

Description

The SX9N90MP 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

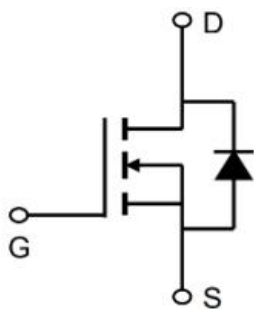
$V_{DS} = 900V$ (Type: 1000V) $I_D = 9A$

$R_{DS(ON)} < 1000m\Omega$ @ $V_{GS}=10V$

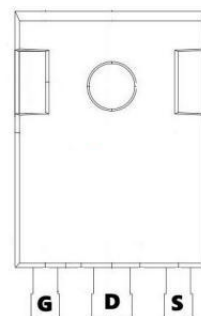
Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



TO-247-3L



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

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	900	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D @ T_c=25^\circ C$	Drain Current, $V_{GS} @ 10V$	9	A
$I_D @ T_c=100^\circ C$	Drain Current, $V_{GS} @ 10V$	5.8	A
I_{DM}	Drain Current - Pulsed	36	A
E_{AS}	Single Pulsed Avalanche Energy	576	mJ
I_{AR}	Avalanche Current	9	A
E_{AR}	Repetitive Avalanche Energy	53	mJ
dv/dt	Peak Diode Recovery dv/dt	5	V/ns
P_D	Power Dissipation	31.2	W
T_J, T_{stg}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	4.0	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	48.0	$^\circ C/W$

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	900	1000		V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, Referenced to 25°C		0.74		V/°C
IDSS	Zero Gate Voltage Drain Current	V _{DS} = 900 V, V _{GS} = 0 V			1	μA
IDSS	Zero Gate Voltage Drain Current	V _{DS} = 720 V, TC = 125°C			10	μA
IGSSF	Gate-Body Leakage Current, Forward	V _{GS} = 30 V, V _{DS} = 0 V			100	nA
IGSSR	Gate-Body Leakage Current, Reverse	V _{GS} = -30 V, V _{DS} = 0 V			-100	nA
VGS(TH)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 uA	2.0		4.0	V
RDS(On)	Drain-Source On-state Resistance	V _{GS} =10 V, I _D =4.5 A,		975	1200	mΩ
gFS	Forward Transconductance	V _{DS} = 40 V, I _D = 4.5 A		11		S
C _{iss}	Input Capacitance	V _{DS} =25 V, V _{GS} =0V, f=1.0 MHz		2752		pF
C _{oss}	Output Capacitance			206		pF
C _{rss}	Reverse Transfer Capacitance			36		pF
td(on)	Turn On Delay Time	V _{DD} =450 V, I _D =9A, R _G =25Ω		33		ns
t _r	Rising Time			57		ns
td(off)	Turn Off Delay Time			270		ns
t _f	Fall Time			91		ns
Q _g	Total Gate Charge	V _{DS} =450V, I _D =9A, V _{GS} =10V		80		nC
Q _{gs}	Gate-Source Charge			12		nC
Q _{gd}	Gate-Drain Charge			38		nC
ISM	Maximum Pulsed Drain-Source Diode Forward Current				36	A
V _{SD}	Diode Forward Voltage	V _{GS} = 0 V, I _S = 9 A			1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =9A, dI _F /dt=100 A/μs		533		ns
Q _{rr}	Reverse Recovery Charge	Note4)		6.2		μC

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2、The EAS data shows Max. rating . L=4.1Mh IAS=18A, VDD=50V, RG=25Ω, Starting T_J = 25 °C
- 3、The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%
- 4、The power dissipation is limited by 150°C 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

