-30V P-Channel Enhancement Mode MOSFET

Description

The SX6P03SI 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 =-6A

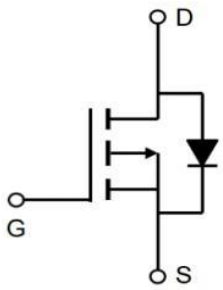
$R_{DS(ON)}$ < 55mΩ @ V_{GS}=10V

Application

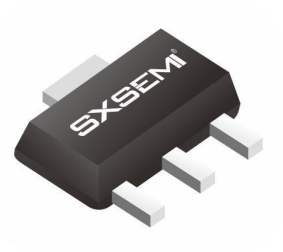
Battery protection

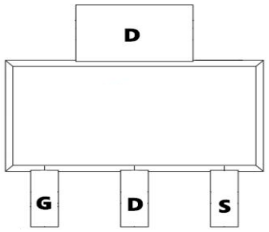
Load switch

Uninterruptible power supply



SOT-89-3L





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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-6.0	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-3.3	A
IDM	Pulsed Drain Current note1	-20.4	A
P_D	Power Dissipation T_A = 25℃	2.15	W
RθJA	Thermal Resistance, Junction to Ambient	70	℃/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	℃

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-30	-33	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250μA	-1.0	-1.6	-2.5	V
RDS(on)	Static Drain-Source on-Resistance note2	V_{GS} =-10V, I_D =-5A	-	40	55	mΩ
		V_{GS} =-4.5V, I_D =-4A	-	65	90	
C_{iss}	Input Capacitance	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz	-	596	-	pF
Coss	Output Capacitance		-	95	-	pF
Crss	Reverse Transfer Capacitance		-	68	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D = -5.1A, V_{GS} = -10V	-	6.8	-	nC
Q_{gs}	Gate-Source Charge		-	1	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	1.4	-	nC
td(on)	Turn-on Delay Time	V_{DD} = -15V, I_D = -1A, V_{GS}=-10V, R_{GEN}=2.5Ω	-	14	-	ns
t_r	Turn-on Rise Time		-	61	-	ns
td(off)	Turn-off Delay Time		-	19	-	ns
t_f	Turn-off Fall Time		-	10	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-5.1	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-20.4	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -5.1A	-	-0.8	-1.2	V

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 ≦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

