

Description

The SX5N40D 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

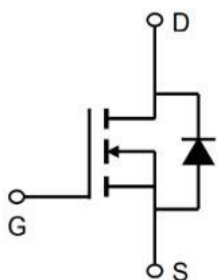
$V_{DS} = 400V$ $I_D = 5A$

$R_{DS(ON)} < 1.5\Omega$ @ $V_{GS}=10V$

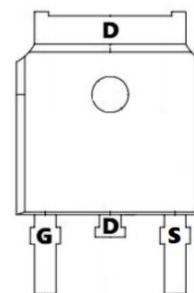
Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



TO-252-3L



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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage ($V_{GS} = 0V$)	400	V
I_D	Continuous Drain Current	5	A
I_{DM}	Pulsed Drain Current	20	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy	90	mJ
I_{AS}	Avalanche Current	3	A
E_{AR}	Repetitive Avalanche Energy	10	mJ
P_D	Power Dissipation ($T_c = 25^\circ\text{C}$)	45	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	$-55 \sim +150$	$^\circ\text{C}$
R_{thJC}	Thermal Resistance, Junction-to-Case	4.1	$^\circ\text{C/W}$
R_{thJA}	Thermal Resistance, Junction-to-Ambient	60	$^\circ\text{C/W}$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	400	440	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = 500V, V _{GS} = 0V, T _J = 25°C	--	--	1	μA
IGSS	Gate-Source Leakage	V _{GS} = ±30V	--	--	±100	nA
VGS(th)	Gate-Source Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.0	3.5	4.0	V
RDS(on)	Drain-Source On-Resistance (Note3)	V _{GS} = 10V, I _D = 2.5A	--	1.2	1.5	Ω
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz	--	462	--	pF
C _{oss}	Output Capacitance		--	54.2	--	
C _{rss}	Reverse Transfer Capacitance		--	8.8	--	
Q _g	Total Gate Charge	V _{DD} = 400V, I _D = 5A, V _{GS} = 10V	--	13.5	--	nC
Q _{gs}	Gate-Source Charge		--	2	--	
Q _{gd}	Gate-Drain Charge		--	6	--	
td(on)	Turn-on Delay Time	V _{DD} = 250V, I _D = 5A, R _G = 25 Ω	--	10	--	ns
t _r	Turn-on Rise Time		--	25	--	
td(off)	Turn-off Delay Time		--	40	--	
t _f	Turn-off Fall Time		--	52	--	
I _S	Continuous Body Diode Current	T _C = 25 °C	--	--	5	A
ISM	Pulsed Diode Forward Current		--	--	20	
V _{SD}	Body Diode Voltage	T _J = 25°C, I _{SD} = 5.0A, V _{GS} = 0V	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _S = 5.0A, di _F /dt = 100A/μs	--	220	--	ns
Q _{rr}	Reverse Recovery Charge		--	3	--	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 . I_{AS} = 2.5A, V_{DD} = 50V, R_G = 25 Ω, 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 I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

