-60V P-Channel Enhancement Mode MOSFET

Description

The SX80P06T uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 6V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

V_{DS} = -60V I_D =-82A

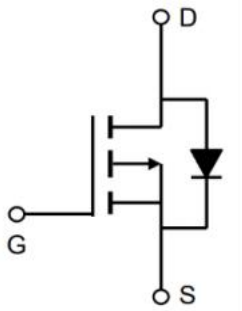
$R_{DS(ON)}$ < -12mΩ @ V_{GS}=-10V

Application

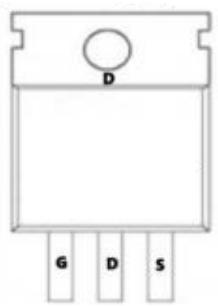
Lithium battery protection

Switching Mode Power Supply

UPS



TO-263-3L



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_C=25℃	Continuous Drain Current, -V_{GS} @ -10V[1]	-82	A
I_D@T_C=100℃	Continuous Drain Current, -V_{GS} @ -10V[1]	-52	A
I_{DM}	Pulsed Drain Current[2]	-328	A
EAS	Single Pulse Avalanche Energy[3]	450	mJ
I_{AS}	Avalanche Current	52	A
P_D@T_C=25℃	Total Power Dissipation[4]	110	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]	0.70	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	60	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V，I_D=-250uA	-60	-68	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃，I_D=-1mA	---	-0.035	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=-10V，I_D=-20A	---	10	12	mΩ
		V_{GS}=-4.5V，I_D=-15A	---	13	16	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS}，I_D =-250uA	-1.0	-2.1	-3.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.28	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=-60V，V_{GS}=0V，T_J=25℃	---	---	1	uA
		V_{DS}=-60V，V_{GS}=0V，T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V，V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V，I_D=-20A	---	50	---	S
R_g	Gate Resistance	V_{DS}=0V，V_{GS}=0V，f=1MHz	---	2.0	---	Ω
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-30V，V_{GS}=-10V，I_D=-20A	---	56	---	nC
Q_{gs}	Gate-Source Charge		---	11	---	
Q_{gd}	Gate-Drain Charge		---	9	---	
Td(on)	Turn-On Delay Time	V_{DD}=-30V，V_{GS}=-10V，R_G=3Ω，I_D=-20A	---	4.5	---	ns
T_r	Rise Time		---	2.5	---	
Td(off)	Turn-Off Delay Time		---	14.5	---	
T_f	Fall Time		---	3.8	---	
C_{iss}	Input Capacitance	V_{DS}=-15V，V_{GS}=0V，f=1MHz	---	3500	---	pF
Coss	Output Capacitance		---	600	---	
Crss	Reverse Transfer Capacitance		---	25	---	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V，Force Current	---	---	-80	A
ISM	Pulsed Source Current[2,5]		---	---	-240	A
VSD	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 inch 2 FR-4 board with 2OZ 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 =-48V，VGS =-10V，L=0.1mH，IAS =-52A

4、The power dissipation is limited by 150℃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

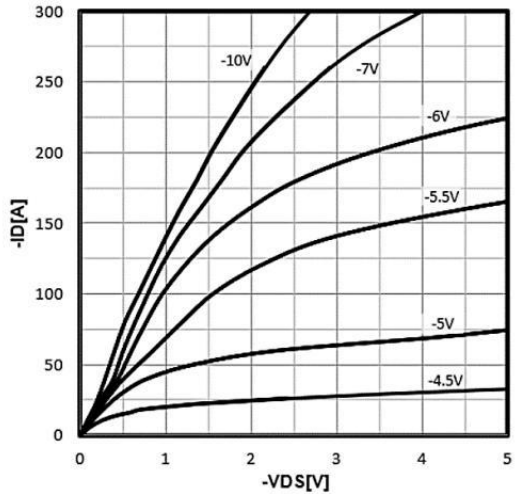


Figure 1. Type. Output Characteristics (Tj=25 ℃)

