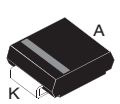
STPS340-Y

Automotive power Schottky rectifier

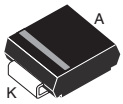
Datasheet – production data

Features

- Very small conduction losses
- Negligible switching losses
- Low forward voltage drop
- Low thermal resistance
- Extremely fast switching
- Surface mounted device
- Avalanche capability specified
- AEC-Q101 qualified



SMB
STPS340UY



SMC
STPS340SY

Table 1. Device summary

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

Description

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

Packaged in SMB, and SMC, 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 for automotive applications.

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			40	V
$I_{F(RMS)}$	Forward rms current			6	A
$I_{F(AV)}$	Average forward current	SMB	T_L = 95 °C δ = 0.5	3	A
		SMC	T_L = 105 °C δ = 0.5	3	A
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) range			-40 to +150	°C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ 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	SMB	25	°C/W
		SMC	20	

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			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: t_p = 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)

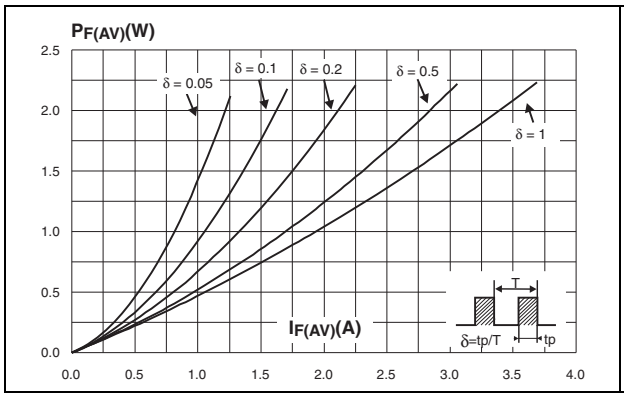


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

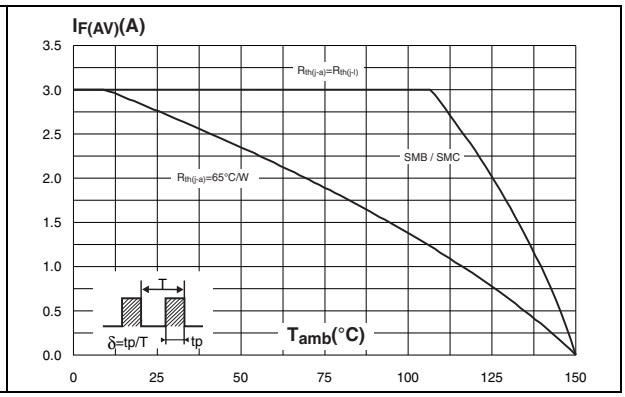


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

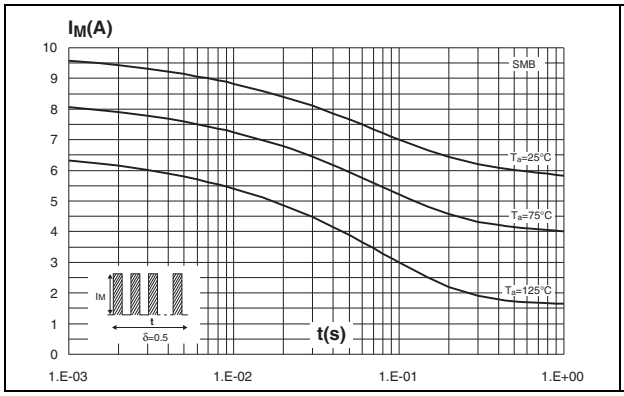


Figure 4. Non repetitive surge peak forward current versus overload duration (maximum values) (SMC)

