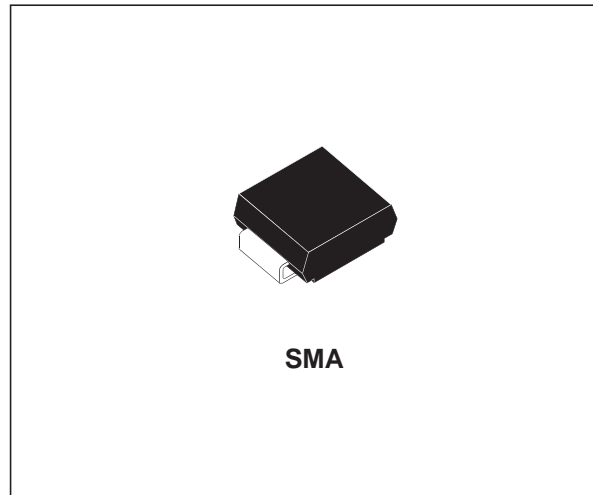


**HIGH EFFICIENCY ULTRAFAST DIODE**
**MAIN PRODUCT CHARACTERISTICS**

<b>I<sub>F(AV)</sub></b>	<b>1A</b>
<b>V<sub>RRM</sub></b>	<b>200 V</b>
<b>T<sub>j</sub> (max)</b>	<b>175 °C</b>
<b>V<sub>F</sub> (max)</b>	<b>0.78 V</b>
<b>t<sub>rr</sub> (max)</b>	<b>20 ns</b>


**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)

<b>Symbol</b>	<b>Parameter</b>		<b>Value</b>	<b>Unit</b>
V <sub>RRM</sub>	Repetitive peak reverse voltage		200	V
I <sub>F(AV)</sub>	Average forward current	T <sub>I</sub> = 148°C δ = 0.5	1	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms Sinusoidal	40	A
T <sub>stg</sub>	Storage temperature range		+ 175	°C
T <sub>j</sub>	Maximum operating junction temperature		175	°C

**THERMAL PARAMETERS**

<b>Symbol</b>	<b>Parameter</b>	<b>Maximum</b>	<b>Unit</b>
R <sub>th(j-l)</sub>	Junction to lead	30	°C/W

**STATIC ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			1	μA
		T <sub>j</sub> = 125°C			1	25	
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 700 mA			0.90	
			I <sub>F</sub> = 1 A			0.97	
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 1 A		0.68	0.78	

Pulse test: \* t<sub>p</sub> = 5ms, δ < 2%

\*\* t<sub>p</sub> = 380μs, δ < 2%

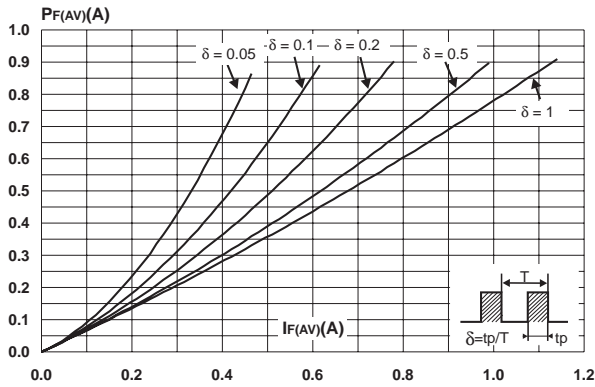
To evaluate the maximum conduction losses use the following equation :

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

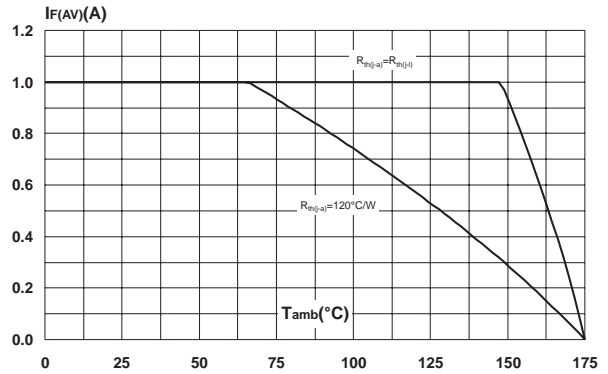
**DYNAMIC ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5 A I <sub>rr</sub> = 0.25 A I <sub>R</sub> = 1A		12	20	ns
t <sub>fr</sub>	Forward recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A dI <sub>F</sub> /dt = 50 A/μs V <sub>FR</sub> = 1.1 x V <sub>Fmax</sub>		50		ns
V <sub>FP</sub>	Forward recovery voltage	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A dI <sub>F</sub> /dt = 50 A/μs		1.8		V

