



# STTH310/S

## HIGH VOLTAGE ULTRAFAST RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

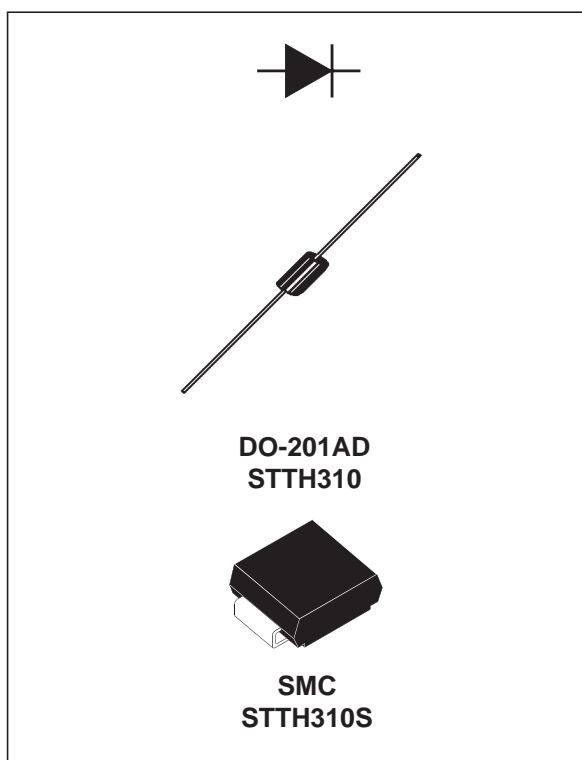
$I_{F(AV)}$	3 A
$V_{RRM}$	1000 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	1.42 V

### FEATURES AND BENEFITS

- Low forward voltage drop
- High reliability
- High surge current capability
- Soft switching for reduced EMI disturbances
- Planar technology

### DESCRIPTION

The STTH310, which is using ST ultrafast high voltage planar technology, is specially suited for free-wheeling, clamping, snubbing, demagnetization in power supplies and other power switching applications.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		1000	V	
$V_{(RMS)}$	RMS voltage		700	V	
$I_{F(AV)}$	Average forward current	$T_I = 75^\circ\text{C} \quad \delta = 0.5$	DO-201AD	3	A
		$T_I = 75^\circ\text{C} \quad \delta = 0.5$	SMC	3	
$I_{FSM}$	Forward surge current $t = 8.3 \text{ ms}$		DO-201AD	55	A
			SMC	45	
$T_{stg}$	Storage temperature range		- 50 + 175	°C	
$T_j$	Maximum operating junction temperature		+ 175	°C	

## THERMAL PARAMETERS

Symbol	Parameter			Value	Unit
R <sub>th(j-l)</sub>	Junction to lead	L = 10 mm	DO-201AD	20	°C/W
			SMC	20	
R <sub>th(j-a)</sub>	Junction to ambient	L = 10 mm	DO-201AD	75	

## STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub>	Reverse leakage current	V <sub>R</sub> = 1000V	T <sub>j</sub> = 25°C			10	μA
			T <sub>j</sub> = 125°C			50	
V <sub>F</sub>	Forward voltage drop	I <sub>F</sub> = 3 A	T <sub>j</sub> = 25°C			1.7	V
			T <sub>j</sub> = 150°C		0.98	1.42	

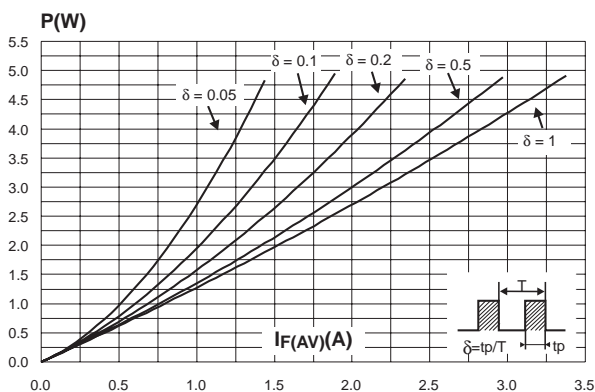
To evaluate the maximum conduction losses use the following equation :

