Description

The SX9N20Y is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

General Features

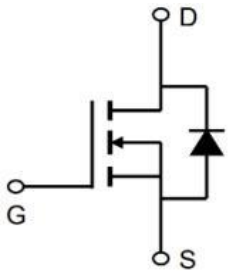
V_{DS} = 200V I_D =9A

$R_{DS(ON)}$ < 300mΩ @ V_{GS}=10V

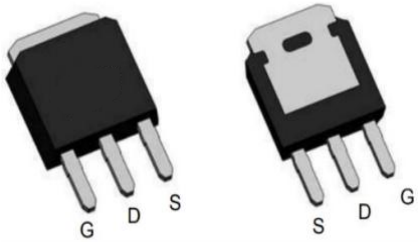
Application

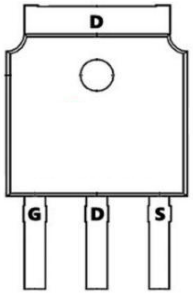
Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



TO-251S-3L





Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Value	Unit
		TO-251	
VDSS	Drain-Source Voltage (V_{GS} = 0V)	200	V
ID	Continuous Drain Current	9	A
IDM	Pulsed Drain Current (note1)	36	A
VGS	Gate-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy (note2)	100	mJ
IAR	Avalanche Current (note1)	7.5	A
E_{AR}	Repetitive Avalanche Energy note1)	8.1	mJ
P_D	Power Dissipation (T_C = 25ºC)	74	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55~+150	ºC
RthJC	Thermal Resistance, Junction-to-Case	1.7	ºC/W
RthJA	Thermal Resistance, Junction-to-Ambient	62.5	ºC/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS = 0V, ID = 250μA	200	222	--	V
IDSS	Zero Gate Voltage Drain Current	VDS = 200V, VGS = 0V, TJ = 25ºC	--	--	5	μA
IDSS	Zero Gate Voltage Drain Current	VDS = 160V, VGS = 0V, TJ = 125ºC	--	--	100	
IGSS	Gate-Source Leakage	VGS = ±20V	--	--	±100	nA
VGS(th)	Gate-Source Threshold Voltage	VDS = VGS, ID = 250μA	2.0	3.5	4.0	V
RDS(on)	Drain-Source On-Resistance	VGS = 10V, ID = 4.5A	--	230	300	mΩ
Ciss	Input Capacitance	VGS = 0V, VDS = 25V, f = 1.0MHz	--	684	--	pF
Coss	Output Capacitance		--	103	--	
Crss	Reverse Transfer Capacitance		--	37	--	
Qg	Total Gate Charge	VDD = 160V, ID = 9.0A, VGS = 10V	--	23	--	nC
Qgs	Gate-Source Charge		--	2.5	--	
Qgd	Gate-Drain Charge		--	10	--	
td(on)	Turn-on Delay Time	VDD = 100V, ID = 9.0A, RG = 25 Ω	--	12	--	ns
tr	Turn-on Rise Time		--	22	--	
td(off)	Turn-off Delay Time		--	50	--	
tf	Turn-off Fall Time		--	48	--	
IS	Continuous Body Diode Current	TC = 25 ºC	--	--	9	A
ISM	Pulsed Diode Forward Current		--	--	36	
VSD	Body Diode Voltage	TJ = 25ºC, ISD = 9A, VGS = 0V	--	--	1.4	V
trr	Reverse Recovery Time	VGS = 0V,IS = 9A, diF/dt =100A /μs	--	190	--	ns
Qrr	Reverse Recovery Charge		--	1.7	--	μC

Note：

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The EAS data shows Max. rating . IAS = 7.5A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 ºC

