

Description

The SX220N10MP 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

$V_{DS} = 100V$ $I_D = 220A$

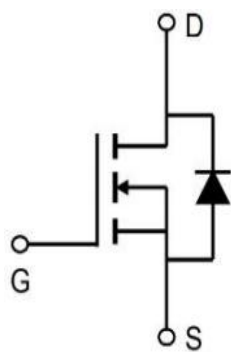
$R_{DS(ON)} < 3.2m\Omega$ @ $V_{GS} = 10V$

Application

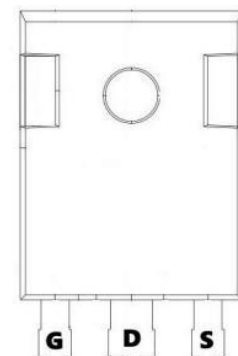
DC/DC Converter

LED Backlighting

Power Management Switches



TO-247-3L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	220	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	180	A
I_{DM}	Pulsed Drain Current	840	A
E_{AS}	Single Pulse Avalanche Energy	500	mJ
I_{AS}	Avalanche Current	106.8	A
$P_D @ T_c = 25^\circ C$	Total Power Dissipation ⁴	296	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	0.42	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	40	$^\circ C/W$

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	100	-	-	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	2.0	2.9	4.0	V
RDS(on)	Drain-Source on-Resistance ²	V _{GS} = 10V, I _D = 20A	-	2.8	3.2	mΩ
Ciss	Input Capacitance	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz	-	8800	-	pF
Coss	Output Capacitance		-	1290	-	
Crss	Reverse Transfer Capacitance		-	40	-	
R _g	Gate Resistance	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz	-	3.4	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10V, V _{DS} = 50V, I _D = 20A	-	150	-	nC
Q _{gs}	Gate-Source Charge		-	34	-	
Q _{gd}	Gate-Drain Charge		-	26	-	
td(on)	Turn-on Delay Time	V _{GS} = 10V, V _{DS} = 50V, R _G = 3Ω, I _D = 20A	-	30.8	-	ns
t _r	Rise Time		-	26	-	
td(off)	Turn-off Delay Time		-	68	-	
t _f	Fall Time		-	12.4	-	
VSD	Diode Forward Voltage ²	I _F = 20A, V _{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	-	-	190	A
trr	Body Diode Reverse Recovery Time	I _F = 20A, dI/dt= 100A/μs	-	110	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	202	-	nC

Notes:

- 1、The data tested by surface mounted on a 1 inch2 FR-4 board with 20Z 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=0.4mH, I_{AS}=64A
- 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

