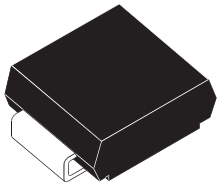
STTH302S

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	3A
V_{RRM}	200 V
Tj (max)	175 °C
V_F (max)	0.75 V
trr (max)	35 ns



SMC

FEATURES AND BENEFITS

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

DESCRIPTION

The STTH302S, 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 = 107°C δ =0.5	3	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	100	A
T_{stg}	Storage temperature range		- 65 + 175	°C
Tj	Maximum operating junction temperature		175	°C

THERMAL PARAMETERS

Symbol	Parameter	Maximum	Unit
$R_{th\ (j-l)}$	Junction to lead	20	°C/W

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R*	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			3	µA
		Tj = 125°C			4	75	
V_F**	Forward voltage drop	Tj = 25°C	I_F = 3 A			0.95	V
		Tj = 125°C	I_F = 3 A		0.66	0.75	

Pulse test: * tp = 5ms, δ < 2%

** tp = 380µs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
$P = 0.60 \times I_{F(AV)} + 0.05\ I_{F}^{2}{}_{(RMS)}$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
trr	Reverse recovery time	Tj = 25°C	I_F =1 A Irr = -50 A/µs V_R = 30V			35	ns
tfr	Forward recovery time	Tj = 25°C	I_F = 3 A dI_F/dt = 50 A/µs V_{FR} = 1.1 x $V_F$max		70		ns
V_{FP}	Forward recovery voltage	Tj = 25°C	I_F = 3 A dI_F/dt = 50 A/µs		1.6		V

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

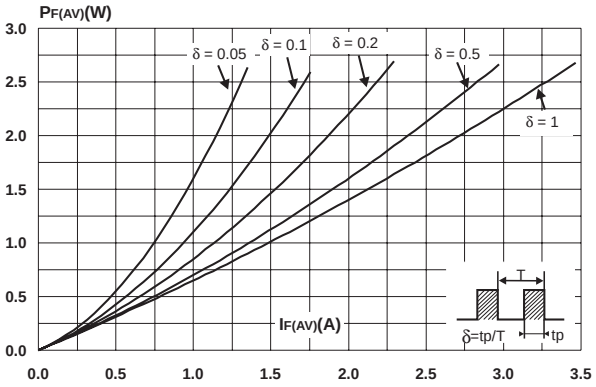


Fig. 2: Average forward current versus ambient temperature (δ = 0.5)

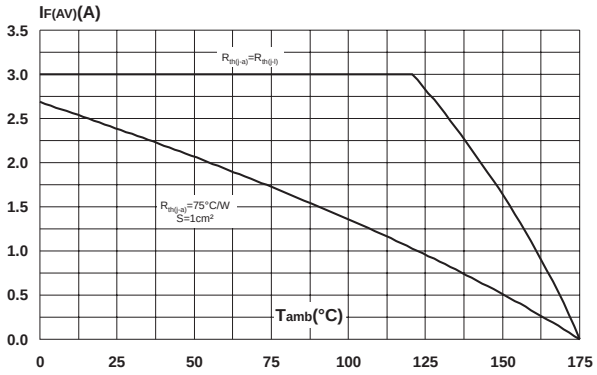


Fig. 3: Relative variation of thermal impedance junction ambient versus pulse duration (Printed circuit board epoxy FR4).

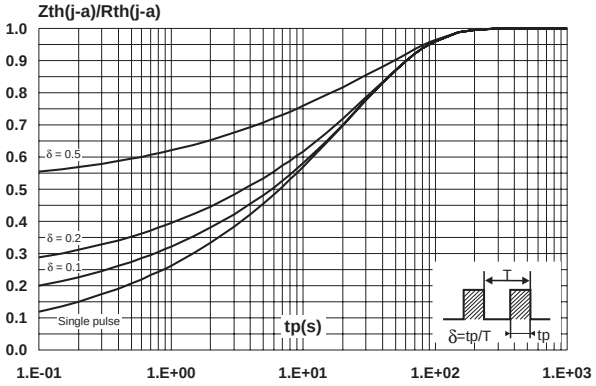


Fig. 4: Forward voltage drop versus forward current.

