STPS340

Power Schottky rectifier

Main product characteristics

$I_{F(AV)}$	3 A
V_{RRM}	40 V
T_j (max)	150° C
V_F (max)	0.57 V

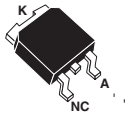
Features and Benefits

- Very small conduction losses
- Negligible switching losses
- Low forward voltage drop
- Low thermal resistance
- Extremely fast switching
- Surface mounted device
- Avalanche capability specified

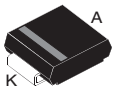
Description

Single chip Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

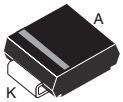
Packaged in DPAK, SMC, SMB, and low profile SMB, this device is intended for use in low and medium voltage operation, high frequency inverters, free wheeling and polarity protection applications where low switching losses are required.



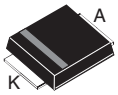
DPAK
STPS340B



SMB
STPS340U



SMC
STPS340S



SMB flat
STPS340UF

Order codes

Part Number	Marking
STPS340U	U34
STPS340S	S34
STPS340B	S340
STPS340B-TR	S340
STPS340UF	FU34

1 Characteristics

Table 1. Absolute Ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			40	V
$I_{F(RMS)}$	RMS forward current		DPAK	6	A
$I_{F(AV)}$	Average forward current	T_c = 135° C δ = 0.5	DPAK	3	A
		T_L = 105° C δ = 0.5	SMB/SMC		
		T_L = 115° C δ = 0.5	SMB flat		
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		1300	W
T_{stg}	Storage temperature range			-65 to + 150	°C
T_j	Operating junction temperature (1)			150	°C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 2. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMB	25	°C/W
		SMB flat	15	
		SMC	20	
$R_{th(j-c)}$	Junction to case	DPAK	5.5	°C/W

Table 3. Static electrical characteristics

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$			20	µA
		T_j = 125° C			2	10	mA
V_F(1)	Forward voltage drop	T_j = 25° C	I_F = 3 A			0.63	V
		T_j = 125° C			0.52	0.57	
		T_j = 25° C	I_F = 6 A			0.84	
		T_j = 125° C			0.63	0.72	

1. Pulse test: tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.42 \times I_{F(AV)} + 0.050\ I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current (per diode)

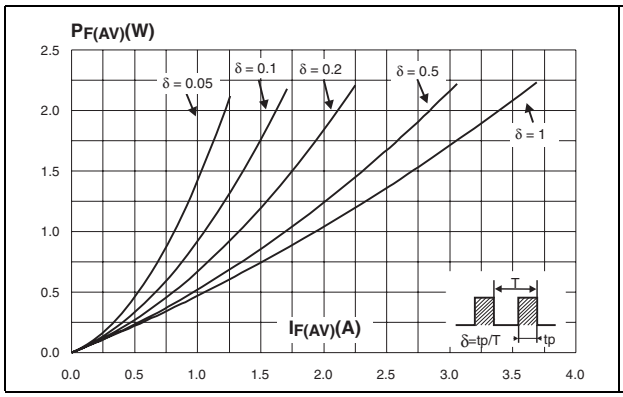


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode) (DPAK / SMB / SMC)

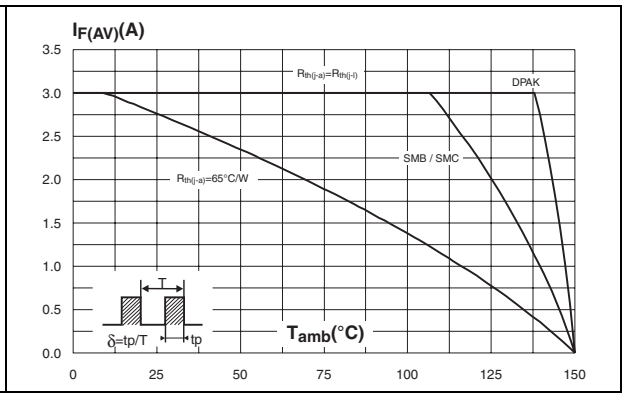


Figure 3. Average forward current versus ambient temperature (δ = 0.5, per diode) (SMB flat)

