



STS11N3LLH5

N-channel 30 V, 0.0117 Ω , 11 A, SO-8
STripFET™ V Power MOSFET

Features

Type	V _{DSS}	R _{DS(on)} max	I _D
STS11N3LLH5	30 V	< 0.0132 Ω	11 A ⁽¹⁾

1. The value is rated according to R_{thj-pcb}

- R_{DS(on)} * Q_g industry benchmark
- Extremely low on-resistance R_{DS(on)}
- Very low switching gate charge
- High avalanche ruggedness
- Low gate drive power losses

Applications

- Switching applications

Description

This device is an N-channel Power MOSFET developed using STMicroelectronics' STripFET™V technology. The device has been optimized to achieve very low on-state resistance, contributing to an FOM that is among the best in its class..

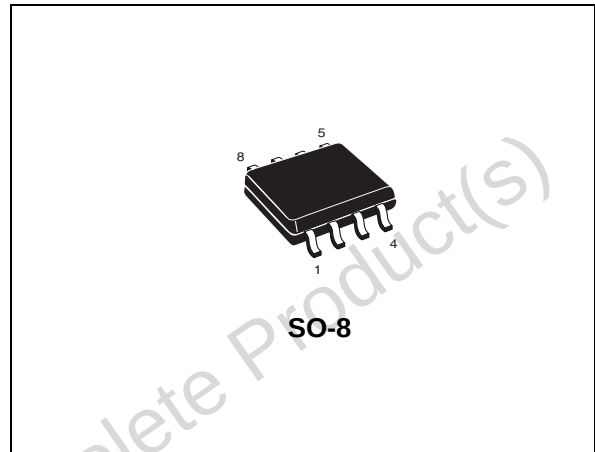


Figure 1. Internal schematic diagram

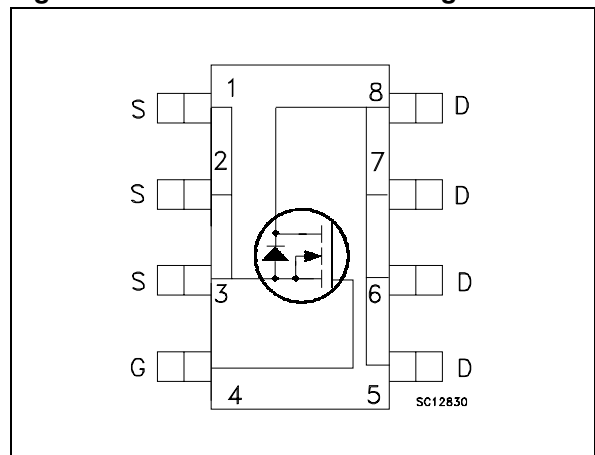


Table 1. Device summary

Order code	Marking	Package	Packaging
STS11N3LLH5	11D3L	SO-8	Tape and reel

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Obsolete Product(s) - Obsolete Product(s)



1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage ($V_{GS} = 0$)	30	V
V_{GS}	Gate-source voltage	+ 22 / - 20	V
$I_D^{(1)}$	Drain current (continuous) at $T_C = 25\text{ }^{\circ}\text{C}$	11	A
$I_D^{(1)}$	Drain current (continuous) at $T_C = 100\text{ }^{\circ}\text{C}$	8	A
$I_{DM}^{(2)}$	Drain current (pulsed)	44	A
$P_{TOT}^{(2)}$	Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$	2.7	W
	Derating factor	0.02	W/ $^{\circ}\text{C}$
T_J T_{stg}	Operating junction temperature Storage temperature	-55 to 150	$^{\circ}\text{C}$

1. The value is rated according to $R_{thj-pcb}$
2. Pulse width limited by safe operating area.

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{thj-pcb}^{(1)}$	Thermal resistance junction-pcb	46	$^{\circ}\text{C/W}$

1. When mounted on FR-4 board of 1inch², 2oz Cu, $t < 10\text{sec}$

2 Electrical characteristics

($T_{CASE}=25^{\circ}\text{C}$ unless otherwise specified)

