

## HIGH EFFICIENCY ULTRAFAST DIODE

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>3A</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>0.75 V</b>
<b>trr (max)</b>	<b>35 ns</b>

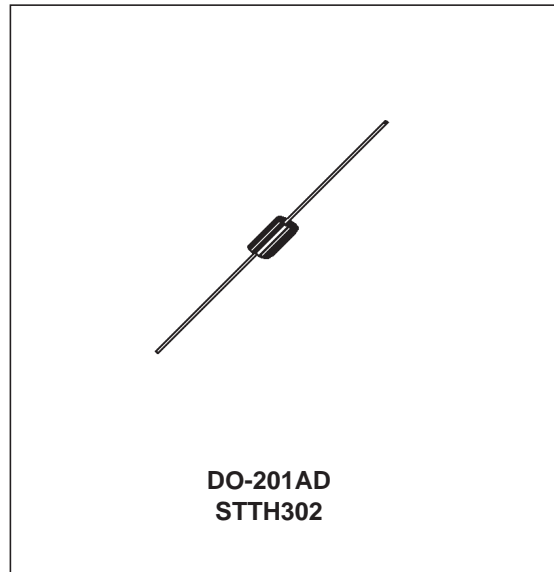
### FEATURES AND BENEFITS

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

### DESCRIPTION

The STTH302 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 <sub>RRM</sub>	Repetitive peak reverse voltage		200	V
I <sub>F(AV)</sub>	Average forward current	T <sub>I</sub> = 107°C    δ = 0.5	3	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10ms    Sinusoidal	130	A
T <sub>stg</sub>	Storage temperature range		- 65 to + 175	°C
T <sub>j</sub>	Maximum operating junction temperature		175	°C

### THERMAL PARAMETERS

Symbol	Parameter	Value	Unit
R <sub>th(j-a)</sub>	Junction-ambient*	25	°C/W

\* On infinite heatsink with 10mm lead length.

## STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			3	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			4	75	
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 3\text{A}$			0.95	V
		$T_j = 125^\circ\text{C}$			0.66	0.75	

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

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

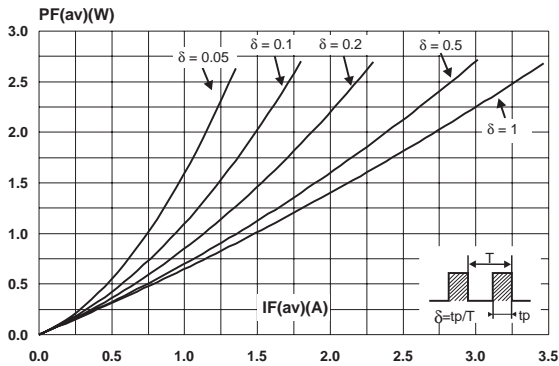
To evaluate the maximum conduction losses use the following equations:

$$P = 0.60 \times I_{F(AV)} + 0.05 I_{F(RMS)}^2$$

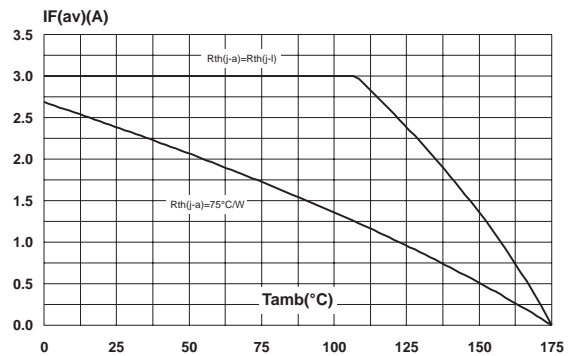
## DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$I_F = 1\text{A}$	$dI_F/dt = -50\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		35	ns
		$V_R = 30\text{V}$					
$t_{fr}$	Forward recovery time	$I_F = 3\text{A}$	$dI_F/dt = 50\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		70	ns
		$V_{FR} = 1.1 \times V_F \text{ max}$					
$V_{FP}$	Forward recovery voltage			$T_j = 25^\circ\text{C}$		1.6	V

