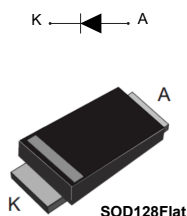


600 V, 1 A, turbo 2 ultrafast rectifier



Features

- Ultrafast recovery
- Low power losses
- High surge capability
- Low leakage current
- High junction temperature
- ECOPACK2 compliant component

Applications

- Clamping function
- Boost diode
- PFC

Description

The STTH1R06AF is an ultrafast recovery power rectifier housed in SOD128Flat to improve space saving.

It is especially designed for clamping function in energy recovery block or boost diode in power correction circuitry.

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

Product status

STTH1R06AF

Product summary

$I_{F(AV)}$	1 A
V_{RRM}	600 V
t_{rr}	30 ns
T_j	175 °C
$V_{F(typ.)}$	1.08 V

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(AV)}$	Average forward current	$T_L = 135\text{ °C}, \delta = 0.5$	1	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	20	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature		175	°C

Table 2. Thermal parameters

Symbol	Parameter	Typ.	Max.	Unit
$R_{th(j-l)}$	Junction to lead	16	24	°C/W

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = 600\text{ V}$	-		1	μA
		$T_j = 150\text{ °C}$		-	10	75	
V_F	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$	-		1.9	V
		$T_j = 150\text{ °C}$		-	1.08	1.4	

To evaluate the conduction losses, use the following equation:

$$P = 1.1 \times I_{F(AV)} + 0.30 \times I_F^2_{(RMS)}$$

Table 4. Dynamic electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}, V_R = 30\text{ V}, di_F/dt = -50\text{ A}/\mu\text{s}$	-	30	45	ns
I_{RM}	Reverse recovery current	$T_j = 125\text{ °C}$	$I_F = 1\text{ A}, V_R = 400\text{ V}, di_F/dt = -200\text{ A}/\mu\text{s}$	-	3		A
Q_{RR}	Reverse recovery charge			-	90		nC
t_{rr}	Reverse recovery time			-	65		ns

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

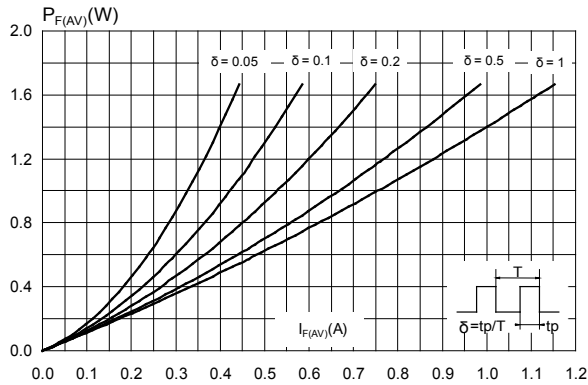


Figure 2. Forward voltage drop versus forward current (typical values)

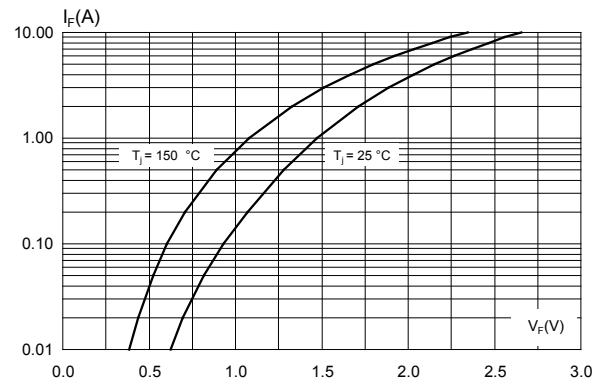


Figure 3. Forward voltage drop versus forward current (maximum values)