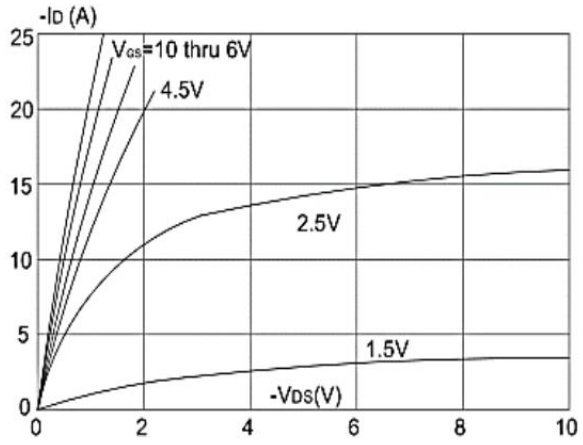


Figure1: Output Characteristics

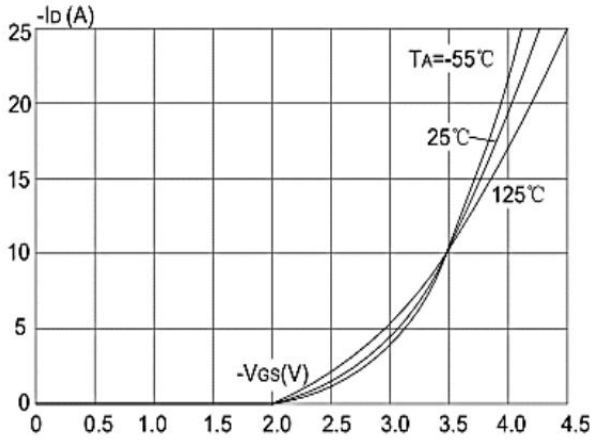


Figure 2: Typical Transfer Characteristics

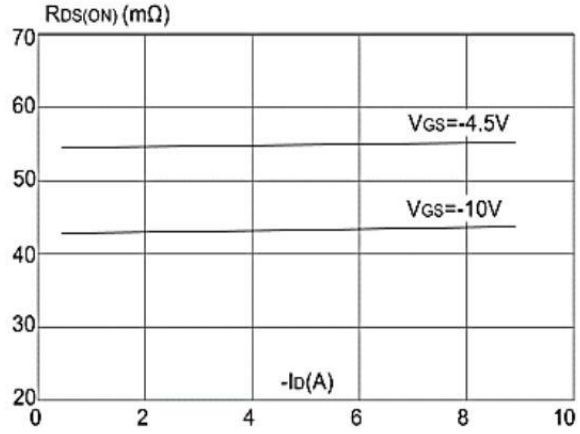


Figure 3:On-resistance vs. Drain Current

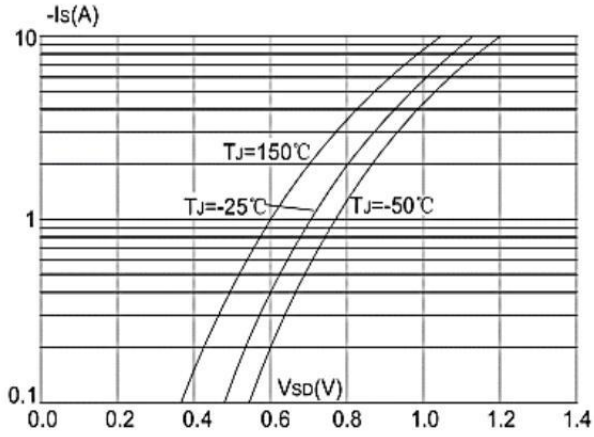


Figure 4: Body Diode Characteristics

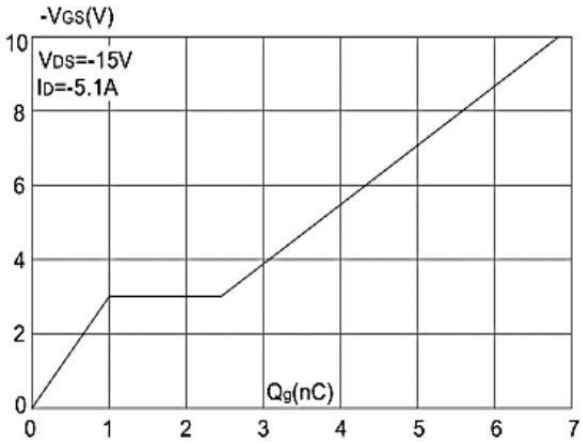


