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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

Description

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

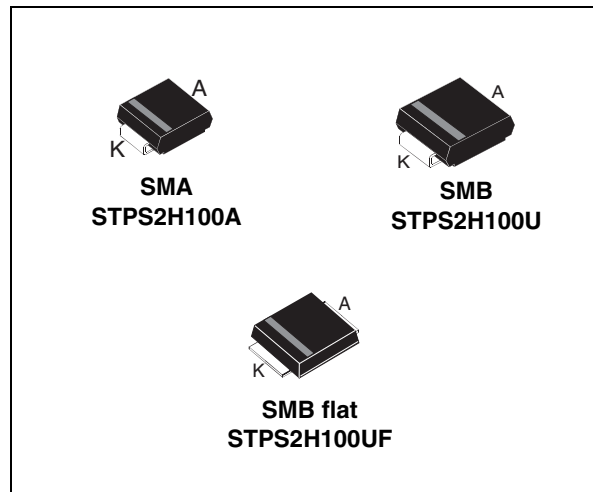


Table 1. Device summary

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
		SMB flat	T _L = 150 °C δ = 0.5		
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 ⁽¹⁾		175	°C	

1. $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ 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	
		SMB flat	15	

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: $P = 0.56 \times I_{F(AV)} + 0.045 I_{F(RMS)}^2$

Figure 1. Average forward power dissipation versus average forward current

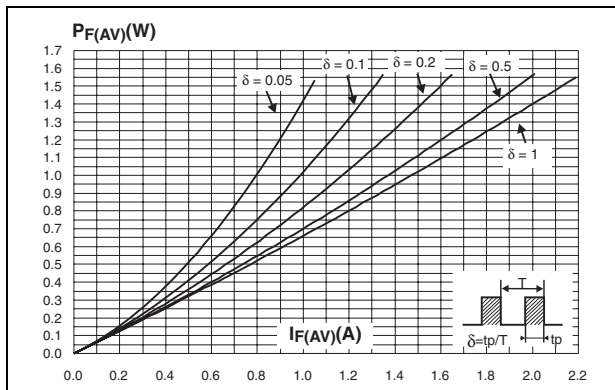


Figure 2. Average forward current versus ambient temperature (delta = 0.5) (SMA / SMB)

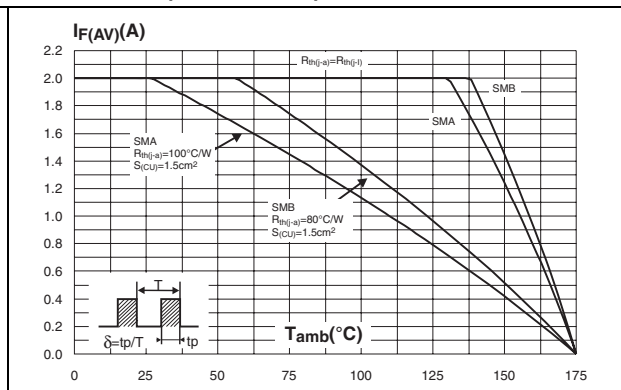


Figure 3. Average forward current versus ambient temperature (delta = 0.5) (SMB flat)

