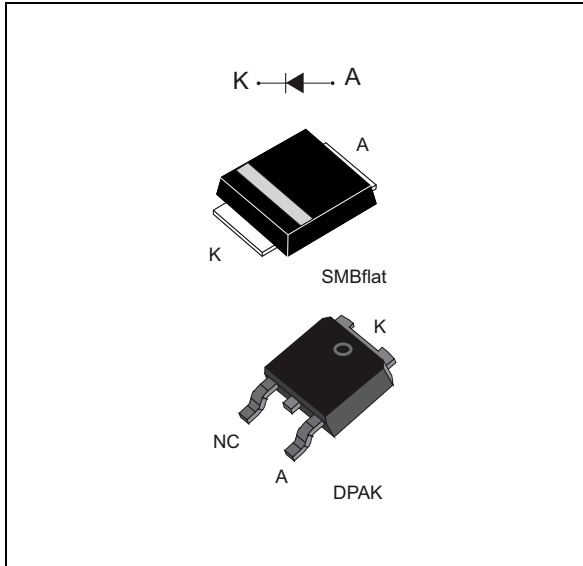


## Power Schottky rectifier

Datasheet – production data



### Description

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

Packaged in DPAK and 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.

**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	4 A
$V_{RRM}$	200 V
$V_F$ (typ)	0.64 V
$T_j$ (max)	175 °C

### Features

- Negligible switching losses
- High junction temperature capability
- Very small conduction losses
- Low leakage current
- Avalanche rated
- ECOPACK<sup>®</sup> compliant component (SMBflat)
- $T_j = -40$  °C minimum operating

# 1 Characteristics

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

Symbol	Parameter	Value	Unit	
V <sub>RRM</sub>	Repetitive peak reverse voltage	200	V	
I <sub>F(RMS)</sub>	Forward rms current	10	A	
I <sub>F(AV)</sub>	Average forward current, δ = 0.5, square wave	DPAK, T <sub>c</sub> = 160 °C	4	A
		SMBflat, T <sub>L</sub> = 125 °C		
I <sub>F(SM)</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	250	A
T <sub>stg</sub>	Storage temperature range	-65 to +175	°C	
T <sub>j</sub>	Operating junction temperature <sup>(1)</sup>	-40 to +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 parameters**

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case, DPAK	3.2	°C/W
R <sub>th(j-l)</sub>	Junction to lead, SMBflat	15	

When the two diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode1}) = P(\text{diode1}) \times R_{th(j-c)}(\text{per diode}) + P(\text{diode2}) \times R_{th(c)}$$

**Table 4. Static electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>		5	μA
		T <sub>j</sub> = 125 °C		0.7	2.5	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 4 A		0.87	V
		T <sub>j</sub> = 125 °C		0.64	0.71	

1. Pulse test: t<sub>p</sub> = 5 ms, δ < 2%
2. Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.63 \times I_{F(AV)} + 0.020 I_{F(RMS)}^2$$

Figure 1. Average forward power dissipation versus average forward current

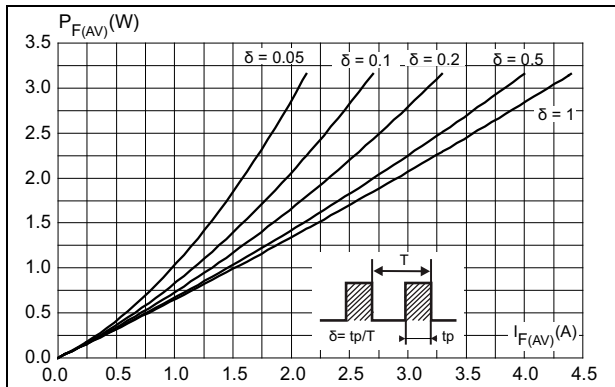


Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )

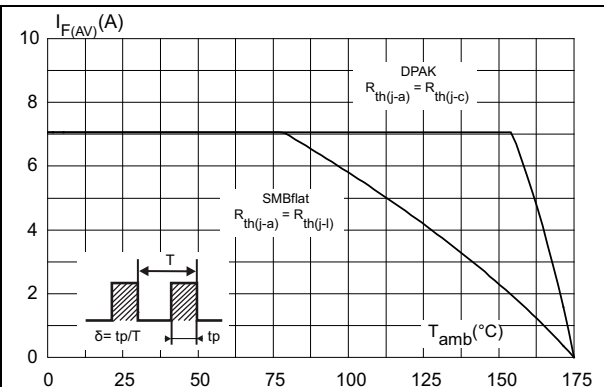


Figure 3. Relative variation of thermal impedance, junction to case, versus pulse duration (DPAK)

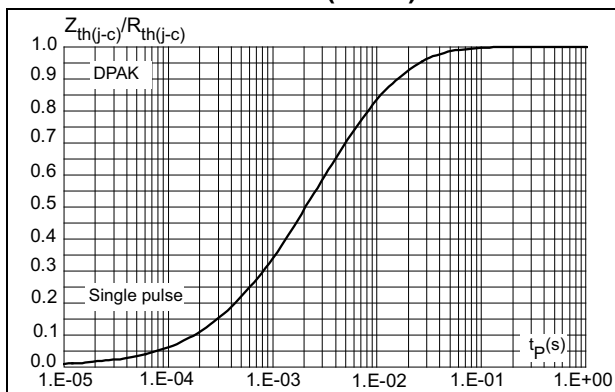


Figure 4. Relative variation of thermal impedance, junction to lead versus pulse duration (SMBflat)

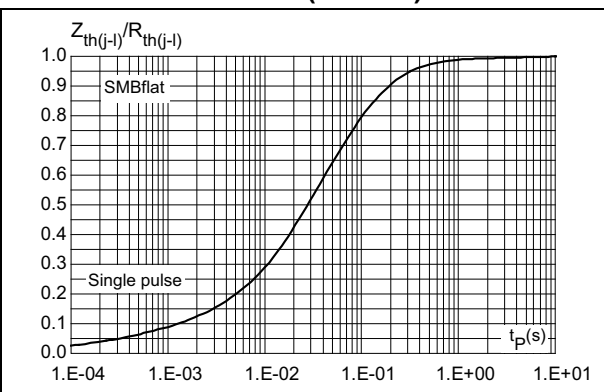


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

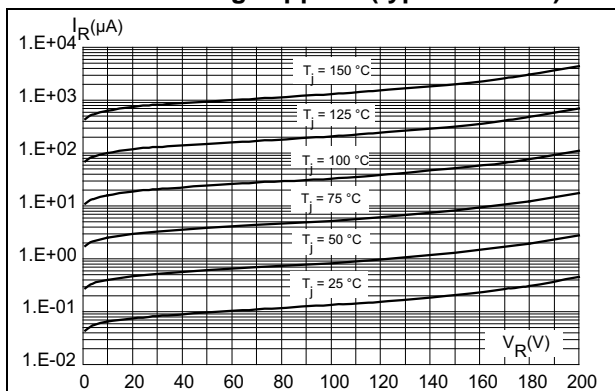
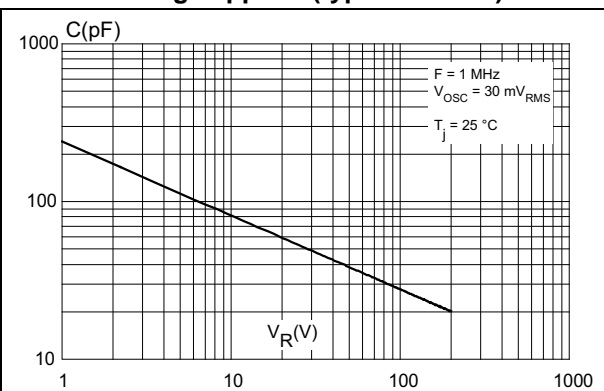
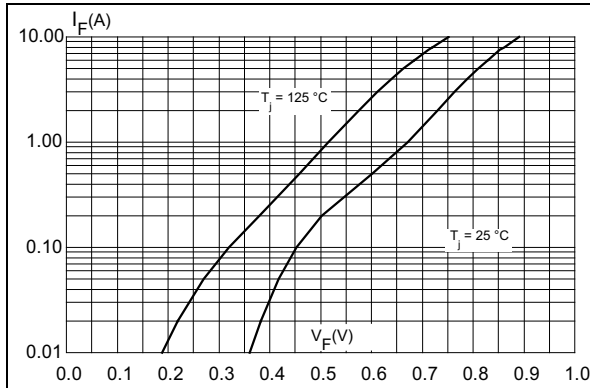


