



STL35NF3LL

N-CHANNEL 30V - 0.0055Ω - 35A PowerFLAT™ LOW GATE CHARGE STRIPFET™ MOSFET

TARGET DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STL35NF3LL	30 V	< 0.007 Ω	35 A

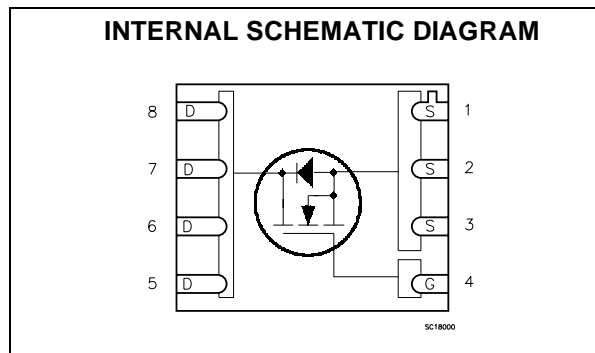
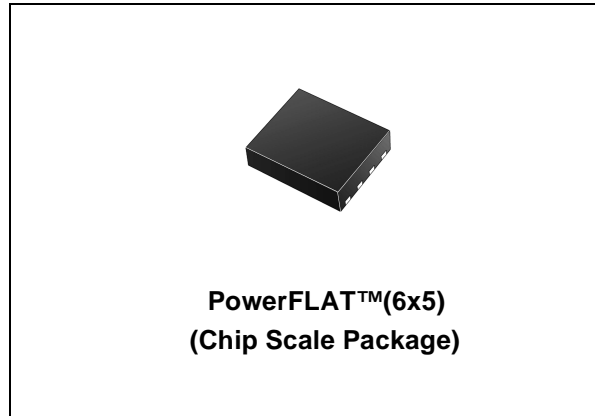
- TYPICAL R_{DS(on)} = 0.0055Ω
- IMPROVED DIE-TO-FOOTPRINT RATIO
- VERY LOW PROFILE PACKAGE

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	± 15	V
I _D (#)	Drain Current (continuous) at T _C = 25°C Drain Current (continuous) at T _C = 100°C	35 22	A A
I _{DM} (●)	Drain Current (pulsed)	140	A
P _{TOT}	Total Dissipation at T _C = 25°C	80	W
	Derating Factor	0.64	W/°C
dv/dt(1)	Peak Diode Recovery voltage slope	TBD	V/ns
E _{AS} (2)	Single Pulse Avalanche Energy	TBD	J
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

(1) I_{SD} < 35A, di/dt < 300A/μs, V_{DD} < V_{(BR)DSS}, T_J < T_{JMAX}
(2) Starting T_j = 25°C, I_D = 30A, V_{DD} = 27.5V

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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 ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating}, T_C = 125 \text{ }^\circ\text{C}$			1 10	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 15V$			± 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	$V_{GS} = 10 V, I_D = 17.5 A$ $V_{GS} = 4.5 V, I_D = 17.5 A$		0.0055 0.007	0.007 0.010	Ω Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$g_{fs} (1)$	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max},$ $I_D = 17.5 A$		TBD		S
C_{iss}	Input Capacitance	$V_{DS} = 25 V, f = 1 \text{ MHz}, V_{GS} = 0$		2650		pF
C_{oss}	Output Capacitance			900		pF
C_{rss}	Reverse Transfer Capacitance			150		pF

ELECTRICAL CHARACTERISTICS (CONTINUED)**SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 15\text{ V}$, $I_D = 17.5\text{ A}$		TBD		ns
t_r	Rise Time	$R_G = 4.7\Omega$, $V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 3)		TBD		ns
Q_g	Total Gate Charge	$V_{DD} = 15\text{ V}$, $I_D = 35\text{ A}$,		80		nC
Q_{gs}	Gate-Source Charge	$V_{GS} = 10\text{ V}$		TBD		nC
Q_{gd}	Gate-Drain Charge			TBD		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off-Delay Time	$V_{DD} = 15\text{ V}$, $I_D = 17.5\text{ A}$,		TBD		ns
t_f	Fall Time	$R_G = 4.7\Omega$, $V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 3)		TBD		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				35	A
$I_{SDM(1)}$	Source-drain Current (pulsed)				140	A
$V_{SD(2)}$	Forward On Voltage	$I_{SD} = 35\text{ A}$, $V_{GS} = 0$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 35\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$,		TBD		ns
Q_{rr}	Reverse Recovery Charge	$V_{DD} = 30\text{ V}$, $T_j = 150^\circ\text{C}$		TBD		nC
I_{RRM}	Reverse Recovery Current	(see test circuit, Figure 5)		TBD		A