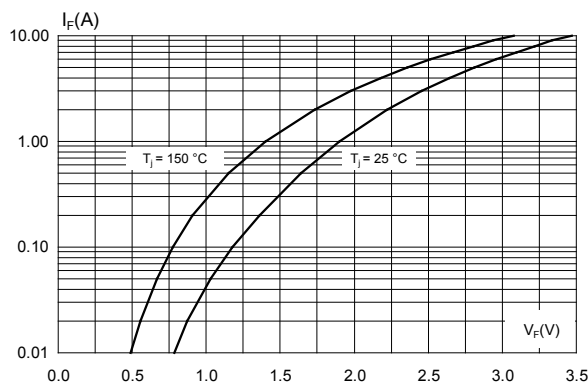


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration

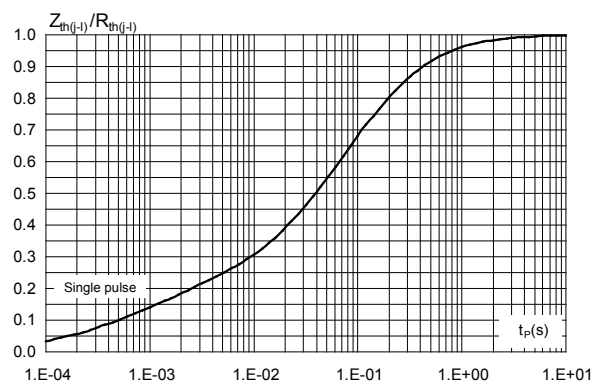


Figure 5. Peak reverse recovery current versus di_F/dt (typical values)

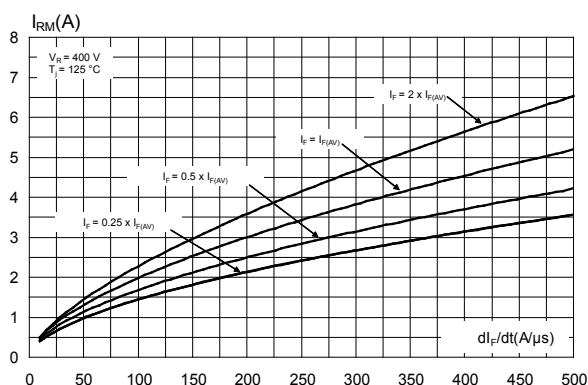


Figure 6. Reverse recovery time versus di_F/dt (typical values)

