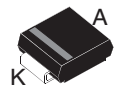
STPS2H100-Y

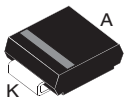
Automotive power Schottky rectifier

Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified
- ECOPACK®2 compliant component
- AEC-Q101 qualified



SMA
STPS2H100AY



SMB
STPS2H100UY

Description

Schottky rectifiers designed for high frequency miniature switched mode power supplies such as adaptators and on board DC/DC converters. Available in SMA and SMB.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 A
V_{RRM}	100 V
T_j (max)	175 °C
V_F (max)	0.65 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
$I_{F(AV)}$	Average forward current	SMA / SMB	T_L = 130 °C δ = 0.5	2	A
I_{FSM}	Surge non repetitive forward current		t_p =10 ms sinusoidal	75	A
P_{ARM}	Repetitive peak avalanche power		t_p = 1 µs T_j = 25 °C	2400	W
T_{stg}	Storage temperature range			-65 to +175	°C
T_j	Operating junction temperature range(1)			-40 to +175	°C

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
$R_{th(j-l)}$	Junction to lead	SMA	30	°C/W
		SMB	25	

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	1	µA
		T_j = 125 °C		-	0.4	1	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 2 A	-	-	0.79	V
		T_j = 125 °C		-	0.6	0.65	
		T_j = 25 °C	I_F = 4 A	-	-	0.88	
		T_j = 125 °C		-	0.69	0.74	

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

To evaluate the conduction losses use the following equation:
$P = 0.56 \times I_{F(AV)} + 0.045\ I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

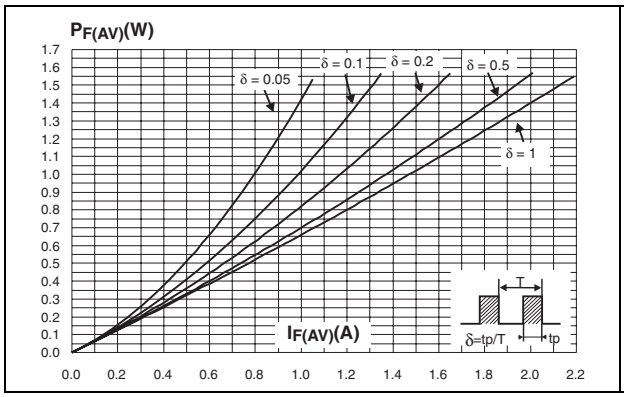


Figure 2. Average forward current versus ambient temperature (δ = 0.5) (SMA / SMB)