$$P = 1.20 \times I_{F(AV)} + 0.075 \times I_{F(RMS)}^2$$

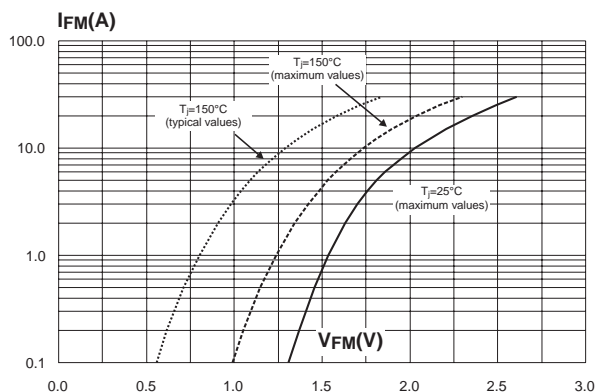
## DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	I <sub>F</sub> = 0.5 A I <sub>rr</sub> = 0.25 A I <sub>R</sub> = 1A	T <sub>j</sub> = 25°C			75	ns
t <sub>fr</sub>	Forward recovery time	I <sub>F</sub> = 3 A dI <sub>F</sub> /dt = 50 A/μs V <sub>FR</sub> = 1.1 x V <sub>F</sub> max	T <sub>j</sub> = 25°C			300	ns
V <sub>FP</sub>	Forward recovery voltage						12

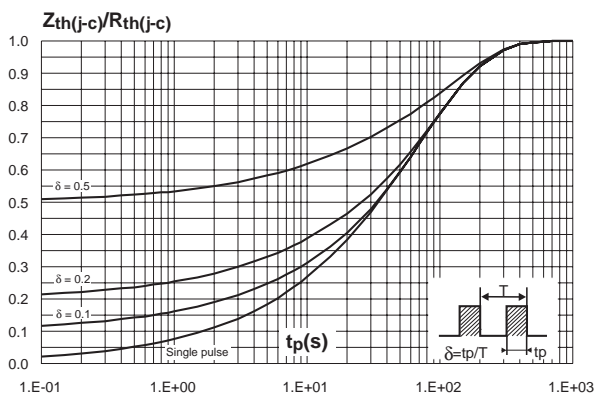
**Fig. 1:** Conduction losses versus average current.



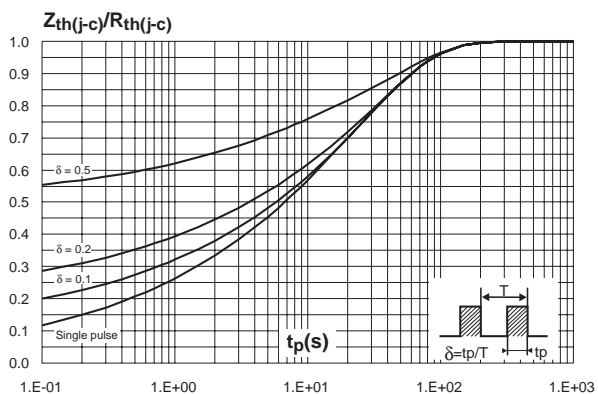
**Fig. 2:** Forward voltage drop versus forward current.



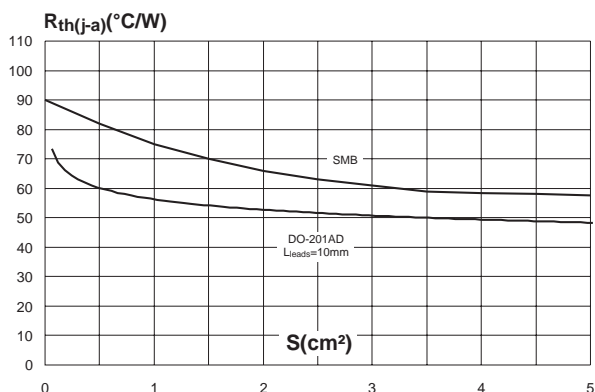
**Fig. 3-1:** Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4,  $L_{leads} = 10\text{mm}$ ) (DO-201AD).