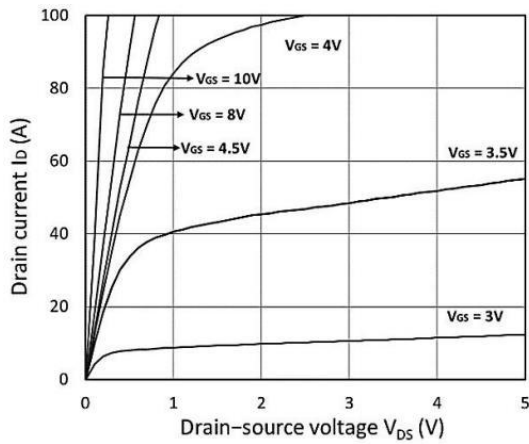


Figure 1. Output Characteristics

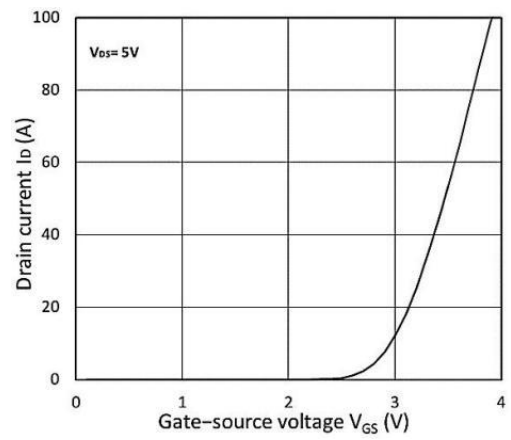


Figure 2. Transfer Characteristics

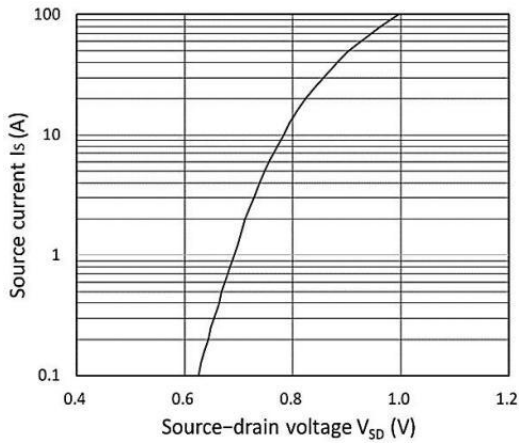


Figure 3. Forward Characteristics of Reverse

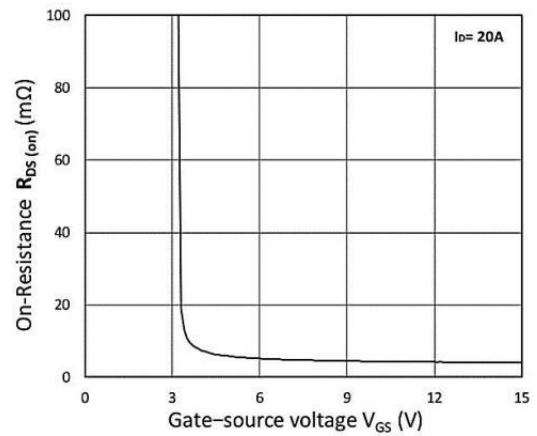


Figure 4. R_DS(ON) vs. V_GS

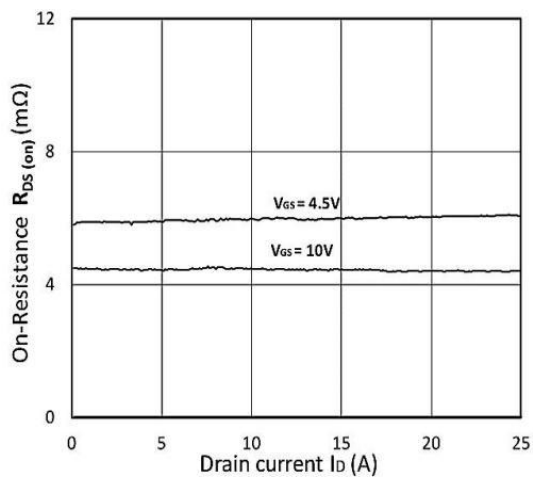


Figure 5. R_DS(ON) vs. I_D

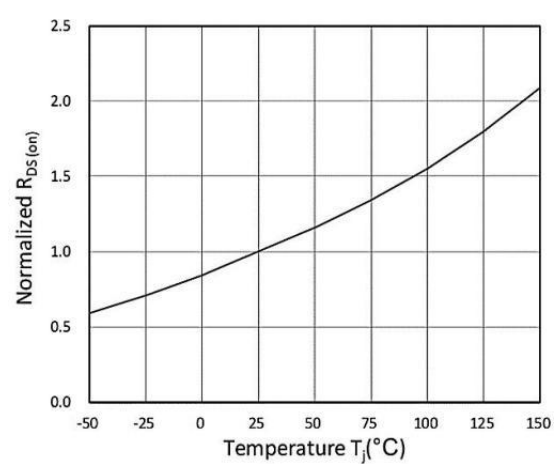