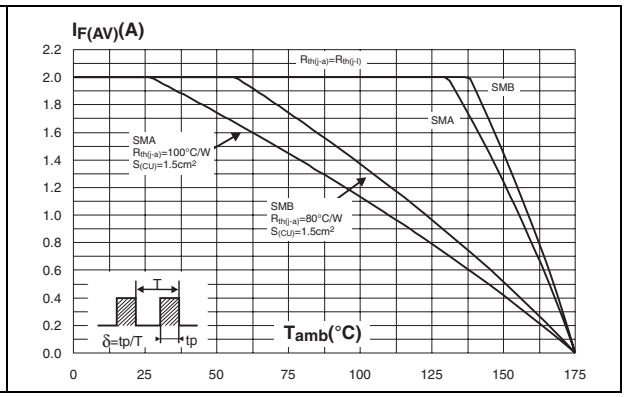


Figure 3. Normalized avalanche power derating versus pulse duration

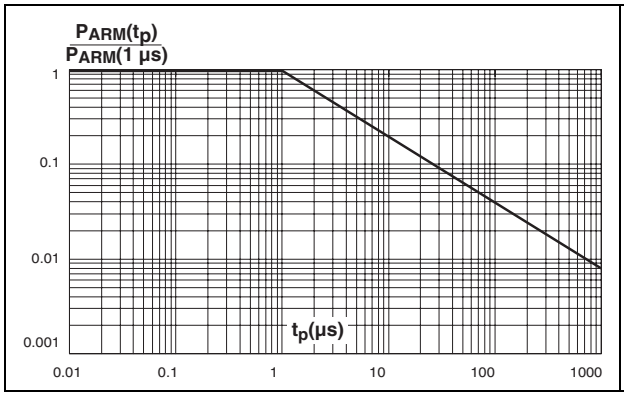


Figure 4. Normalized avalanche power derating versus junction temperature

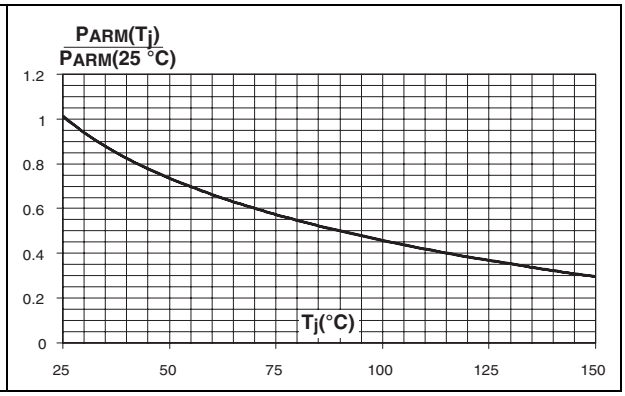


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)

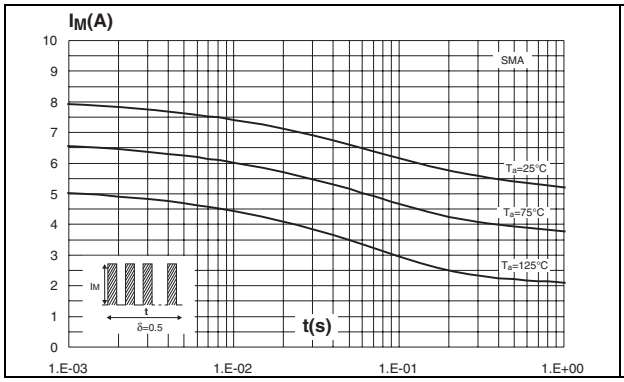


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

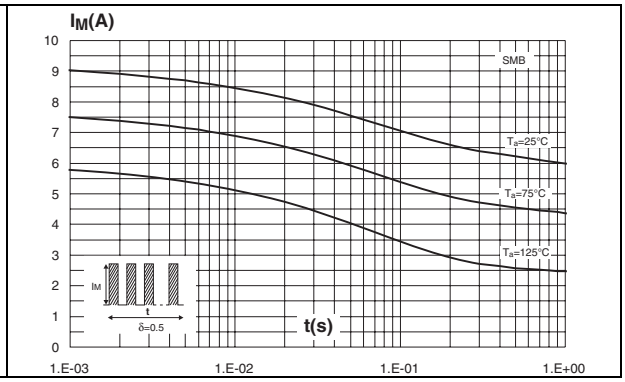


Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA / SMB)

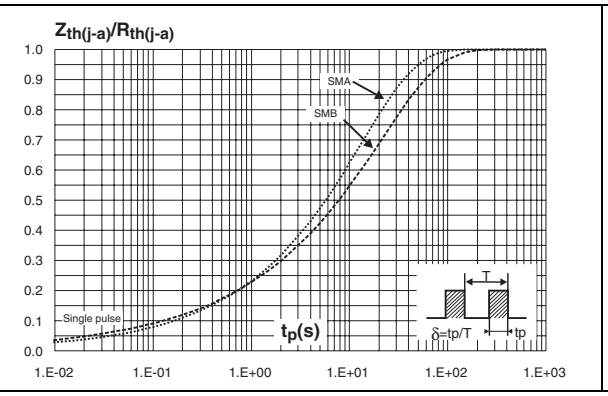


Figure 8. Reverse leakage current versus reverse voltage applied (typical values)

