

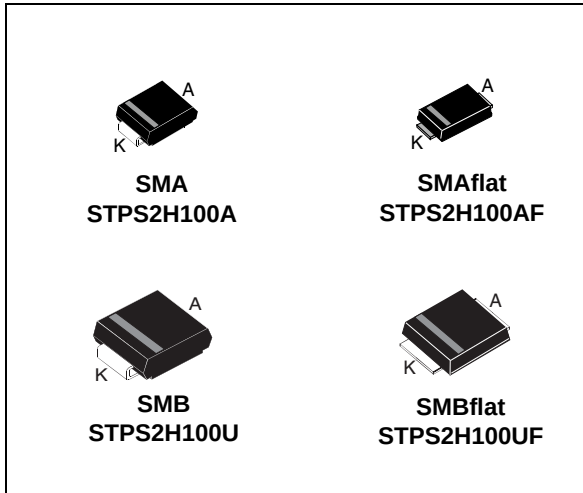


Table 1. Device summary

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

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 adapters and on board DC/DC converters. Available in SMA, low-profile SMA, SMB, low-profile SMB.

1 Characteristics

Table 2. Absolute ratings (limiting values -T_{amb} = 25° C unless otherwise stated)

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
		SMAflat	T _L = 145 °C δ = 0.5		
		SMBflat	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	Maximum 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
		SMAflat	20	
		SMB	25	
		SMBflat	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

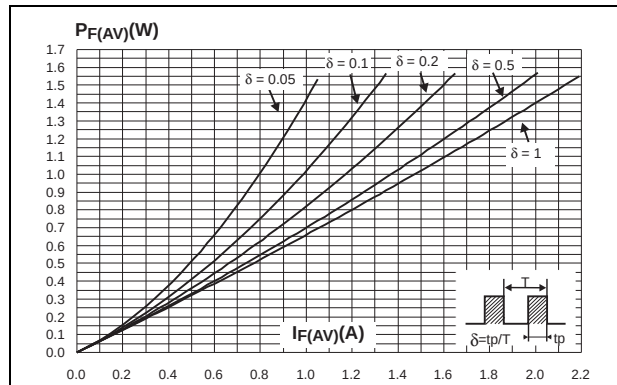


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$) (SMA / SMB)

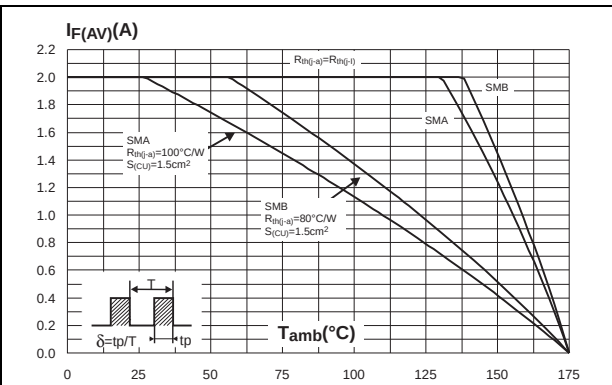


Figure 3. Average forward current versus ambient temperature ($\delta = 0.5$) (SMBflat)

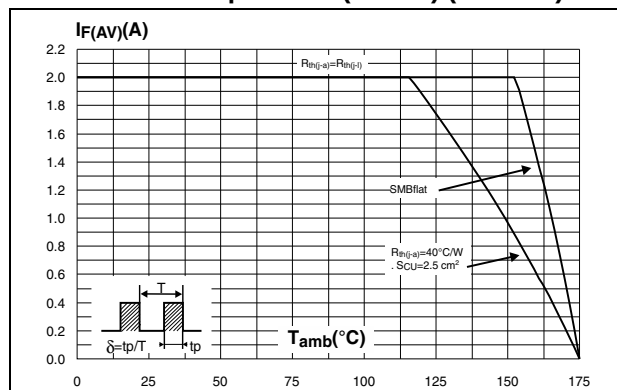


Figure 4. Average forward current versus ambient temperature ($\delta = 0.5$) (SMAflat)