Table 4. On/off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage ($V_{GS} = 0$)	$I_D = 250\ \mu\text{A}$	30			V
I_{DSS}	Zero gate voltage drain current ($V_{GS} = 0$)	$V_{DS} = \text{max rating}$, $V_{DS} = \text{max rating}$ $T_C = 125^{\circ}\text{C}$			1 10	μA μA
I_{GSS}	Gate body leakage current ($V_{DS} = 0$)	$V_{GS} = +22 / -20\ \text{V}$			± 100	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	1			V
$R_{DS(on)}$	Static drain-source on resistance	$V_{GS} = 10\ \text{V}$, $I_D = 5.5\ \text{A}$ $V_{GS} = 4.5\ \text{V}$, $I_D = 5.5\ \text{A}$		0.0117 0.017	0.0132 0.019	Ω Ω

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	$V_{DS} = 25\ \text{V}$, $f = 1\ \text{MHz}$, $V_{GS} = 0$	-	724 132 20		pF pF pF
Q_g Q_{gs} Q_{gd}	Total gate charge Gate-source charge Gate-drain charge	$V_{DD} = 15\ \text{V}$, $I_D = 11\ \text{A}$ $V_{GS} = 4.5\ \text{V}$ Figure 14	-	5 2 2		nC nC nC
R_G	Intrinsic gate resistance	$f = 1\ \text{MHz}$ gate dc bias = 0 test signal level = 20 mV open drain	-		3.3	Ω

Table 6. Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	Turn-on delay time Rise time Turn-off delay time Fall time	$V_{DD} = 15\ \text{V}$, $I_D = 5.5\ \text{A}$, $R_G = 4.7\ \Omega$, $V_{GS} = 10\ \text{V}$ Figure 13	-	4 4.2 21 3.5	-	ns ns ns ns

Table 7. Source drain diode

Symbol	Parameter	Test conditions	Min	Typ.	Max	Unit
I_{SD}	Source-drain current		-		11	A
$I_{SDM}^{(1)}$	Source-drain current (pulsed)		-		44	A
$V_{SD}^{(2)}$	Forward on voltage	$I_{SD} = 11\text{ A}$, $V_{GS}=0$	-		1.1	V
t_{rr}	Reverse recovery time	$I_{SD} = 11\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $V_{DD} = 25\text{ V}$, $T_J = 150\text{ }^{\circ}\text{C}$	-	21		ns
Q_{rr}	Reverse recovery charge			10		nC
I_{RRM}	Reverse recovery current			1		A

