



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.

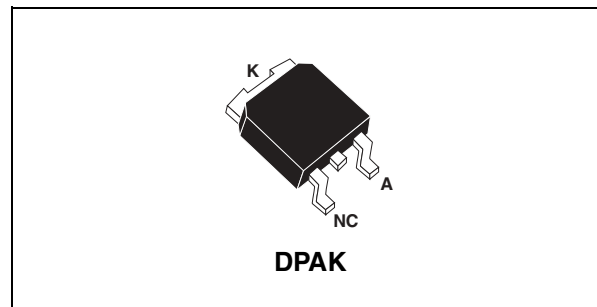


Table 2: Order Codes

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 voltage		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/ μs

* : $\frac{dP_{tot}}{dT_j} > \frac{1}{R_{th(j-a)}}$ 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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		3.5	μA
		$T_j = 125^\circ\text{C}$		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: $P = 0.51 \times I_{F(AV)} + 0.02 I_{F(RMS)}^2$

Figure 1: Average forward power dissipation versus average forward current

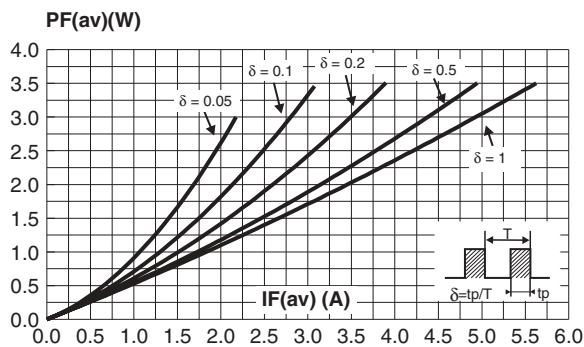
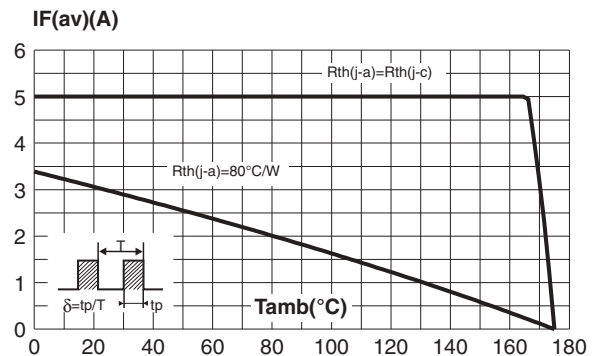
Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$)

