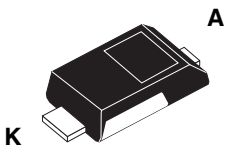
STPS1H100MF

High voltage power Schottky rectifier

Features

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



STmite flat
(DO222-AA)

Description

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

Table 1. Device summary

$I_{F(AV)}$	1 A
V_{RRM}	100 V
T_j (max)	175 °C
V_F (max)	0.62 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		100	V
$I_{F(RMS)}$	Forward current rms		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
I_{RRM}	Repetitive peak reverse current	t_p = 2 µs, F = I kHz square	1	A
I_{RSM}	Non-repetitive peak reverse current	t_p = 100 µs square	1	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25 °C	1500	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 (rated V_R, T_j = 25 °C)		10000	V/µs

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

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	20	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Tests 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: = 5 ms, δ < 2%
2. Pulse test: = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation: $P = 0.54 \times I_{F(AV)} + 0.08\ I_{F^2(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

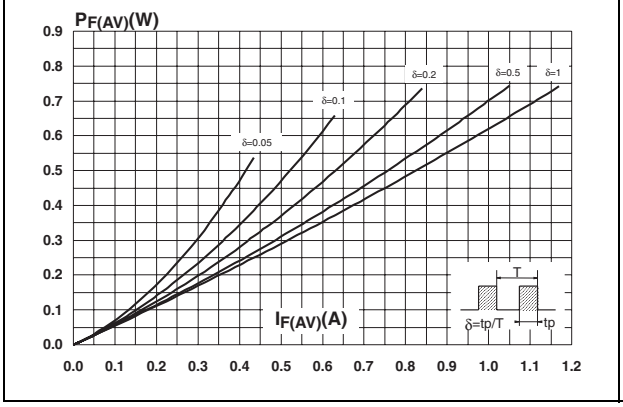


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

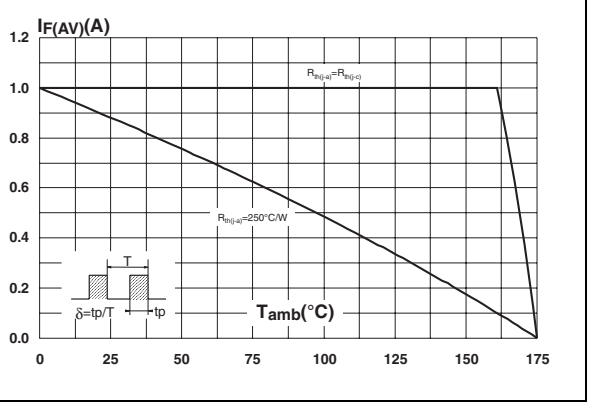


Figure 3. Normalized avalanche power derating versus pulse duration

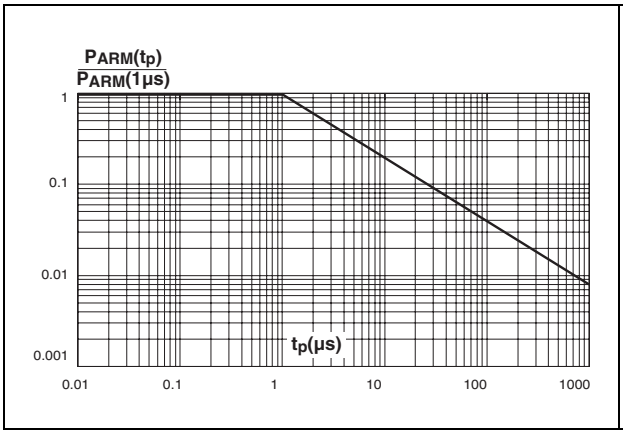


Figure 4. Normalized avalanche power derating versus junction temperature

