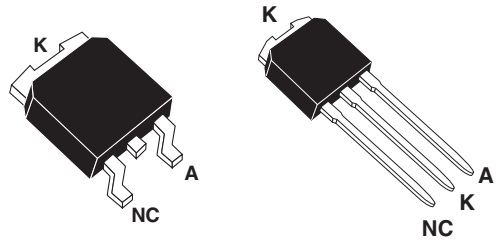
STPS5H100

High voltage power Schottky rectifier

Main product characteristics

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



DPAK
STPS5H100B

IPAK
STPS5H100H

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

This high voltage Schottky barrier rectifier is packaged in DPAK and IPAK, and designed for high frequency miniature switched mode power supplies such as adaptators and on board DC to DC converters.

Order codes

Part number	Marking
STPS5H100B	S5H100
STPS5H100B-TR	S5H100
STPS5H100H	S5H100H

Table 1. Absolute ratings (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 =10 ms sinusoidal	75	A
I_{RRM}	Repetitive peak reverse current	t_p = 2 µs F = 1 KHz	1	A
I_{RSM}	Non repetitive peak reverse current	t_p = 100 µs square	2	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25° C	7200	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature(1)		175	°C
dV/dt	Critical rate of rise of reverse voltage		10000	V/µs

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

1 Characteristics

Table 2. Thermal resistance

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

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	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(2)	Forward voltage drop	T_j = 25° C	I_F = 5 A			0.73	V
		T_j = 125° C			0.57	0.61	
		T_j = 25° C	I_F = 10 A			0.85	
		T_j = 125° C			0.66	0.71	