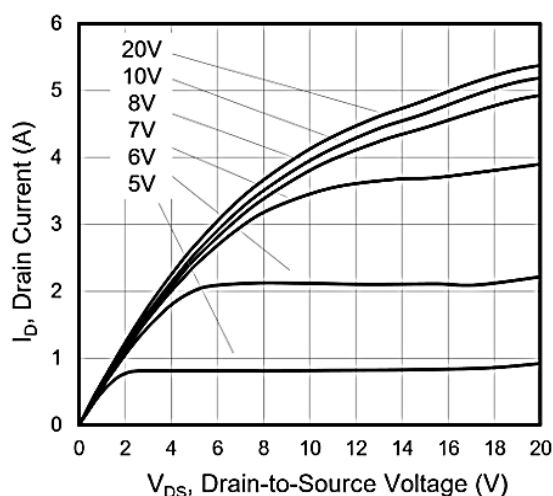


Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

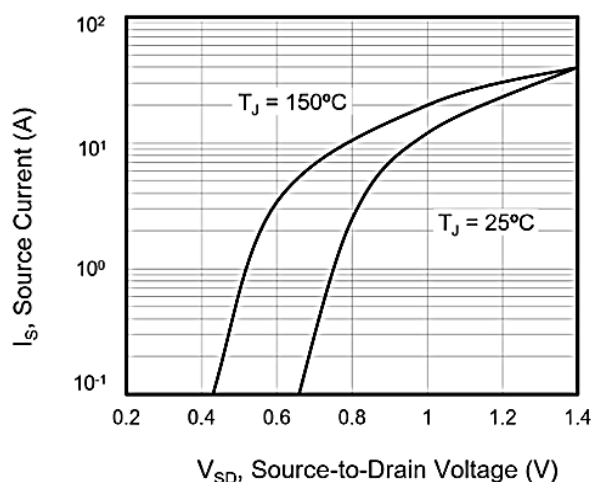


Figure 2. Body Diode Forward Voltage

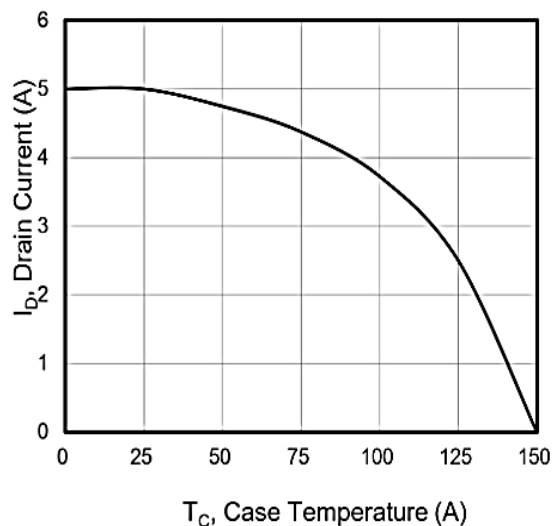


Figure 3. Drain Current vs. Temperature

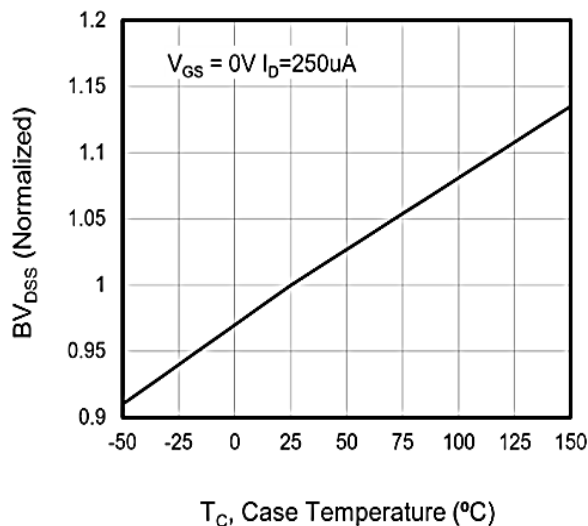


Figure 4. BV DSS Variation vs. Temperature

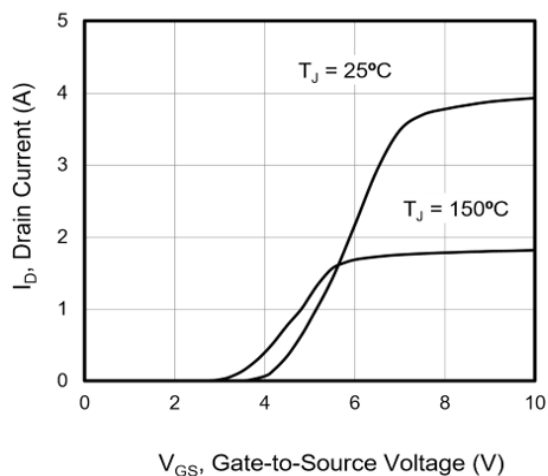


Figure 5. Transfer Characteristics