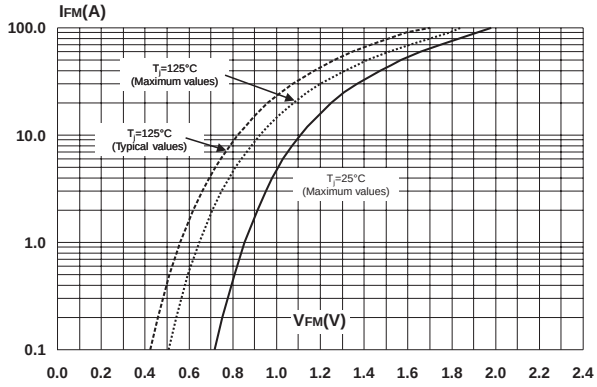


Fig. 5: Junction capacitance versus reverse voltage applied (typical values).

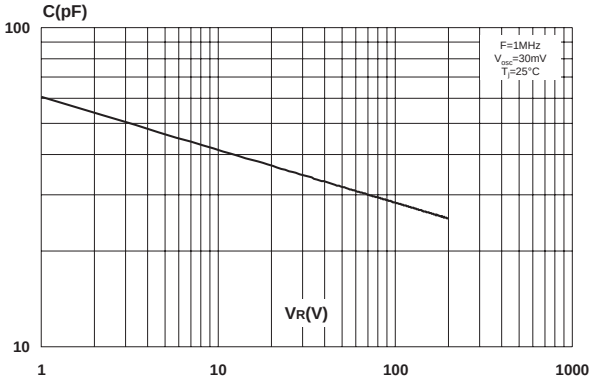


Fig. 6: Reverse recovery time versus dI_F/dt (90% confidence).

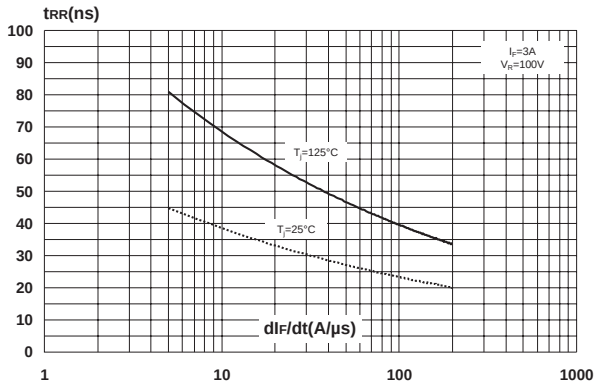


Fig. 7: Peak reverse recovery current versus dI_F/dt (90% confidence).

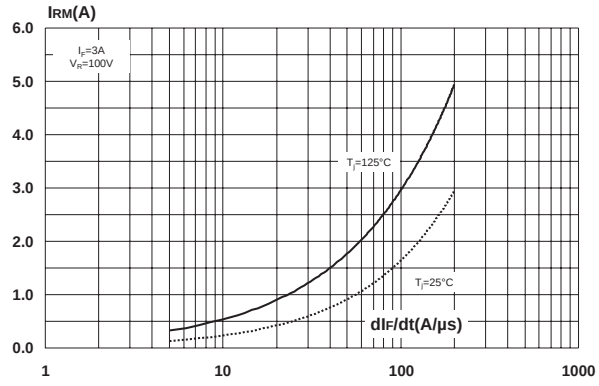


Fig. 8: Reverse recovery charges versus dI_F/dt (90% confidence).