1. Pulse test: tp = 5 ms, δ < 2%
2. Pulse test: 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

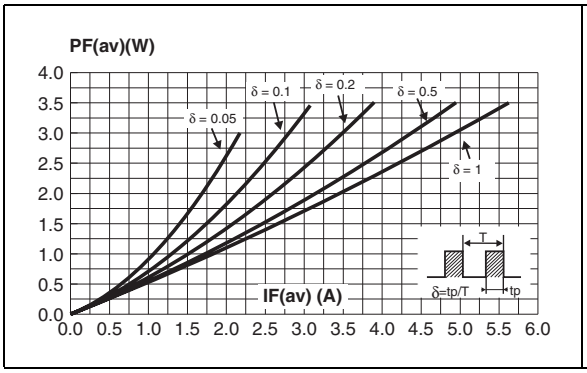


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

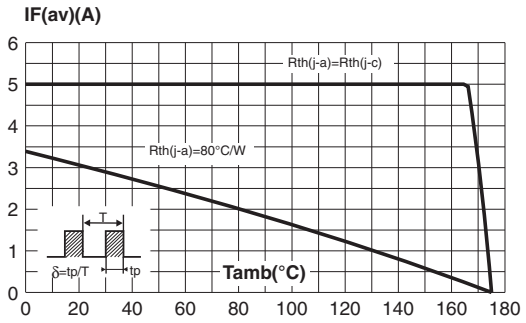


Figure 3. Normalized avalanche power derating versus pulse duration

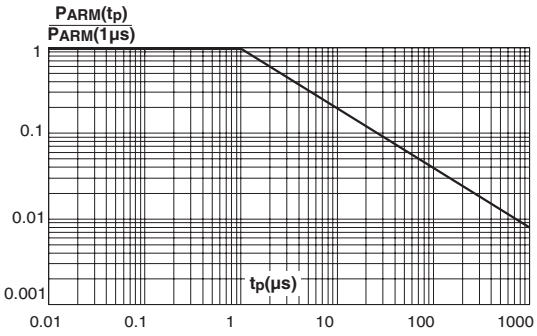


Figure 4. Normalized avalanche power derating versus junction temperature

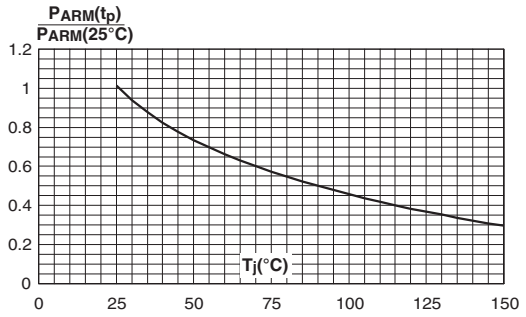


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

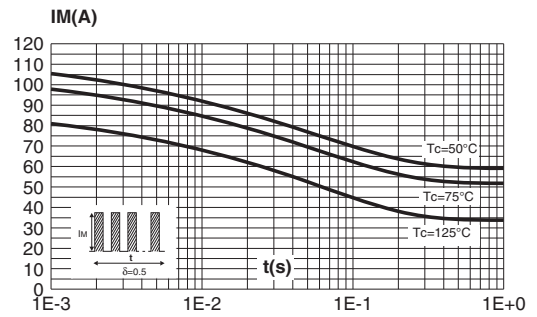


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

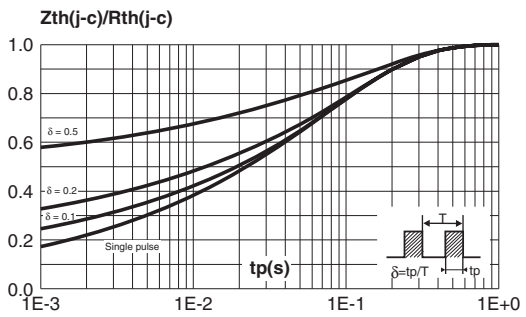


Figure 7. Reverse leakage current versus reverse voltage applied

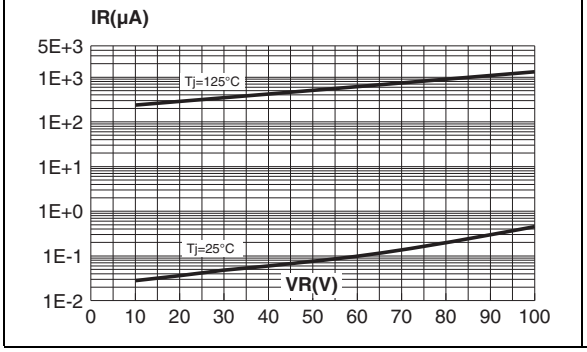


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

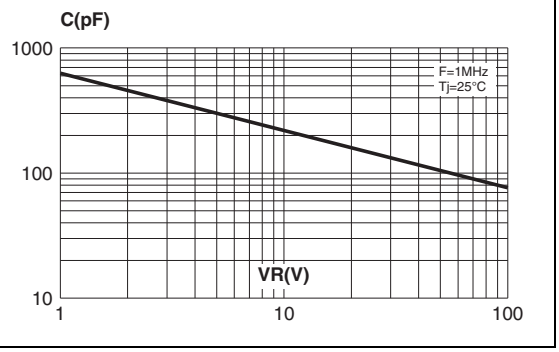


Figure 9. Forward voltage drop versus forward current (maximum values)

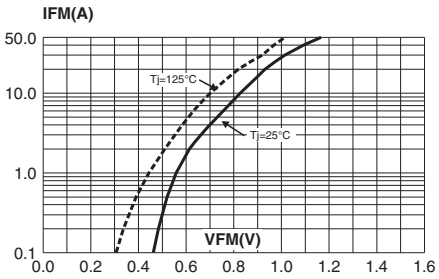
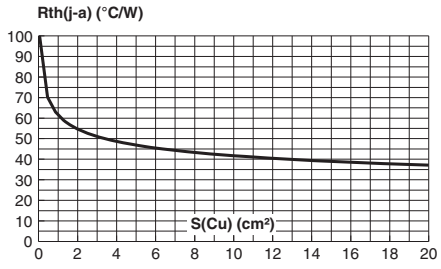


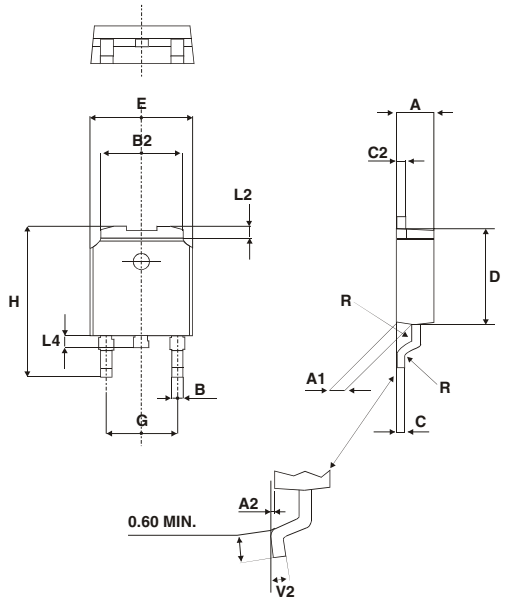
Figure 10. Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: 35 µm)



2 Package information

- Cooling method: by conduction (C)
- Epoxy meets UL94, V0

Figure 11. DPAK dimensions



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. Footprint dimensions (in millimeters)

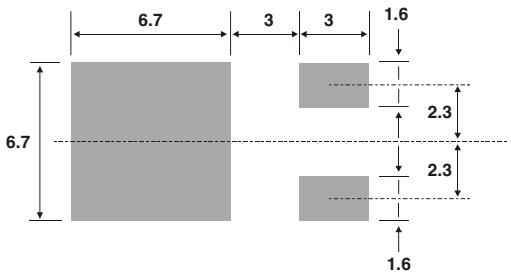
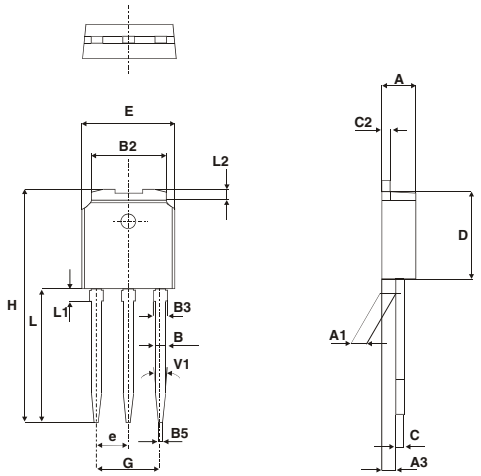


Table 4. IPAK Dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.094
A1	0.90		1.10	0.035		0.043
A3	0.70		1.30	0.027		0.051
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.212
B3			0.95			0.037
B5		0.30			0.035	
C	0.45		0.60	0.017		0.023
C2	0.48		0.60	0.019		0.023
D	6		6.20	0.236		0.244
E	6.40		6.60	0.252		0.260
e		2.28			0.090	
G	4.40		4.60	0.173		0.181
H		16.10			0.634	
L	9		9.40	0.354		0.370
L1	0.8		1.20	0.031		0.047
L2		0.80	1		0.031	0.039
V1		10°			10°	

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.

3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS5H100B	S5H100	DPAK	0.30 g	75	Tube
STPS5H100B-TR	S5H100			2500	Tape and reel
STPS5H100H	S5H100H	IPAK	0.40 g	75	Tube

4 Revision history

Date	Revision	Description of changes
Jul-2003	6B	Last issue.
03-Nov-2005	7	DPAK footprint dimensions updated.
15-Feb-2006	8	ECOPACK statement added.
05-Mar-2007	9	IPAK package added.

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