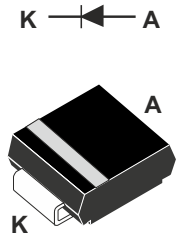
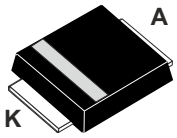
STPS2200

Power Schottky diode

Datasheet – production data



SMB
STPS2200U



SMBflat
STPS2200UF

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 A
V_{RRM}	200 V
$T_{j(max)}$	175 °C
$V_{F(typ)}$	0.58 V

Features

- Low forward voltage drop
- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low thermal resistance
- -40°C minimum operating T_j
- ECOPACK®2 compliant component

Description

This device is a 200 V Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in SMB, SMBflat, this device is especially intended for use in low voltage, high frequency inverters, freewheeling and polarity protection. Also ideal for all LED lighting applications.

1 Characteristics

Table 2. Absolute ratings (limiting values, at 25 °C unless otherwise stated)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			200	V
$I_{F(RMS)}$	Forward rms current			10	A
$I_{F(AV)}$	Average forward current δ = 0.5, square wave	SMB	T_l = 145 °C	2	A
		SMBflat	T_l = 150 °C		
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal, T_l = 25 °C		100	A
T_{stg}	Storage temperature range			-65 to +175	°C
T_j	Operating junction temperature range			-40 to +175	°C

Table 3. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMB	20	°C/W
		SMBflat	15	

Table 4. Static electrical characteristics

Symbol	Test conditions			Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			5	µA
		T_j = 125 °C			0.7	2.5	mA
V_F(1)	Forward voltage drop	T_j = 25 °C	I_F = 2 A		0.73	0.80	V
		T_j = 125 °C			0.58	0.64	V

1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the maximum conduction losses use the following equation:
$P = 0.58 \times I_{F(AV)} + 0.03\ I_F{}^2{}_{(RMS)}$

Note: More information is available in the application notes:

AN604 Calculation of conduction losses in a power rectifier

AN4021 Calculation of reverse losses in a power diode

Figure 1. Average forward power dissipation versus average forward current

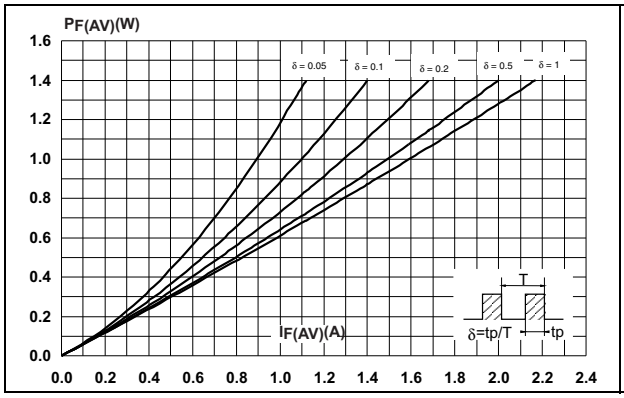


Figure 2. Forward voltage drop versus forward current

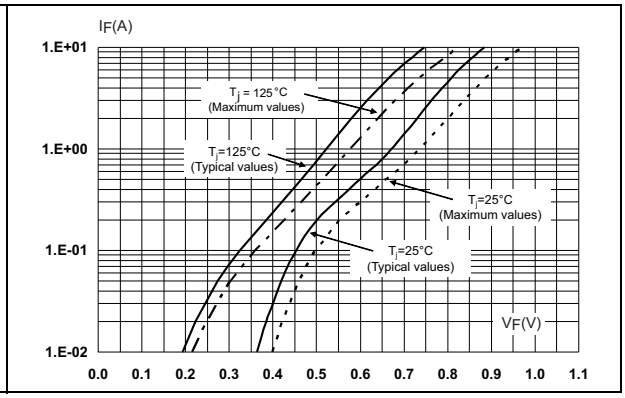


Figure 3. Reverse leakage current versus reverse voltage applied (typical values)

