



STS25NH3LL

N-CHANNEL 30V - 0.0027Ω - 25A SO-8 STripFET™ III MOSFET FOR DC-DC CONVERSION

PRELIMINARY DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STS25NH3LL	30 V	< 0.0035Ω	25 A

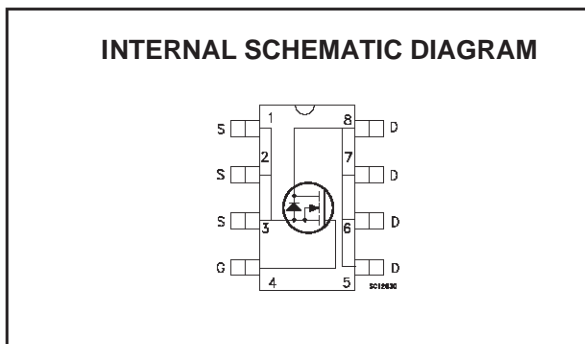
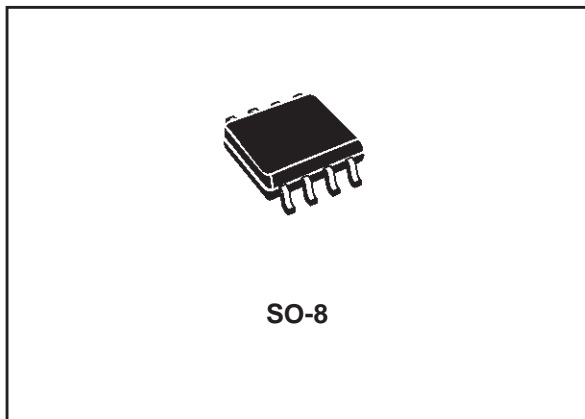
- TYPICAL R_{DS(on)} = 0.0027Ω
- OPTIMAL R_{DS(ON)} x Q_g TRADE-OFF @4.5V
- CONDUCTION LOSSES REDUCED
- SWITCHING LOSSES REDUCED
- WORLD INDUSTRY'S LOWEST ON-RESISTANCE

DESCRIPTION

The **STS25NH3LL** utilizes the latest advanced design rules of ST's proprietary STripFET™ technology. This novel 0.6μ process coupled to unique metallization techniques realizes the most advanced low voltage MOSFET in SO-8 ever produced. It is therefore suitable for the most demanding DC-DC converter applications where high efficiency is to be achieved at high output current.

APPLICATIONS

- DC-DC CONVERTERS FOR TELECOM AND NOTEBOOK CPU CORE
- SYNCHRONOUS RECTIFIER



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DS}	Drain-source Voltage (V _{GS} = 0)	30	V
V _{DGR}	Drain-gate Voltage (R _{GS} = 20 kΩ)	30	V
V _{GS}	Gate- source Voltage	± 18	V
I _D	Drain Current (continuous) at T _A = 25°C Drain Current (continuous) at T _A = 100°C	25 18	A A
I _{DM} (t)	Drain Current (pulsed)	100	A
P _{TOT}	Total Dissipation at T _A = 25°C	3.2	W

(●) Pulse width limited by safe operating area

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THERMAL DATA

Rthj-amb	(*) Thermal Resistance Junction-ambient Max	47	°C/W
Rthj-lead	Thermal Resistance Junction-leads Max	16	°C/W
T _j	Max. Operating Junction Temperature	-55 to 175	°C
T _{stg}	Storage Temperature		

(*) When mounted on 1 inch FR4 Board, 2 oz of Cu, t ≤ 10 sec.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C UNLESS OTHERWISE SPECIFIED)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{(BR)DSS}	Drain-source Breakdown Voltage	I _D = 250 μA, V _{GS} = 0	30			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V _{DS} = Max Rating V _{DS} = Max Rating, T _C = 125 °C			1 10	μA μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ± 18V			±100	nA

ON (1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1			V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10 V, I _D = 12 A V _{GS} = 4.5 V, I _D = 12 A		0.0027 0.0035	0.0035	Ω Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (1)	Forward Transconductance	V _{DS} = 15V, I _D = 12 A		TBD		S
C _{iss}	Input Capacitance	V _{DS} = 25 V, f = 1 MHz, V _{GS} = 0		3650		pF
C _{oss}	Output Capacitance			592		pF
C _{rss}	Reverse Transfer Capacitance			80		pF

ELECTRICAL CHARACTERISTICS (CONTINUED)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 15\text{ V}, I_D = 12.5\text{ A}$		24		ns
t_r	Rise Time	$R_G = 4.7\Omega, V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 1)		60		ns
Q_g	Total Gate Charge	$V_{DD} = 15\text{ V}, I_D = 25\text{ A},$		32	43	nC
Q_{gs}	Gate-Source Charge	$V_{GS} = 5\text{ V}$		10.5		nC
Q_{gd}	Gate-Drain Charge	(see test circuit, Figure 2)		6.5		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off-Delay Time	$V_{DD} = 15\text{ V}, I_D = 12.5\text{ A},$		55		ns
t_f	Fall Time	$R_G = 4.7\Omega, V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 1)		25		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				25	A
$I_{SDM(2)}$	Source-drain Current (pulsed)				100	A
$V_{SD(1)}$	Forward On Voltage	$I_{SD} = 25\text{ A}, V_{GS} = 0$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 25\text{ A}, di/dt = 100\text{ A}/\mu\text{s},$		33		ns
Q_{rr}	Reverse Recovery Charge	$V_{DD} = 25\text{ V}, T_j = 150^\circ\text{C}$		30		nC
I_{RRM}	Reverse Recovery Current	(see test circuit, Figure 3)		1.8		A

Note: 1. Pulsed: Pulse duration = 300 μs , duty cycle 1.5%.
 2. Pulse width limited by safe operating area.

