



## STTH102A

### HIGH EFFICIENCY ULTRAFAST DIODE

#### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	1A
$V_{RRM}$	200 V
$T_j$ (max)	175 °C
$V_F$ (max)	0.78 V
$t_{rr}$ (max)	20 ns

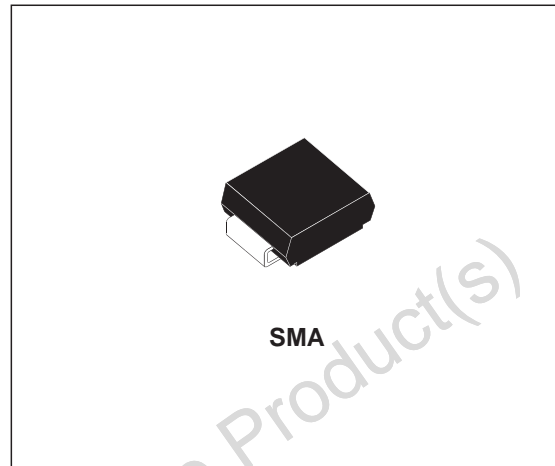
#### FEATURES AND BENEFITS

- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery times
- High junction temperature

#### DESCRIPTION

The STTH102A, which is using ST's new 200V planar technology, is specially suited for switching mode base drive & transistor circuits.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.



#### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	200	V
$I_{F(AV)}$	Average forward current	1	A
$I_{FSM}$	Surge non repetitive forward current	40	A
$T_{stg}$	Storage temperature range	+ 175	°C
$T_j$	Maximum operating junction temperature	175	°C

#### THERMAL PARAMETERS

Symbol	Parameter	Maximum	Unit
$R_{th(j-l)}$	Junction to lead	30	°C/W

## STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			1	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			1	25	
$V_F^*$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 700\text{ mA}$			0.90	
			$I_F = 1\text{ A}$			0.97	
		$T_j = 125^\circ\text{C}$	$I_F = 1\text{ A}$		0.68	0.78	

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

\*\*  $t_p = 380\mu\text{s}$ ,  $\delta < 2\%$

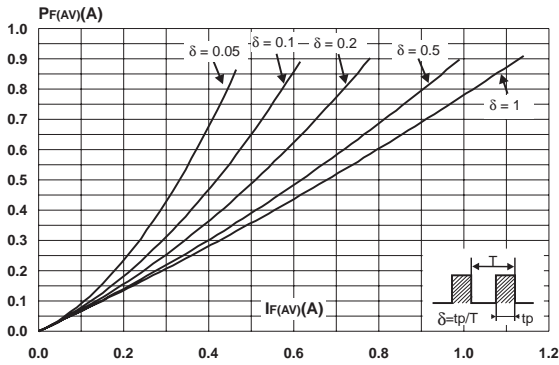
To evaluate the maximum conduction losses use the following equation :

$$P = 0.65 \times I_{F(AV)} + 0.130 I_{F(RMS)}^2$$

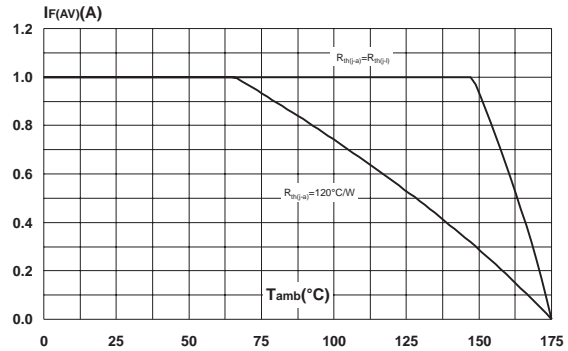
## DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$		12	20	ns
$t_{fr}$	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $di_F/dt = 50\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$		50		ns
$V_{FP}$	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $di_F/dt = 50\text{ A}/\mu\text{s}$		1.8		V