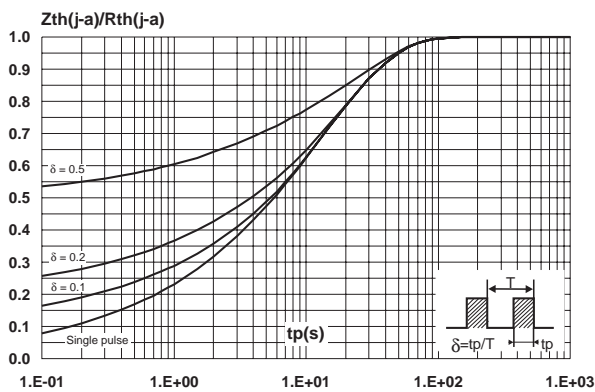
**Fig. 1:** Average forward power dissipation versus average forward current.



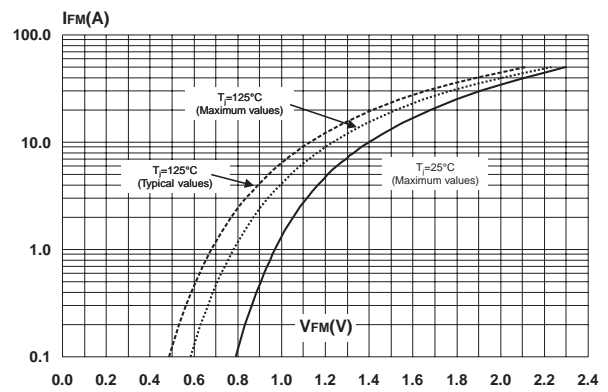
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ).



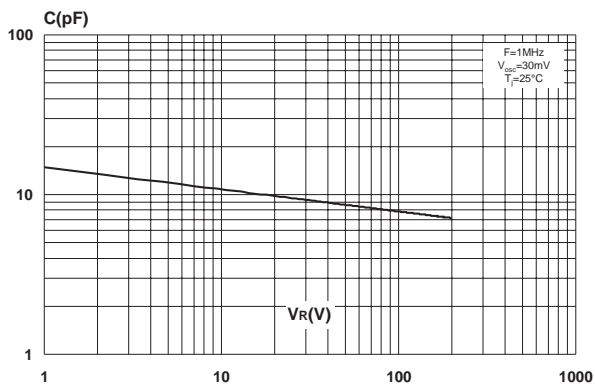
**Fig. 3:** Relative variation of thermal impedance junction ambient versus pulse duration (Printed circuit board epoxy FR4).



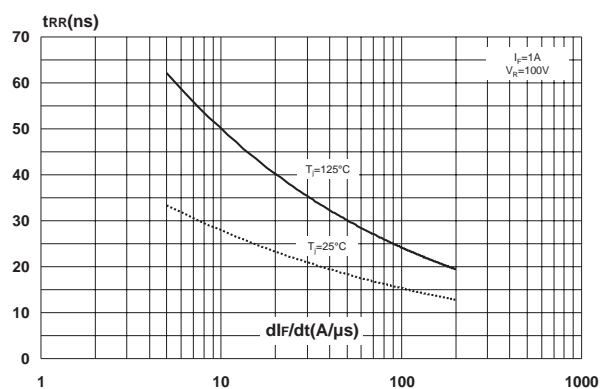
**Fig. 4:** Forward voltage drop versus forward current.



