

Description

The SX120N12T uses advanced trench 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

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

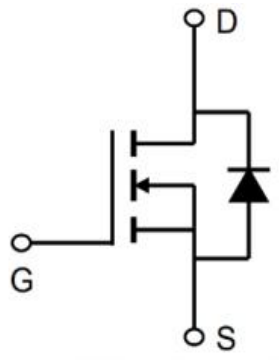
$R_{DS(ON)} < 8.5m\Omega$ @ $V_{GS}=10V$

Application

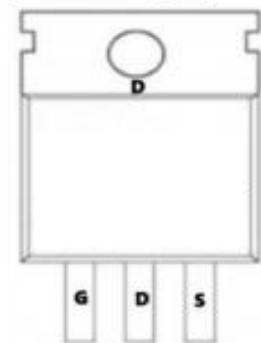
Battery protection

Load switch

Uninterruptible power supply



TO-263-3L



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

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	120	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current ¹	120	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current ¹	70	A
I_{DM}^{a1}	Pulsed Drain Current	320	A
E_{ASa2}	Single pulse avalanche energy	240	mJ
I_{AR}	Single pulse avalanche current	40	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	125	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ C$
T_L	Maximum Temperature for Soldering	300	$^\circ C$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.89	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	$^\circ C/W$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
VDSS	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	120	--	--	V
IDSS	Drain to Source Leakage Current	V _{DS} = 120V, V _{GS} = 0V	--	--	1	μA
IGSS(F)	Gate to Source Forward Leakage	V _{GS} =+20V	--	--	100	nA
IGSS(R)	Gate to Source Reverse Leakage	V _{GS} =-20V	--	--	-100	nA
VGS(TH)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = 250μA	2.5	3.0	3.5	V
RDS(ON)1	Drain-to-Source On-Resistance	V _{GS} =10V, I _D =20A	--	6.8	8.5	mΩ
gFS	Forward Transconductance	V _{DS} =5V, I _D =50A		130	--	S
Ciss	Input Capacitance	V _{GS} = 0V V _{DS} = 50V f = 1.0MHz	--	4282	--	pF
Coss	Output Capacitance		--	429	--	pF
Crss	Reverse Transfer Capacitance		--	17	--	pF
R _g	Gate resistance		--	2.5	--	Ω
td(ON)	Turn-on Delay Time	I _D =20A V _{DS} = 50V V _{GS} = 10V R _G = 5Ω	--	20	--	ns
tr	Rise Time		--	11	--	ns
td(OFF)	Turn-Off Delay Time		--	55	--	ns
tf	Fall Time		--	28	--	ns
Q _g	Total Gate Charge	V _{GS} =0~10V V _{DS} = 50V I _D =20A	--	61.4	--	nC
Q _{gs}	Gate Source Charge		--	17.4	--	nC
Q _{gd}	Gate Drain Charge		--	14.1	--	nC
IS	Diode Forward Current	T _C =25 °C	--	--	100	A
ISM	Diode Pulse Current		--	--	320	A
VSD	Diode Forward Voltage	I _S =6.0A, V _{GS} =0V	--	--	1.2	V
trr	Reverse Recovery time	I _S =20A, V _{DD} =50V dI _F /dt=100A/μs	--	100	--	ns
Q _{rr}	Reverse Recovery Charge		--	250	--	nC

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=50V, L=0.3mH, R_g=25Ω, Starting T_J=25 °C
- 4、The power dissipation is limited by 150°C junction temperature