Figure 6. Normalized R_DS(on) vs. Temperature

Typical Characteristics

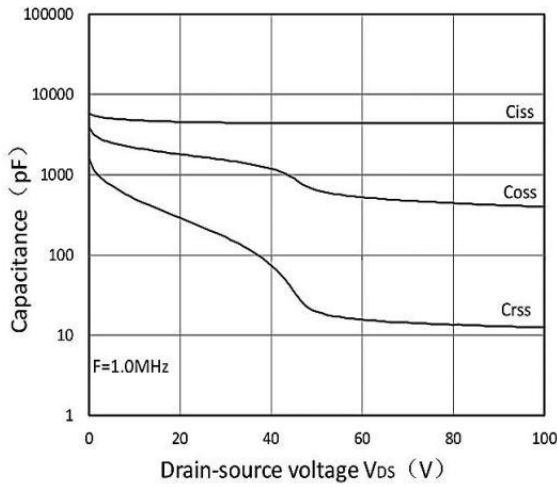


Figure 7. Capacitance Characteristics

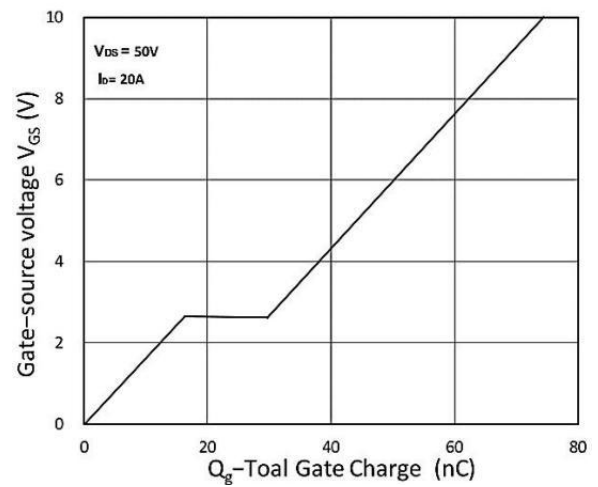


Figure 8. Gate Charge Characteristics

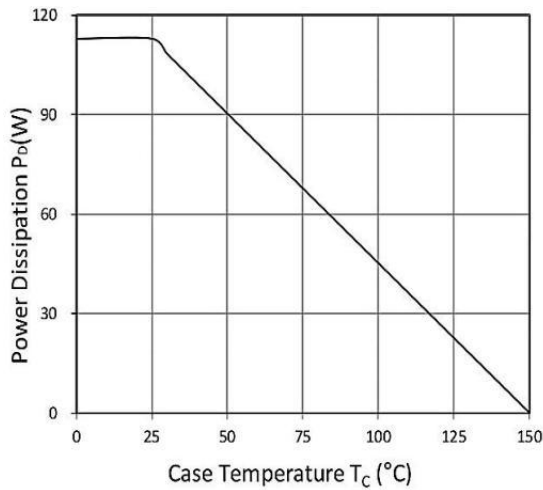


Figure 9. Power Dissipation

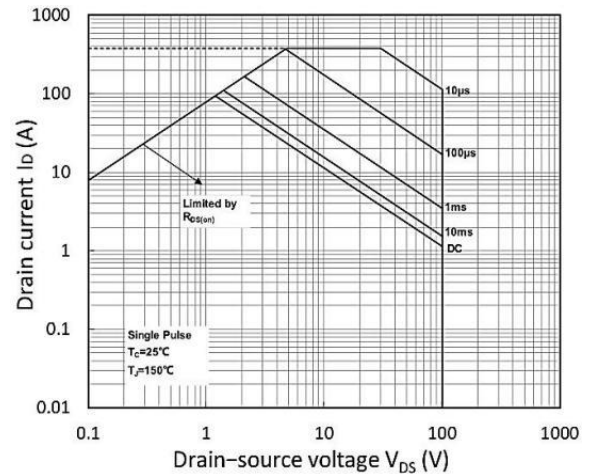


Figure 10. Safe Operating Area

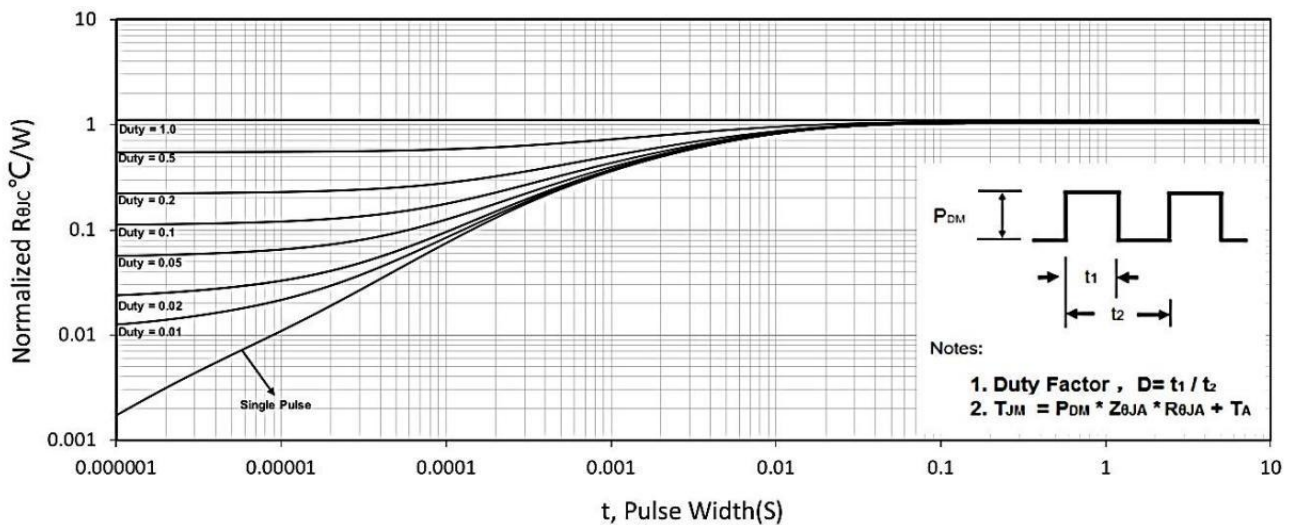