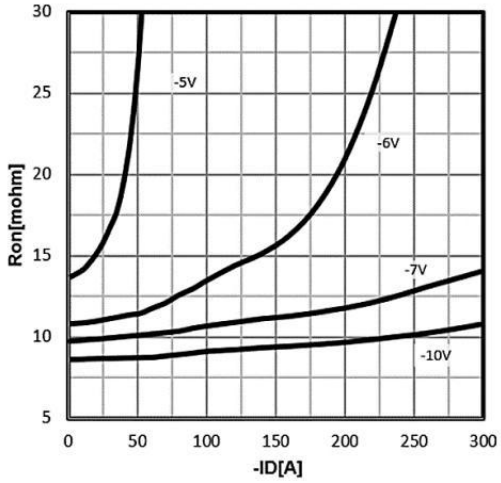


Figure 2. Type. drain-source on resistance

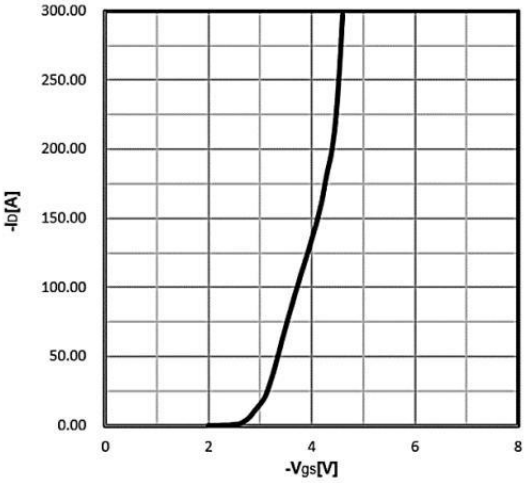


Figure 3. Type. transfer characteristics

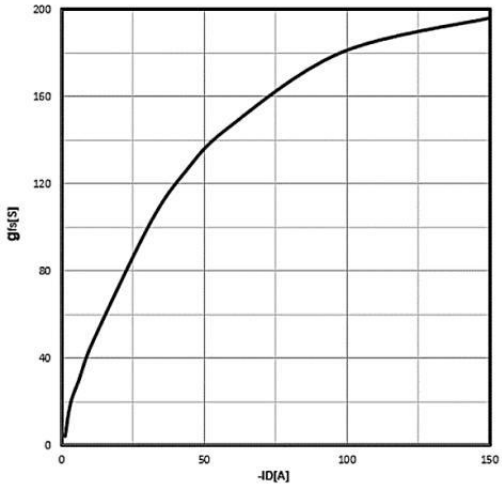


Figure 4. Type. forward transconductance

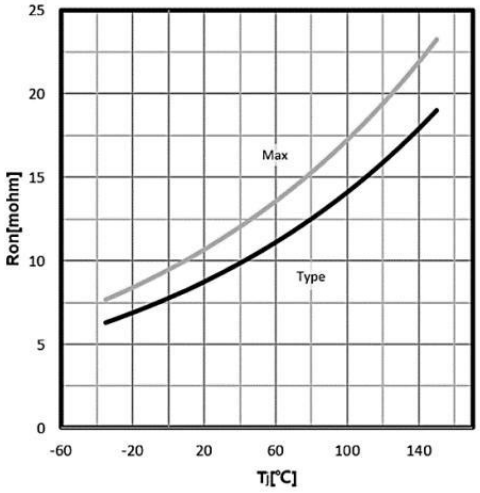


Figure 5. Drain-source on-state resistance
RDS(on) =f(Tj); ID =80A; VGS =10V

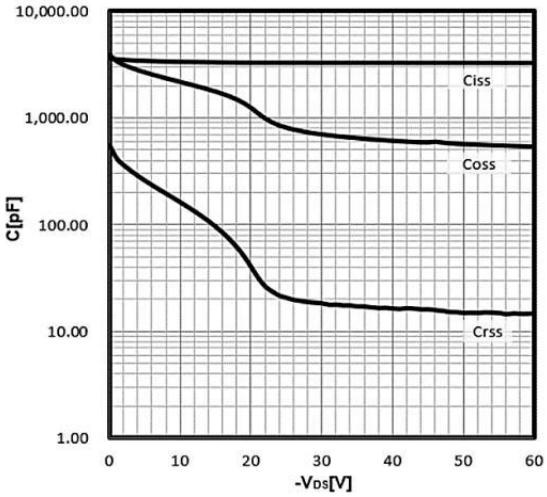