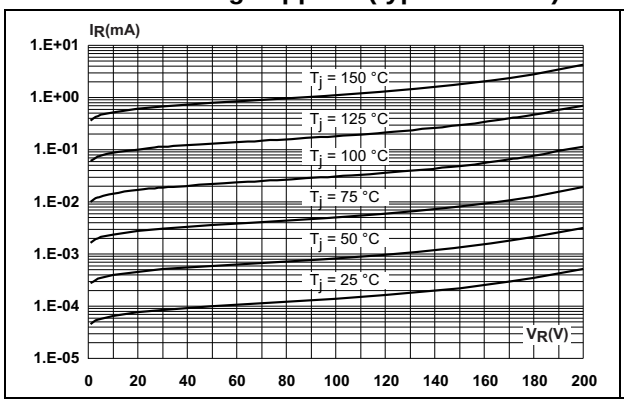


Figure 4. Junction capacitance versus reverse voltage applied (typical values)

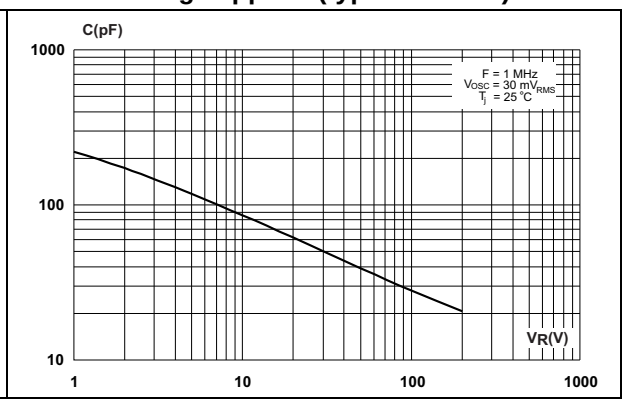


Figure 5. Relative variation of thermal impedance junction to lead versus pulse duration (SMB)

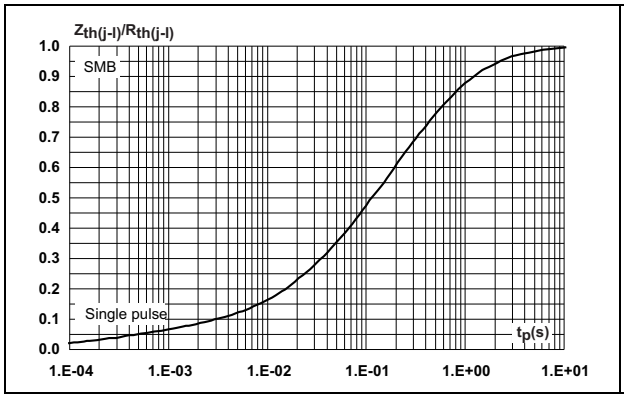


Figure 6. Relative variation of thermal impedance junction to lead versus pulse duration (SMBflat)

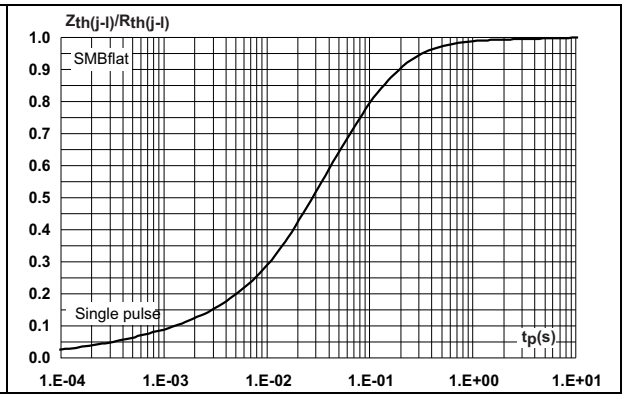


Figure 7. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

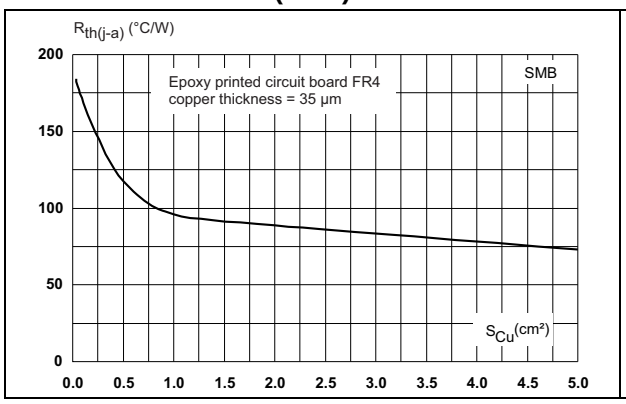
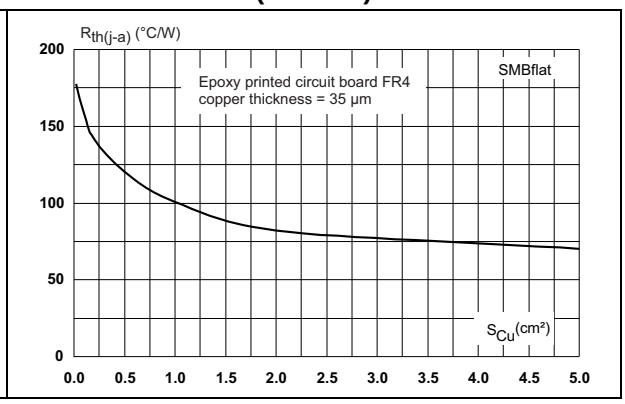


