



STT1NF100

N-CHANNEL 100V - 0.7Ω - 1A SOT23-6L

STripFET™ II POWER MOSFET

PRELIMINARY DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STT1NF100	100V	<0.8Ω	1A

- TYPICAL R_{DS(on)} = 0.7Ω
- EXCEPTIONAL dv/dt CAPABILITY
- VERY LOW Q_g

DESCRIPTION

This Power MOSFET is the latest development of ST-Microelectronics unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility.

APPLICATIONS

- DC-DC & DC-AC CONVERTERS
- DC MOTOR CONTROL (DISK DRIVES, etc.)
- SYNCHRONOUS RECTIFICATION

MARKING

- STQ0

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DS}	Drain-source Voltage (V _{GS} = 0)	100	V
V _{DGR}	Drain-gate Voltage (R _{GS} = 20 kΩ)	100	V
V _{GS}	Gate- source Voltage	± 20	V
I _D	Drain Current (continuous) at T _C = 25°C	1	A
I _D	Drain Current (continuous) at T _C = 100°C	0.6	A
I _{DM} (●)	Drain Current (pulsed)	4	A
P _{TOT}	Total Dissipation at T _C = 25°C	1.6	W
	Derating Factor	0.013	W/°C
dv/dt(1)	Peak Diode Recovery voltage slope	20	V/ns
T _{stg}	Storage Temperature	- 55 to 150	°C
T _j	Max. Operating Junction Temperature		

(●) Pulse width limited by safe operating area

(1) I_{SD} ≤ 1A, di/dt ≤ 350A/μs, V_{DD} ≤ V_{(BR)DSS}, T_j ≤ T_{JMAX}.

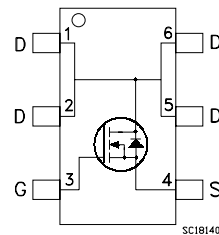
September 2002

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SOT23-6L

INTERNAL SCHEMATIC DIAGRAM



STT1NF100

THERMAL DATA

Rthj-amb(*)	Thermal Resistance Junction-ambient Max	78	°C/W
T _I	Maximum Lead Temperature For Soldering Purpose	260	°C

(*) When mounted on FR-4 board of 1inch² pad, 0.5oz Cu

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	100			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} = ± 20V			±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	2			V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10V, I _D = 0.5 A		0.7	0.8	Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (1)	Forward Transconductance	V _{DS} = 15V, I _D = 1A		1		S
C _{iss}	Input Capacitance	V _{DS} = 25V, f = 1 MHz, V _{GS} = 0		105		pF
C _{oss}	Output Capacitance			20		pF
C _{rss}	Reverse Transfer Capacitance			9		pF

ELECTRICAL CHARACTERISTICS (CONTINUED)**SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 50V$, $I_D = 0.5A$		4		ns
t_r	Rise Time	$R_G = 4.7\Omega$, $V_{GS} = 10V$ (see test circuit, Figure 1)		5.5		ns
Q_g	Total Gate Charge	$V_{DD} = 50V$, $I_D = 1A$,		4	6	nC
Q_{gs}	Gate-Source Charge	$V_{GS} = 10V$		1		nC
Q_{gd}	Gate-Drain Charge	(see test circuit, Figure 2)		1.5		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off-Delay Time	$V_{DD} = 50V$, $I_D = 0.5A$,		13		ns
t_f	Fall Time	$R_G = 4.7\Omega$, $V_{GS} = 10V$ (see test circuit, Figure 1)		6.5		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				1	A
$I_{SDM(2)}$	Source-drain Current (pulsed)				4	A
$V_{SD(1)}$	Forward On Voltage	$I_{SD} = 1A$, $V_{GS} = 0$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 1A$, $di/dt = 100A/\mu s$,		45		ns
Q_{rr}	Reverse Recovery Charge	$V_{DD} = 20V$, $T_j = 150^\circ C$		60		nC
I_{RRM}	Reverse Recovery Current	(see test circuit, Figure 3)		2.7		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

