



# STL35NF10

## N-CHANNEL 100V - 0.025Ω - 35A PowerFLAT™ LOW GATE CHARGE STripFET™ MOSFET

PRELIMINARY DATA

TYPE	V <sub>DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
STL35NF10	100 V	< 0.030 Ω	35 A

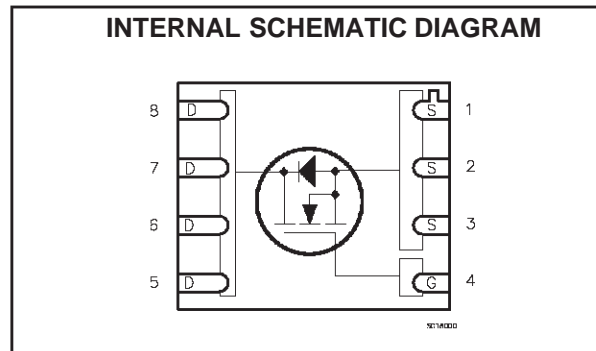
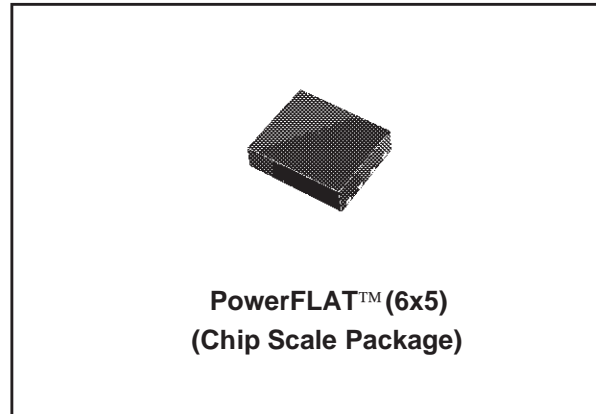
- TYPICAL R<sub>DS(on)</sub> = 0.025Ω
- IMPROVED DIE-TO-FOOTPRINT RATIO
- VERY LOW PROFILE PACKAGE

### 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

- HIGH EFFICIENCY ISOLATED DC/DC CONVERTERS



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-source Voltage (V <sub>GS</sub> = 0)	100	V
V <sub>DGR</sub>	Drain-gate Voltage (R <sub>GS</sub> = 20 kΩ)	100	V
V <sub>GS</sub>	Gate- source Voltage	± 20	V
I <sub>D</sub>	Drain Current (continuous) at T <sub>C</sub> = 25°C Drain Current (continuous) at T <sub>C</sub> = 100°C	35 22	A A
I <sub>DM</sub> (●)	Drain Current (pulsed)	140	A
P <sub>TOT</sub>	Total Dissipation at T <sub>C</sub> = 25°C	80	W
	Derating Factor	0.64	W/°C
EAS (1)	Single Pulse Avalanche Energy	135	mJ
T <sub>stg</sub>	Storage Temperature	-65 to 150	°C
T <sub>j</sub>	Max. Operating Junction Temperature	-55 to 150	°C

(●) Pulse width limited by safe operating area

(1) Starting T<sub>j</sub> = 25°C, I<sub>D</sub> = 35A, V<sub>DD</sub> = 50V

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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 <sub>(BR)DSS</sub>	Drain-source Breakdown Voltage	I <sub>D</sub> = 250 μA, V <sub>GS</sub> = 0	100			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current (V <sub>GS</sub> = 0)	V <sub>DS</sub> = Max Rating V <sub>DS</sub> = Max Rating, T <sub>C</sub> = 125 °C			1 10	μA μA
I <sub>GSS</sub>	Gate-body Leakage Current (V <sub>DS</sub> = 0)	V <sub>GS</sub> = ± 20V			±100	nA

#### ON (1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2	2.8	4	V
R <sub>DS(on)</sub>	Static Drain-source On Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 17.5 A		0.025	0.030	Ω

#### DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g <sub>fs</sub> (1)	Forward Transconductance	V <sub>DS</sub> = 20 V, I <sub>D</sub> = 15 A		18		S
C <sub>iSS</sub>	Input Capacitance	V <sub>DS</sub> = 25 V, f = 1 MHz, V <sub>GS</sub> = 0		1780		pF
C <sub>oSS</sub>	Output Capacitance			265		pF
C <sub>rSS</sub>	Reverse Transfer Capacitance			162		pF

