STTH310

High voltage ultrafast rectifier

Features

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

Description

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

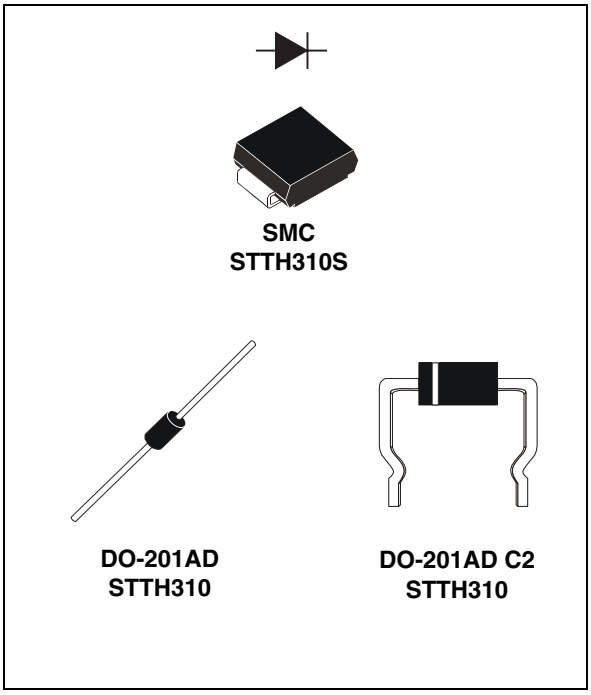


Table 1. Device summary

$I_{F(AV)}$	3 A
V_{RRM}	1000 V
T_j	175 °C
V_F (max)	1.42 V
t_{rr} (max)	75 ns

1 Characteristics

Table 2. Absolute ratings (limiting values)

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

Table 3. Thermal parameters

Symbol	Parameter			Value	Unit
$R_{th(j-l)}$	Junction to lead	L = 10 mm	DO-201AD	20	°C/W
			SMC	20	
$R_{th(j-a)}$	Junction to ambient	L = 10 mm	DO-201AD	75	

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	10	µA
		T_j = 125 °C		-	-	50	
V_F	Forward voltage drop	T_j = 25 °C	I_F = 3 A	-	-	1.7	V
		T_j = 150 °C		-	0.98	1.42	

To evaluate the conduction losses use the following equation: $P = 1.20 \times I_{F(AV)} + 0.075\ I_F{}^2{}_{(RMS)}$

Table 5. Dynamic electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	I_F = 0.5 A, I_{rr} = 0.25 A I_R = 1 A, T_j = 25 °C	-	-	75	ns
t_{fr}	Forward recovery time	I_F = 3 A, dI_F/dt = 50 A/µs V_{FR} = 1.1 x V_{Fmax}, T_j = 25 °C	-	-	300	ns
V_{FP}	Forward recovery voltage		-	-	12	V

Figure 1. Conduction losses versus average current

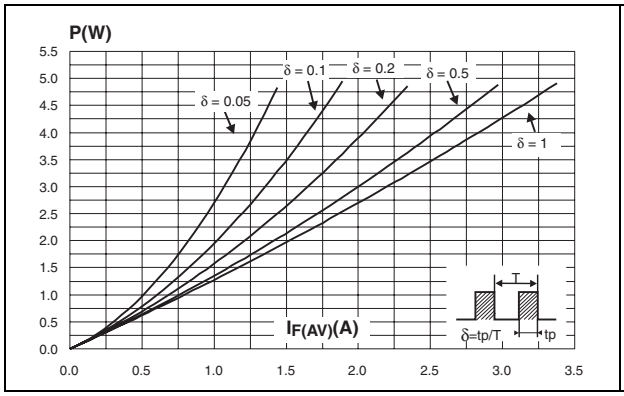


Figure 2. Forward voltage drop versus forward current

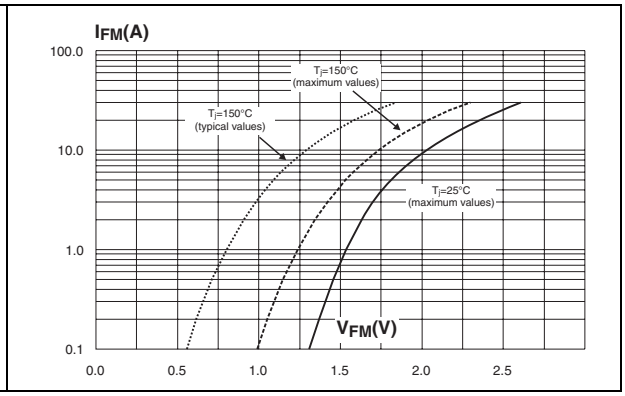


Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-201AD)

