

### Features

- Very low conduction losses
- High surge capability
- Negligible switching losses
- Low forward and reverse recovery times
- High junction temperature
- ECOPACK®2 compliant component
- Surface mount miniature packages

### Description

The STTH1R02ZF is an ultrafast recovery rectifier used for energy recovery in switched mode power supplies, switching mode base drive and transistor circuits. Packaged in SOD123Flat, this device is intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection.

The compromise between forward voltage drop and recovery time offers optimized performances.

**Table 1: Device summary**

Symbol	Value
$I_{F(AV)}$	1 A
$V_{RRM}$	200 V
$T_j$ (max.)	175 °C
$V_F$ (typ.)	0.75 V
$t_{rr}$ (typ.)	25 ns

# 1 Characteristics

**Table 2: Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter	Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage	200	V
I <sub>F(AV)</sub>	Average forward current	T <sub>lead</sub> = 153 °C , δ = 0.5 square wave	1
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	25
T <sub>stg</sub>	Storage temperature range	-65 to +175	°C
T <sub>j</sub>	Maximum operating junction temperature	+175	°C

**Table 3: Thermal parameter**

Symbol	Parameter	Maximum	Unit
R <sub>th(j-l)</sub>	Junction to lead	23	°C/W

**Table 4: Static electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit	
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>	-	0.5	μA	
		T <sub>j</sub> = 125 °C		-	1	10	μA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 1 A	-	0.87	1.00	V
		T <sub>j</sub> = 125 °C		-	0.75	0.85	

