

Description

The SX120P06T uses advanced 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

$V_{DS} = -60V$ $I_D = -120A$

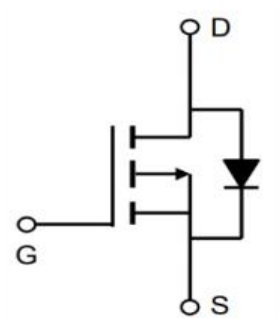
$R_{DS(ON)} < 6.5m\Omega$ @ $V_{GS} = -10V$

Application

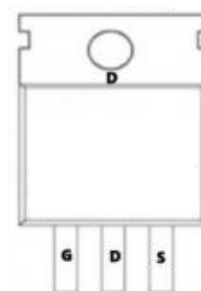
Lithium battery protection

Wireless impact

Mobile phone fast charging



TO-263-3L



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	-120	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $-V_{GS}$ @ -10V ¹	-70	A
I_{DM}	Pulsed Drain Current ²	-360	A
EAS	Single Pulse Avalanche Energy ³	800	mJ
I_{AS}	Avalanche Current	51	A
$P_D @ T_c=25^\circ C$	Total Power Dissipation ⁴	110	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	25	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	0.69	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250uA	-60	-68	---	V
ΔBVDSS/ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C , I _D =-1mA	---	-0.035	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =-10V , I _D =-20A	---	5.5	6.5	mΩ
		V _{GS} =-4.5V , I _D =-15A	---	7.2	10	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-2.0	-2.5	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	4.28	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =-60V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =-60V , V _{GS} =0V , T _J =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
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 =-15A	---	80.2	---	nC
Q _{gs}	Gate-Source Charge		---	15.2	---	
Q _{gd}	Gate-Drain Charge		---	11	---	
Td(on)	Turn-On Delay Time	V _{DD} =-30V , V _{GS} =-10V , R _G =3Ω, I _D =-15A	---	4.5	---	ns
T _r	Rise Time		---	2.5	---	
Td(off)	Turn-Off Delay Time		---	14.5	---	
T _f	Fall Time		---	3.5	---	
C _{iss}	Input Capacitance	V _{DS} =-30V , V _{GS} =0V , f=1MHz	---	5403	---	pF
C _{oss}	Output Capacitance		---	941	---	
Crss	Reverse Transfer Capacitance		---	48	---	
I _s	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	-120	A
ISM	Pulsed Source Current ^{2,5}		---	---	-480	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-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 =-51A
- 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