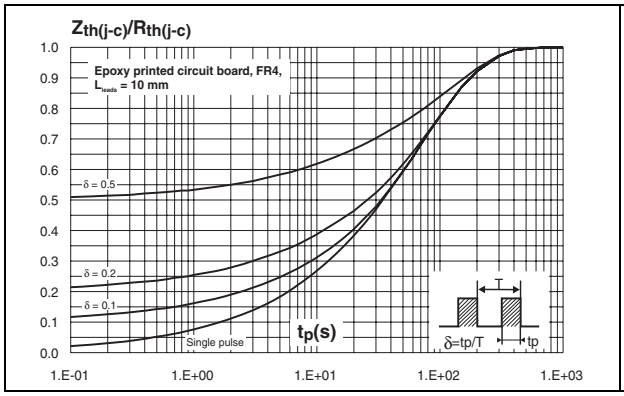


Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (SMC)

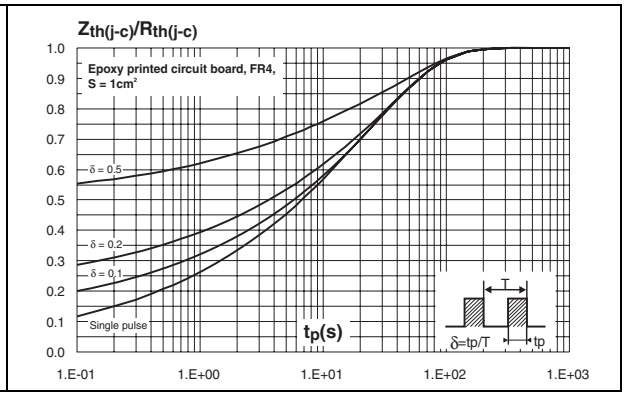
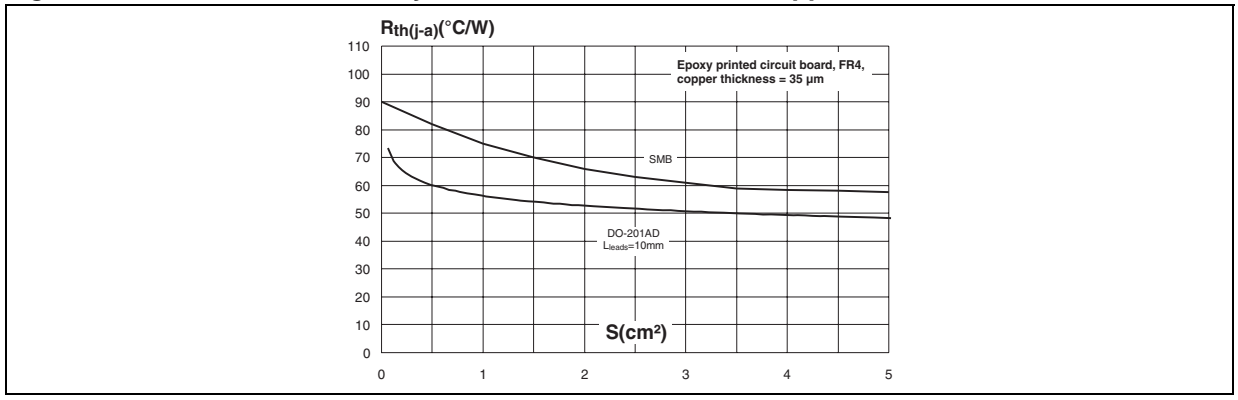


Figure 5. Thermal resistance junction to ambient versus copper surface under each lead