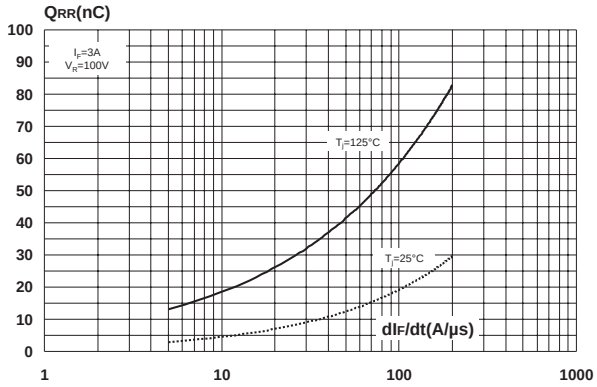


Fig. 9: Relative variations of dynamic parameters versus junction temperature.

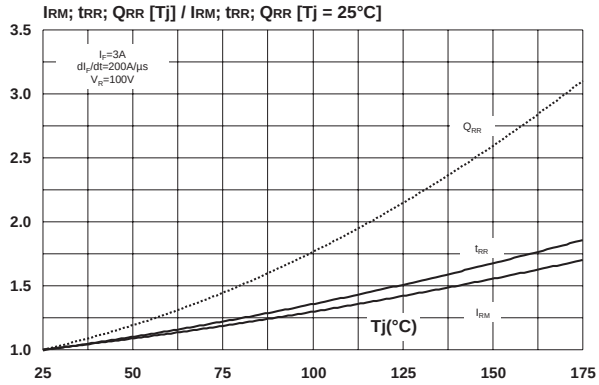
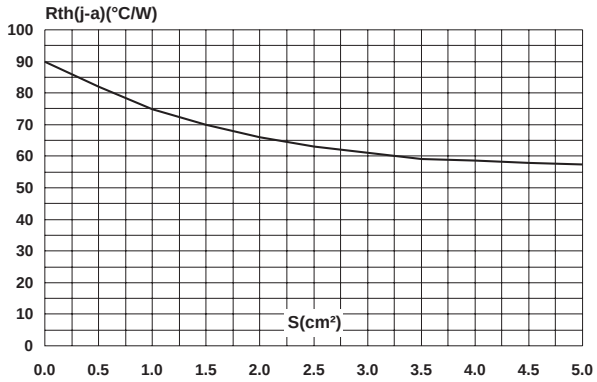


Fig. 10: Thermal resistance junction to ambient versus copper surface under each lead (epoxy FR4, e = 35µm).



PACKAGE MECHANICAL DATA

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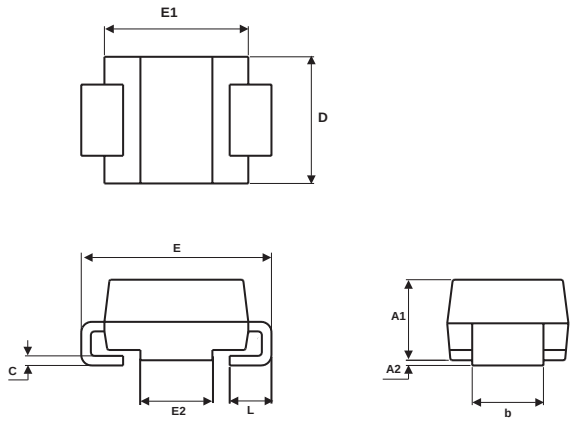
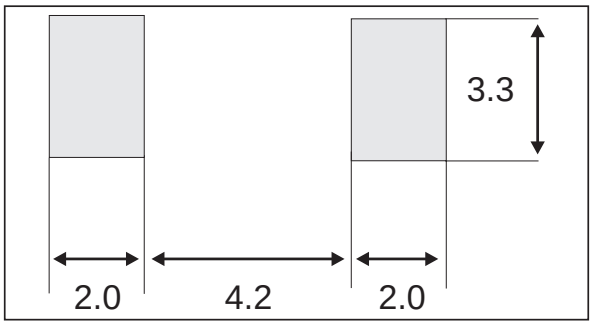


REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	2.90	3.2	0.114	0.126
c	0.15	0.41	0.006	0.016
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
D	5.55	6.25	0.218	0.246
L	0.75	1.60	0.030	0.063

FOOTPRINT



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH302S	U32	SMC	0.245 g	2500	Tape & reel

- Epoxy meets UL 94,V0