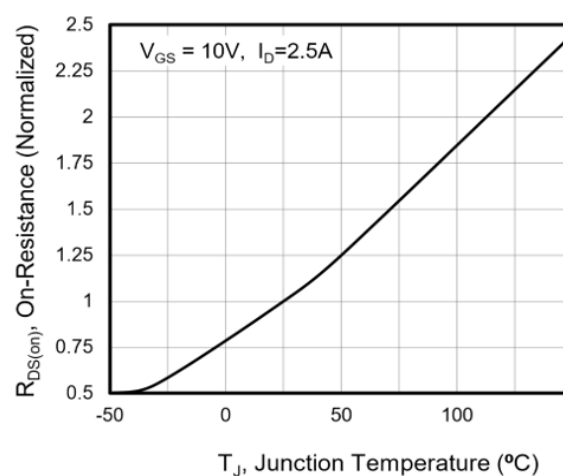


Figure 6. On-Resistance vs. Temperature

Typical Characteristics

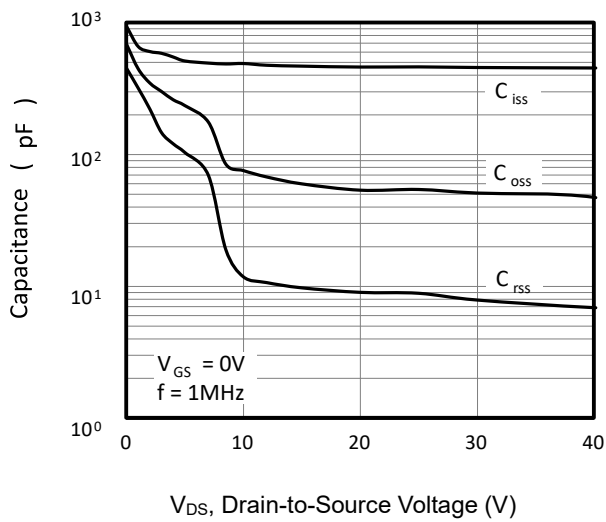


Figure 7. Capacitance

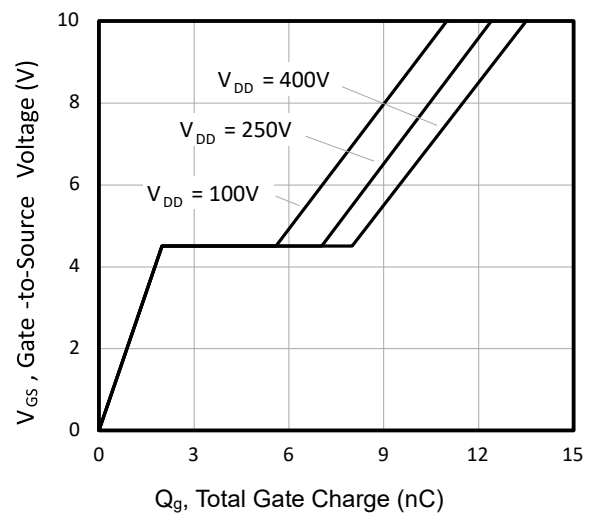


Figure 8. Gate Charge

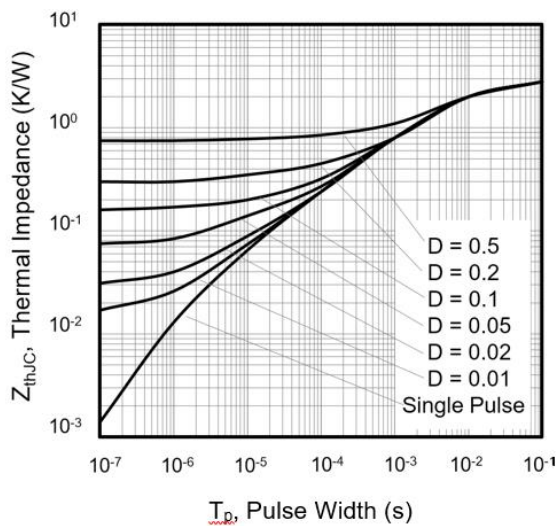
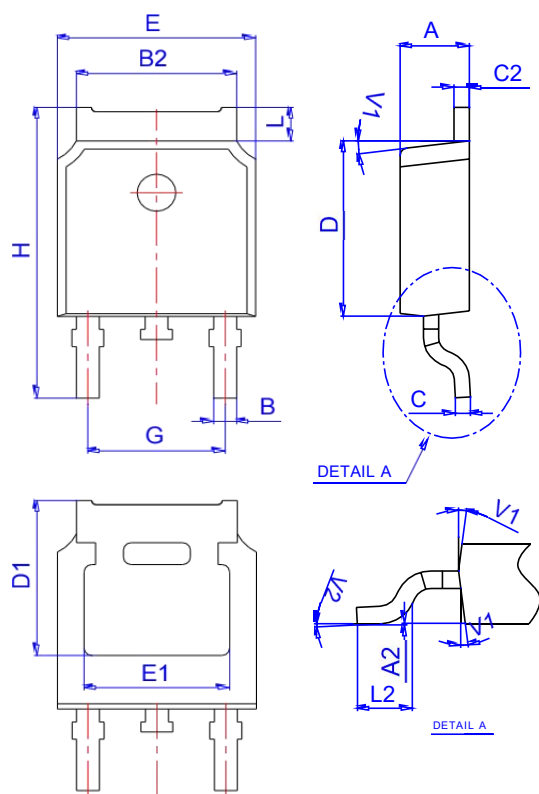


Figure 9. Transient Thermal Impedance

Package Mechanical Data: TO-252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-252-3L		2500