STPS0530Z

Schottky rectifiers

Main product characteristics

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

SOD-123
STPS0503Z

Features and benefits

- 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.

Order code

Order code	Marking
STPS0503Z	Z53

Table 1. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		30	V
$I_{F(RMS)}$	RMS forward current		2	A
$I_{F(AV)}$	Average forward current δ = 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	Maximum operating junction temperature (1)		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

1 Characteristics

Table 2. 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 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Value		Unit
				STPS0530Z		
				Typ.	Max.	
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, δ < 2%
2. Pulse test: tp = 380 µs, δ < 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

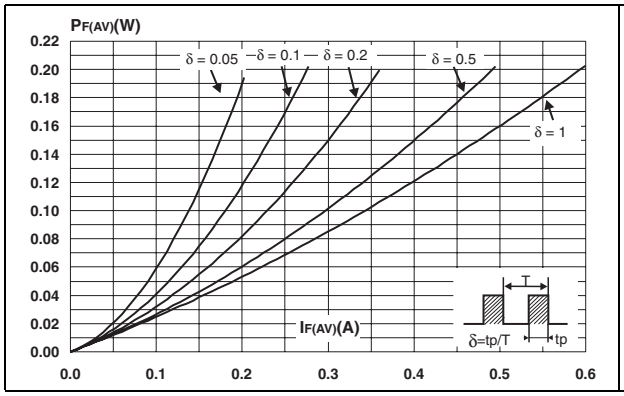


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

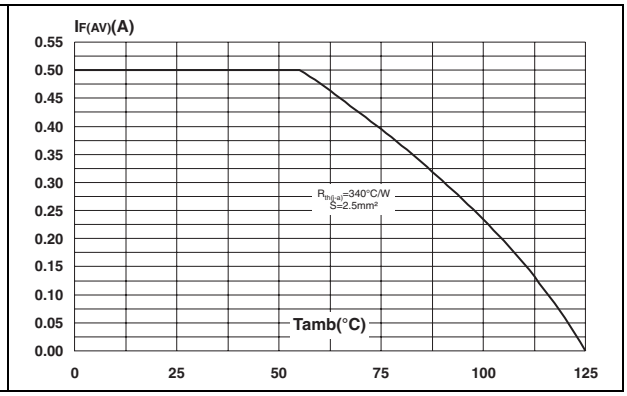


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

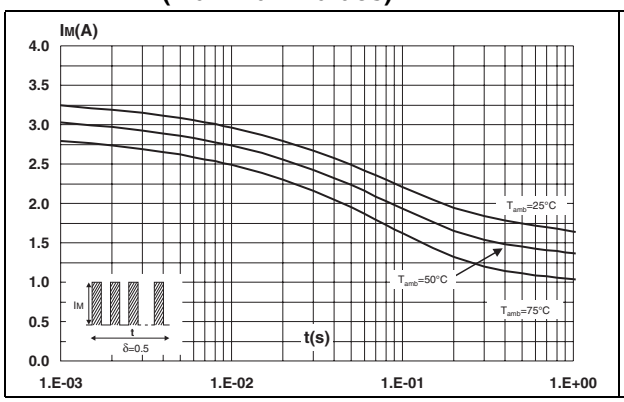


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration

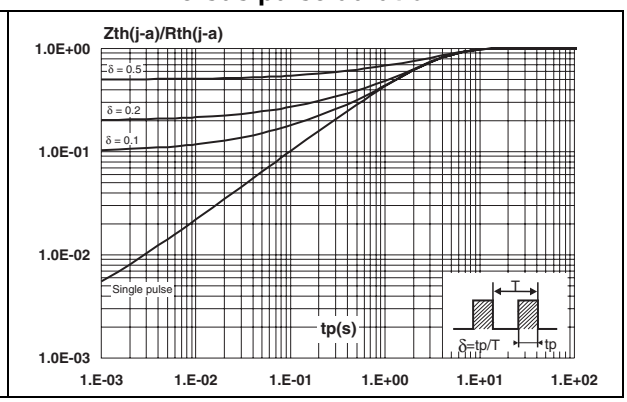


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

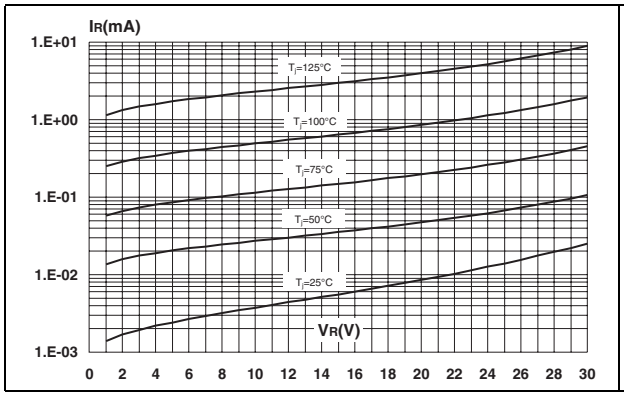


Figure 6. Reverse leakage current versus junction temperature (typical values)