3、The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

4、The power dissipation is limited by 150℃junction temperature

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

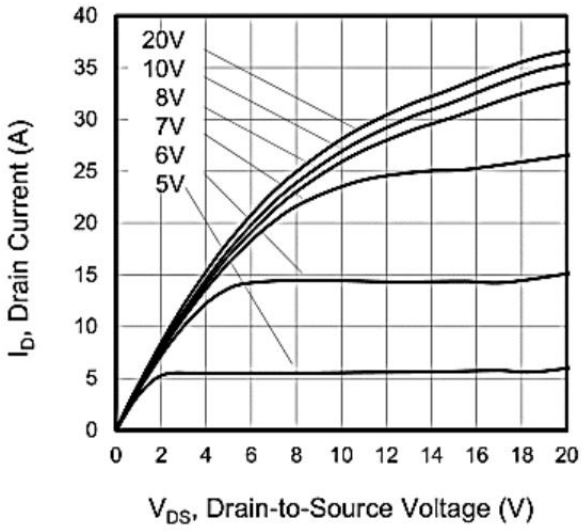


Figure 1. Output Characteristics (T_J = 25°C)

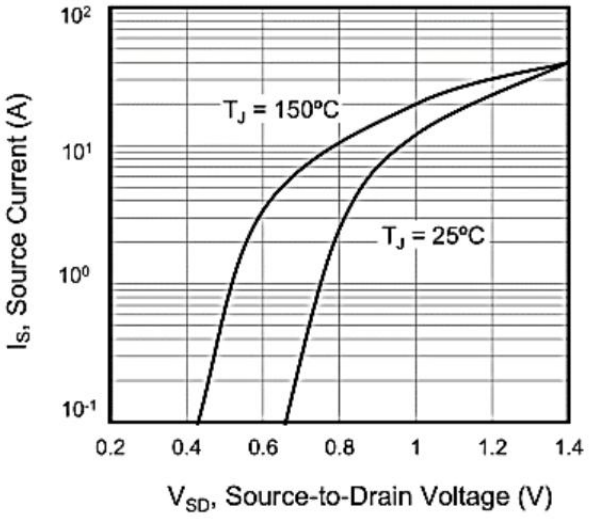


Figure 2. Body Diode Forward Voltage

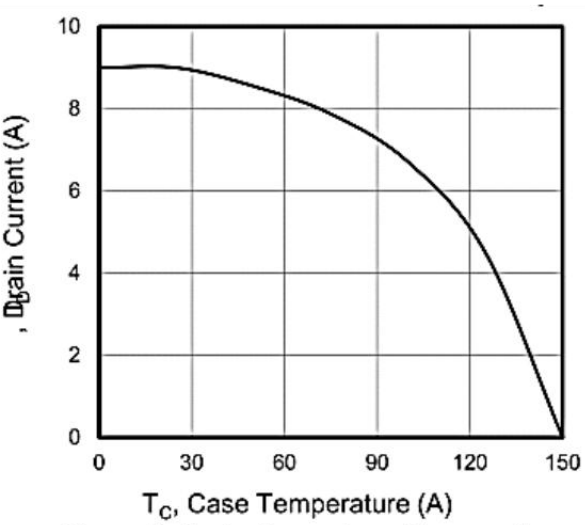


Figure 3. Drain Current vs. Temperature