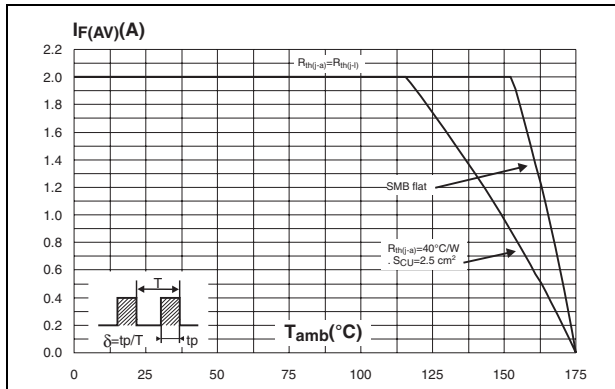


Figure 4. Normalized avalanche power derating versus pulse duration

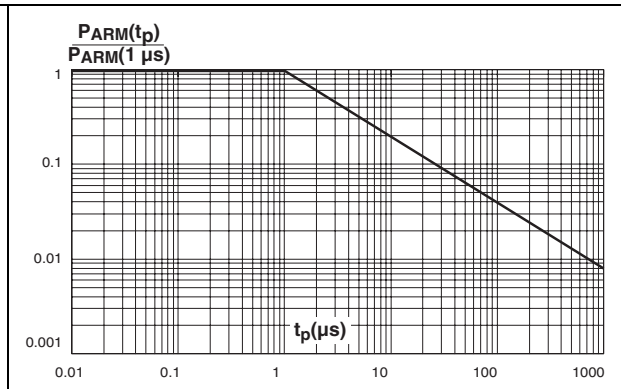


Figure 5. Normalized avalanche power derating versus junction temperature

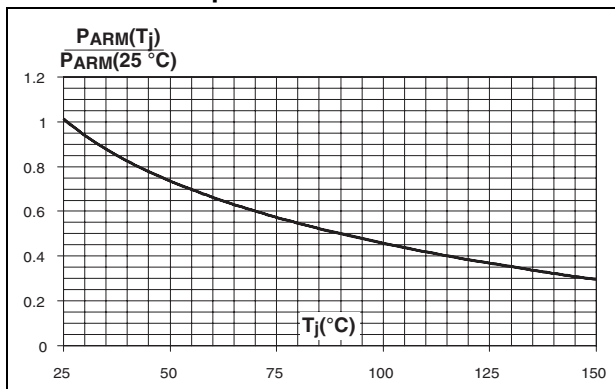


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)

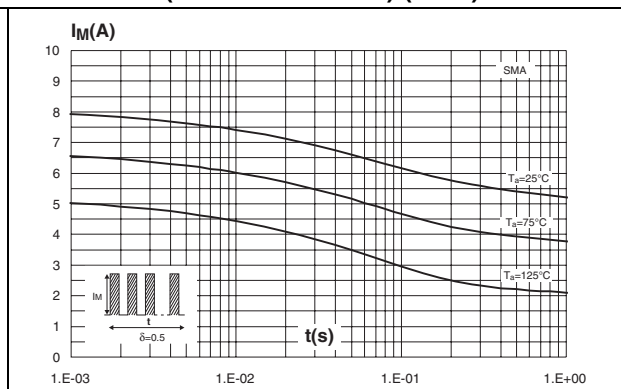


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

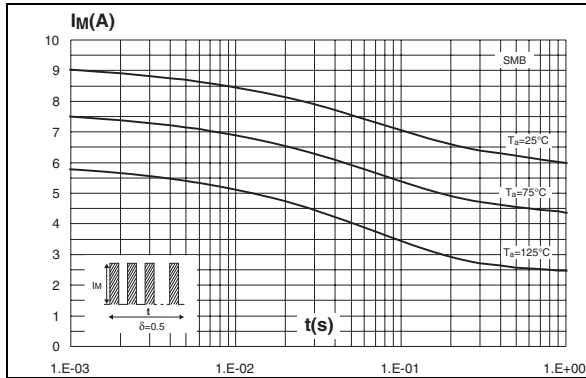


Figure 8. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB flat)

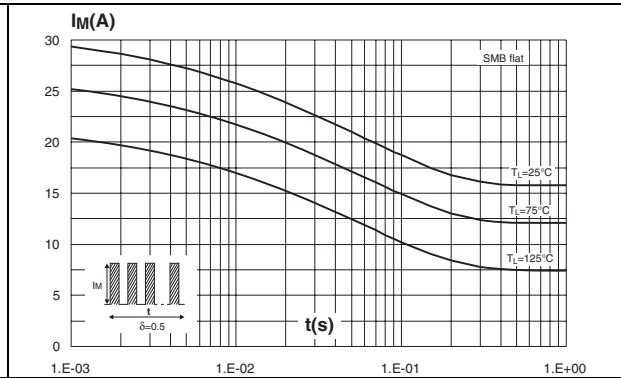


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA / SMB)

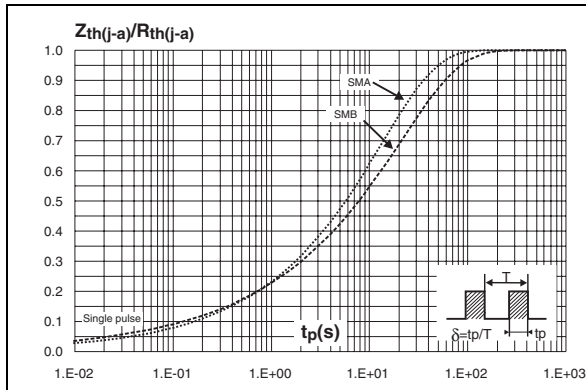


Figure 10. Relative variation of thermal impedance junction to lead versus pulse duration (SMB flat)