**ELECTRICAL CHARACTERISTICS (CONTINUED)**  
**SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 50\text{ V}$ , $I_D = 17.5\text{ A}$		28		ns
$t_r$	Rise Time	$R_G = 4.7\Omega$ , $V_{GS} = 10\text{ V}$ (see test circuit, Figure 1)		63		ns
$Q_g$	Total Gate Charge	$V_{DD} = 80\text{ V}$ , $I_D = 35\text{ A}$ ,		60	80	nC
$Q_{gs}$	Gate-Source Charge	$V_{GS} = 10\text{ V}$		10		nC
$Q_{gd}$	Gate-Drain Charge	(see test circuit, Figure 2)		23		nC

**SWITCHING OFF**

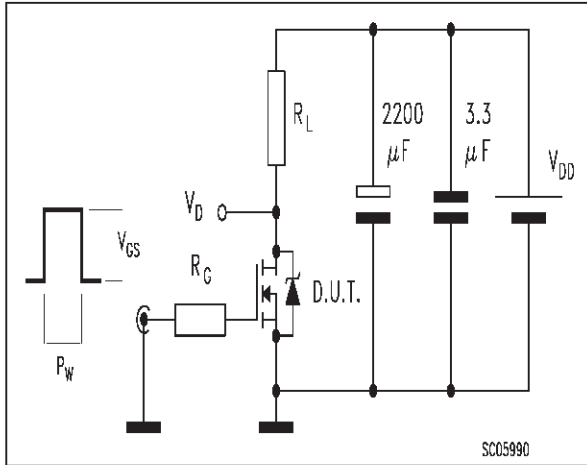
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off-Delay Time	$V_{DD} = 50\text{ V}$ , $I_D = 17.5\text{ A}$ ,		84		ns
$t_f$	Fall Time	$R_G = 4.7\Omega$ , $V_{GS} = 10\text{ V}$ (see test circuit, Figure 1)		28		ns

**SOURCE DRAIN DIODE**

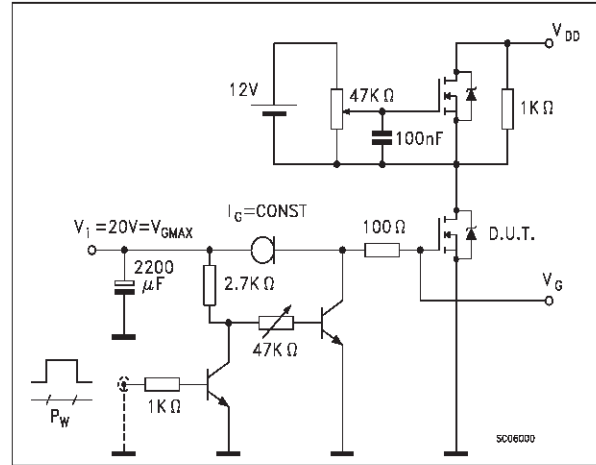
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{SD}$	Source-drain Current				35	A
$I_{SDM}$ (1)	Source-drain Current (pulsed)				140	A
$V_{SD}$ (2)	Forward On Voltage	$I_{SD} = 18\text{ A}$ , $V_{GS} = 0$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 35\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ ,		114		ns
$Q_{rr}$	Reverse Recovery Charge	$V_{DD} = 25\text{ V}$ , $T_j = 150^\circ\text{C}$		456		nC
$I_{RRM}$	Reverse Recovery Current	(see test circuit, Figure 3)		8		A

Note: 1. Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5%.  
 2. Pulse width limited by safe operating area.