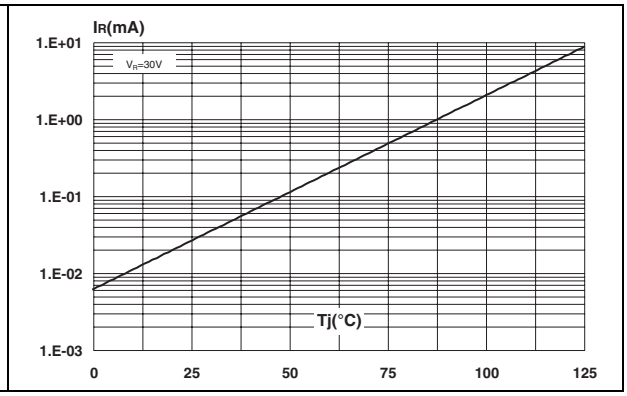


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

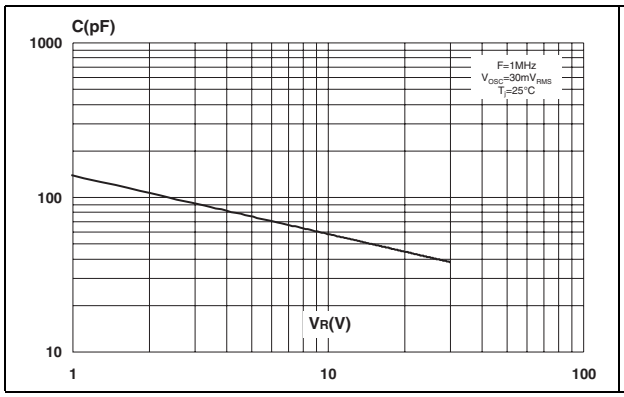


Figure 8. Forward voltage drop versus forward current

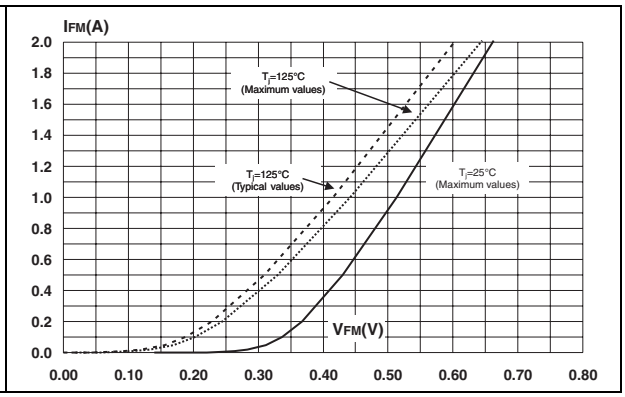
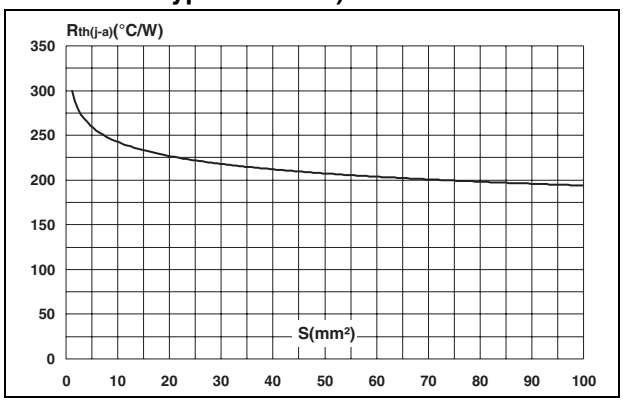


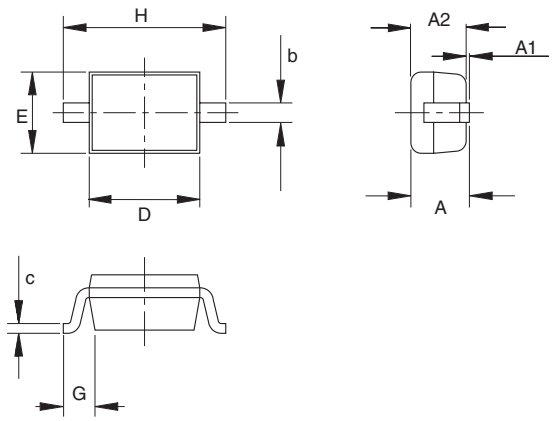
Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, Cu = 35 µm, typical values)



2 Package information

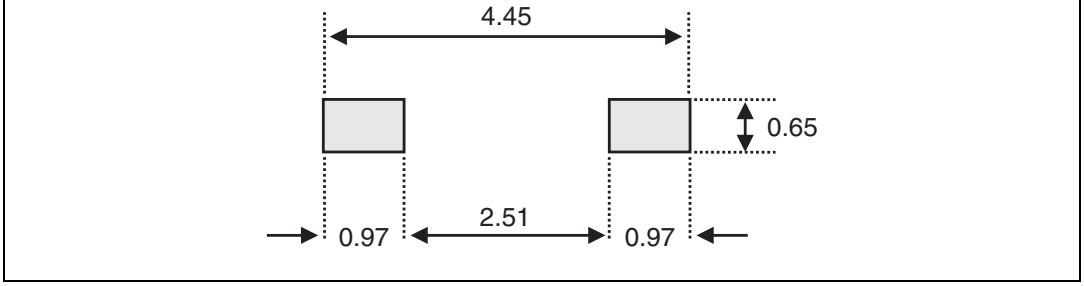
- Epoxy meets UL94, V0.
- Band indicates cathode.

Table 4. 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	3.95	0.14	0.156

Figure 10. Footprint (in millimeters)



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS0530Z	Z53	SOD-123	0.01 g	3000	Tape & reel

4 Revision history

Date	Revision	Changes
Mar-2003	1A	Initial release.
17-Oct-2006	2	Reformated to current standards. Updated maximum junction temperatures to 150° C and updated package illustration to show cathode bar on page 1

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