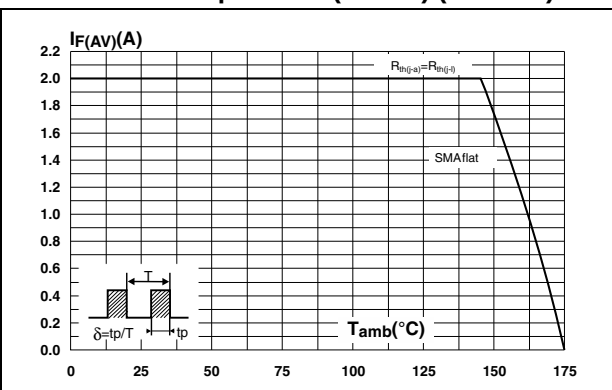


Figure 5. Normalized avalanche power derating versus pulse duration

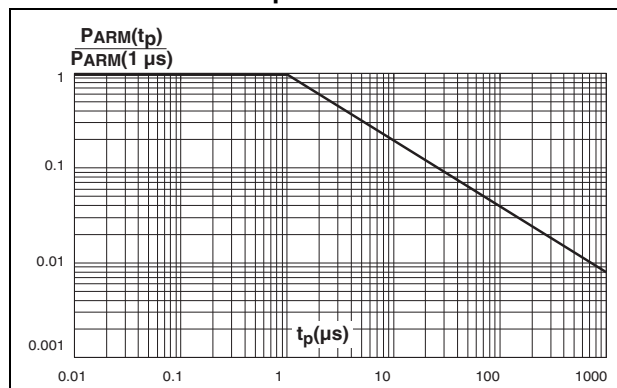


Figure 6. Normalized avalanche power derating versus junction temperature

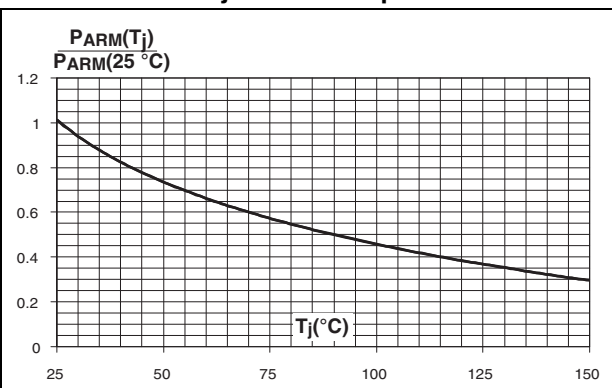


Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA)

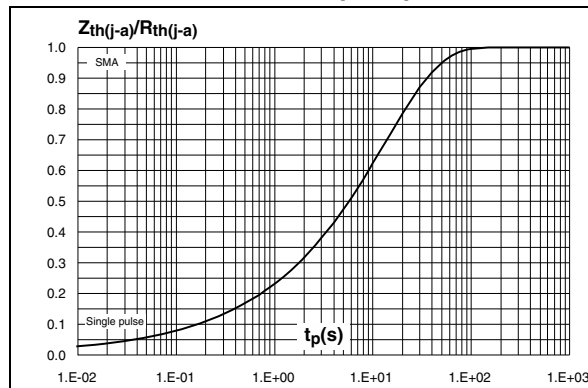


Figure 8. Relative variation of thermal impedance junction to lead versus pulse duration (SMAflat)

