

## High voltage power Schottky rectifier

### Main product characteristics

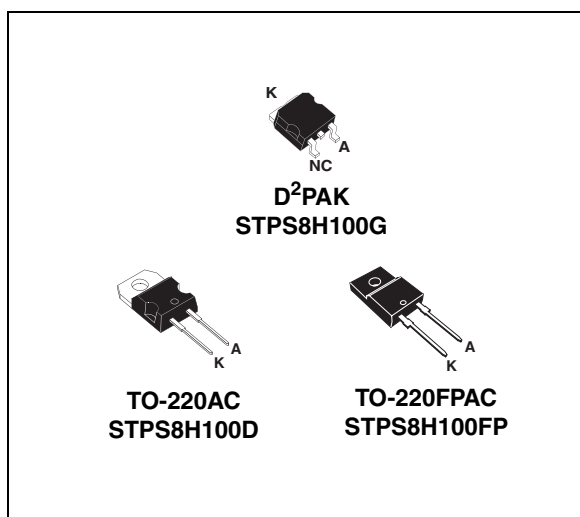
$I_{F(AV)}$	8 A
$V_{RRM}$	100 V
$T_j$	175° C
$V_F(max)$	0.58 V

### Features and benefits

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Insulated package:
  - TO-220FPAC  
Insulating voltage = 2000 V DC  
Typical package capacitance = 12 pF
- Avalanche capability specified

### Description

Schottky barrier rectifier designed for high frequency compact Switched Mode Power Supplies such as adaptators and on board DC/DC converters.



### Order Codes

Part Number	Marking
STPS8H100D	STPS8H100D
STPS8H100G	STPS8H100G
STPS8H100G-TR	STPS8H100G
STPS8H100FP	STPS8H100FP

**Table 1. Absolute ratings (limiting values)**

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		100	V	
$I_{F(RMS)}$	RMS forward voltage		30	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AC, D <sup>2</sup> PAK	8	A	
		DO-15			$T_C = 150^\circ\text{C}$
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10\text{ ms sinusoidal}$	250	A
$P_{ARM}$	Repetitive peak avalanche power		$t_p = 1\ \mu\text{s}$ $T_j = 25^\circ\text{C}$	10800	W
$T_{stg}$	Storage temperature range		-65 to + 175	° C	
$T_j$	Maximum operating junction temperature		175	° C	

# 1 Characteristics

**Table 2. Thermal resistance**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC, D <sup>2</sup> PAK	1.6	°C/W
		TO-220FPAC	4	

**Table 3. Static electrical characteristics (per diode)**

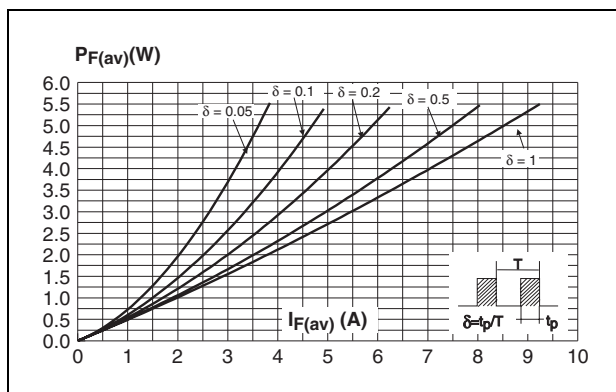
Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ C$	$V_R = V_{RRM}$			4.5	$\mu A$
		$T_j = 125^\circ C$			2	6.0	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ C$	$I_F = 8 A$			0.71	V
		$T_j = 125^\circ C$			0.56	0.58	
		$T_j = 25^\circ C$	$I_F = 10 A$			0.77	
		$T_j = 125^\circ C$			0.59	0.64	
		$T_j = 25^\circ C$	$I_F = 16 A$			0.81	
		$T_j = 125^\circ C$			0.65	0.68	

- $t_p = 5 \text{ ms}$ ,  $\delta < 2\%$
- $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$

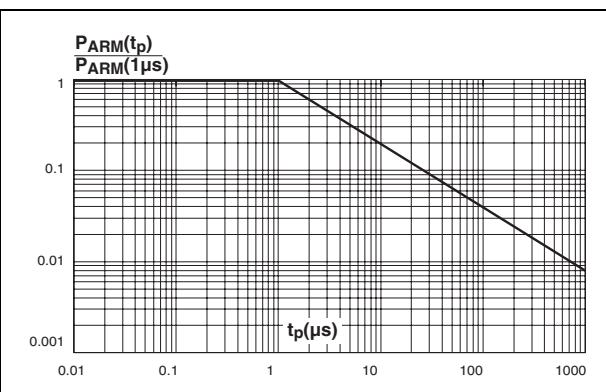
To evaluate the conduction losses use the following equation:

