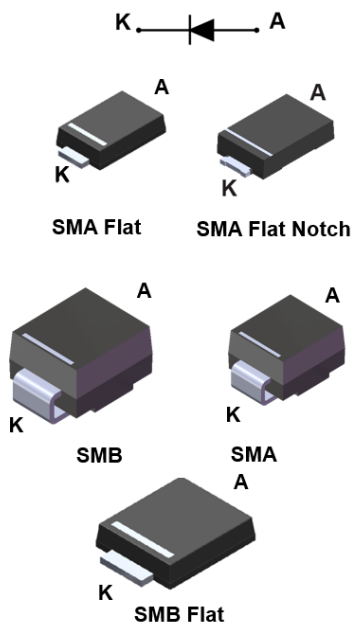


## 100 V, 2 A power Schottky rectifier



### Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified
- **ECOPACK2** component

### Applications

- Switching diode
- Battery charger
- SMPS
- DC / DC converter
- Telecom power
- LED lighting

### Description

This Schottky rectifier is designed for high frequency miniature switched mode power supplies such as adaptors and on board DC/DC converters.

Packaged in SMA, SMA Flat, SMB, SMB Flat and SMA Flat Notch, the **STPS2H100** is ideal for use in lighting and telecom power applications.

#### Product status link

[STPS2H100](#)

#### Product 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 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		100	V	
$I_{F(AV)}$	Average forward current	SMA	$T_I = 130\text{ °C}, \delta = 0.5$	2	A
		SMB	$T_I = 135\text{ °C}, \delta = 0.5$		
		SMA Flat, SMA Flat Notch	$T_I = 145\text{ °C}, \delta = 0.5$		
		SMB Flat	$T_I = 150\text{ °C}, \delta = 0.5$		
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10\text{ ms}$ sinusoidal	75	A
$P_{ARM}$	Repetitive peak avalanche power		$t_p = 10\text{ }\mu\text{s}, T_j = 125\text{ °C}$	173	W
$T_{stg}$	Storage temperature range		-65 to +175		°C
$T_j$	Maximum operating junction temperature <sup>(1)</sup>		175		°C

1.  $(dP_{tot}/dT_j) < (1/R_{th(j-a)})$  condition to avoid thermal runaway for a diode on its own heatsink.

**Table 2. Thermal resistance parameters**

Symbol	Parameter		Max. value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	°C/W
		SMA Flat, SMA Flat Notch	20	
		SMB	25	
		SMB Flat	15	

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		1.00	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	0.40	1.00	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 2\text{ A}$	-		0.79	V
		$T_j = 125\text{ °C}$		-	0.60	0.65	
		$T_j = 25\text{ °C}$	$I_F = 4\text{ A}$	-		0.88	
		$T_j = 125\text{ °C}$		-	0.69	0.74	

1. Pulse test:  $t_p = 5\text{ ms}, \delta < 2\%$

2. Pulse test:  $t_p = 380\text{ }\mu\text{s}, \delta < 2\%$

To evaluate the conduction losses, use the following equation:

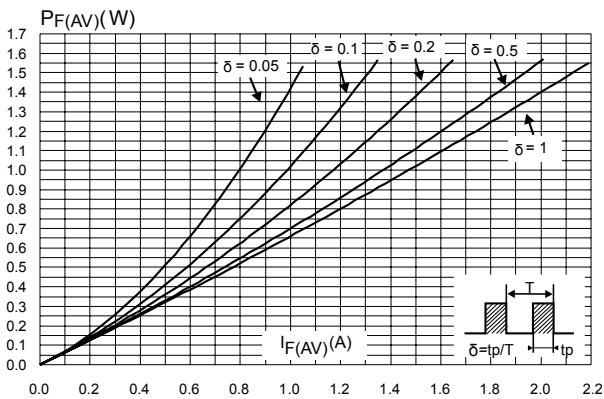
$$P = 0.56 \times I_{F(AV)} + 0.045 \times I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses :