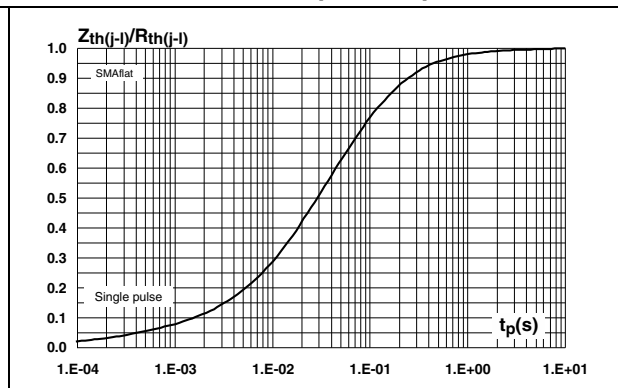


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

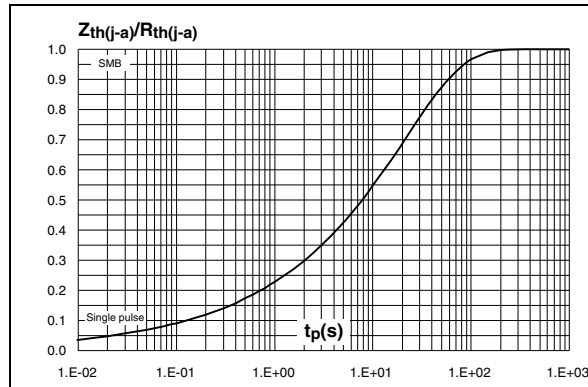


Figure 10. Relative variation of thermal impedance junction to lead versus pulse duration (SMBflat)

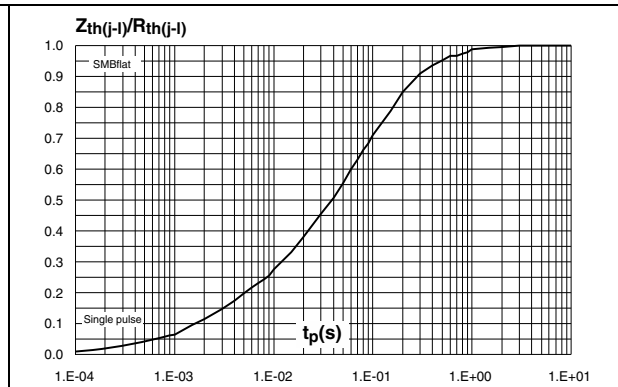


Figure 11. Reverse leakage current versus reverse voltage applied (typical values)

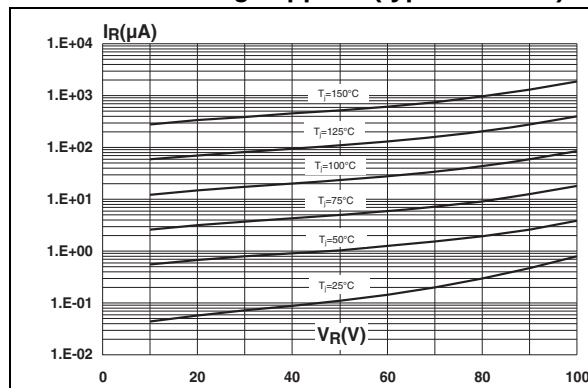


Figure 12. Junction capacitance versus reverse voltage applied (typical values)

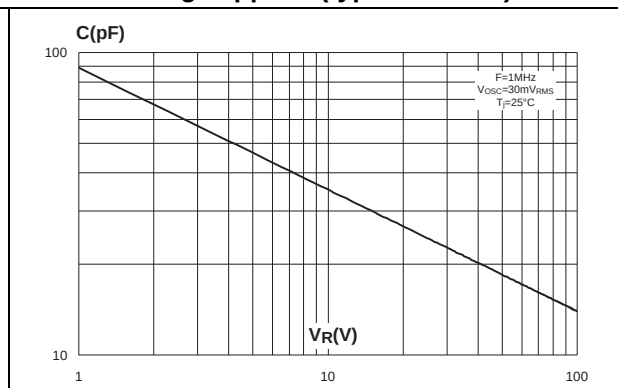


Figure 13. Forward voltage drop versus forward current (low level)

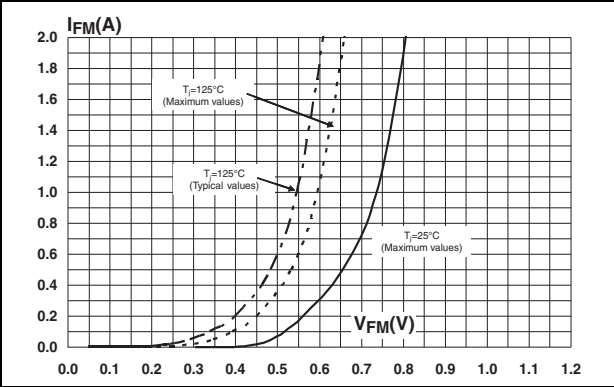


Figure 14. Forward voltage drop versus forward current (high level)

