-60V P-Channel Enhancement Mode MOSFET

Description

The SX5P06MSI 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 =-5A

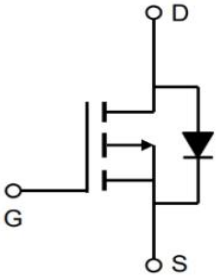
$R_{DS(ON)}$ < -130mΩ @ V_{GS}=-10V

Application

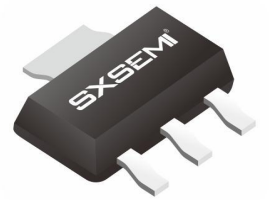
Battery protection

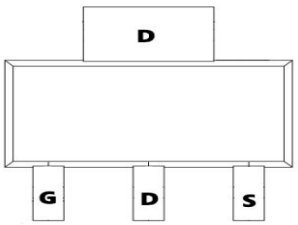
Load switch

Uninterruptible power supply



SOT-223-3L





Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	-5	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	-3.5	A
I_{DM}	Pulsed Drain Current[2]	-14	A
P_D@T_A=25℃	Total Power Dissipation[3]	2	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	70	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	100	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V，I_D=-250uA	-60	-67	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V，I_D=-2A	---	110	130	mΩ
		V_{GS}=-4.5V，I_D=-1.5A	---	140	190	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}，I_D =-250uA	-1.0	-1.7	-2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-48V，V_{GS}=0V，T_J=25℃	---	---	1	uA
		V_{DS}=-48V，V_{GS}=0V，T_J=150℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V，V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V，I_D=-2A	---	5.8	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-20V，V_{GS}=-4.5V，I_D=-2A	---	5.9	---	nC
Q_{gs}	Gate-Source Charge		---	2.9	---	
Q_{gd}	Gate-Drain Charge		---	1.8	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-12V，V_{GS}=-10V，R_G=3.3Ω，I_D=-1	---	10	---	ns
T_r	Rise Time		---	17	---	
$T_{d(off)}$	Turn-Off Delay Time		---	22	---	
T_f	Fall Time		---	21	---	
C_{iss}	Input Capacitance	V_{DS}=-15V，V_{GS}=0V，F=1MHz	---	715	---	pF
C_{oss}	Output Capacitance		---	51	---	
C_{rss}	Reverse Transfer Capacitance		---	34	---	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V，Force Current	---	---	-4	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V，I_S=-1A，T_J=25℃	---	---	-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 power dissipation is limited by 150℃junction temperature

4、The data is theoretically the same as ID and IDM，in real applications，should be limited by total power dissipation.