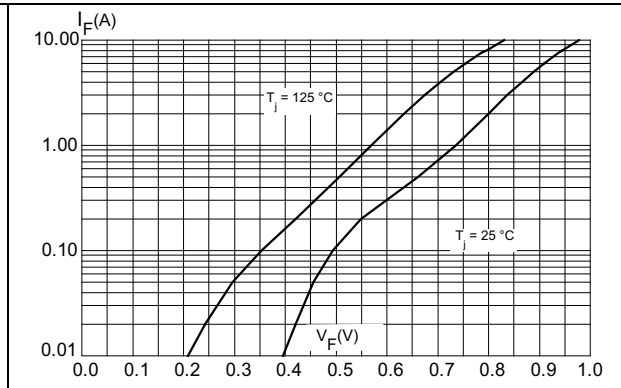
Figure 6. Junction capacitance versus reverse voltage applied (typical values)



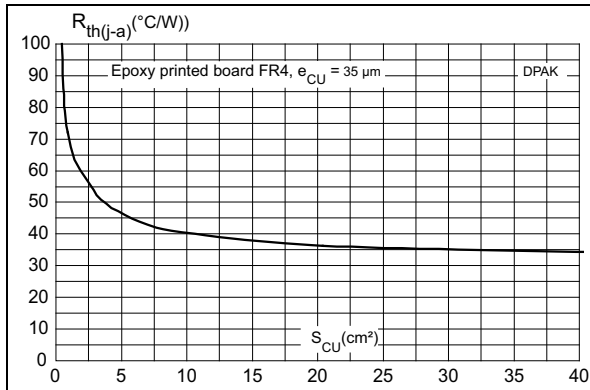
**Figure 7. Forward voltage drop versus forward current (typical values)**



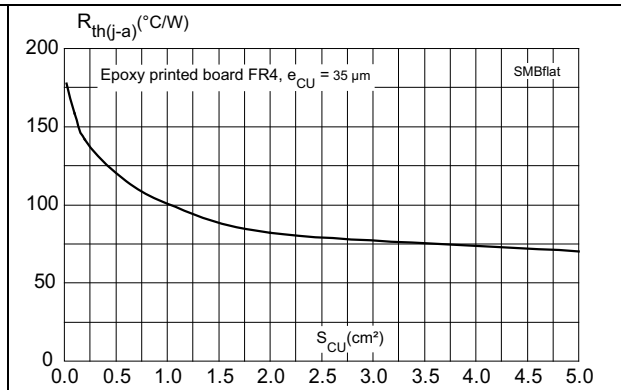
**Figure 8. Forward voltage drop versus forward current (maximum values)**



