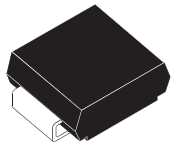
STTH102A

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

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



SMA

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	Tl = 148°C δ =0.5	1	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	40	A
T_{stg}	Storage temperature range		+ 175	°C
Tj	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	Tj = 25°C	$V_R = V_{RRM}$			1	µA
		Tj = 125°C			1	25	
V_F*	Forward voltage drop	Tj = 25°C	I_F = 700 mA			0.90	
			I_F = 1 A			0.97	
		Tj = 125°C	I_F = 1 A		0.68	0.78	

Pulse test: * tp = 5ms, δ < 2%

** tp = 380µs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
$P = 0.65 \times I_{F(AV)} + 0.130\ I_{F^2(RMS)}$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
trr	Reverse recovery time	Tj = 25°C	I_F = 0.5 A Irr = 0.25 A I_R = 1A		12	20	ns
tfr	Forward recovery time	Tj = 25°C	I_F = 1 A dI_F/dt = 50 A/µs $V_{FR} = 1.1 \times V_F$max		50		ns
V_{FP}	Forward recovery voltage	Tj = 25°C	I_F = 1 A dI_F/dt = 50 A/µs		1.8		V

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

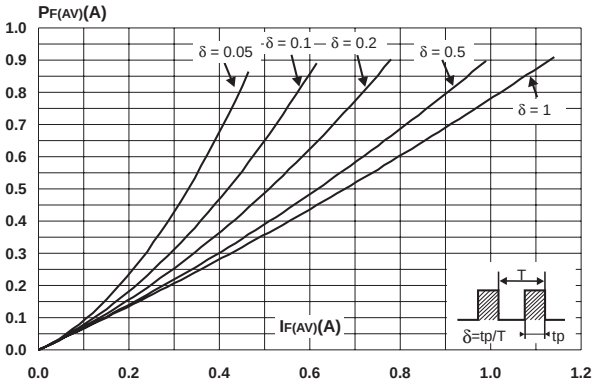


Fig. 2: Average forward current versus ambient temperature (δ = 0.5)

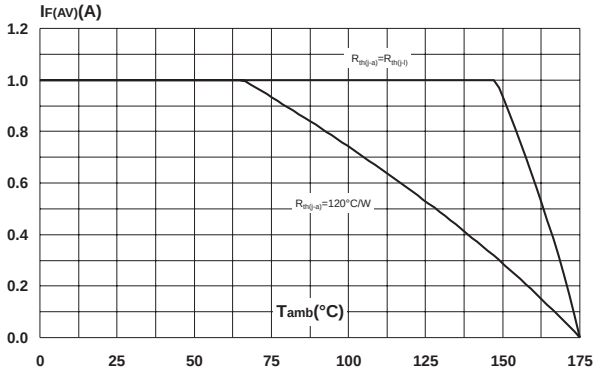


Fig. 3: Relative variation of thermal impedance junction ambient versus pulse duration (Printed circuit board epoxy FR4).

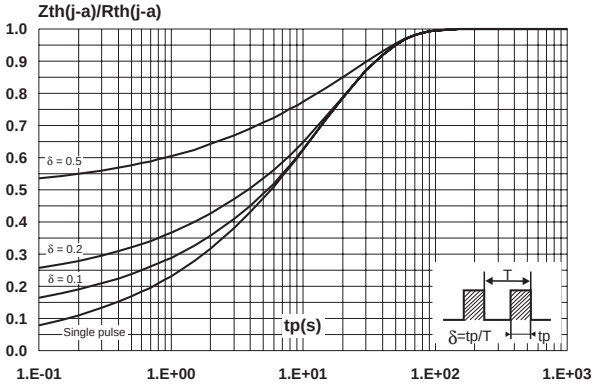


Fig. 4: Forward voltage drop versus forward current.

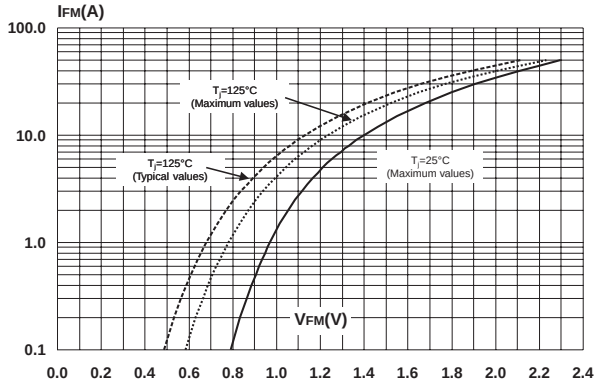


Fig. 5: Junction capacitance versus reverse voltage applied (typical values).

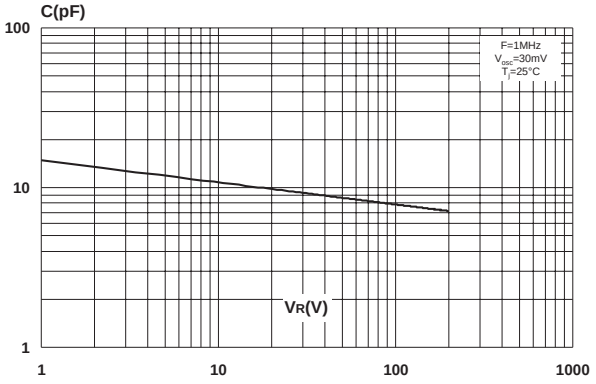


Fig. 6: Reverse recovery time versus dI_F/dt (90% confidence).

