



# STPS5H100

## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

**Table 1: Main Product Characteristics**

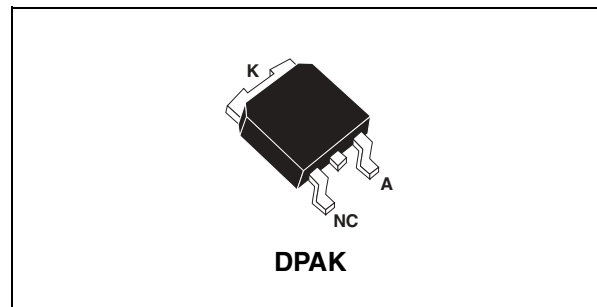
$I_{F(AV)}$	5 A
$V_{RRM}$	100 V
$T_j$	175°C
$V_F(max)$	0.61 V

### FEATURES AND BENEFITS

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Avalanche specification

### DESCRIPTION

High voltage Schottky barrier rectifier designed for high frequency miniature Switched Mode Power Supplies such as adaptators and on board DC to DC converters.



**Table 2: Order Codes**

Part Number	Marking
STPS5H100B	S5H100
STPS5H100B-TR	S5H100

**Table 3: Absolute Maximum (limiting values)**

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	100	V
$I_{F(RMS)}$	RMS forward current	10	A
$I_{F(AV)}$	Average forward current	$T_c = 165^\circ\text{C} \quad \delta = 0.5$ 5	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ms sinusoidal}$ 75	A
$I_{RRM}$	Repetitive peak reverse current	$t_p = 2\mu\text{s} \quad F = 1\text{KHz}$ 1	A
$I_{RSM}$	Non repetitive peak reverse current	$t_p = 100\mu\text{s square}$ 2	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\mu\text{s} \quad T_j = 25^\circ\text{C}$ 7200	W
$T_{stg}$	Storage temperature range	-65 to + 175	°C
$T_j$	Maximum operating junction temperature	175	°C
dV/dt	Critical rate of rise of reverse voltage	10000	V/ $\mu\text{s}$

\*:  $\frac{dP_{tot}}{dT_j} > \frac{1}{R_{th(j-a)}}$  thermal runaway condition for a diode on its own heatsink

**Table 4: Thermal Parameters**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	2.5	°C/W

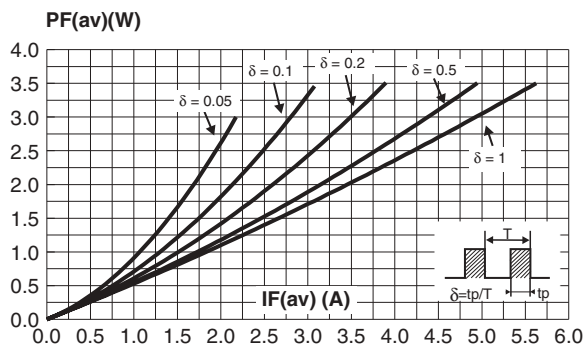
**Table 5: Static Electrical Characteristics**

Symbol	Parameter	Tests conditions	Min.	Typ	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$			3.5	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$		1.3	4.5	mA
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5\text{A}$		0.73	V
		$T_j = 125^\circ\text{C}$		0.57	0.61	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{A}$		0.85	
		$T_j = 125^\circ\text{C}$		0.66	0.71	

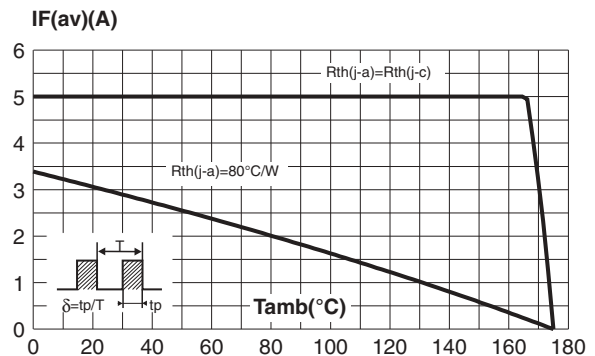
Pulse test: \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$   
 \*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:  $P = 0.51 \times I_{F(AV)} + 0.02 I_F^2(\text{RMS})$

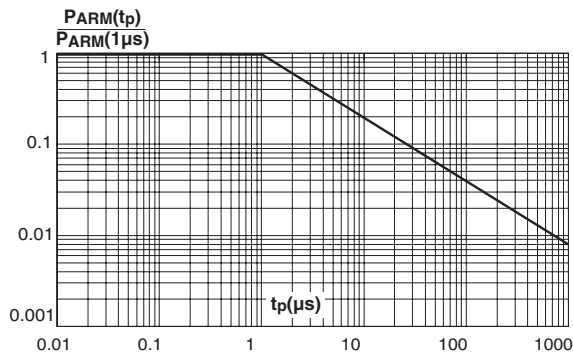
**Figure 1: Average forward power dissipation versus average forward current**



