STPS0530Z

Schottky rectifier

Datasheet - production data

SOD-123
STPS0503Z

Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching

Description

Single Schottky rectifier 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 applications. Due to the small size of the package this device fits GSM and PCMCIA requirements.

Table 1. Device summary

$I_{F(AV)}$	0.5 A
V_{RRM}	30 V
V_F(max)	0.33 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		30	V
$I_{F(RMS)}$	Forward rms current		2	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_a = 55\ °C$	0.5	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal	5.5	A
dV/dt	Critical rate of rise of reverse voltage		10000	V/µs
T_{stg}	Storage temperature range		-65 to +150	°C
T_j	Operating junction temperature range[1]		-40 to +150	°C
T_L	Maximum temperature for soldering during 10 s		260	°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
$R_{th(j-a)}$	Junction to ambient	340 [1]	°C/W

1. Copper area on PCB S = 2.5 mm^2

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Typ.	Max.	Unit
I_R[1]	Reverse leakage current	$T_j = 25\ °C$	$V_R = 15$ V		12	µA
		$T_j = 125\ °C$		3	5	mA
		$T_j = 25\ °C$	$V_R = V_{RRM}$		130	µA
		$T_j = 125\ °C$		9	21	mA
V_F[2]	Forward voltage drop	$T_j = 25\ °C$	$I_F = 0.1$ A		0.375	V
		$T_j = 125\ °C$		0.20	0.22	
		$T_j = 25\ °C$	$I_F = 0.5$ A		0.43	
		$T_j = 125\ °C$		0.31	0.33	

1. Pulse test: tp = 5 ms, $\delta < 2\%$
2. Pulse test: tp = 380 µs, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation:
$P = 0.23 \times I_{F(AV)} + 0.18\ I_F{}^2{}_{(RMS)}$

Figure 1. Conduction losses versus average current

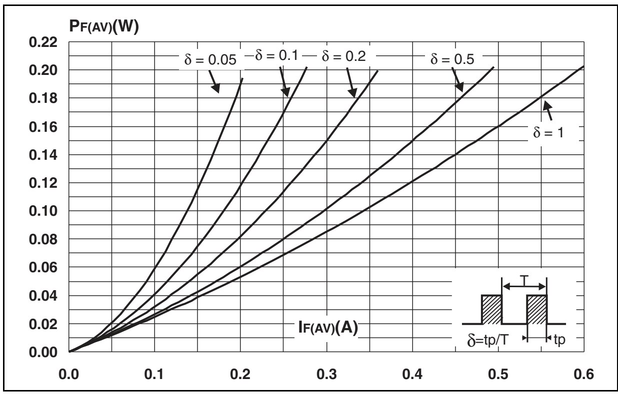


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

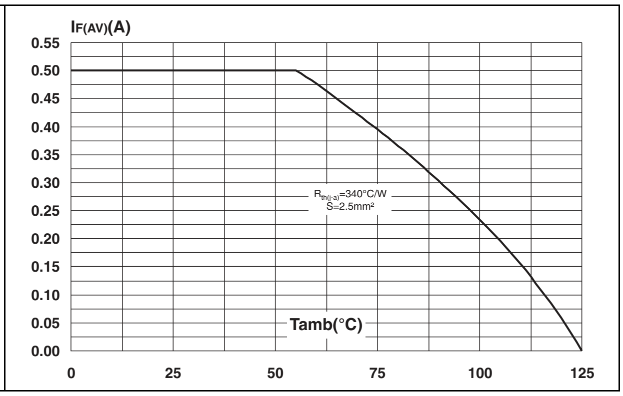


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

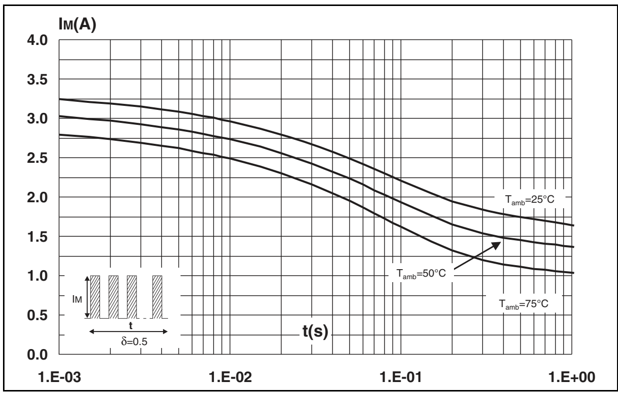


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration

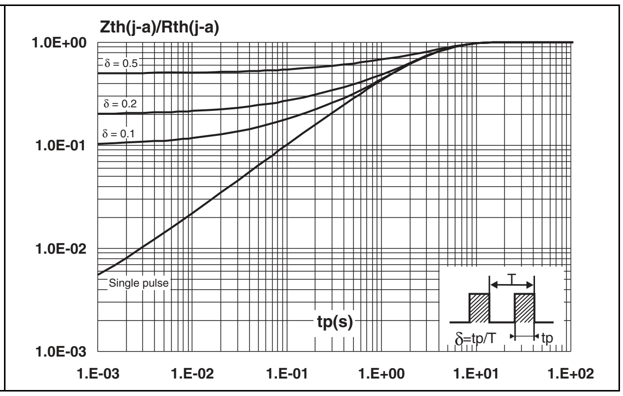


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

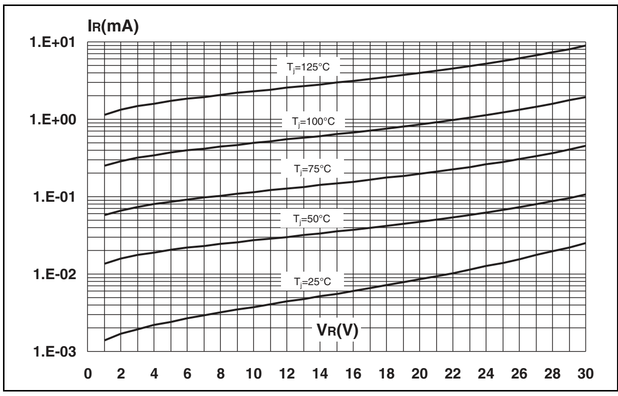


Figure 6. Reverse leakage current versus junction temperature (typical values)

