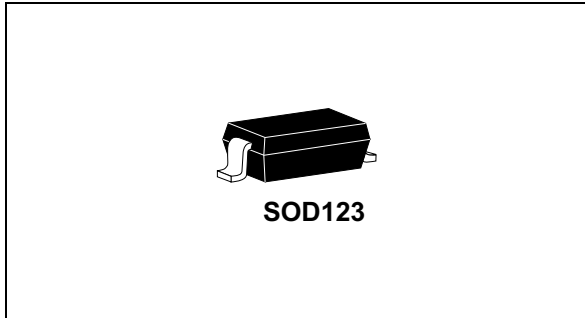


Automotive power Schottky rectifier

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.

Features

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

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

1 Characteristics

Table 2. Absolute Ratings (limiting values)

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

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 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

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V _R = 5 V			10	μA
		T _j = 25 °C	V _R = 40 V			40	
		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
		T _j = 100 °C			0.45	0.51	

1. Pulse test: t_p = 5 ms, δ < 2%

2. Pulse test: t_p = 380 ms, δ < 2%

To evaluate the maximum conduction losses use the following equation:

$$P = 0.2 \times I_{F(AV)} + 0.3 \times I_{F(RMS)}^2 \text{ at } T_j = 150 \text{ °C}$$

Figure 1. Average forward power dissipation versus average forward current

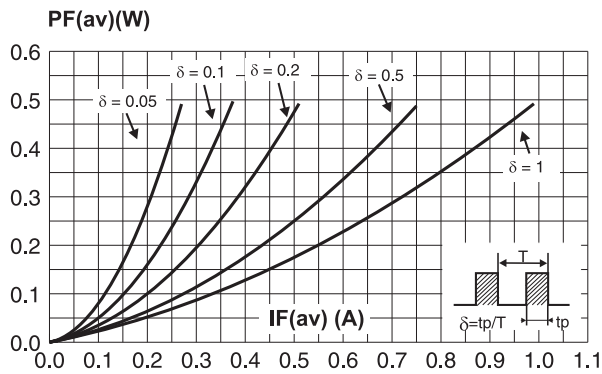


Figure 2. Average forward current versus ambient temperature ($\delta = 1$)