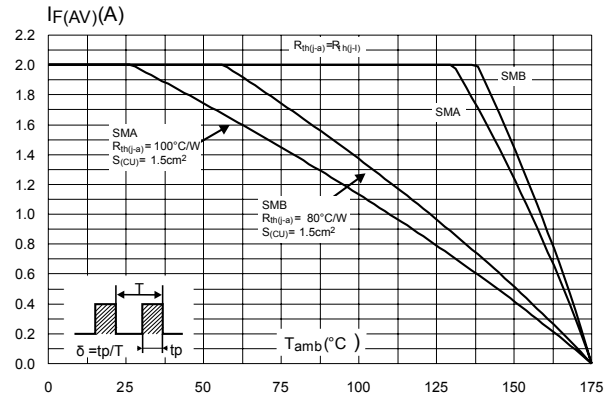
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

## 1.1 Characteristics (curves)

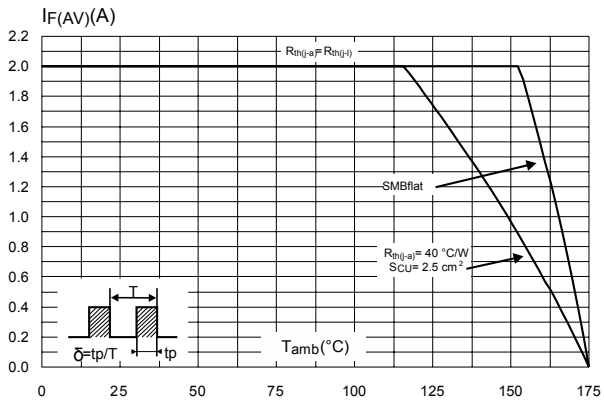
**Figure 1. Average forward power dissipation versus average forward current**



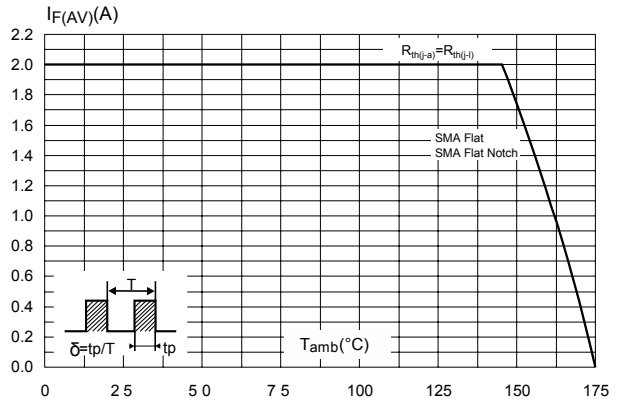
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , SMA / SMB)**



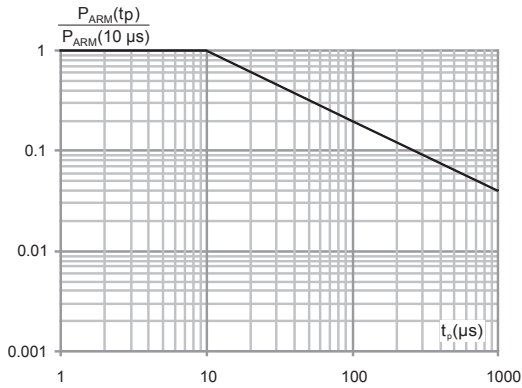
**Figure 3. Average forward current versus ambient temperature ( $\delta = 0.5$ , SMB Flat)**



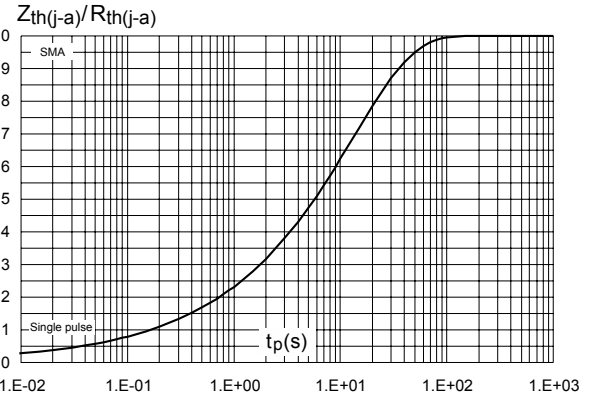
**Figure 4. Average forward current versus ambient temperature ( $\delta = 0.5$ , SMA Flat, SMA Flat Notch)**