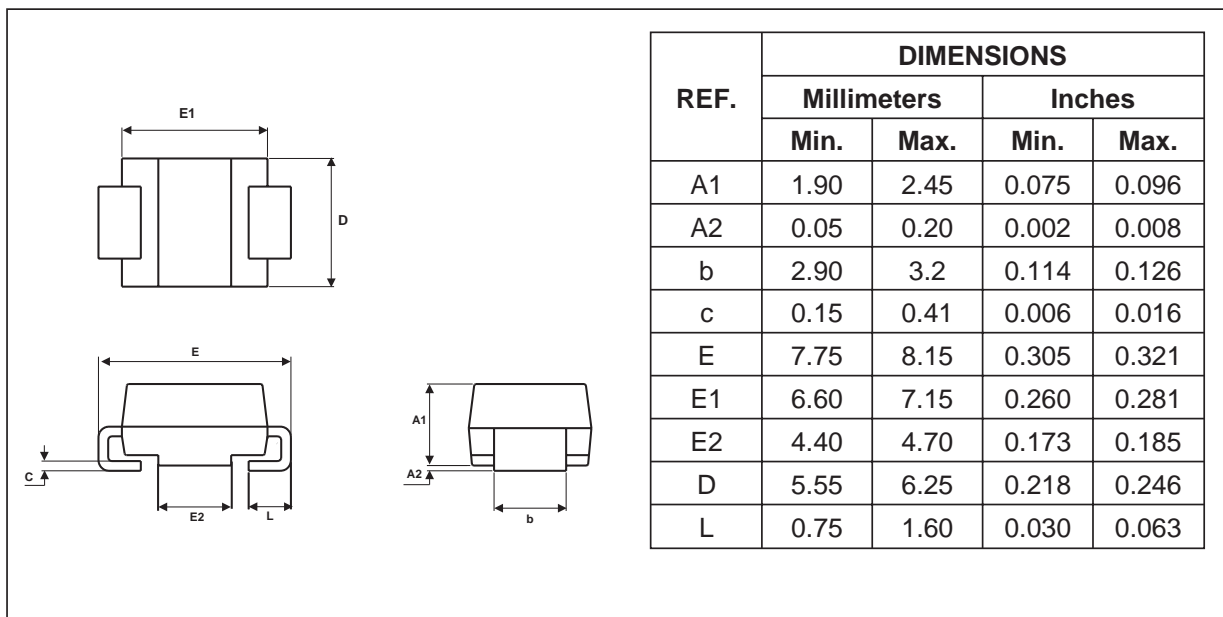
**Fig. 3-2:** Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4,  $S=1\text{cm}^2$ ) (SMC).



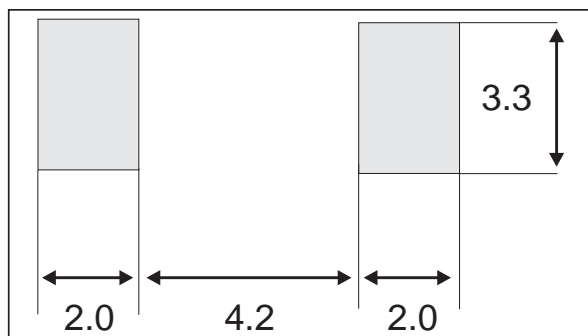
**Fig. 4:** Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness:  $35\mu\text{m}$ ).

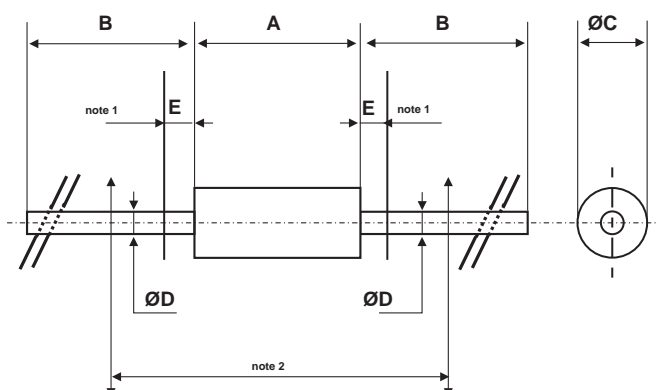


PACKAGE MECHANICAL DATA  
SMC



FOOTPRINT (in millimeters)



**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 length which must stay straight between the right angles after bending is 0.59"(15 mm)
B	25.40		1.000		
C		5.30		0.209	
D		1.30		0.051	
E		1.25		0.049	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH310	STTH310	DO-201AD	1.12 g	600	Ammopack
STTH310S	S10	SMC	0.245 g	2500	Tape & reel
STTH310RL	STTH310	DO-201AD	1.12 g	1900	Tape & reel

- Epoxy meets UL 94,V0

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