**Figure 9. Thermal resistance junction to ambient versus copper surface under tab (typical values)**



**Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (typical values)**



## 2 Package information

- Epoxy meets UL94,V0
- Lead-free package
- Band indicates cathode

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

Figure 11. DPAK dimension definitions

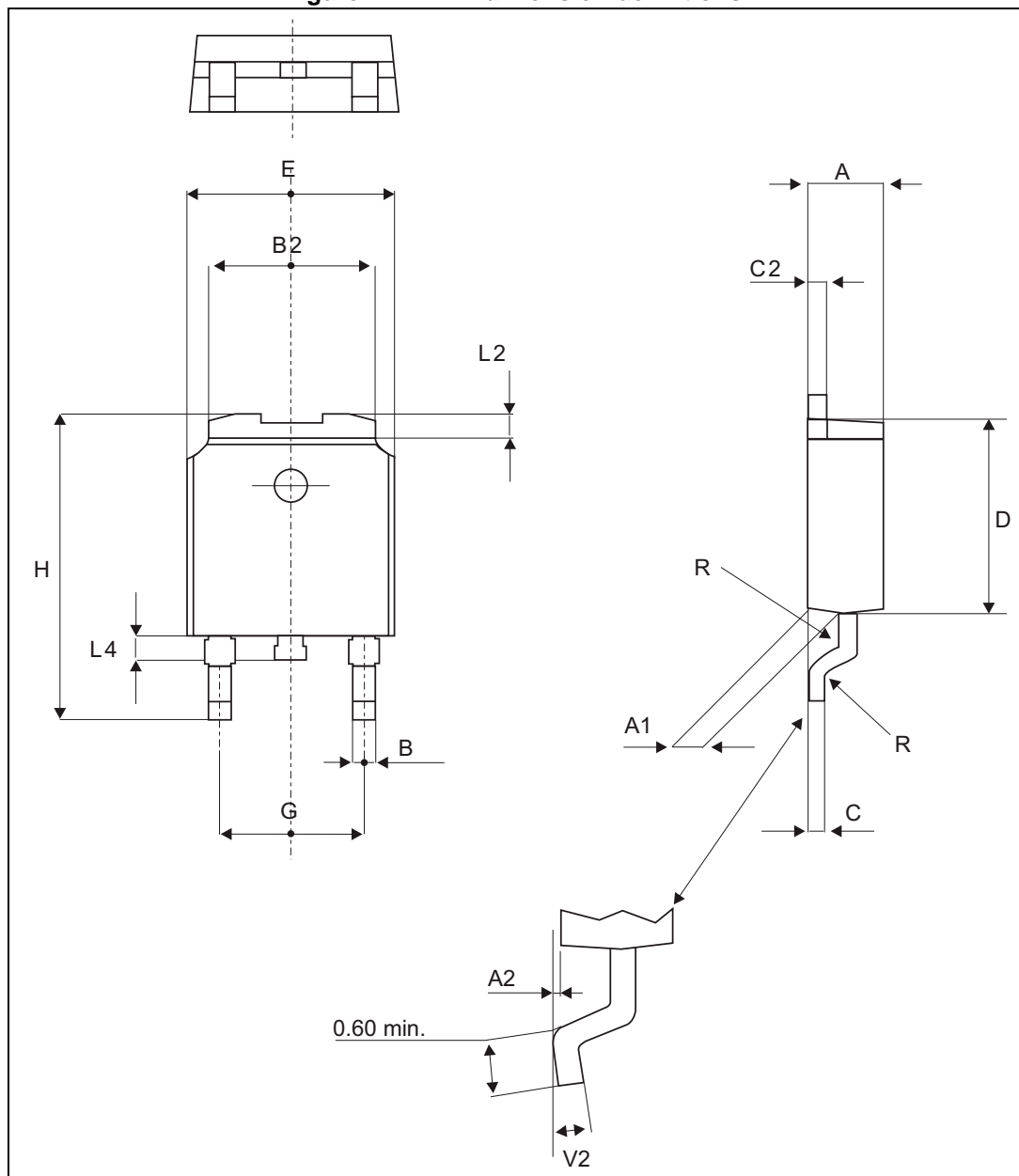


Table 5. DPAK dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.212
C	0.45		0.60	0.017		0.023
C2	0.48		0.60	0.018		0.023
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.251		0.259
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.397
L2		0.80 typ.			0.031 typ.	
L4	0.60		1.00	0.023		0.039
V2	0°		8°	0°		8°

Figure 12. Footprint (dimensions in mm)

