

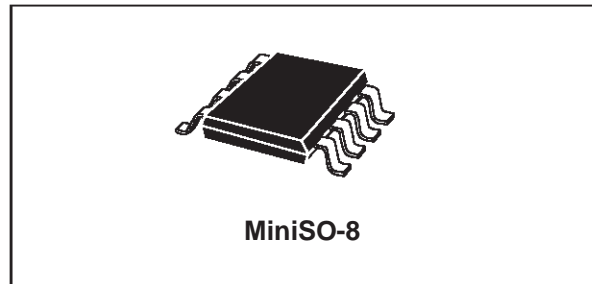


STM2DPFS30L

P - CHANNEL 30V - 0.145Ω - 2A MiniSO-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

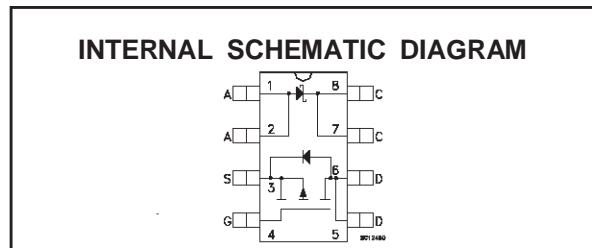


DESCRIPTION:

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

STM2DPFS30L

THERMAL DATA

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

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

MOSFET ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D = 250\ \mu A$ $V_{GS} = 0$	30			V
I_{DSS}	Zero Gate Voltage Drain Current ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating}$ $T_c = 125^{\circ}C$			1 10	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 20\ V$			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\ \mu A$	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	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 10\ V$	2			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_D = 1\ A$		2		S
C_{iss}	Input Capacitance	$V_{DS} = 25\ V$ $f = 1\ MHz$ $V_{GS} = 0$		510	660	pF
C_{oss}	Output Capacitance			170	220	pF
C_{rss}	Reverse Transfer Capacitance			55	72	pF

ELECTRICAL CHARACTERISTICS (continued)**SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 15\text{ V}$ $I_D = 1.5\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 4.5\text{ V}$ (Resistive Load, see fig. 1)		14.5	19	ns
t_r	Rise Time			37	48	ns
Q_g	Total Gate Charge	$V_{DD} = 24\text{ V}$ $I_D = 3\text{ A}$ $V_{GS} = 5\text{ V}$		5.5		nC
Q_{gs}	Gate-Source Charge			1.7		nC
Q_{gd}	Gate-Drain Charge			1.8		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-off Delay Time	$V_{DD} = 15\text{ V}$ $I_D = 1.5\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 4.5\text{ V}$ (Resistive Load, see fig. 1)		88		ns
t_f	Fall Time			23		ns