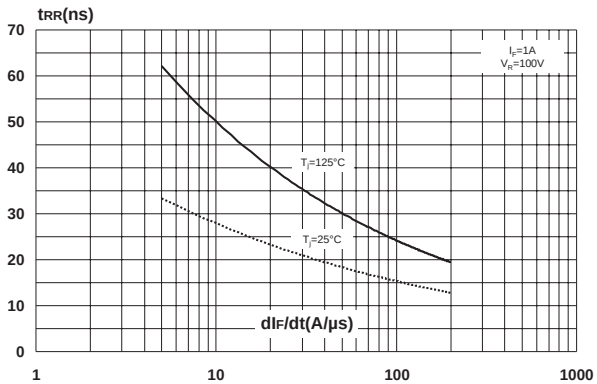


Fig. 7: Peak reverse recovery current versus dI_F/dt (90% confidence).

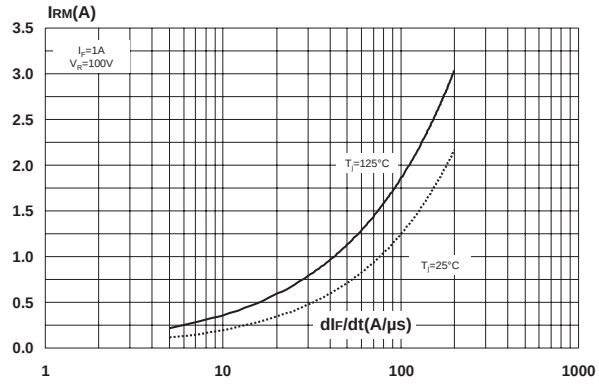


Fig. 8: Reverse recovery charges versus dI_F/dt (90% confidence).

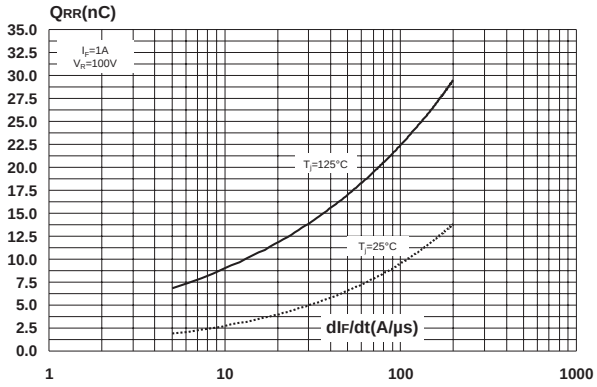


Fig. 9: Relative variations of dynamic parameters versus junction temperature.

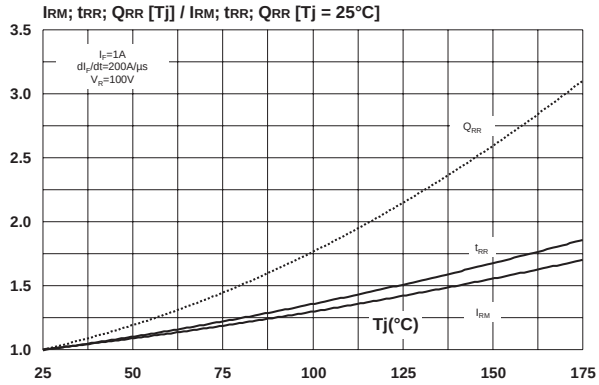
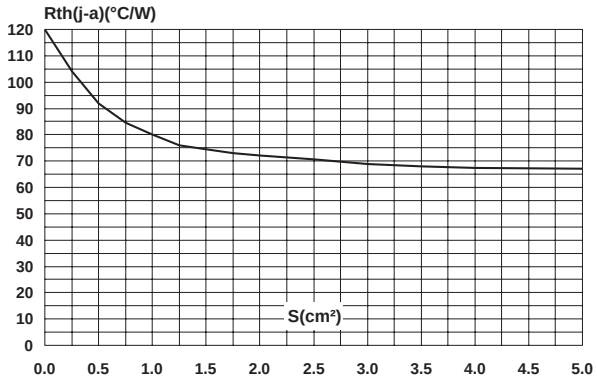


Fig. 10: Thermal resistance junction to ambient versus copper surface under each lead (epoxy FR4, e = 35µm).



PACKAGE MECHANICAL DATA

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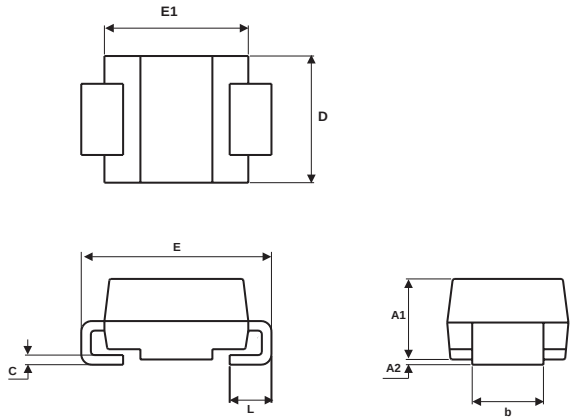
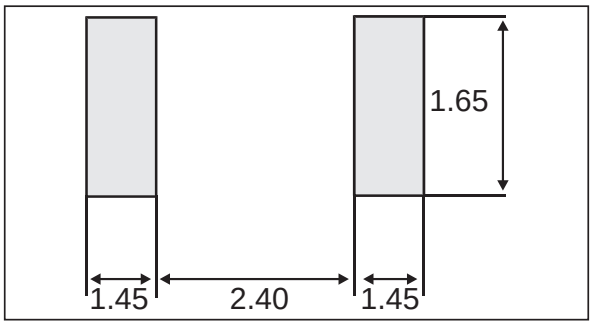


REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

FOOTPRINT



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

- Epoxy meets UL 94,V0