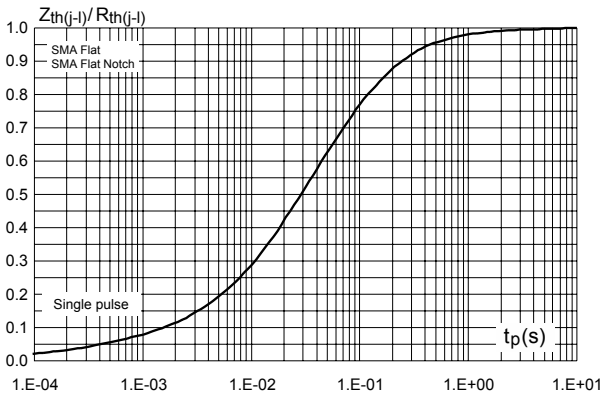
**Figure 5. Normalized avalanche power derating versus junction temperature ( $T_j = 125\text{ }^\circ\text{C}$ )**



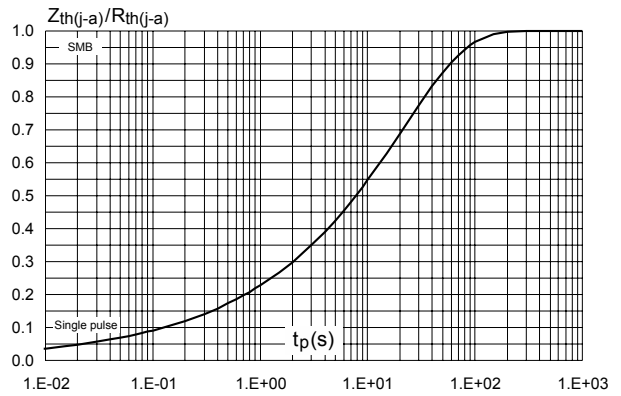
**Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA)**



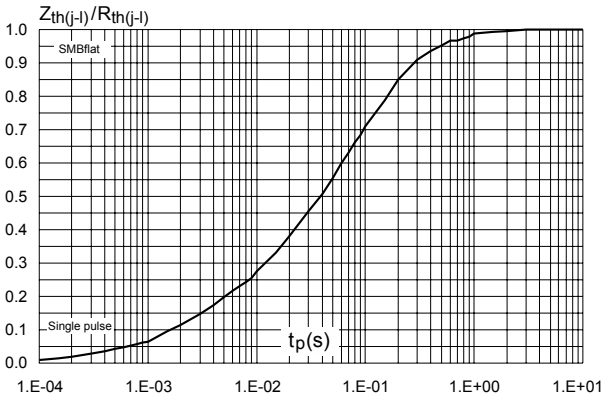
**Figure 7. Relative variation of thermal impedance junction to lead versus pulse duration (SMA Flat, SMA Flat Notch)**



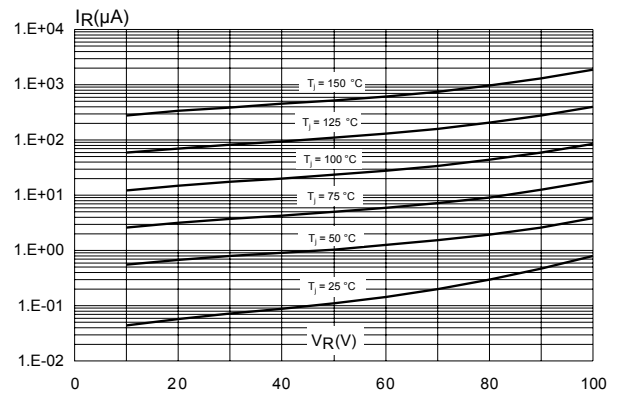
**Figure 8. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)**



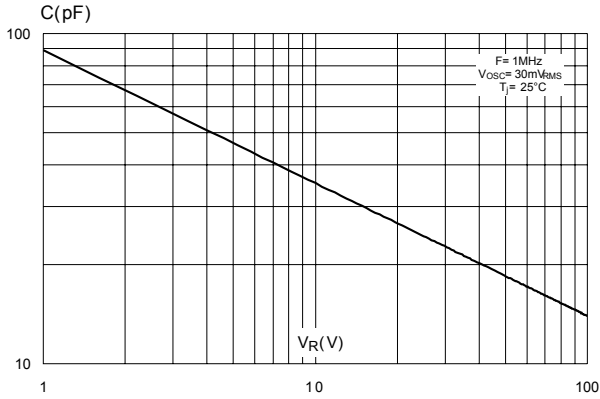
**Figure 9. Relative variation of thermal impedance junction to lead versus pulse duration (SMB Flat)**