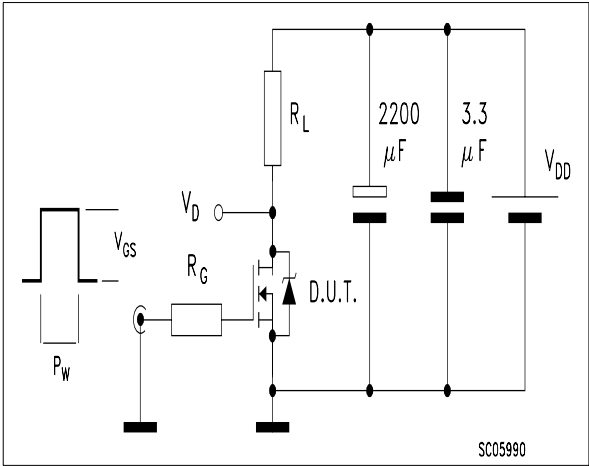


Fig. 2: Gate Charge test Circuit

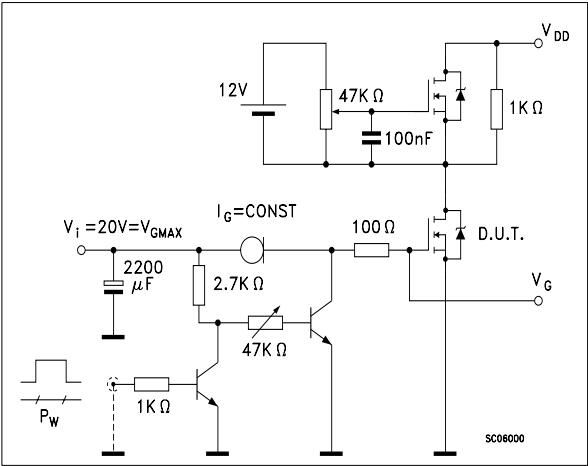
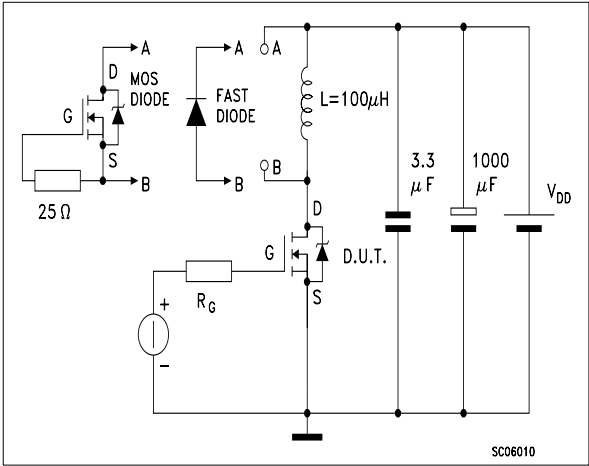
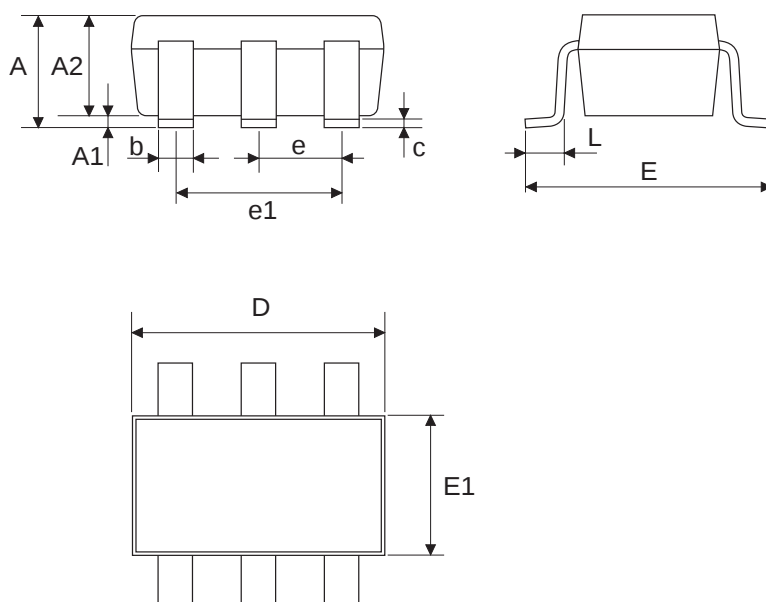


Fig. 3: Test Circuit For Diode Recovery Behaviour



TSOP-6 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.90		1.45	0.035		0.057
A1	0.00		0.15	0.000		0.006
A2	0.90		1.30	0.035		0.051
b	0.25		0.50	0.010		0.020
C	0.09		0.20	0.004		0.008
D	2.80		3.10	0.110		0.122
E	2.60		3.00	0.102		0.118
E1	1.50		1.75	0.059		0.069
L	0.35		0.55	0.014		0.022
e		0.95			0.037	
e1		1.90			0.075	



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