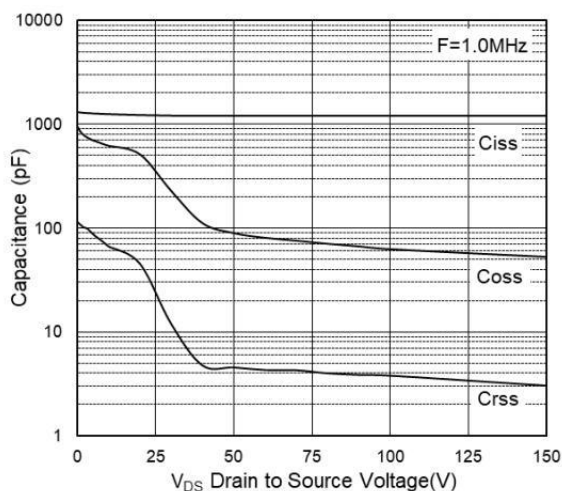


Fig.7 Capacitance

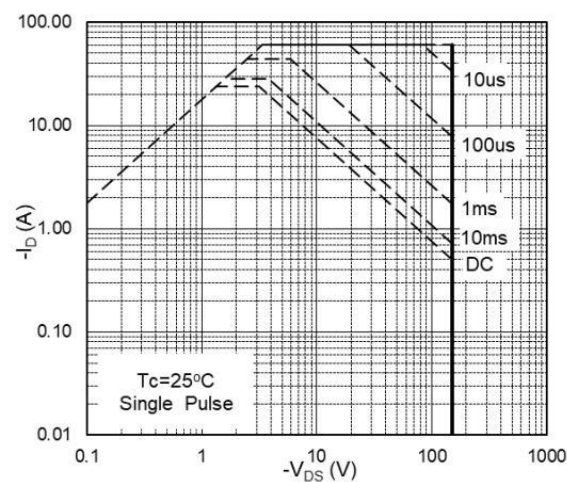


Fig.8 Safe Operating Area

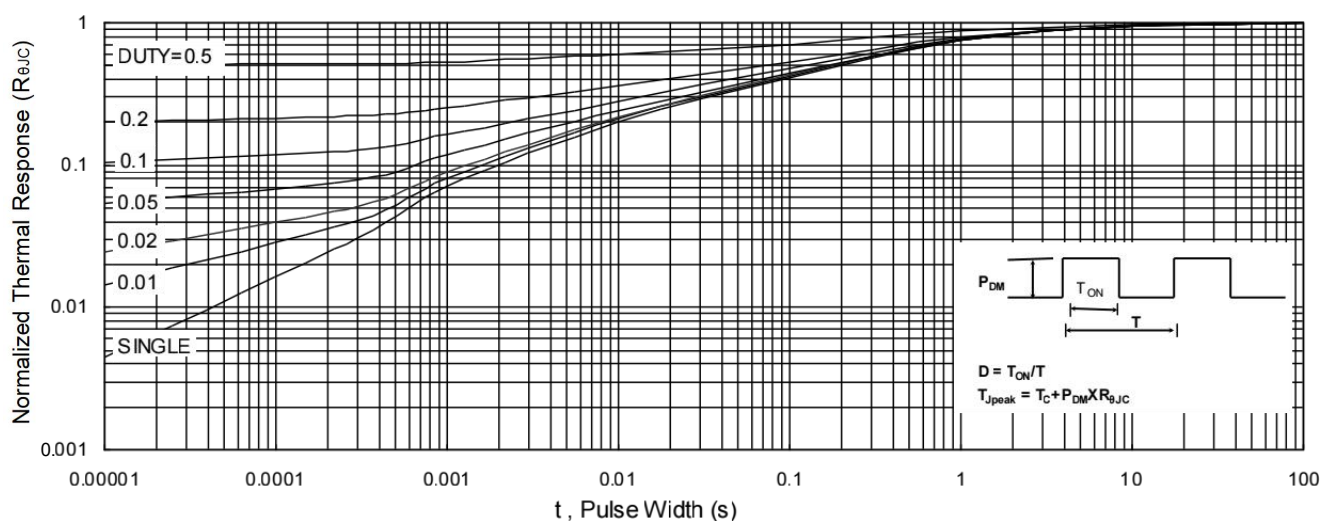


Fig.9 Normalized Maximum Transient Thermal Impedance

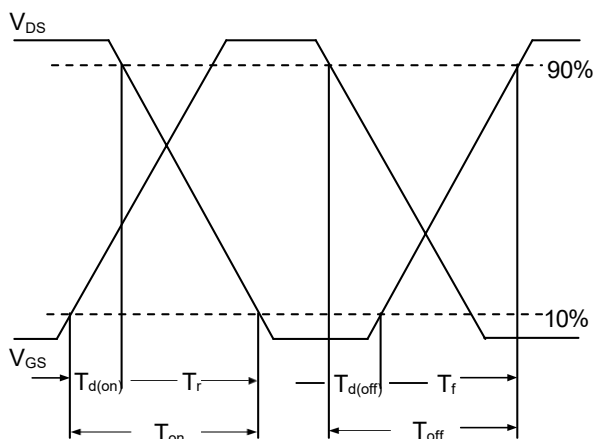


Fig.10 Switching Time Waveform

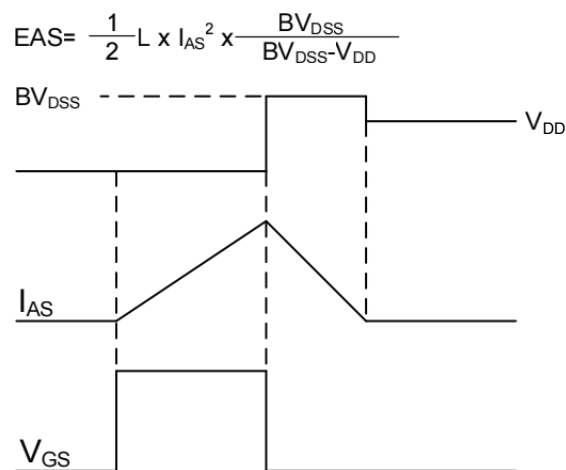
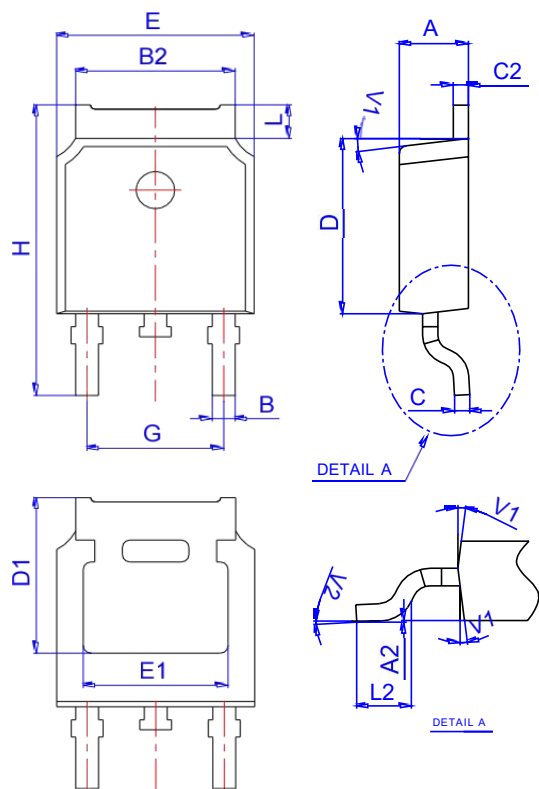


Fig.11 Unclamped Inductive Switching Waveform

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