Figure 3: Normalized avalanche power derating versus pulse duration

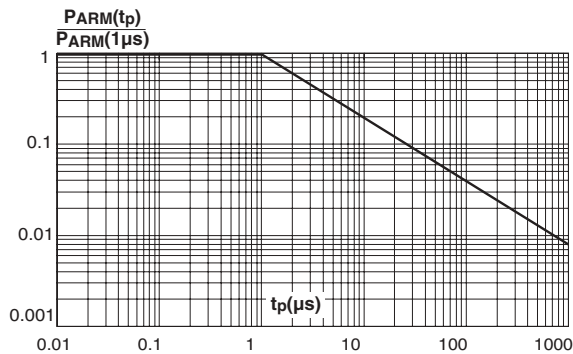


Figure 4: Normalized avalanche power derating versus junction temperature

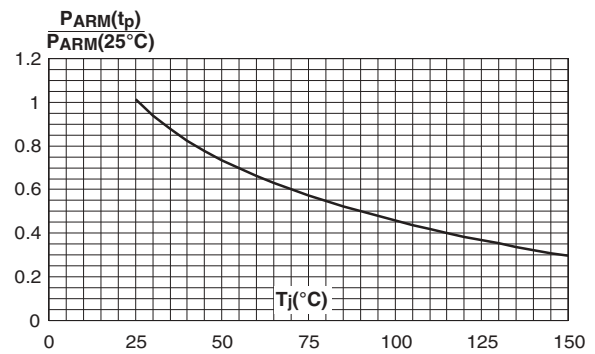


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

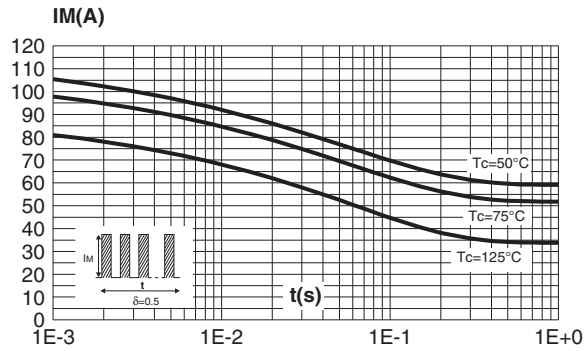


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

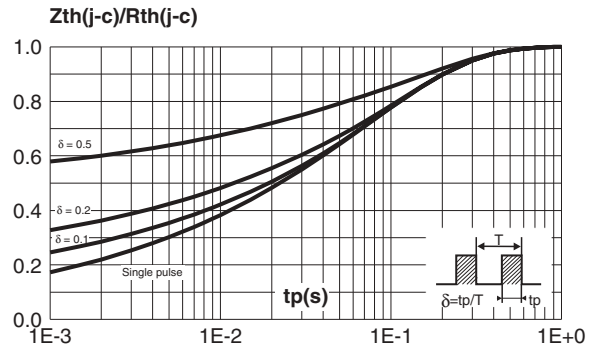


Figure 7: Reverse leakage current versus reverse voltage applied

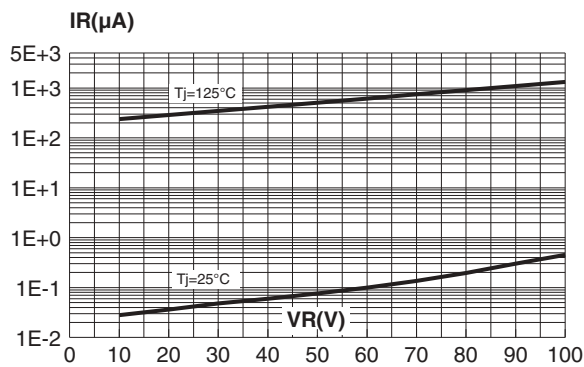


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

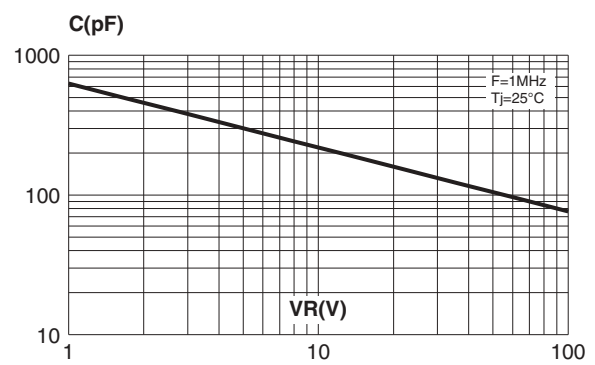


Figure 9: Forward voltage drop versus forward current (maximum values)

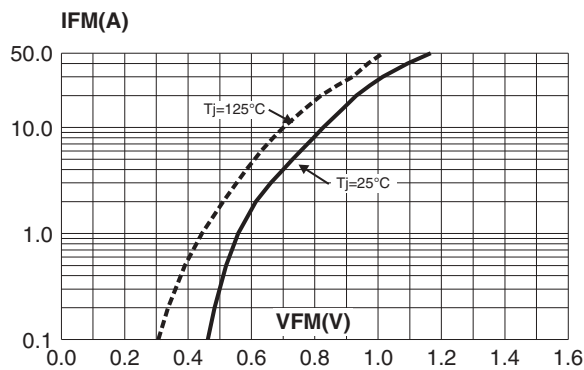


Figure 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: $35\mu\text{m}$)

