

# STPS0540Z Datasheet

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DiGi Electronics Part Number	STPS0540Z-DG
Manufacturer	<a href="#">STMicroelectronics</a>
Manufacturer Product Number	STPS0540Z
Description	DIODE SCHOTTKY 40V 500MA SOD123
Detailed Description	Diode 40 V 500mA Surface Mount SOD-123

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## Purchase and inquiry

Manufacturer Product Number:

STPS0540Z

Series:

-

Technology:

Schottky

Current - Average Rectified (Io):

500mA

Speed:

Fast Recovery =< 500ns, > 200mA (Io)

Capacitance @ Vr, F:

-

Package / Case:

SOD-123

Operating Temperature - Junction:

150°C (Max)

Manufacturer:

STMicroelectronics

Product Status:

Active

Voltage - DC Reverse (Vr) (Max):

40 V

Voltage - Forward (Vf) (Max) @ If:

500 mV @ 500 mA

Current - Reverse Leakage @ Vr:

40 µA @ 40 V

Mounting Type:

Surface Mount

Supplier Device Package:

SOD-123

Base Product Number:

STPS0540

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.10.0070

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



## STPS0540Z / STPS0560Z

### SCHOTTKY RECTIFIER

#### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	0.5 A
$V_{RRM}$	40 / 60V
$V_F$ (max)	0.40 / 0.50V

#### 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.

Packages in SOD-123, these devices are intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications. Due to the small size of the package these devices fit GSM and PCMCIA requirements.



SOD-123

#### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value		Unit
				STPS		
				0540Z	0560Z	
$V_{RRM}$	Repetitive peak reverse voltage			40	60	V
$I_{F(RMS)}$	RMS forward current			2		A
$I_{F(AV)}$	Average forward current $\delta=0.5$	STPS0540Z STPS0560Z	$T_a=60^\circ\text{C}$ $T_a=40^\circ\text{C}$	0.5		A
$I_{FSM}$	Surge non repetitive forward current		$t_p=10\text{ms}$ sinusoidal	5.5		A
dV/dt	Critical rate of rise of reverse voltage			10000		V/ $\mu\text{s}$
$T_{stg}$	Storage temperature range			- 65 to + 150		$^\circ\text{C}$
$T_j$	Maximum operating junction temperature *			150		$^\circ\text{C}$
TL	Maximum temperature for soldering during 10s			260		$^\circ\text{C}$

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j-a)}$  thermal runaway condition for a diode on its own heatsink

**STPS0540Z / STPS0560Z****THERMAL RESISTANCE**

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient (*)	340	°C/W

(\*) Mounted on epoxy board.

**STATIC ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Tests conditions		Value				Unit
				STPS0540Z		STPS0560Z		
				typ.	max.	typ.	max.	
$I_R^*$	Reverse leakage current	$T_j=25^\circ\text{C}$	$V_R = V_{RRM}$		40		50	$\mu\text{A}$
		$T = 100^\circ\text{C}$		1.5	5	1	4	mA
$V_F^{**}$	Forward voltage drop	$T_j=25^\circ\text{C}$	$I_F = 0.5\text{ A}$		0.50		0.53	V
		$T_j=100^\circ\text{C}$		0.35	0.40	0.44	0.50	
		$T_j=25^\circ\text{C}$	$I_F = 1\text{ A}$		0.55		0.66	
		$T_j=100^\circ\text{C}$		0.45	0.51	0.58	0.65	

Pulse test : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$ \*\*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$ 

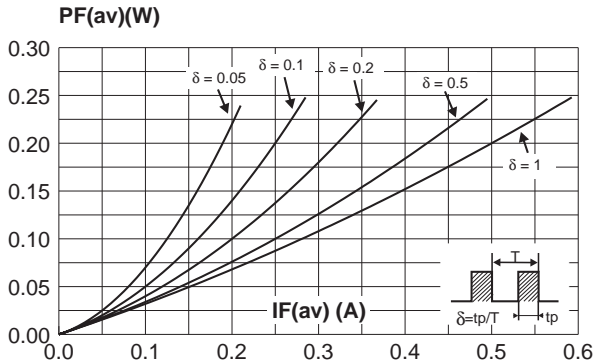
To evaluate the maximum conduction losses use the following equation :