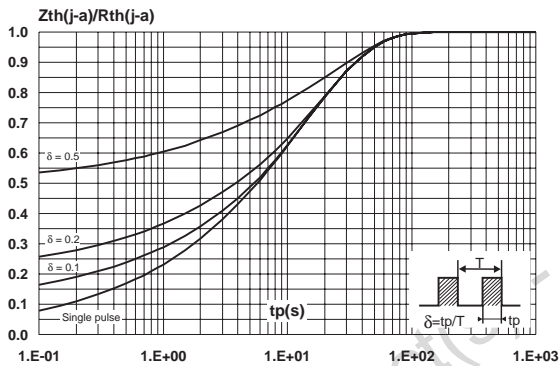
**Fig. 1:** Average forward power dissipation versus average forward current.



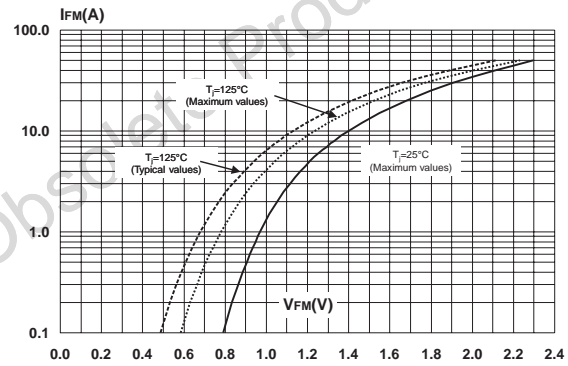
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ )



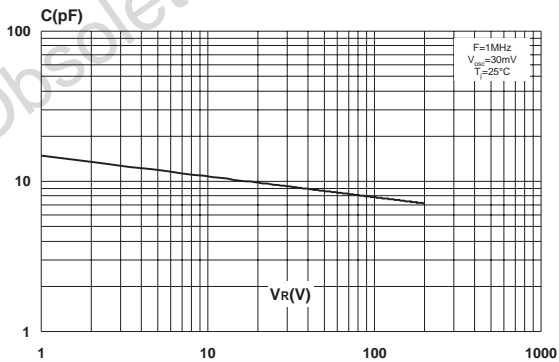
**Fig. 3:** Relative variation of thermal impedance junction ambient versus pulse duration (Printed circuit board epoxy FR4).



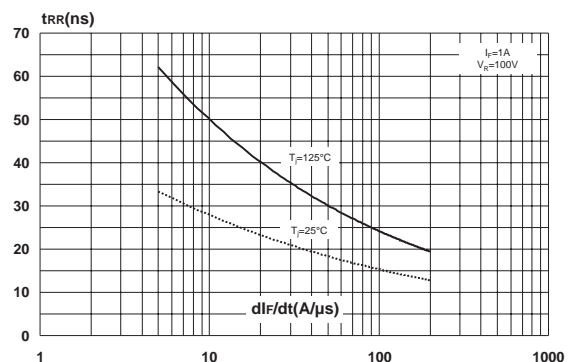
**Fig. 4:** Forward voltage drop versus forward current.



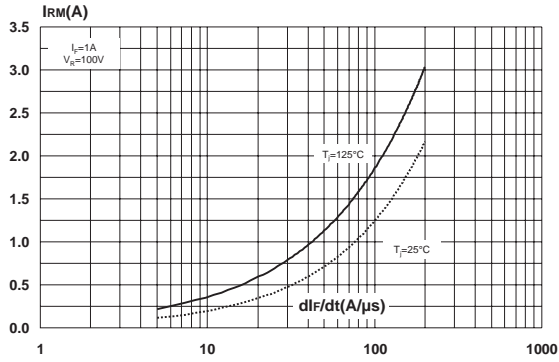
**Fig. 5:** Junction capacitance versus reverse voltage applied (typical values).