Typical Characteristics

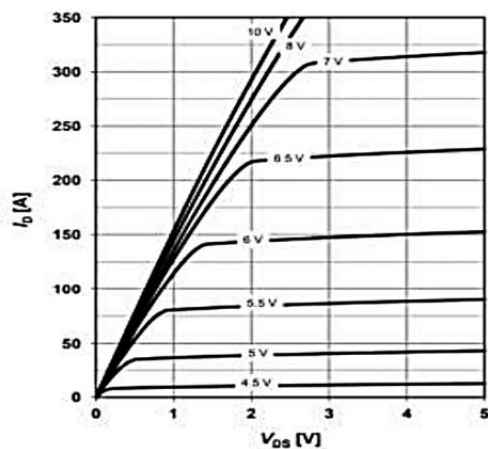


Figure1: output characteristics

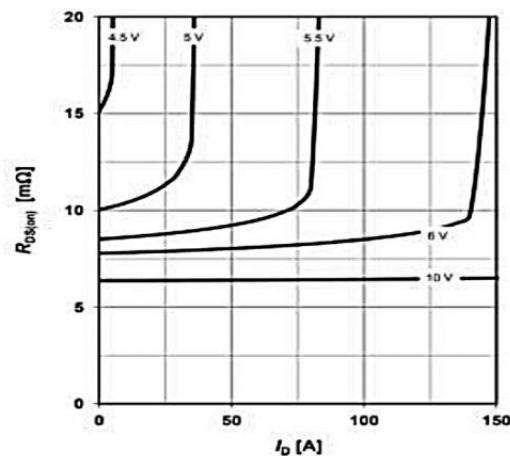


Figure2: Typical drain-source on resistance

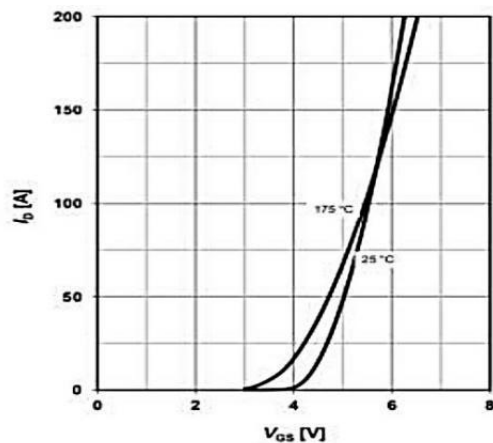


Figure3: transfer characteristics

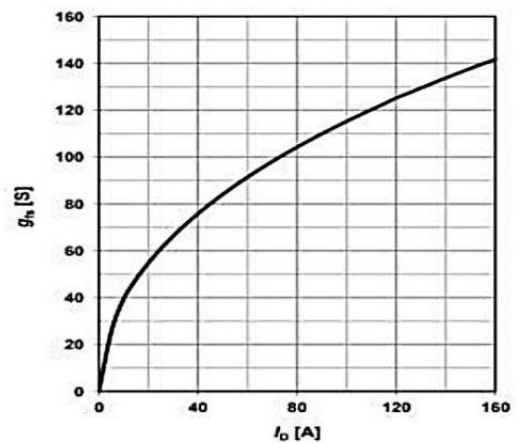


Figure4: forward transconductance

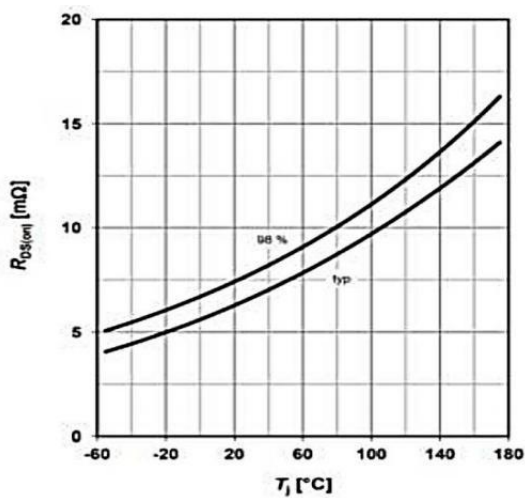


Figure5: Drain-source on-state resistance

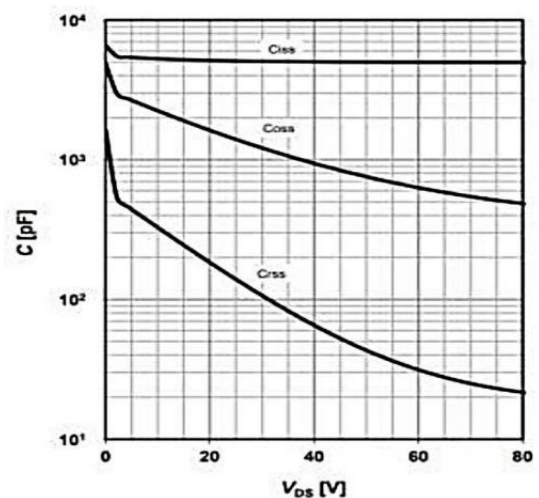