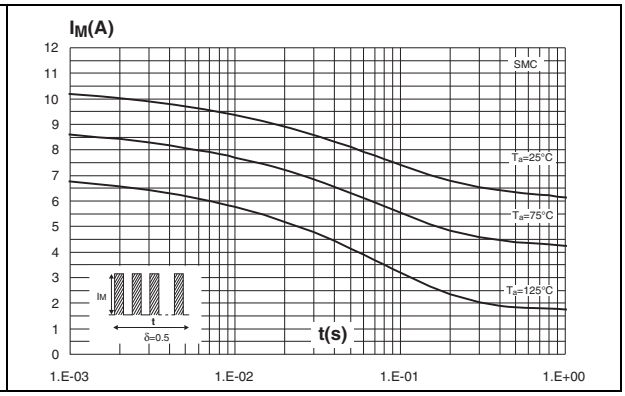


Figure 5. Normalized avalanche power derating versus pulse duration

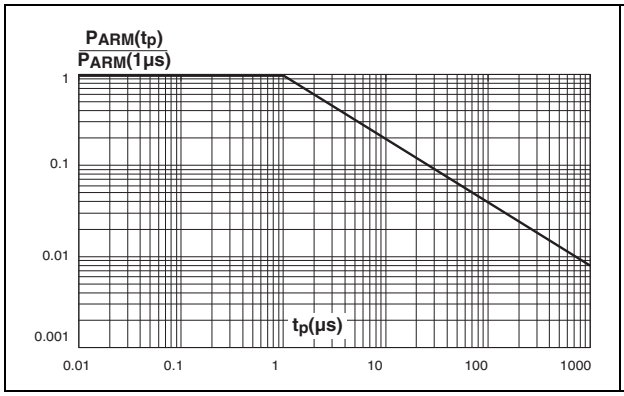


Figure 6. Normalized avalanche power derating versus junction temperature

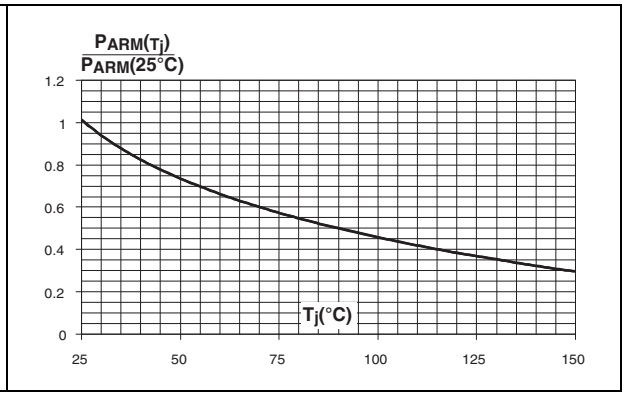


Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

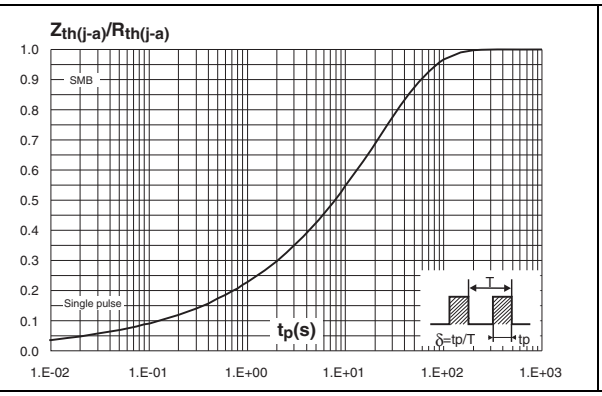


Figure 8. Relative variation of thermal impedance junction to ambient versus pulse duration (SMC)

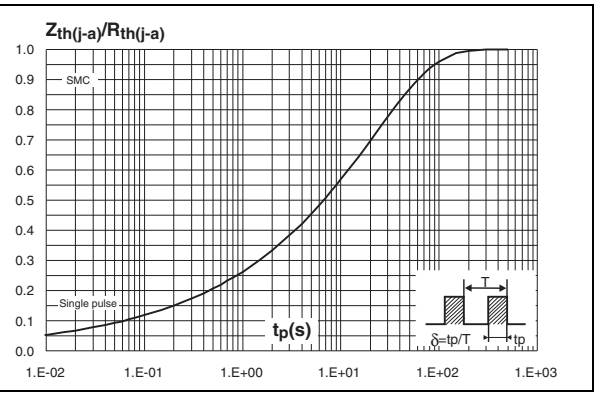


Figure 9. Reverse leakage current versus reverse voltage applied (typical values)

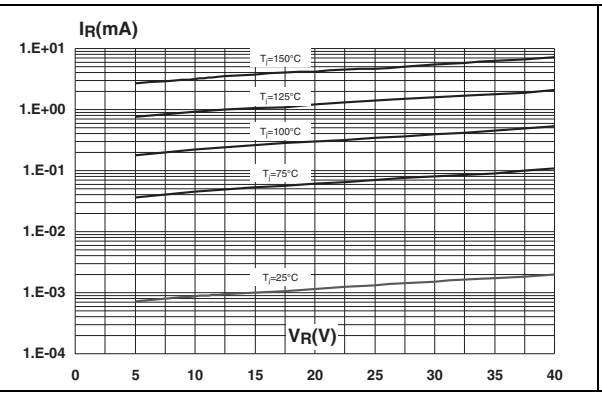


Figure 10. Junction capacitance versus reverse voltage applied (typical values)

