

Power Schottky diode

Datasheet - production data

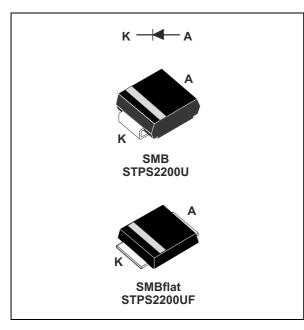


Table 1. Device summary

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_i
- 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.

Characteristics STPS2200

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	Α
	Average femore current S = 0.5, equare weve	SMB	T _I = 145 °C	2	Α
IF(AV)	Average forward current δ = 0.5, square wave	SMBflat	T _I = 150 °C	2	A
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}, T_l = 25 \text{ °C}$				Α
T _{stg}	Storage temperature range				°C
T _j	Operating junction temperature range	-40 to +175	°C		

Table 3. Thermal parameters

Symbol	Parameter	Value	Unit	
В	Junction to lead	SMB	20	°C/W
R _{th(j-l)}		SMBflat	15	C/VV

Table 4. Static electrical characteristics

Symbol	Test conditions			Min.	Тур.	Max.	Unit
I _R ⁽¹⁾	Poverse leakage current	T _j = 25 °C	\/ - \/			5	μΑ
'R`	Reverse leakage current	T _j = 125 °C	$V_R = V_{RRM}$		0.7	2.5	mA
V _E ⁽¹⁾	Forward voltage drop	T _j = 25 °C	I _F = 2 A		0.73	0.80	V
VF`	Forward voltage drop	T _j = 125 °C	7 IF = 2 A		0.58	0.64	V

^{1.} Pulse test: t_p = 380 μ s, 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:

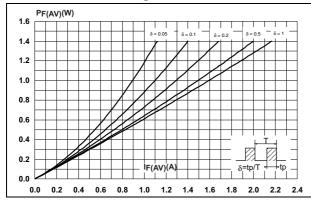
AN604 Calculation of conduction losses in a power rectifier

AN4021 Calculation of reverse losses in a power diode

STPS2200 Characteristics

Figure 1. Average forward power dissipation versus average forward current

Figure 2. Forward voltage drop versus forward current



1.E+01

1.E+00

1.E+01

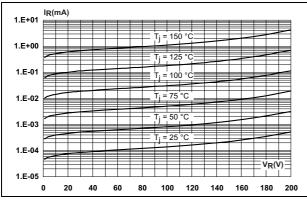
1.E-01

1.E-02

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1

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

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



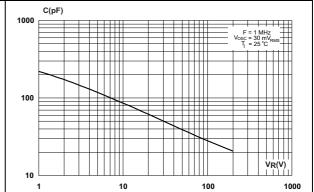
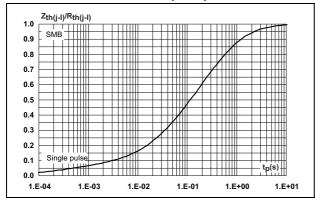
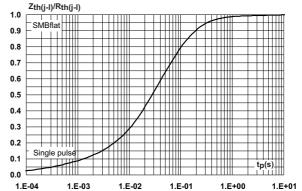


Figure 5. Relative variation of thermal impedance junction to lead versus pulse duration (SMB)

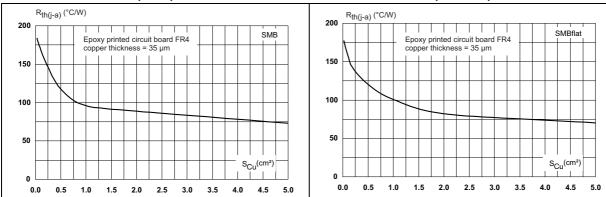
Figure 6. Relative variation of thermal impedance junction to lead versus pulse duration (SMBflat)





Characteristics STPS2200

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.

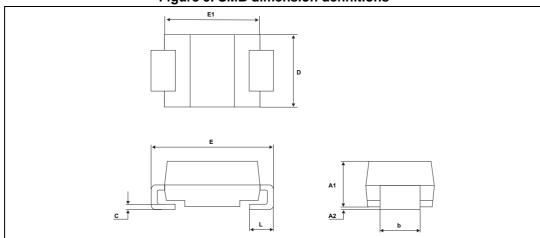


Figure 9. SMB dimension definitions

Table 5. SMB dimension values

			Dime	nsions		
Ref.		Millimeters			Inches	
	Min.	Тур.	Max.	Min.	Тур.	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
С	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

Package information STPS2200

1.62 (0.064) (0.102) (0.064) (0.086) (0.23)

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

Figure 11. SMBflat (non exposed pad) dimension definitions

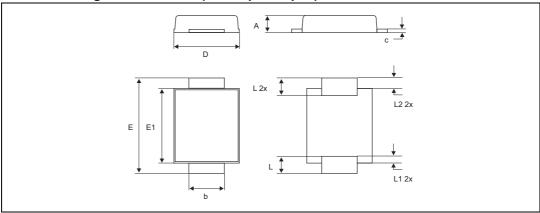


Table 6. SMBflat (non exposed pad) dimension values

	Dimensions					
Ref.		Millimeters			Inches	
	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	0.90		1.10	0.035		0.043
b	1.95		2.20	0.077		0.087
С	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	

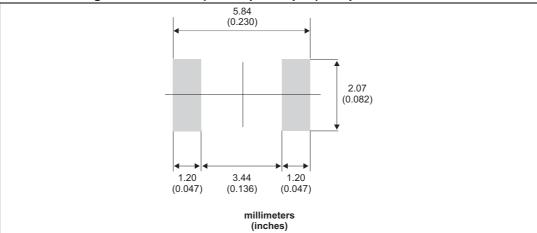


Figure 12. SMBflat (non exposed pad) footprint dimensions

Ordering information STPS2200

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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