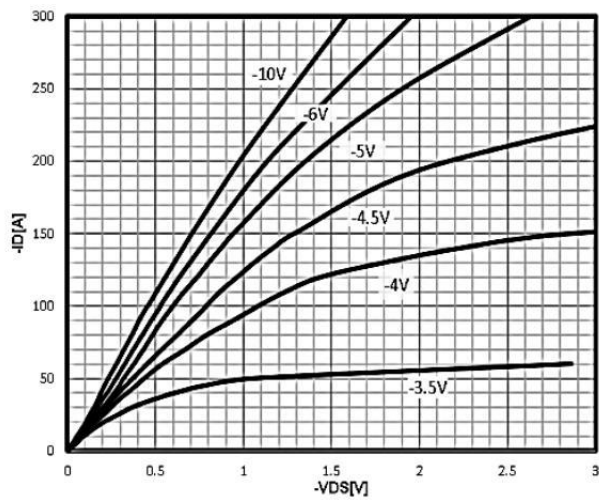


Figure 1. Typ. output characteristics

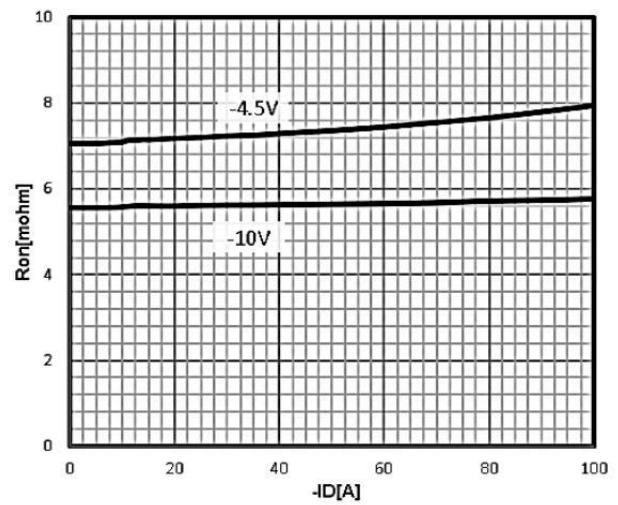


Figure 2. Typ. drain-source on

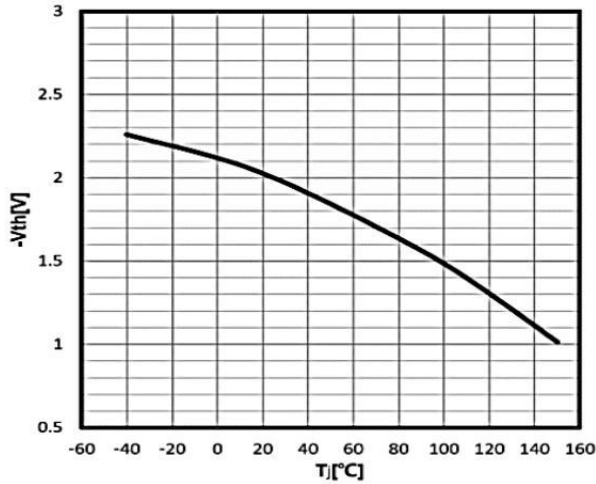


Figure 3. Gate Threshold Voltage

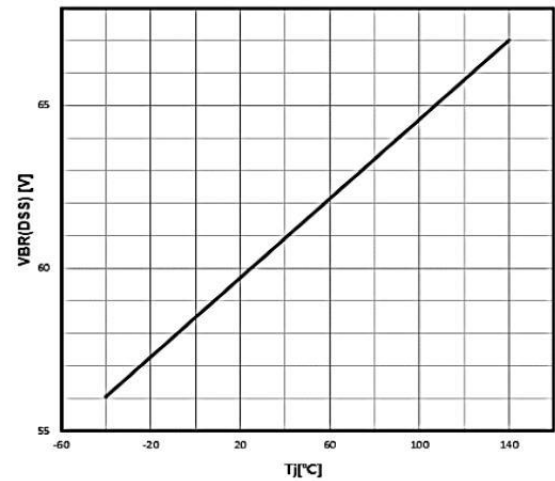


Figure 4. Drain-source breakdown voltage