Figure 6 . Body-Diode Characteristics
C=f(VDS); VGS =0V; f=1MHz

Typical Characteristics

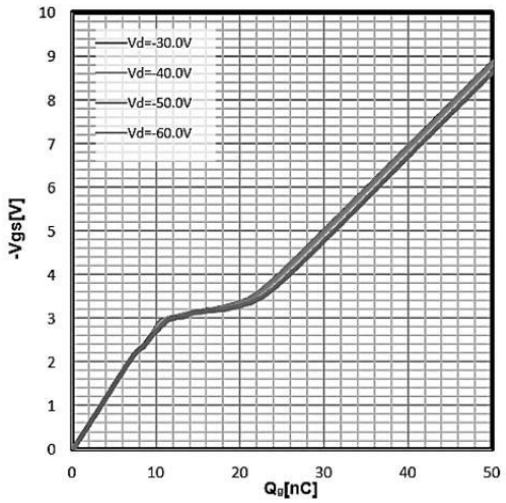


Figure 7. Typ. gate charge
VGS =f(Q gate) ; ID =20A

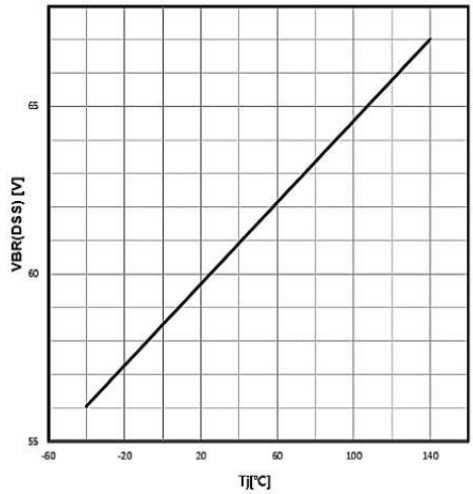


Figure 8. Drain Current Derating
VBR(DSS) =f(Tj); I D =250uA

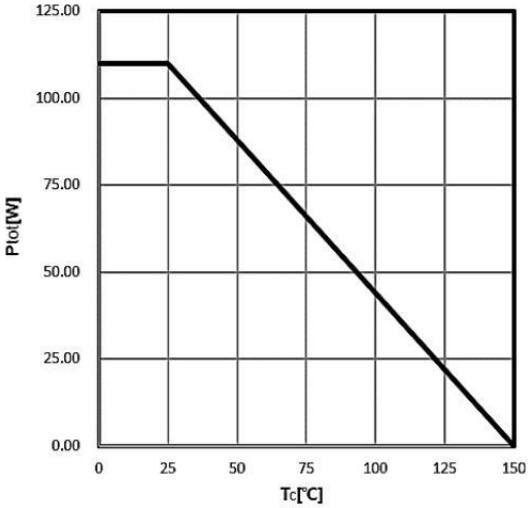


Figure 7. Power Dissipation

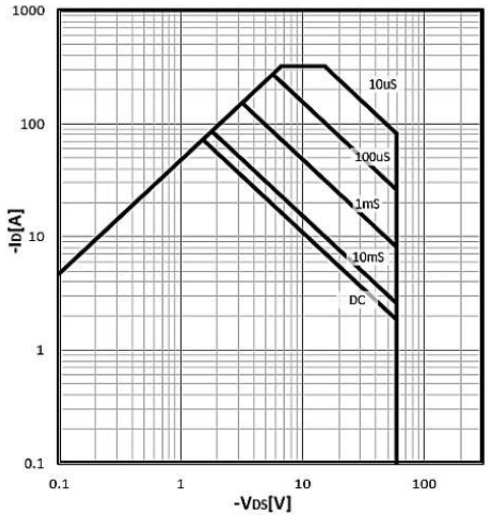


Figure 8. Safe operating area

