STC6NF30V

N-CHANNEL 30V - 0.020 Ω - 6A TSSOP8
2.5V-DRIVE STripFET™ II POWER MOSFET

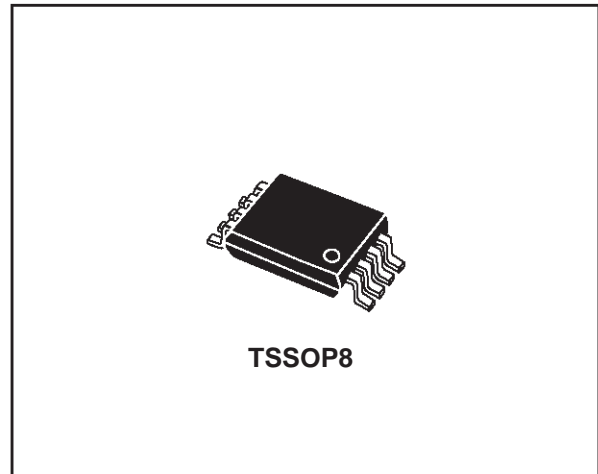| TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STC6NF30V	30 V	< 0.025 Ω (@ 4.5 V) < 0.030 Ω (@ 2.5 V)	6 A

- TYPICAL R_{DS}(on) = 0.020 Ω @ 4.5 V
- TYPICAL R_{DS}(on) = 0.025 Ω @ 2.5 V
- ULTRA LOW THRESHOLD GATE DRIVE (2.5 V)
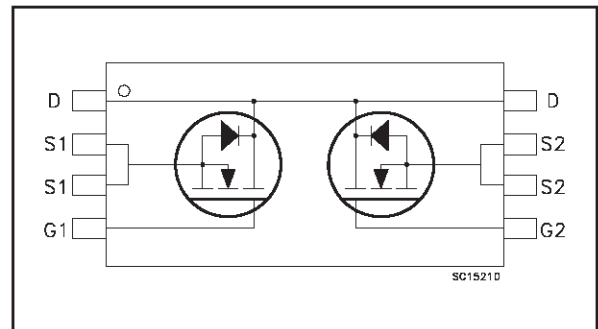- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY

DESCRIPTION

This Power MOSFET is the latest development of STMicroelectronis unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance.

APPLICATIONS

- DC MOTOR DRIVE
- DC-DC CONVERTERS
- BATTERY SAFETY UNIT FOR NOMADIC EQUIPMENT
- POWER MANAGEMENT IN PORTABLE/DESKTOP PCs

TSSOP8

INTERNAL SCHEMATIC DIAGRAM

SC15210

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	± 12	V
I_D	Drain Current (continuous) at T_C = 25°C	6	A
I_D	Drain Current (continuous) at T_C = 100°C	3.8	A
I_{DM}(•)	Drain Current (pulsed)	24	A
P_{tot}	Total Dissipation at T_C = 25°C	1.25	W

(•) Pulse width limited by safe operating area.

THERMAL DATA

Rthj-amb	Thermal Resistance Junction-ambient	Max	100	°C/W
T_j	Max. Operating Junction Temperature		150	°C
T_{stg}	Storage Temperature		-55 to 150	°C

(*) When Mounted on 1 in2 of FR4 board

ELECTRICAL CHARACTERISTICS (T_j = 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} = ± 12 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	0.6			V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 4.5 V V_{GS} = 2.5 V	I_D = 3 A I_D = 3 A		0.020 0.025	0.025 0.030	Ω Ω

DYNAMIC

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	V_{DS} = 10 V	I_D = 6 A		18		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{DS} = 25V f = 1 MHz, V_{GS} = 0			800 180 32		pF pF pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Delay Time Rise Time	V_{DD} = 15 V $\quad$ I_D = 3 A R_G = 4.7 Ω $\quad$ V_{GS} = 2.5 V (Resistive Load, Figure 1)		20 25		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V_{DD}= 15V I_D= 6A V_{GS}=2.5V (see test circuit, Figure 2)		6.8 2.0 3.4	9	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$ t_f	Turn-off Delay Time Fall Time	V_{DD} = 15 V $\quad$ I_D = 3 A R_G = 4.7Ω, $\quad$ V_{GS} = 2.5 V (Resistive Load, Figure 1)		32 13		ns ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM} (•)	Source-drain Current Source-drain Current (pulsed)				6 24	A A
V_{SD} (*)	Forward On Voltage	I_{SD} = 6 A $\quad$ V_{GS} = 0			1.2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	I_{SD} = 6 A $\quad$ di/dt = 100A/µs V_{DD} = 15 V $\quad$ T_j = 150°C (see test circuit, Figure 3)		25 21 1.7		ns nC A

(*)Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %.
(•)Pulse width limited by safe operating area.

