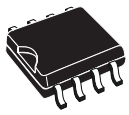
STS2DPF20V

DUAL P-CHANNEL 20V - 0.14Ω - 2A SO-8
2.7V-DRIVE STripFET™ II POWER MOSFET

PRELIMINARY DATA

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STS2DPF20V	20 V	<0.20Ω (@4.5V) <0.25Ω (@2.7V)	2 A

- TYPICAL R_{DS}(on) = 0.14Ω (@4.5V)
- TYPICAL R_{DS}(on) = 0.2Ω (@2.7V)
- ULTRA LOW THRESHOLD GATE DRIVE (2.7V)
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY

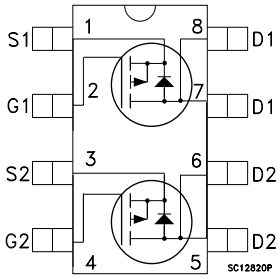


SO-8

DESCRIPTION

This Power MOSFET is the second generation 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.

INTERNAL SCHEMATIC DIAGRAM



APPLICATIONS

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

MOSFET ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage (V_{GS} = 0)	20	V
V_{DGR}	Drain-gate Voltage (R_{GS} = 20 kΩ)	20	V
V_{GS}	Gate- source Voltage	± 12	V
I_D	Drain Current (continuos) at T_C = 25°C Single Operation Drain Current (continuos) at T_C = 100°C Single Operation	2 1.26	A A
I_{DM} (●)	Drain Current (pulsed)	8	A
P_{TOT}	Total Dissipation at T_C = 25°C Dual Operation Total Dissipation at T_C = 25°C Single Operation	1.6 2	W 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 Single Operation Dual Operation	62.5 78	°C/W °C/W
T_{stg}	Storage Temperature	-55 to 150	°C
T_j	Junction-ambient Temperature	-55 to 150	°C
	(*) When Mounted on 0.5 in² of 2 oz. Copper		

MOSFET 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	20			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} = ± 12 V			±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	0.6			V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 4.5 V, I_D = 1 A		0.14	0.20	Ω
		V_{GS} = 2.7 V, I_D = 1 A		0.20	0.25	Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward Transconductance	V_{DS} = 15 V, I_D = 1.5 A		4.5		S
C_{iss}	Input Capacitance	V_{DS} = 15V, f = 1 MHz, V_{GS} = 0		315		pF
C_{oss}	Output Capacitance			87		pF
C_{rss}	Reverse Transfer Capacitance			17		pF

ELECTRICAL CHARACTERISTICS (CONTINUED)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 10 V, I_D = 1.5A		38		ns
t_r	Rise Time	R_G = 4.7Ω V_{GS} = 4.5V (see test circuit, Figure 1)		30		ns
Q_g	Total Gate Charge	V_{DD} = 10V, I_D = 2 A,		3.8	4.8	nC
Q_{gs}	Gate-Source Charge	V_{GS} = 4.5 V (see test circuit, Figure 2)		0.34		nC
Q_{gd}	Gate-Drain Charge			0.8		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off Delay Time	V_{DD} = 10 V, I_D = 1 A,		45		ns
t_f	Fall Time	R_G = 4.7Ω, V_{GS} = 4.5 V (see test circuit, Figure 1)		11		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				2	A
I_{SDM} (2)	Source-drain Current (pulsed)				8	A
V_{SD} (1)	Forward On Voltage	I_{SD} = 2 A, V_{GS} = 0			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD} = 2 A, di/dt = 100A/µs,		15		ns
Q_{rr}	Reverse Recovery Charge	V_{DD} = 10 V, T_j = 150°C (see test circuit, Figure 3)		7.5		nC
I_{RRM}	Reverse Recovery Current			1		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

