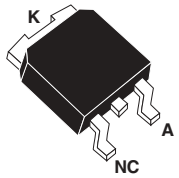
STPS5H100

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



DPAK

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

Table 2: Order Codes

Part Number	Marking
STPS5H100B	S5H100
STPS5H100B-TR	S5H100

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 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°C δ = 0.5	5	A
I_{FSM}	Surge non repetitive forward current	t_p = 10ms sinusoidal	75	A
I_{RRM}	Repetitive peak reverse current	t_p = 2µs F = 1KHz	1	A
I_{RSM}	Non repetitive peak reverse current	t_p = 100µs square	2	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1µs T_j = 25°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

* : $\frac{dPtot}{dTj} > \frac{1}{Rth(j-a)}$ 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°C	$V_R = V_{RRM}$			3.5	µA
		T_j = 125°C			1.3	4.5	mA
V_F **	Forward voltage drop	T_j = 25°C	I_F = 5A			0.73	V
		T_j = 125°C			0.57	0.61	
		T_j = 25°C	I_F = 10A			0.85	
		T_j = 125°C			0.66	0.71	

Pulse test: * tp = 5 ms, δ < 2%
** tp = 380 µs, δ < 2%

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

Figure 1: Average forward power dissipation versus average forward current

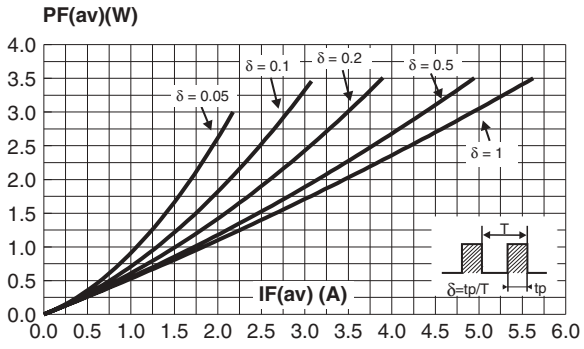


Figure 2: Average forward current versus ambient temperature (δ = 0.5)