STPS0540Z:  $P = 0.29 \times I_{F(AV)} + 0.22 \times I_F^2(RMS)$

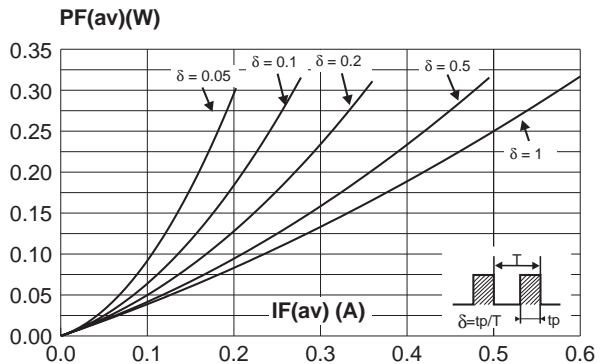
STPS0560Z:  $P = 0.35 \times I_{F(AV)} + 0.3 \times I_F^2(RMS)$

STPS0540Z / STPS0560Z

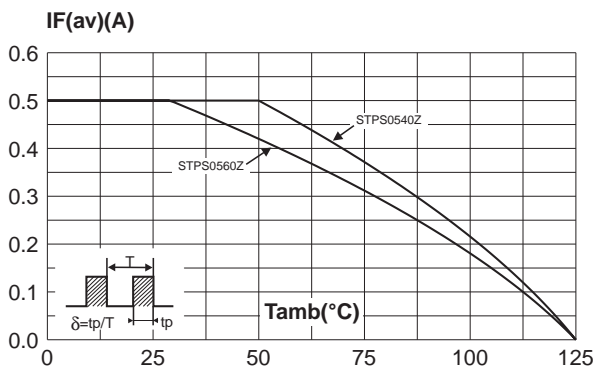
**Fig. 1-1:** Average forward power dissipation versus average forward current.(STPS0540Z)



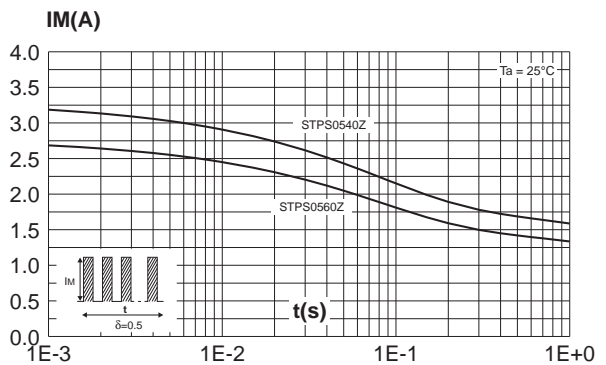
**Fig. 1-2:** Average forward power dissipation versus average forward current.(STPS0560Z)



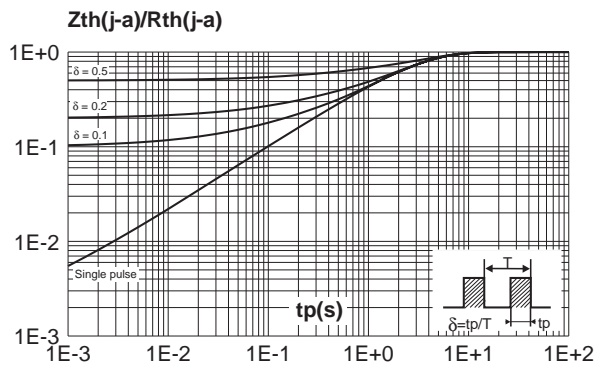
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ).



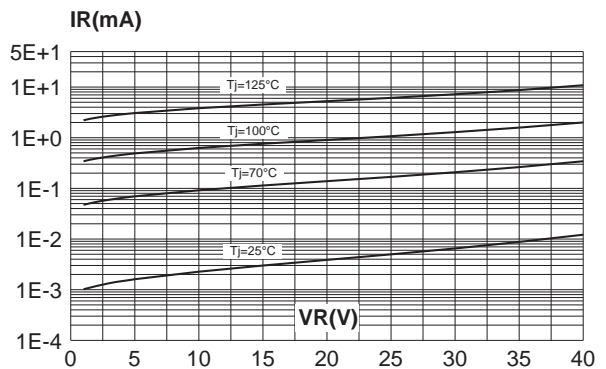
**Fig. 3:** Non repetitive surge peak forward current versus overload duration (maximum values).