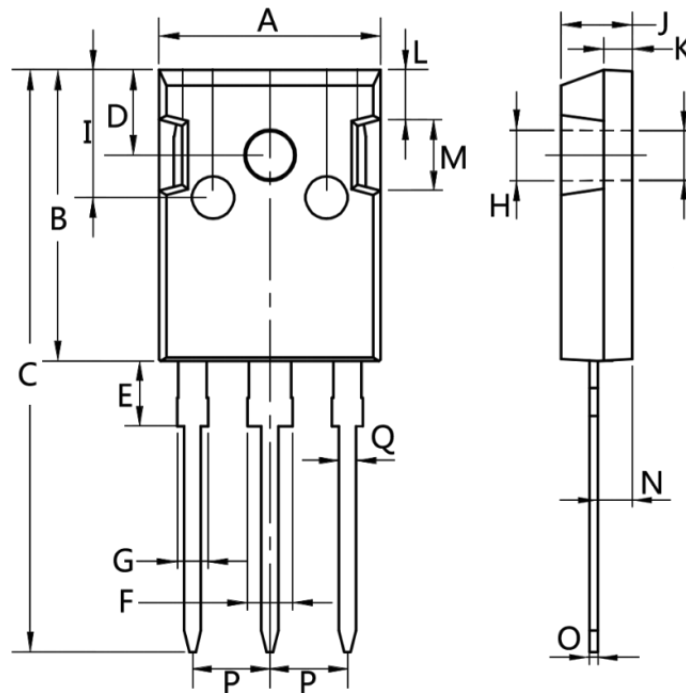


Figure 11. Normalized Maximum Transient Thermal Impedance

MOSFET Package Mechanical Data-TO-247-3L


Dim.	Min.	Max.
A	15.0	16.0
B	20.0	21.0
C	41.0	42.0
D	5.0	6.0
E	4.0	5.0
F	2.5	3.5
G	1.75	2.5
H	3.0	3.5
I	8.0	10.0
J	4.9	5.1
K	1.9	2.1
L	3.5	4.0
M	4.75	5.25
N	2.0	3.0
O	0.55	0.75
P	Typ 5.08	
Q	1.2	1.3

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-247-3L		330