1. Pulse width limited by safe operating area

2. Pulsed: pulse duration=300 μ s, duty cycle 1.5%

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

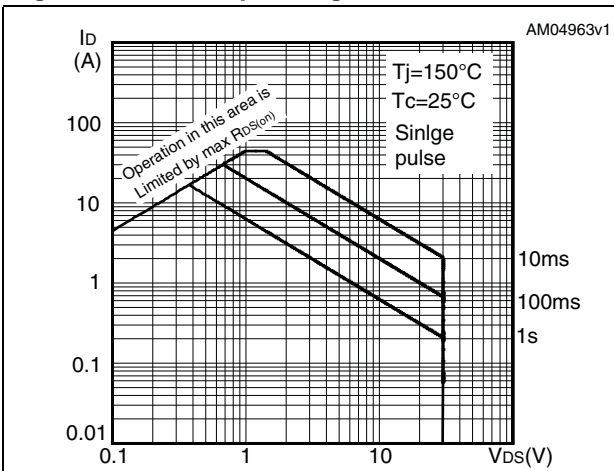


Figure 3. Thermal impedance

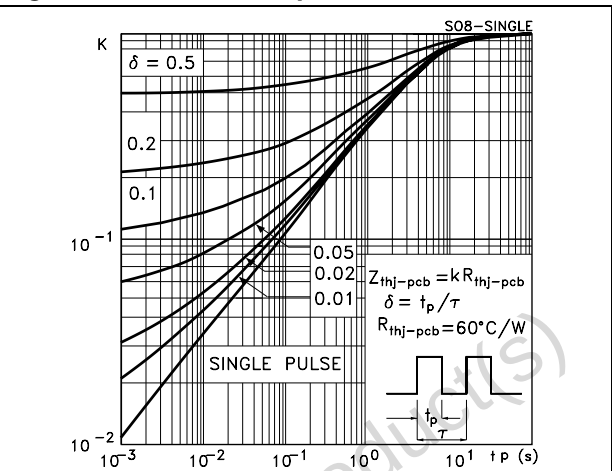


Figure 4. Output characteristics

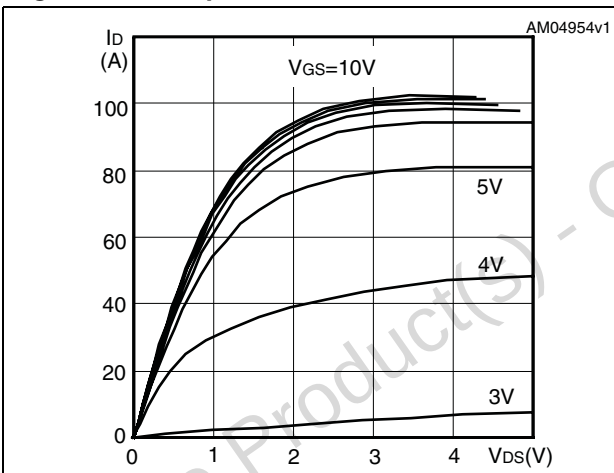


Figure 5. Transfer characteristics

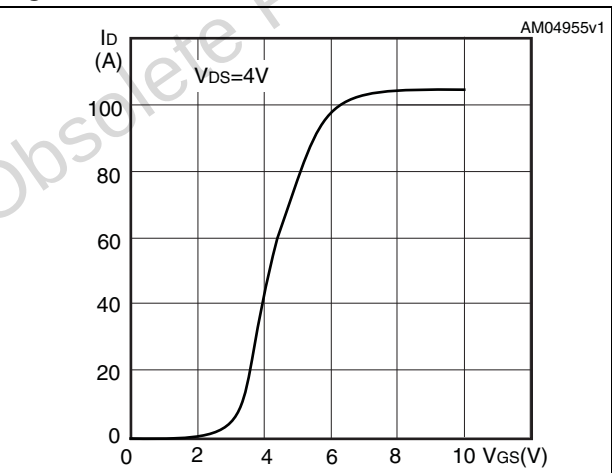


Figure 6. Normalized BVdss vs temperature