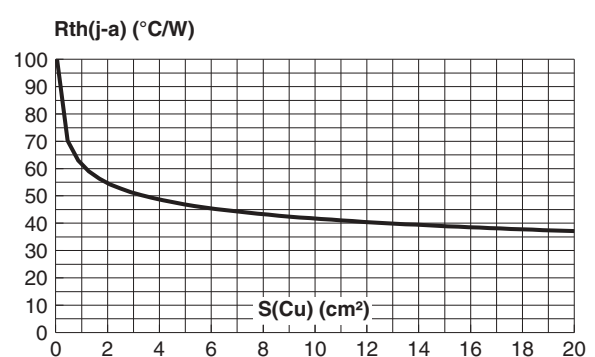


Figure 11: DPAK Package Mechanical Data

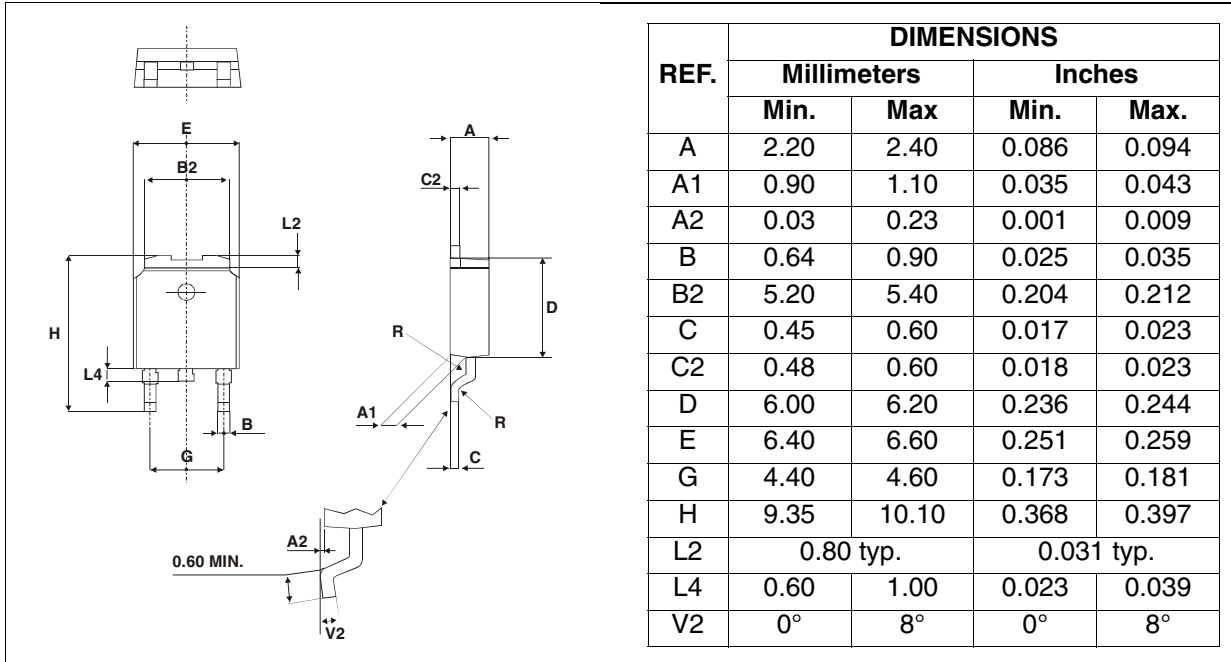
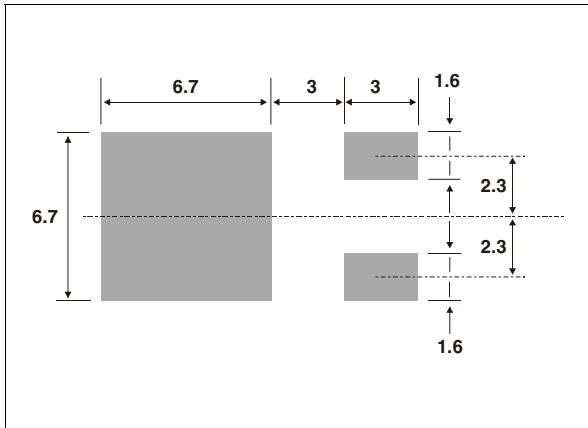


Figure 12: Foot Print Dimensions (in millimeters)



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.

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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