**Figure 2: Average forward current versus ambient temperature (delta = 0.5)**



**Figure 3: Normalized avalanche power derating versus pulse duration**



**Figure 4: Normalized avalanche power derating versus junction temperature**

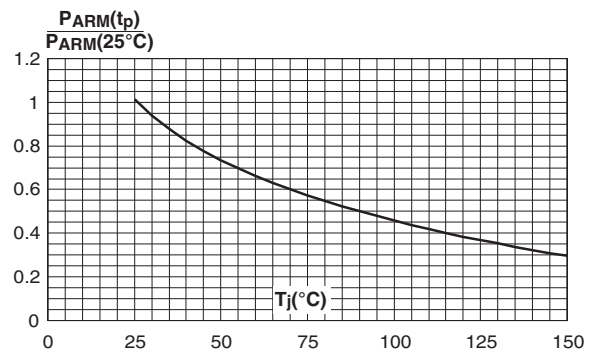


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

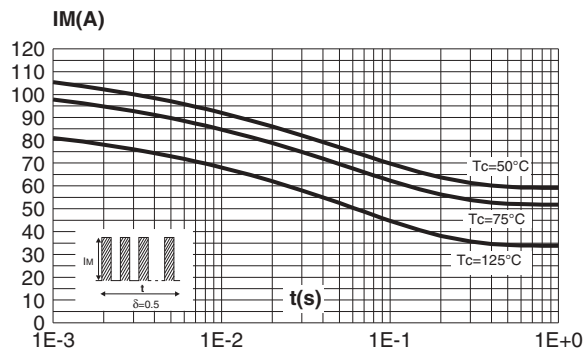


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

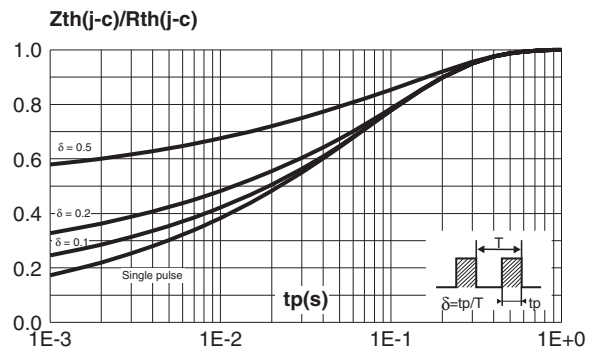


Figure 7: Reverse leakage current versus reverse voltage applied

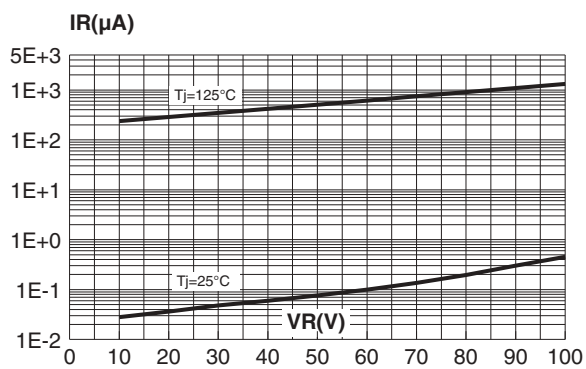


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

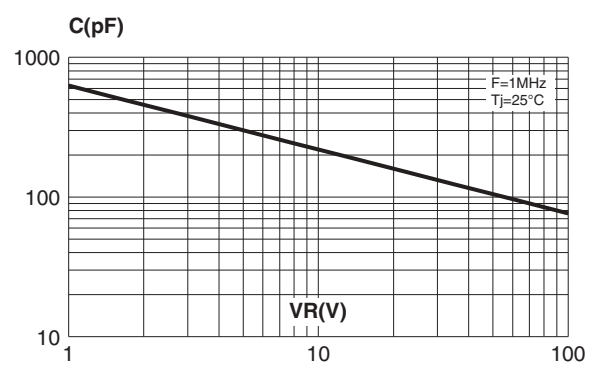


Figure 9: Forward voltage drop versus forward current (maximum values)

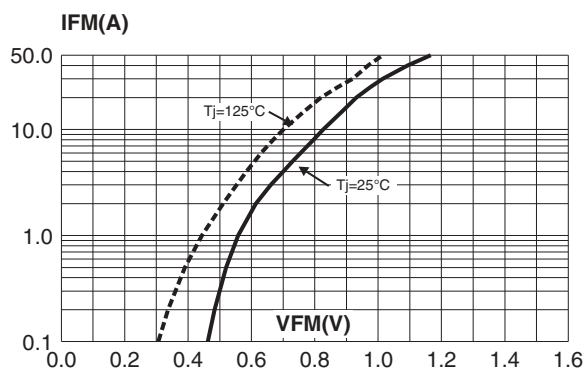


Figure 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: 35µm)

