

Description

The SX50P06D 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

$V_{DS} = -60V$ $I_D = -58A$

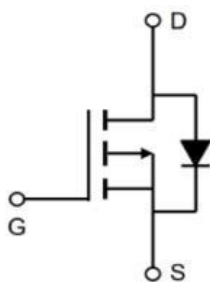
$R_{DS(ON)} < 16m\Omega$ @ $V_{GS} = -10V$

Application

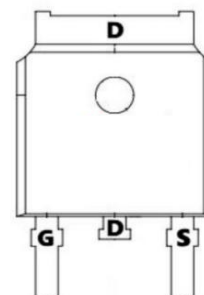
Lithium battery protection

Wireless impact

Mobile phone fast charging



TO-252-3L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c = 25^\circ C$	Continuous Drain Current, $-V_{GS}$ @ $-10V^1$	-58	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current, $-V_{GS}$ @ $-10V^1$	-49	A
I_{DM}	Pulsed Drain Current ²	-250	A
EAS	Single Pulse Avalanche Energy ³	450	mJ
I_{AS}	Avalanche Current	41	A
$P_D @ T_c = 25^\circ C$	Total Power Dissipation ⁴	114	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	1.1	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	62.5	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=-250μA	-60	-68		V
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=-250μA	-1.2	-1.8	-2.5	V
IGSS	Gate Leakage Current	VDS=0V, VGS=±20V			±100	nA
IDSS	Zero Gate Voltage Drain Current	VDS=-60V, VGS=0V			-1	μA
RDS(ON)	Drain-Source On-State Resistance ^a	VGS=-10V, ID= -20A		12	16	mΩ
		VGS=-4.5V, ID= -10A		15	18	
VSD	Diode Forward Voltage	IS=-17A, VGS=0V		-0.9	-1.2	V
Qg	Total Gate Charge(10V)	VDS=-30V, VGS=-10V, ID=-50A		94		nC
Qg	Total Gate Charge(4.5V)	VDS=-30V, VGS=-4.5V, ID=-50A		46		
Qgs	Gate-Source Charge			18		
Qgd	Gate-Drain Charge			24		
Ciss	Input capacitance	VDS=-15V, VGS=0V, F=1MHz		4707		pF
Coss	Output Capacitance			373		
Crss	Reverse Transfer Capacitance			336		
td(on)	Turn-On Delay Time	VDS=-30V, RL =30Ω VGEN=-10V, RG=6Ω		53		ns
tr	Turn-On Rise Time			19		
td(off)	Turn-Off Delay Time			221		
tf	Turn-Off Fall Time			61		

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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The EAS data shows Max. rating . The test condition is VDD =-48V,VGS =-10V,L=0.1mH,IAS =-41A
- 4、The power dissipation is limited by 150°Cjunction 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