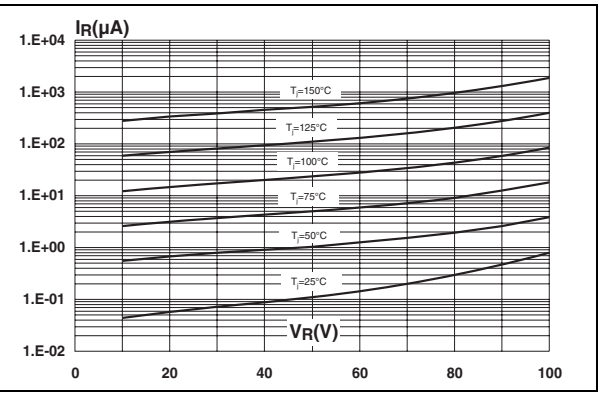


Figure 9. Junction capacitance versus reverse voltage applied (typical values)

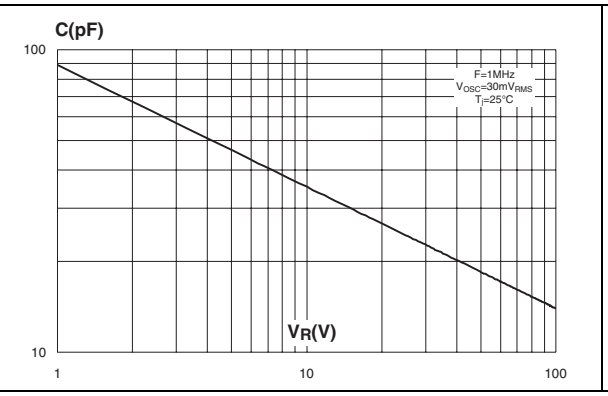


Figure 10. Forward voltage drop versus forward current (low level)

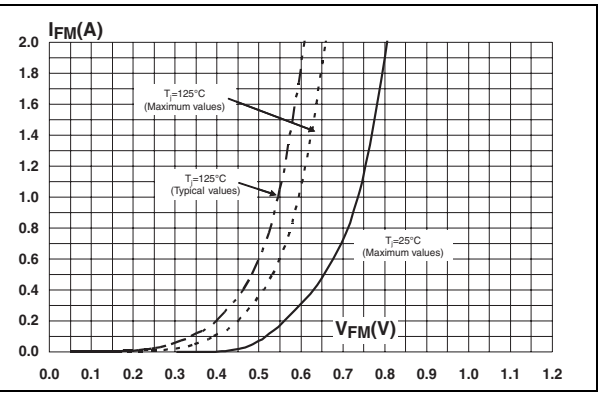


Figure 11. Forward voltage drop versus forward current (high level)

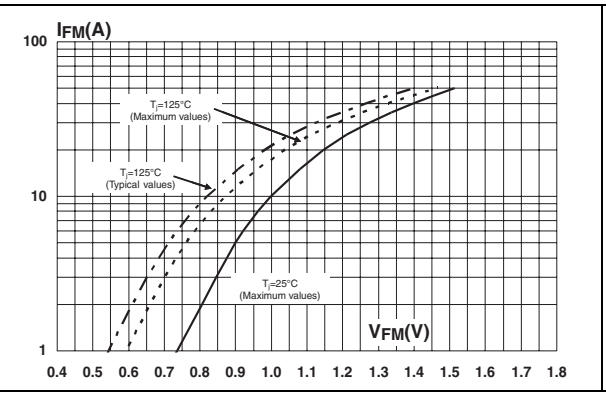


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead (SMA)

