

Description

The SX120N15T uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 150V$ $I_D = 120A$

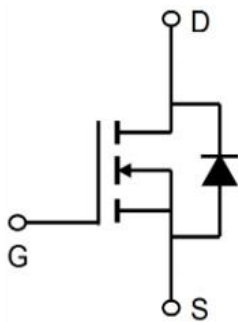
$R_{DS(ON)} < 12m\Omega$ @ $V_{GS}=10V$

Application

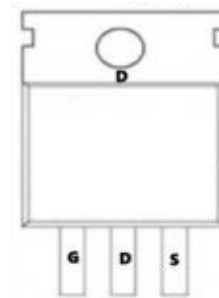
DC/DC Converter

LED Backlighting

Power Management Switches



TO-263-3L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	120	A
$I_D @ T_c=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	80	A
I_{DM}	Pulsed Drain Current	360	A
E_{AS}	Single Pulse Avalanche Energy	406	mJ
I_{AS}	Avalanche Current	43	A
$P_D @ T_c=25^\circ\text{C}$	Total Power Dissipation ⁴	160	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	0.78	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	62	$^\circ\text{C/W}$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VDSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	150	168	-	V
IGSS	Gate-body Leakage current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T _J =25°C	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
IDSS	Zero Gate Voltage Drain Current T _J =100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.5	3.5	4.5	V
RDS(on)	Drain-Source on-Resistance ²	V _{GS} = 10V, I _D = 20A	-	9.5	12	mΩ
Ciss	Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 100KHz	-	5469	-	pF
Coss	Output Capacitance		-	1702	-	
Crss	Reverse Transfer Capacitance		-	186	-	
R _g	Gate Resistance	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz	-	1.7	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10 V, V _{DS} = 80 V, I _D = 40 A	-	65.5	-	nC
Q _{gs}	Gate-Source Charge		-	26	-	
Q _{gd}	Gate-Drain Charge		-	17.2	-	
t _{d(on)}	Turn-on Delay Time	V _{GS} = 10 V, V _{DS} = 80 V, R _G = 2Ω, I _D = 40A	-	36	-	ns
t _r	Rise Time		-	95	-	
t _{d(off)}	Turn-off Delay Time		-	56	-	
t _f	Fall Time		-	11	-	
VSD	Diode Forward Voltage ²	I _F = 20A, V _{GS} = 0V	-	-	1.2	V
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	-	-	120	A
t _{rr}	Body Diode Reverse Recovery Time	V _R = 80 V, I _S = 40 A, di/dt=100 A/μs	-	76	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	285	-	nC

Notes:

- 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 EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=35A
- 4、The power dissipation is limited by 150°C 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

