



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

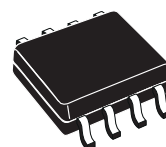
- TYPICAL R_{DS(on)} = 0.016Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY
- LOW THRESHOLD DRIVE

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.

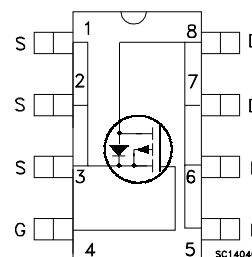
APPLICATIONS

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



SO-8

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	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

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THERMAL DATA

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

(#) When mounted on 1 inch² FR4 Board, 2 oz of Cu and t ≤ 10s

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} = ± 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 V _{GS} = 4.5V, I _D = 3.5A	0.011 0.016	0.016 0.022	0.021 0.028	Ω 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	$R_G = 4.7\Omega, V_{GS} = 4.5V$ (Resistive Load, Figure 3)		54		ns
Q_g	Total Gate Charge	$V_{DD} = 15V, I_D = 7A,$ $V_{GS} = 4.5V$		28	38	nC
Q_{gs}	Gate-Source Charge			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	$V_{DD} = 15V, I_D = 3.5A,$		65		ns
t_f	Fall Time	$R_G = 4.7\Omega, V_{GS} = 4.5V$ (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	$I_{SD} = 7A, V_{GS} = 0$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 7A, di/dt = 100A/\mu s,$		40		ns
Q_{rr}	Reverse Recovery Charge	$V_{DD} = 24V, T_j = 150^\circ C$		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