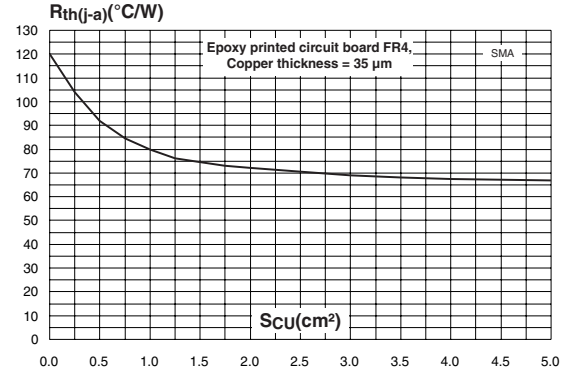
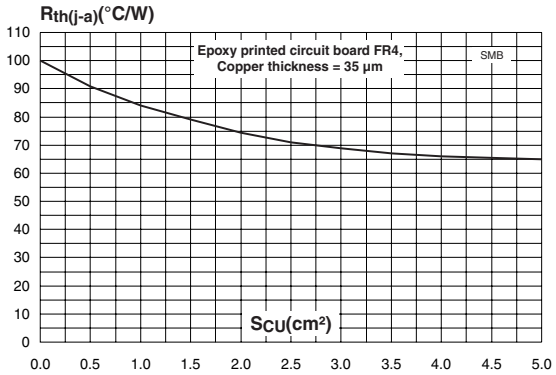


Figure 13. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

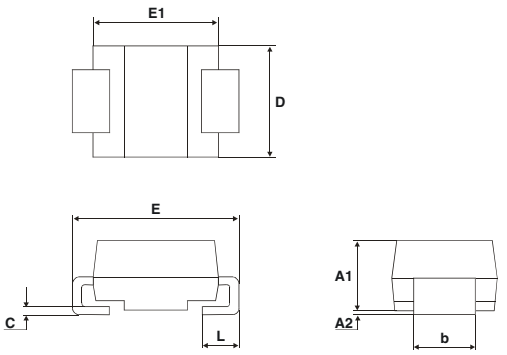


2 Package information

- Epoxy meets UL94, V0
- Lead-free packages

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.

Table 5. SMA dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.094
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.40	0.006	0.016
D	2.25	2.90	0.089	0.114
E	4.80	5.35	0.189	0.211
E1	3.95	4.60	0.156	0.181
L	0.75	1.50	0.030	0.059

Figure 14. SMA footprint (dimensions in mm)

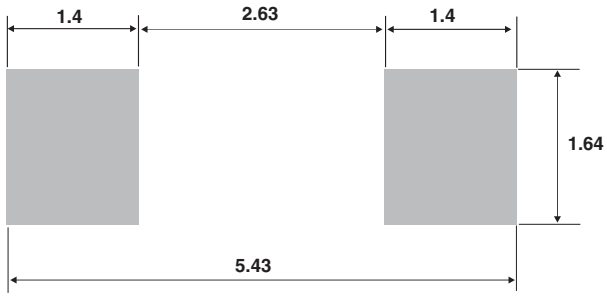
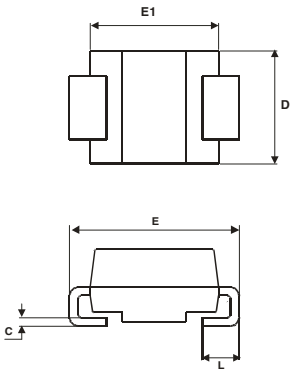
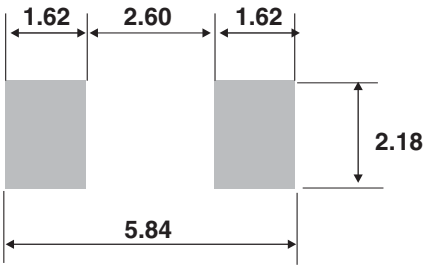


Table 6. SMB dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.50	0.030	0.059

Figure 15. SMB footprint (dimensions in mm)



3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS2H100AY	S21Y	SMA	0.068 g	5000	Tape and reel
STPS2H100UY	G21Y	SMB	0.107 g	2500	Tape and reel

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
03-Dec-2010	1	Initial release.

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