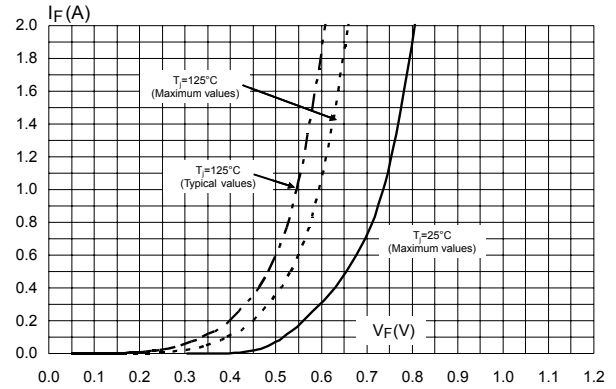
**Figure 10. Reverse leakage current versus reverse voltage applied (typical values)**



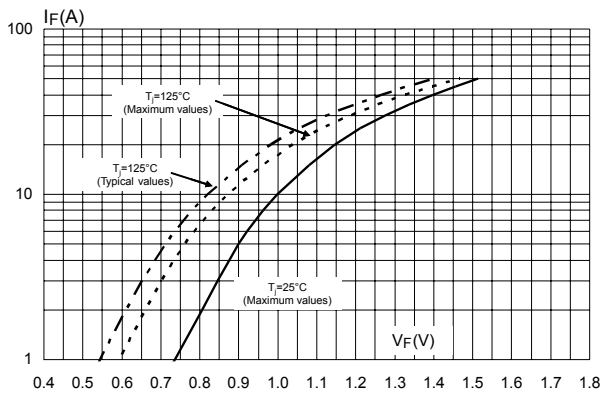
**Figure 11. Junction capacitance versus reverse voltage applied (typical values)**



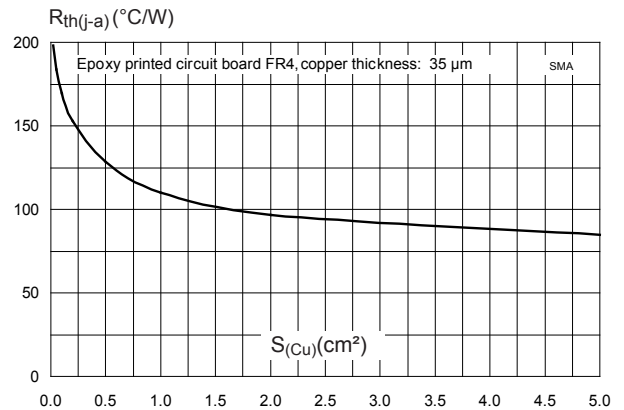
**Figure 12. Forward voltage drop versus forward current (low level)**



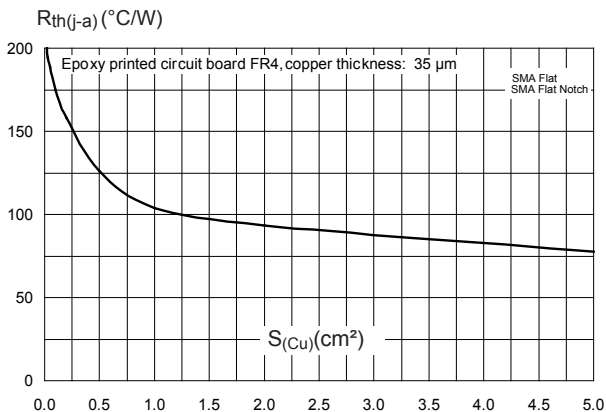
**Figure 13. Forward voltage drop versus forward current (high level)**