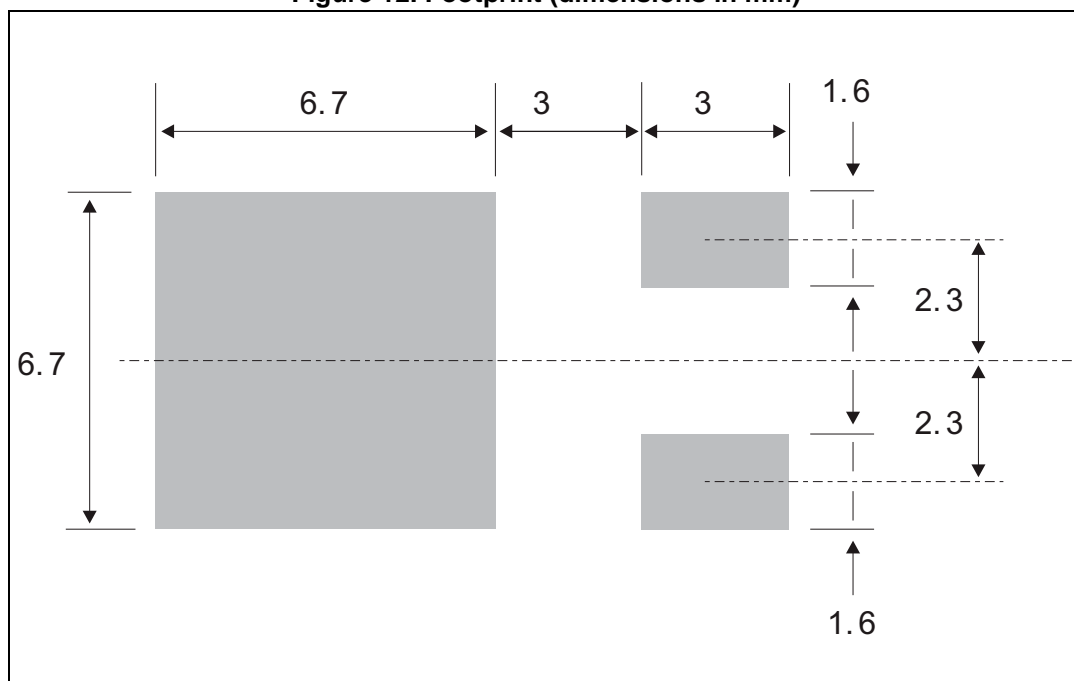


Figure 13. SMBflat dimensions definitions

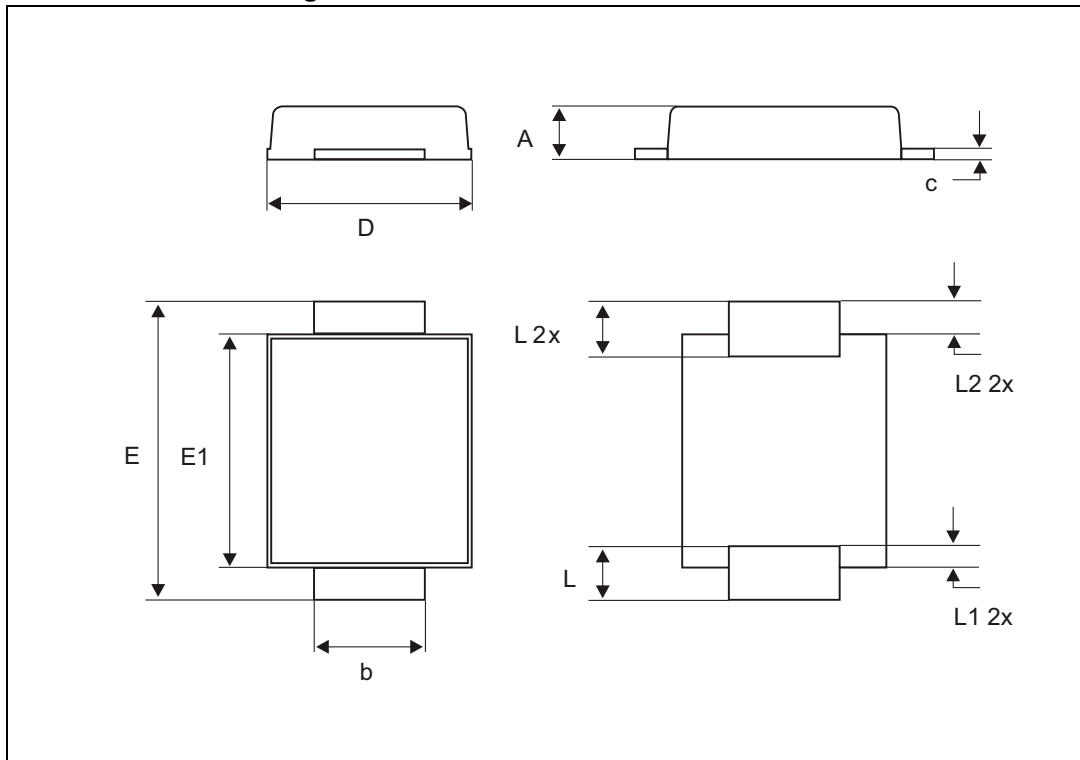
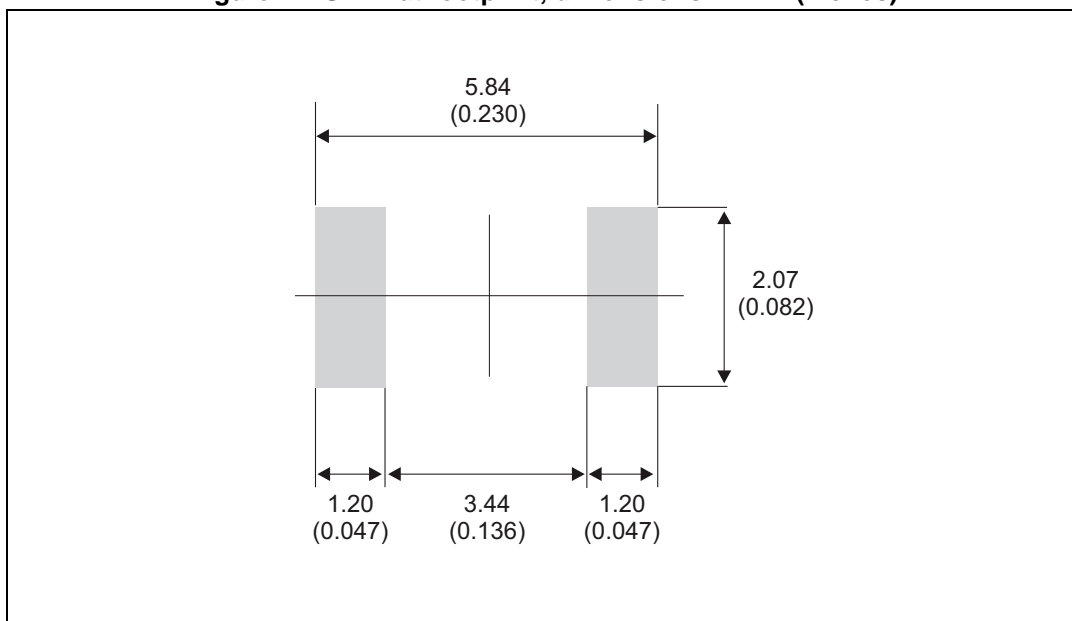


Table 6. SMBflat dimension values

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	0.130		0.155
E	5.10		5.60	0.200		0.220
E1	4.05		4.60	0.159		0.181
L	0.75		1.50	0.029		0.059
L1		0.40			0.016	
L2		0.60			0.024	

Figure 14. SMBflat footprint, dimensions in mm (inches)





### 3 Ordering information

**Table 7. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS4S200B-TR	S4 200B	DPAK	0.3 g	2500	Tape and reel
STPS4S200UF	FG42	SMBflat	0.050 g	5000	Tape and reel

### 4 Revision history

**Table 8. Document revision history**

Date	Revision	Changes
17-Oct-2014	1	First release.

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