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

Fig. 1: Unclamped Inductive Load Test Circuit

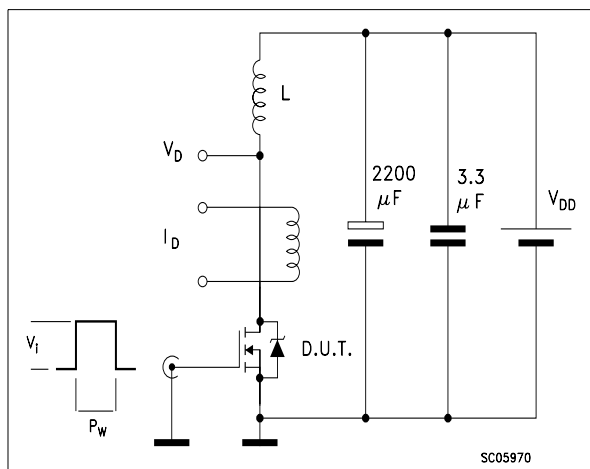


Fig. 2: Unclamped Inductive Waveform

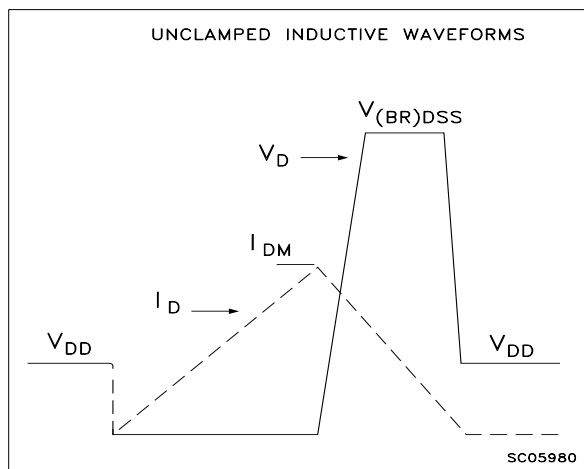


Fig. 3: Switching Times Test Circuit For Resistive Load

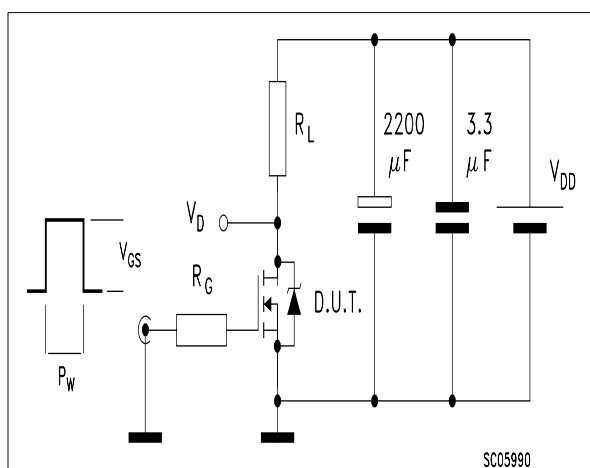


Fig. 4: Gate Charge test Circuit

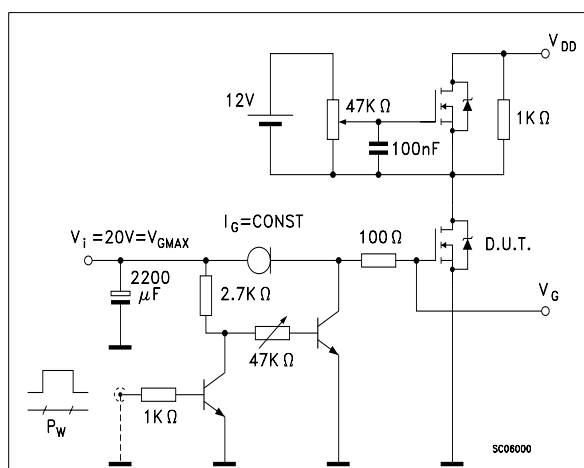
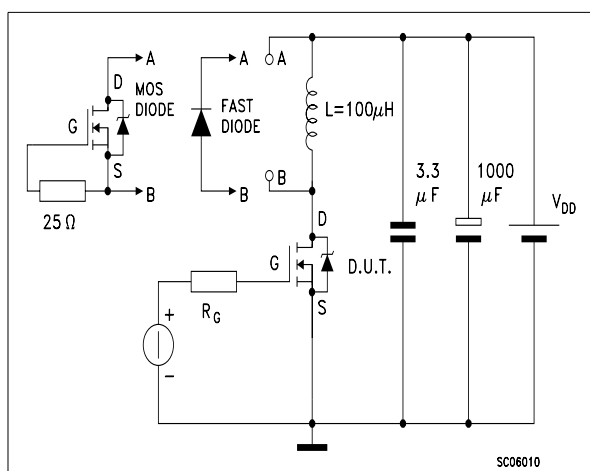