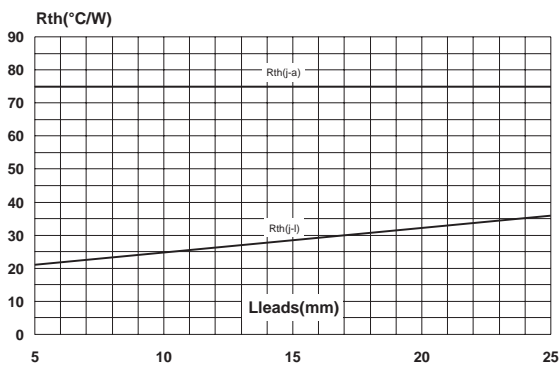
**Fig. 1:** Average forward power dissipation versus average forward current.



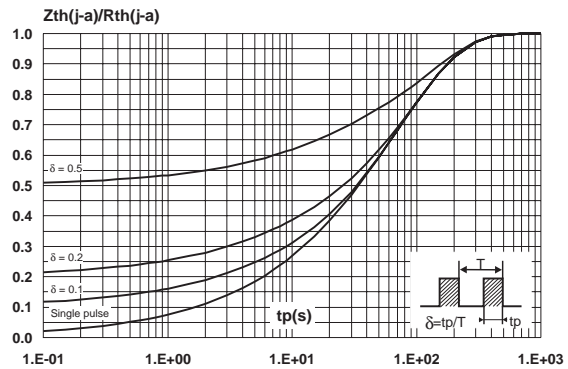
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ ).



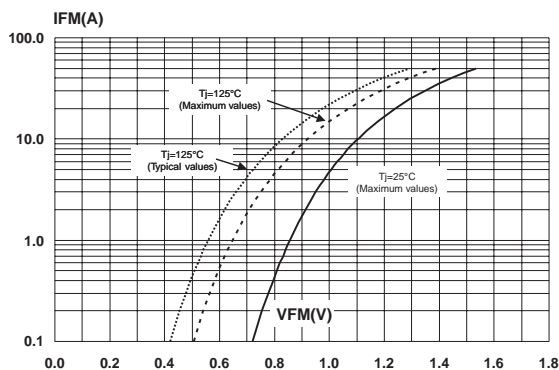
**Fig. 3:** Thermal resistance versus lead length.



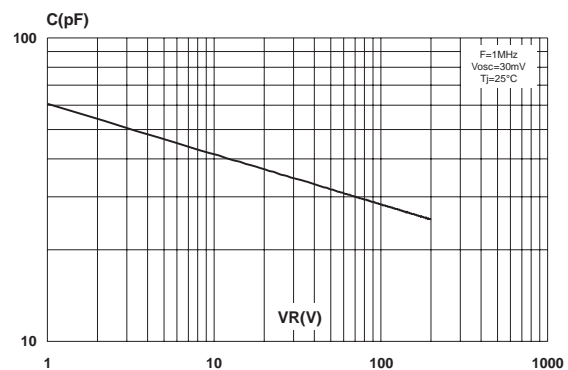
**Fig. 4:** Relative variation of thermal impedance junction ambient versus pulse duration (printed circuit board epoxy FR4, Leads = 10mm).



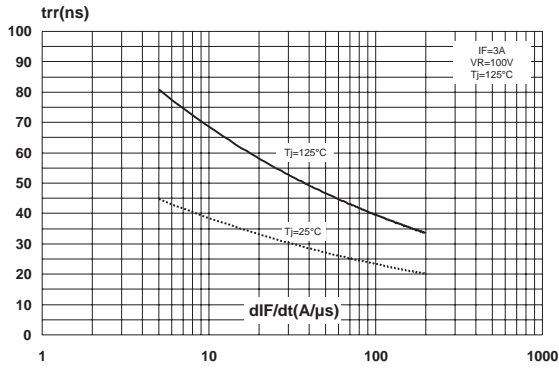
**Fig. 5:** Forward voltage drop versus forward current.