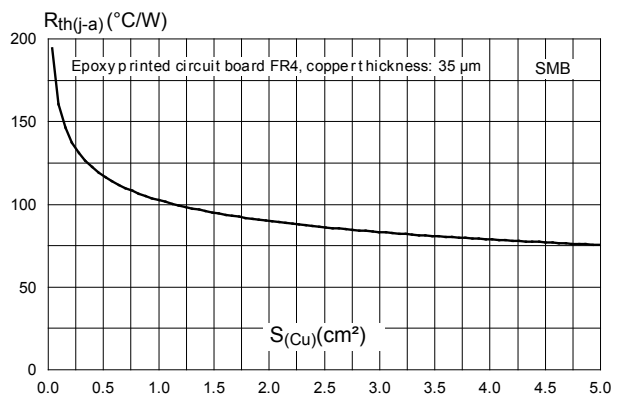
**Figure 14. Thermal resistance junction to ambient versus copper surface under each lead (SMA)**



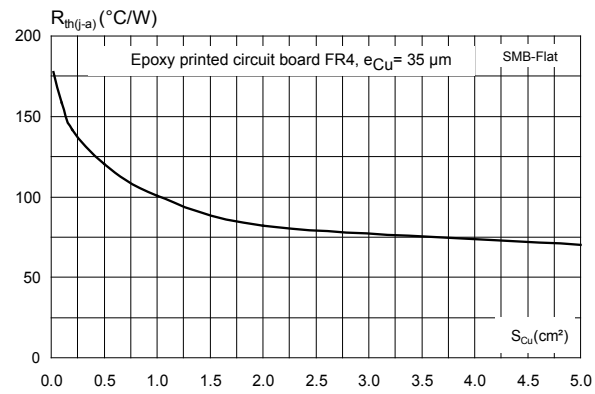
**Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (SMA Flat, SMA Flat Notch)**



**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)**



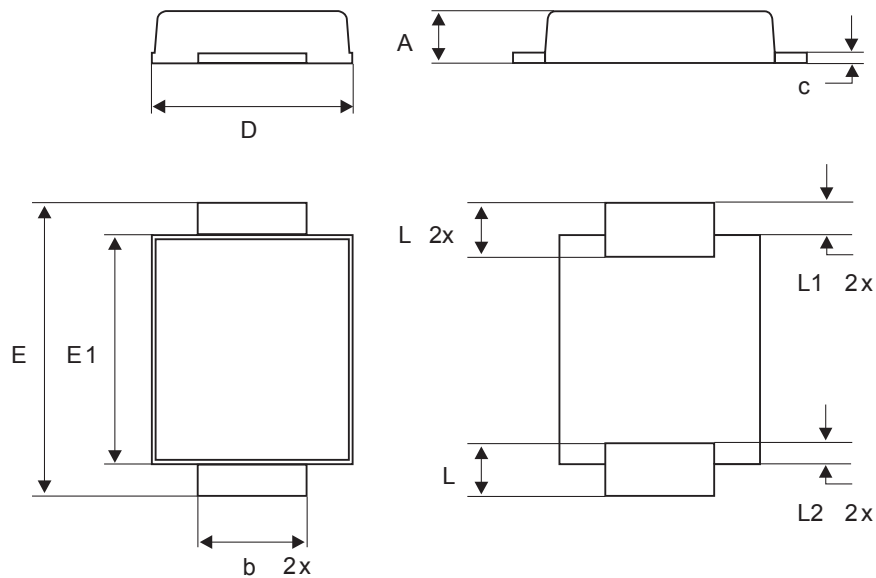
## 2 Package information

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](http://www.st.com). ECOPACK is an ST trademark.

### 2.1 SMA Flat package information

- Epoxy meets UL94, V0
- Lead-free package

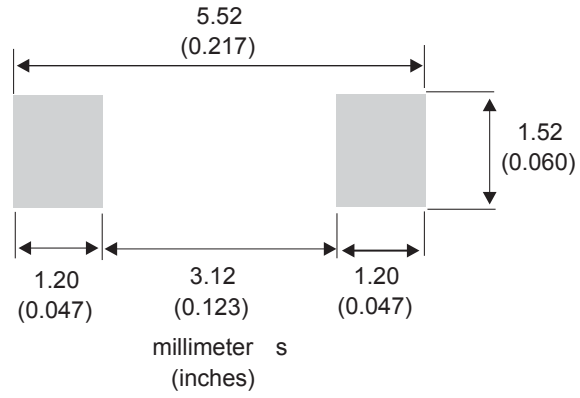
**Figure 18. SMA Flat package outline**



**Table 4. SMA Flat package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.044
b	1.25		1.65	0.049		0.065
c	0.15		0.40	0.005		0.016
D	2.25		2.95	0.088		0.117
E	4.80		5.60	0.188		0.221
E1	3.95		4.60	0.155		0.182
L	0.75		1.50	0.029		0.060
L1		0.50			0.020	
L2		0.50			0.020	