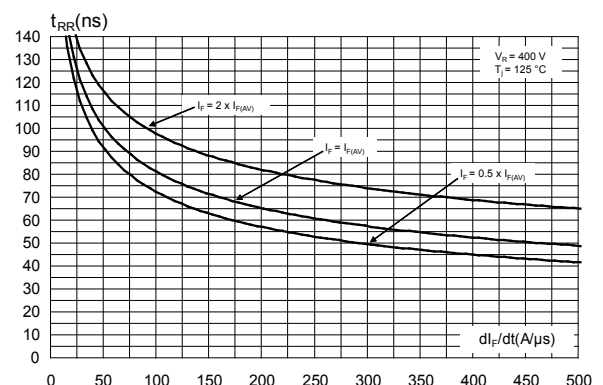
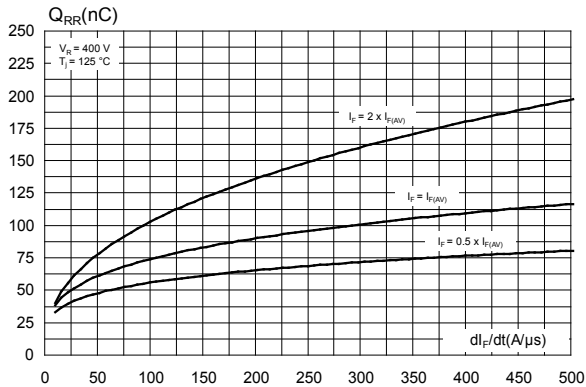
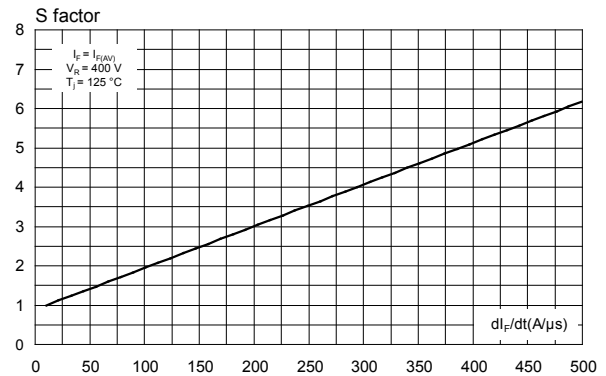
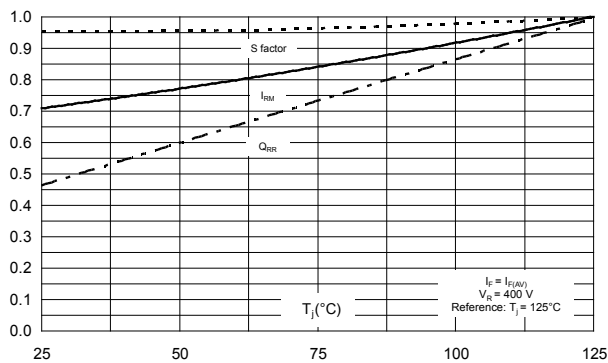
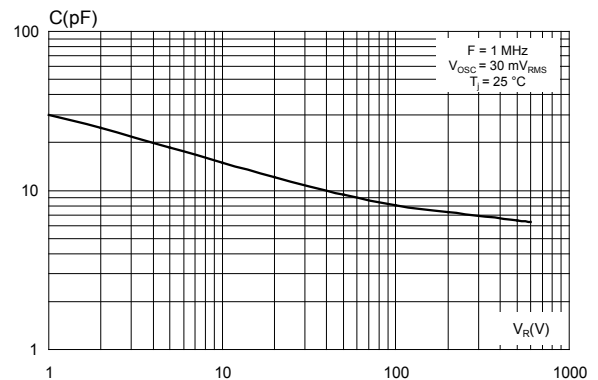
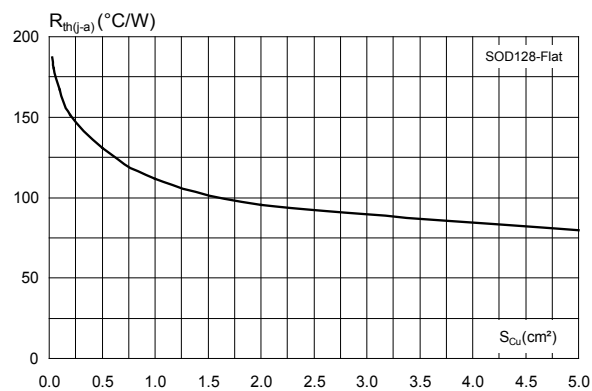


Figure 7. Reverse recovery charges versus di_F/dt (typical values)

Figure 8. Softness factor versus di_F/dt (typical values)

Figure 9. Relative variations of dynamic parameters versus junction temperature

Figure 10. Junction capacitance versus reverse voltage applied (typical values)

Figure 11. Thermal resistance junction to ambient versus copper surface under each lead (typical values, epoxy printed board FR4, $e_{Cu} = 35 \mu m$)


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.