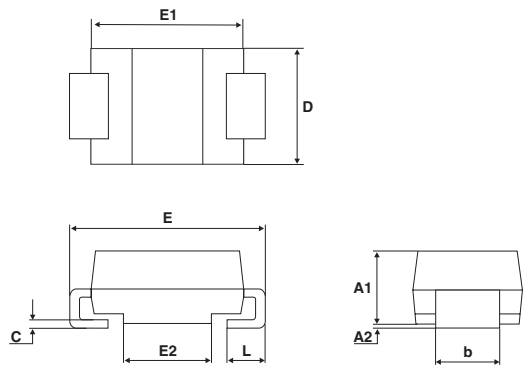


2 Package information

- Epoxy meets UL94, V0
- Band indicates cathode
- Cooling method: by conduction (C)

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 6. SMC dimensions



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(1)	2.90	3.20	0.114	0.126
c(1)	0.15	0.40	0.006	0.016
D	5.55	6.25	0.218	0.246
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
L	0.75	1.50	0.030	0.059

1. Dimensions b and c apply to plated leads

Figure 6. Footprint, dimensions in mm (inches)

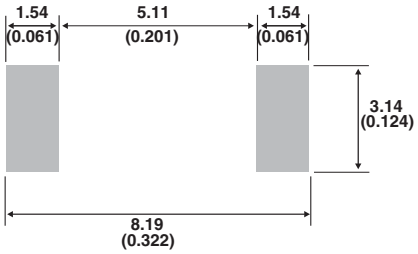
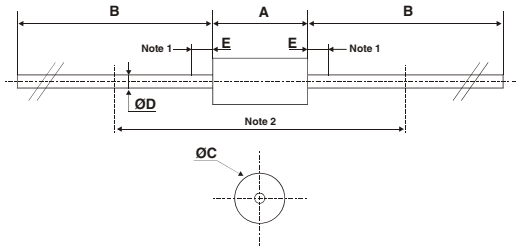
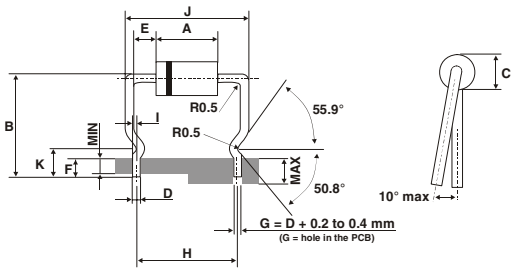


Table 7. DO-201AD dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	-	9.50	-	0.374
B	25.40	-	1.000	-
C	-	5.30	-	0.209
D	-	1.30	-	0.051
E	-	1.25	-	0.049
Notes	1 - The lead diameter ø D is not controlled over zone E 2 - The minimum length which must stay straight between the right angles after bending is 0.59"(15mm)			

Table 8. DO-201AD C2 dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	-	9.5	-	-	0.374
B	13.75	-	17.75	0.541	-	0.699
C	-	-	5.3	-	-	0.208
D	-	-	1.3	-	-	0.051
E	3.1	3.6	4.1	0.122	0.142	0.161
F	2.4	3.15	3.9	0.094	0.124	0.153
G	-	1.6	-	-	0.063	-
H	14.9	-	15.6	0.587	-	0.614
I	0.5	0.6	0.8	0.019	0.024	0.031
J	-	18.78	-	-	0.739	-
K	3.8	-	4.8	0.150	-	0.189
Note	The difference between E dimensions on both sides of resinous body (which express the bending centering) must not be larger than 0.7 millimeter.					

3 Ordering information

Table 9. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH310S	S10	SMC	0.245 g	2500	Tape and reel
STTH310	STTH310	DO-201AD	1.16 g	600	Ammopack
STTH310RL	STTH310	DO-201AD	1.16 g	1900	Tape and reel
STTH310-C2	STTH 310	DO-201AD C2	1.12 g	500	Box

4 Revision history

Table 10. Document revision history

Date	Revision	Changes
Jan-2003	1	First release.
03-Apr-2007	2	DO-201AD C2 package added. SMC package information updated.
07-Dec-09	3	Updated *Table 6* package dimensions.

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