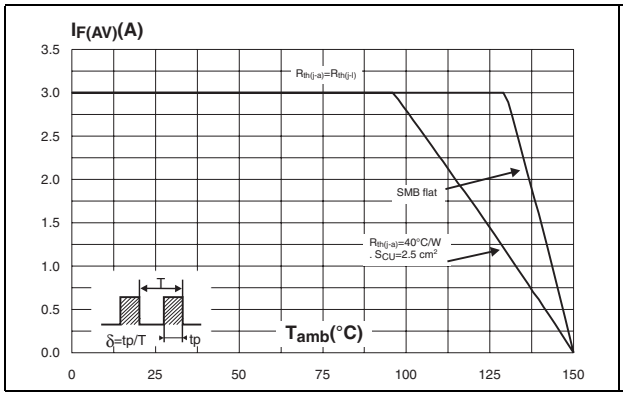


Figure 4. Non repetitive surge peak forward current versus overload duration (maximum values) (DPAK)

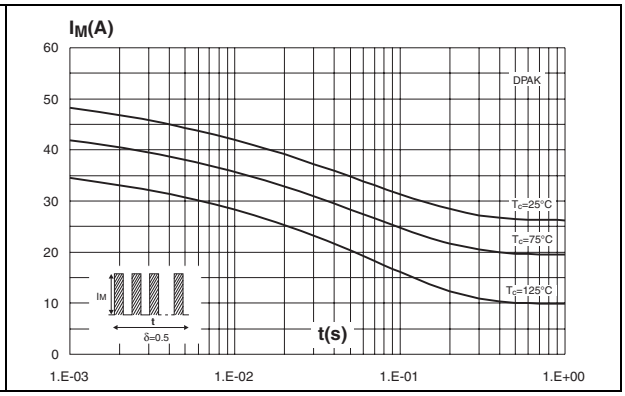


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

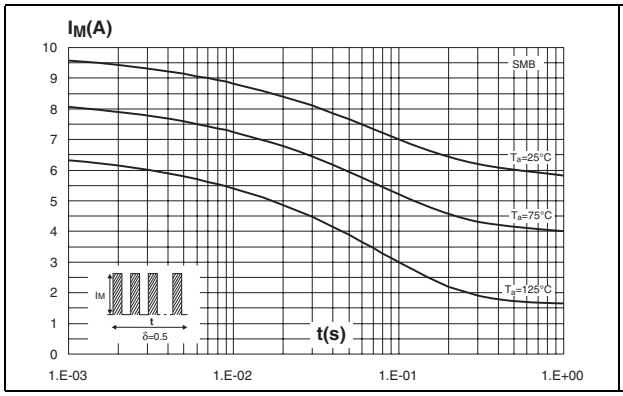


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) (SMC)