Figure 5: Gate Charge Characteristics

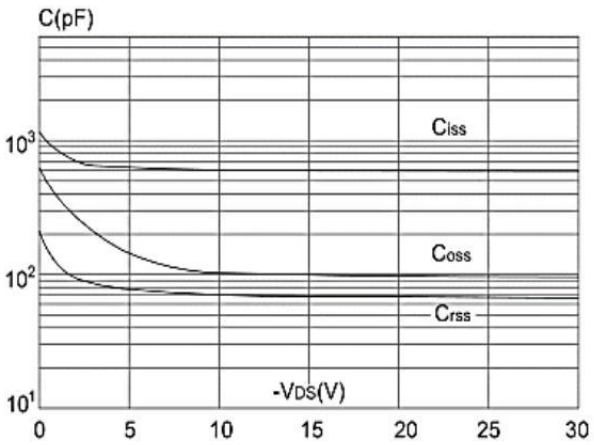


Figure 6: Capacitance Characteristics

Typical Characteristics

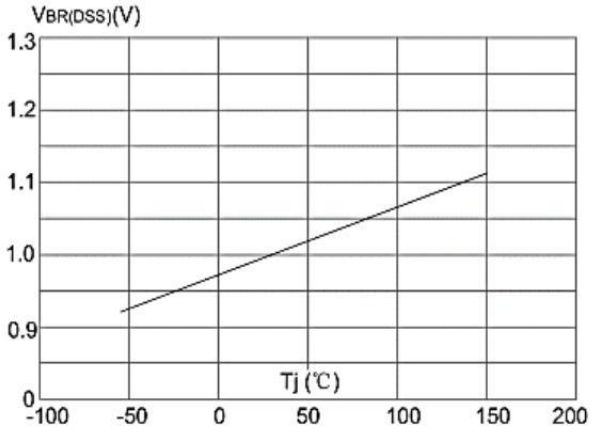


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

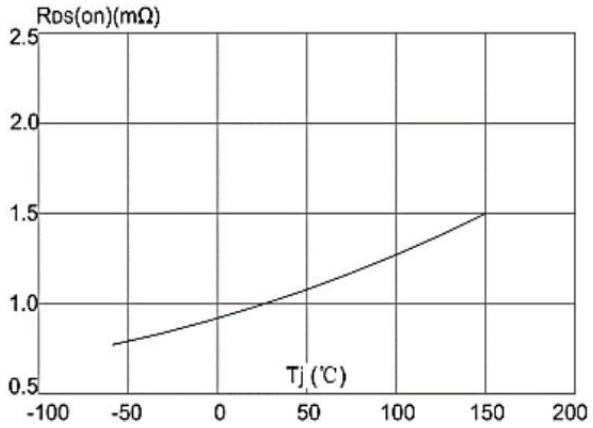


Figure 8: Normalized on Resistance vs Junction Temperature

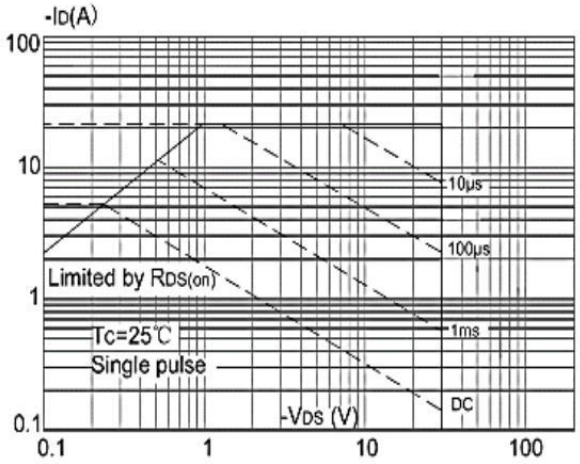