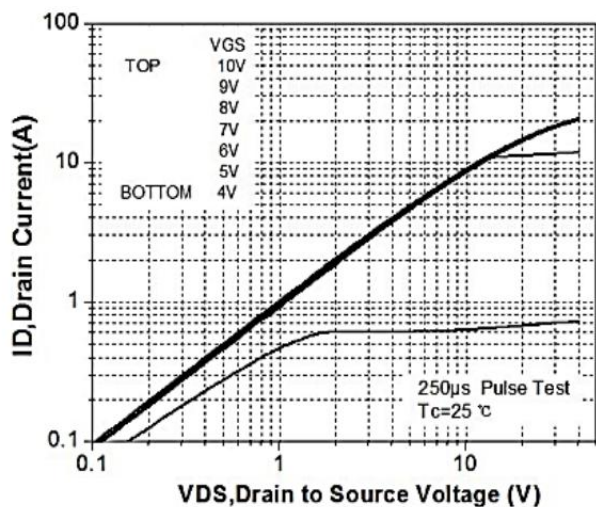


Figure 1. On-Region Characteristics

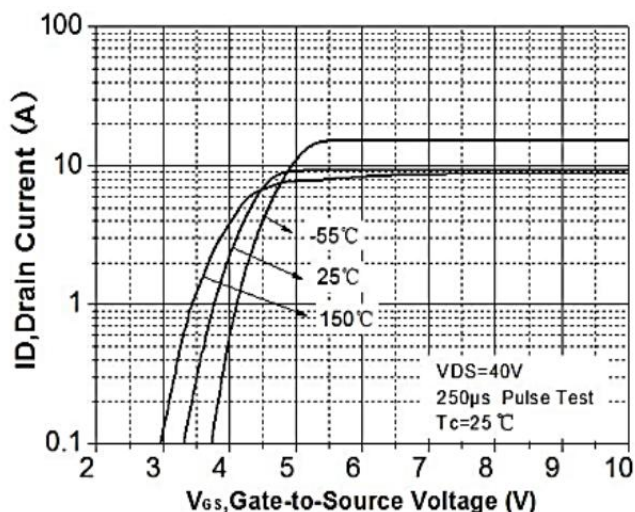


Figure 2. Transfer Characteristics

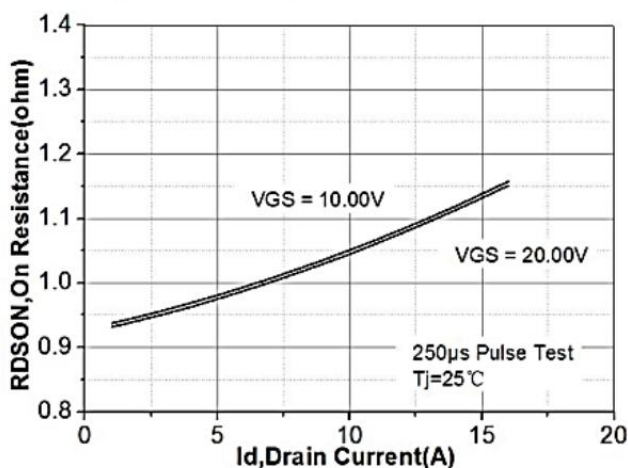


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

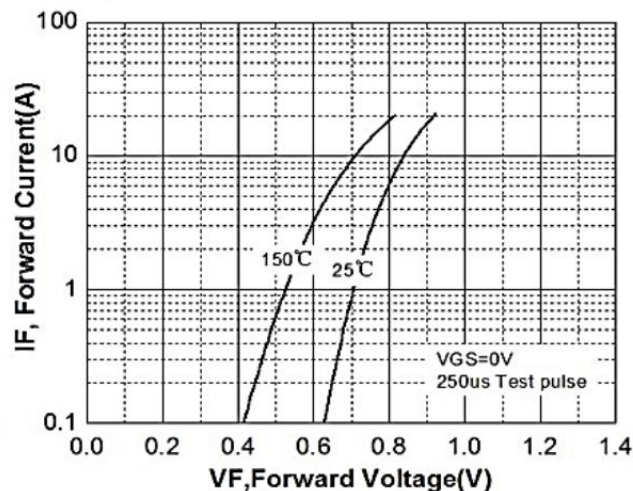


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