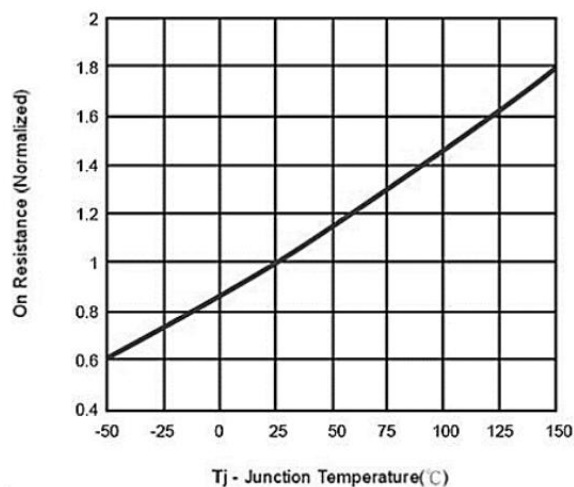


Fig.1 On Resistance Vs Junction Temperature

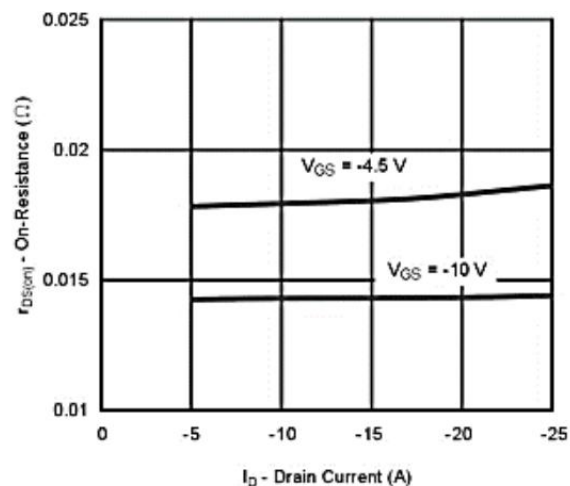


Fig.2 On-Resistance Vs. Drain Current

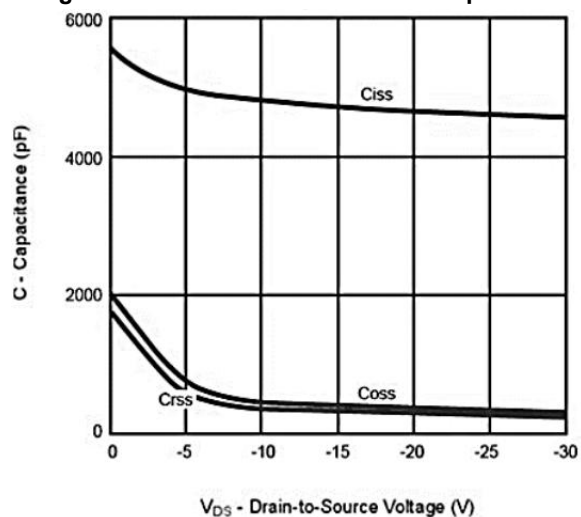


Fig.3 Capacitance