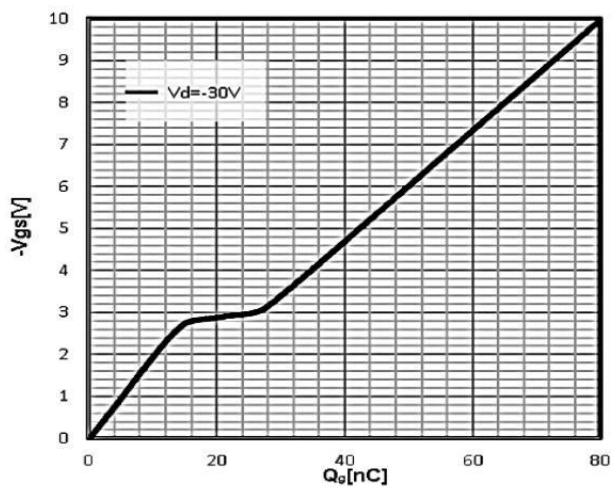


Figure 5. Typ. gate charge

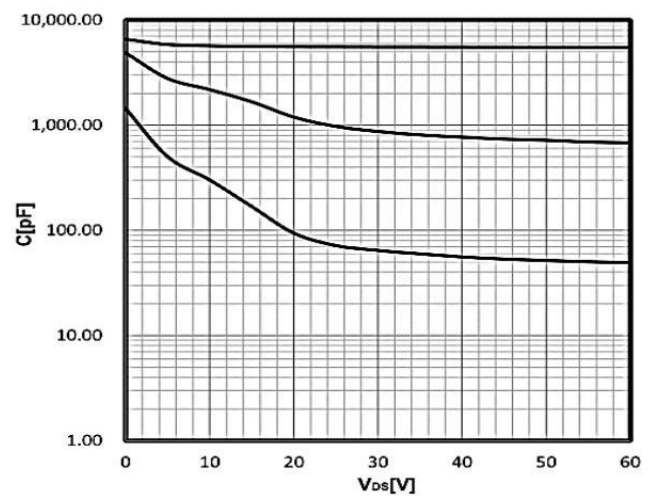


Figure 6. Typ. capacitances

Typical Characteristics

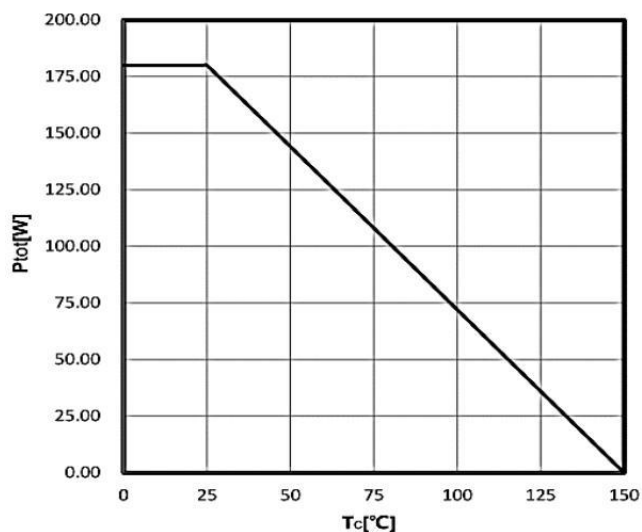


Figure 7. Power Dissipation

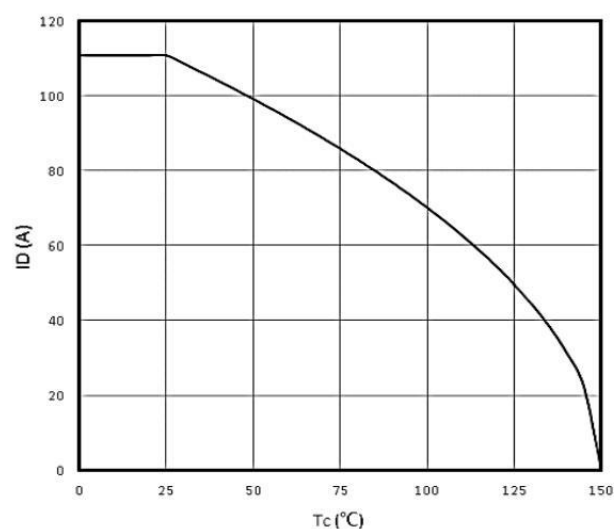


Figure 8. Maximum Drain Current