SOURCE DRAIN DIODE

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

(*) Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %

(\bullet) Pulse width limited by safe operating area

SCHOTTKY STATIC ELECTRICAL CHARACTERISTICS

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

Fig. 1: Switching Times Test Circuits For Resistive Load

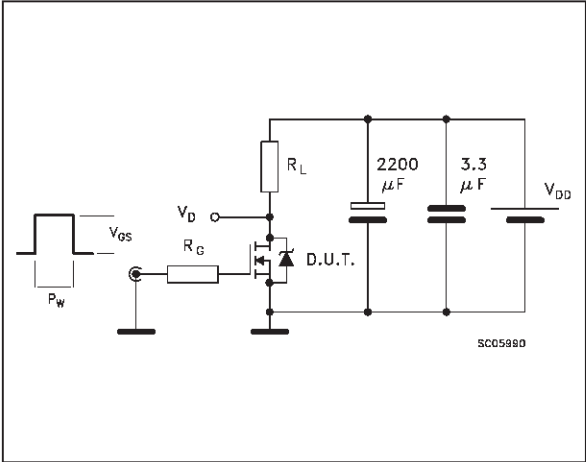
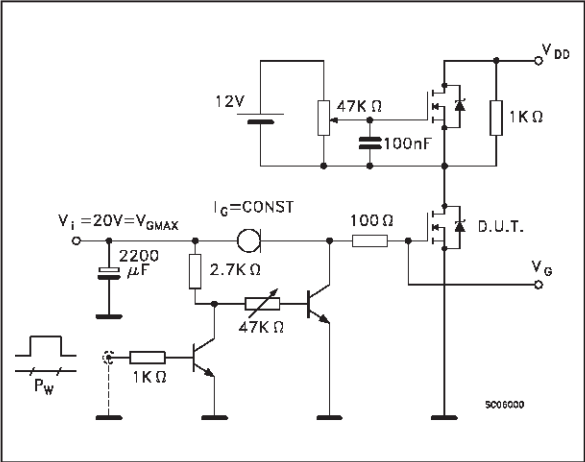
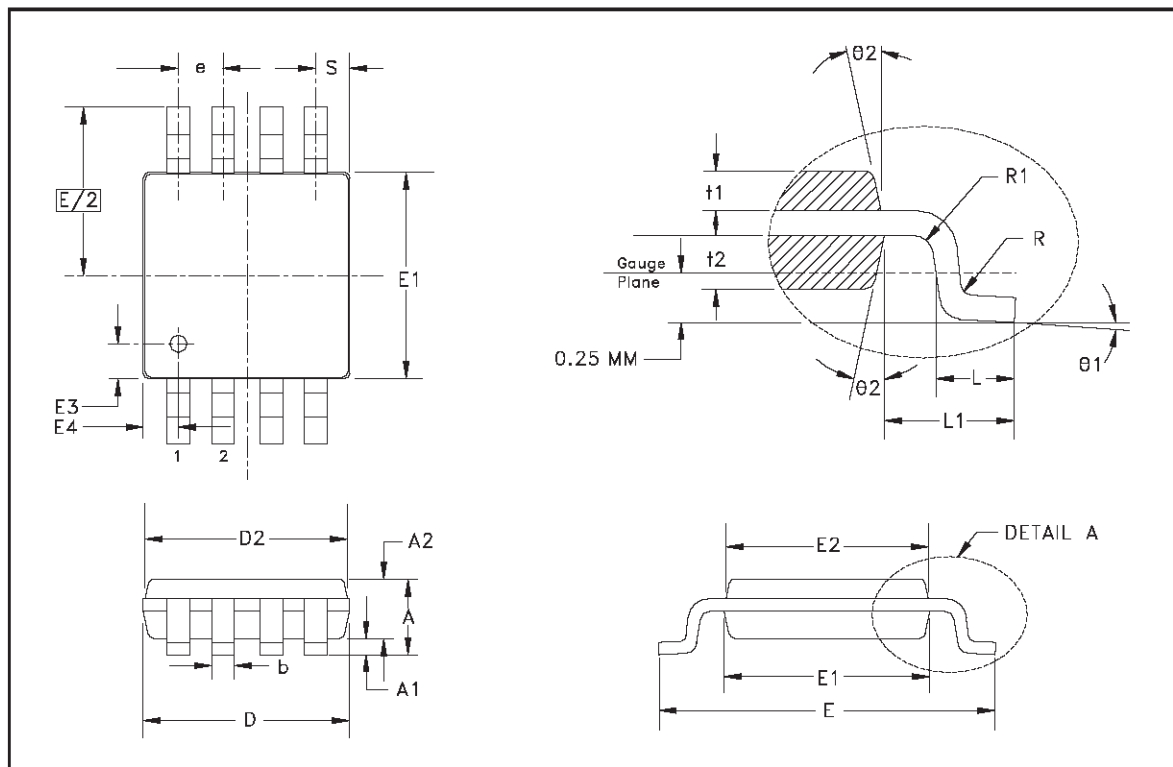


Fig. 2: Gate Charge test Circuit



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				



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