**Figure 19. SMA Flat recommended footprint in mm (inches)**

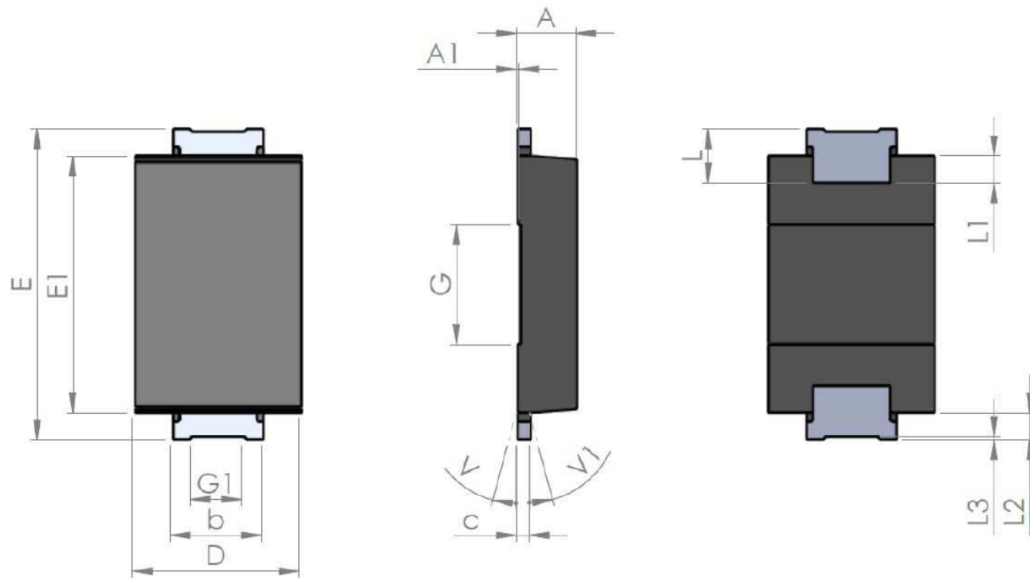




## 2.2 SMA Flat Notch package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Band indicates cathode

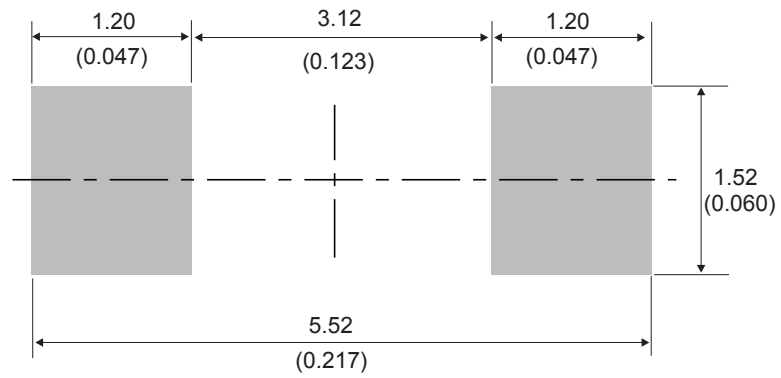
**Figure 20. SMA Flat Notch package outline**



**Table 5. SMA Flat Notch package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A1	0.90		1.10	0.035		0.044
A1		0.05			0.002	
b	1.25		1.65	0.049		0.065
C	0.15		0.40	0.005		0.016
D	2.25		2.90	0.088		0.115
E	5.00		5.35	0.196		0.211
E1	3.95		4.60	0.155		0.182
G		2.00			0.079	
G1		0.85			0.033	
L	0.75		1.20	0.029		
L1		0.45			0.018	
L2		0.45			0.018	
L3		0.05			0.002	
V			8°			8°
V1			8°			8°