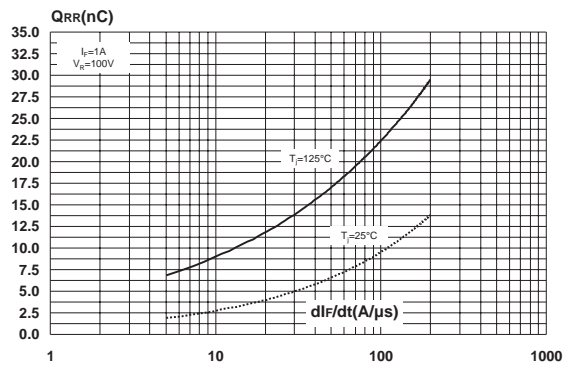
**Fig. 6:** Reverse recovery time versus  $di_F/dt$  (90% confidence).



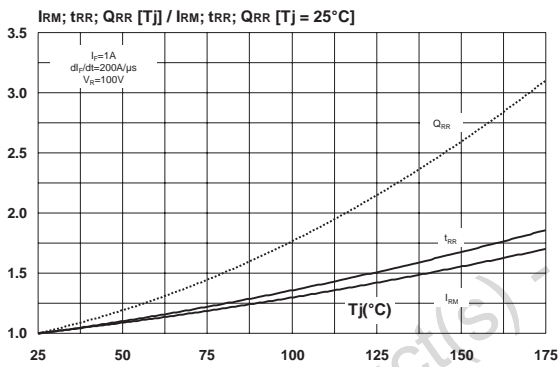
**Fig. 7:** Peak reverse recovery current versus  $di_F/dt$  (90% confidence).



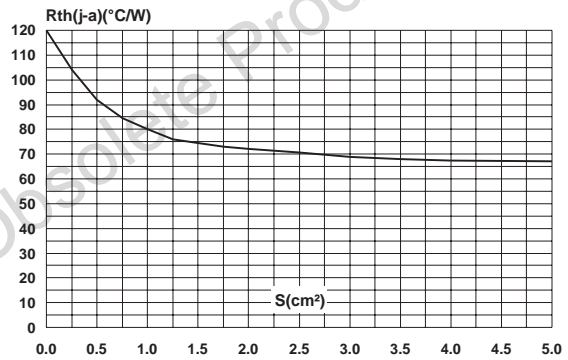
**Fig. 8:** Reverse recovery charges versus  $di_F/dt$  (90% confidence).



**Fig. 9:** Relative variations of dynamic parameters versus junction temperature.

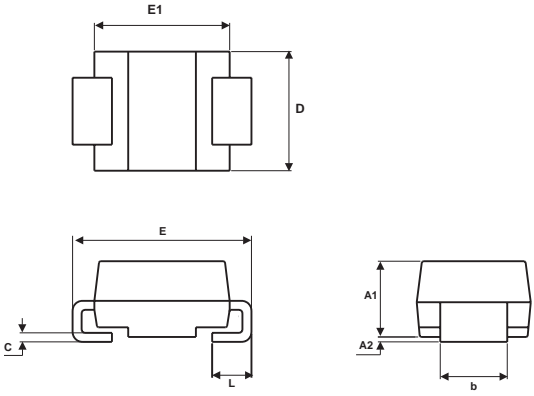
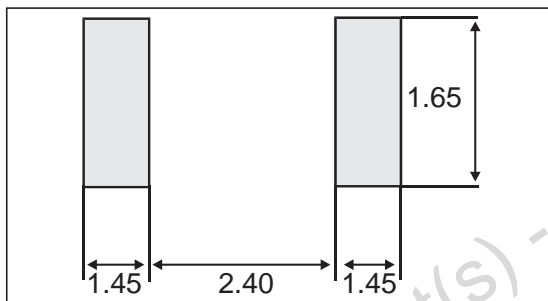


**Fig. 10:** Thermal resistance junction to ambient versus copper surface under each lead (epoxy FR4,  $e = 35\mu\text{m}$ ).



**PACKAGE MECHANICAL DATA**  
**SMA**

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063


**FOOTPRINT**


Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH102A	U12	SMA	0.07 g	5000	Tape & reel

- Epoxy meets UL 94,V0

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