



STL30NF3LL

N-CHANNEL 30V - 0.008Ω - 30A PowerFLAT™ LOW GATE CHARGE STripFET™ MOSFET

PRELIMINARY DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STL30NF3LL	30 V	< 0.010 Ω	30 A

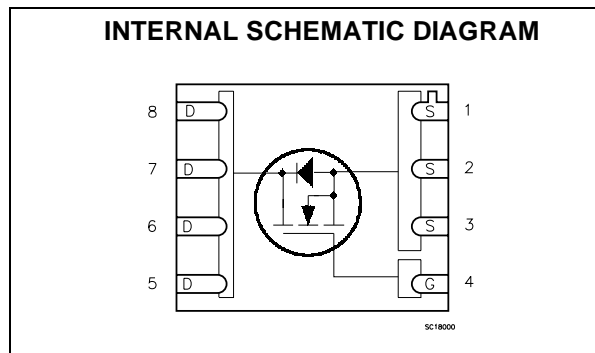
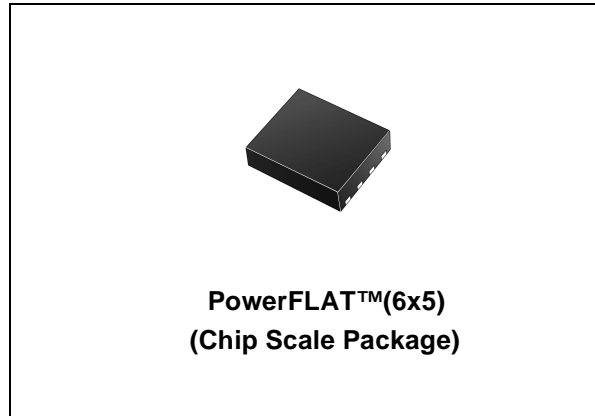
- TYPICAL R_{DS(on)} = 0.008Ω
- IMPROVED DIE-TO-FOOTPRINT RATIO
- VERY LOW PROFILE PACKAGE

DESCRIPTION

This Power MOSFET is the second generation of STMicroelectronics unique "STripFET™" technology. The resulting transistor shows extremely low on-resistance and minimal gate charge. The new PowerFLAT™ package allows a significant reduction in board space without compromising performance.

APPLICATIONS

- DC-DC CONVERTERS
- BATTERY MANAGEMENT IN NOMADIC EQUIPMENT



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	± 16	V
I _D (#)	Drain Current (continuous) at T _C = 25°C	30	A
	Drain Current (continuous) at T _C = 100°C	19	A
I _{DM} (•)	Drain Current (pulsed)	120	A
P _{TOT}	Total Dissipation at T _C = 25°C	80	W
	Derating Factor	0.64	W/°C
T _{stg}	Storage Temperature	- 55 to 150	°C
T _j	Max. Operating Junction Temperature		

(•) Pulse width limited by safe operating area

(#) Limited by Wire Bonding

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THERMAL DATA

Rthj-case	Thermal Resistance Junction-case Max	1.56	°C/W
Rthj-amb	Thermal Resistance Junction-ambient Max	50	°C/W

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

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0$	30			V
I_{DSS}	Zero Gate Voltage Drain Current ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating}, T_C = 125 \text{ °C}$			1 10	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 16V$			± 100	nA

ON (1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 10 V, I_D = 15 A$ $V_{GS} = 4.5 V, I_D = 15 A$		0.008 0.0095	0.010 0.013	Ω Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$g_{fs} (1)$	Forward Transconductance	$V_{DS} = 15V, I_D = 15 A$		30		S
C_{iss}	Input Capacitance	$V_{DS} = 25 V, f = 1 \text{ MHz}, V_{GS} = 0$		2210		pF
C_{oss}	Output Capacitance			635		pF
C_{rss}	Reverse Transfer Capacitance			138		pF

