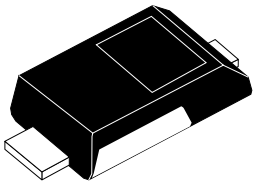
STPS1H100MF

Datasheet

High voltage power Schottky rectifier



STmite Flat

Features

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

Description

The STPS1H100MF is a Schottky rectifier designed for high frequency miniature switch mode power supplies such as adaptors and on-board DC/DC convertors. This device is housed in STmite flat package.

It is ideal for lighting and telecom power applications.

Product status link	
STPS1H100MF	
Product summary	
Symbol	**Value**
$I_{F(AV)}$	1 A
V_{RRM}	100 V
T_j (max.)	175 °C
V_F (max.)	0.62 V

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		100	V
$I_{F(RMS)}$	Forward rms current		2	A
$I_{F(AV)}$	Average forward current	T_c = 160 °C, δ = 0.5	1	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	50	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C	108	W
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature range(1)		175	°C

1. *$(dP_{tot}/dT_j) < (1/R_{th(j-a)})$ condition to avoid thermal runaway for a diode on its own heatsink.*

Table 2. Thermal parameters

Symbol	Parameter	Max. value	Unit
$R_{th(j-c)}$	Junction to case	20	°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	$V_R = V_{RRM}$	-		4	µA
		T_j = 125 °C		-	0.2	0.5	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 1 A	-		0.77	V
		T_j = 125 °C		-	0.58	0.62	
		T_j = 25 °C	I_F = 2 A	-		0.86	
		T_j = 125 °C		-	0.65	0.7	

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

To evaluate the conduction losses, use the following equation:

$P = 0.54 \times I_{F(AV)} + 0.08 \times I_F{}^2{}_{(RMS)}$

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

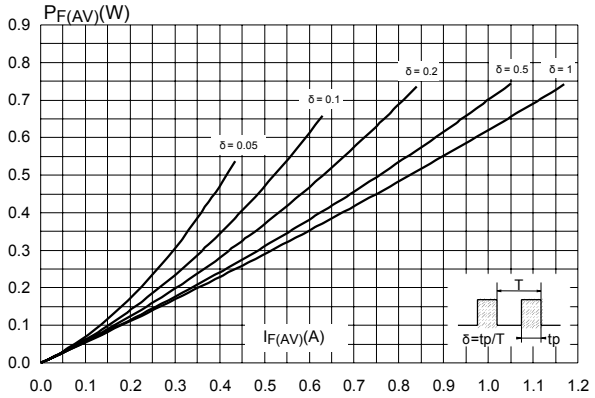


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

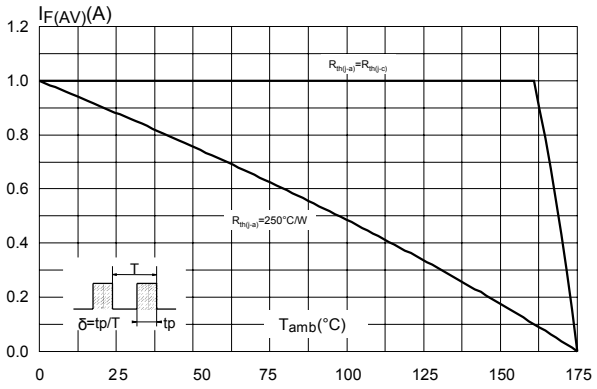


Figure 3. Normalized avalanche power derating versus junction temperature (T_j = 125 °C)

