

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

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.





Table 1.Device summary

I _{F(AV)}	3 A
V _{RRM}	40 V
T _j (max)	150 °C
V _F (max)	0.57 V

This is information on a product in full production.

1 Characteristics

	Absolute lutings (initiality values)					
Symbol	Pa	Value	Unit			
V _{RRM}	Repetitive peak reverse voltage	ge		40	V	
I _{F(RMS)}	Forward rms current			6	А	
1	Average forward current	SMB	$T_L = 95 \ ^\circ C \ \delta = 0.5$	3	А	
IF(AV)	Average forward current	SMC	$T_L = 105 \ ^\circ C \ \delta = 0.5$	3	А	
I _{FSM}	Surge non repetitive forward of	75	А			
P _{ARM}	Repetitive peak avalanche po	1300	W			
T _{stg}	Storage temperature range	-65 to + 150	°C			
Тj	Operating junction temperature ⁽¹⁾ range			-40 to +150	°C	
-IDtt	2					

Table 2. Absolute ratings (limiting values)

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

Table 3.Thermal resistance

Symbol	Parameter	Parameter			
R _{th(j-l)} Junction to lead	SM	ИВ	25	°C/W	
	SM	VIC	20	0/00	

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _B ⁽¹⁾	Reverse leakage	T _j = 25 °C	V _R = V _{RRM}			20	μΑ
^I R ⁽¹⁾ current	T _j = 125 °C	VR − VRRM		2	10	mA	
	V (1) Forward voltage drap	T _j = 25 °C	I _F = 3 A			0.63	
V _F ⁽¹⁾		T _j = 125 °C			0.52	0.57	V
V _F ⁽¹⁾ Forward voltage drop	T _j = 25 °C	I _F = 6 A			0.84	v	
	T _j = 125 °	T _j = 125 °C	1F - 0 A		0.63	0.72	

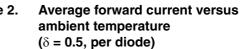
1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

 $P = 0.42 \text{ x } I_{F(AV)} + 0.050 \text{ } I_{F}{}^{2}_{(RMS)}$



Figure 1. Average forward power dissipation Figure 2. versus average forward current (per diode)



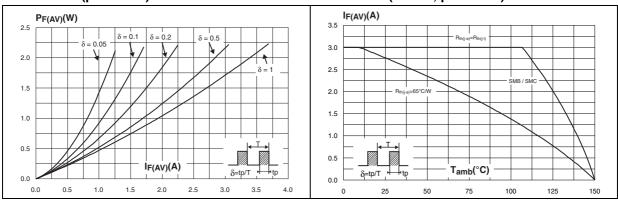


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

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

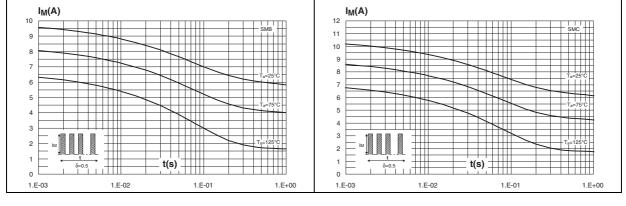
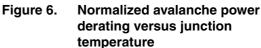


Figure 5. Normalized avalanche power derating versus pulse duration



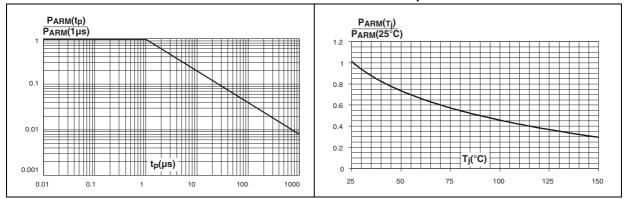
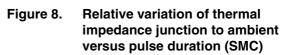
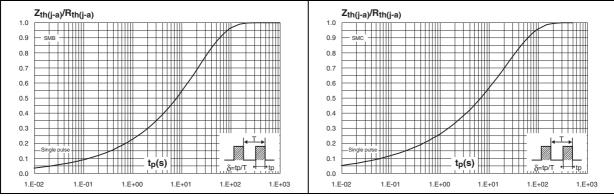
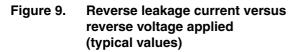


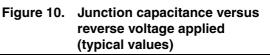


Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)









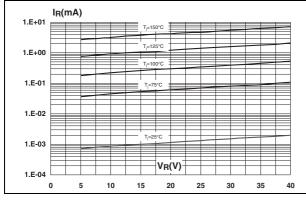


Figure 11. Forward voltage drop versus forward current

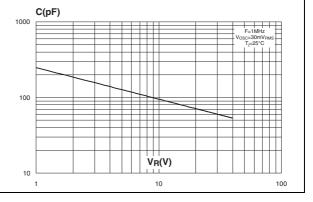
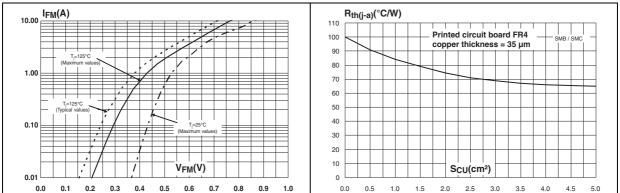


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead





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			
E1			Millimeters		Inches	
			Min.	Max.	Min.	Max.
D		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
		С	0.15	0.40	0.006	0.016
		Е	5.10	5.60	0.201	0.220
			4.05	4.60	0.159	0.181
	⊾ b E	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)

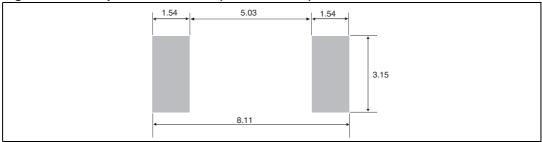




 Table 6.
 SMC package dimensions

				Dimer	nsions	
		Ref	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
E		С	0.15	0.41	0.006	0.016
		Е	7.75	8.15	0.305	0.321
		E1	6.60	7.15	0.260	0.281
	<u>A2</u> ↑b	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	2300	Tape and reer

4 Revision history

Table 8.Document revision history

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



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