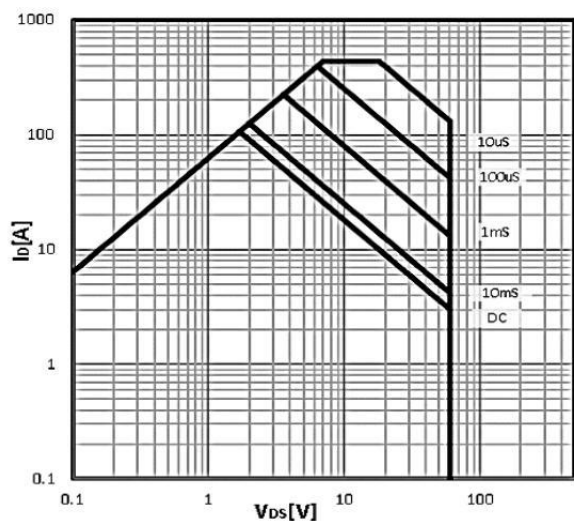


Figure 9. Safe operating area

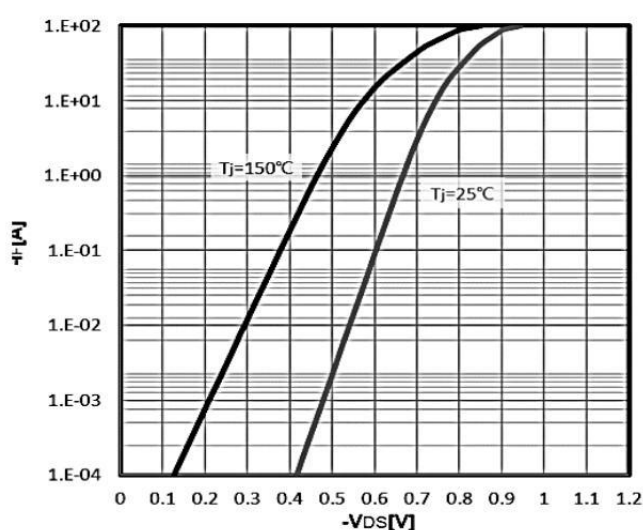


Figure 10. Body Diode Forward Voltage Variation

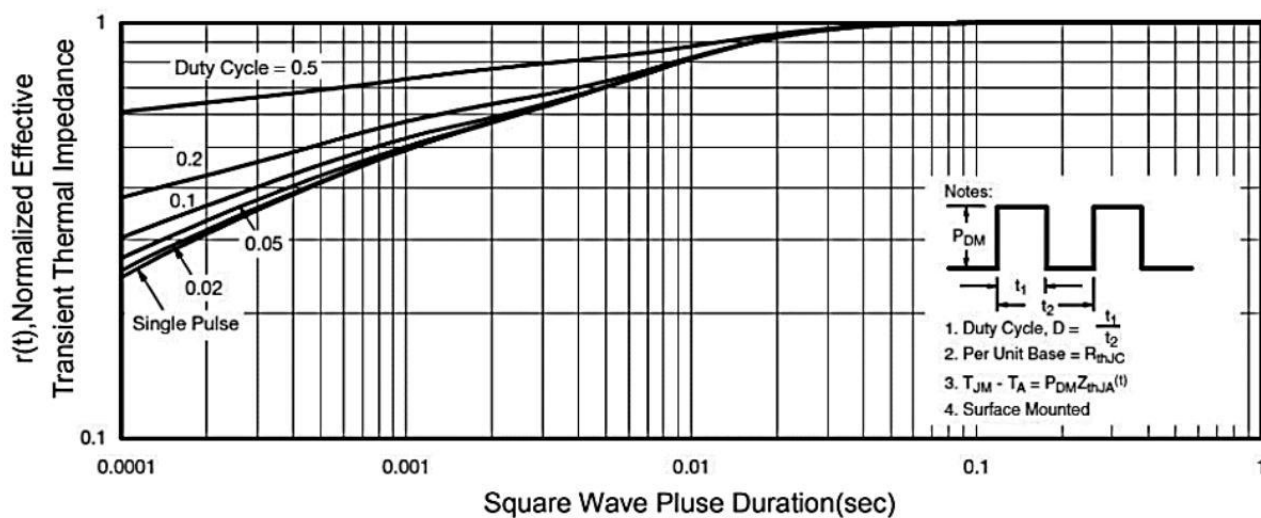
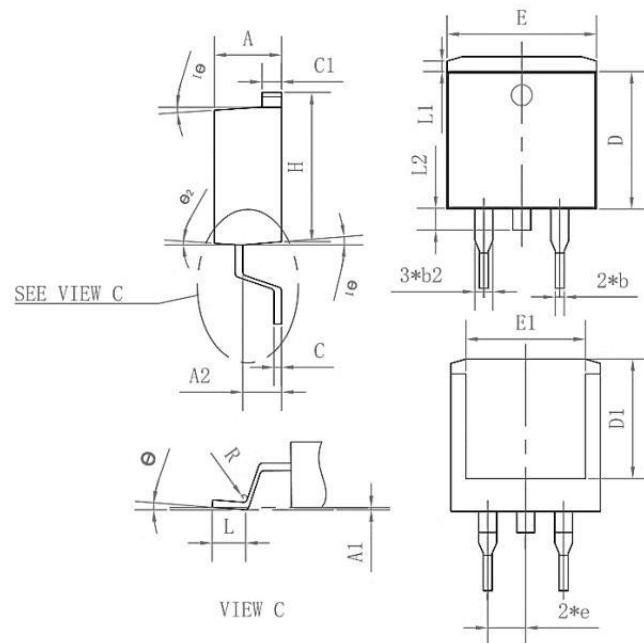


Figure 11. Max. transient thermal impedance

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