

STPS140Z-Y

Automotive power Schottky rectifier

Datasheet - production data



Description

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

Packaged in SOD-123, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection for automotive applications.

Table 1. Device summary

Symbol	Value
I _{F(AV)}	1 A
V _{RRM}	40 V
T _j (max)	150 °C
V _{F (max)}	0.51 V

Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- ECOPACK[®]2 compliant component
- AEC-Q101 qualified

1 Characteristics

Table 2	Absolute	Ratings	(limitina	values)
	Absolute	Ratings	linning	valuesj

Symbol	Parameter	Value	Unit	
V _{RRM}	Repetitive peak reverse voltage		40	V
١ _F	Continuous forward current	T _{amb} = 60 °C	1	А
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms sinusoidal	5.5	А
I _{RRM}	Repetitive peak reverse current $t_p = 2 \ \mu s \ F = 1 \ kHz \ square$		0.5	А
I _{RSM}	Non repetitive peak reverse current $t_p = 100 \ \mu s$ square		1	А
T _{stg}	Storage temperature range	- 65 to + 150	°C	
Тj	Operating junction temperature ⁽¹⁾	- 40 to + 150	°C	
dV/dt	Critical rate of rise of reverse voltage	10000	V/µs	

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	Value	Unit
R _{th(j-a)}	Junction to ambient ⁽¹⁾	500	°C/W

1. Mounted on epoxy board.

Table 4.	Static electrical characteristics
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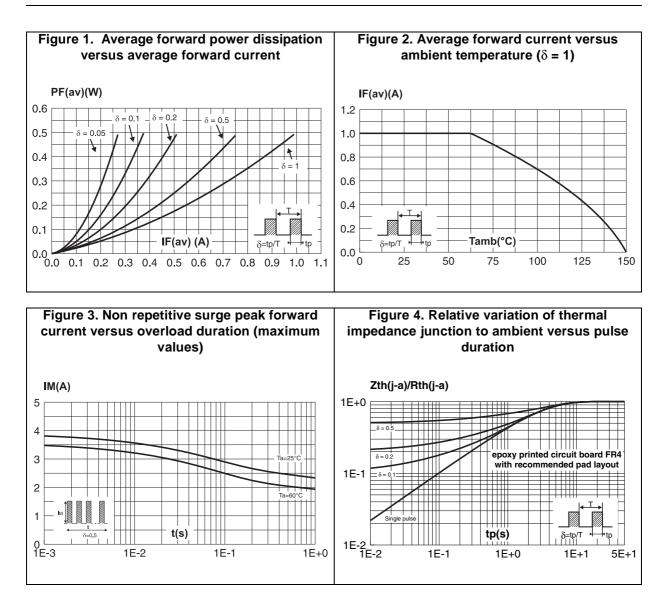
Symbol	Parameter	Test co	nditions	Min.	Тур.	Max.	Unit
		T _j = 25 °C	V _R = 5 V			10	μA
$I_{R}^{(1)}$	Reverse leakage current	T _j = 25 °C	V _R = 40 V			40	μΛ
		T _j = 100 °C			1.5	5	mA
V _F ⁽²⁾	Forward voltage drop	T _j = 25 °C	I _F = 1 A			0.55	V
VF` /		$T_j = 100 \ ^\circ C$			0.45	0.51	v

1. Pulse test: $t_p = 5 \text{ ms}, \delta < 2\%$

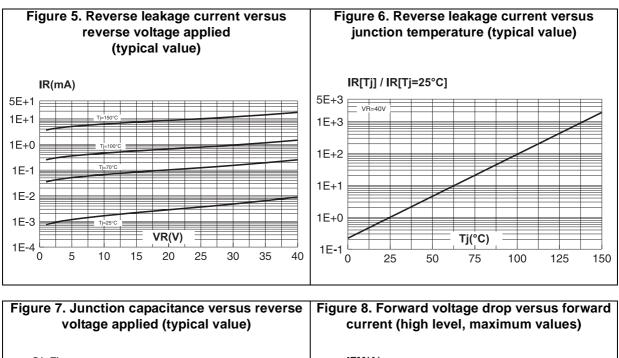
2. Pulse test: $t_p = 380 \text{ ms}, \delta < 2\%$

To evaluate the maximum conduction losses use the following equation: P = 0.2 x I_{F(AV)} + 0.3 x I_F²_(RMS) at T_j = 150 °C









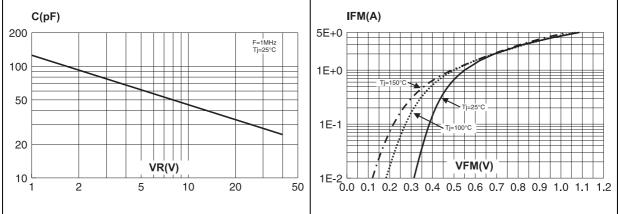
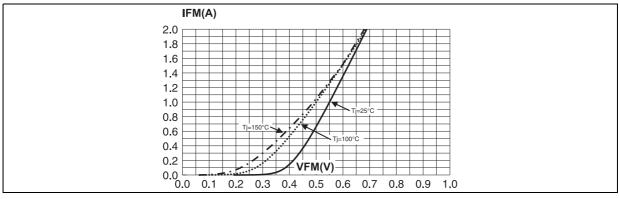


Figure 9. Forward voltage drop versus forward current (low level, maximum values)





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.

2.1 SOD-123 package information

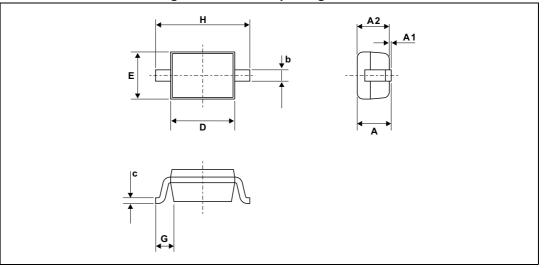


Figure 10. SOD123 package outline

	Dimensions							
Ref.		Millimeters		Inches				
	Min.	Тур.	Max.	Min.	Тур.	Max.		
А			1.45			0.057		
A1	0		0.1	0		0.004		
A2	0.85		1.35	0.033		0.053		
b		0.55			0.022			
С		0.15			0.039			
D	2.55		2.85	0.1		0.112		
Е	1.4		1.7	0.055		0.067		
G	0.25			0.01				
Н	3.55		3.75	0.14		0.148		

Table 5. SOD123 package mechanical data



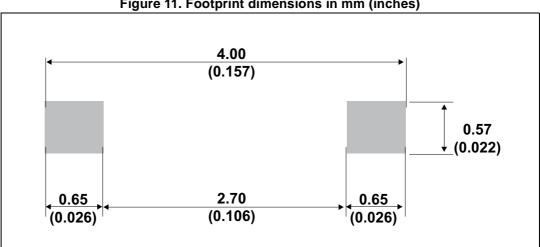


Figure 11. Footprint dimensions in mm (inches)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS140ZY	Z1Y	SOD-123	0.01 g	3000	Tape and reel

4 Revision history

Table 7.Document revision history

Date	Revision	Changes	
24-Oct-2012	1	First issue.	
07-Jul-2015	2	Updated Table 4 and reformatted to current standard.	



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