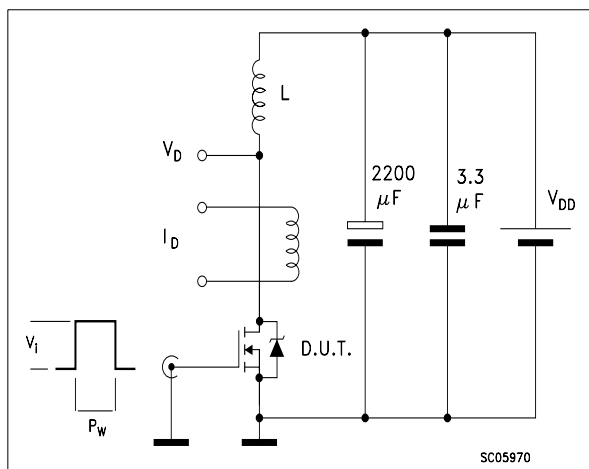


Fig. 2: Unclamped Inductive Waveform

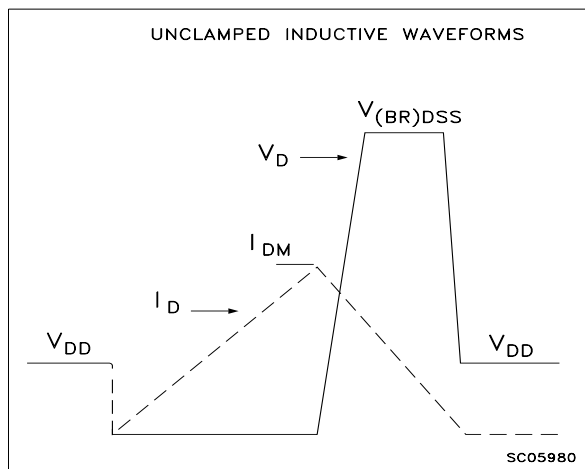


Fig. 3: Switching Times Test Circuit For Resistive Load

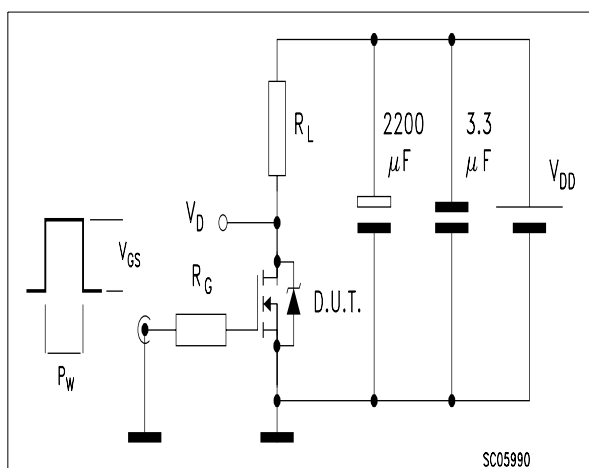


Fig. 4: Gate Charge test Circuit

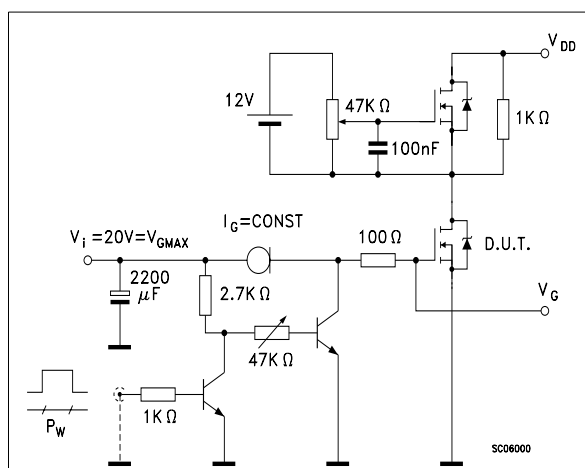
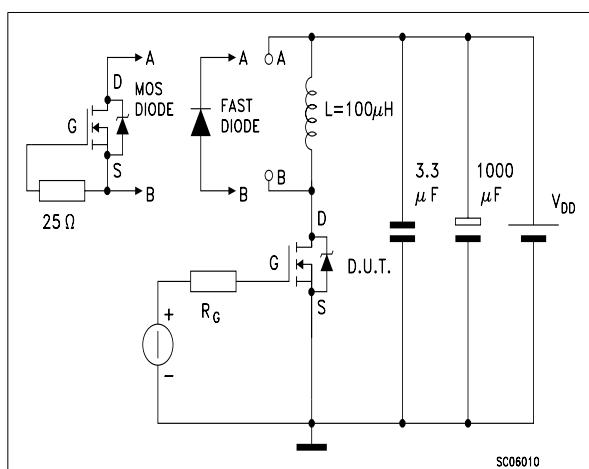
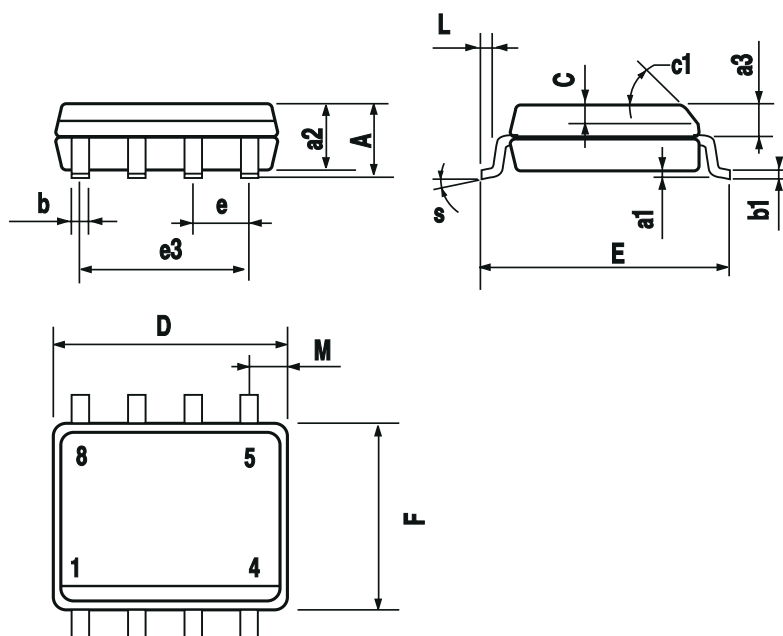


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



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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