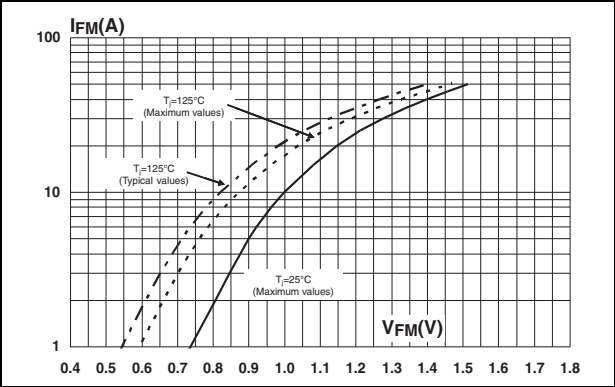


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (SMA)

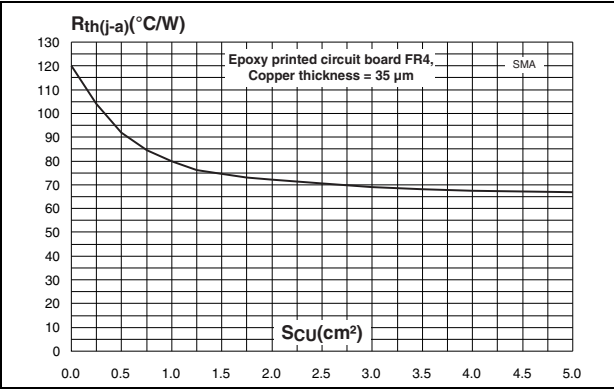


Figure 16. Thermal resistance junction to ambient versus copper surface under each lead (SMAflat)

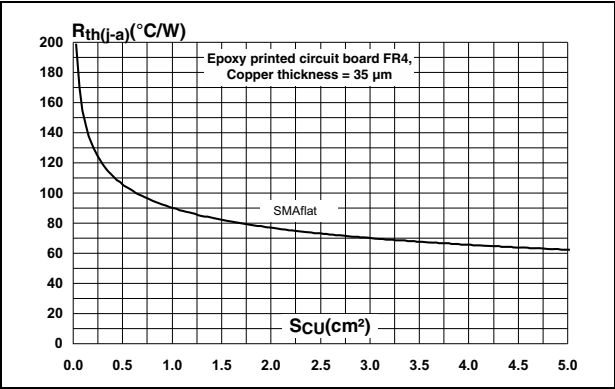


Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

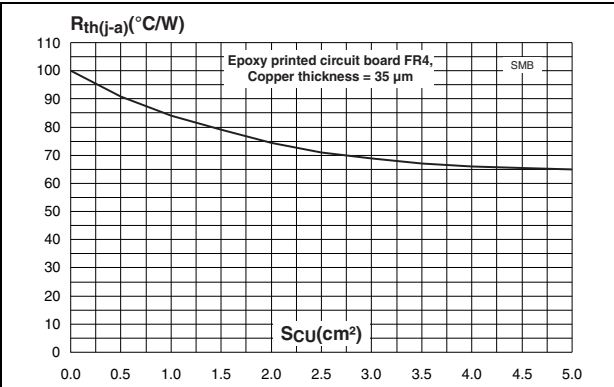
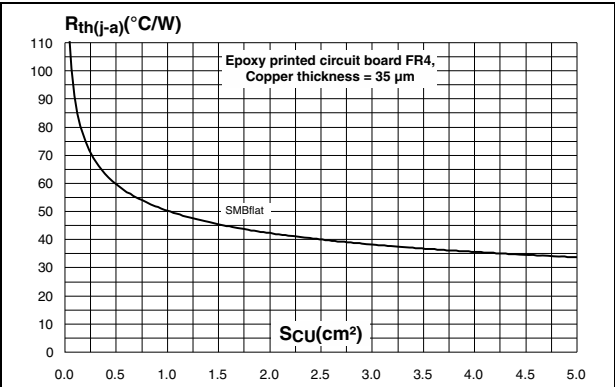


Figure 18. Thermal resistance junction to ambient versus copper surface under each lead (SMBflat)



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.