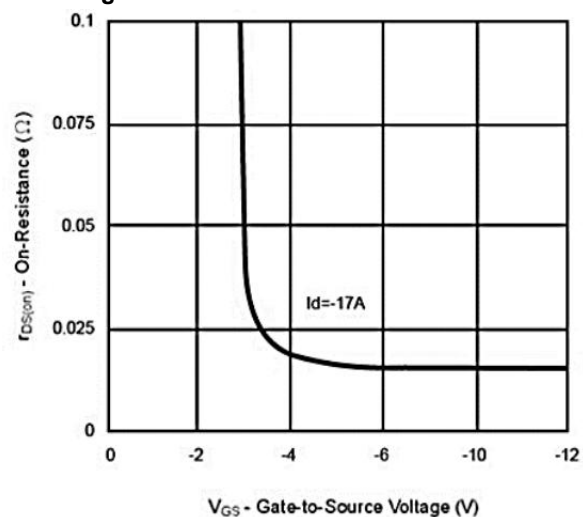


Fig.4 On-Resistance Vs. Gate-to-Source Voltage

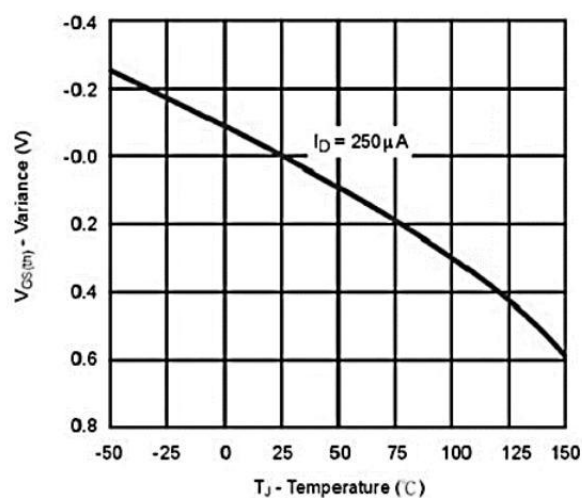


Fig.5 Threshold Voltage

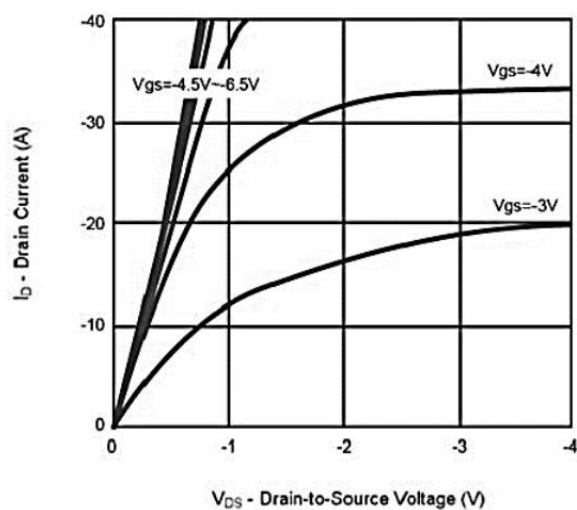
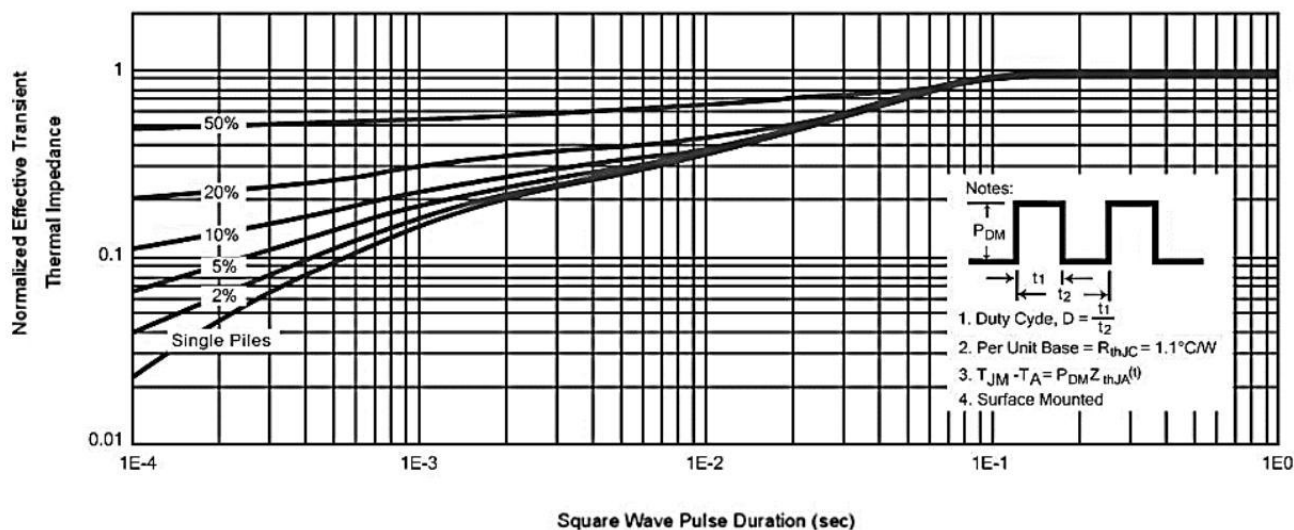