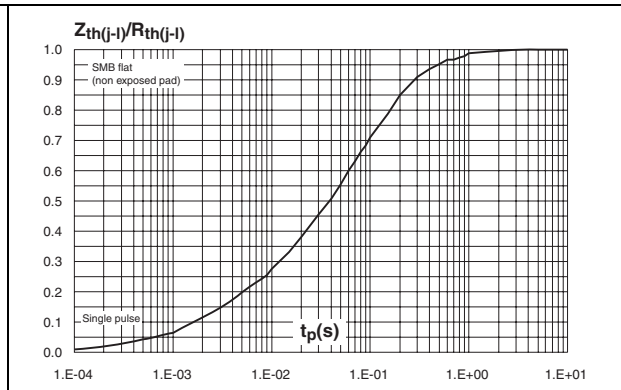


Figure 11. Reverse leakage current versus reverse voltage applied (typical values)

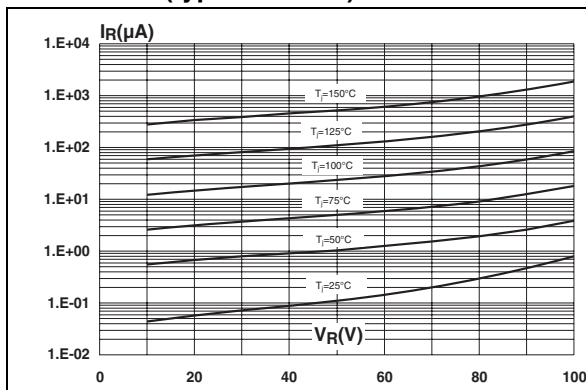


Figure 12. Junction capacitance versus reverse voltage applied (typical values)

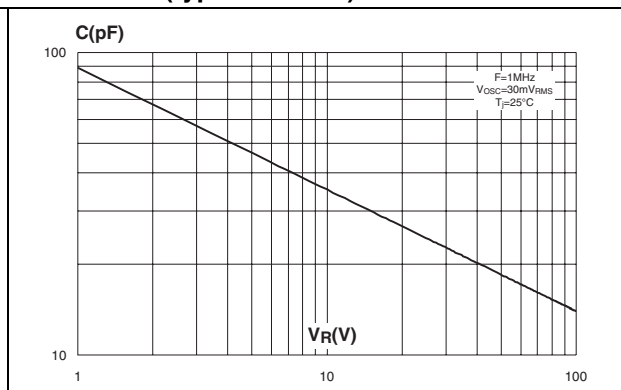


Figure 13. Forward voltage drop versus forward current (low level)

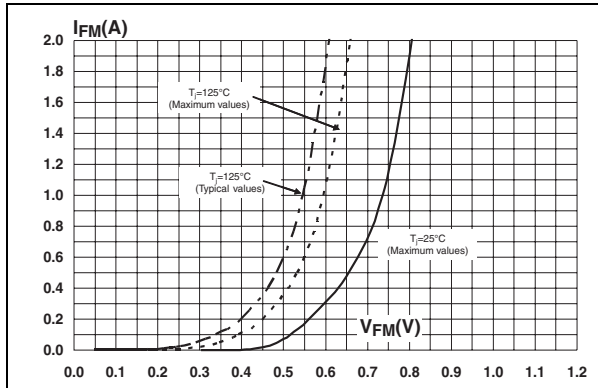


Figure 14. Forward voltage drop versus forward current (high level)

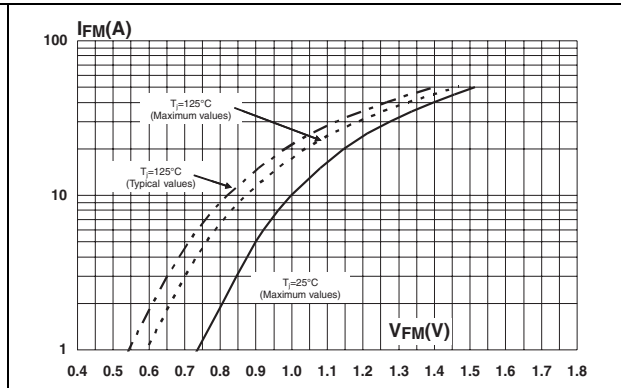


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (SMA)

