

Description

The SX5N50D-L 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

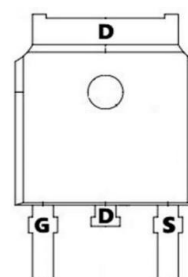
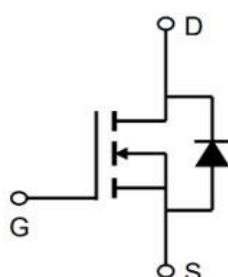
$V_{DS} = 500V$ $I_D = 5.0A$

$R_{DS(ON)} < 1.85\Omega$ @ $V_{GS}=10V$

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



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

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage ($V_{GS} = 0V$)	500	V
$I_D@T_c=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	5	A
$I_D@T_c=75^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	3	A
I_{DM}	Pulsed Drain Current (note1)	20	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy (note2)	137	mJ
$P_D@T_c=25^\circ\text{C}$	Total Power Dissipation ⁴	83	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	$-55 \sim +150$	$^\circ\text{C}$
R_{thJC}	Thermal Resistance, Junction-to-Case	1.5	$^\circ\text{C/W}$
R_{thJA}	Thermal Resistance, Junction-to-Ambient	62.5	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	I _b = 250mA, V _{GS} = 0V	500	-	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = 500V, V _{GS} = 0V	-	-	1.0	mA
IGSS	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±30V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} = V _{GS} , I _b = 250mA	2.0	3.0	4.0	V
RDS(ON)	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} = 10V, I _b = 2.5A	-	1.55	1.85	mΩ
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	-	615	-	pF
C _{oss}	Output Capacitance		-	67	-	pF
C _{rss}	Reverse Transfer Capacitance		-	10	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 250V, I _b = 2A	-	14	-	nC
Q _{gs}	Gate Source Charge		-	3.3	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	4	-	nC
td(on)	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 240V I _b = 2A, R _{GEN} = 24W	-	12	-	ns
t _r	Turn-On Rise Time		-	17	-	ns
td(off)	Turn-Off DelayTime		-	45	-	ns
t _f	Turn-Off Fall Time		-	25	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	20	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _s = 5A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 5A, di/dt = 100A/us	-	340	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	2.9	-	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 = 2.4A, VDD = 50V, RG = 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 ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