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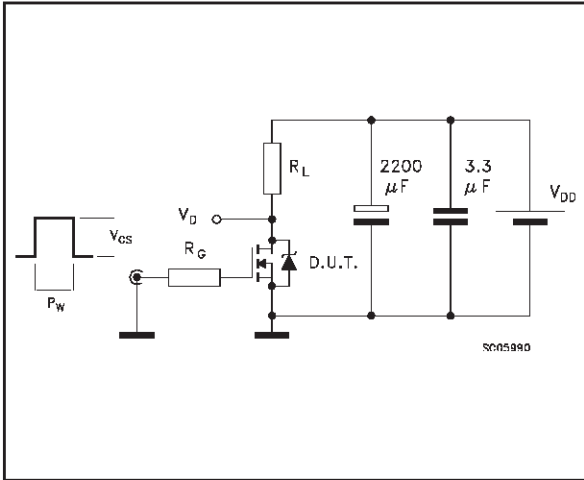
Fig. 1: Switching Times Test Circuits For Resistive Load
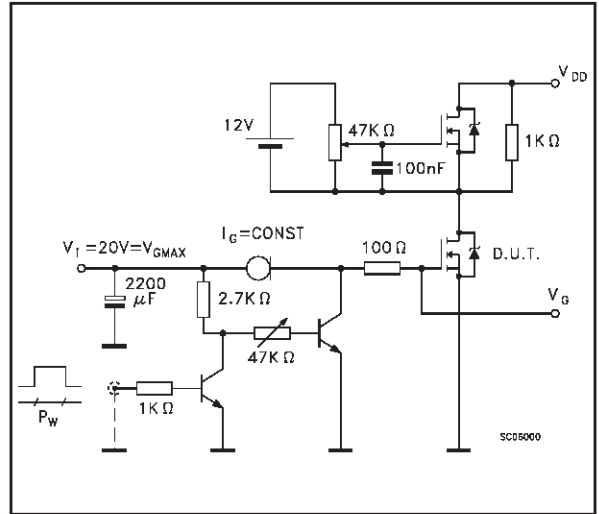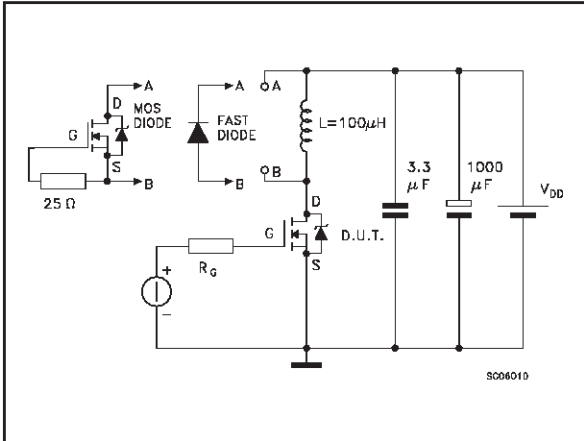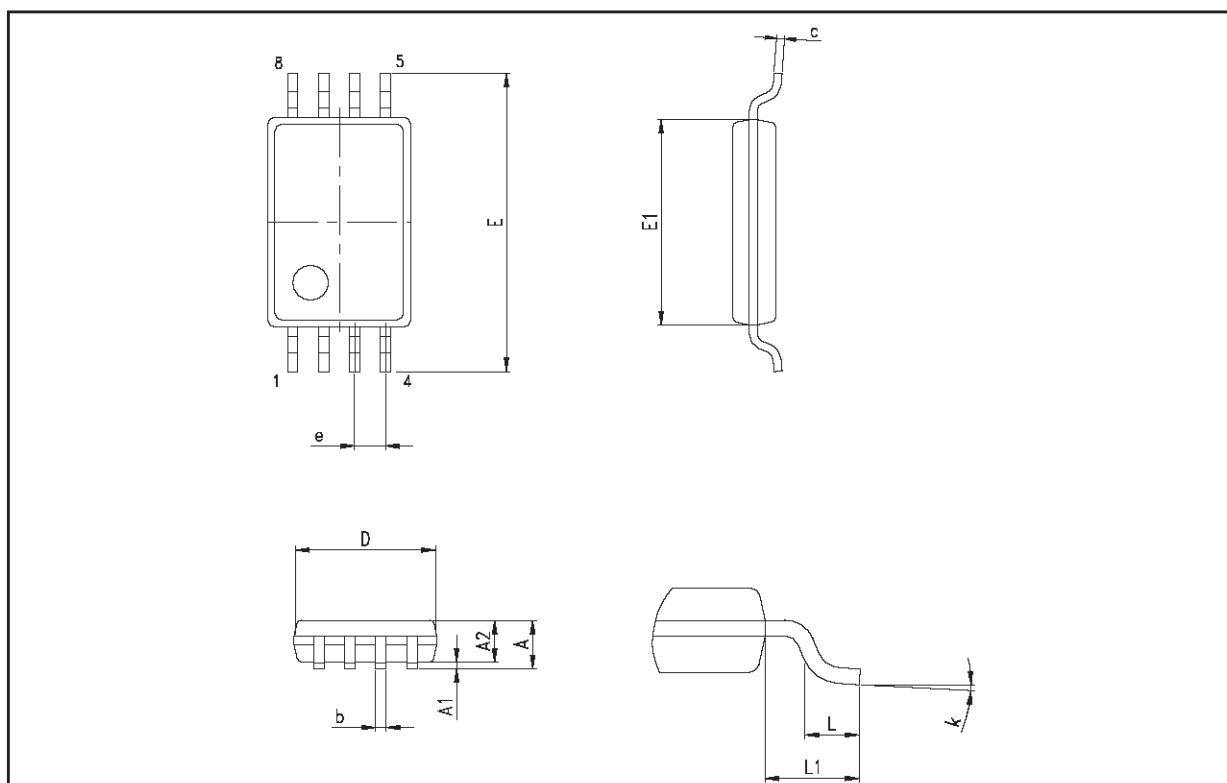

Fig. 2: Gate Charge test Circuit

Fig. 3: Test Circuit For Diode Recovery Behaviour

TSSOP8 MECHANICAL DATA

DIM.	mm.			inch.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.05		1.20	0.041		0.047
A1	0.05		0.15	0.002		0.006
A2	0.80		1.05	0.032		0.041
b	0.19		0.30	0.008		0.012
c	0.090		0.20	0.003		0.007
D	2.90		3.10	0.114		0.122
E	6.20		6.60	0.240		0.260
E1	4.30		4.50	0.170		0.177
e		0.65			0.025	
L	0.45		0.75	0.018		0.030
L1		1.00			0.039	
k	0º		8º	0.192		0.208