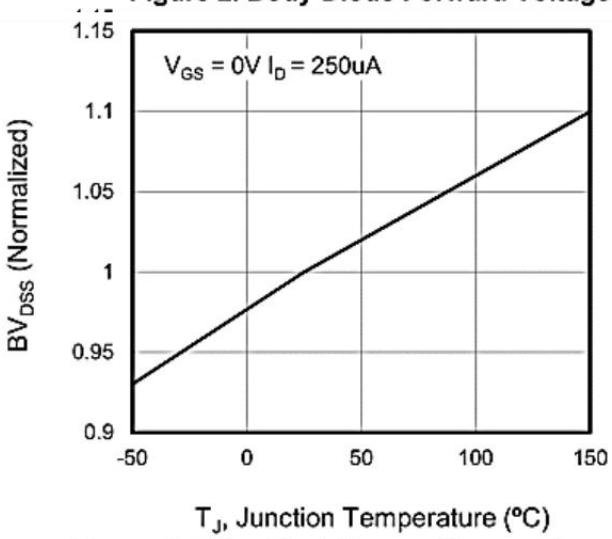


Figure 4. BV_{DSS} Variation vs. Temperature

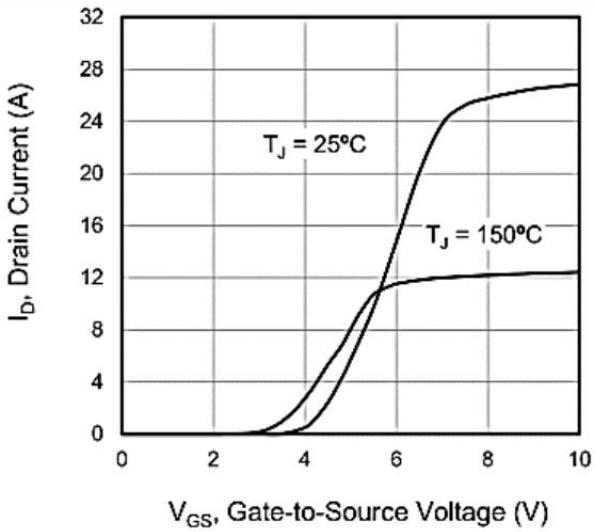


Figure 5. Transfer Characteristics

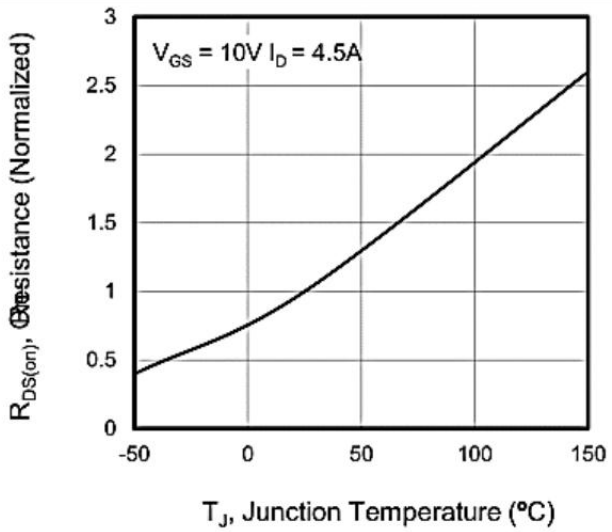


Figure 6. On-Resistance vs. Temperature

Typical Characteristics

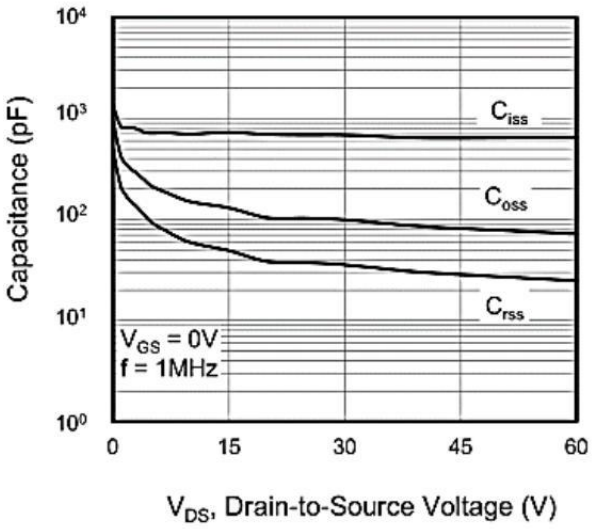


Figure 7. Capacitance

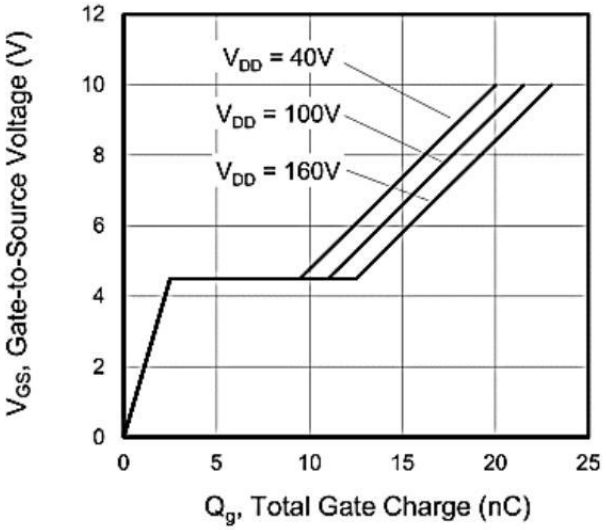


Figure 8. Gate Charge

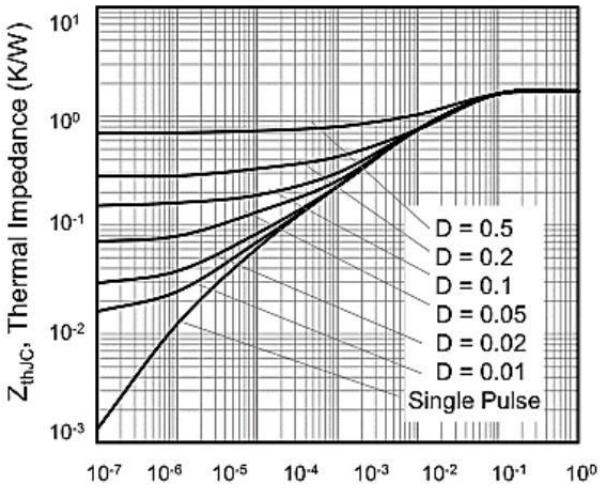