Figure 8. Thermal resistance junction to ambient versus copper surface under each lead (SMBflat)



2 Package information

- Epoxy meets UL94, V0
- Lead-free package
- Cooling method: by conduction (C)
- Recommended torque value: 0.4 to 0.6 N·m

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.

Figure 9. SMB dimension definitions

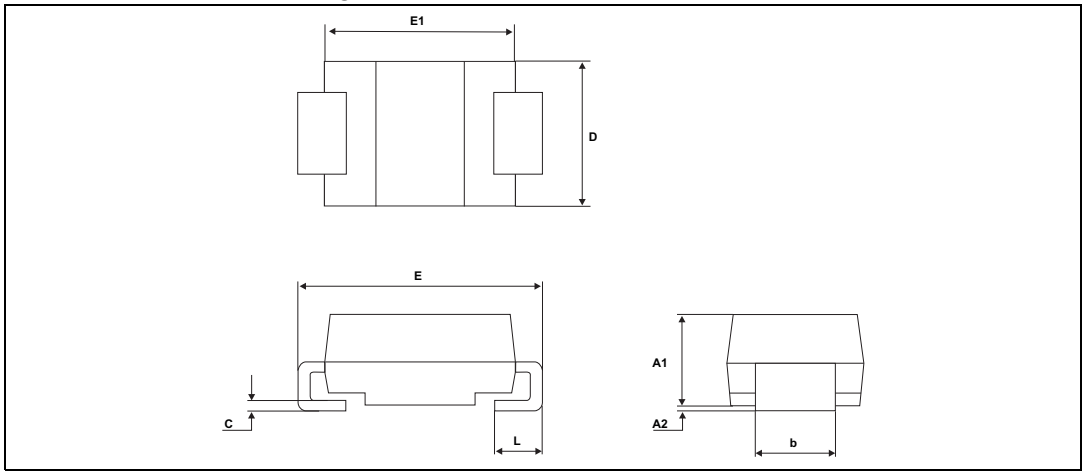


Table 5. SMB dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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
D	3.30		3.95	0.130		0.156
E	5.10		5.60	0.201		0.220
E1	4.05		4.60	0.159		0.181
L	0.75		1.50	0.030		0.059

Figure 10. SMB footprint, dimensions in mm (inches)

