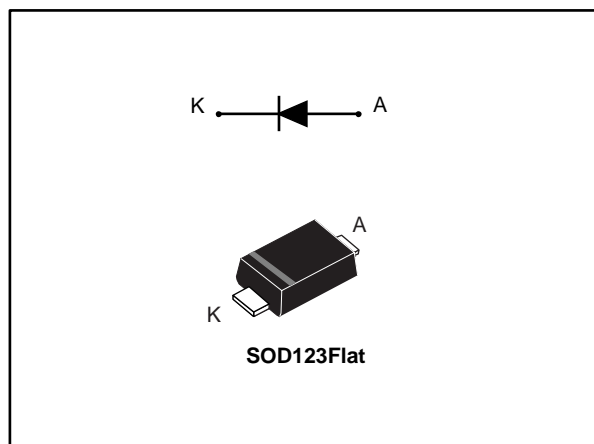


Automotive ultrafast rectifier

Datasheet - production data


Description

The STTH1R02-Y is an ultrafast recovery rectifier used for energy recovery in automotive applications, housed in a SOD123Flat package for improved space saving.


It is especially designed for reverse battery protection function in all automotive application.

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

Features

- AEC-Q101 qualified 
- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery times
- High junction temperature
- ECOPACK®2 compliant component
- V_{RRM} guaranteed from -40 to +175 °C
- PPAP capable

1 Characteristics

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

Symbol	Parameter		Value	Unit
V _R RM	Repetitive peak reverse voltage	T _j = -40 °C	200	V
I _F (AV)	Average forward current	T _{lead} = 153 °C , δ = 0.5 square wave	1	A
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms sinusoidal	25	A
T _{stg}	Storage temperature range		-65 to +175	°C
T _j	Maximum operating junction temperature		-40 to +175	°C

Table 3: Thermal parameter

Symbol	Parameter	Maximum	Unit
R _{th(j-l)}	Junction to lead	23	°C/W

Table 4: Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V _R = V _R RM	-		0.5	μA
		T _j = 125 °C		-	1	10	μA
V _F ⁽²⁾	Forward voltage drop	T _j = 25 °C	I _F = 1 A	-	0.87	1.00	V
		T _j = 125 °C		-	0.75	0.85	

Notes:

(1)Pulse test: t_p = 5 ms, δ < 2%

(2)Pulse test: t_p = 380 μs, δ < 2%

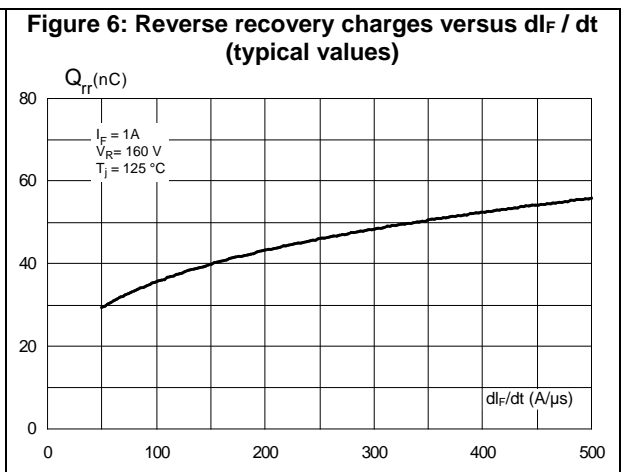
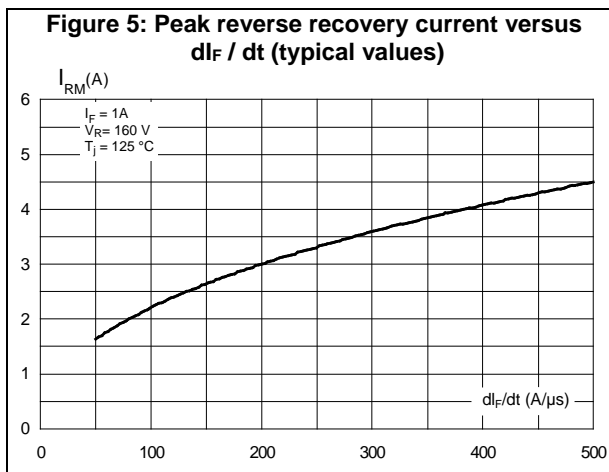
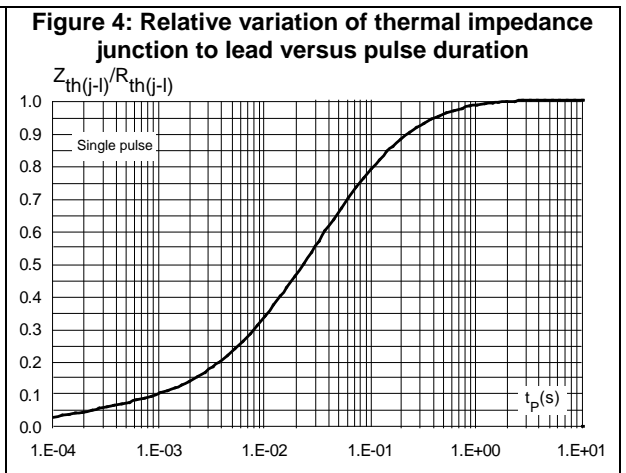
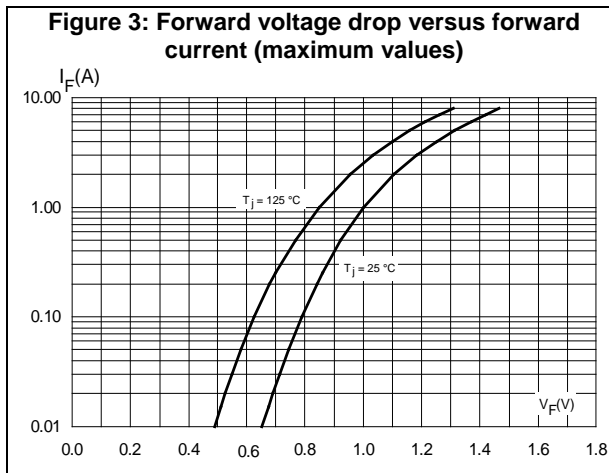
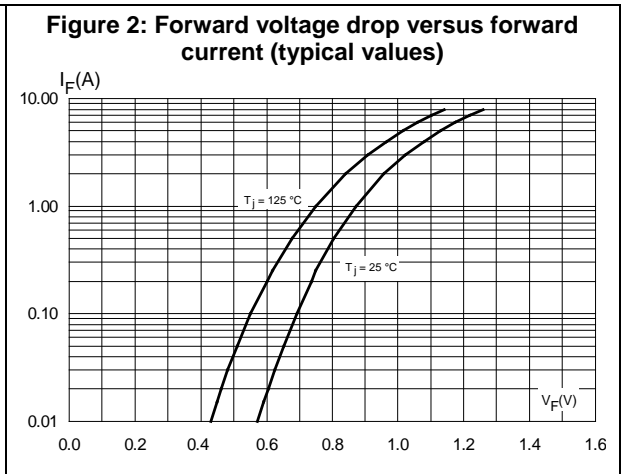
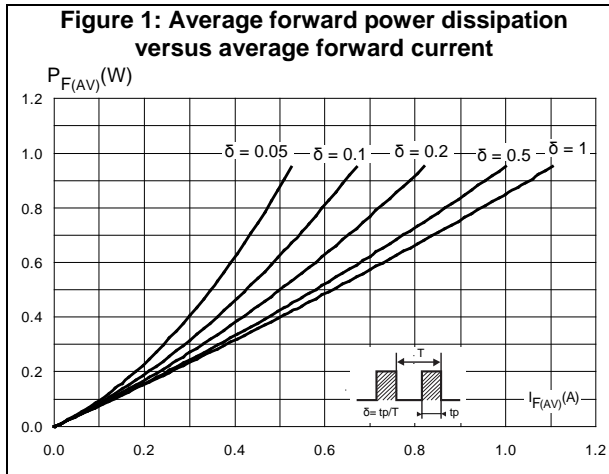
To evaluate the conduction losses, use the following equation:

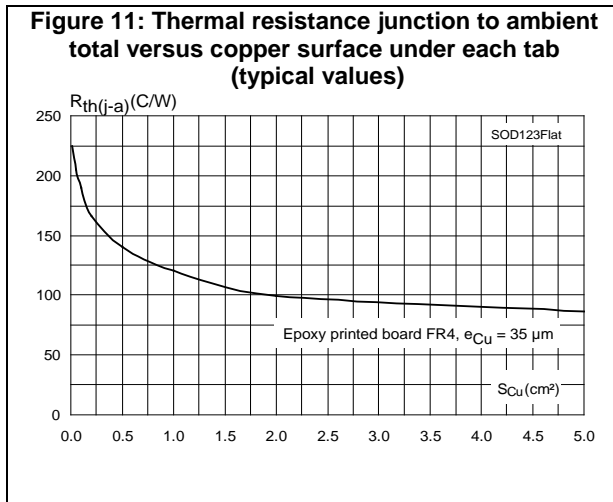
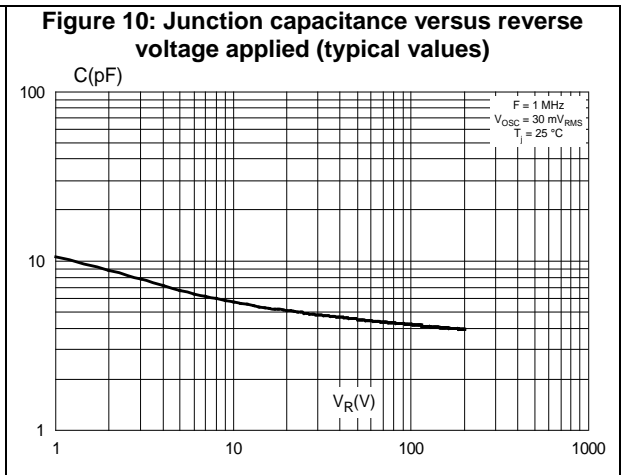
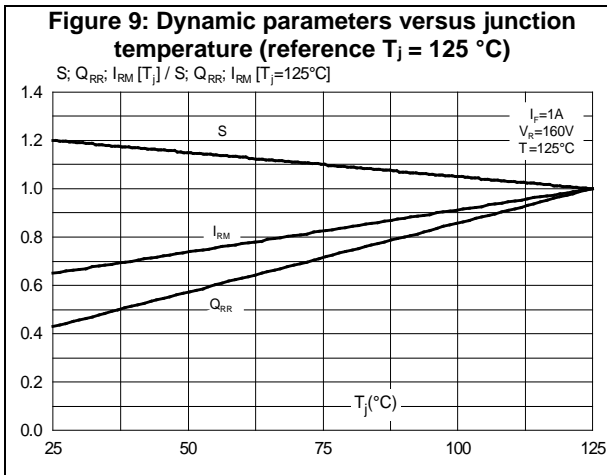
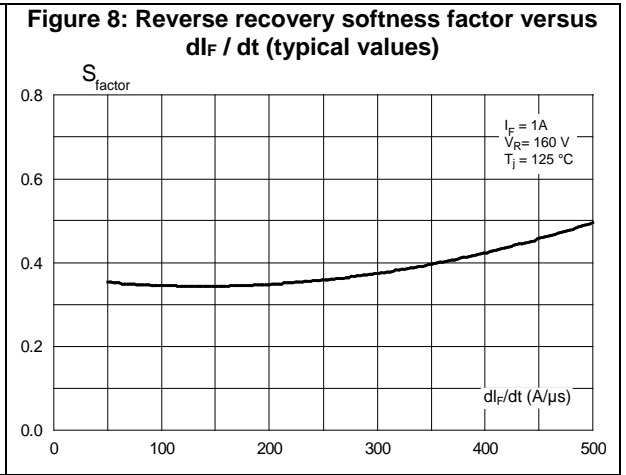
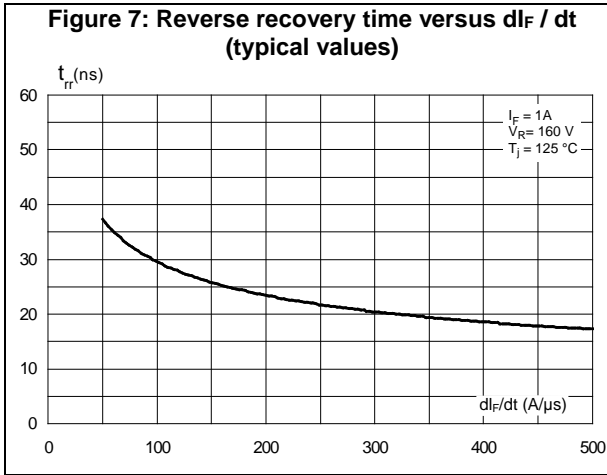
$$P = 0.75 \times I_{F(AV)} + 0.1 \times I_{F(RMS)}^2$$