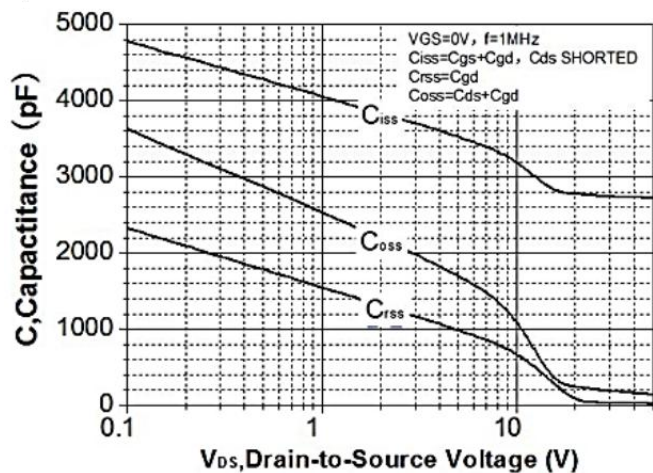


Figure 5. Capacitance Characteristics

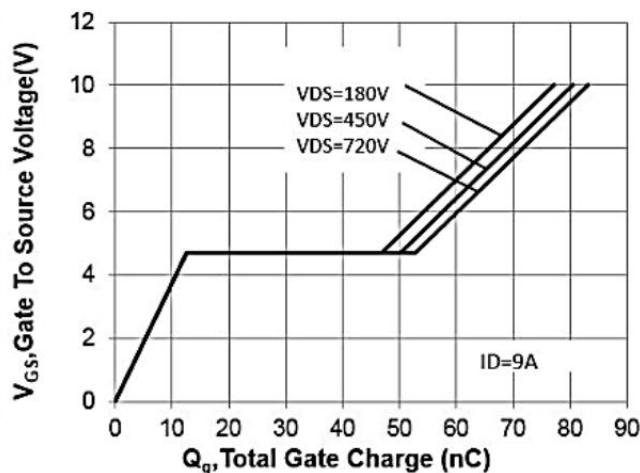


Figure 6. Gate Charge Characteristics

Typical Characteristics

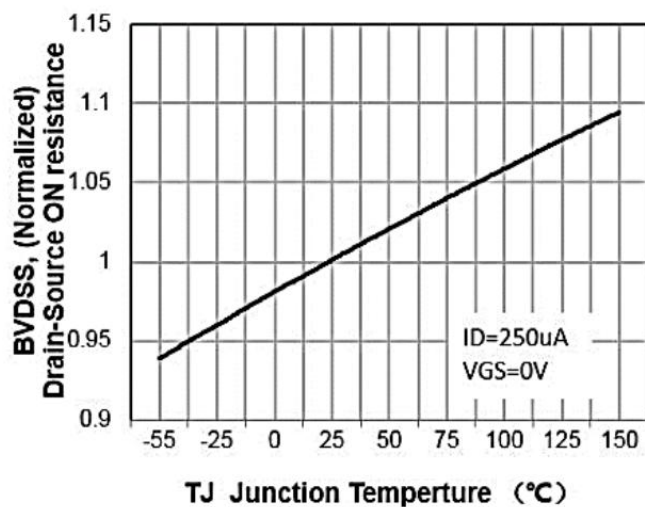


Figure 7. Breakdown Voltage Variation vs Temperature

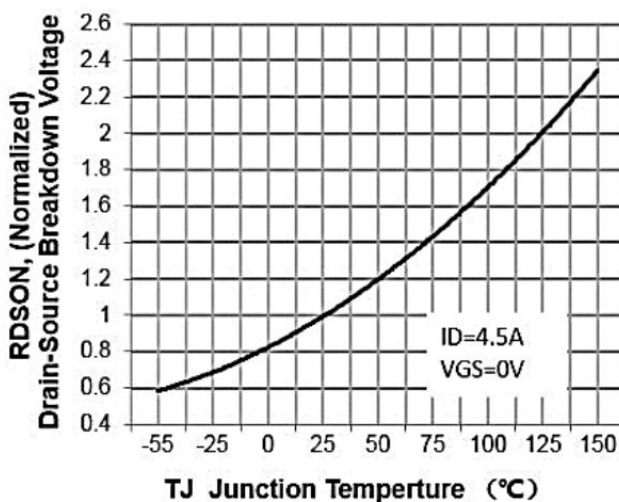


Figure 8. On-Resistance Variation vs Temperature