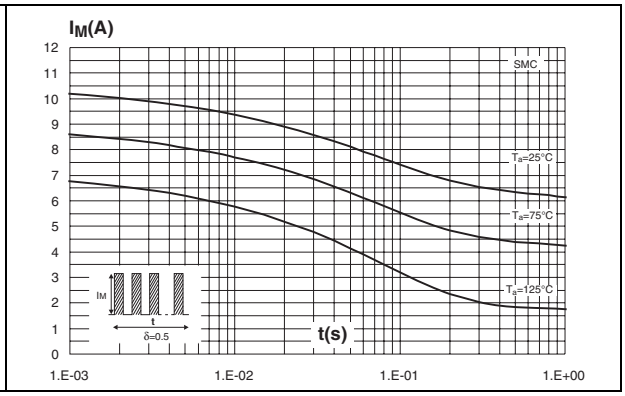


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) SMB flat

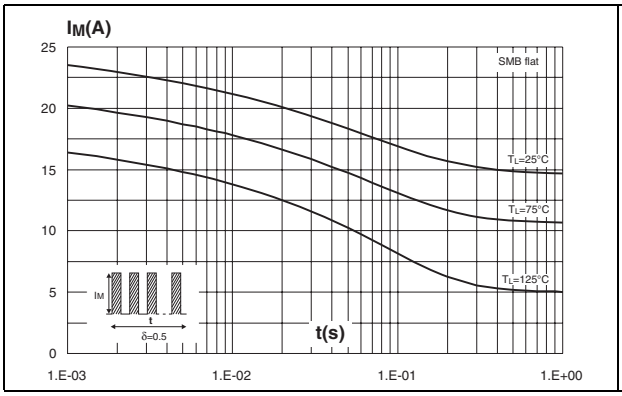


Figure 8. Normalized avalanche power derating versus pulse duration

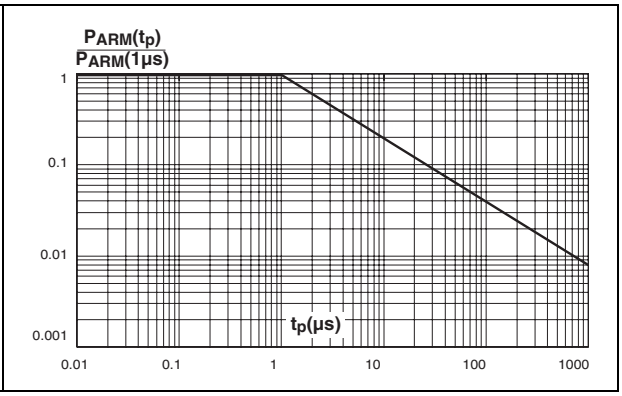


Figure 9. Normalized avalanche power derating versus junction temperature

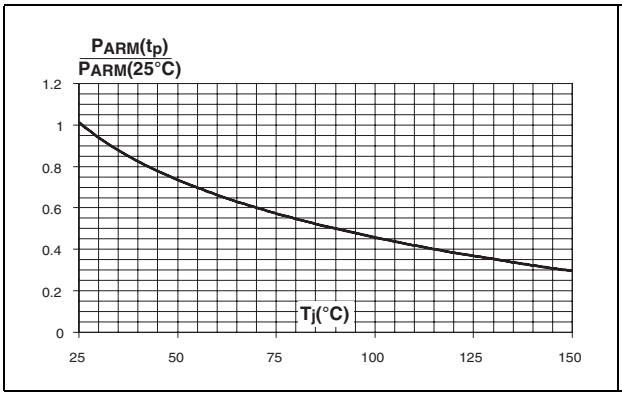


Figure 10. Relative variation of thermal impedance junction to ambient versus pulse duration (DPAK)

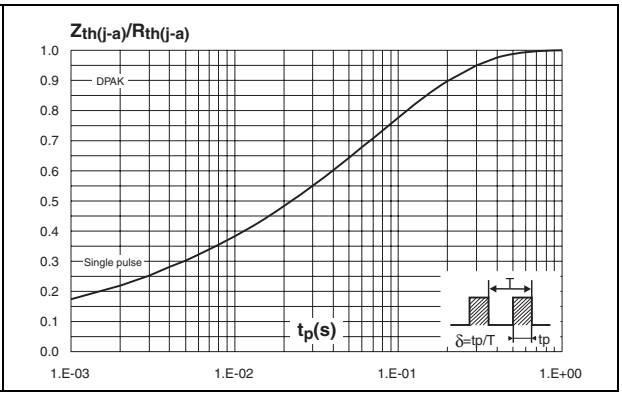


Figure 11. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

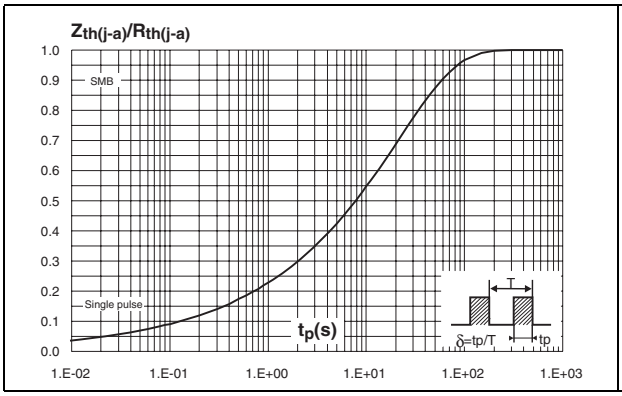


Figure 12. Relative variation of thermal impedance junction to ambient versus pulse duration (SMC)