ELECTRICAL CHARACTERISTICS (CONTINUED)**SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 15\text{ V}$, $I_D = 30\text{ A}$		22		ns
t_r	Rise Time	$R_G = 4.7\Omega$, $V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 1)		130		ns
Q_g	Total Gate Charge	$V_{DD} = 24\text{ V}$, $I_D = 30\text{ A}$,		30	40	nC
Q_{gs}	Gate-Source Charge	$V_{GS} = 5\text{ V}$		9		nC
Q_{gd}	Gate-Drain Charge	(see test circuit, Figure 1)		12.5		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off-Delay Time	$V_{DD} = 15\text{ V}$, $I_D = 30\text{ A}$,		36.5		ns
t_f	Fall Time	$R_G = 4.7\Omega$, $V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 1)		36.5		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				30	A
$I_{SDM(2)}$	Source-drain Current (pulsed)				120	A
$V_{SD(1)}$	Forward On Voltage	$I_{SD} = 15\text{ A}$, $V_{GS} = 0$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 30\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$,		65		ns
Q_{rr}	Reverse Recovery Charge	$V_{DD} = 15\text{ V}$, $T_j = 150^\circ\text{C}$		105		nC
I_{RRM}	Reverse Recovery Current	(see test circuit, Figure 3)		3.4		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