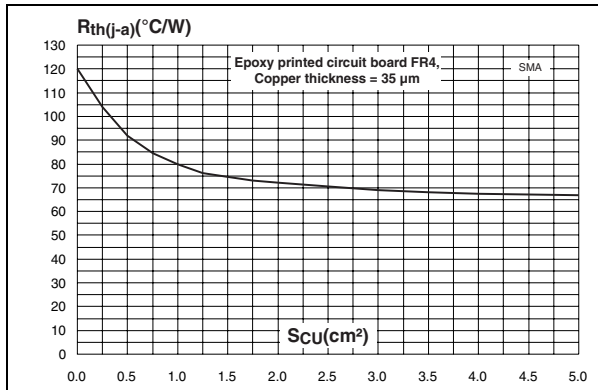


Figure 16. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

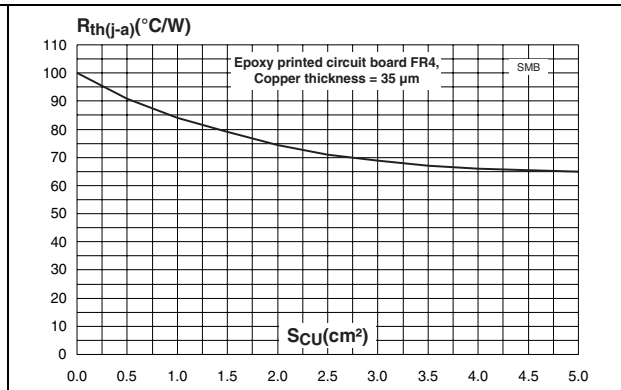
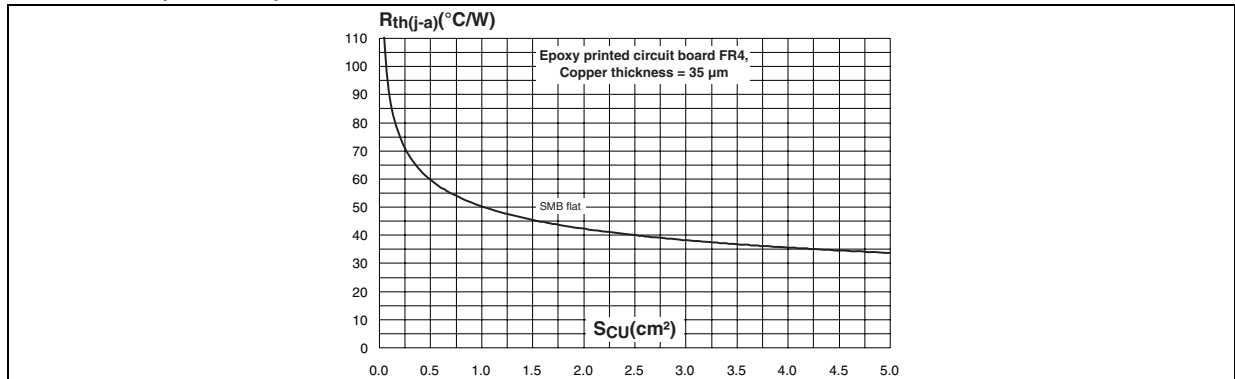


Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (SMB flat)



2 Package information

- Epoxy meets UL94, V0
- Lead-free package

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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 18. SMA footprint (dimensions in mm)

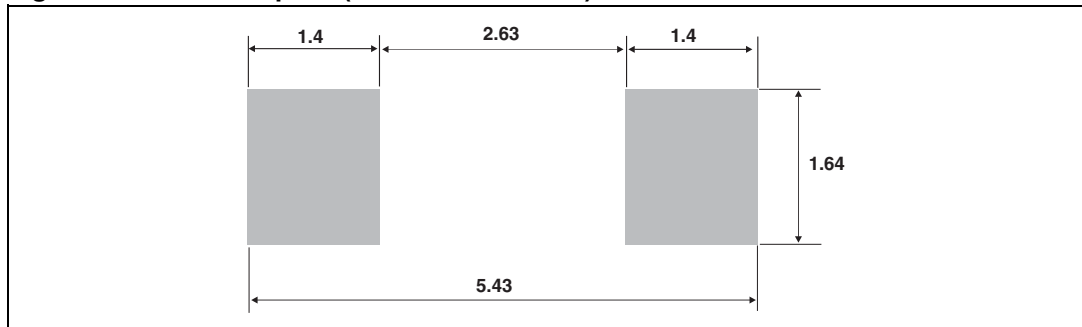


Table 6. SMB dimensions

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 19. SMB footprint (dimensions in mm)