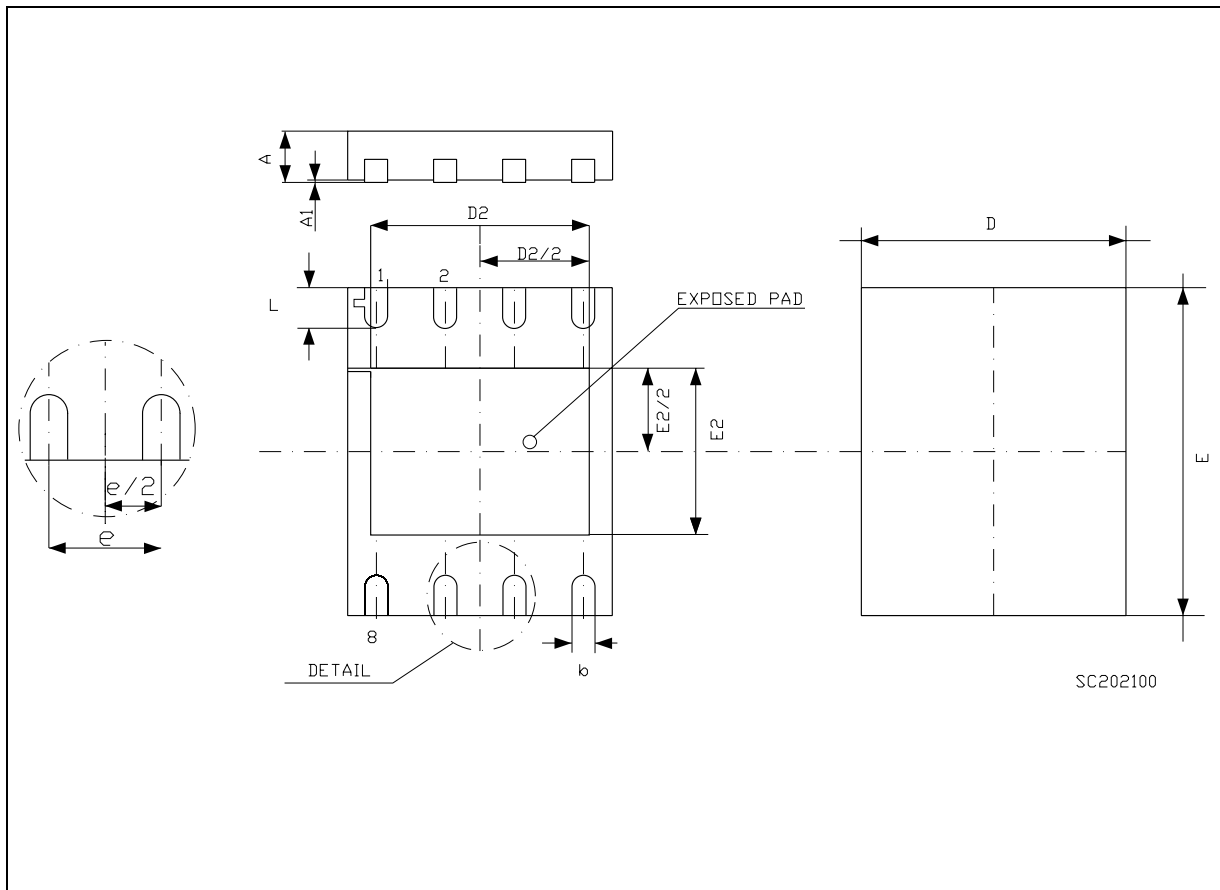


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



PowerFLAT™(6x5) MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.80		1.00	0.031		0.039
A1		0.08			0.003	
b	0.36		0.48	0.014		0.018
D		4.89			0.191	
D2	3.95		4.05	0.154		0.158
E		6.00			0.235	
E2	2.95		3.05	0.115		0.119
e		1.27			0.049	
L	0.65		0.85	0.025		0.033



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