Fig. 1: Switching Times Test Circuit For Resistive Load

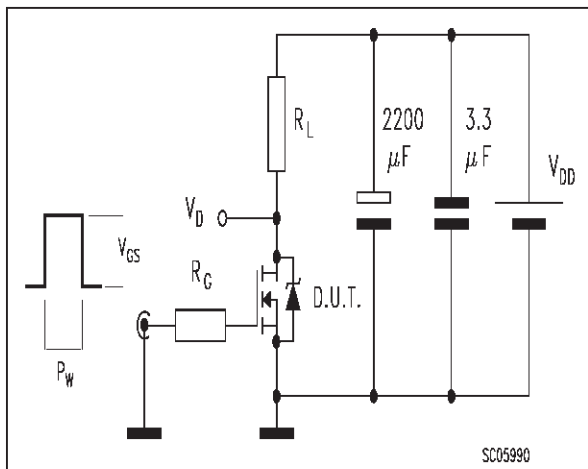


Fig. 2: Gate Charge test Circuit

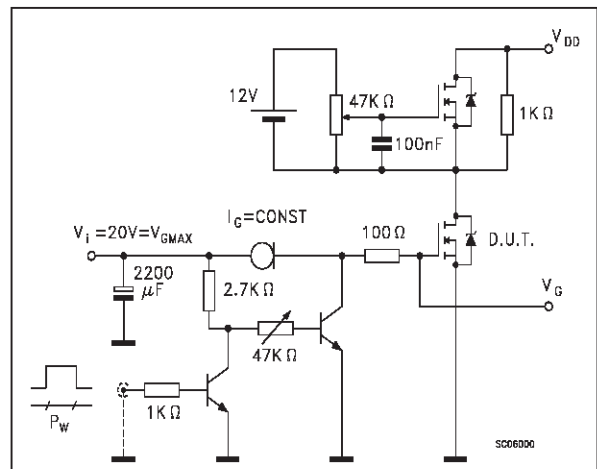
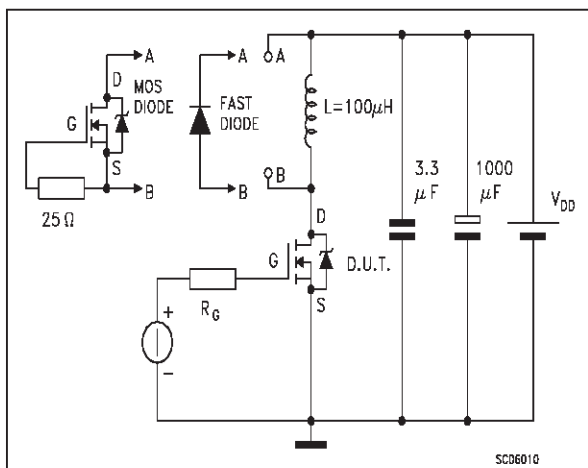
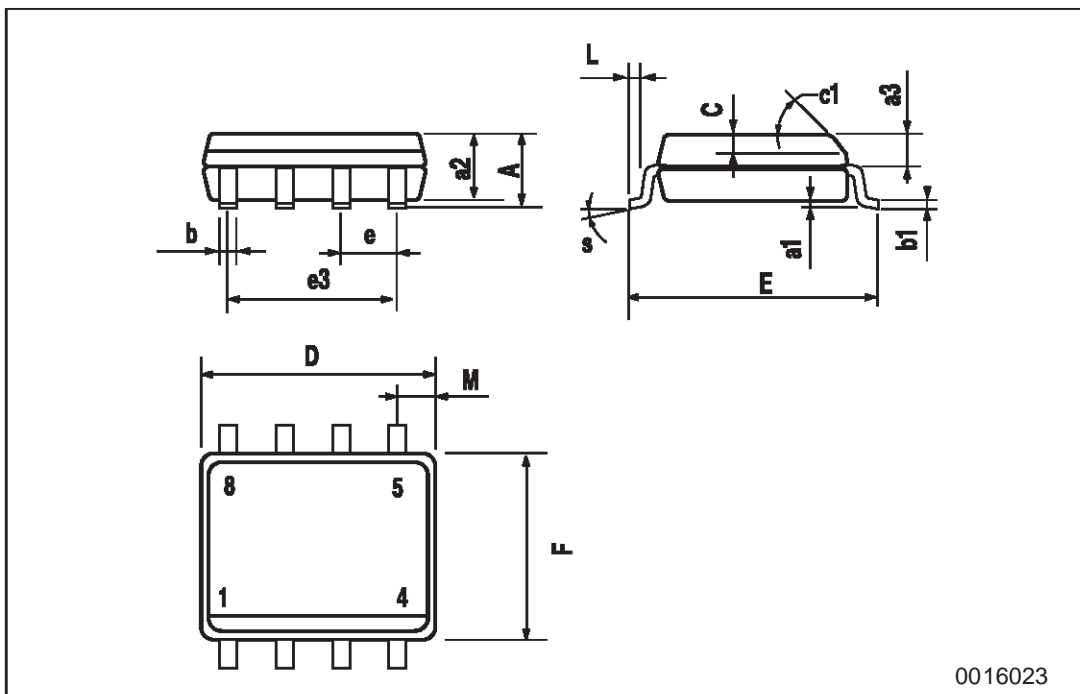


Fig. 3: Test Circuit For Diode Recovery Behaviour



SO-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.25	0.003		0.009
a2			1.65			0.064
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.013		0.018
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.019
c1	45 (typ.)					
D	4.8		5.0	0.188		0.196
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.14		0.157
L	0.4		1.27	0.015		0.050
M			0.6			0.023
S	8 (max.)					



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