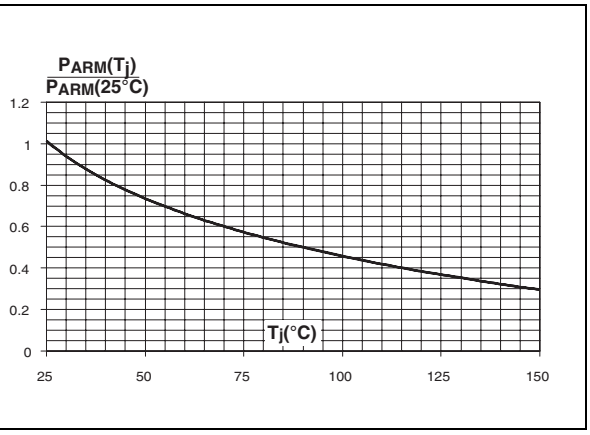


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

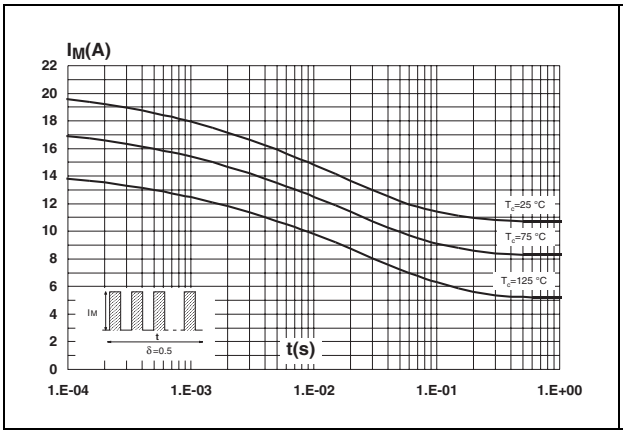


Figure 6. Forward voltage drop versus forward current

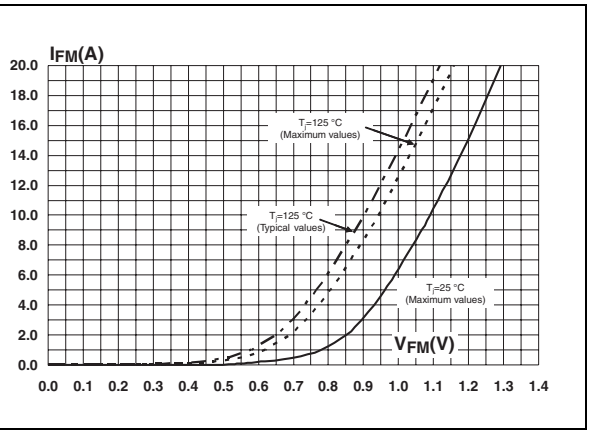


Figure 7. Relative variation of thermal impedance, junction to ambient, versus pulse duration (epoxy printed circuit board, copper thickness = 35 µm, recommended pad layout)

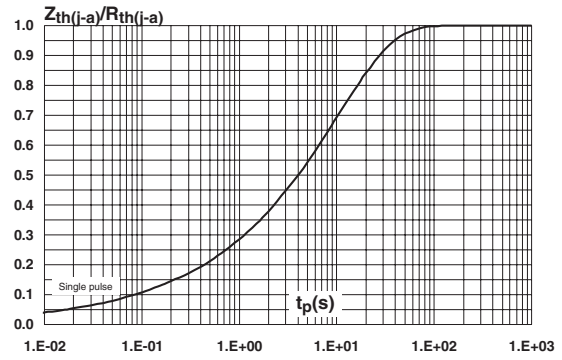


Figure 8. Thermal resistance, junction to ambient, versus copper surface under each lead (epoxy printed board FR4, copper thickness = 35 µm)

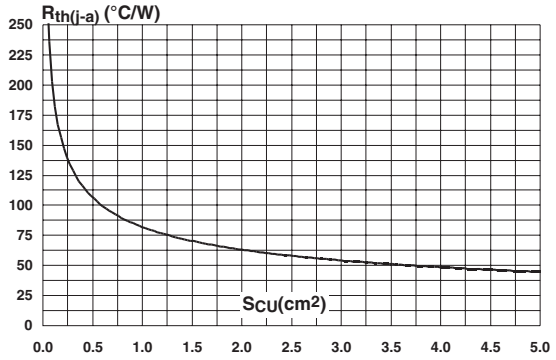


Figure 9. Reverse leakage current versus voltage applied (typical values)

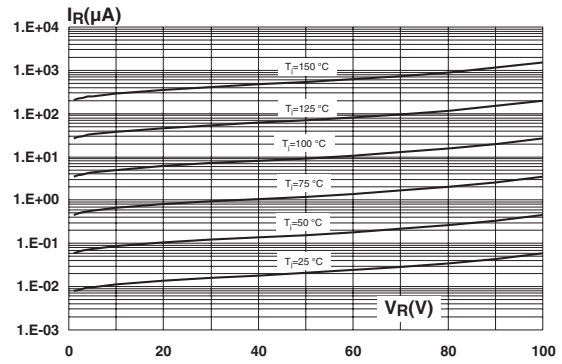
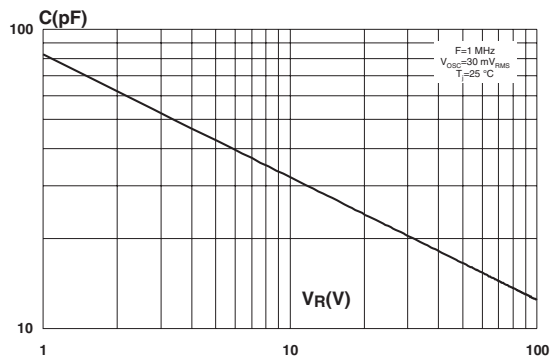


Figure 10. Junction capacitance versus reverse voltage applied (typical values)

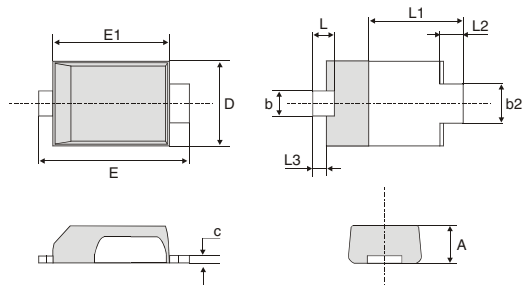


2 Package information

- Epoxy meets UL94, V0

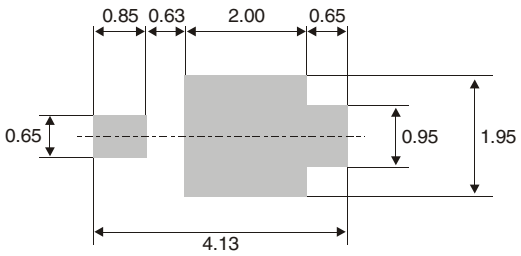
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings 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 5. STmite flat dimensions



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 11. STmite flat recommended footprint (all dimensions in mm)



3 Ordering information

Table 6. Ordering information

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

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
15-May-2008	1	First issue.

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