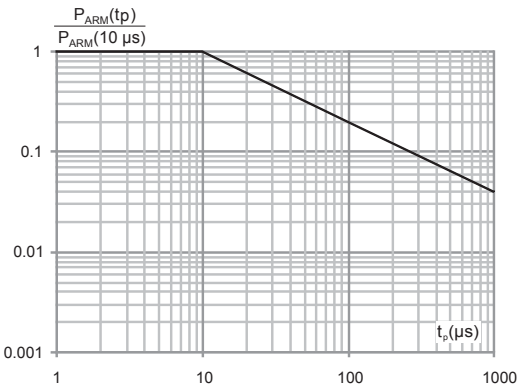


Figure 4. Forward voltage drop versus forward current

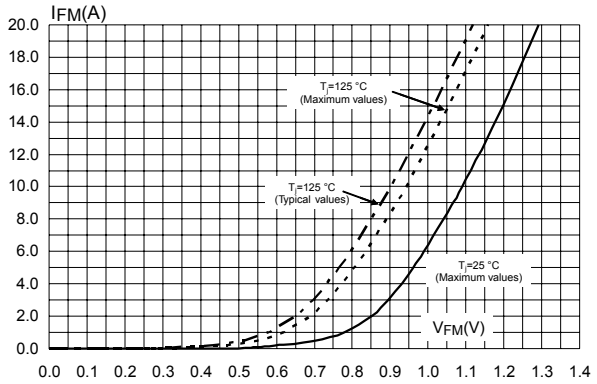


Figure 5. Relative variation of thermal impedance, junction to ambient, versus pulse duration (epoxy printed circuit board, copper thickness = 35 µm, recommended pad layout)

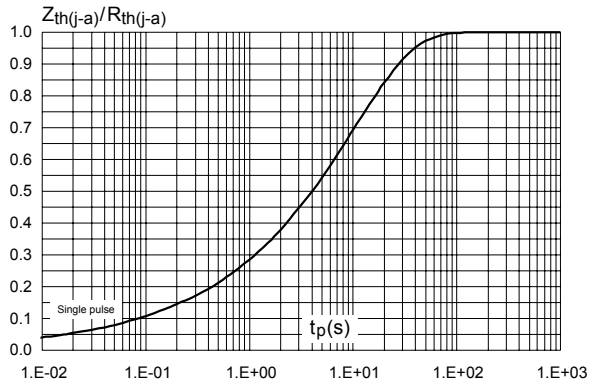


Figure 6. Thermal resistance, junction to ambient, versus copper surface under tab (epoxy printed board FR4, copper thickness = 35 µm)

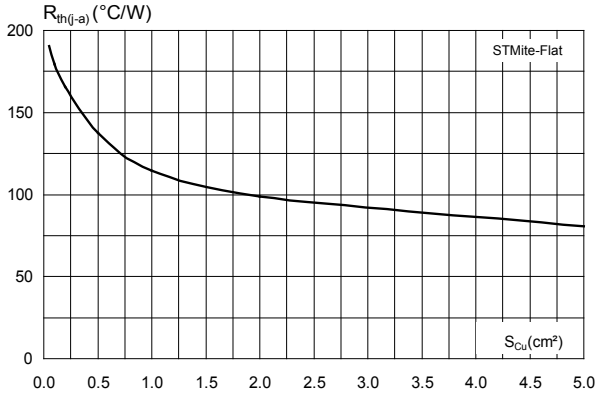


Figure 7. Reverse leakage current versus voltage applied (typical values)

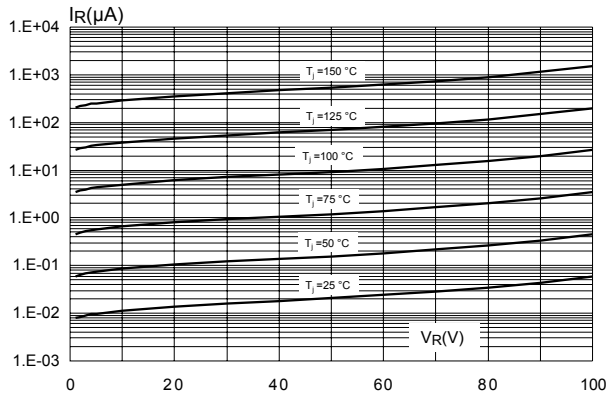
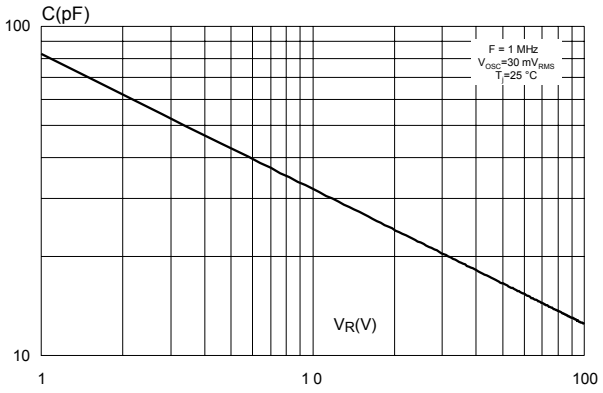