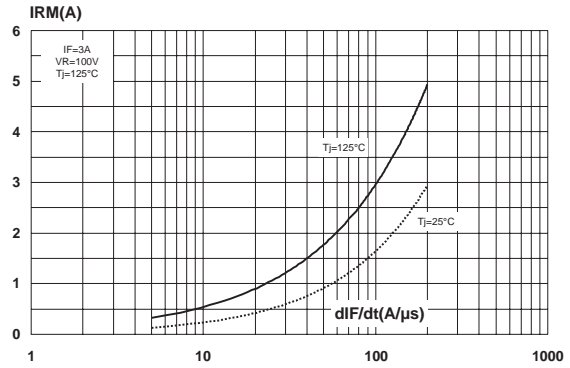
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values).



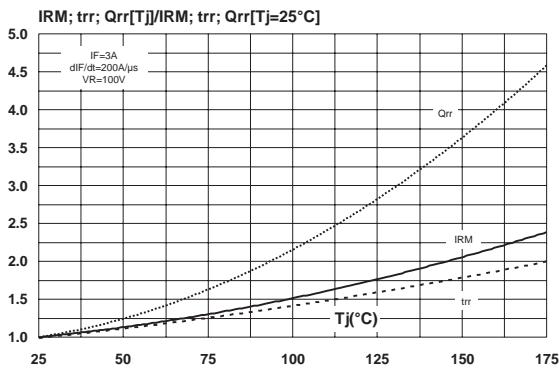
**Fig. 7:** Reverse recovery time versus  $dI_F/dt$  (90% confidence).



**Fig. 8:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).

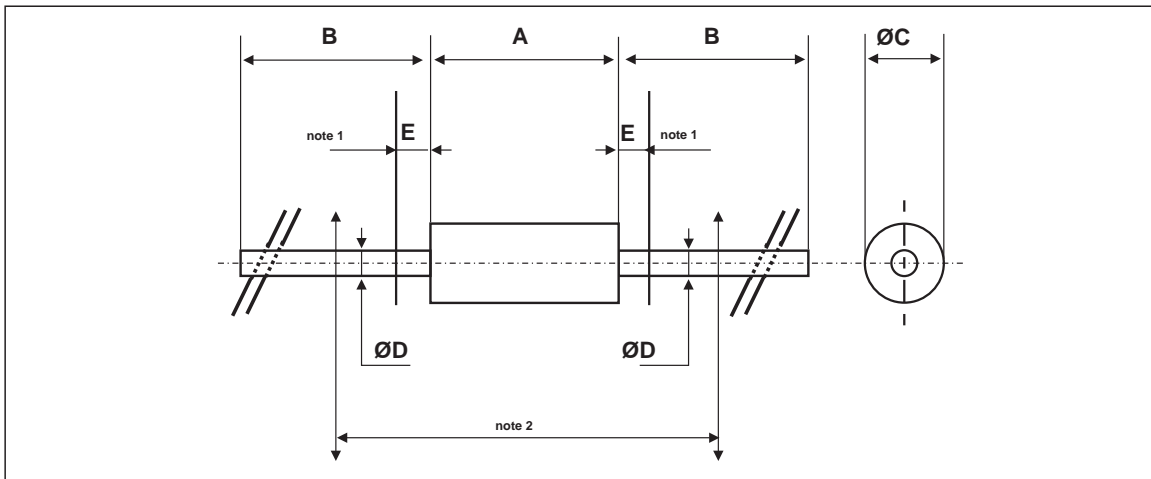


**Fig. 9:** Relative variations of dynamic parameters versus junction temperature.



## PACKAGE MECHANICAL DATA

DO-201AD



REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter $\varnothing D$ is not controlled over zone E 2 - The minimum axial length within which the device may be placed with its leads bent at right angles is 0.59"(15 mm)
B	25.40		1.000		
$\varnothing C$		5.30		0.209	
$\varnothing D$		1.30		0.051	
E		1.25		0.049	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH302	STTH302	DO-201AD	1.16 g	600	Ammopack
STTH302RL	STTH302	DO-201AD	1.16 g	1900	Tape and reel

- White band indicates cathode
- Epoxy meets UL94,V0

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