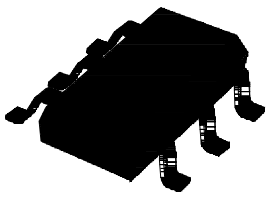
STT4NF30L

N - CHANNEL 30V - 0.055Ω - 4A - TSOP-6
STripFET™ MOSFET

PRELIMINARY DATA

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STT4NF30L	30 V	< 0.065 Ω	4 A

- TYPICAL $R_{DS(on)}$ = 0.055 Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY
- LOW THRESHOLD DRIVE



TSOP-6

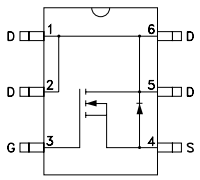
DESCRIPTION

This Power MOSFET is the latest development of STMicroelectronics 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 MOTOR DRIVE
- DC-DC CONVERTERS
- BATTERY MANAGEMENT IN NOMADIC EQUIPMENT
- POWER MANAGEMENT IN PORTABLE/DESKTOP PCs

INTERNAL SCHEMATIC DIAGRAM



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	± 20	V
I_D	Drain Current (continuous) at T_c = 25 °C	4	A
I_D	Drain Current (continuous) at T_c = 100 °C	2.5	A
I_{DM}(•)	Drain Current (pulsed)	16	A
P_{tot}	Total Dissipation at T_c = 25 °C	2	W

(•) Pulse width limited by safe operating area

THERMAL DATA

$R_{thj\text{-}amb}$	(*)Thermal Resistance Junction-ambient Max	62.5	°C/W
T_J	Maximum Operating Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55 to 150	°C

(*) Mounted on FR-4 board (t ≤ 5 sec)

ELECTRICAL CHARACTERISTICS (T_{case} = 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 V_{DS} = Max Rating T_c = 125 °C				1 10	µA µA
I_{GSS}	Gate-body Leakage Current (V_{DS} = 0)	V_{GS} = ± 20 V			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS} I_D = 250 µA	1	1.7	2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 10V I_D = 2 A V_{GS} = 4.5V I_D = 2 A		0.055 0.06	0.065 0.09	Ω Ω
$I_{D(on)}$	On State Drain Current	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$ V_{GS} = 10 V	4			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$ I_D =6 A		6		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{DS} = 25 V f = 1 MHz V_{GS} = 0		420 62 20	550 80 30	pF pF pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Time Rise Time	V_{DD} = 15 V I_D = 2 A R_G =4.7 Ω V_{GS} = 4.5 V (see test circuit, figure 3)		13 30	17 40	ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V_{DD} = 24 V I_D = 4 A V_{GS} = 4.5 V		8 3.2 2.6	12	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	V_{DD} = 24 V I_D = 4 A R_G =4.7 Ω V_{GS} = 4.5 V (see test circuit, figure 5)		6 9 20	8 12 26	ns ns ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM}(•)	Source-drain Current Source-drain Current (pulsed)				4 16	A A
V_{SD} (*)	Forward On Voltage	I_{SD} = 4 A V_{GS} = 0			1.2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	I_{SD} = 4 A di/dt = 100 A/µs V_{DD} = 15 V T_j = 150 °C (see test circuit, figure 5)		22 13 1.2		ns nC A