$$P = 0.48 \times I_{F(AV)} + 0.0125 I_{F(RMS)}^2$$

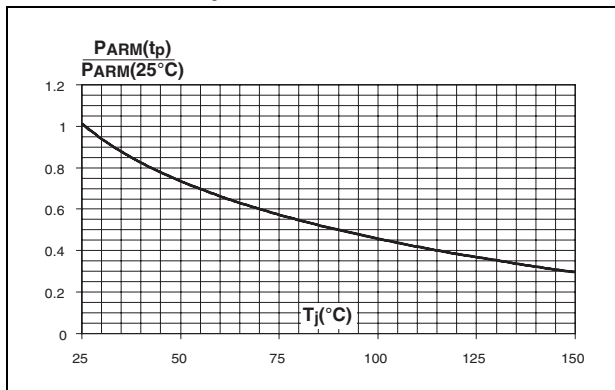
**Figure 1. Average forward power dissipation versus average forward current**



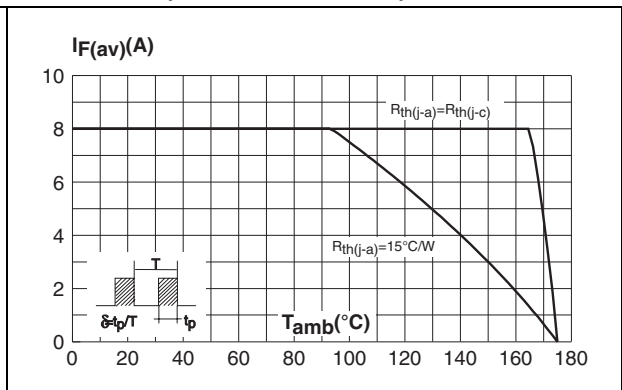
**Figure 2. Normalized avalanche power derating versus pulse duration**



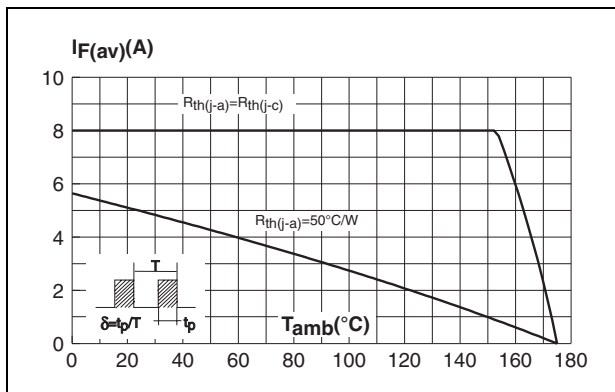
**Figure 3. Normalized avalanche power derating versus junction temperature**



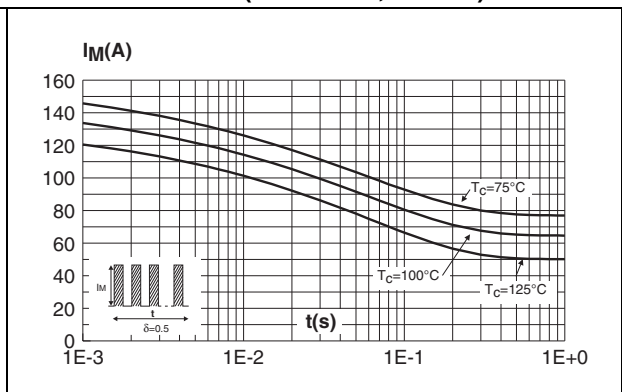
**Figure 4. Average forward current versus ambient temperature,  $\delta = 0.5$ , (TO-220AC, D<sup>2</sup>PAK)**



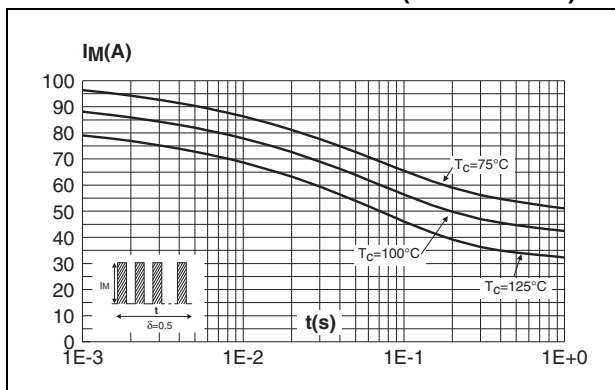
**Figure 5. Average forward current versus ambient temperature,  $\delta = 0.5$ , (TO-220FPAC)**