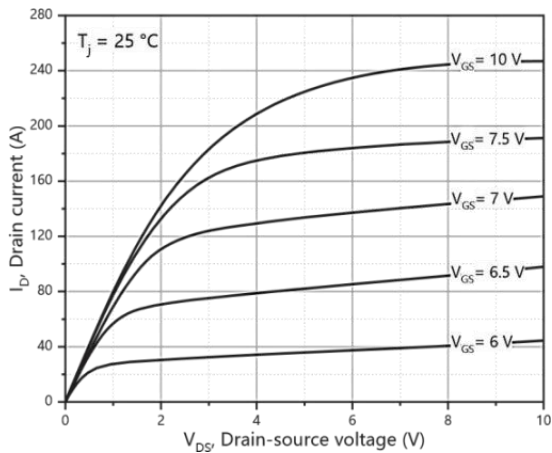


Figure 1. Type. output characteristics

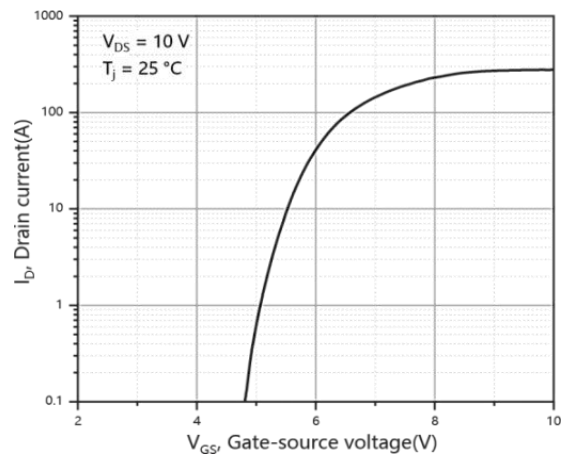


Figure 2. Type. transfer characteristics

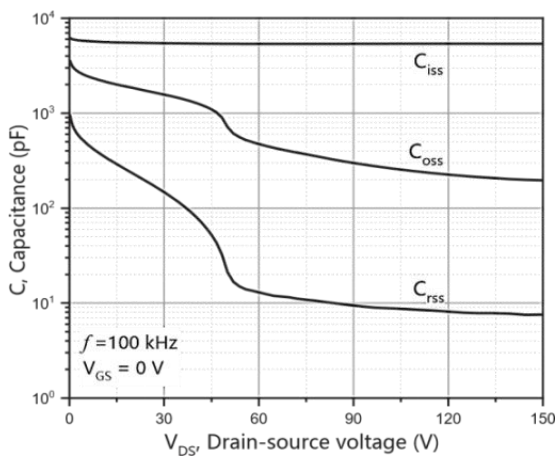


Figure 3. Type. capacitances

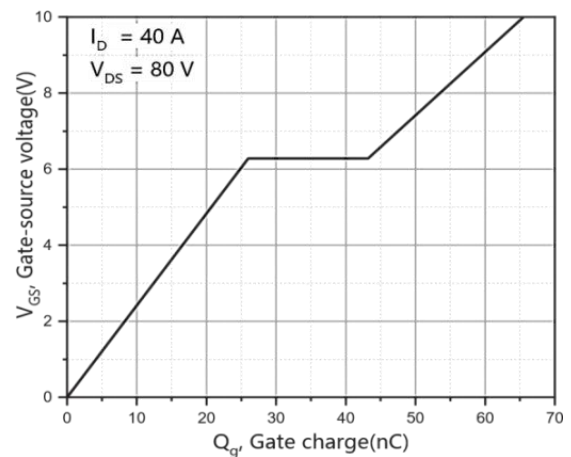


Figure 4. Type. gate charge

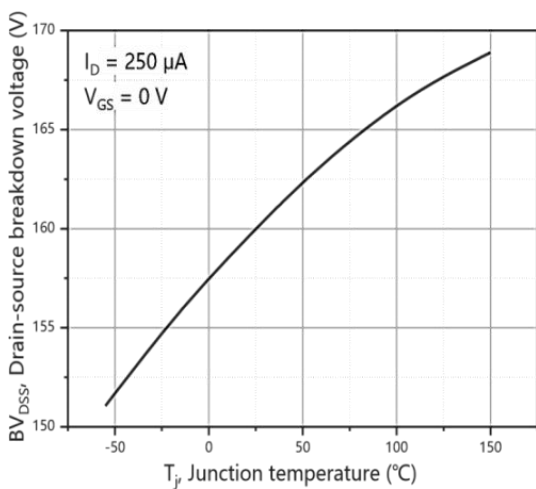