Figure 9: Maximum Safe Operating Area vs. Case Temperature

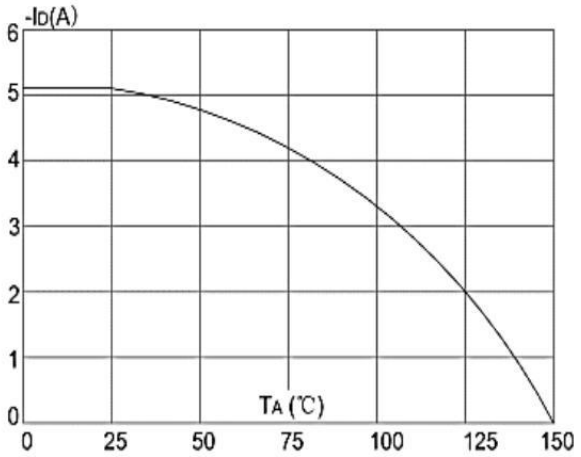


Figure 10: Maximum Continuous Drain Current

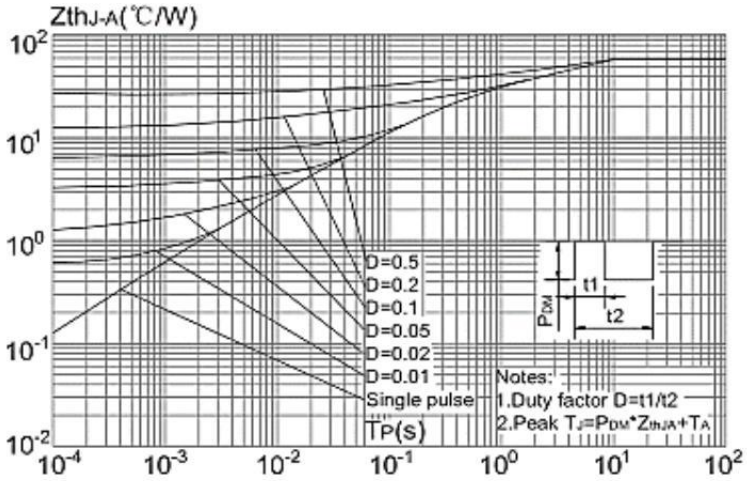
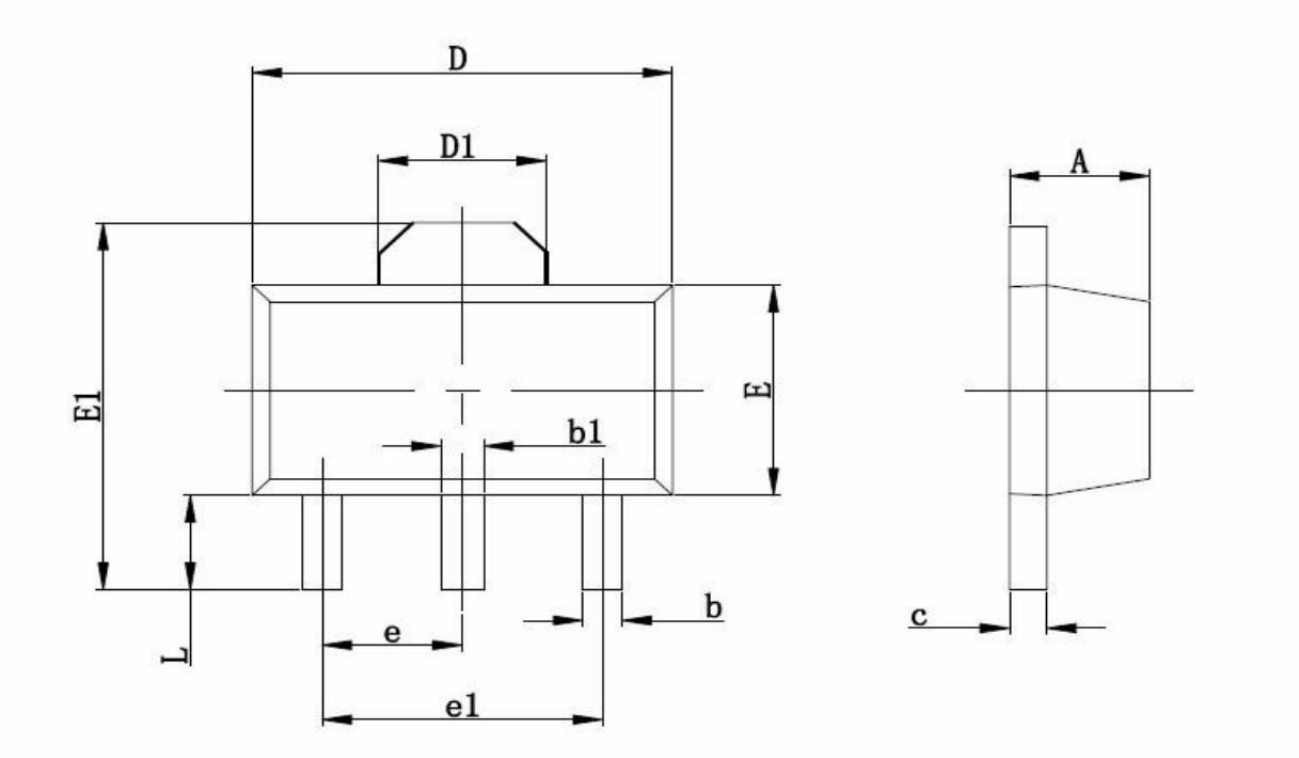


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data:SOT89-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT89-3L		3000