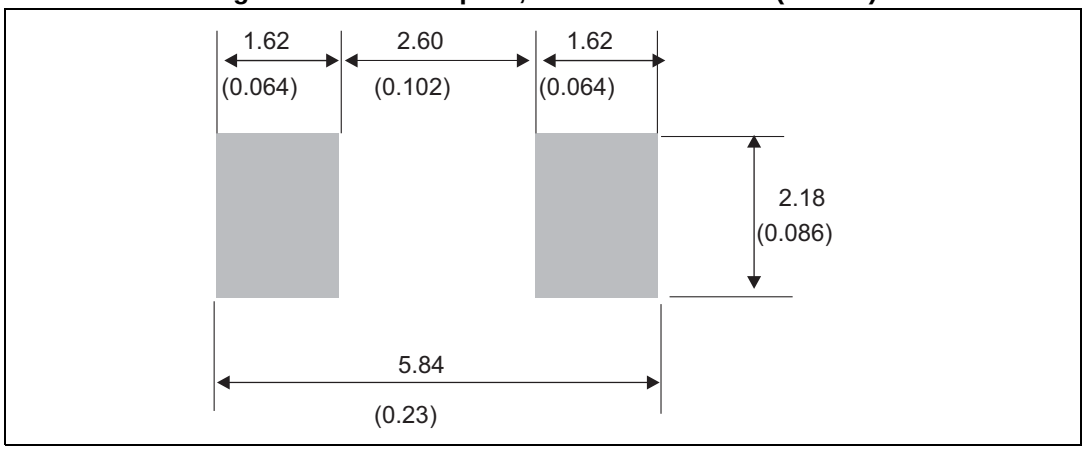


Figure 11. SMBflat (non exposed pad) dimension definitions

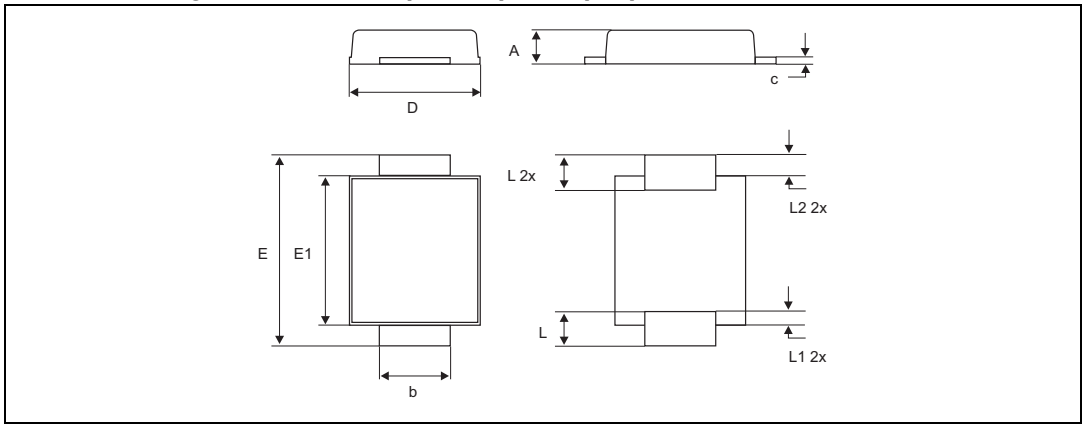
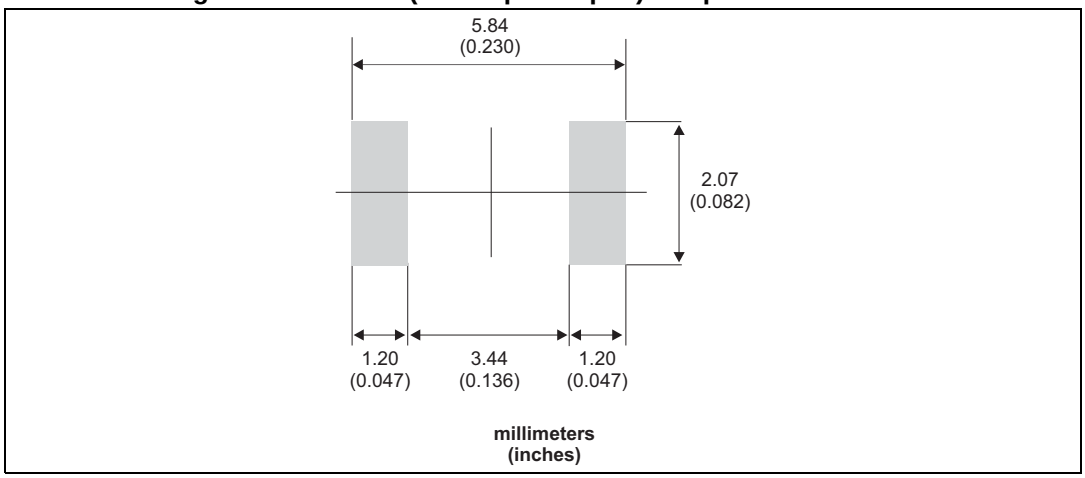


Table 6. SMBflat (non exposed pad) dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b	1.95		2.20	0.077		0.087
c	0.15		0.40	0.006		0.016
D	3.30		3.95	1.30		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	

Figure 12. SMBflat (non exposed pad) footprint dimensions



3 Ordering information

Table 7. Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS2200U	G22	SMB	g	2500	Tape and reel
STPS2200UF	FG22	SMBflat	g	5000	Tape and reel

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
11-Apr-2013	1	First issue

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