Figure 19. SMA dimension definitions

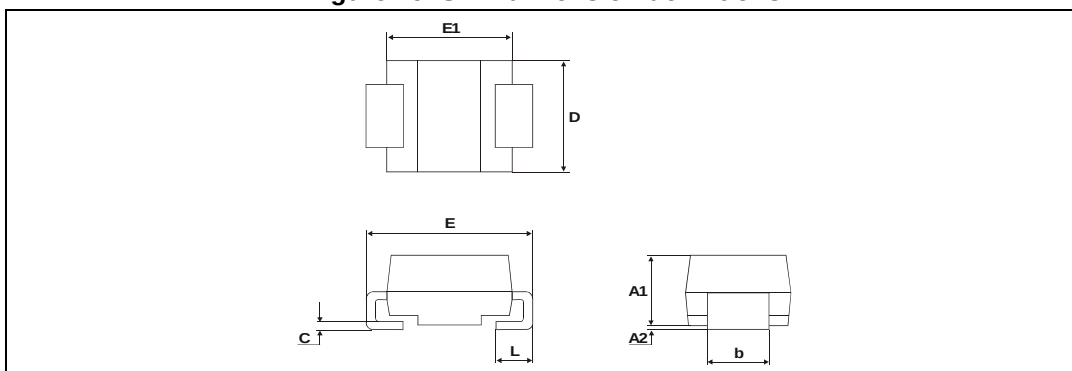


Table 5. SMA dimension values

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 20. SMA footprint (dimensions in mm)

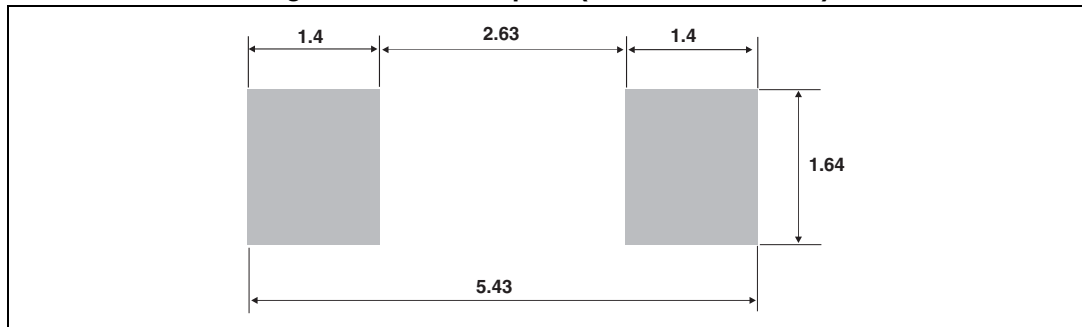


Figure 21. SMB dimension definitions

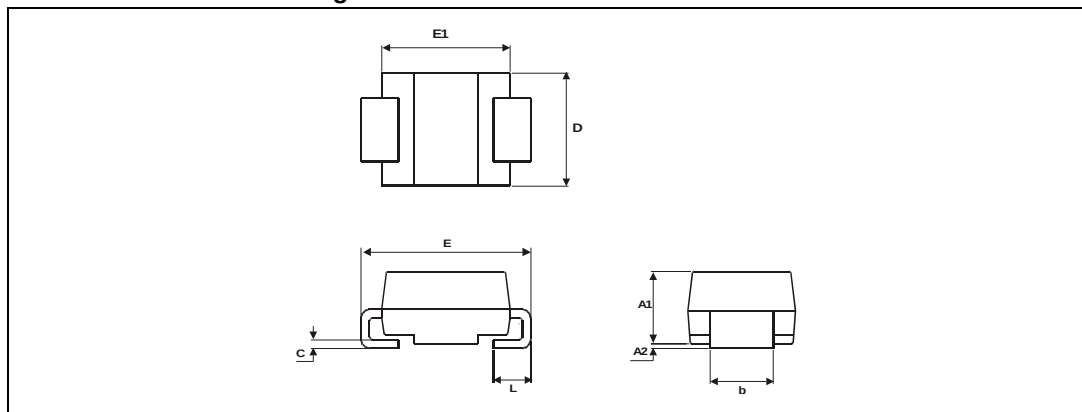


Table 6. SMB dimension values

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 22. SMB footprint (dimensions in mm)