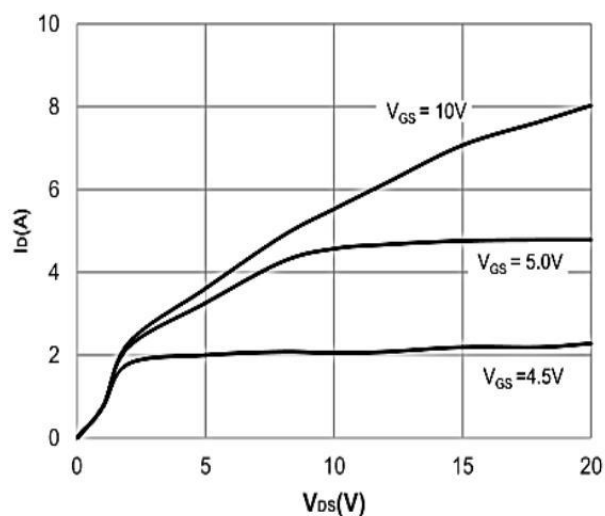


Figure 1: Output Characteristics

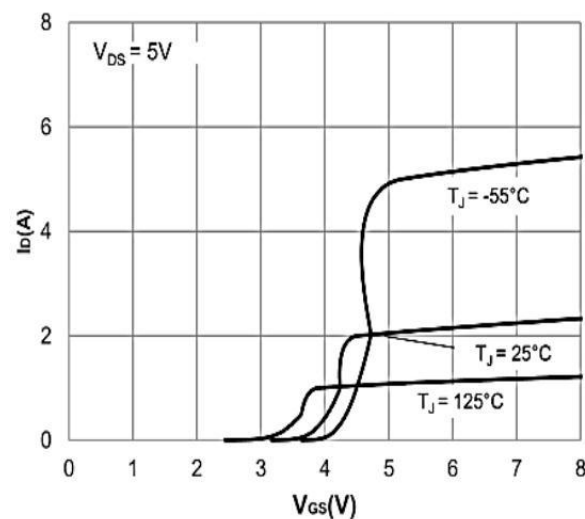


Figure 2: Typical Transfer Characteristics

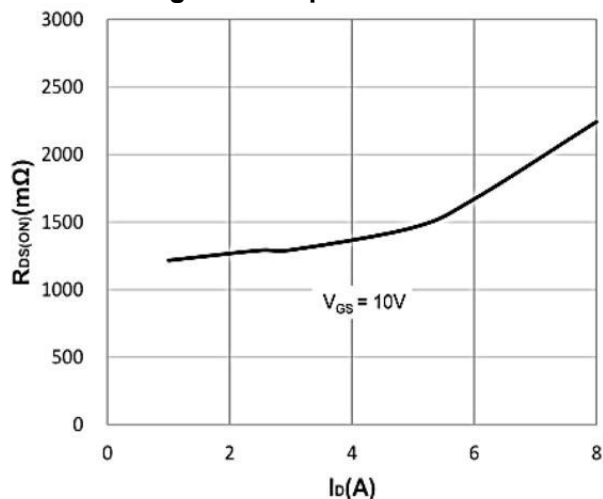


Figure 3: On-resistance vs. Drain Current

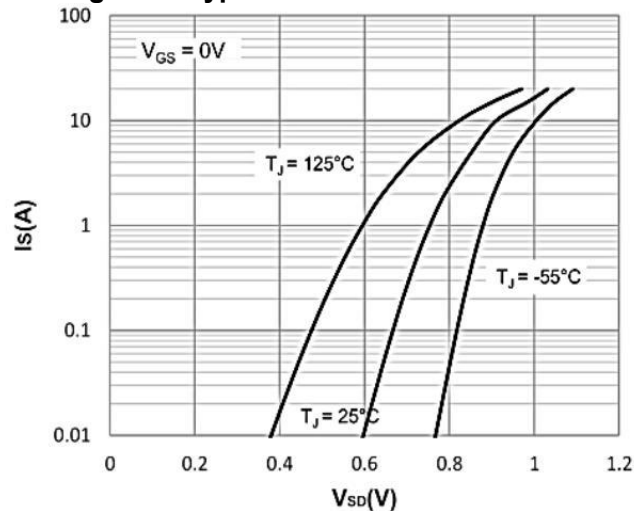


Figure 4: Body Diode Characteristics

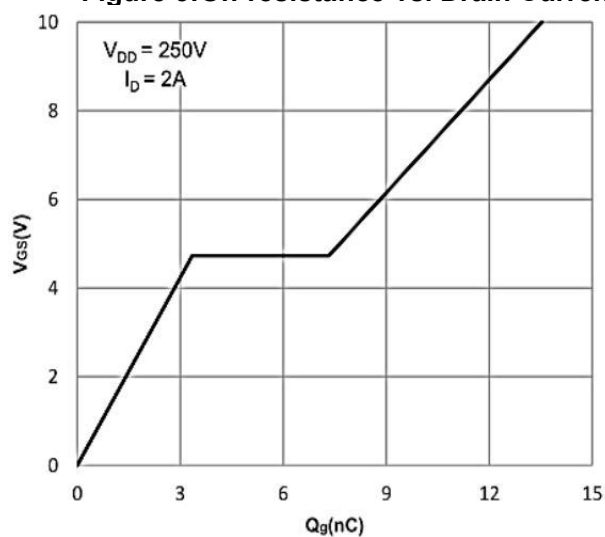


Figure 5: Gate Charge Characteristics

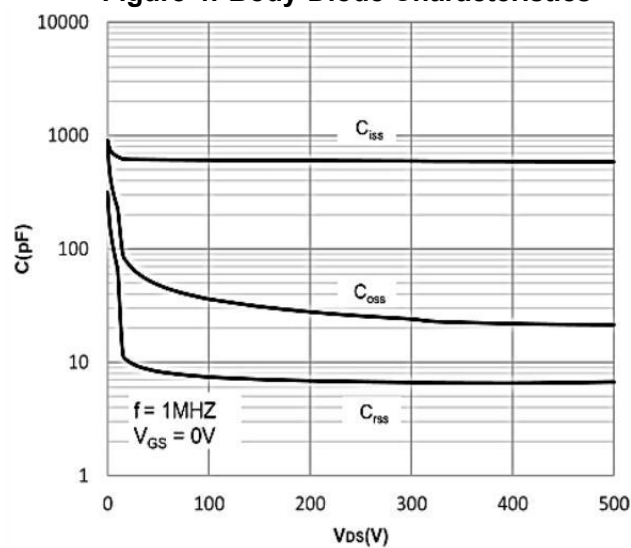


Figure 6: Capacitance Characteristics

