

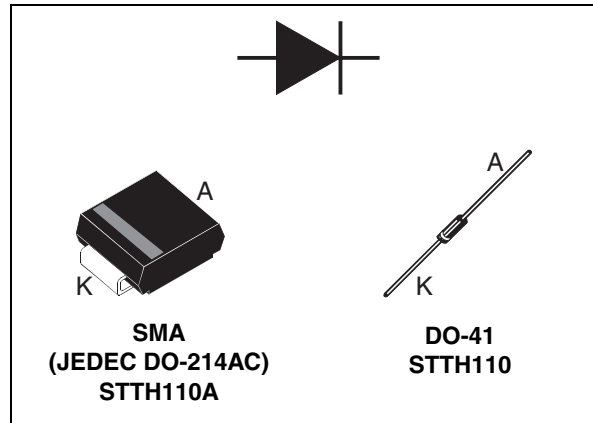
## High voltage ultrafast rectifier

### Features

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

### Description

The STTH110, 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.



**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	1 A
$V_{RRM}$	1000 V
$T_j(max)$	175 °C
$V_F(max)$	1.42 V

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		1000	V	
$V_{(RMS)}$	Voltage rms		700	V	
$I_{F(AV)}$	Average forward current	SMA	$T_L = 110\text{ °C}$ $\delta = 0.5$	1	A
		DO-41	$T_L = 125\text{ °C}$ $\delta = 0.5$		
$I_{FSM}$	Forward Surge current $t = 8.3\text{ ms}$	SMA	18	A	
		DO-41	20		
$T_{stg}$	Storage temperature range		-50 to + 175	°C	
$T_j$	Maximum operating junction temperature		175	°C	

**Table 3. Thermal resistance**

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	°C/W
		Lead length = 10 mm	45	
$R_{th(j-a)}$	Junction to ambient	Lead length = 10 mm	110	

**Table 4. Static Electrical Characteristics**

Symbol	Parameter	Tests conditions	Min.	Typ.	Max.	Unit
$I_R$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = 1000\text{ V}$		10	$\mu\text{A}$
		$T_j = 125\text{ °C}$			50	
$V_F$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$		1.7	V
		$T_j = 125\text{ °C}$		0.98	1.42	

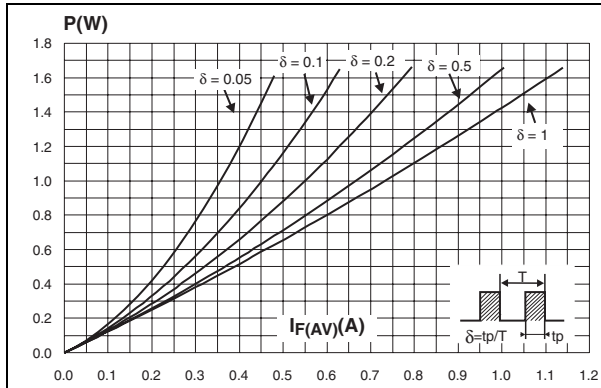
To evaluate the conduction losses use the following equation:

$$P = 1.20 \times I_{F(AV)} + 0.225 I_F^2(RMS)$$

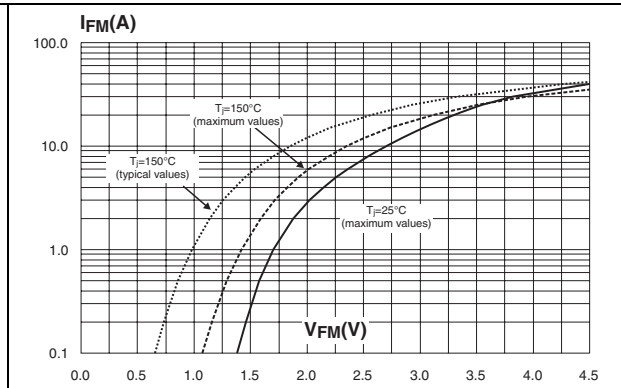
**Table 5. Dynamic electrical characteristics**

Symbol	Parameter	Tests conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$T_j = 25\text{ °C}$ $I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			75	ns
$t_{fr}$	Forward recovery time	$T_j = 25\text{ °C}$ $I_F = 1\text{ A}$ $di_F/dt = 50\text{ A/ms}$ $V_{FR} = 1.1 \times V_{Fmax}$			300	ns
$V_{FP}$	Forward recovery voltage				18	V

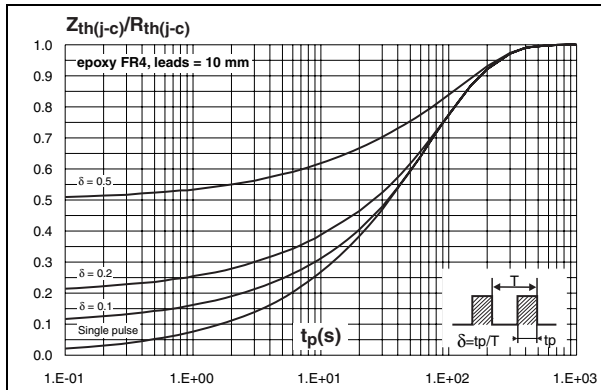
**Figure 1. Conduction losses versus average current**