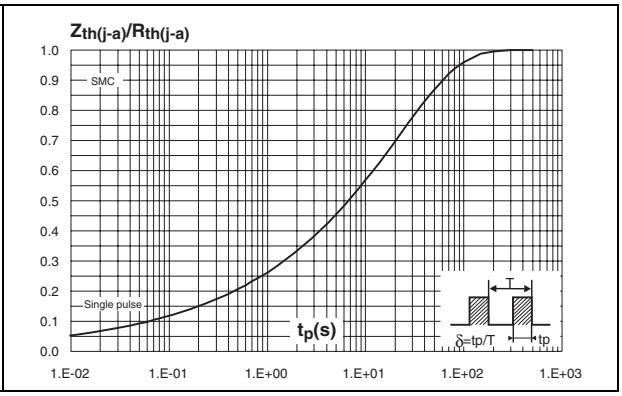


Figure 13. Relative variation of thermal impedance junction to lead versus pulse duration - SMB flat

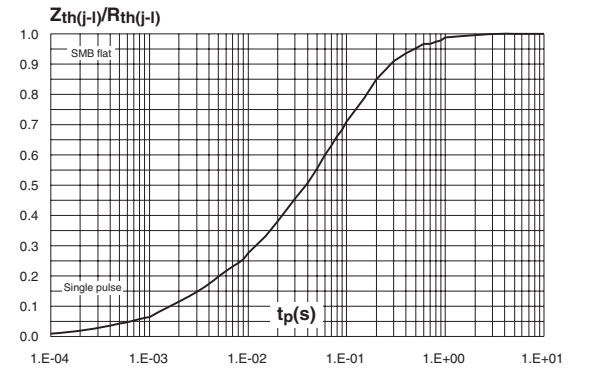


Figure 14. Reverse leakage current versus reverse voltage applied (typical values)

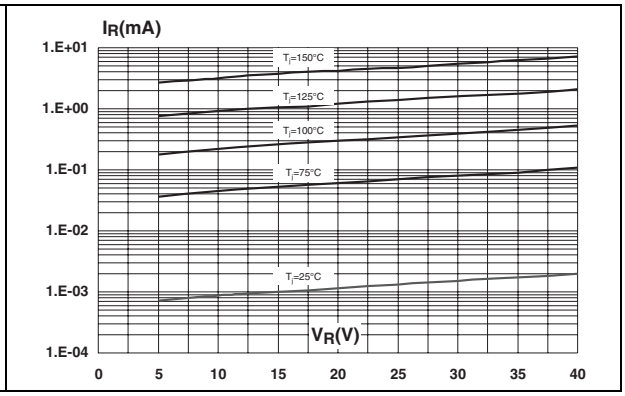


Figure 15. Junction capacitance versus reverse voltage applied (typical values)