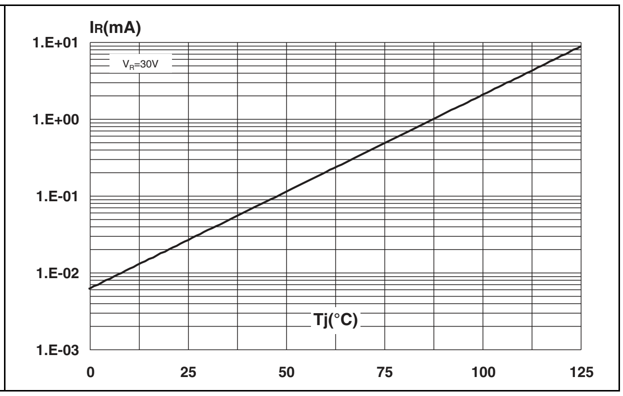


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

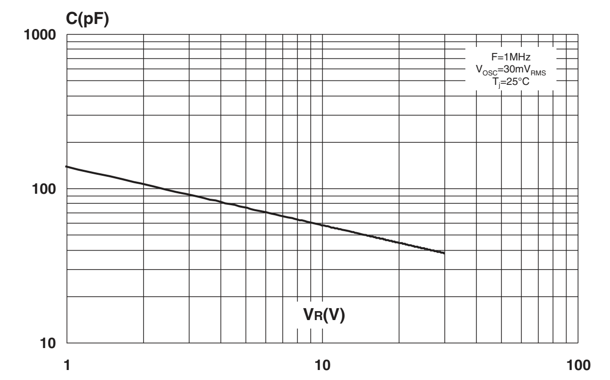


Figure 8. Forward voltage drop versus forward current

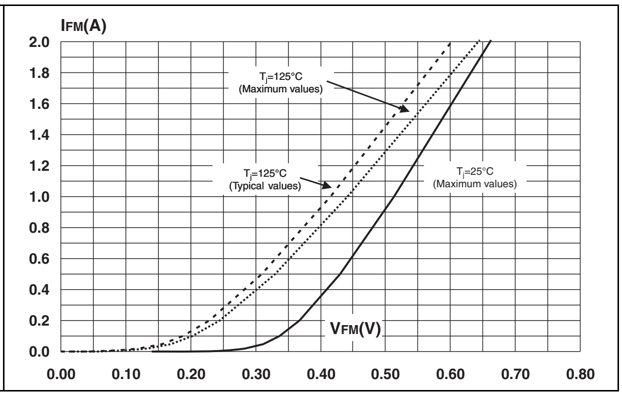
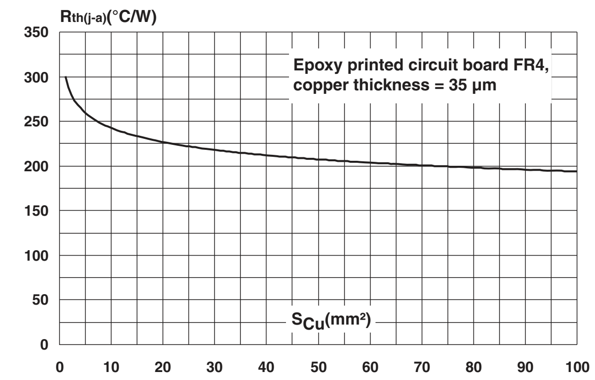


Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (typical values)

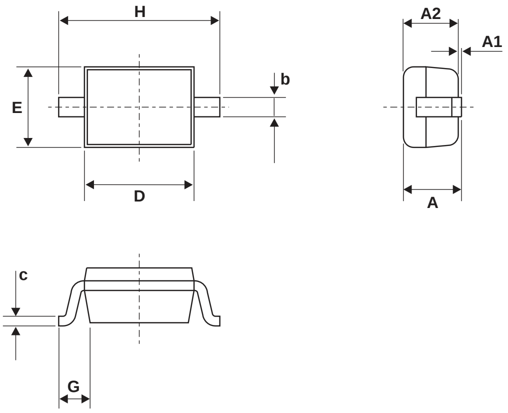


2 Package information

- Epoxy meets UL94, V0.
- Band indicates cathode.

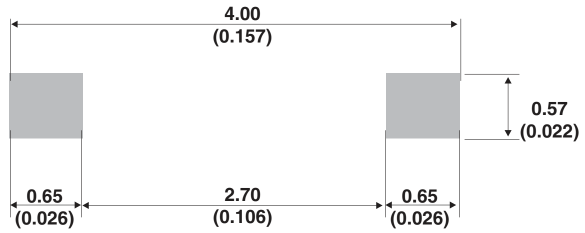
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 5. SOD-123 dimensions



Ref	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	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 Typ.		0.022 Typ.	
c	0.15 Typ.		0.039 Typ.	
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	0.1148

Figure 10. Footprint - dimensions in millimeters (inches)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS0530Z	Z53	SOD-123	0.01 g	3000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Mar-2003	1A	Initial release.
17-Oct-2006	2	Reformatted to current standards. Updated maximum junction temperatures to 150 °C and updated package illustration to show cathode bar on page 1
23-Apr-2014	3	Updated Tj max to Tj range in *Table 2*.