(*) Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

(•) Pulse width limited by safe operating area

Fig. 1: Unclamped Inductive Load Test Circuit

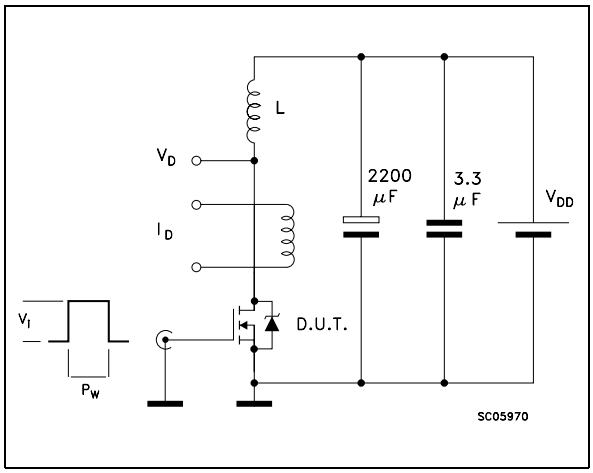


Fig. 2: Unclamped Inductive Waveform

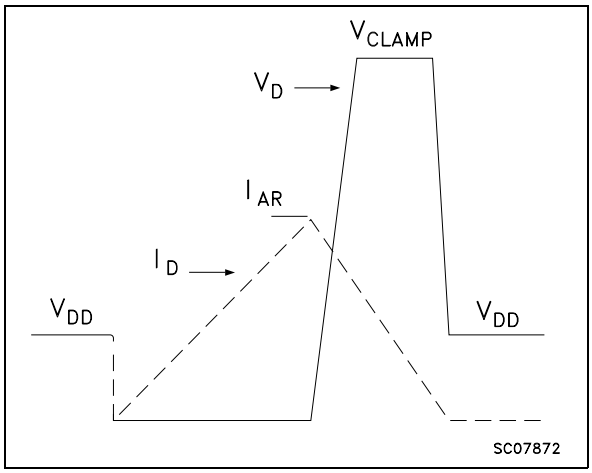


Fig. 3: Switching Times Test Circuits For Resistive Load

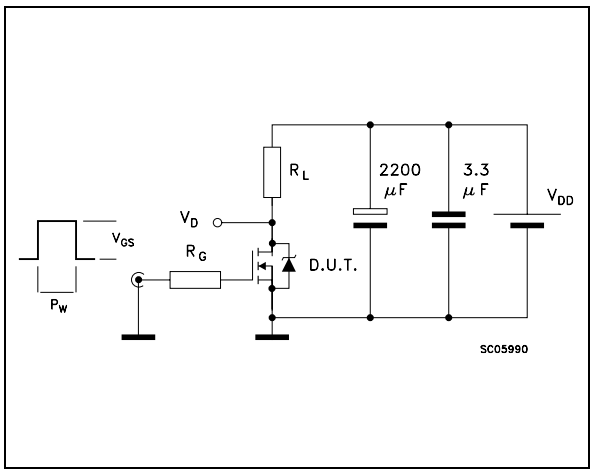


Fig. 4: Gate Charge test Circuit

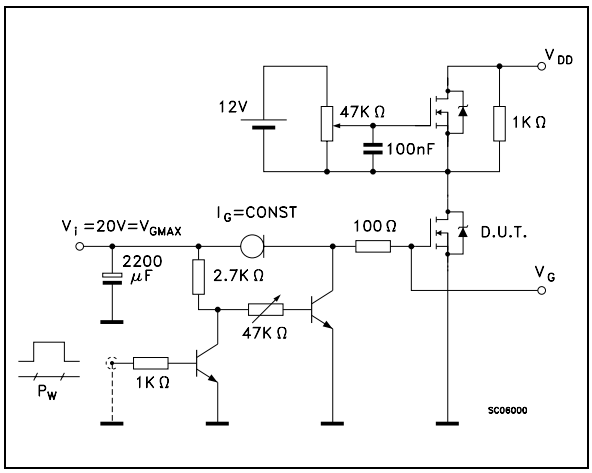
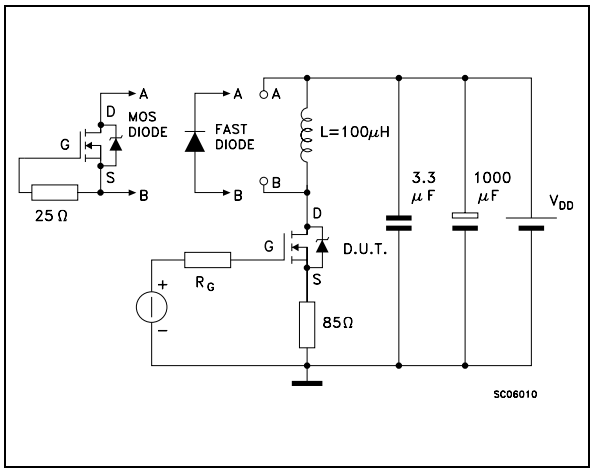


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



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