**Fig. 4:** Relative variation of thermal impedance junction to ambient versus pulse duration (Epoxy printed circuit board FR4 with recommended pad layout).

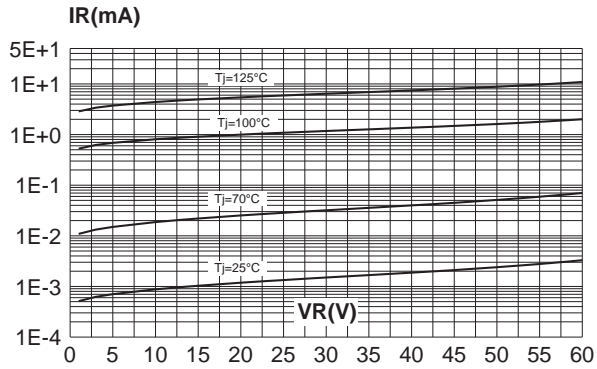


**Fig. 5-1:** Reverse leakage current versus reverse voltage applied (typical values).(STPS0540Z)

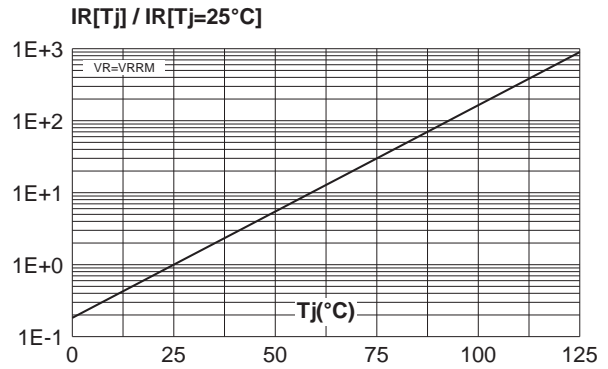


**STPS0540Z / STPS0560Z**

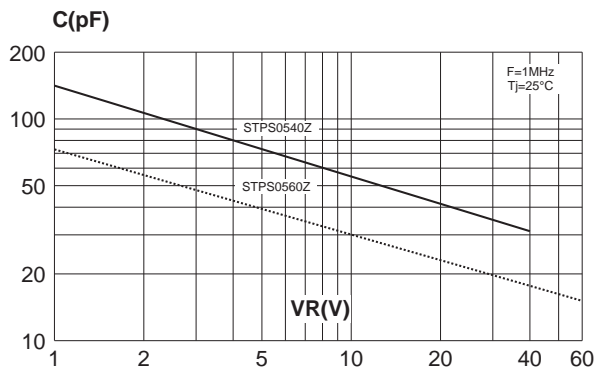
**Fig. 5-2:** Reverse leakage current versus reverse voltage applied (typical values).(STPS0560Z)



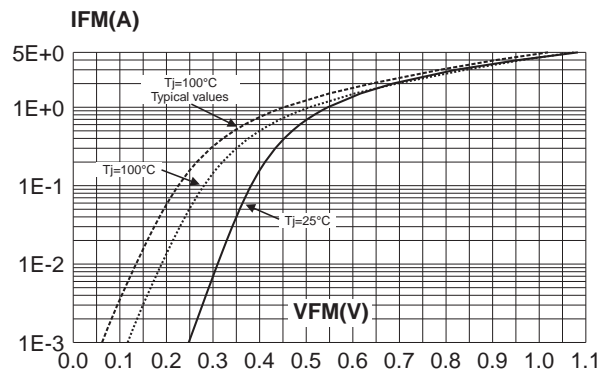
**Fig. 6:** Reverse leakage current versus junction temperature (typical values).



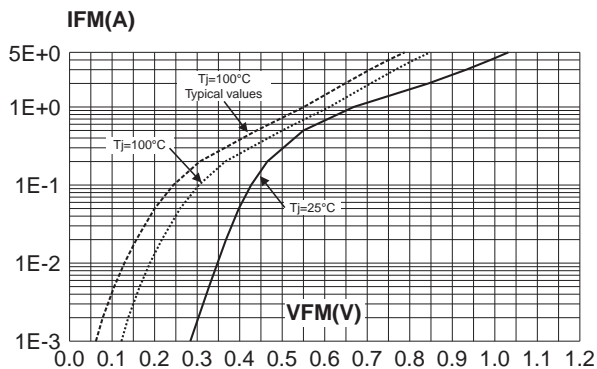
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values).