Table 5: Dynamic electrical characteristics

Symbol	Parameters	Test conditions	Min.	Typ.	Max.	Unit
t _{rr}	Reverse recovery time	I _F = 1 A dI _F /dt = 50 A/μs V _R = 30 V T _j = 25 °C	-	25	32	ns
		I _F = 1 A dI _F /dt = 100 A/μs	-	30		
I _{RM}	Reverse recovery current	V _R = 160 V	-	2.2		A
Q _{rr}	Reverse recovery charges	T _j = 125 °C	-	34		nC

1.1 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. ECOPACK® is an ST trademark.

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

2.1 SOD123Flat package information

Figure 12: SOD123Flat package outline

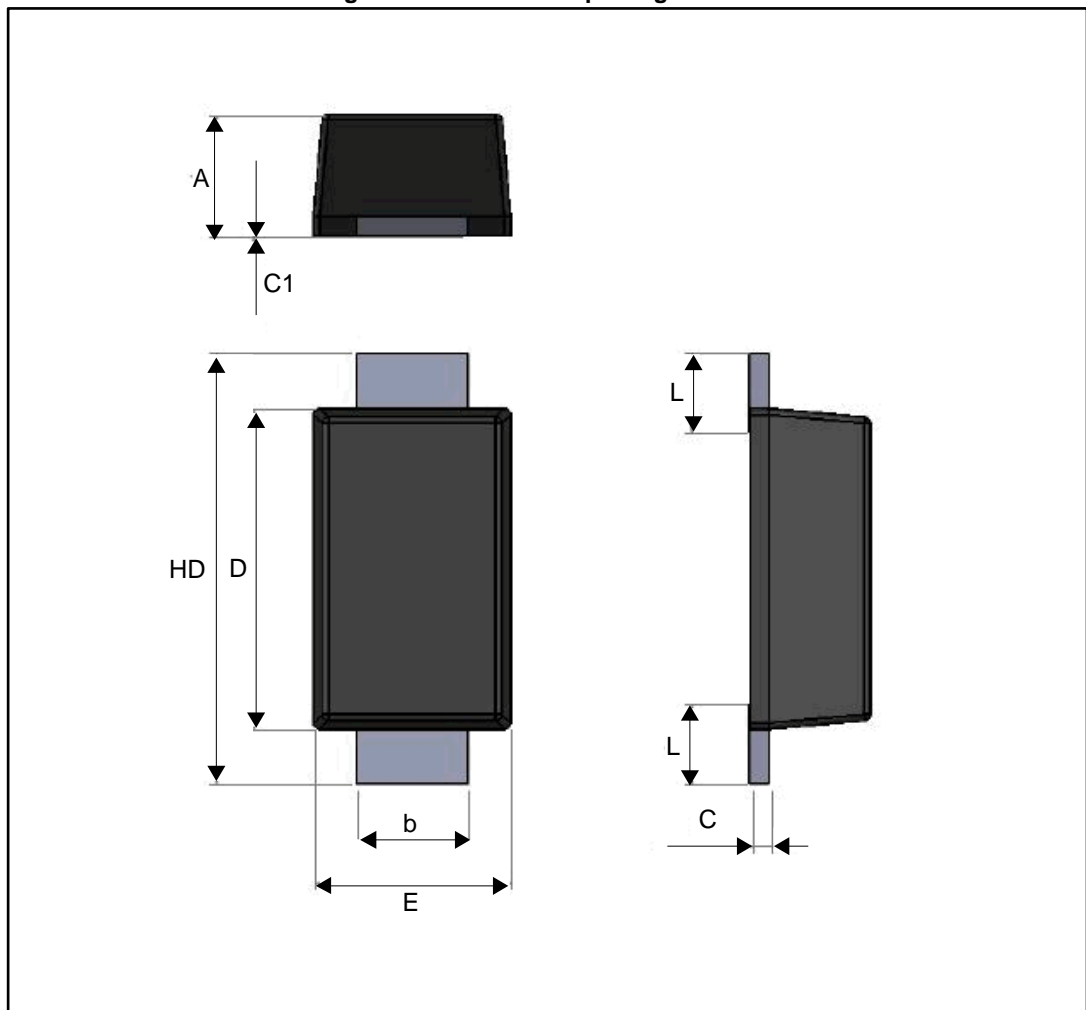
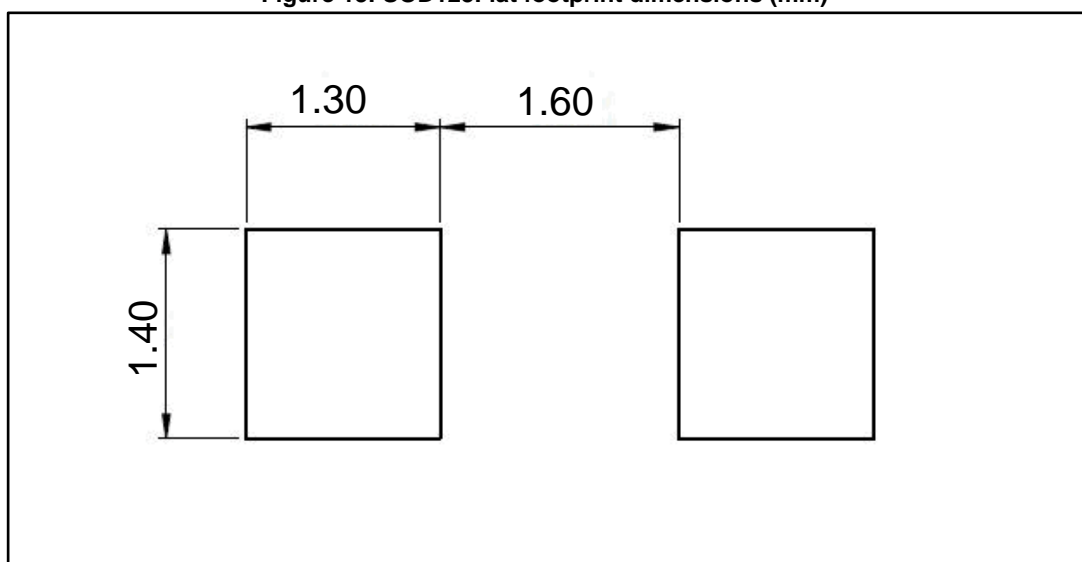


Table 6: SOD123Flat package mechanical data

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
STTH1R02ZFY	1Y2	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

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2017 STMicroelectronics – All rights reserved