Typical Characteristics

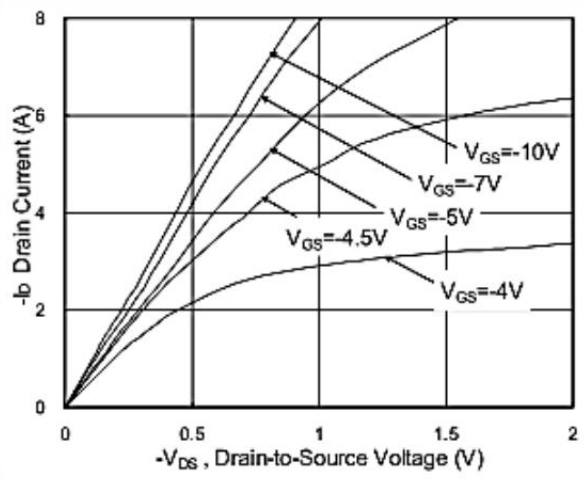


Fig.1 Typical Output Characteristics

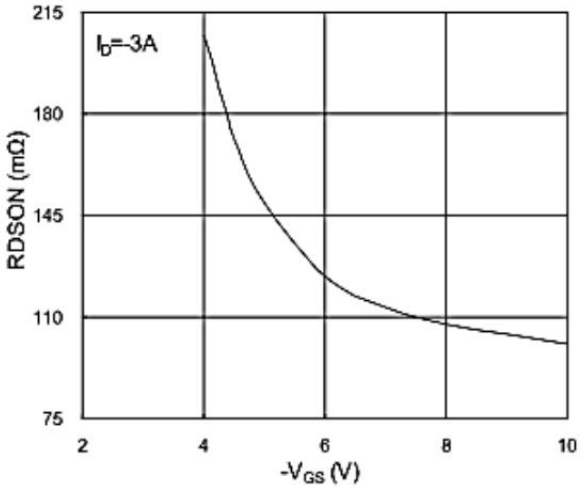


Fig.2 On-Resistance vs. G-S Voltage

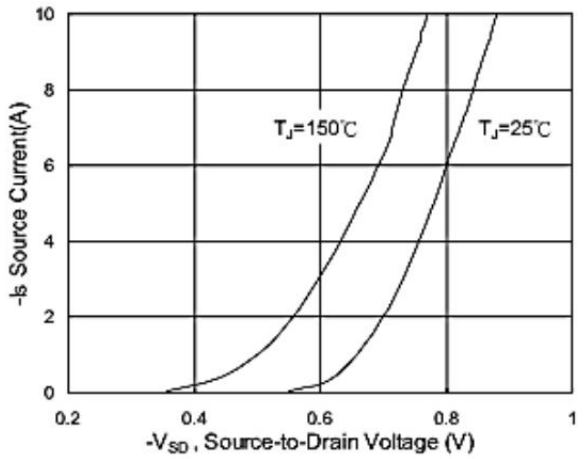


Fig.3 Forward Characteristics Of Reverse

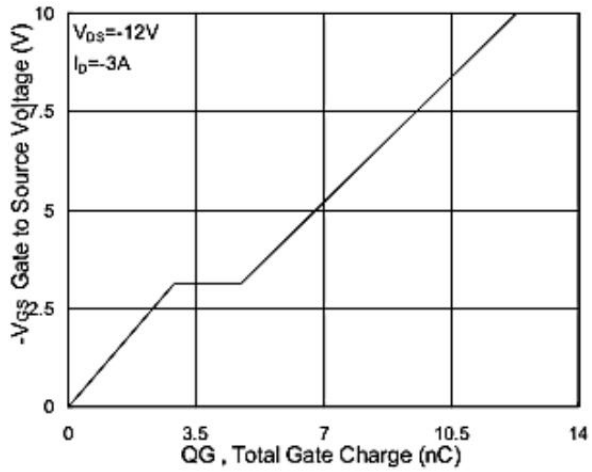


Fig.4 Gate-Charge Characteristics

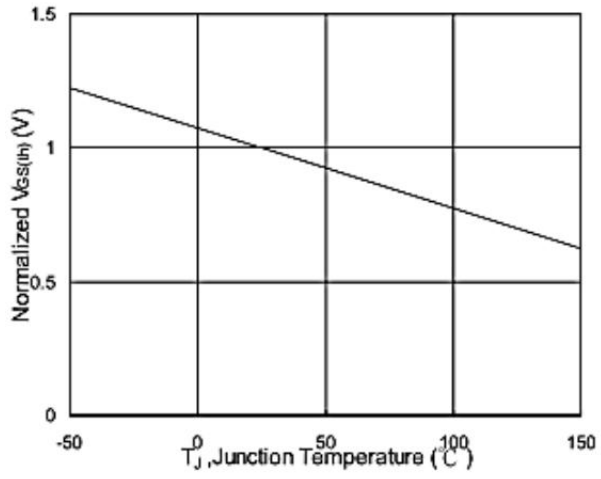


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

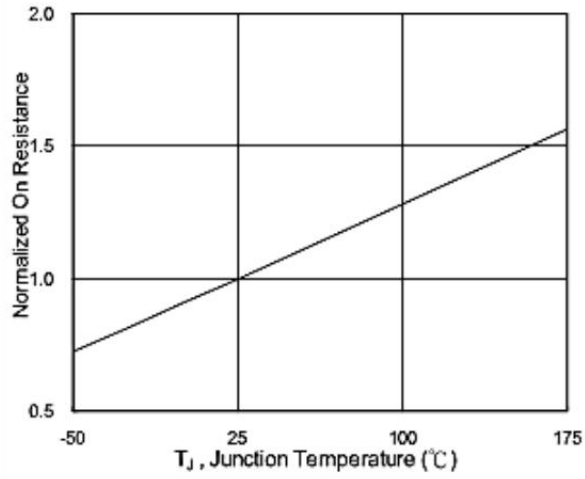


