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

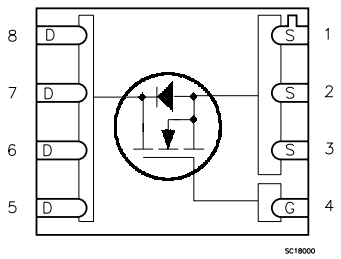
- TYPICAL $R_{DS}(on)$ = 0.0055Ω
- IMPROVED DIE-TO-FOOTPRINT RATIO
- VERY LOW PROFILE PACKAGE

PowerFLAT™(6x5)
(Chip Scale 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.

INTERNAL SCHEMATIC DIAGRAM



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 (continuos) at T_C = 25°C Drain Current (continuos) 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

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 µA, V_{GS} = 0	30			V
I_{DSS}	Zero Gate Voltage Drain Current (V_{GS} = 0)	V_{DS} = Max Rating			1	µA
		V_{DS} = Max Rating, T_C = 125 °C			10	µA
I_{GSS}	Gate-body Leakage Current (V_{DS} = 0)	V_{GS} = ± 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 = 250µA	1			V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 10 V, I_D = 17.5 A		0.0055	0.007	Ω
		V_{GS} = 4.5 V, I_D = 17.5A		0.007	0.010	Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward Transconductance	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$, I_D = 17.5 A		TBD		S
C_{iss}	Input Capacitance	V_{DS} = 25 V, f = 1 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 V, I_D = 17.5 A		TBD		ns
t_r	Rise Time	R_G = 4.7Ω V_{GS} = 4.5V (see test circuit, Figure 3)		TBD		ns
Q_g	Total Gate Charge	V_{DD} = 15 V, I_D = 35 A,		80		nC
Q_{gs}	Gate-Source Charge	V_{GS} = 10 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 V, I_D = 17.5 A,		TBD		ns
t_f	Fall Time	R_G = 4.7Ω, V_{GS} = 4.5 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 A, V_{GS} = 0			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD} = 35 A, di/dt = 100A/µs,		TBD		ns
Q_{rr}	Reverse Recovery	V_{DD} = 30 V, T_j = 150°C		TBD		nC
I_{RRM}	ChargeReverse 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

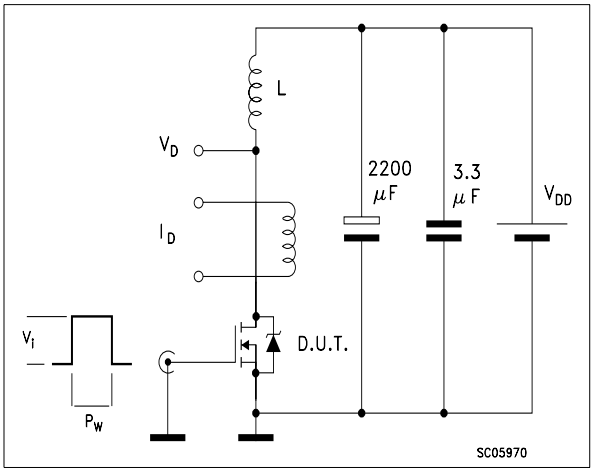


Fig. 2: Unclamped Inductive Waveform

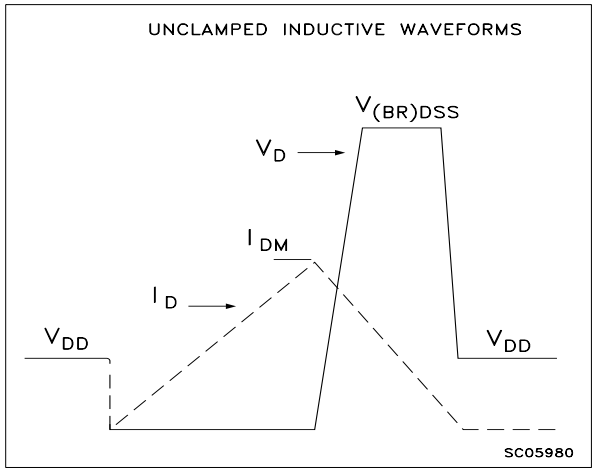


Fig. 3: Switching Times Test Circuit For Resistive Load

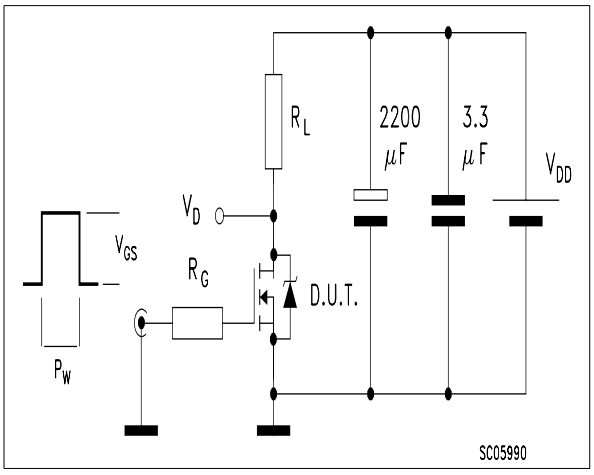


Fig. 4: Gate Charge test Circuit

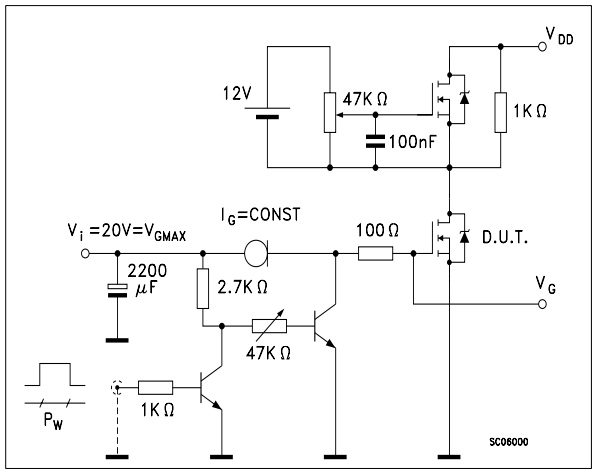
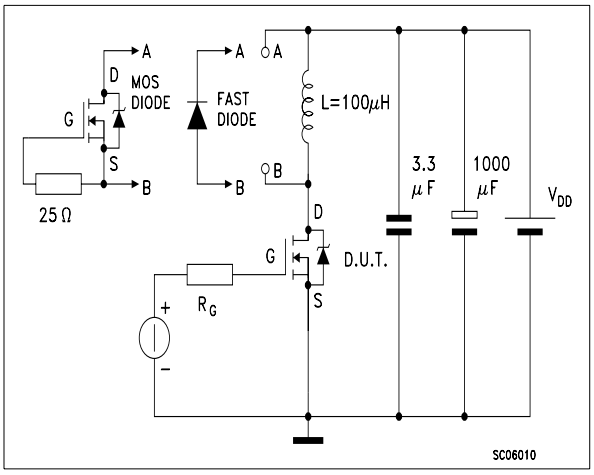


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



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