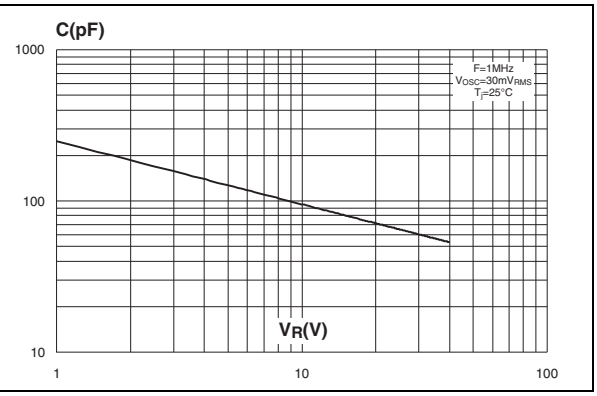


Figure 11. Forward voltage drop versus forward current

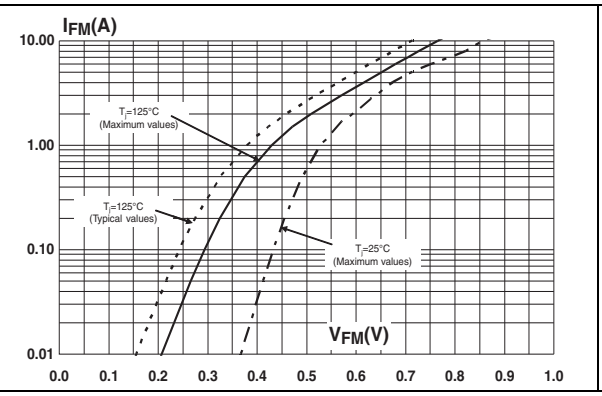
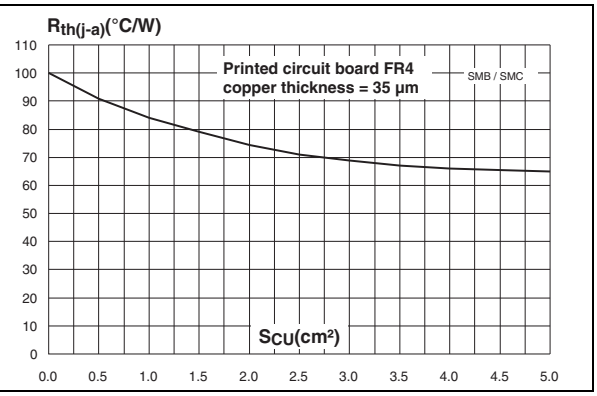


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead

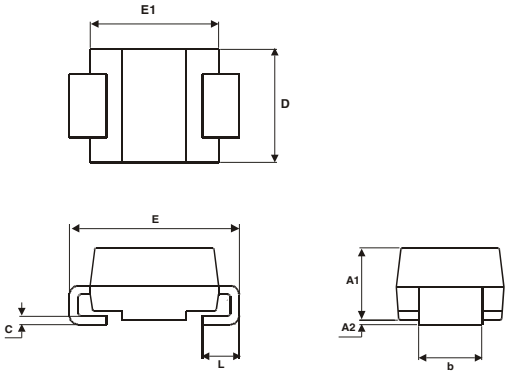


2 Package information

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

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.

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 13. SMB footprint (dimensions in mm)

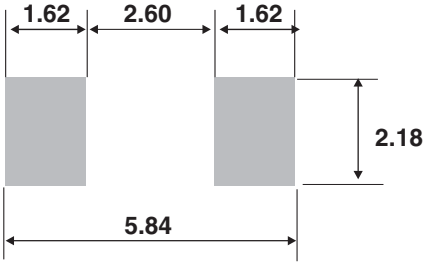
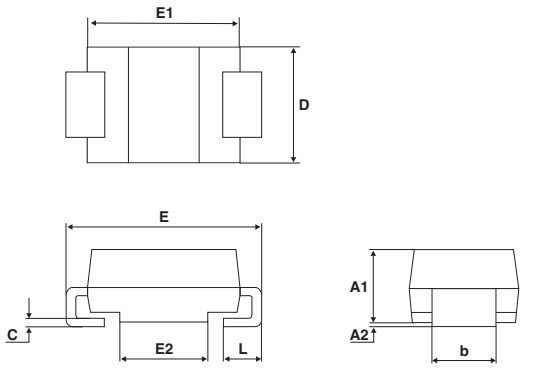
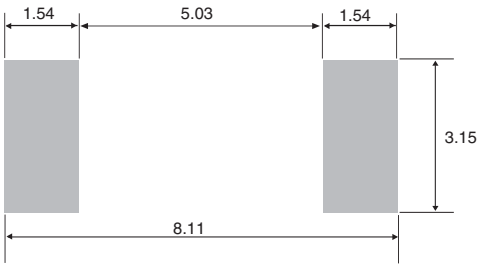


Table 6. SMC package dimensions



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	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 14. Footprint dimensions (in millimeters)



3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS340UY	U34Y	SMB	0.107 g	2500	Tape and reel
STPS340SY	S34Y	SMC	0.243 g		

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
24-Oct-2012	1	First issue.

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