STPS0540-Y

Automotive Schottky rectifier

Features

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

Description

Single Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packages in SOD-123, these devices is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection for automotive applications.

SOD-123
STPS0540ZY

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	0.5 A
V_{RRM}	40 V
V_F(max)	0.40 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		40	V
$I_{F(RMS)}$	Forward rms voltage		2	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	Ta = 60 °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 (1)		-40 to + 150	°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(1)	500	°C/W

1. Mounted on epoxy board.

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		typ.	max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$		40	µA
		T_j = 100 °C		1.5	5	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 0.5 A		0.50	V
		T_j = 100 °C		0.35	0.40	
		T_j = 25 °C	I_F = 1 A		0.55	
		T_j = 100 °C		0.45	0.51	

1. Pulse test: t_p = 5 ms, δ < 2%
2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.29 \times I_{F(AV)} + 0.22 \times I_{F}^{2}{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

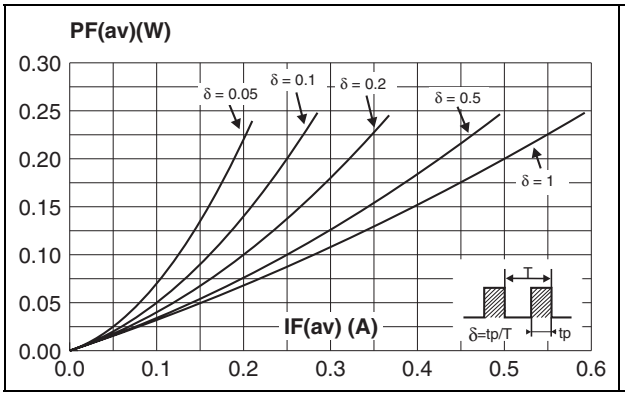


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

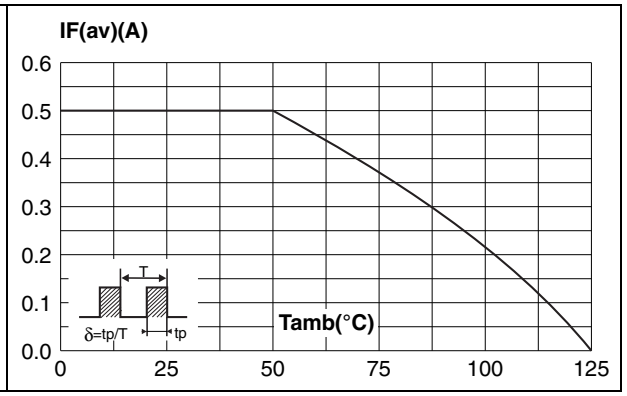


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

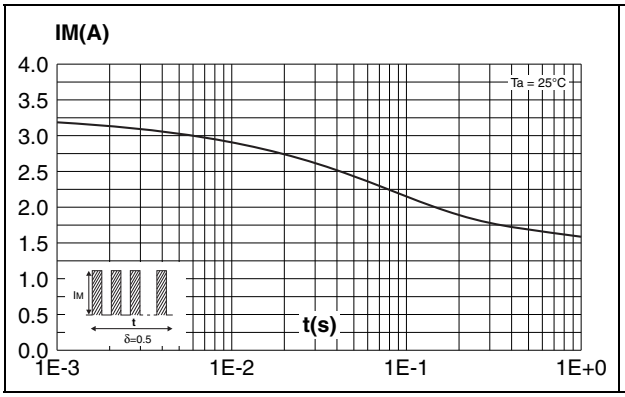


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration

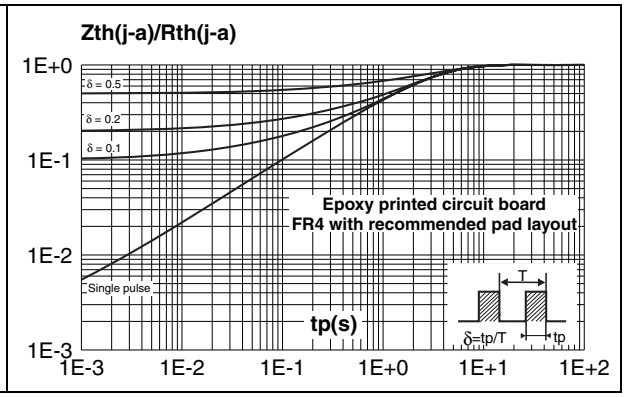


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

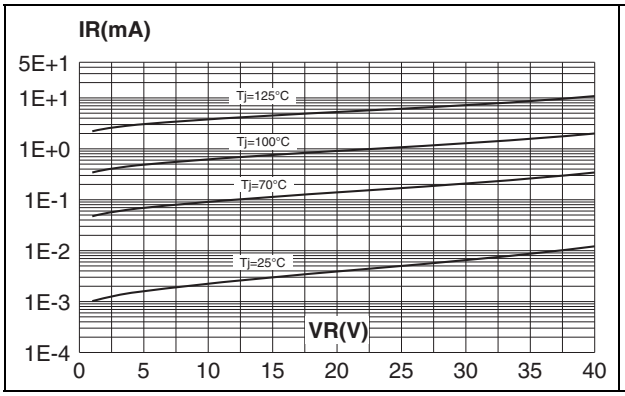


Figure 6. Reverse leakage current versus junction temperature (typical values)