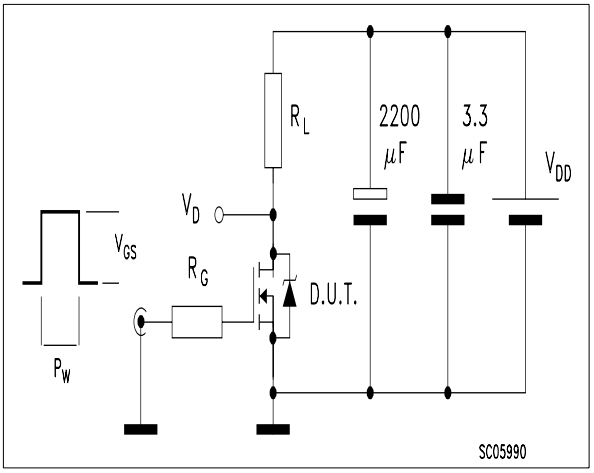


Fig. 2: Gate Charge test Circuit

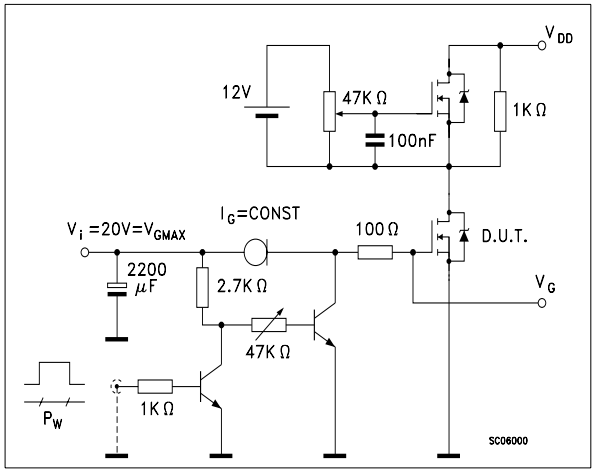
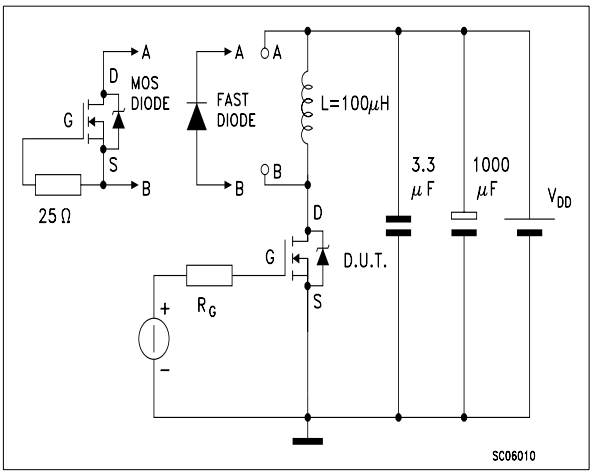
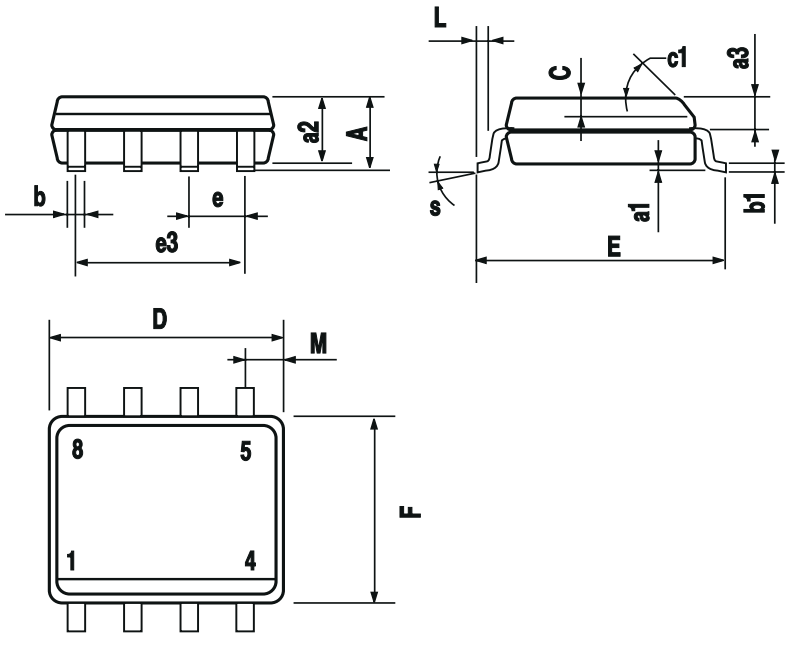


Fig. 3: Test Circuit For Diode Recovery Behaviour



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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