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

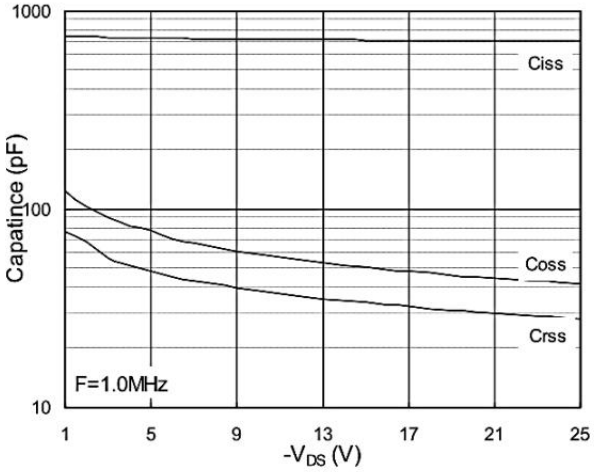


Fig.7 Capacitance

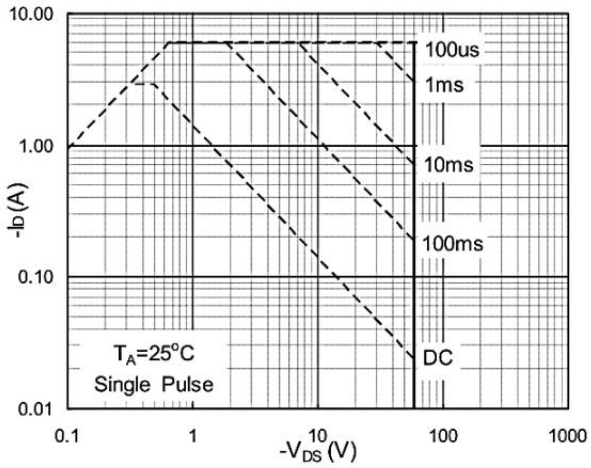


Fig.8 Safe Operating Area

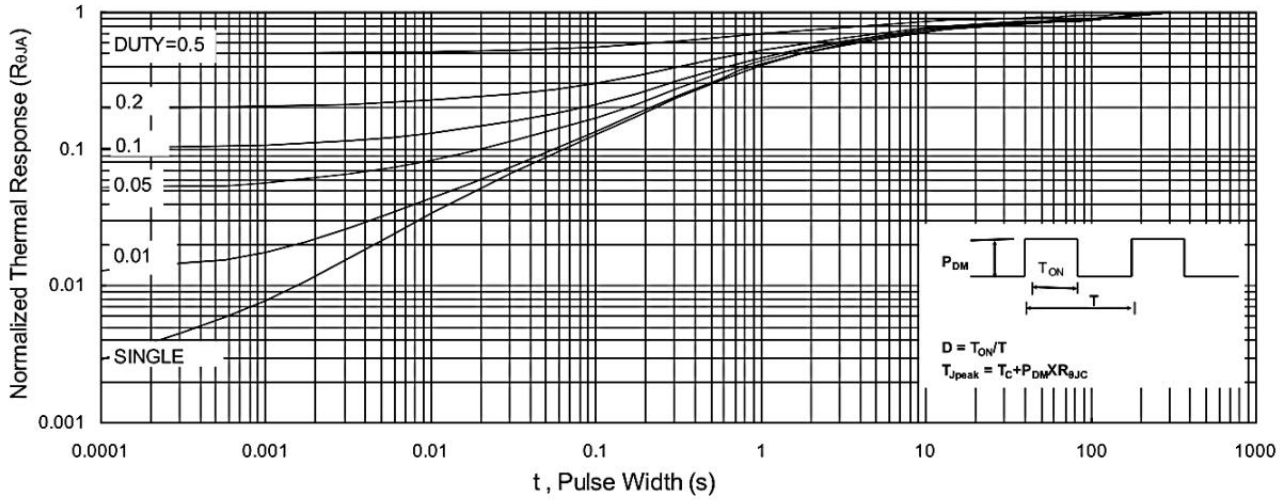


Fig.9 Normalized Maximum Transient Thermal Impedance

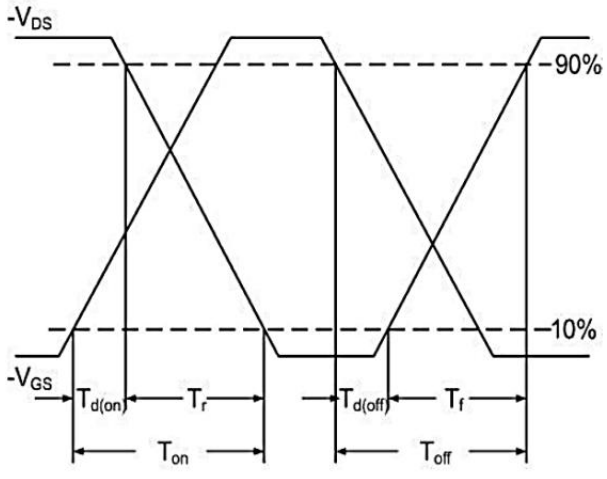


Fig.10 Switching Time Waveform

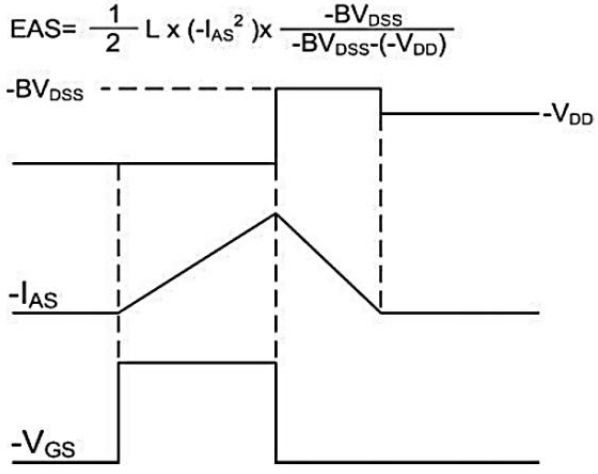
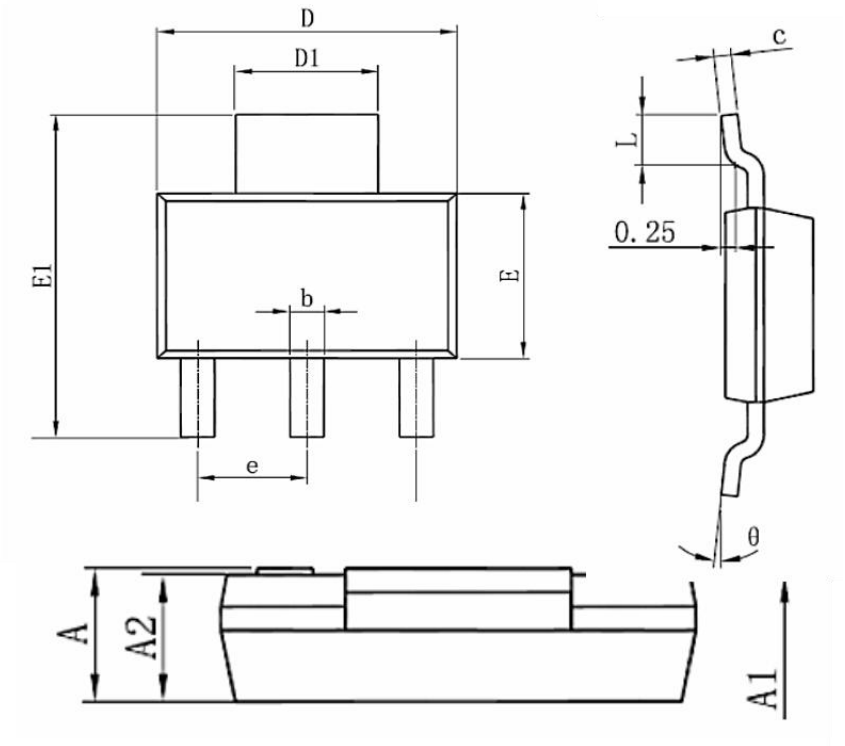


Fig.11 Unclamped Inductive Waveform

Package Mechanical Data:SOT223-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.52	1.8	0.06	0.049
A1	0.000	0.100	0.000	0.004
A2	1.5	1.7	0.059	0.045
b	0.66	0.82	0.026	0.032
c	0.25	0.35	0.010	0.014
D	6.2	6.4	0.244	0.252
D1	2.9	3.1	0.114	0.122
E	3.3	3.7	0.130	0.146
E1	6.83	7.07	0.269	0.278
e	2.300(BSC)		0.037(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.15	0.035	0.045
θ	0°	10°	0°	10°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT223-3L		3000