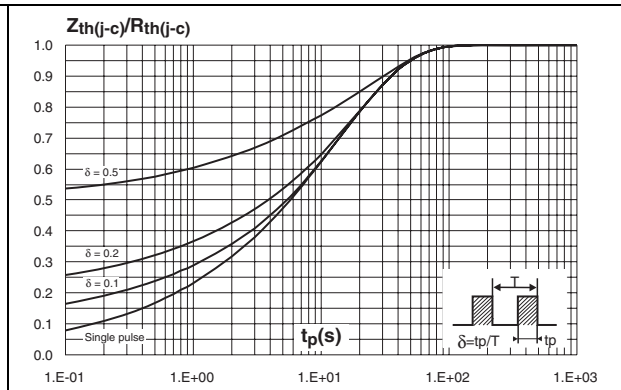
**Figure 2. Forward voltage drop versus forward current**



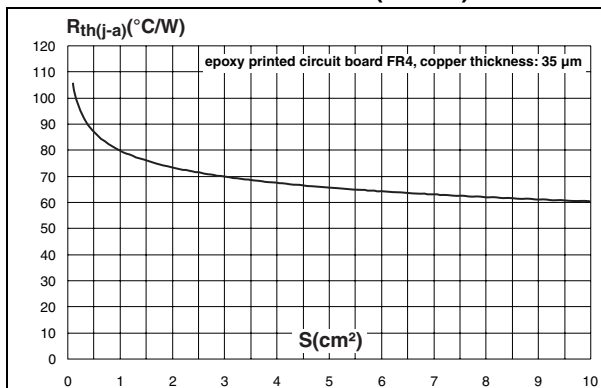
**Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)**



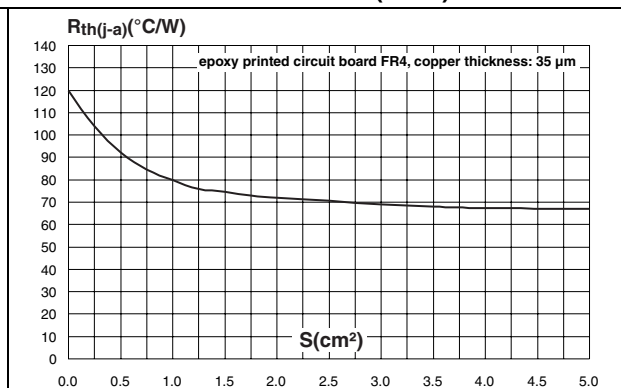
**Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA)**



**Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (DO-41)**



**Figure 6. Thermal resistance junction to ambient versus copper surface under each lead (SMA).**



## 2 Package information

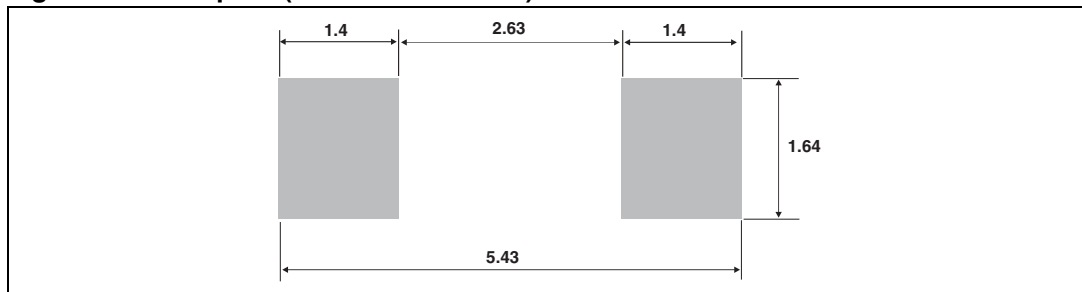
- Epoxy meets UL 94, V0
- Band indicates cathode
- Bending method (DO-41): see Application note AN1471

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**Table 6. SMA dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.094
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.40	0.006	0.016
D	2.25	2.90	0.089	0.114
E	4.80	5.35	0.189	0.211
E1	3.95	4.60	0.156	0.181
L	0.75	1.50	0.030	0.059

**Figure 7. Footprint (dimensions in mm)**



**Table 7. DO-41 (plastic) package dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107
C	25.4		1	
D	0.71	0.86	0.028	0.034

### 3 Ordering information

**Table 8. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH110	STTH110	DO-41	0.34 g	2000	Ammopack
STTH110A	H10	SMA	0.068 g	5000	Tape and reel
STTH110RL	STTH110	DO-41	0.34 g	5000	Tape and reel

### 4 Revision history

**Table 9. Document revision history**

Date	Revision	Changes
Jan-2003	1	Last update.
30-Sept-2009	2	Updated table 7 package dimensions.

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