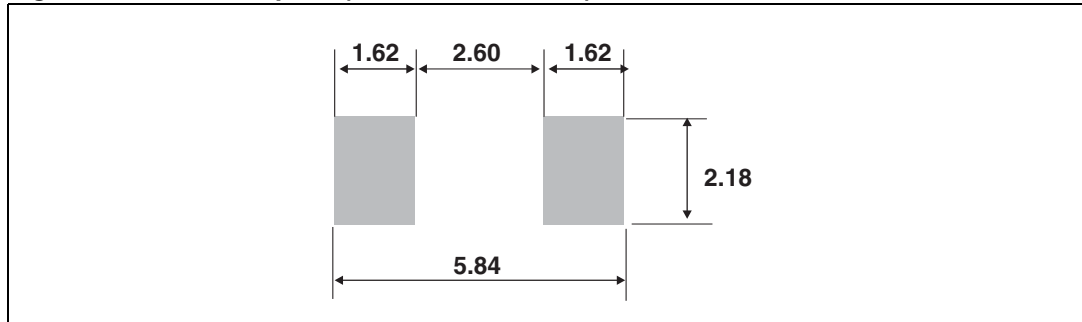
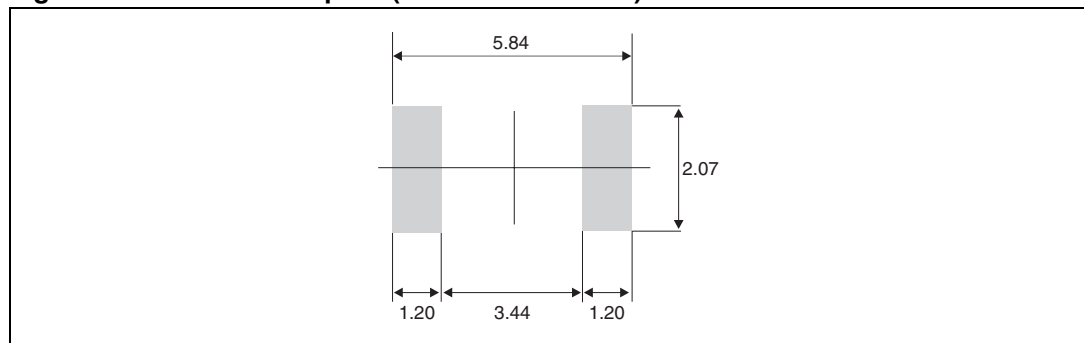


Table 7. SMB flat dimensions

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b ⁽¹⁾	1.95		2.20	0.077		0.087
c ⁽¹⁾	0.15		0.40	0.006		0.016
D	3.30		3.95	0.130		0.156
E	5.10		5.60	0.200		0.220
E1	4.05		4.60	0.189		0.181
L	0.75		1.50	0.029		0.059
L1		0.40			0.016	
L2		0.60			0.024	

1. Applies to plated leads

Figure 20. SMB flat footprint (dimensions in mm)



3 Ordering information

Table 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS2H100A	S21	SMA	0.068 g	5000	Tape and reel
STPS2H100U	G21	SMB	0.107 g	2500	Tape and reel
STPS2H100UF	FG21	SMB flat	0.050 g	5000	Tape and reel

4 Revision history

Table 9. Document revision history

Date	Revision	Changes
Jul-2003	4A	Last update.
Aug-2004	5	SMA package dimensions update. Reference A1 max. changed from 2.70 (0.106 inches) to 2.03 mm (0.080 inches).
08-Feb-2007	6	Reformatted to current standards. Added ECOPACK statement. Added SMB flat package.
15-Feb-2010	7	Updated weight for SMB flat in Table 8 .

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