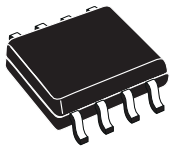
STS7PF30L

P-CHANNEL 30V - 0.016Ω - 7A SO-8
STripFET™ II POWER MOSFET

PRELIMINARY DATA

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STS7PF30L	30 V	< 0.021 Ω	7 A

- TYPICAL $R_{DS}(on)$ = 0.016Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY
- LOW THRESHOLD DRIVE

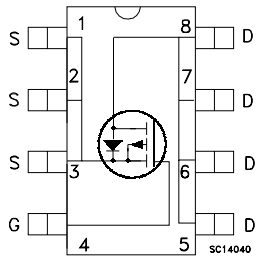


SO-8

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.

INTERNAL SCHEMATIC DIAGRAM



APPLICATIONS

- BATTERY MANAGEMENT IN NOMADIC EQUIPMENT
- POWER MANAGEMENT IN CELLULAR PHONES

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	7	A
I_D	Drain Current (continuous) at T_C = 100°C	4.4	A
I_{DM}	Drain Current (pulsed)	28	A
P_{TOT}	Total Dissipation at T_C = 25°C	2.5	W

(●) Pulse width limited by safe operating area

Note: For the P-CHANNEL MOSFET actual polarity of voltages and current has to be reversed

THERMAL DATA

Rthj-amb(#)	Thermal Resistance Junction-ambient Max	50	°C/W
Tj	Maximum Lead Temperature For Soldering Purpose Typ	150	°C
T_{stg}	Storage Temperature	–55 to 150	°C

(#) When mounted on 1 inch^2 FR4 Board, 2 oz of Cu and t ≤ 10s

ELECTRICAL CHARACTERISTICS (T_J = 25 °C UNLESS OTHERRWISE 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} = ± 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	1	1.6	2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 10V, I_D = 3.5A	0.011	0.016	0.021	Ω
		V_{GS} = 4.5V, I_D = 3.5A	0.016	0.022	0.028	Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs}	Forward Transconductance	V_{DS} = 10V, I_D = 3.5A		16		S
C_{iss}	Input Capacitance	V_{DS} = 25 V, f = 1 MHz, V_{GS} = 0		2600		pF
C_{oss}	Output Capacitance			523		pF
C_{rss}	Reverse Transfer Capacitance			174		pF

ELECTRICAL CHARACTERISTICS (CONTINUED)

SWITCHING ON(2)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 15V, I_D = 3.5A		68		ns
t_r	Rise Time	R_G = 4.7Ω V_{GS} = 4.5 V (Resistive Load, Figure 3)		54		ns
Q_g	Total Gate Charge	V_{DD} =15 V, I_D = 7 A,		28	38	nC
Q_{gs}	Gate-Source Charge	V_{GS} = 4.5V		8.8		nC
Q_{gd}	Gate-Drain Charge			12		nC

SWITCHING OFF(2)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off-Delay Time	V_{DD} =15 V, I_D = 3.5 A,		65		ns
t_f	Fall Time	R_G = 4.7Ω, V_{GS} = 4.5 V (Resistive Load, Figure 3)		23		ns

SOURCE DRAIN DIODE (2)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				7	A
I_{SDM} (1)	Source-drain Current (pulsed)				28	A
V_{SD} (2)	Forward On Voltage	I_{SD} = 7 A, V_{GS} = 0			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD} = 7A, di/dt = 100A/µs,		40		ns
Q_{rr}	Reverse Recovery Charge	V_{DD} = 24 V, T_j = 150°C		46		nC
I_{RRM}	Reverse Recovery Current	(see test circuit, Figure 5)		2.3		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

