

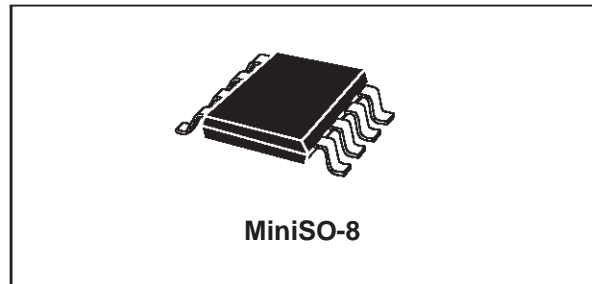


# STM2DPFS30L

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

PRELIMINARY DATA

MAIN PRODUCT CHARACTERISTICS			
<b>MOSFET</b>	<b>V<sub>DSS</sub></b>	<b>R<sub>DS(on)</sub></b>	<b>I<sub>D</sub></b>
	30V	<0.165Ω	2A
<b>SCHOTTKY</b>	<b>I<sub>F(AV)</sub></b>	<b>V<sub>RRM</sub></b>	<b>V<sub>F(MAX)</sub></b>
	1A	40V	0.55V

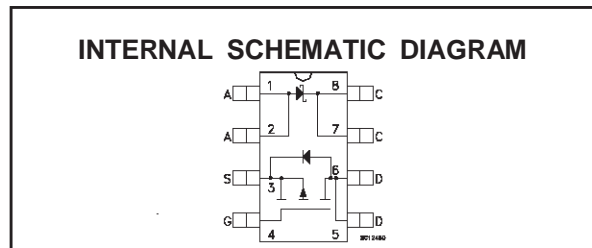


### DESCRIPTION:

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 <sub>DS</sub>	Drain-source Voltage (V <sub>GS</sub> = 0)	30	V
V <sub>DGR</sub>	Drain- gate Voltage (R <sub>GS</sub> = 20 kΩ)	30	V
V <sub>GS</sub>	Gate-source Voltage	± 20	V
I <sub>D</sub>	Drain Current (continuous) at T <sub>c</sub> = 25 °C	2	A
I <sub>D</sub>	Drain Current (continuous) at T <sub>c</sub> = 100 °C	1.3	A
I <sub>DM(•)</sub>	Drain Current (pulsed)	8	A
P <sub>tot</sub>	Total Dissipation at T <sub>c</sub> = 25 °C	1.25	W

### SCHOTTKY ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage		40	V
I <sub>F(RMS)</sub>	RMS Forward Current		2	A
I <sub>F(AV)</sub>	Average Forward Current	T <sub>a</sub> =60 °C δ =0.5	1.2	A
I <sub>FSM</sub>	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	$^{\circ}\text{C}/\text{W}$
$T_{stg}$	Storage Temperature Range	Maximum	-65 to 150	$^{\circ}\text{C}$
$T_j$	Junction Temperature		150	$^{\circ}\text{C}$

(\*) Mounted on a  $1\text{ in}^2$  pad of 2oz Cu in FR-4 board

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

#### OFF

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

#### ON (\*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\ \mu\text{A}$	1	1.7	2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 10\text{V}$ $I_D = 1\ \text{A}$ $V_{GS} = 4.5\text{V}$ $I_D = 1\ \text{A}$		0.145 0.18	0.165 0.2	$\Omega$
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 10\ \text{V}$	2			A

#### DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$g_{fs}$ (*)	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_D = 1\ \text{A}$		2		S
$C_{iss}$	Input Capacitance	$V_{DS} = 25\ \text{V}$ $f = 1\ \text{MHz}$ $V_{GS} = 0$		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

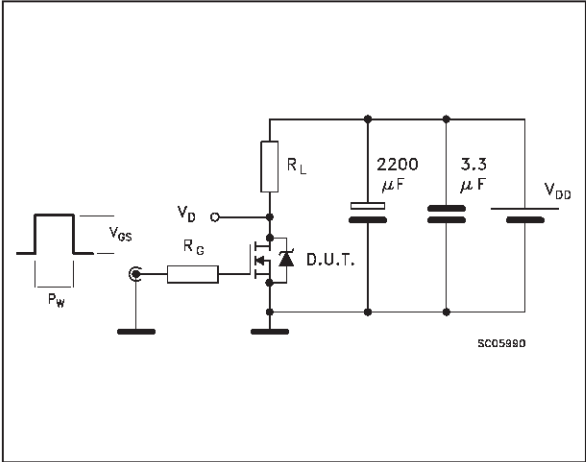
(\*) Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5 %

