



STS3DPFS30

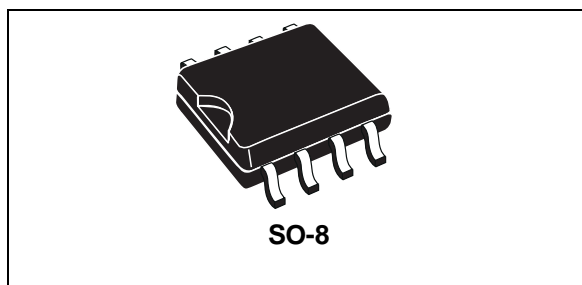
STripFET™ P - CHANNEL 30V - 0.065Ω - 3A - S0-8 MOSFET PLUS SCHOTTKY RECTIFIER

PRELIMINARY DATA

MAIN PRODUCT CHARACTERISTICS			
MOSFET	V _{DSS}	R _{DS(on)}	I _D
	30V	0.09Ω	3A
SCHOTTKY	I _{F(AV)}	V _{RRM}	V _{F(MAX)}
	3A	30V	0.51V

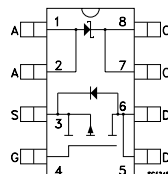
DESCRIPTION:

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.



S0-8

INTERNAL SCHEMATIC DIAGRAM



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	3	A
I _D	Drain Current (continuous) at T _c = 100 °C	1.9	A
I _{DM} (•)	Drain Current (pulsed)	12	A
P _{tot}	Total Dissipation at T _c = 25 °C	2	W

SCHOTTKY ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage		30	V
I _{F(RMS)}	RMS Forward Current		20	A
I _{F(AV)}	Average Forward Current	T _L =125 °C δ =0.5	3	A
I _{FSM}	Surge Non Repetitive Forward Current	tp= 10 ms Sinusoidal	75	A
I _{RRM}	Repetitive Peak Reverse Current	tp=2 μs F=1 kHz	1	A
I _{RSM}	Non Repetitive Peak Reverse Current	tp=100 μs	1	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

STS3DPFS30

THERMAL DATA

$R_{thj-amb}$	(*) Thermal Resistance Junction-ambient MOSFET	85	$^{\circ}\text{C/W}$
$R_{thj-amb}$	(*) Thermal Resistance Junction-ambient SCHOTTKY	100	$^{\circ}\text{C/W}$
T_{stg}	Storage Temperature Range	-65 to 150	$^{\circ}\text{C}$
T_j	Junction Temperature	150	$^{\circ}\text{C}$
	(*) mounted on FR-4 board (steady state)		

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	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 20\ \text{V}$			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\ \mu\text{A}$	2	3	4	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 10\text{V}$ $I_D = 1.5\ \text{A}$		0.065	0.09	Ω
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 10\ \text{V}$	3			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_D = 1.5\ \text{A}$		5		S
C_{iss}	Input Capacitance	$V_{DS} = 25\ \text{V}$ $f = 1\ \text{MHz}$ $V_{GS} = 0$		1600		pF
C_{oss}	Output Capacitance			500		pF
C_{rss}	Reverse Transfer Capacitance			125		pF

ELECTRICAL CHARACTERISTICS (continued)**SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 15\text{ V}$ $I_D = 1.5\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$ (Resistive Load, see fig. 3)		15		ns
t_r	Rise Time			29		ns
Q_g	Total Gate Charge	$V_{DD} = 15\text{ V}$ $I_D = 3\text{ A}$ $V_{GS} = 10\text{ V}$		23	30	nC
Q_{gs}	Gate-Source Charge			4.2		nC
Q_{gd}	Gate-Drain Charge			5.8		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$	Off-voltage Rise Time	$V_{clamp} = 24\text{ V}$ $I_D = 3\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$ (Inductive Load, see fig. 5)		11		ns
t_f	Fall Time			11		ns
t_c	Cross-over Time			23		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				3	A
$I_{SDM}(\bullet)$	Source-drain Current (pulsed)				12	A
$V_{SD} (*)$	Forward On Voltage	$I_{SD} = 3\text{ A}$ $V_{GS} = 0$			2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 3\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 15\text{ V}$ $T_J = 150\text{ }^\circ\text{C}$ (see test circuit, figure 5)		34		ns
Q_{rr}	Reverse Recovery Charge			45		nC
I_{RRM}	Reverse Recovery Current			2.6		A

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

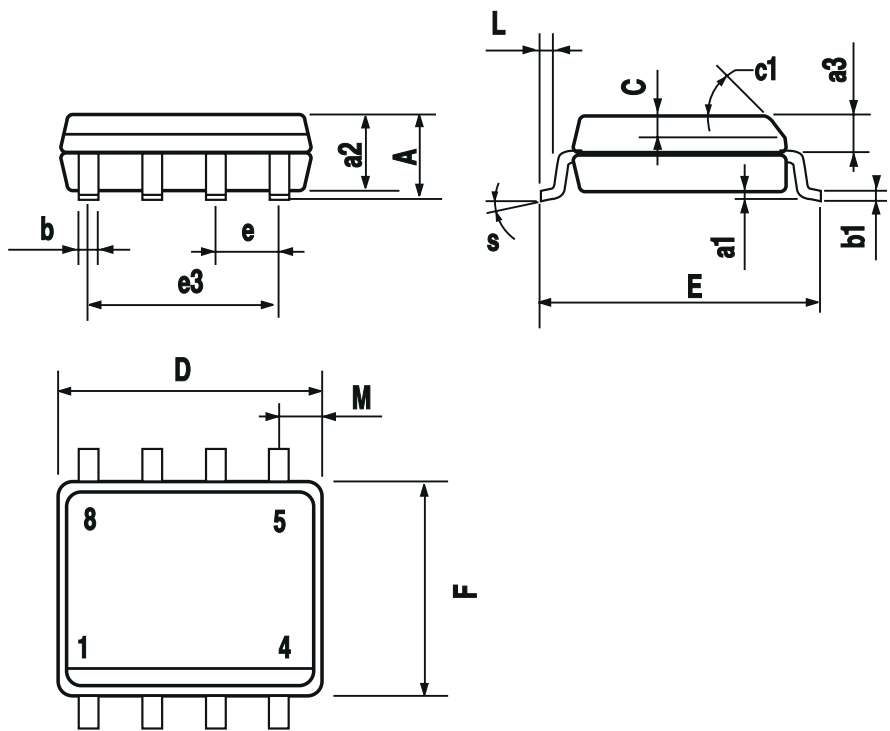
(\bullet) Pulse width limited by safe operating area

SCHOTTKY STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_R (*)$	Reversed Leakage Current	$T_J = 25\text{ }^\circ\text{C}$ $V_R = 30\text{ V}$ $T_J = 125\text{ }^\circ\text{C}$ $V_R = 30\text{ V}$		0.03	0.2	mA
$V_F (*)$	Forward Voltage drop	$T_J = 25\text{ }^\circ\text{C}$ $I_F = 3\text{ A}$ $T_J = 125\text{ }^\circ\text{C}$ $I_F = 3\text{ A}$			0.51	V
				0.46	0.46	V

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.)					



0016023

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 1999 STMicroelectronics – Printed in Italy – All Rights Reserved
STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>