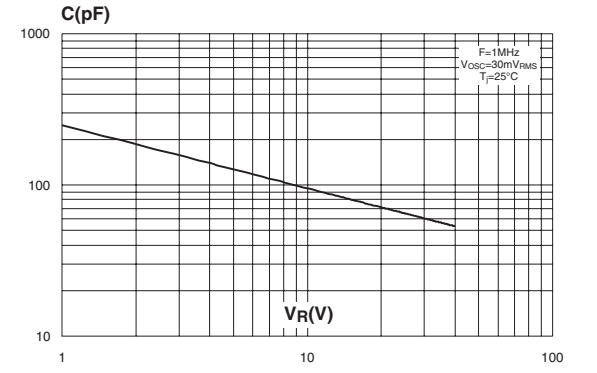


Figure 16. Forward voltage drop versus forward current

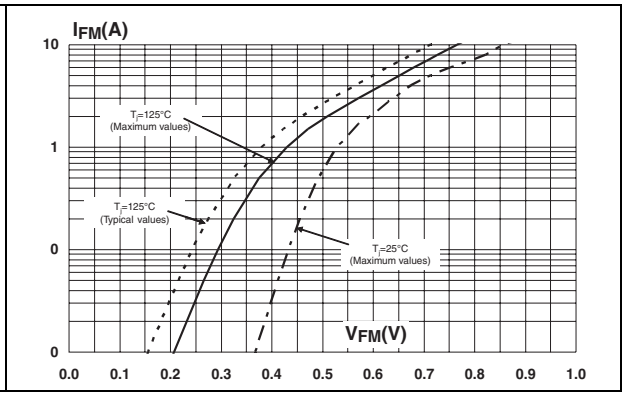


Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, e_{CU} = 35 µm) (DPAK)

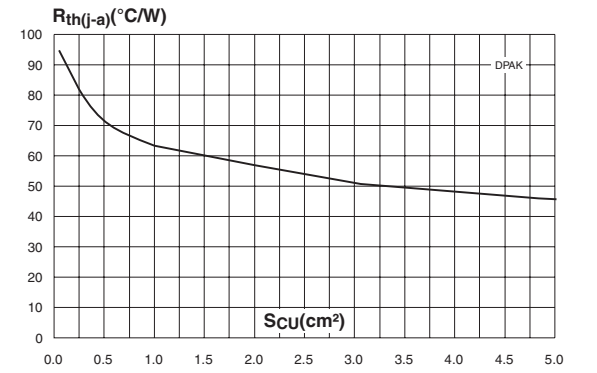


Figure 18. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, e_{CU} = 35 µm) (SMB / SMC)

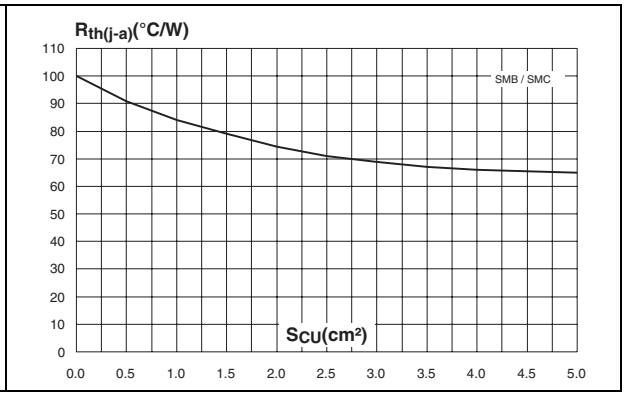
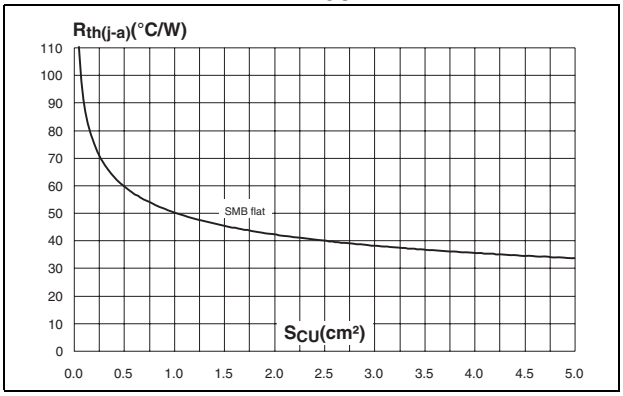