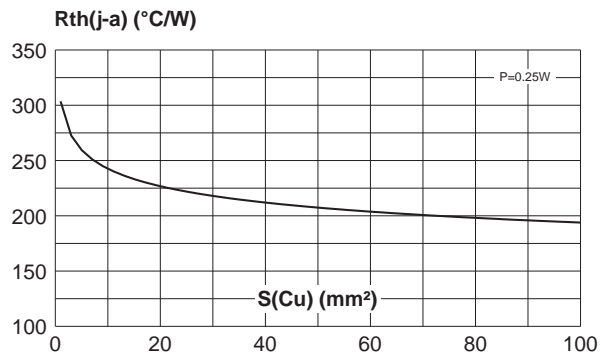
**Fig. 8-1:** Forward voltage drop versus forward current (maximum values).(STPS0540Z)

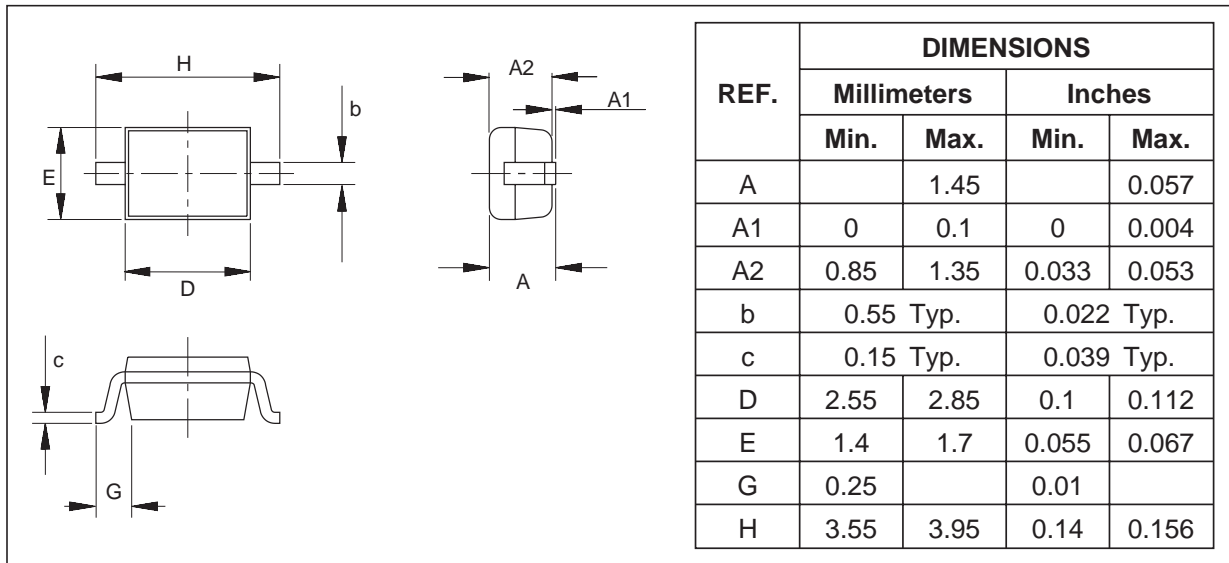
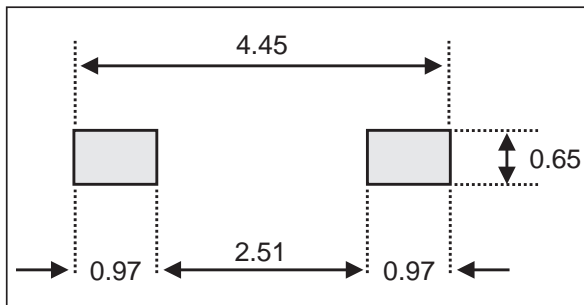


**Fig. 8-2:** Forward voltage drop versus forward current (maximum values).(STPS0560Z)



**Fig. 9:** Variation of thermal resistance junction to ambient versus copper surface under each lead (Printed circuit board FR4, e(Cu) = 35µm).



**STPS0540Z / STPS0560Z****PACKAGE MECHANICAL DATA**  
SOD-123**FOOTPRINT (in millimeters)****MARKING**

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS0540Z	Z54	SOD-123	0.01 g	3000	Tape & reel
STPS0560Z	Z56	SOD-123	0.01 g	3000	Tape & reel

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

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