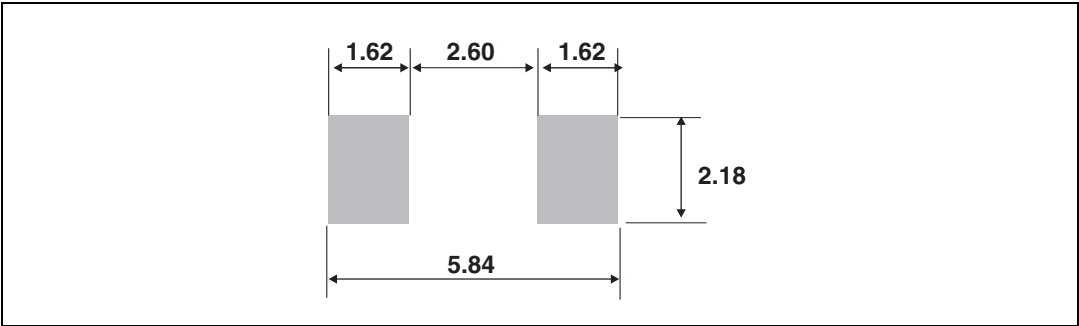


Figure 23. SMAflat dimension definitions

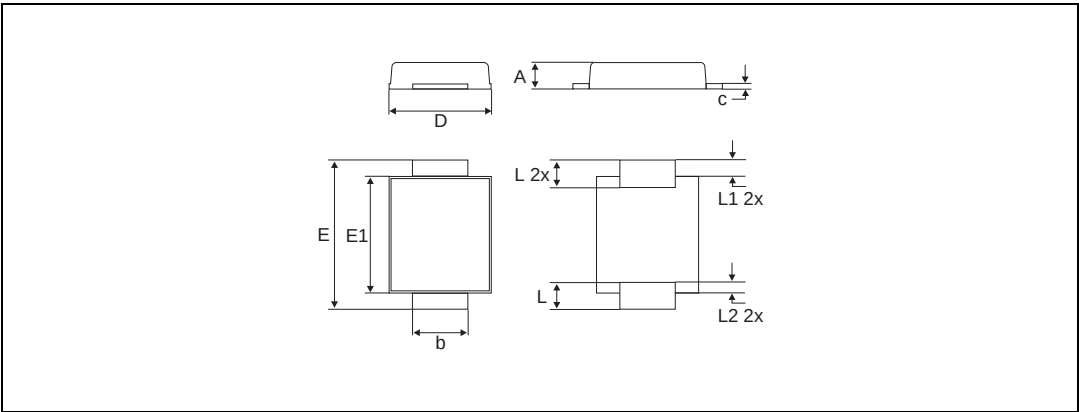


Table 7. SMAflat dimensions

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b	1.25		1.65	0.049		0.065
c	0.15		0.40	0.006		0.016
D	2.25		2.95	0.088		0.116
E	4.80		5.60	0.189		0.220
E1	3.95		4.60	0.156		0.181
L	0.75		1.50	0.030		0.059
L1		0.50			0.019	
L2		0.50			0.019	