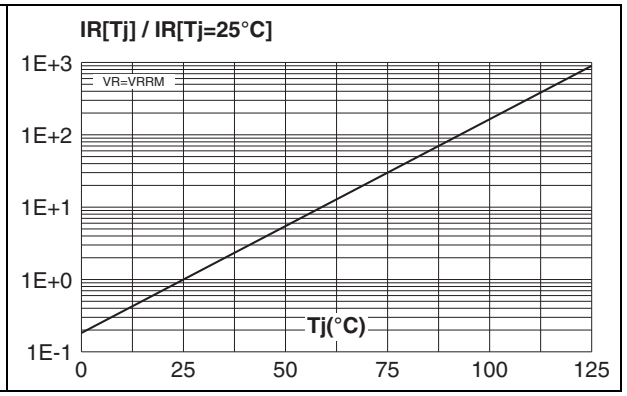


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

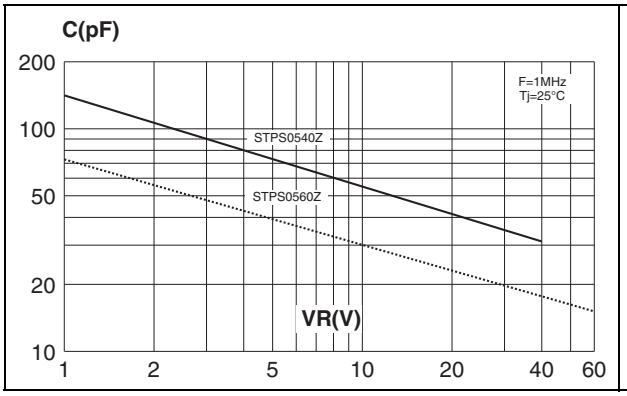
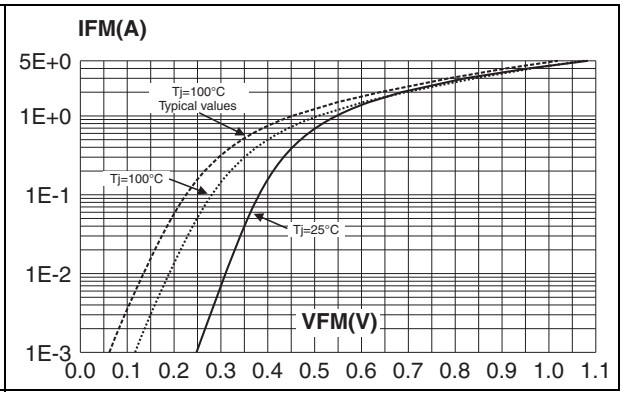


Figure 8. Forward voltage drop versus forward current (maximum values)

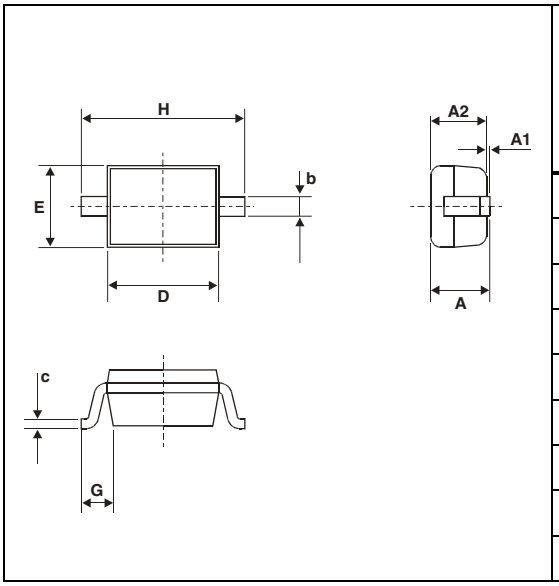


2 Package information

- Epoxy meets UL94, V0
- Band indicates cathode

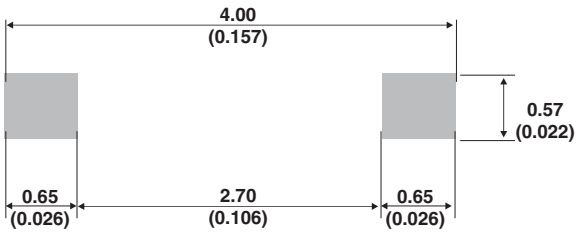
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

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	0.148

Figure 9. Footprint dimensions in mm (inches)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS0540ZY	Z5Y	SOD-123	0.01 g	3000	Tape and reel

3.1 Revision history

Table 7. Revision history

Date	Revision	Changes
03-Nov-2011	1	Initial release.