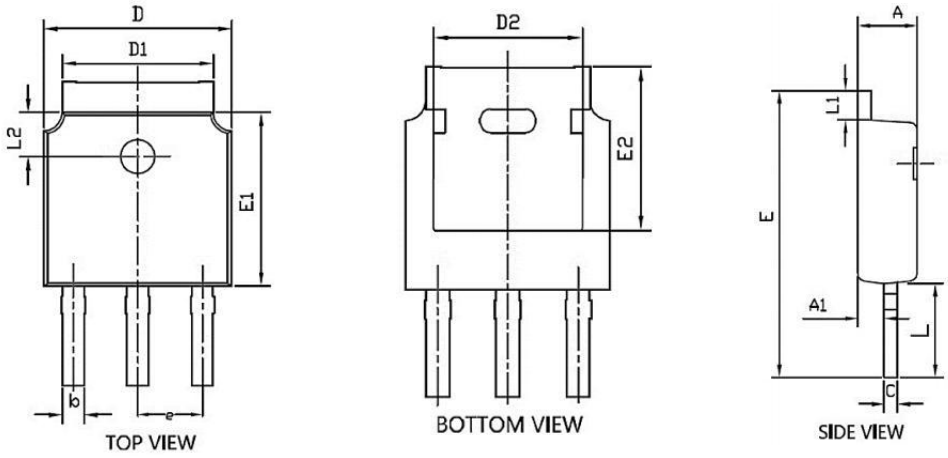


Figure 10. Transient Thermal Impedance

Package Mechanical Data-TO-251S-3L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	2.2	2.3	2.4
A1	0.9	1.0	1.1
b	0.66	0.76	0.86
C	0.46	0.52	0.58
D	6.50	6.6	6.7
D1	5.15	5.3	5.45
D2	4.6	4.8	4.95
E	10.4	----	11.5
E1	6.0	6.1	6.2
E2	5.400REF		
e	2.286BSC		
L	3.5	4.0	4.3
L1	0.9	---	1.27
L2	1.4	---	1.9

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-251S-3L		4000