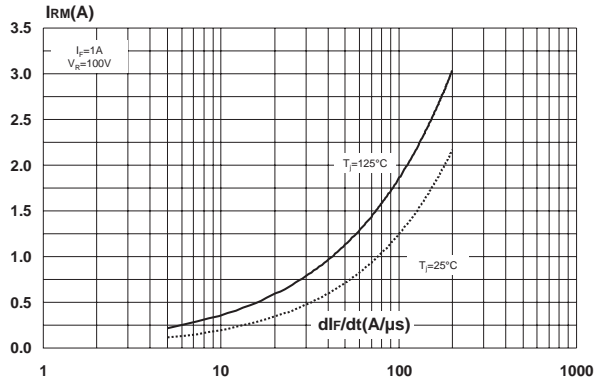
**Fig. 5:** Junction capacitance versus reverse voltage applied (typical values).



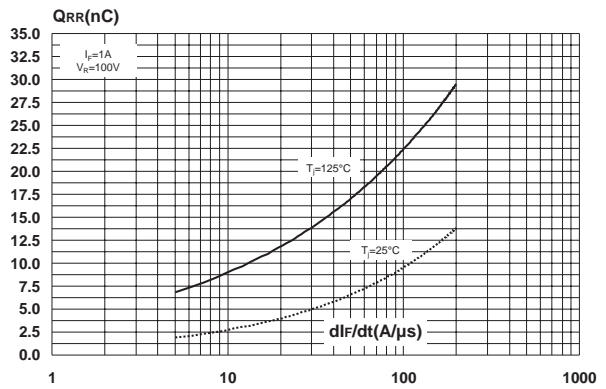
**Fig. 6:** Reverse recovery time versus  $di_F/dt$  (90% confidence).



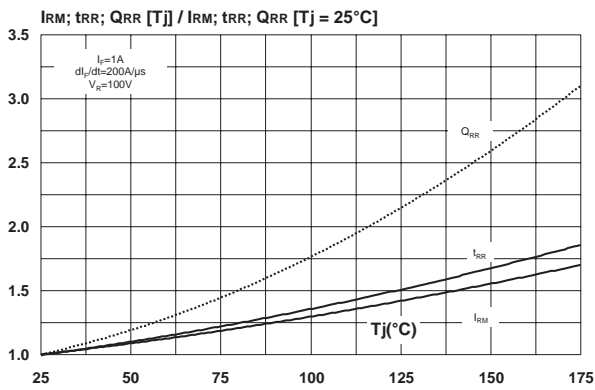
**Fig. 7:** Peak reverse recovery current versus  $dl_F/dt$  (90% confidence).



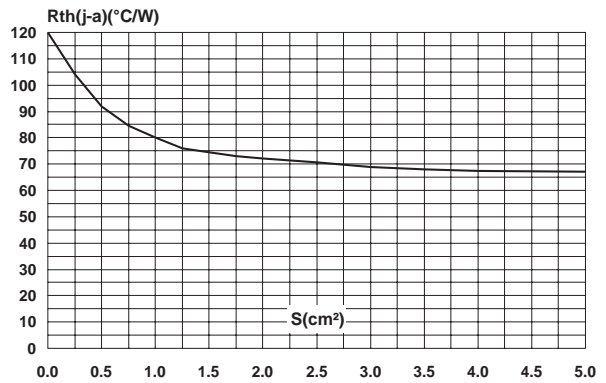
**Fig. 8:** Reverse recovery charges versus  $dl_F/dt$  (90% confidence).



**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,  $e = 35\mu\text{m}$ ).

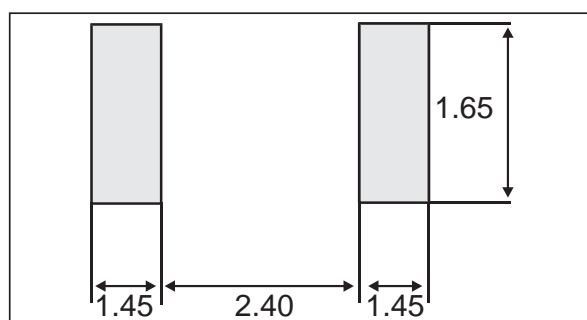


## PACKAGE MECHANICAL DATA

## 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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