**Notes:**

(1)Pulse test: t<sub>p</sub> = 5 ms, δ < 2%

(2)Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

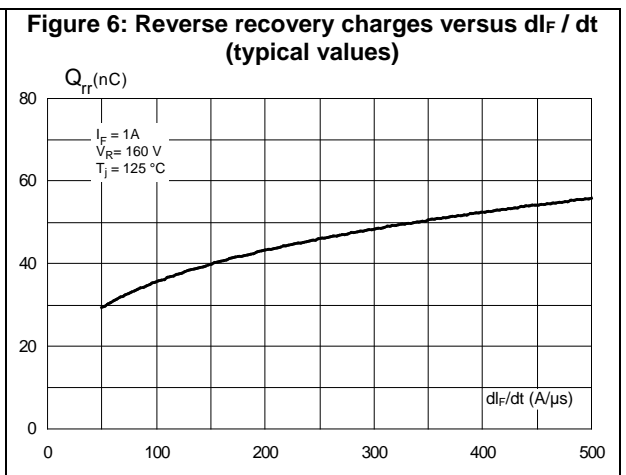
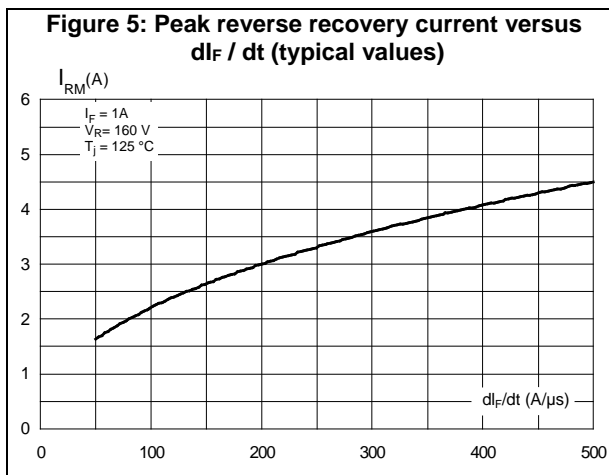
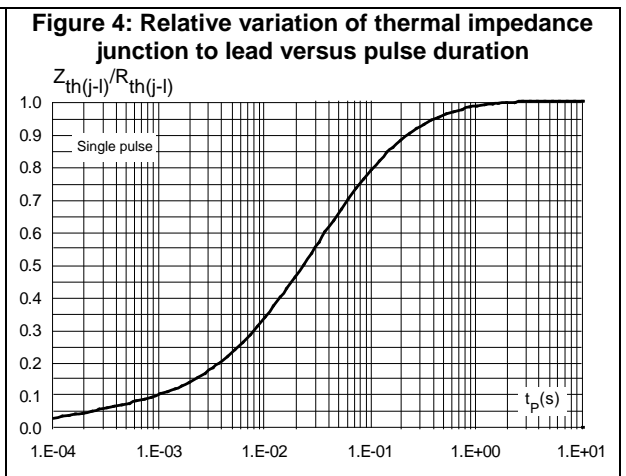
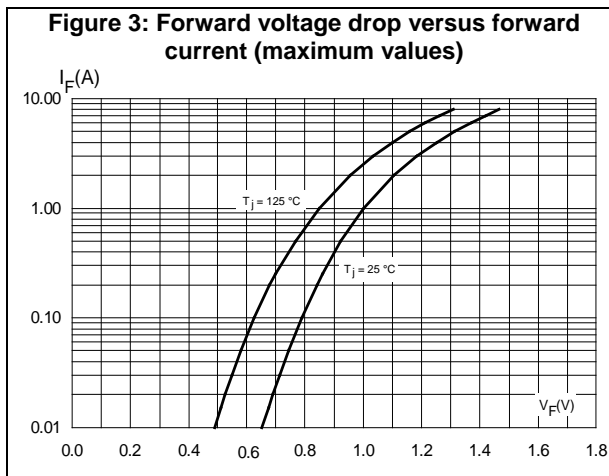
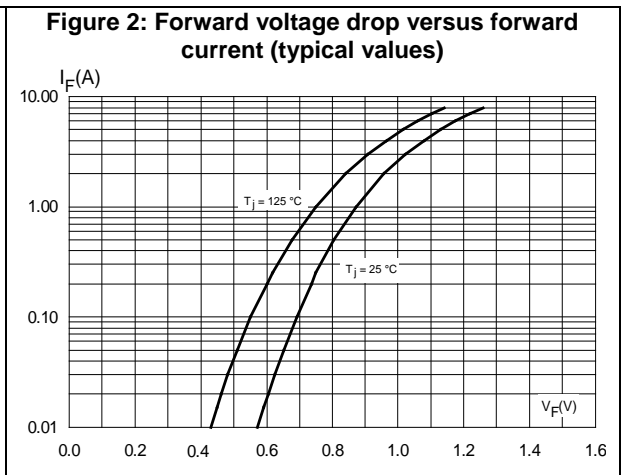
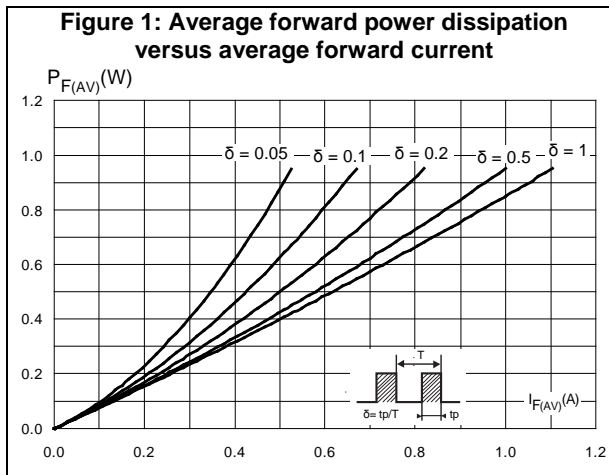
To evaluate the conduction losses, use the following equation:

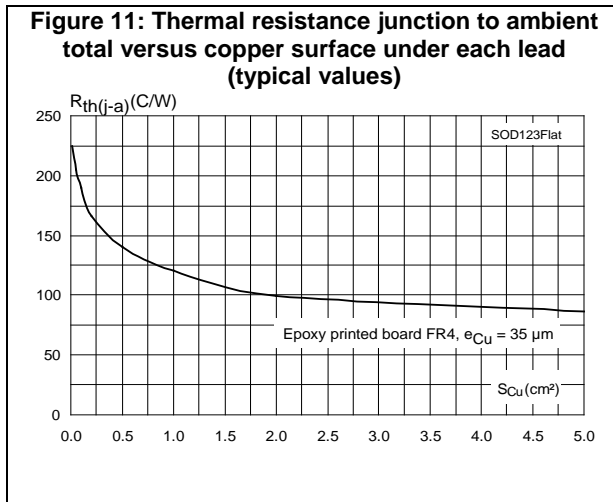
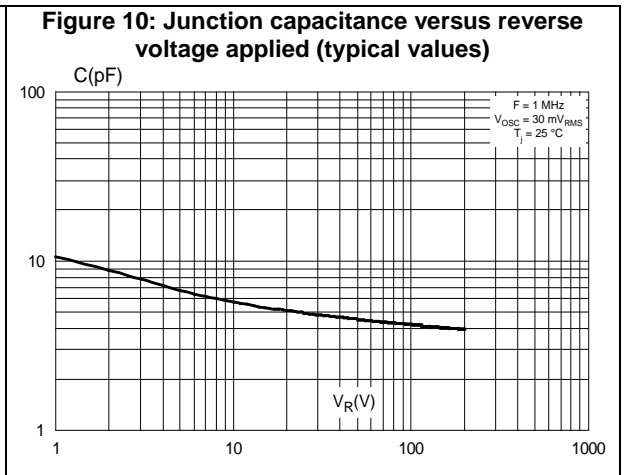
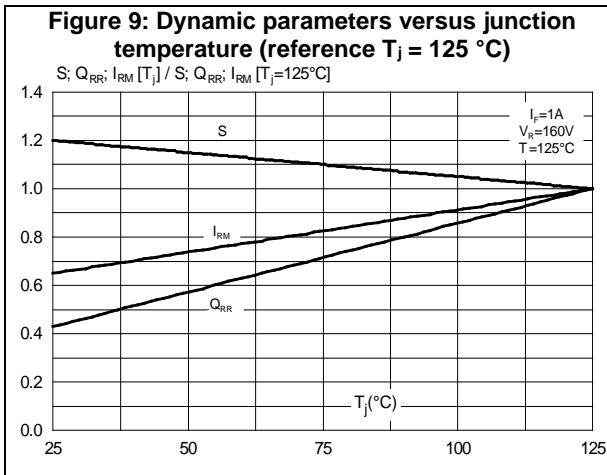
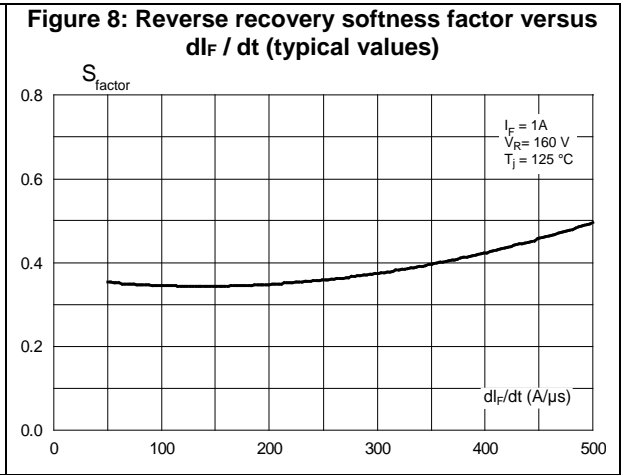
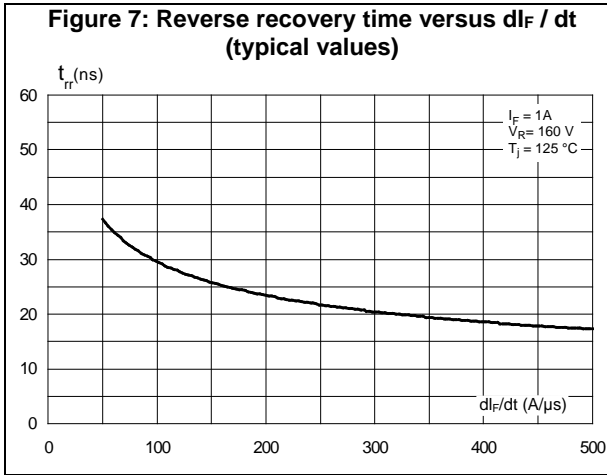
$$P = 0.75 \times I_{F(AV)} + 0.1 \times I_{F(RMS)}^2$$