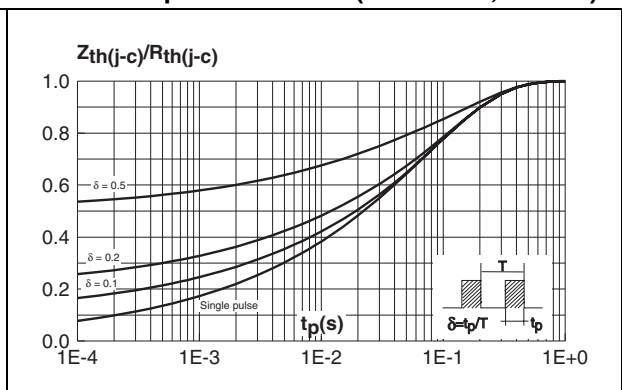
**Figure 6. Non repetitive surge peak forward current versus overload duration - maximum values, per diode (TO-220AC, D<sup>2</sup>PAK)**



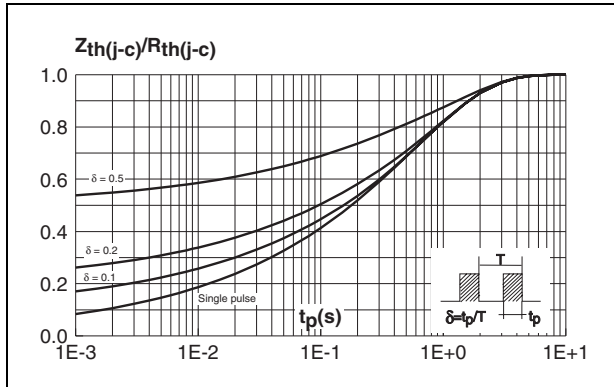
**Figure 7. Non repetitive surge peak forward current versus overload duration - maximum values (TO-220FPAC)**



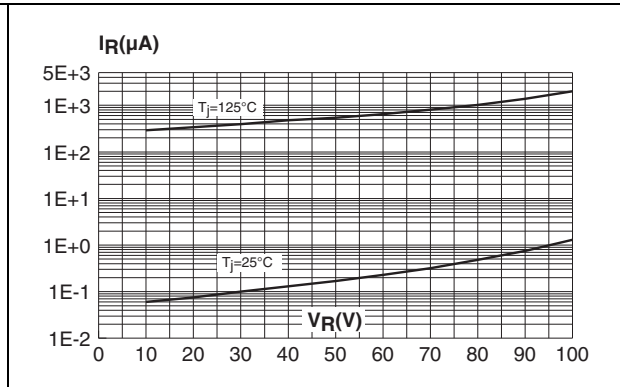
**Figure 8. Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, D<sup>2</sup>PAK)**



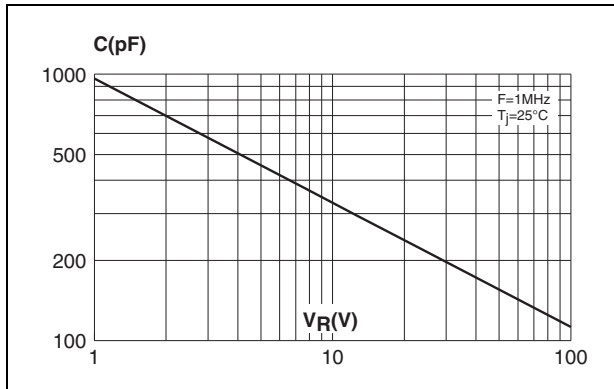
**Figure 9. Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC)**



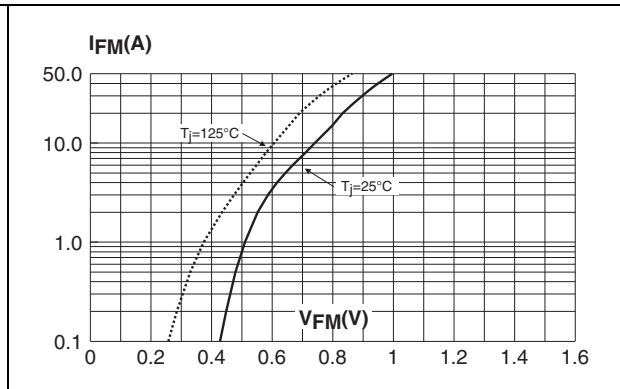
**Figure 10. Reverse leakage current versus reverse voltage applied (typical values)**