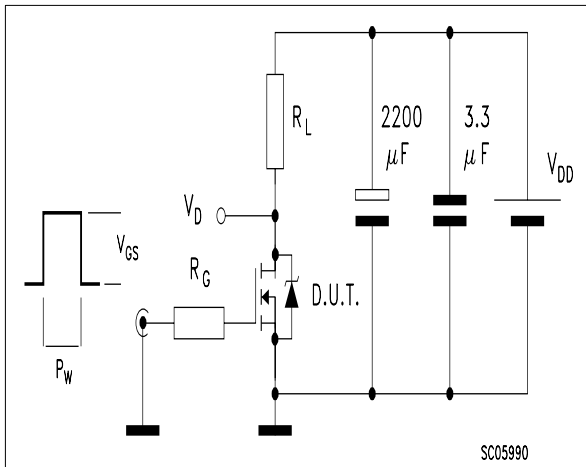


Fig. 2: Gate Charge test Circuit

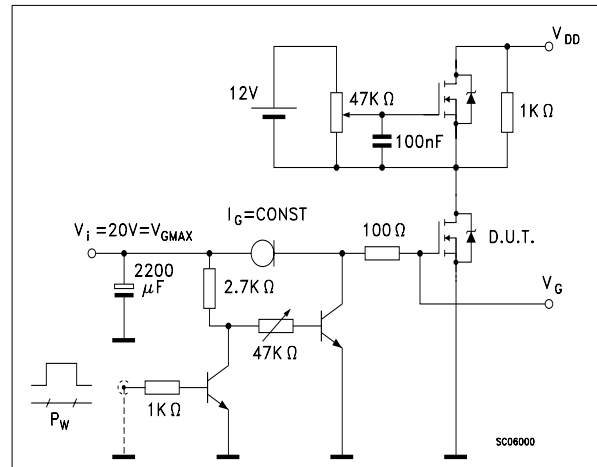
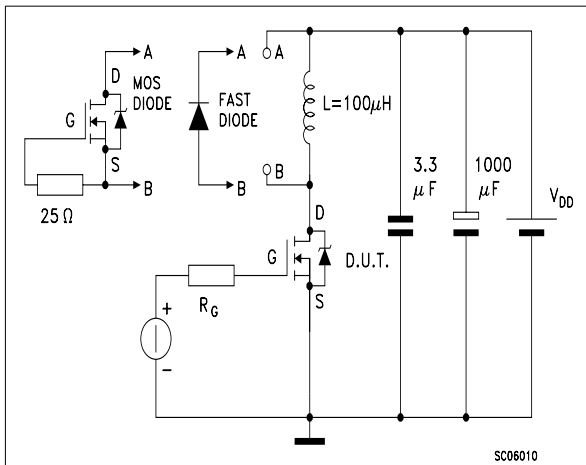
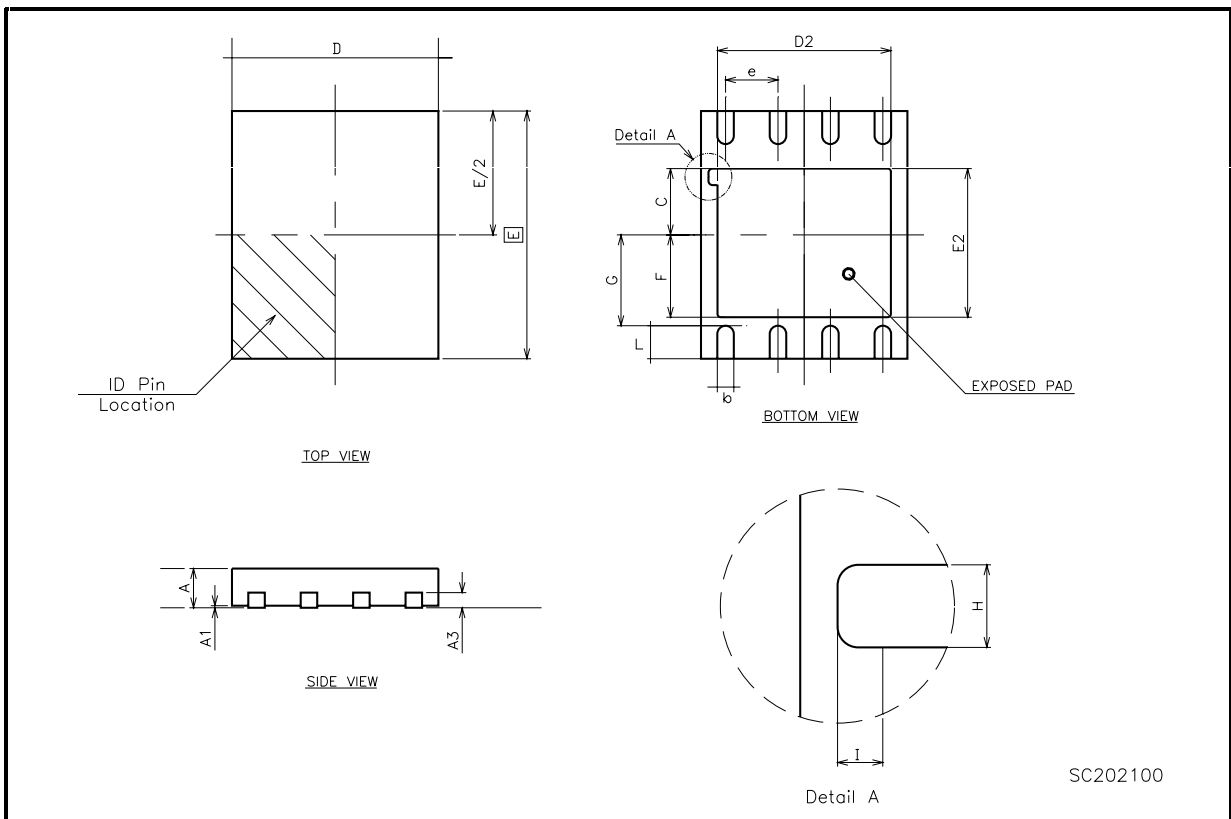


Fig. 3: Test Circuit For Diode Recovery Behaviour



PowerFLAT™(6x5) MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	0.80		1.00	0.031		0.039
A1		0.02			0.001	
b	0.35		0.47	0.014		0.018
C		1.61			0.063	
D		5.00			0.197	
D2	4.15		4.25	0.163		0.167
E		6.00			0.236	
E2	3.55		3.65	0.140		0.144
e		1.27			0.049	
F		1.99			0.078	
G		2.20			0.086	
H		0.40			0.015	
I		0.219			0.0086	
L	0.70		0.90	0.028		0.035



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