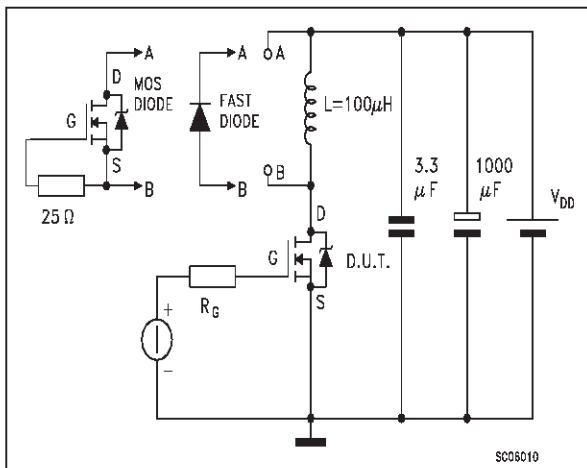
**Fig. 1:** Switching Times Test Circuit For Resistive Load



**Fig. 2:** Gate Charge test Circuit

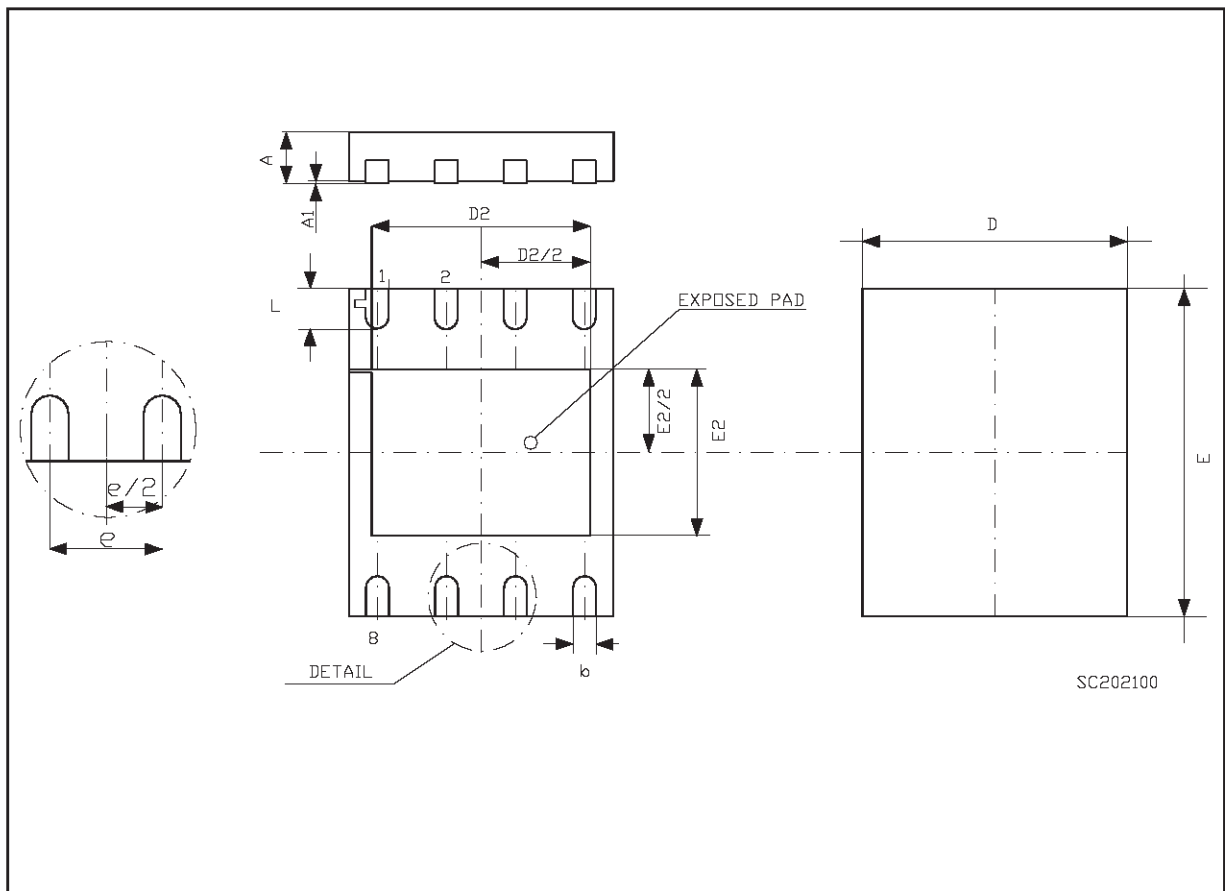


**Fig. 3:** Test Circuit For Diode Recovery Behaviour



### PowerFLAT™ (6x5) MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.80		1.00	0.031		0.039
A1		0.08			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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