

Description

The SX120N04T 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

$V_{DS} = 40V$ $I_D = 120A$

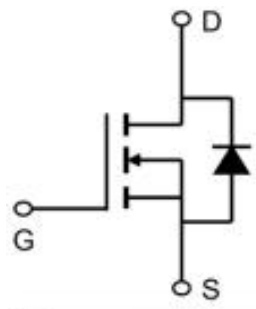
$R_{DS(ON)} < 4.0m\Omega$ @ $V_{GS}=10V$

Application

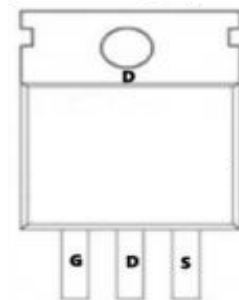
Battery protection

Load switch

Uninterruptible power supply



TO-263-3L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	120	A
$I_D @ T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	98	A
I_{DM}	Pulsed Drain Current ²	600	A
EAS	Single Pulse Avalanche Energy ³	272	mJ
I_{AS}	Avalanche Current	33	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation ⁴	180	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	50	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	0.7	$^\circ C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	40	44	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V,	-	-	1.0	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	1.2	-	2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =30A	-	3.0	4.0	mΩ
Ciss	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1.0MHz	-	4900	-	pF
Coss	Output Capacitance		-	528	-	pF
Crss	Reverse Transfer Capacitance		-	317	-	pF
Qg	Total Gate Charge	V _{DS} =20V, I _D =30A, V _{GS} =10V	-	80	-	nC
Qgs	Gate-Source Charge		-	17	-	nC
Qgd	Gate-Drain(“Miller”) Charge		-	21	-	nC
td(on)	Turn-on Delay Time	V _{DD} =20V, I _D =30A, R _L =1Ω, R _{GEN} =3Ω, V _{GS} =10V	-	21	-	ns
tr	Turn-on Rise Time		-	32	-	ns
td(off)	Turn-off Delay Time		-	71	-	ns
tf	Turn-off Fall Time		-	40	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	150	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	600	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	T _J =25℃, I _F =20A,dI/dt=100A/μs	-	27	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	46	-	nC

Note :

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、The EAS data shows Max. rating . The test condition is T_J=25°C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=33A
- 3、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 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.
- 6、Package limitation current is 180A