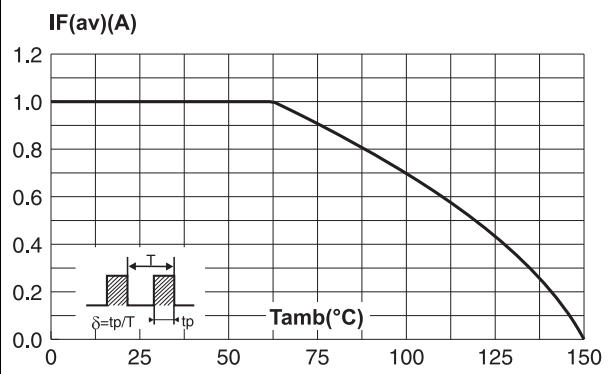


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

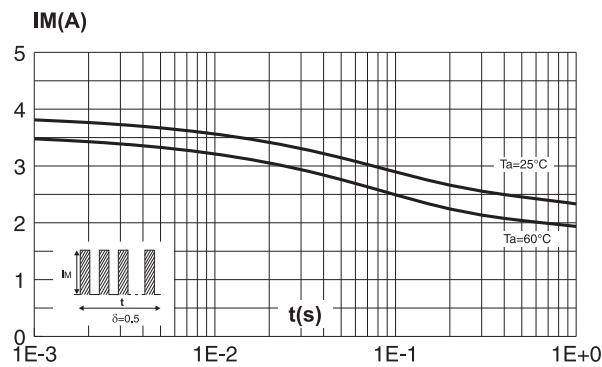
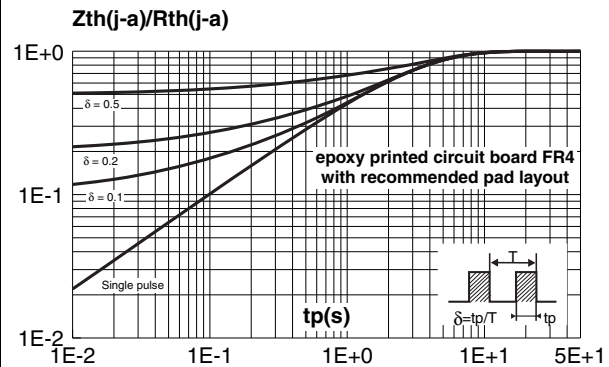
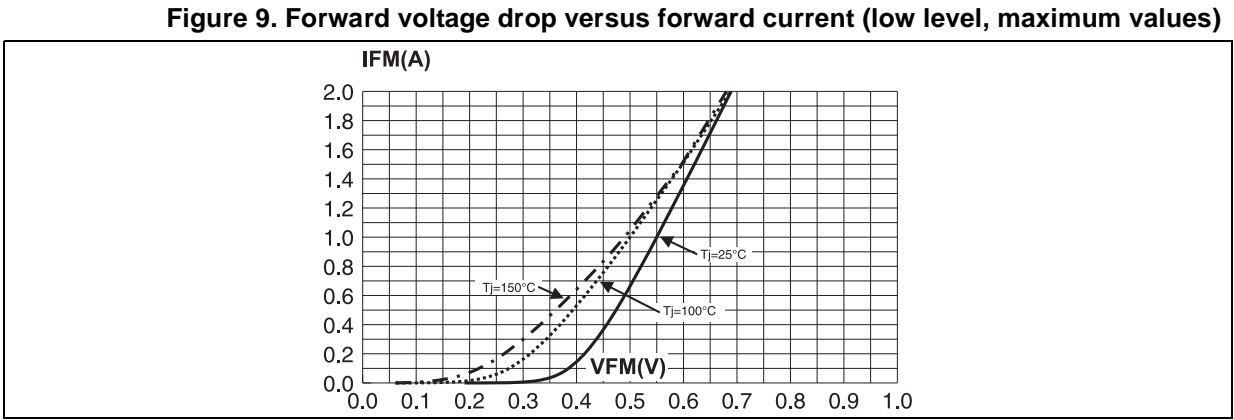
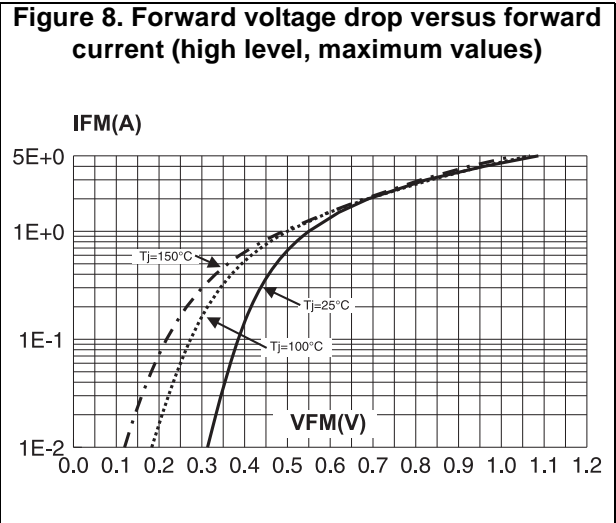
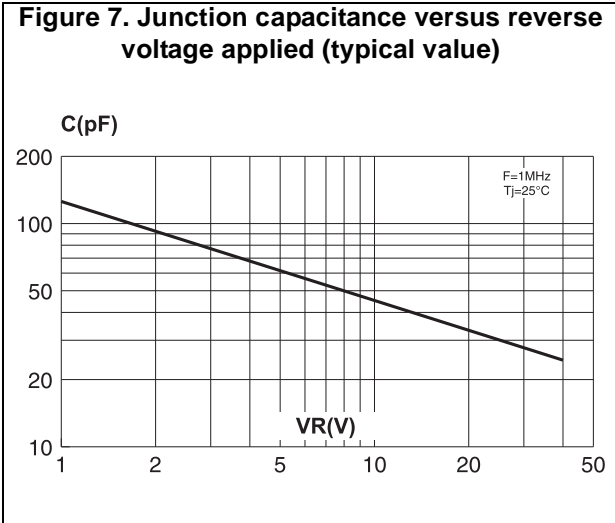
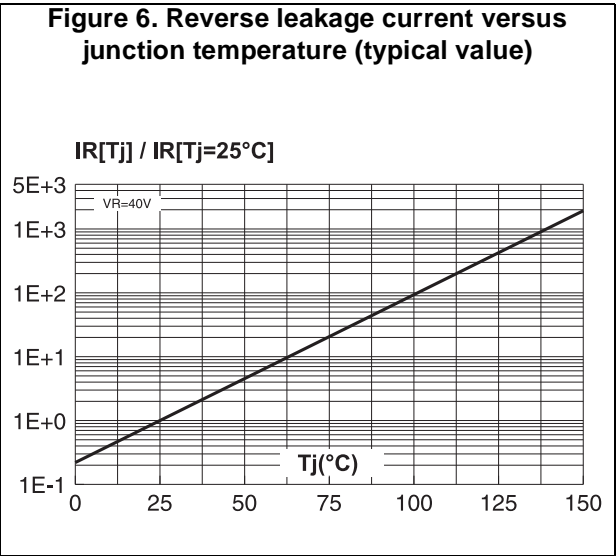
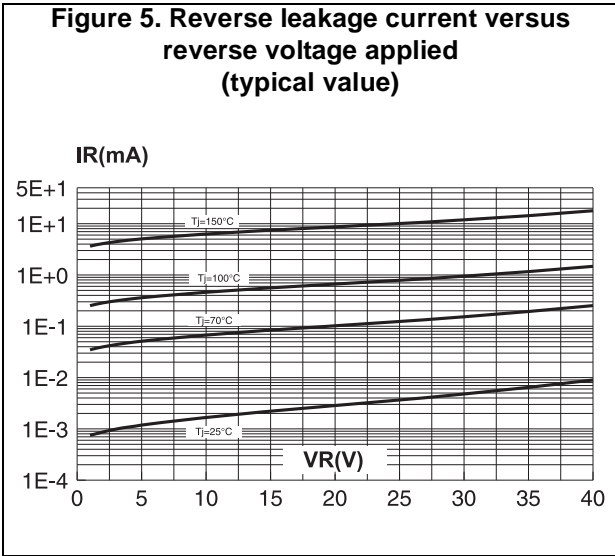