( $\bullet$ ) Pulse width limited by safe operating area

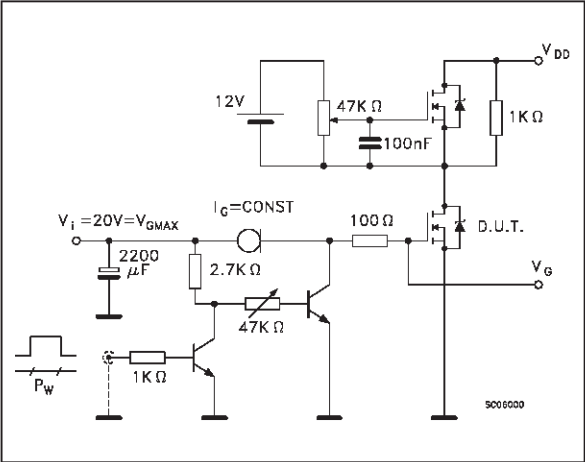
**SCHOTTKY STATIC ELECTRICAL CHARACTERISTICS**

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	$\mu\text{A}$ 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**

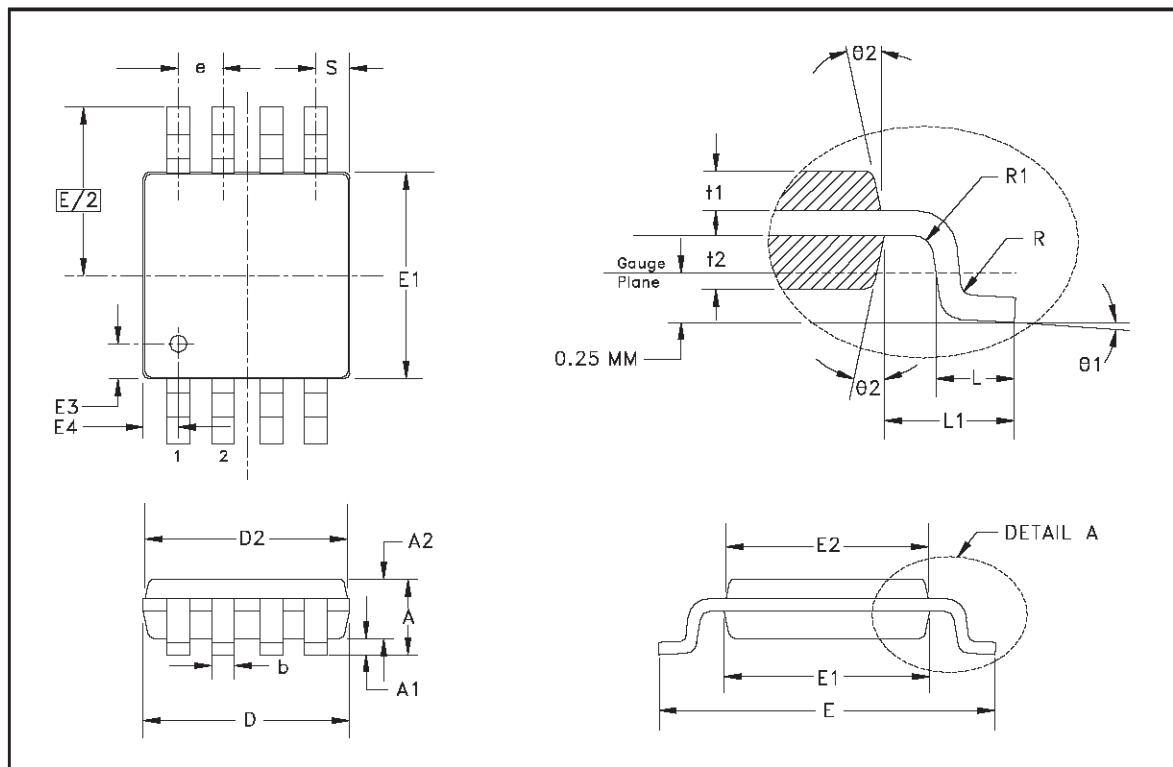


**Fig. 2: Gate Charge test Circuit**



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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