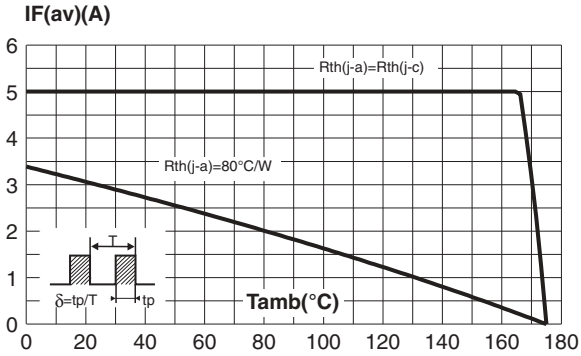


Figure 3: Normalized avalanche power derating versus pulse duration

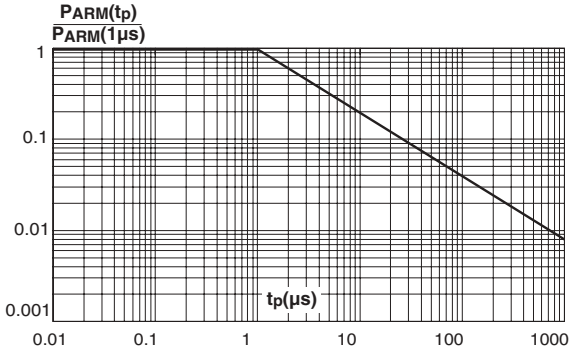


Figure 4: Normalized avalanche power derating versus junction temperature

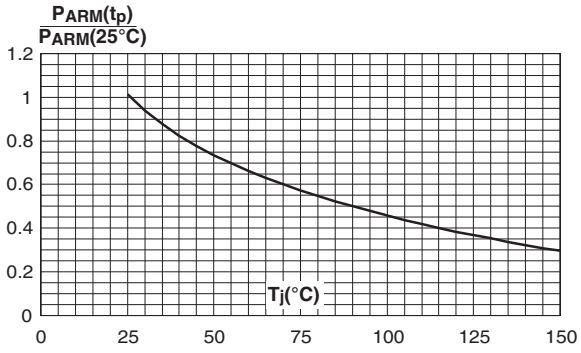


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

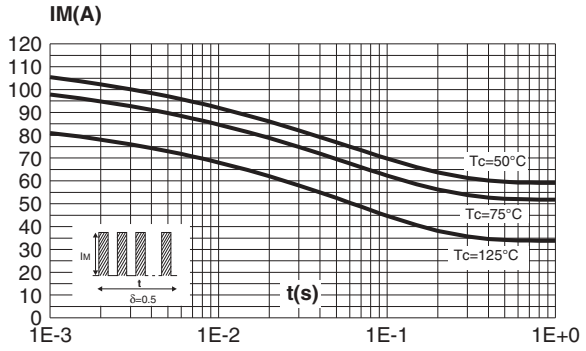


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

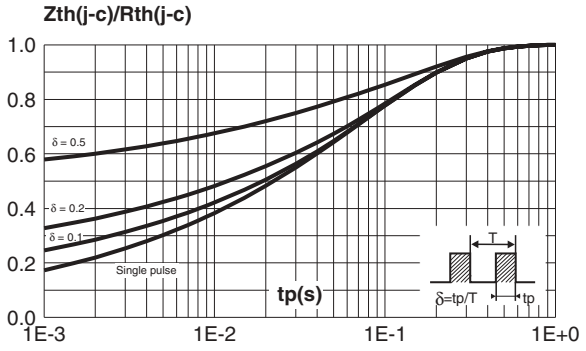


Figure 7: Reverse leakage current versus reverse voltage applied

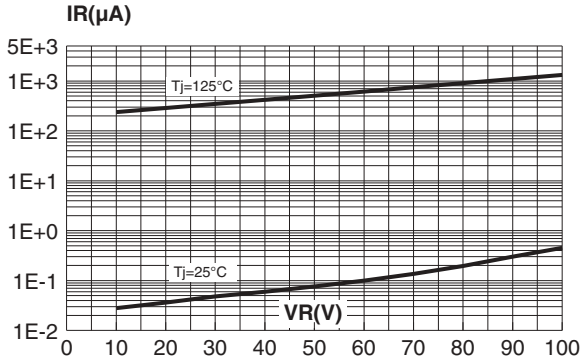


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

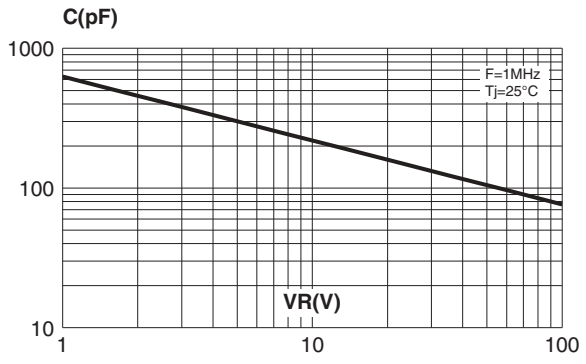


Figure 9: Forward voltage drop versus forward current (maximum values)

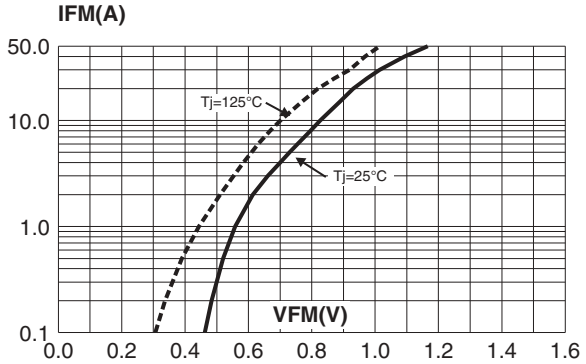


Figure 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: 35µm)

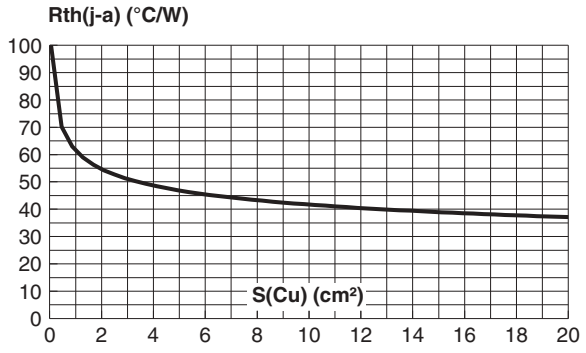
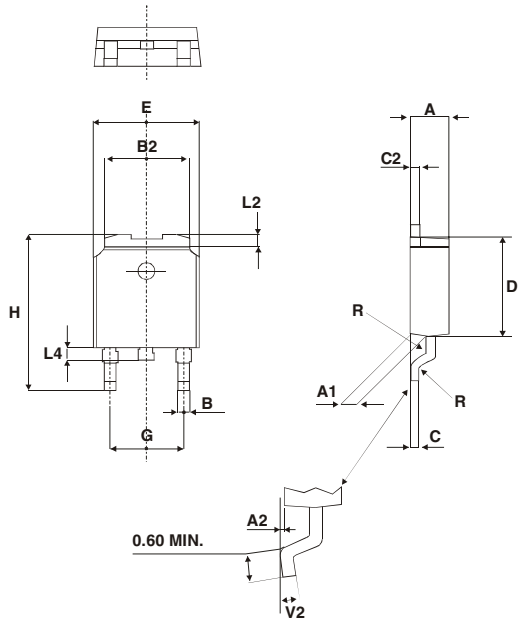
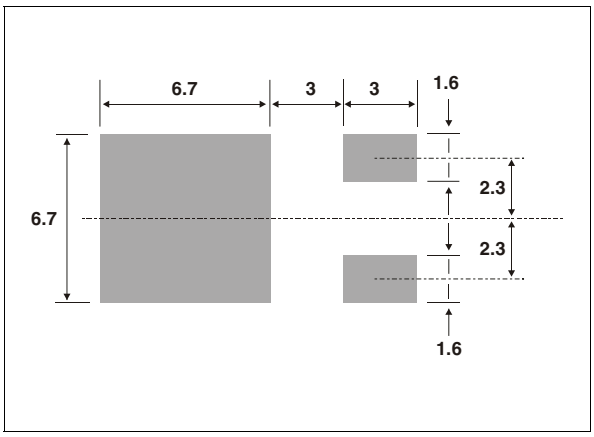


Figure 11: DPAK Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
V2	0°	8°	0°	8°

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.