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration





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

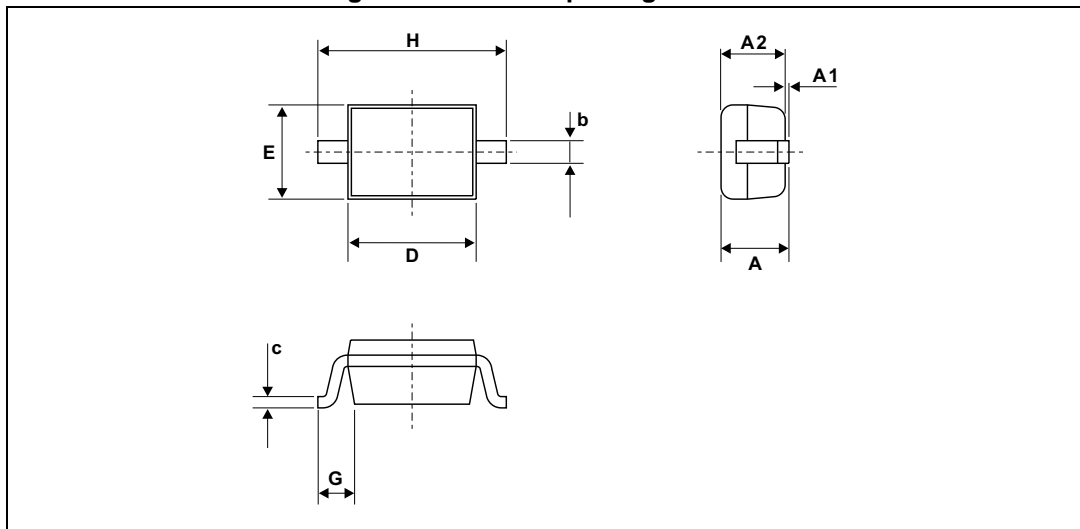
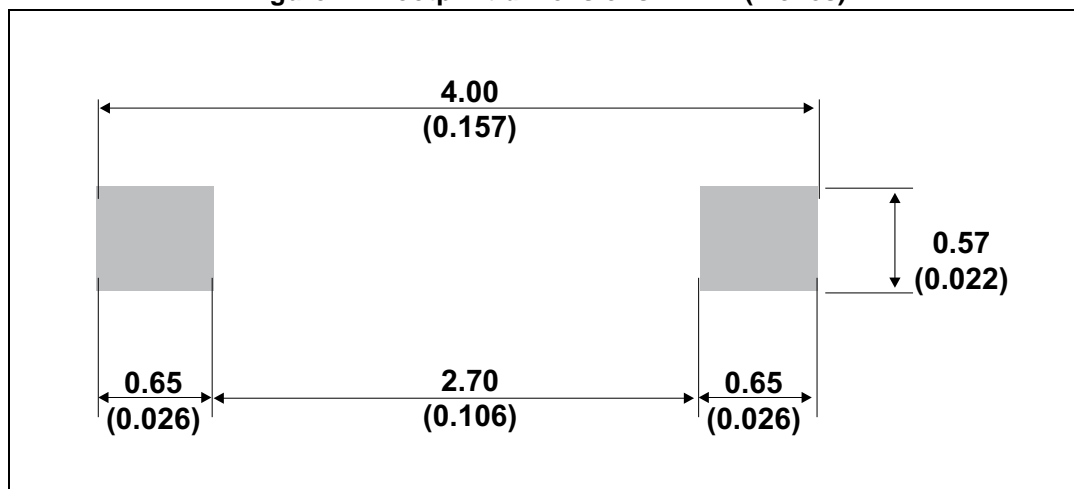


Table 5. SOD123 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			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	
c		0.15			0.039	
D	2.55		2.85	0.1		0.112
E	1.4		1.7	0.055		0.067
G	0.25			0.01		
H	3.55		3.75	0.14		0.148

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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