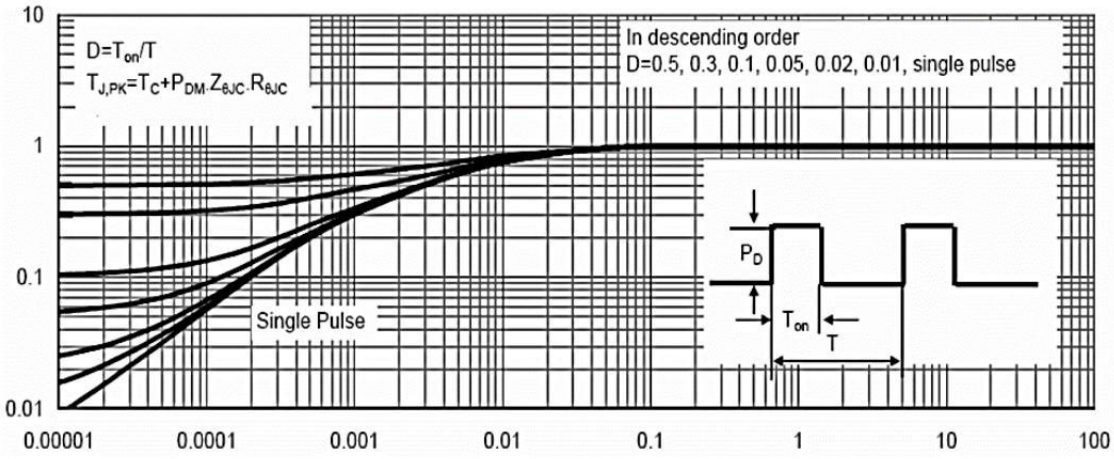
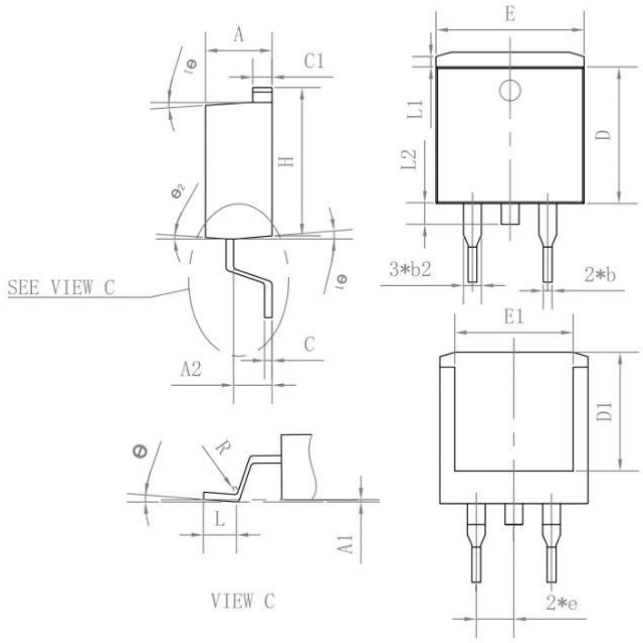


Figure 10. Max. transient thermal impedance

ZthJC =f(tp)

Package Mechanical Data-TO-263-3L-SLK



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.70
b	0.70	0.80	1.00
b2	1.25	1.36	1.50
C	0.45	0.50	0.65
C1	1.29	1.30	9.40
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
Θ1	4°	7°	10。
Θ2	0°	3°	6°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-263-3L		800