Typical Characteristics

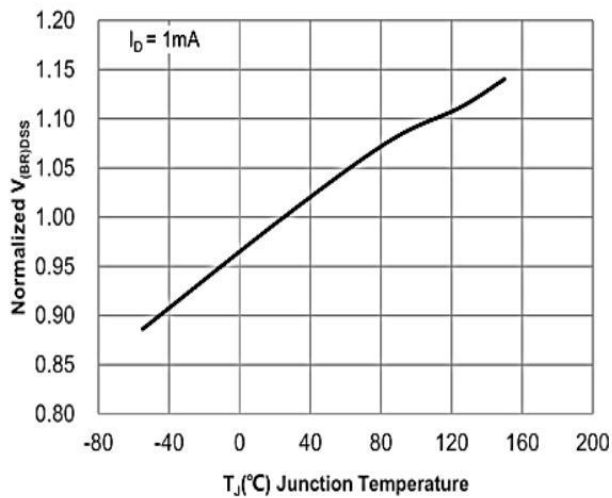


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

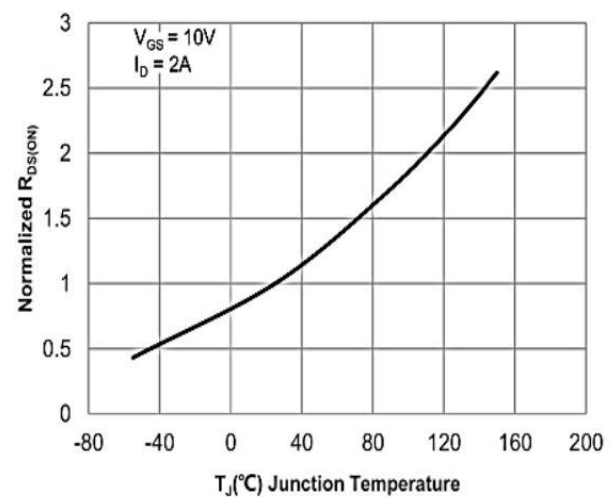


Figure 8: Normalized on Resistance vs. Junction Temperature

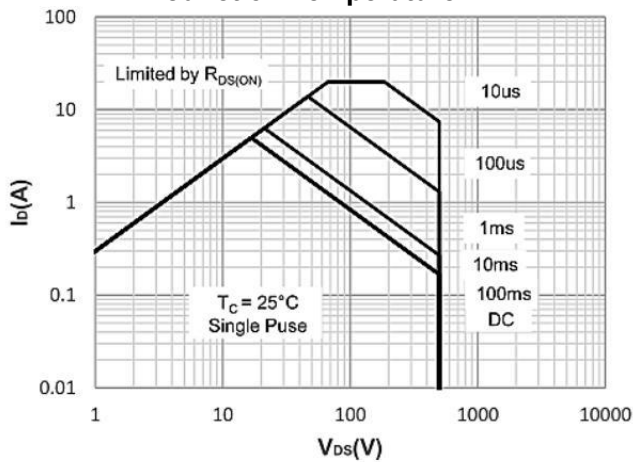


Figure 9: Maximum Safe Operating Are

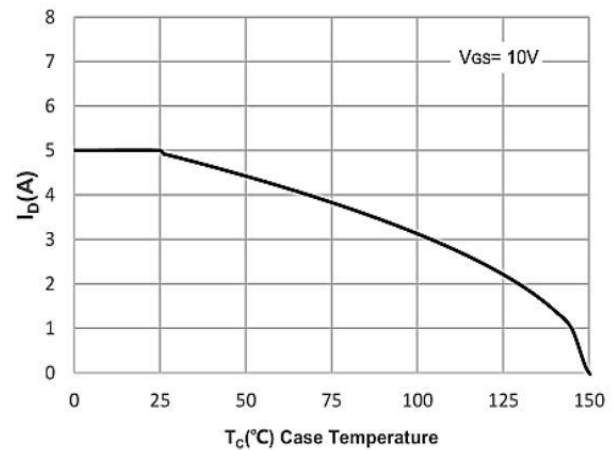


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

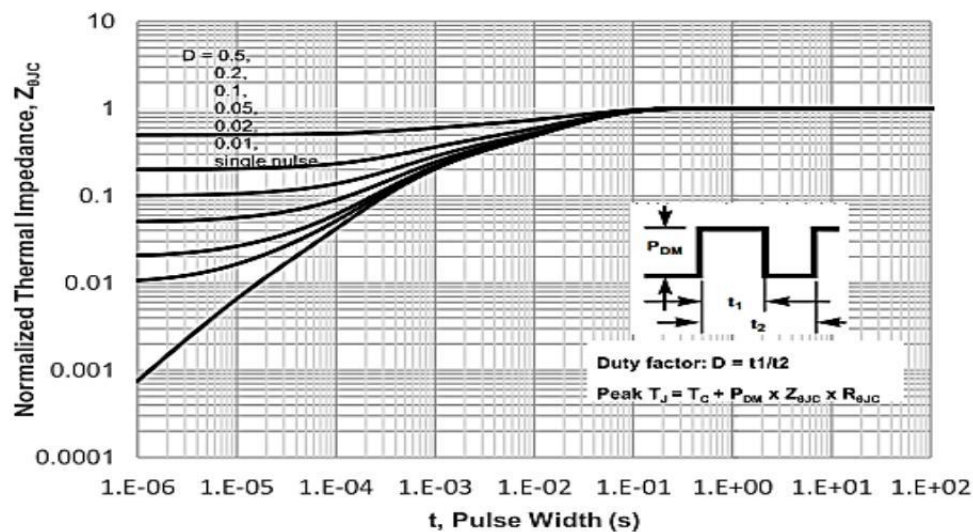
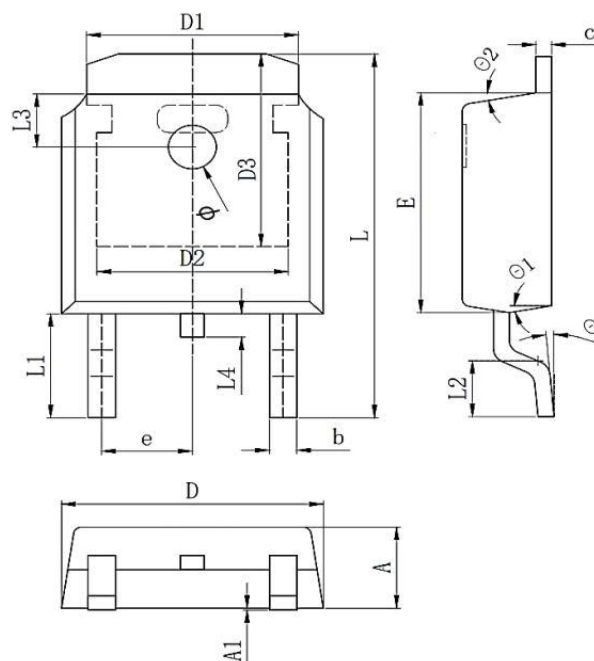


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ca

Package Mechanical Data-TO-252-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	2.1	2.3	2.5
A1	0	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.6
D	6.4	6.6	6.8
D1	5.33REF		
D2	4.83REF		
D3	5.25REF		
E	5.9	6.1	6.3
e	2.286TYP		
L	9.8	10.1	10.4
L1	2.888REF		
L2	1.4	1.5	1.7
L3	1.65REF		
L4	0.6	0.8	1
φ	1.1	1.2	1.3
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

Package Marking and Ordering Information

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