2.1 SOD128Flat package information

- Epoxy meets UL94, V0
- Lead-free package

Figure 12. SOD128Flat package outline

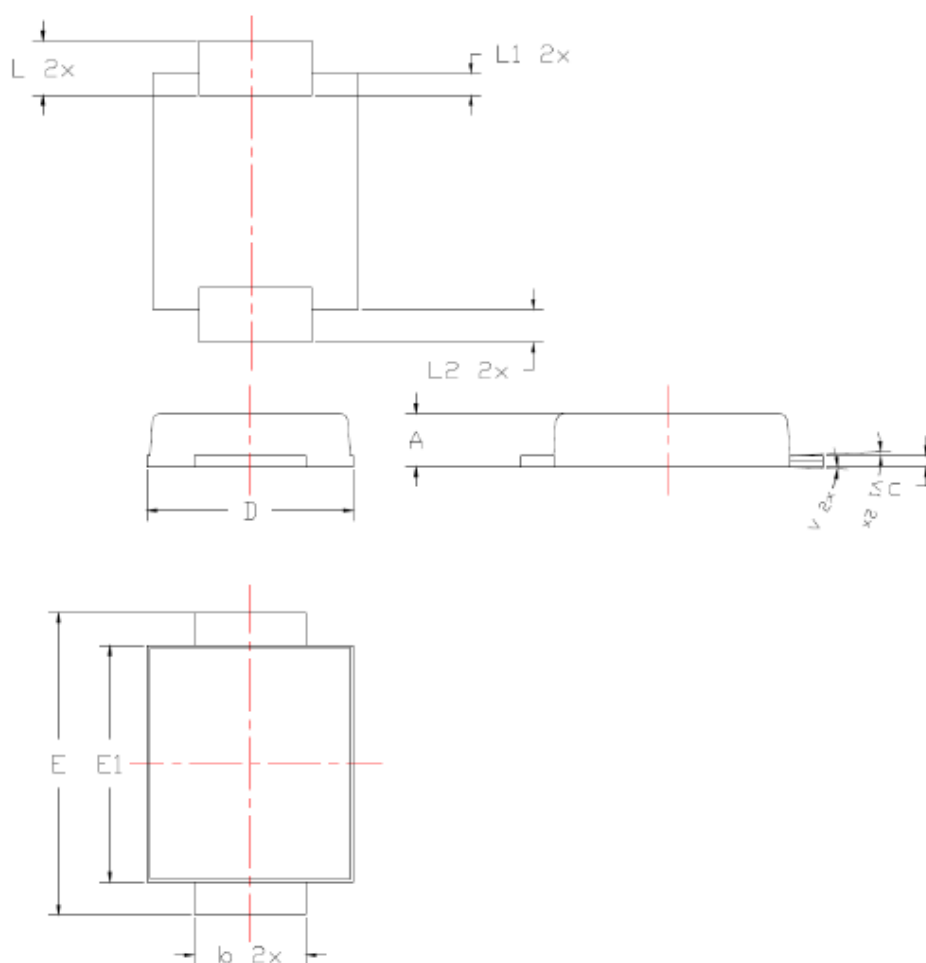
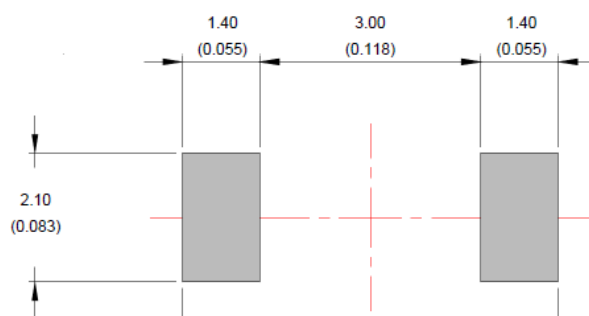


Table 5. SOD128Flat package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.93	1.03	0.037	0.041
b	1.69	1.81	0.067	0.071
c	0.10	0.22	0.004	0.009
D	2.30	2.50	0.091	0.098
E	4.60	4.80	0.181	0.189
E1	3.70	3.90	0.146	0.154
L	0.55	0.85	0.026	0.033
L1	0.30 typ.		0.012 typ.	
L2	0.45 typ.		0.018 typ.	

Figure 13. SOD128Flat footprint in mm (inches)


3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH1R06AF	1R6A	SOD128Flat	26.4 mg	3000	Tape and reel

Revision history

Table 7. Document revision history

Date	Revision	Changes
03-Apr-2018	1	Initial release.
06-Dec-2018	2	Added Section Applications . Updated title of document.
11-Apr-2022	3	Updated Table 6 .

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