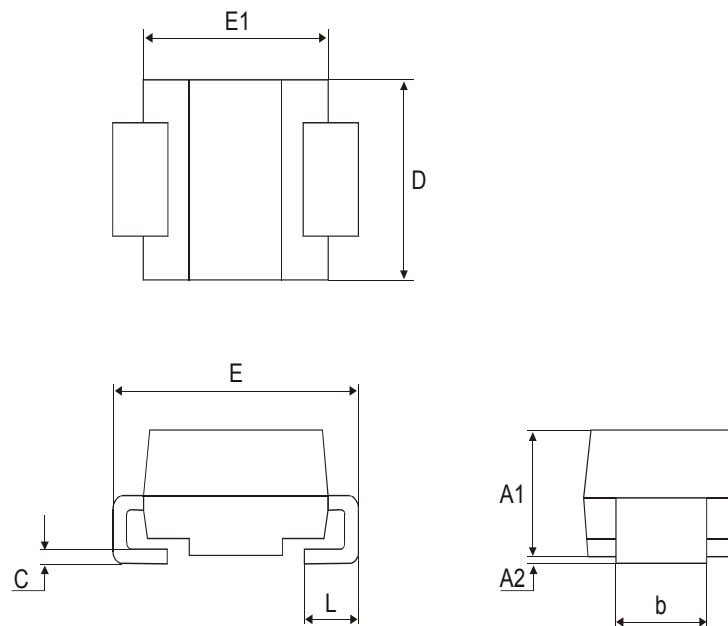
Figure 21. SMA Flat Notch recommended footprint in mm (inches)



### 2.3 SMA package information

- Epoxy meets UL94, V0
- Lead-free package

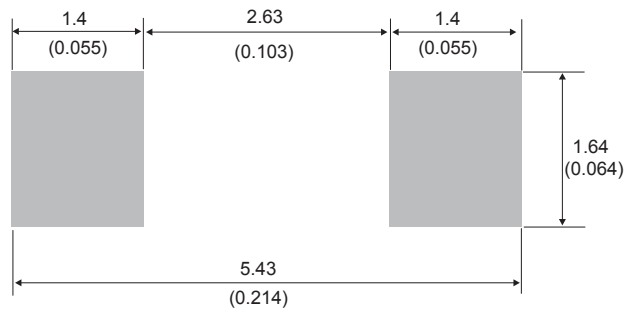
**Figure 22. SMA package outline**



**Table 6. SMA package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.097
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

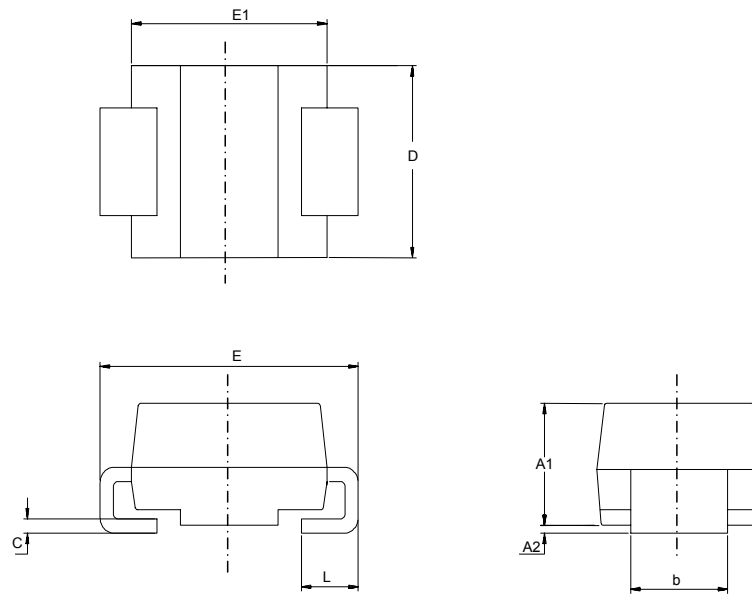
Figure 23. SMA recommended footprint in mm (inches)