Figure 5. Drain-source breakdown voltage

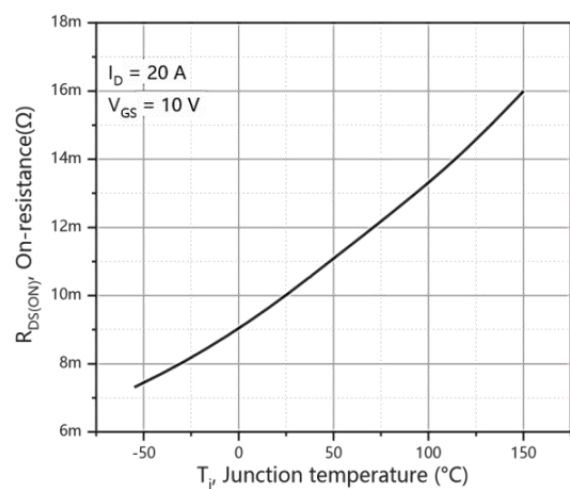


Figure 6. Drain-source on-state resistance

Typical Characteristics

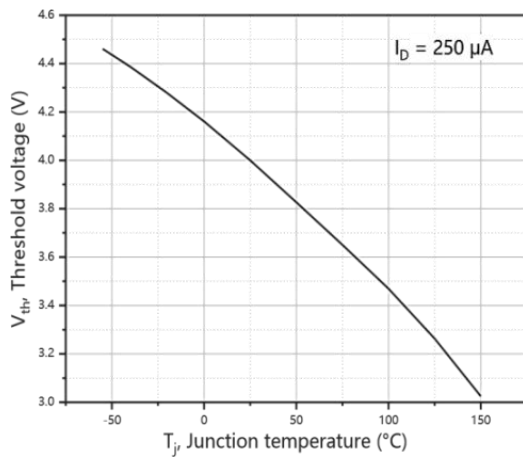


Figure 7. Threshold voltage

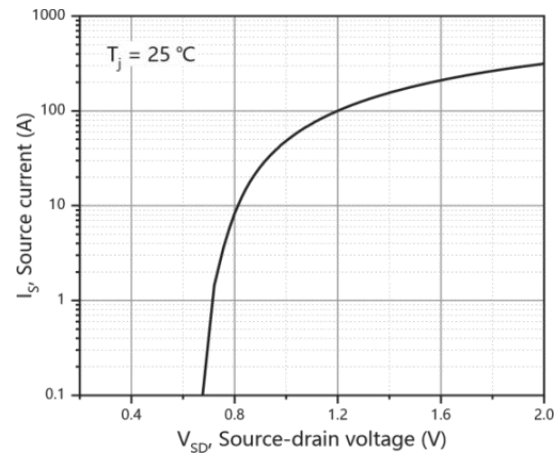


Figure 8. Forward characteristic of body diode

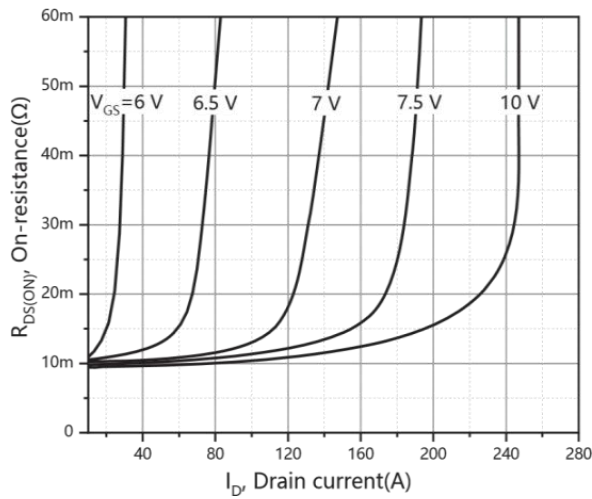


Figure 9. Drain-source on-state resistance