Typical Characteristics

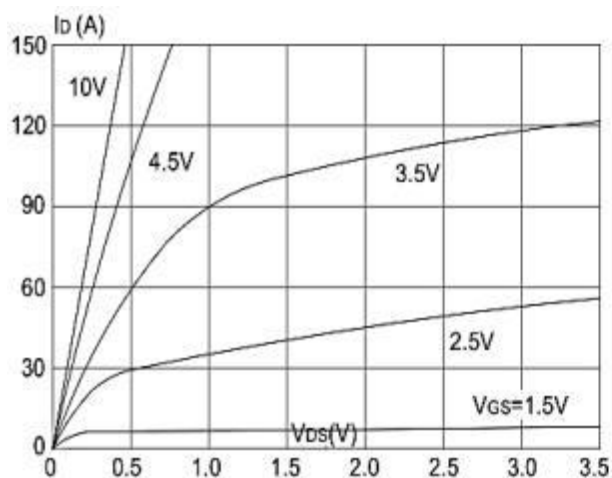


Figure1: Output Characteristics

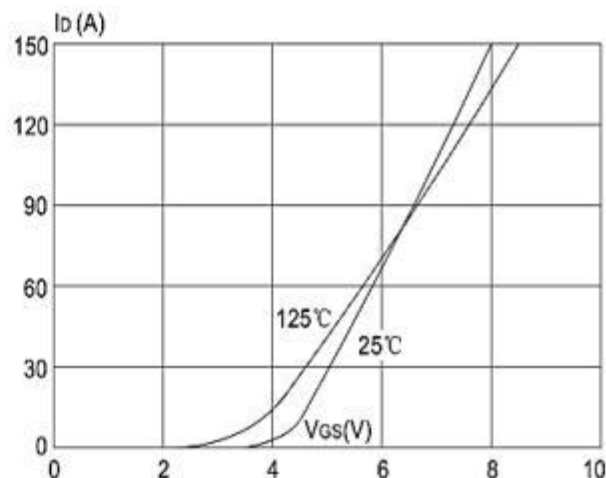


Figure 2: Typical Transfer Characteristics

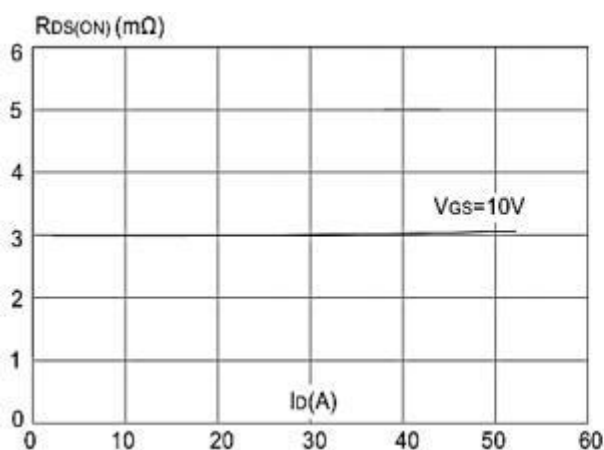


Figure 3: On-resistance vs. Drain Current

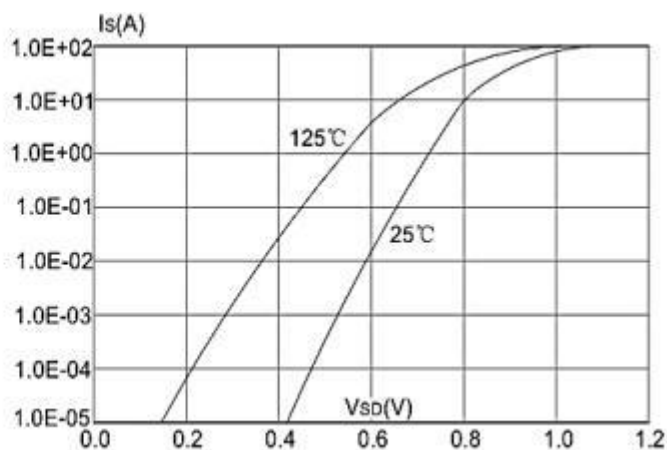


Figure 4: Body Diode Characteristics

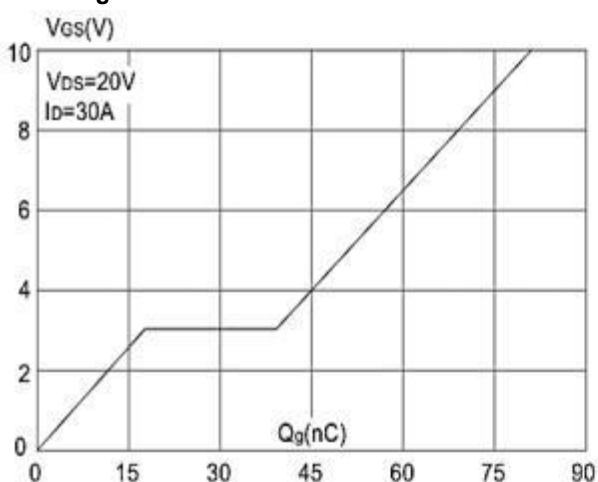


Figure 5: Gate Charge Characteristics

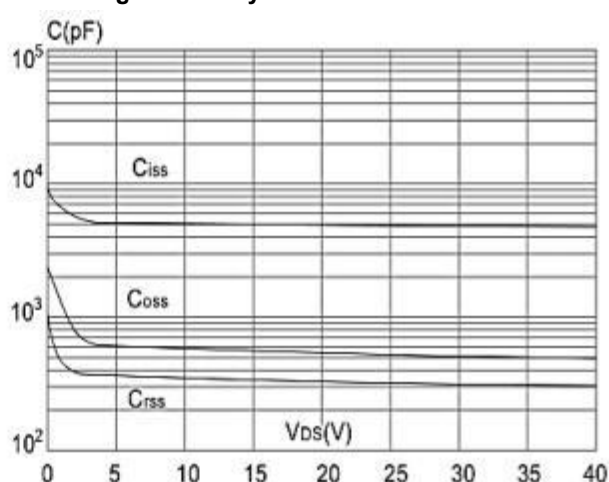


Figure 6: Capacitance Characteristics

Typical Characteristics

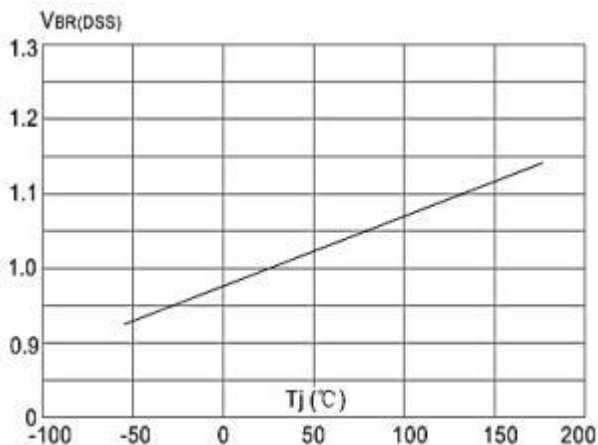


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