Figure 8. Junction capacitance versus reverse voltage applied (typical values)



2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

2.1 STmite Flat package information

- Epoxy meets UL 94,V0

Figure 9. STmite Flat package outline

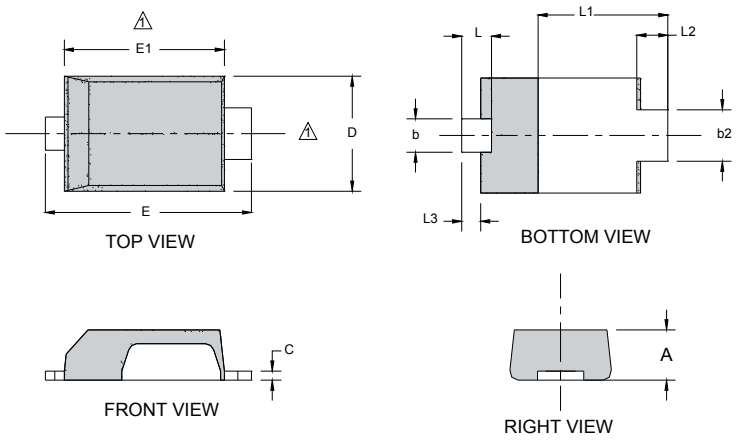
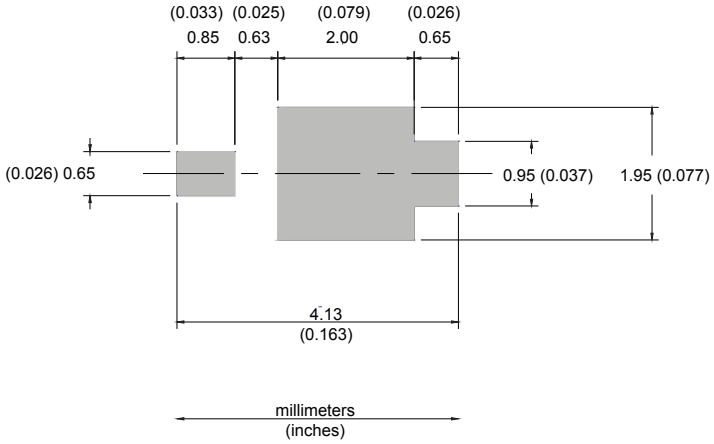


Table 4. STmite Flat package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.80	0.85	0.95	0.031	0.033	0.037
b	0.40	0.55	0.65	0.016	0.022	0.026
b2	0.70	0.85	1.00	0.027	0.033	0.039
c	0.10	0.15	0.25	0.004	0.006	0.009
D	1.75	1.90	2.05	0.069	0.075	0.081
E	3.60	3.80	3.90	0.142	0.150	0.154
E1	2.80	2.95	3.10	0.110	0.116	0.122
L	0.50	0.55	0.80	0.020	0.022	0.031
L1	2.10	2.40	2.60	0.083	0.094	0.102
L2	0.45	0.60	0.75	0.018	0.024	0.030
L3	0.20	0.35	0.50	0.008	0.014	0.020

Figure 10. STmite Flat Recommended footprint



3 Ordering information

Table 5. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS1H100MF	M11	STmite flat	16 mg	12000	Tape and reel

Revision history

Table 6. Document revision history

Date	Version	Changes
15-May-2008	1	First issue.
10-Apr-2018	2	Removed figure 4 and figure 5. Updated Section ● Description, Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified) and Figure 3. Normalized avalanche power derating versus junction temperature (T_j = 125 °C). Minor text changes to improve readability.

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