## 2.4 SMB package information

- Epoxy meets UL94, V0
- Lead-free package

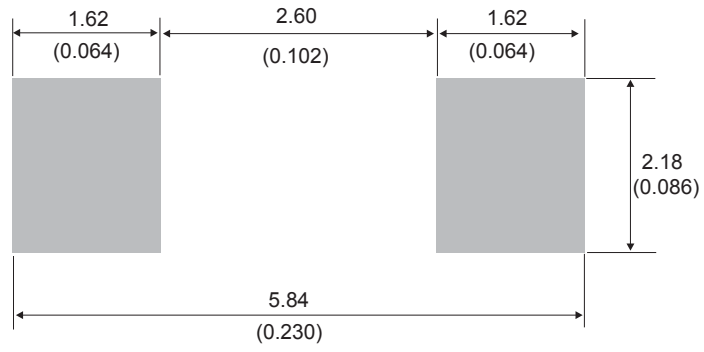
**Figure 24. SMB package outline**



**Table 7. SMB package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches (for reference only)	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.0748	0.0965
A2	0.05	0.20	0.0020	0.0079
b	1.95	2.20	0.0768	0.0867
c	0.15	0.40	0.0059	0.0157
D	3.30	3.95	0.1299	0.1556
E	5.10	5.60	0.2008	0.2205
E1	4.05	4.60	0.1594	0.1811
L	0.75	1.50	0.0295	0.0591

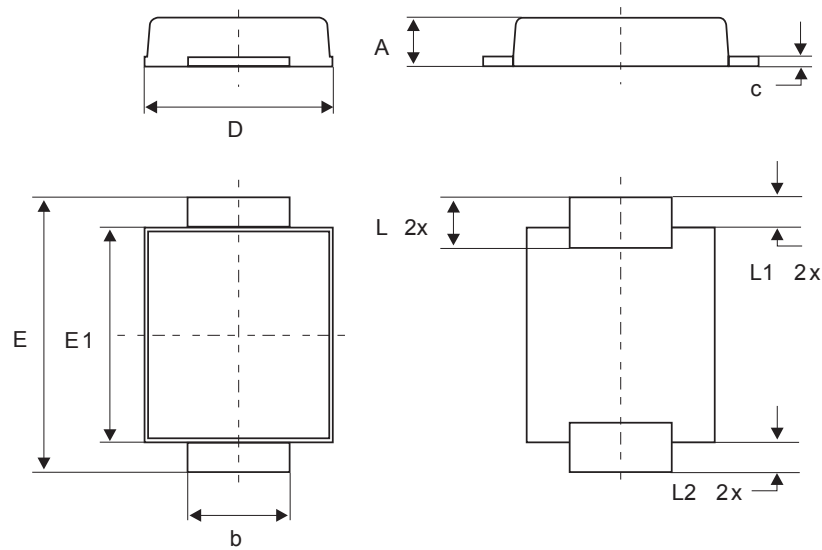
Figure 25. SMB recommended footprint



## 2.5 SMB Flat package information

- Epoxy meets UL94, V0
- Lead-free package

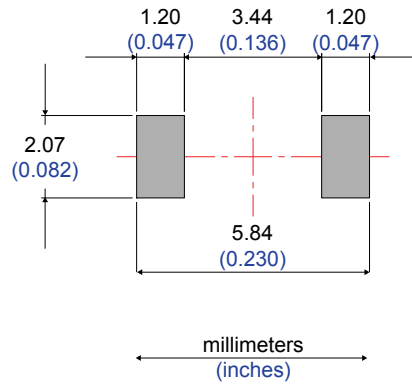
**Figure 26. SMB Flat package outline**



**Table 8. SMB Flat mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	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	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
L1		0.40			0.016	
L2		0.60			0.024	

**Figure 27. Footprint recommendations, dimensions in mm (inches)**





### 3 Ordering Information

**Table 9. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS2H100A	S21	SMA	0.068 g	5000	Tape and reel
STPS2H100AF	F21	SMA Flat	0.035 g	10 000	Tape and reel
STPS2H100AFN	A21	SMA Flat Notch	0.039 g	10 000	Tape and reel
STPS2H100U	G21	SMB	0.107 g	2500	Tape and reel
STPS2H100UF	FG21	SMB Flat	0.050 g	5000	Tape and reel

## Revision history

**Table 10. Document revision history**

Date	Version	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 SMBflat package.
15-Feb-2010	7	Updated weight for SMBflat in Table 9.
24-Jun-2013	8	Added SMAflat package
17-May-2018	9	Removed figure 6. Updated Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified) and Section Description. Minor text changes to improve readability.
08-Oct-2019	10	Added Section 2.2 SMA Flat Notch package information.

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