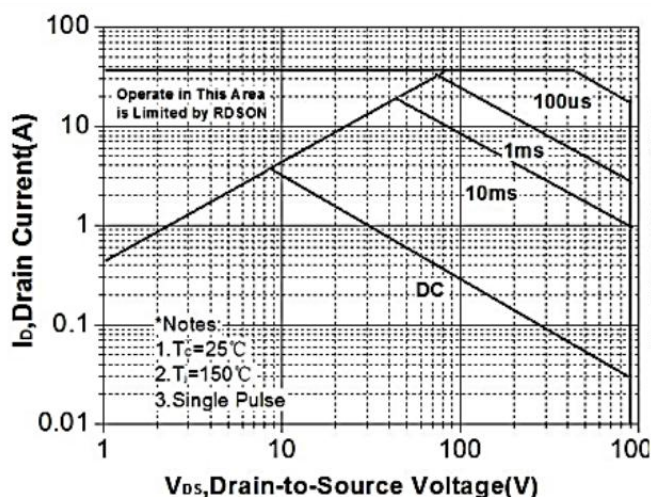


Figure 9. Maximum Safe Operating Area

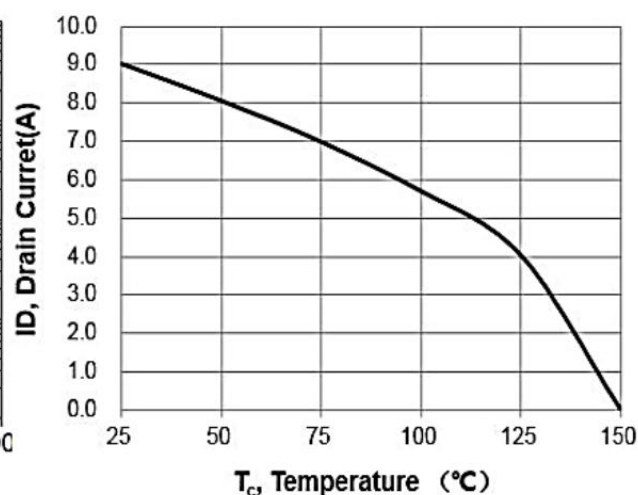


Figure 10. Maximum Drain Current vs Case Temperature

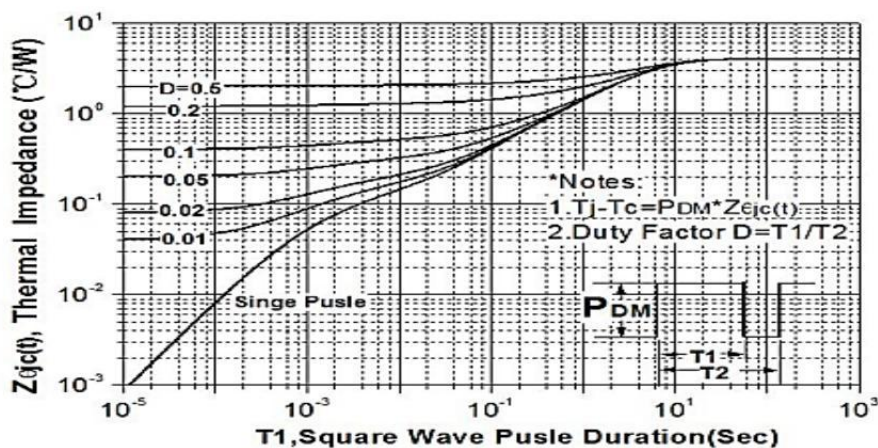
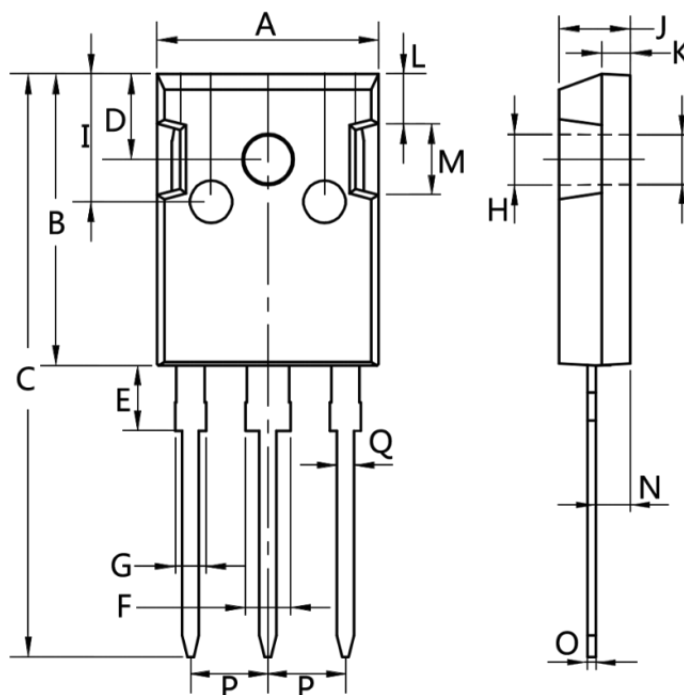


Figure 11. Transient Thermal Response Curve

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