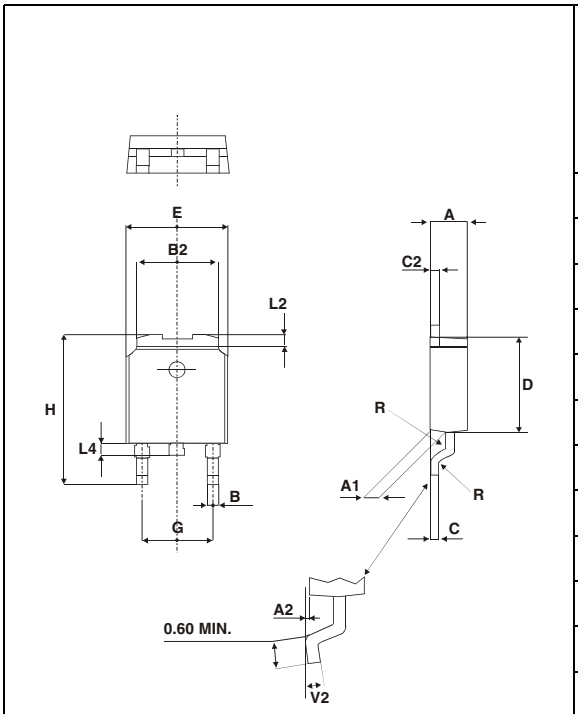
Figure 19. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, e_{CU} = 35 µm) (SMB flat)



2 Package Information

- Band indicates cathode on SMB and SMC
- Epoxy meets UL94, V0

Table 4. DPAK dimensions



Ref	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	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 20. DPAK footprint dimensions (in millimeters)

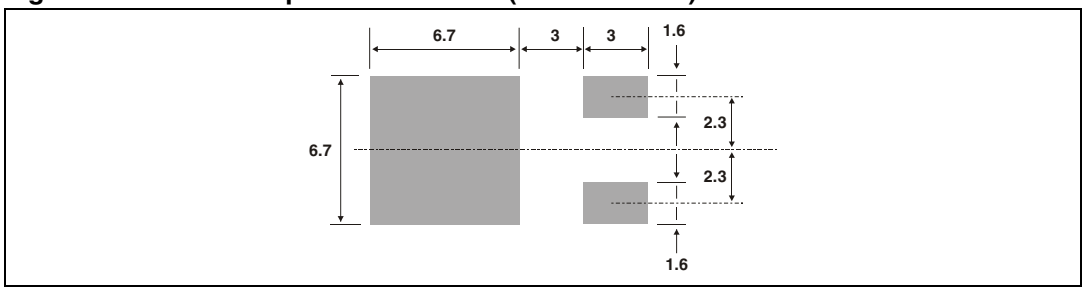
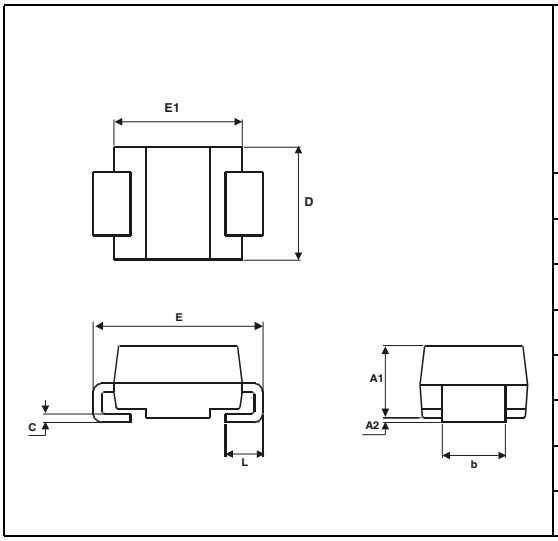


Table 5. SMB dimensions



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 21. SMB footprint (dimensions in mm)

