



## STS5PF30L

P-channel 30V - 0.045Ω - 5A SO-8  
STripFET™ Power MOSFET

### General features

Type	V <sub>DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
STS5PF30L	30V	<0.055Ω	5A

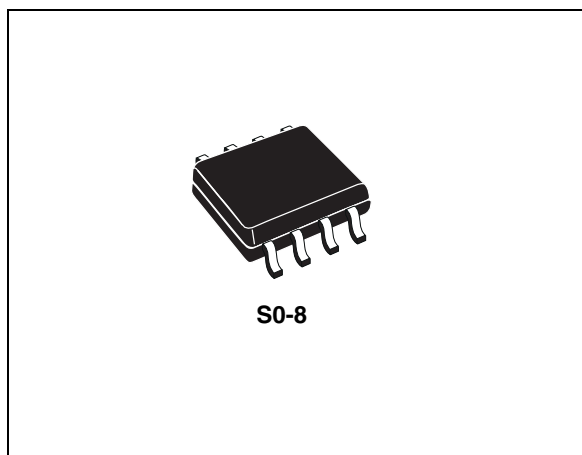
- Conduction losses reduced
- Switching losses reduced
- Low threshold drive
- Standard outline for easy automated surface mount assembly

### Description

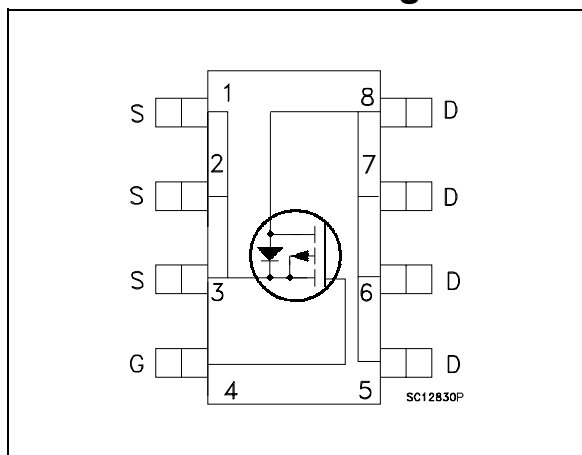
This Power MOSFET is the latest development of STMicroelectronics unique “single feature size™” strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility.

### Applications

- Switching application



### Internal schematic diagram



### Order code

Part number	Marking	Package	Packaging
STS5PF30L	S5PF30L	SO-8	Tape & reel

# 1 Electrical ratings

**Table 1. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain-source voltage ( $v_{gs} = 0$ )	30	V
$V_{GS}$	Gate- source voltage	$\pm 16$	V
$I_D$	Drain current (continuous) at $T_C = 25^\circ\text{C}$	5	A
$I_D$	Drain current (continuous) at $T_C = 100^\circ\text{C}$	4	A
$I_{DM}^{(1)}$	Drain current (pulsed)	20	A
$P_{TOT}$	Total dissipation at $T_C = 25^\circ\text{C}$ dual operating	2.5	W
$T_J$	Junction temperature	-55 to 150	$^\circ\text{C}$
$T_{stg}$	Storage temperature range	150	$^\circ\text{C}$

1. Pulse width limited by safe operating area

*Note: For the p-channel Power MOSFET actual polarity of voltages and current has to be reversed*

**Table 2. Thermal data**

$R_{thj-a}$	<sup>(1)</sup> Thermal resistance junction-ambient Max	50	$^\circ\text{C}/\text{W}$
$T_L$	Maximum lead temperature for soldering purpose	300	$^\circ\text{C}$

1. Mounted on FR-4 board ( $t \leq 10\text{sec}$ )

## 2 Electrical characteristics

( $T_{CASE}=25^{\circ}\text{C}$  unless otherwise specified)

**Table 3. On/off states**

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 ( $V_{DS} = 0$ )	$V_{GS} = \pm 16\text{V}$			$\pm 100$	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}$ , $I_D = 250\mu\text{A}$	1	1.6	2.5	V
$R_{DS(on)}$	Static drain-source on resistance	$V_{GS} = 10\text{V}$ , $I_D = 2.5\text{A}$ $V_{GS} = 4.5\text{V}$ , $I_D = 2.5\text{A}$		0.045 0.065	0.055 0.075	$\Omega$ $\Omega$

**Table 4. Dynamic**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$g_{fs}^{(1)}$	Forward transconductance	$V_{DS} = 15\text{V}$ , $I_D = 2.5\text{A}$		10		S
$C_{iss}$	Input capacitance	$V_{DS} = 25\text{V}$ , $f = 1 \text{ MHz}$ , $V_{GS} = 0$		1350		pF
$C_{oss}$	Output capacitance			490		pF
$C_{rss}$	Reverse transfer capacitance			130		pF
$Q_g$	Total gate charge	$V_{DD} = 24\text{V}$ , $I_D = 5\text{A}$ , $V_{GS} = 5\text{V}$ <i>(see Figure 14)</i>		12.5	16	nC
$Q_{gs}$	Gate-source charge			5		nC
$Q_{gd}$	Gate-drain charge			3		nC

1. Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5.

**Table 5. Switching times**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ $t_r$	Turn-on delay time Rise time	$V_{DD}=15\text{ V}$ , $I_D=2.5\text{ A}$ , $R_G=4.7\Omega$ , $V_{GS}=4.5\text{ V}$ <i>(see Figure 13)</i>		25 35		ns ns
$t_{d(off)}$ $t_f$	Turn-off Delay Time Fall Time	$V_{DD}=15\text{ V}$ , $I_D=2.5\text{ A}$ , $R_G=4.7\Omega$ , $V_{GS}=4.5\text{ V}$ <i>(see Figure 13)</i>		125 35		ns ns

**Table 6. Source drain diode**

Symbol	Parameter	Test conditions	Min	Typ.	Max	Unit
$I_{SD}$	Source-drain current				5	A
$I_{SDM}^{(1)}$	Source-drain current (pulsed)				20	A
$V_{SD}^{(2)}$	Forward on voltage	$I_{SD} = 5\text{ A}$ , $V_{GS} = 0$			1.2	V
$t_{rr}$ $Q_{rr}$ $I_{RRM}$	Reverse recovery time Reverse recovery charge Reverse recovery current	$I_{SD} = 5\text{ A}$ , $V_{DD} = 15\text{ V}$ $di/dt = 100\text{ A}/\mu\text{s}$ , $T_j = 150^\circ\text{C}$ <i>(see Figure 15)</i>		45 36 1.6		ns nC A

1. Pulse width limited by safe operating area.
2. Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5%

## 4 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark.

**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.)					