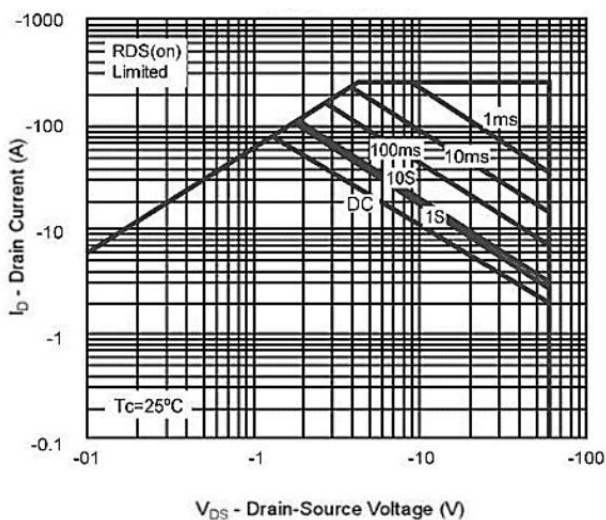
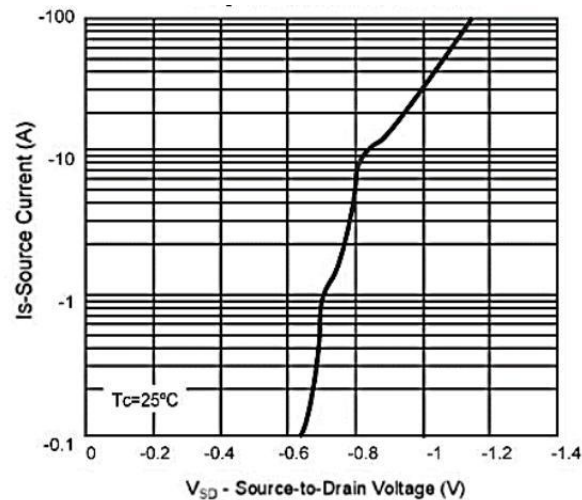
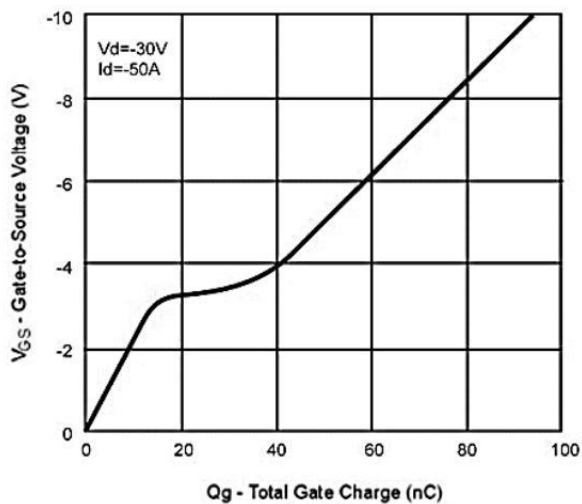
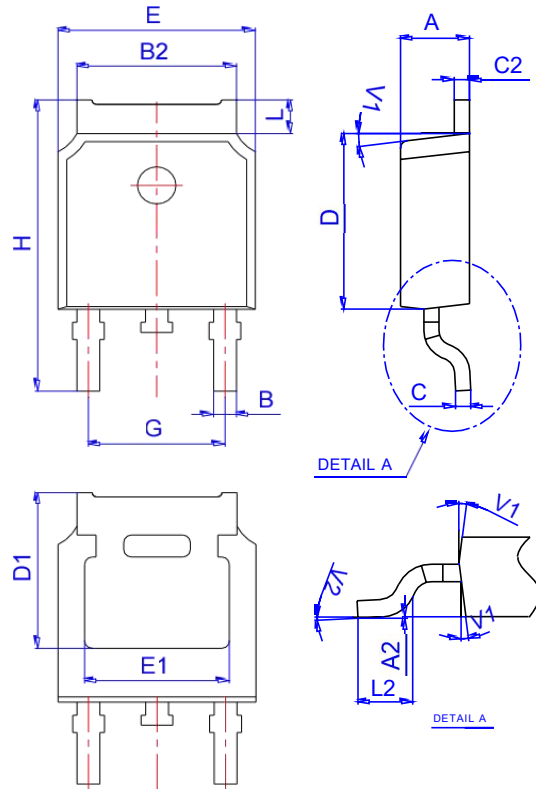


Fig.6 On-Region Characteristics

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