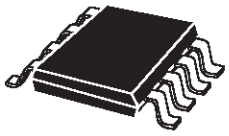
STM2DPFS30L

P - CHANNEL 30V - 0.145Ω - 2A MiniS0-8 STripFET™ MOSFET PLUS SCHOTTKY RECTIFIER

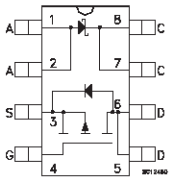
PRELIMINARY DATA

MAIN PRODUCT CHARACTERISTICS			
MOSFET	V_{DSS}	$R_{DS(on)}$	I_D
	30V	<0.165Ω	2A
SCHOTTKY	$I_{F(AV)}$	V_{RRM}	$V_{F(MAX)}$
	1A	40V	0.55V



MiniSO-8

INTERNAL SCHEMATIC DIAGRAM



DESCRIPTION:

This product associates the latest low voltage StripFET™ in p-channel version to a low drop Schottky diode. Such configuration is extremely versatile in implementing a large variety of DC-DC converters for printers, portable equipment, and cellular phones.

New MiniSO-8 package features:

- Half footprint area versus standard SO-8, for application where minimum circuit board space is necessary.
- Extremely low profile, ideal for low thickness equipment.

MOSFET 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	2	A
I_D	Drain Current (continuous) at T_c = 100 °C	1.3	A
I_{DM}(•)	Drain Current (pulsed)	8	A
P_{tot}	Total Dissipation at T_c = 25 °C	1.25	W

SCHOTTKY ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		40	V
$I_{F(RMS)}$	RMS Forward Current		2	A
$I_{F(AV)}$	Average Forward Current	T_a=60 °C δ =0.5	1.2	A
I_{FSM}	Surge Non Repetitive Forward Current	tp= 10 ms Sinusoidal	5.5	A
dv/dt	Critical Rate Of Rise Of Reverse Voltage		10000	V/µs

(•) 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

$R_{thj\text{-}amb}$	(*) Thermal Resistance Junction-ambient MOSFET	100	$^oC/W$
T_{stg}	Storage Temperature Range Maximum	-65 to 150	^oC
T_j	Junction Temperature	150	^oC

(*) Mounted on a 1 in^2 pad of 2oz Cu in FR-4 board

MOSFET ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC 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 ^oC			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 = 1 A V_{GS} = 4.5V I_D = 1 A		0.145 0.18	0.165 0.2	Ω
$I_{D(on)}$	On State Drain Current	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$ V_{GS} = 10 V	2			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 =1 A		2		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{DS} = 25 V f = 1 MHz V_{GS} = 0		510 170 55	660 220 72	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 I_D = 1.5 A R_G = 4.7 Ω V_{GS} = 4.5 V (Resistive Load, see fig. 1)		14.5 37	19 48	ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V_{DD} = 24 V I_D = 3 A V_{GS} = 5 V		5.5 1.7 1.8		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 I_D = 1.5 A R_G = 4.7 Ω V_{GS} = 4.5 V (Resistive Load, see fig. 1)		88 23		ns ns

SOURCE DRAIN DIODE

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

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

SCHOTTKY STATIC ELETTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_R(*)	Reversed Leakage Current	T_J= 25 °C V_R=40V T_J= 100 °C V_R=40V		 1.5	40 5	µA mA
V_F(*)	Forward Voltage drop	T_J= 25 °C I_F=1A T_J= 100 °C I_F=1A T_J= 25 °C I_F=2A T_J= 100 °C I_F=2A		 0.45	0.55 0.51 0.7 0.7	V V V V

Fig. 1: Switching Times Test Circuits For Resistive Load

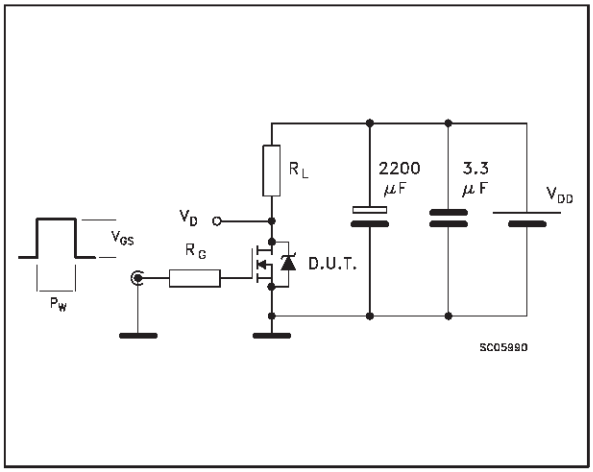
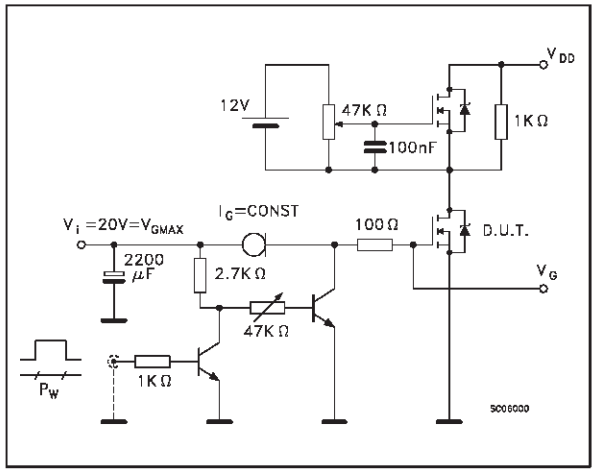


Fig. 2: Gate Charge test Circuit



MiniSO-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		1.10				
A1		0.10				
A2		0.86				
D		3.00				
D2		2.95				
E		4.90				
E1		3.00				
E2		2.95				
E3		0.51				
E4		0.51				
R		0.15				
R1		0.15				
t1		0.31				
t2		0.41				
θ1		3.0°				
θ2		12.0°				
L		0.55				
L1		0.95				
e		0.65				
S		0.525