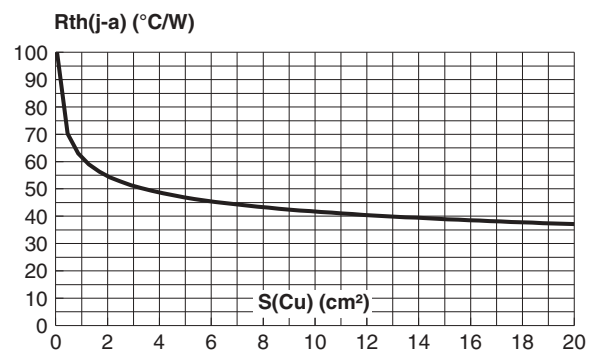


Figure 11: DPAK Package Mechanical Data

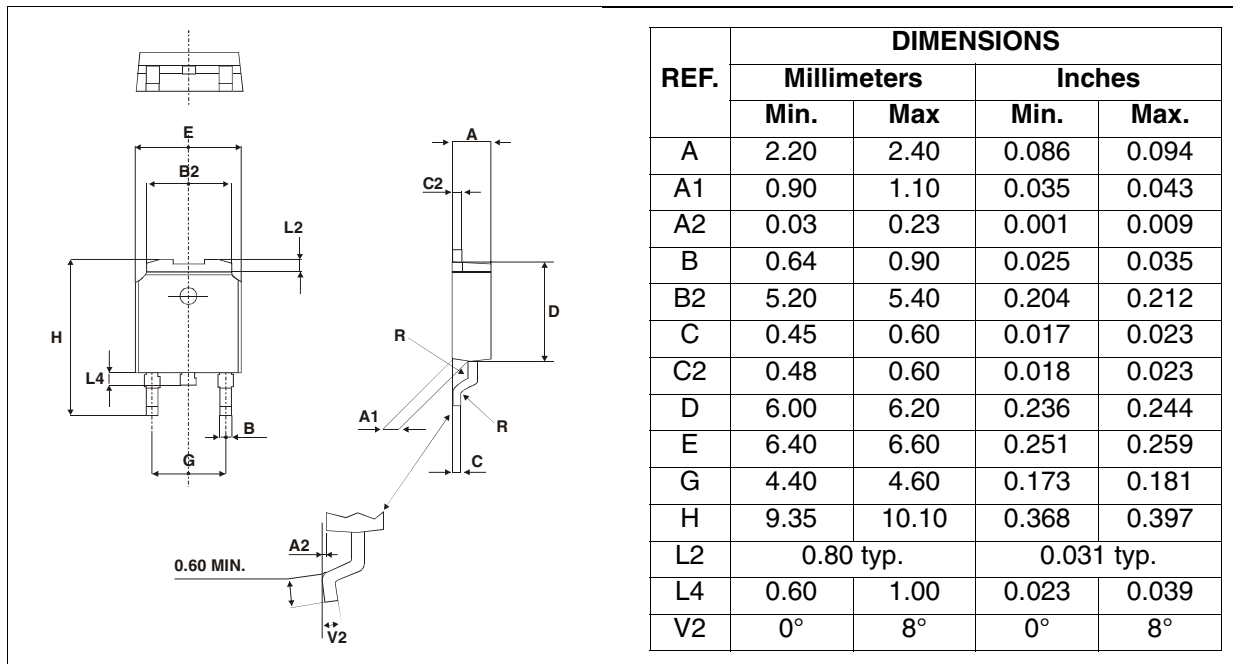
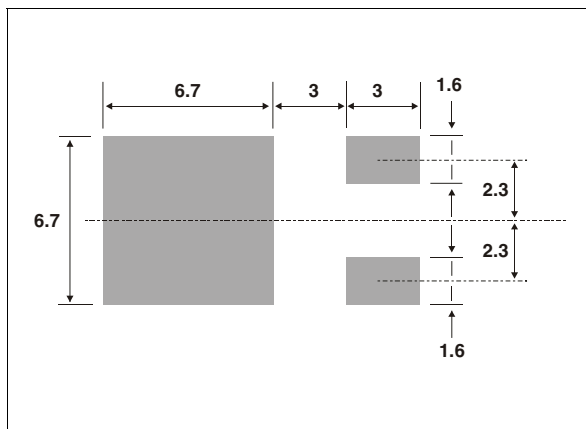


Figure 12: Foot Print Dimensions (in millimeters)



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. ECOPACK specifications are available at: [www.st.com](http://www.st.com).

**Table 6: Ordering Information**

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS5H100B	S5H100	DPAK	0.30 g	75	Tube
STPS5H100B-TR	S5H100			2500	Tape & reel

- Cooling method: by conduction (C)

**Table 7: Revision History**

Date	Revision	Description of Changes
Jul-2003	6B	Last issue.
03-Nov-2005	7	DPAK Foot Print dimensions updated.
15-Feb-2006	8	ECOPACK statement added.

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