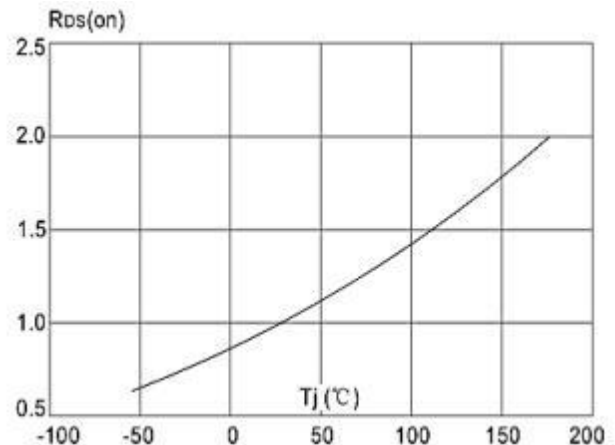


Figure 8: Normalized on Resistance vs. Junction Temperature

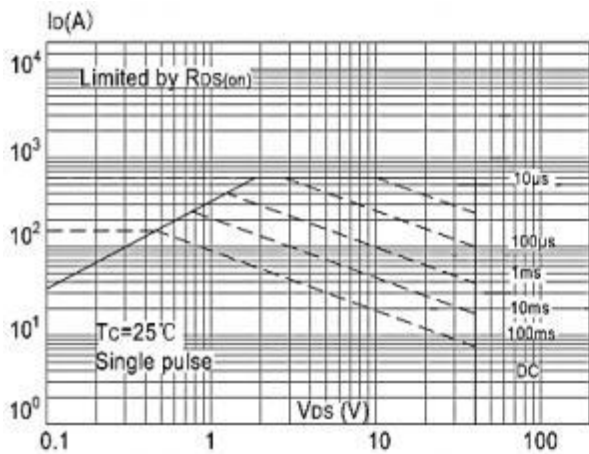


Figure 9: Maximum Safe Operating Area

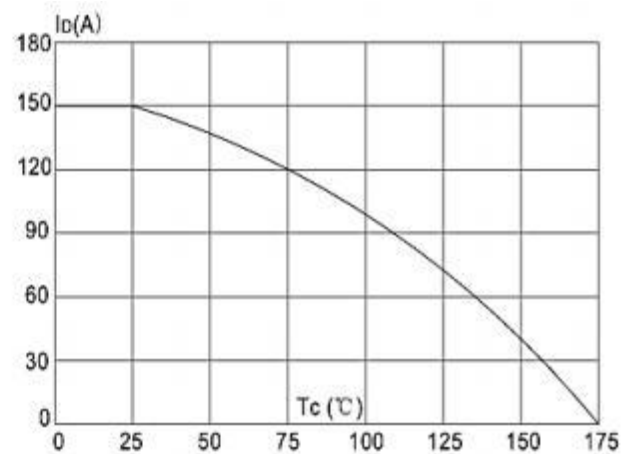


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

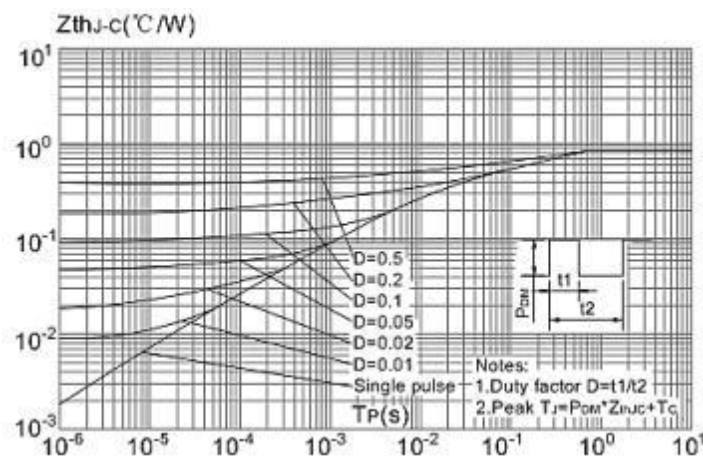
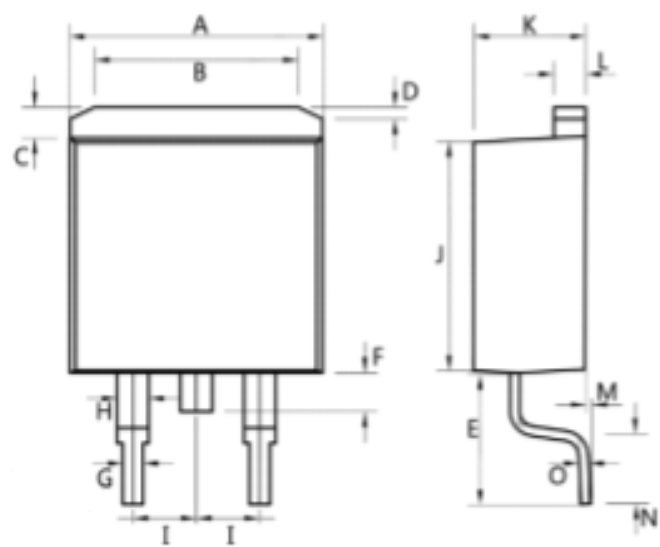


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Mechanical Data- TO-263-3L



Dim.	Min.	Max.
A	10.0	10.5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		

Package Marking and Ordering Information

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