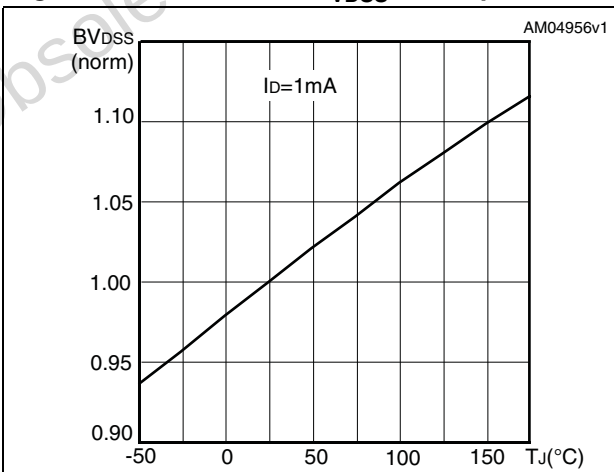


Figure 7. Static drain-source on resistance

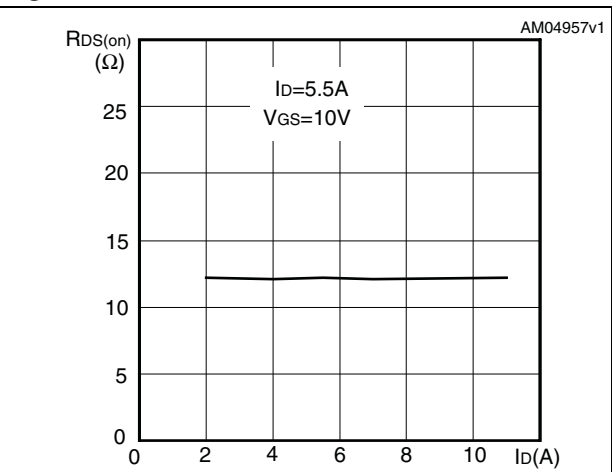


Figure 8. Gate charge vs gate-source voltage Figure 9. Capacitance variations

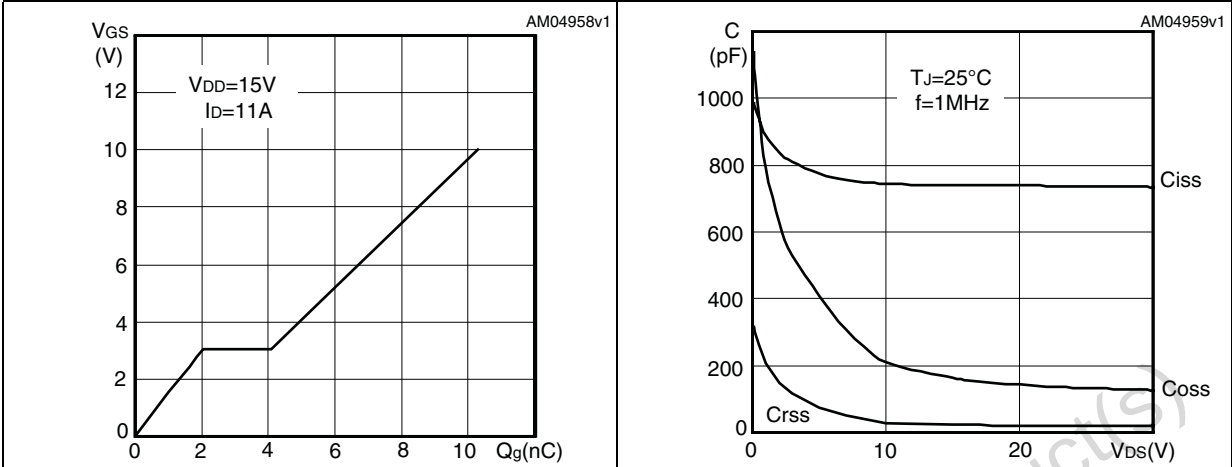


Figure 10. Normalized gate threshold voltage vs temperature Figure 11. Normalized on resistance vs temperature

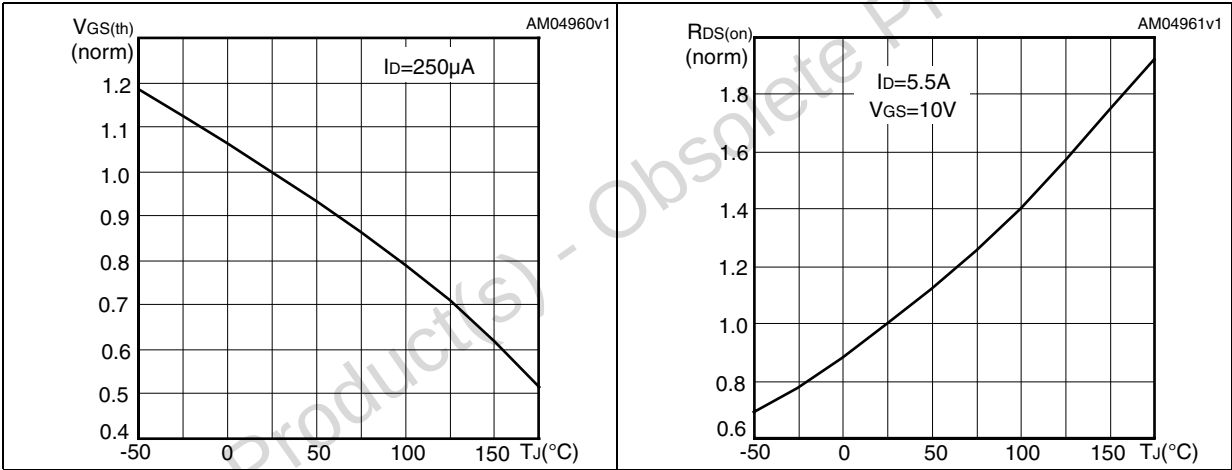
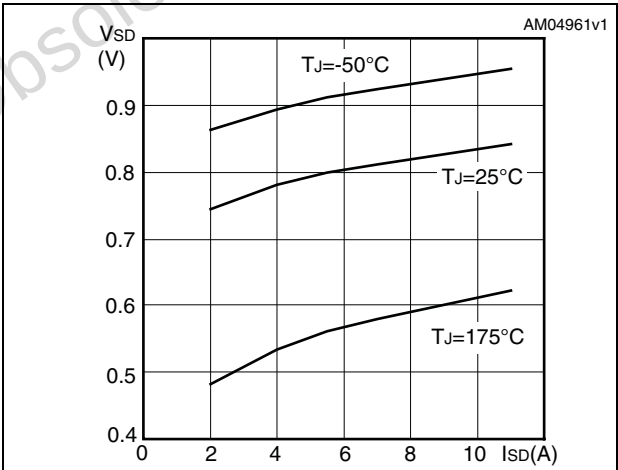