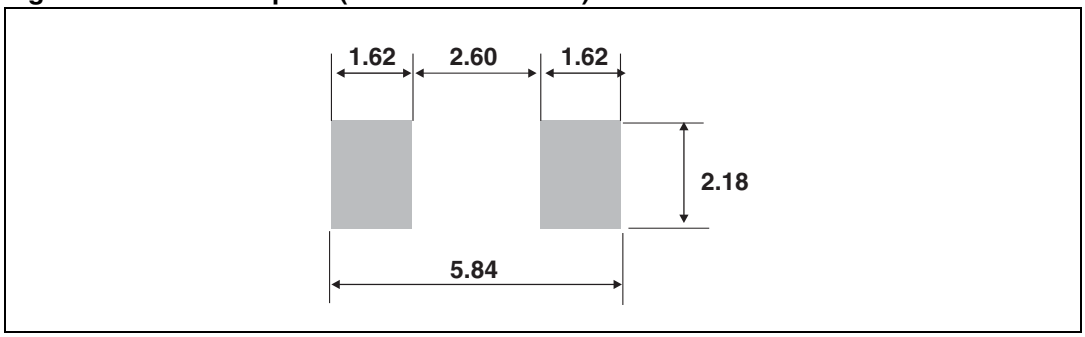
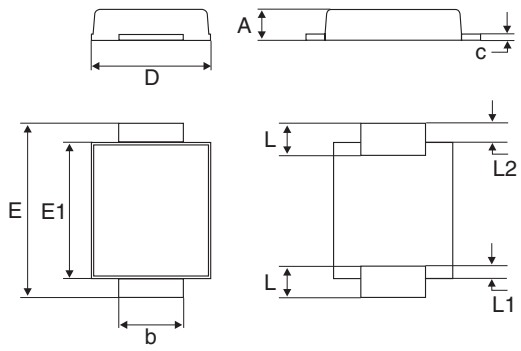


Table 6. SMB Flat dimensions



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 22. SMB Flat footprint (dimensions in mm)

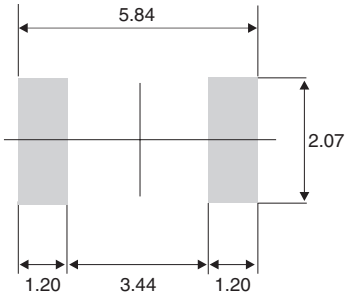
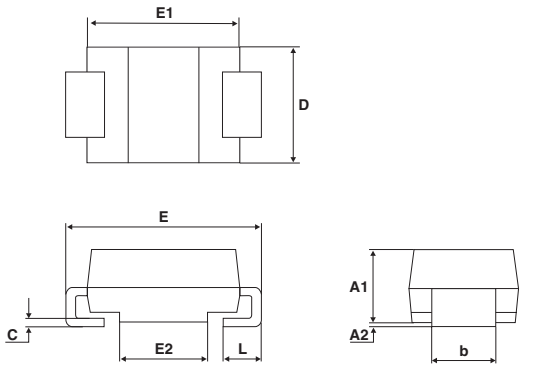
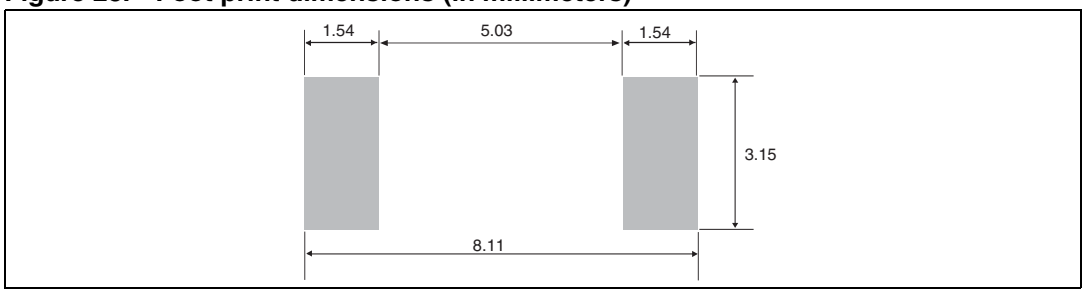


Table 7. SMC package mechanical data



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	2.90	3.2	0.114	0.126
c	0.15	0.41	0.006	0.016
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
D	5.55	6.25	0.218	0.246
L	0.75	1.40	0.030	0.063

Figure 23. Foot print dimensions (in millimeters)



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS340U	U34	SMB	0.107 g	2500	Tape and reel
STPS340S	S34	SMC	0.243 g	2500	
STPS340B	S340	DPAK	0.30 g	75	Tube
STPS340B-TR				2500	Tape and reel
STPS340UF	FU34	SMB flat	0.50 g	5000	Tape and reel

4 Revision history

Date	Revision	Description of Changes
Jul-2003	7B	Last update.
Feb-2005	8	Layout update. No content change.
08-Feb-2007	9	Reformatted to current standard. Added ECOPACK statement. Added SMB flat package.

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