Figure 24. SMAflat footprint dimensions

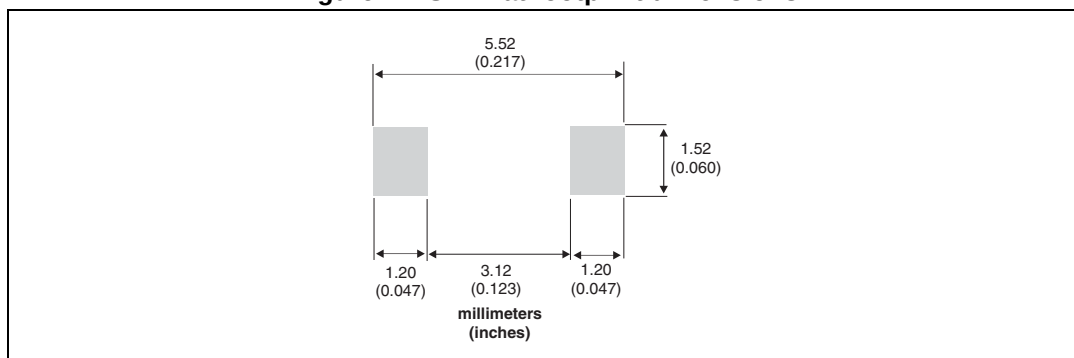


Figure 25. SMBflat dimension definitions

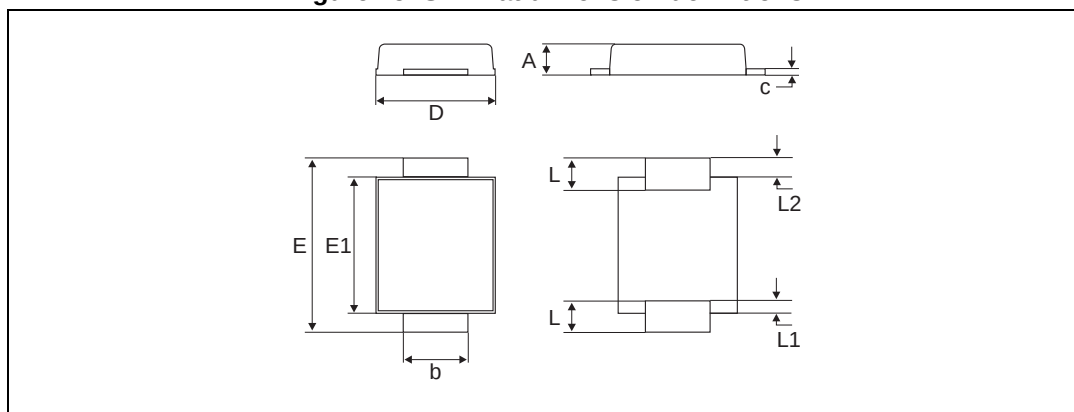
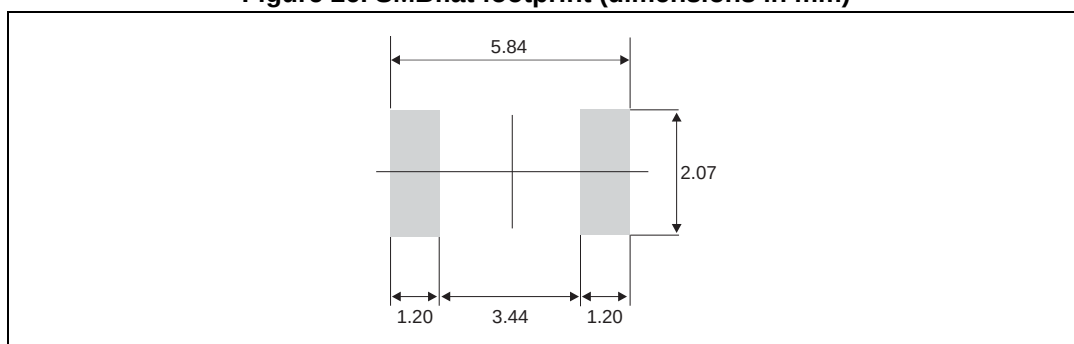


Table 8. SMBflat dimensions

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 26. SMBflat footprint (dimensions in mm)



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	SMAflat	0.035 g	10000	Tape and reel
STPS2H100U	G21	SMB	0.107 g	2500	Tape and reel
STPS2H100UF	FG21	SMBflat	0.050 g	5000	Tape and reel

4 Revision history

Table 10. 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 SMBflat package.
15-Feb-2010	7	Updated weight for SMBflat in Table 9 .
24-Jun-2013	8	Added SMAflat package

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