Figure 12. Source-drain diode forward characteristics



4 Package mechanical data

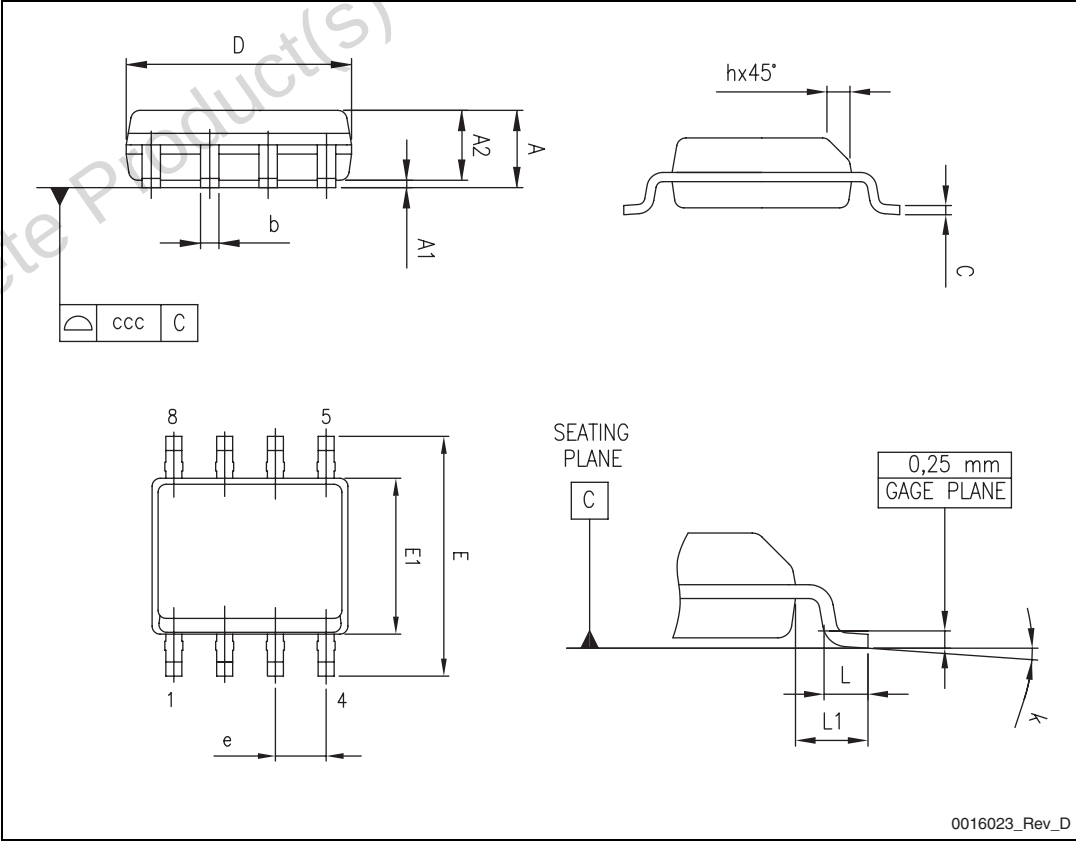
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Obsolete Product(s) - Obsolete Product(s)

Table 8. SO-8 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A			1.75
A1	0.10		0.25
A2	1.25		
b	0.28		0.48
c	0.17		0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e		1.27	
h	0.25		0.50
L	0.40		1.27
L1		1.04	
k	0°		8°
ccc			0.10

Figure 19. SO-8 drawing



5 Revision history

Table 9. Document revision history

Date	Revision	Changes
02-Jul-2009	1	First release.
21-Jun-2011	2	New $R_{DS(on)}$ value. Updated mechanical data.

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