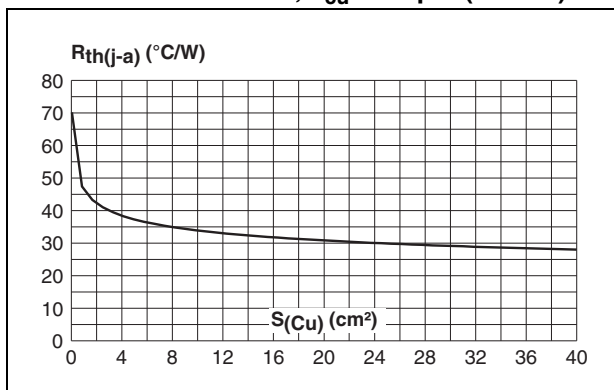
**Figure 11. Junction capacitance versus reverse voltage applied (typical values)**



**Figure 12. Forward voltage drop versus forward current (maximum values)**



**Figure 13. Thermal resistance junction to ambient versus copper surface under tab - Epoxy printed circuit board FR4, e<sub>cu</sub> = 35 μm (D<sup>2</sup>PAK)**



## 2 Package information

Epoxy meets UL94, V0.

**Table 4. D<sup>2</sup>PAK Dimensions**

REF.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

**Figure 14. D<sup>2</sup>PAK footprint dimensions (in mm)**

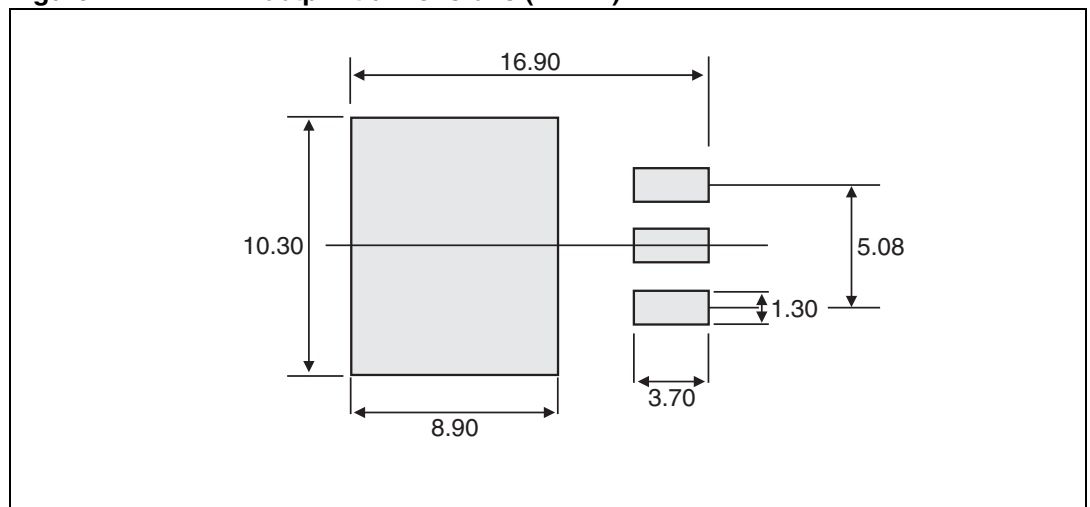
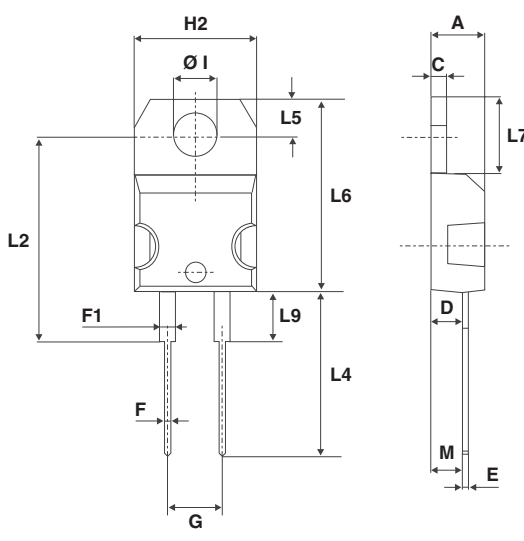


Table 5. TO-220AC Dimensions



REF.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam. I	3.75	3.85	0.147	0.151

Table 6. TO-220FPAC Dimensions

REF.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

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).

### 3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS8H100D	STPS8H100D	TO-220AC	1.86 g	50	Tube
STPS8H100FP	STPS8H100FP	TO-220FPAC	1.9 g	50	Tube
STPS8H100G	STPS8H100G	D <sup>2</sup> PAK	1.48 g	50	Tube
STPS8H100G-TR	STPS8H100G	D <sup>2</sup> PAK	1.48 g	500	Tape and reel

### 4 Revision history

Date	Revision	Description of Changes
Jul-2003	6D	Last update.
1-June-2006	10	Reformatted to current standard. Added ECOPACK statement. Changed nF to pF in Figure 11. Revision number set to 10 to align with on-line versioning.



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