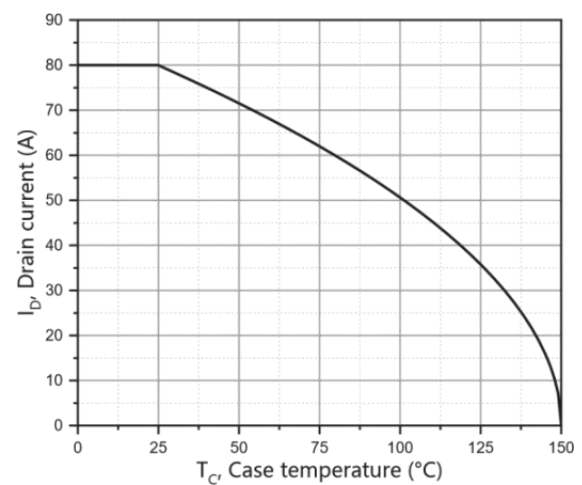


Figure 10. Drain current

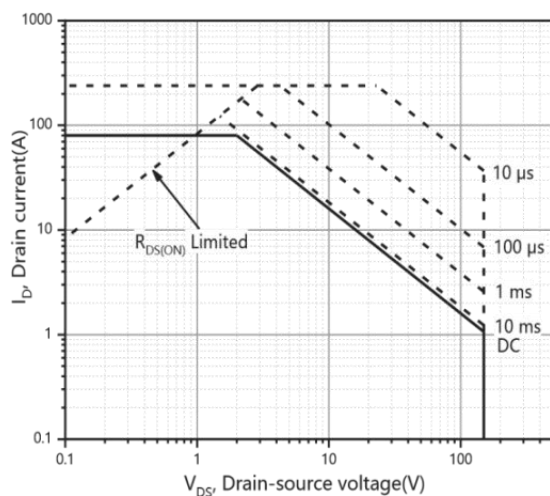


Figure 11. Safe operation area $T_c=25^{\circ}\text{C}$

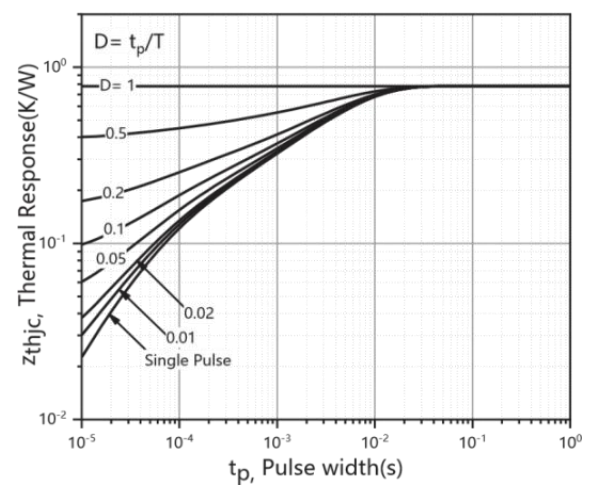
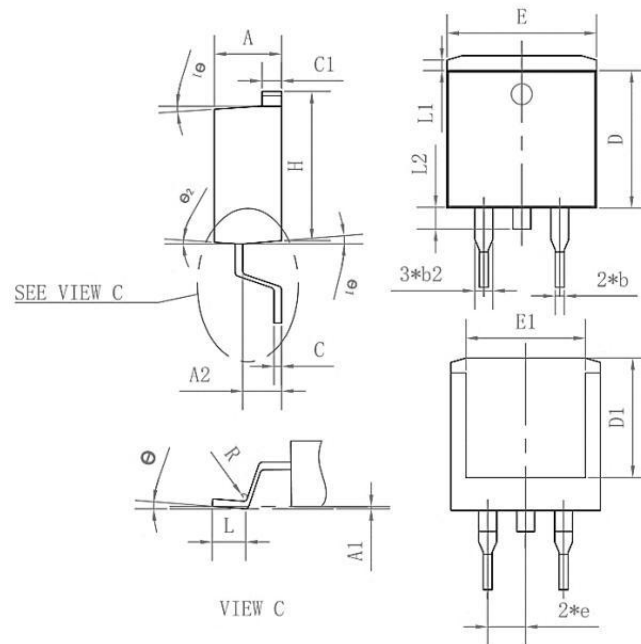


Figure 12. Max. transient thermal impedance

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