**Table 5: Dynamic electrical characteristics**

Symbol	Parameters	Test conditions	Min.	Typ.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	I <sub>F</sub> = 1 A dI <sub>F</sub> /dt = 50 A/μs V <sub>R</sub> = 30 V T <sub>j</sub> = 25 °C	-	25	32	ns
		I <sub>F</sub> = 1 A dI <sub>F</sub> /dt = 100 A/μs	-	30		
I <sub>RM</sub>	Reverse recovery current	V <sub>R</sub> = 160 V	-	2.2		A
Q <sub>rr</sub>	Reverse recovery charges	T <sub>j</sub> = 125 °C	-	34		nC

## 1.2 Characteristics (curves)





## 2 Package information

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](http://www.st.com). ECOPACK® is an ST trademark.

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

### 2.1 SOD123Flat package information

Figure 12: SOD123Flat package outline

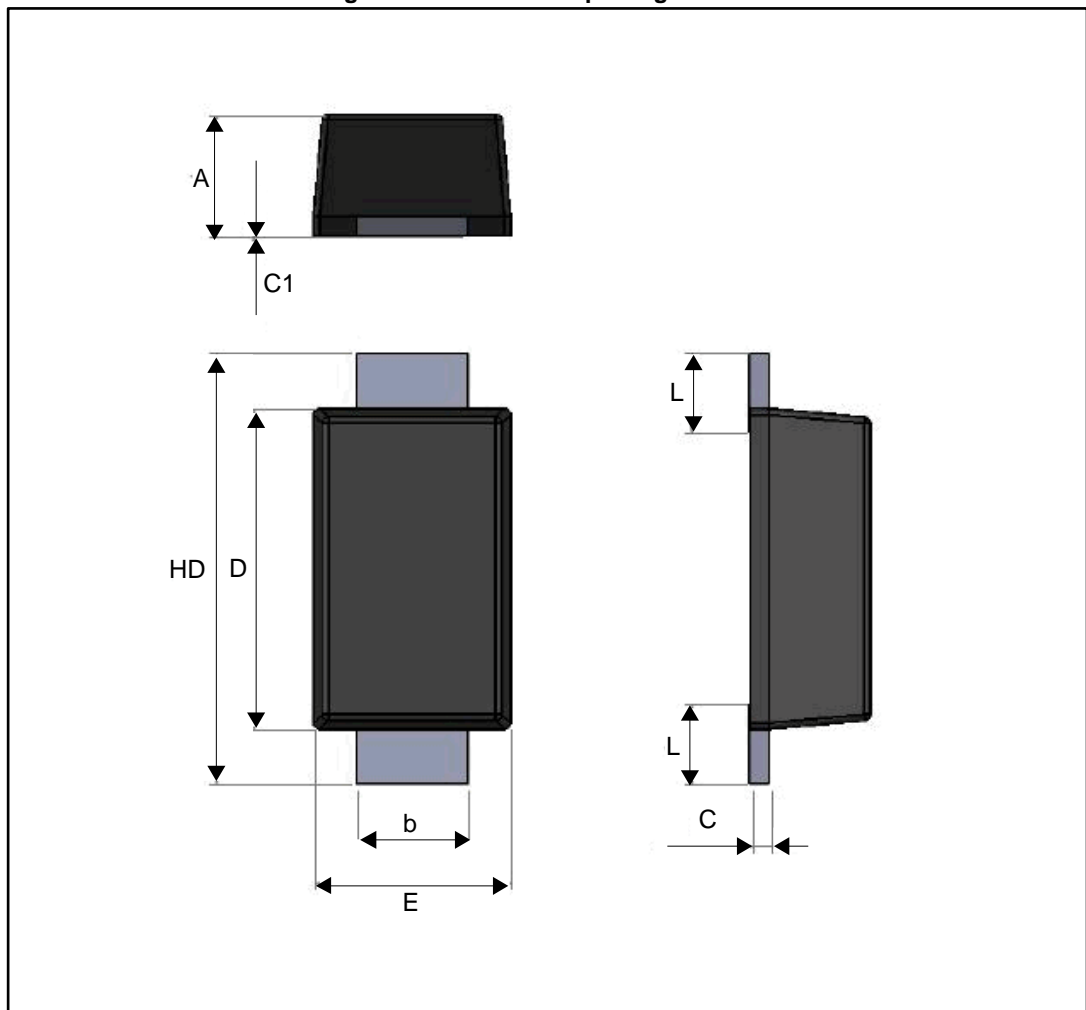
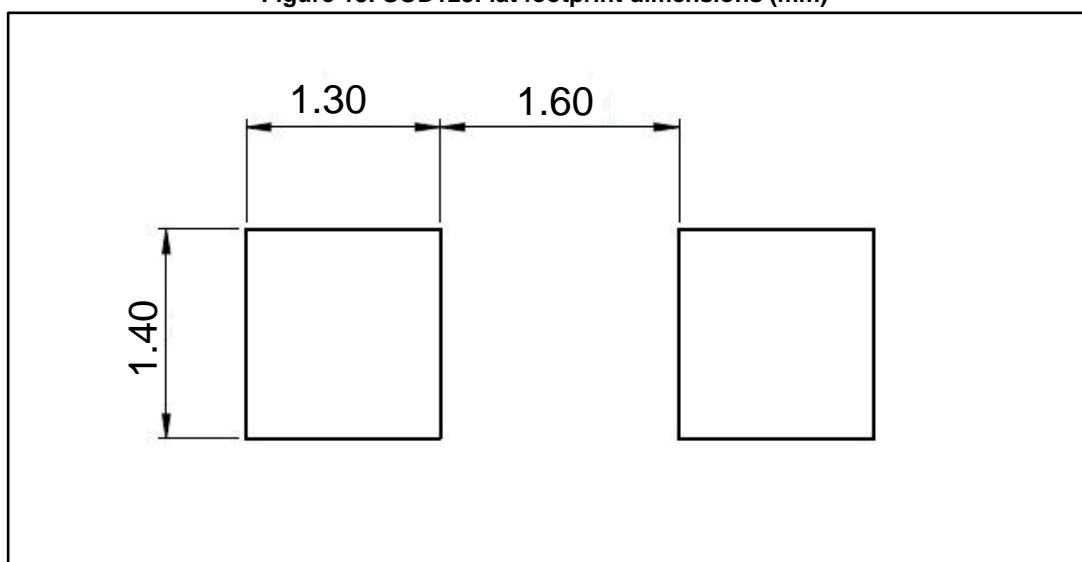


Table 6: SOD123Flat package mechanical data

Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
A	0.86	0.98	1.10
b	0.80	0.90	1.00
c	0.08	0.15	0.25
c1	0.00		0.10
D	2.50	2.60	2.70
E	1.50	1.60	1.80
HD	3.30	3.50	3.70
L	0.45	0.65	0.85

Figure 13: SOD123Flat footprint dimensions (mm)



### 3 Ordering information

Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH1R02ZF	1R2	SOD123Flat	12.5 mg	3000	Tape and reel

### 4 Revision history

Table 8: Document revision history

Date	Revision	Changes
06-Feb-2017	1	First issue

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