Figure6: Typ. capacitances

Typical Characteristics

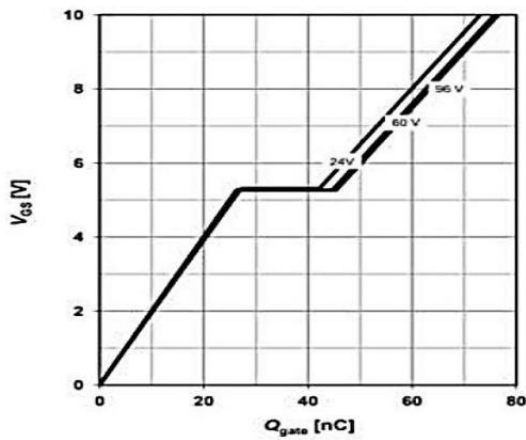


Figure7: Typ. gate charge

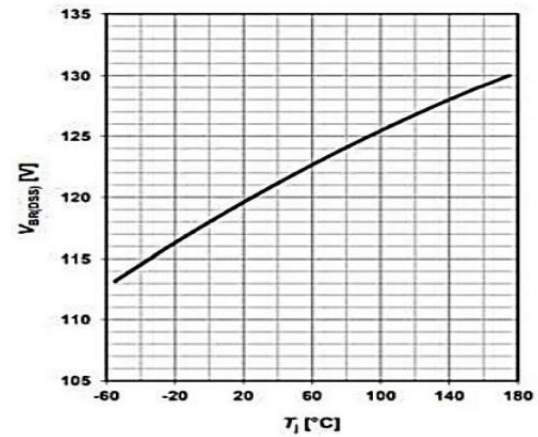


Figure8: Drain-source breakdown voltage

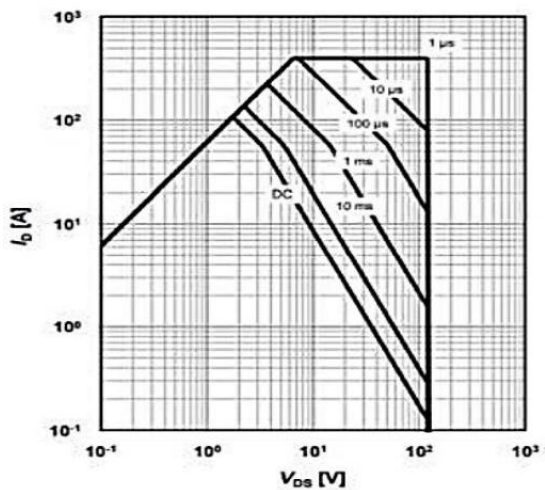


Figure9: Safe operating area

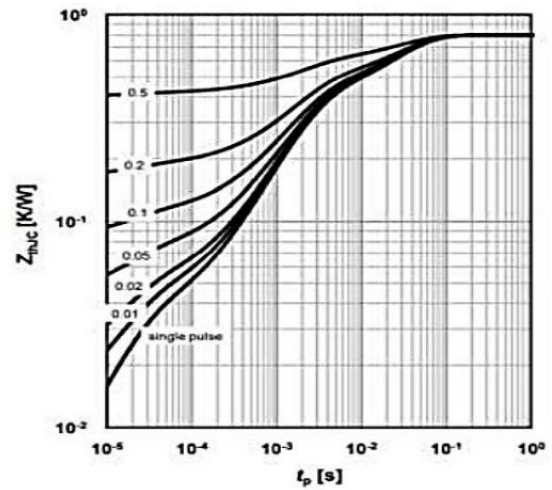
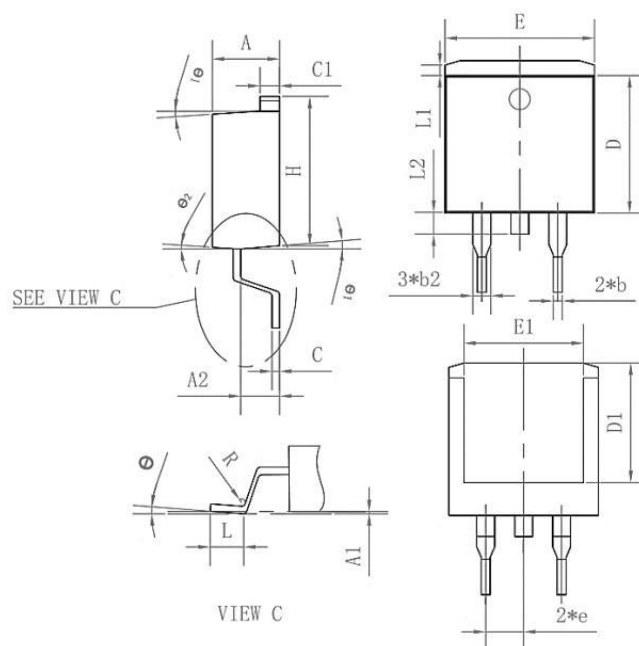


Figure10: Max. transient thermal impedance

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