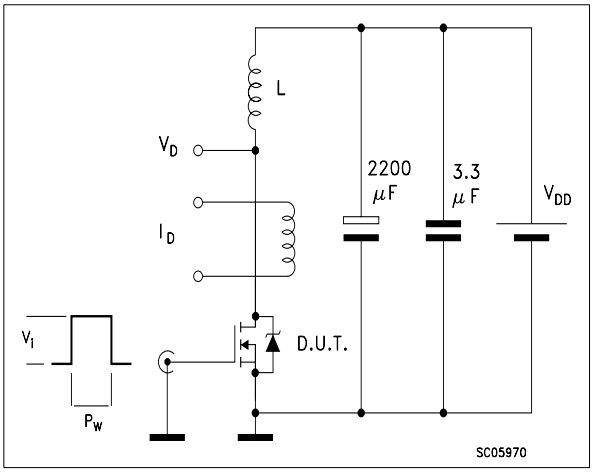


Fig. 2: Unclamped Inductive Waveform

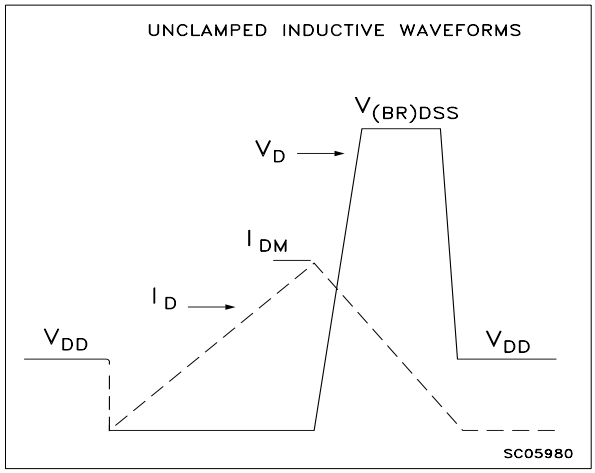


Fig. 3: Switching Times Test Circuit For Resistive Load

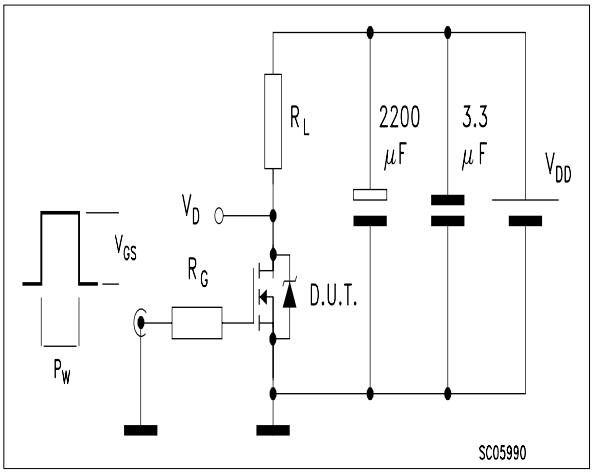


Fig. 4: Gate Charge test Circuit

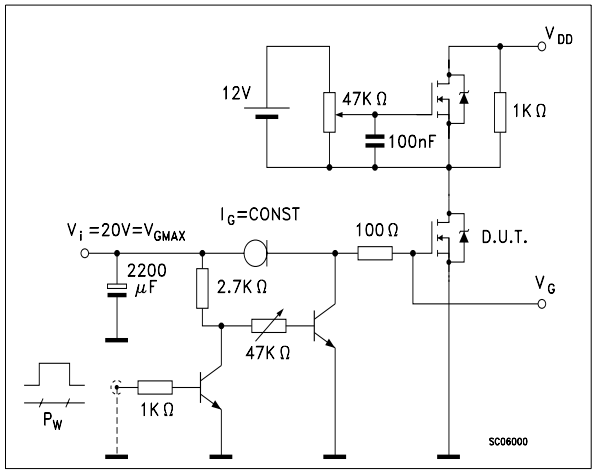
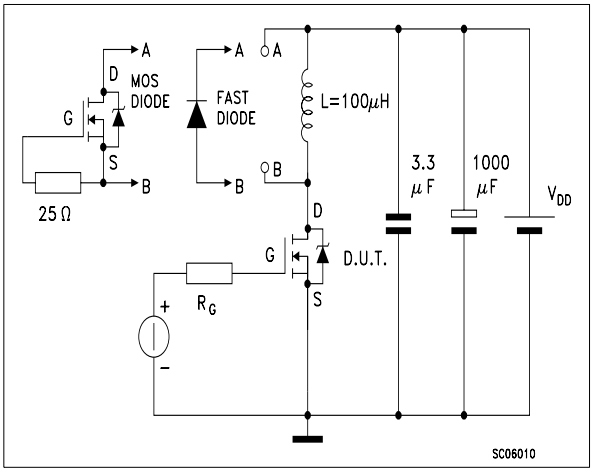
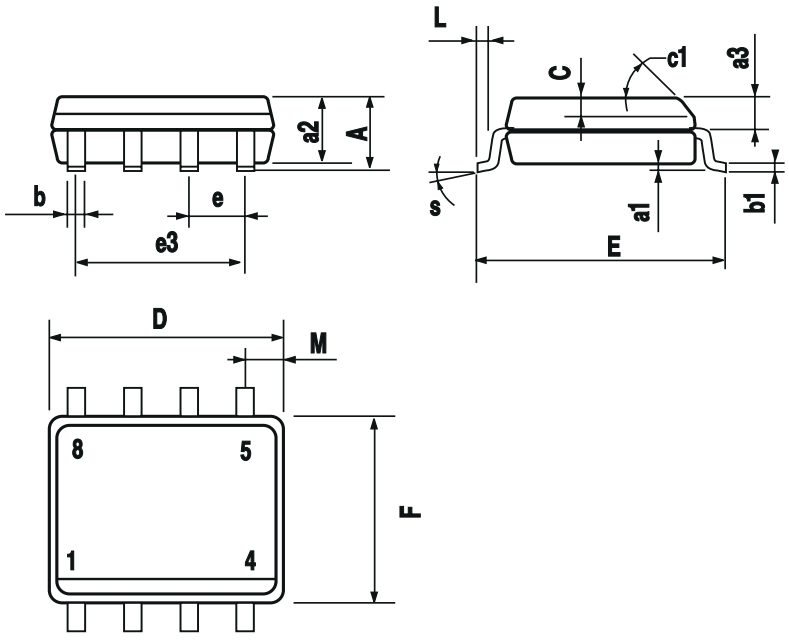


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



SO-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.25	0.003		0.009
a2			1.65			0.064
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.013		0.018
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.019
c1	45 (typ.)					
D	4.8		5.0	0.188		0.196
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.14		0.157
L	0.4		1.27	0.015		0.050
M			0.6			0.023
S	8 (max.)					



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