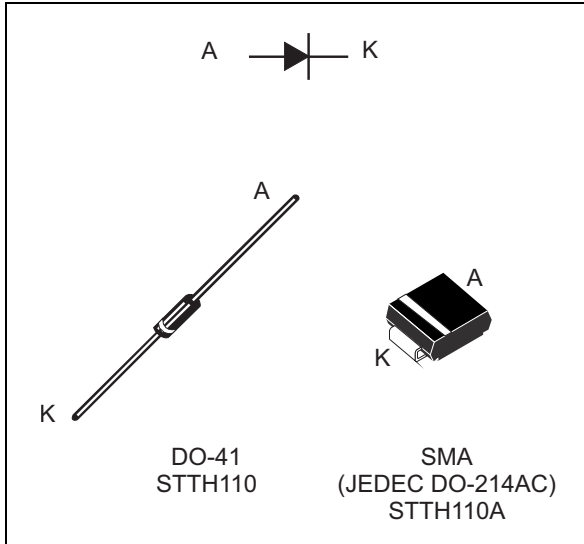


## High voltage ultrafast rectifier

Datasheet - production data



### Description

The STTH110, which is using ST ultrafast high voltage planar technology, is especially 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

### Features

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

# 1 Characteristics

**Table 2. Absolute ratings (limiting values at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified)**

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	$T_L = 110\text{ }^\circ\text{C}$ $\delta = 0.5$	1	A
		DO-41	$T_L = 125\text{ }^\circ\text{C}$ $\delta = 0.5$	1	
$I_{FSM}$	Forward Surge current $t = 8.3\text{ ms}$	SMA	18	A	
		DO-41	20		
$T_{stg}$	Storage temperature range		-50 to + 175	$^\circ\text{C}$	
$T_j$	Maximum operating junction temperature		175	$^\circ\text{C}$	

**Table 3. Thermal resistance**

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	$^\circ\text{C/W}$
		Lead length = 10 mm	DO-41	
$R_{th(j-a)}$	Junction to ambient	Lead length = 10 mm	DO-41	

**Table 4. Static electrical characteristics**

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R$	Reverse leakage current	$T_j = 25\text{ }^\circ\text{C}$	$V_R = 1000\text{ V}$			10	$\mu\text{A}$
		$T_j = 125\text{ }^\circ\text{C}$				50	
$V_F$	Forward voltage drop	$T_j = 25\text{ }^\circ\text{C}$	$I_F = 1\text{ A}$			1.7	V
		$T_j = 150\text{ }^\circ\text{C}$			0.98	1.42	

To evaluate the conduction losses use the following equation:

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

**Table 5. Dynamic electrical characteristics**

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

Figure 1. Conduction losses versus average current

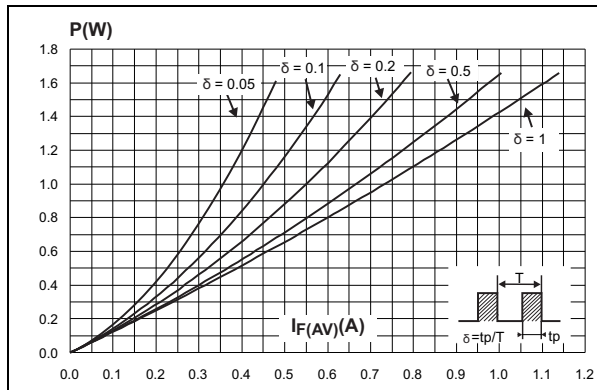


Figure 2. Forward voltage drop versus forward current (typical values)

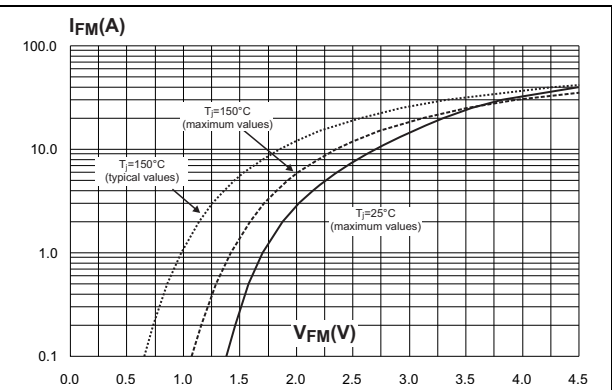


Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)

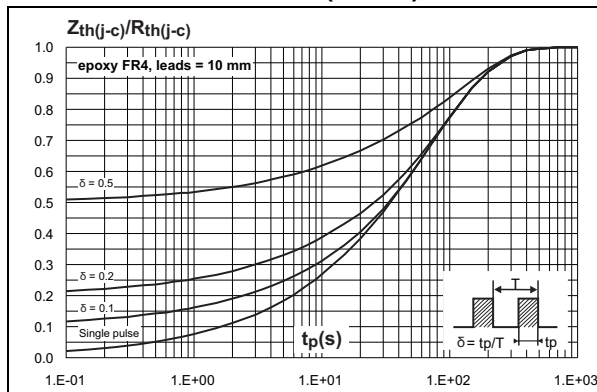


Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (SMA)

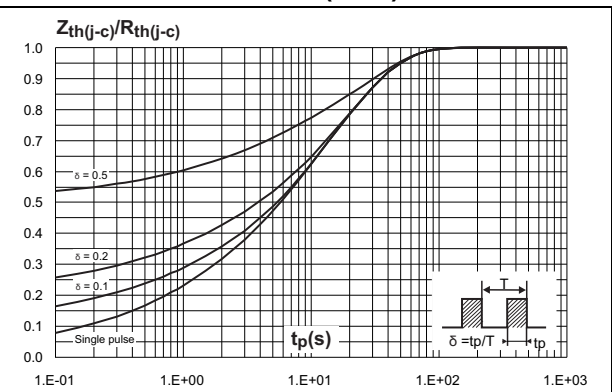


Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (DO-41)

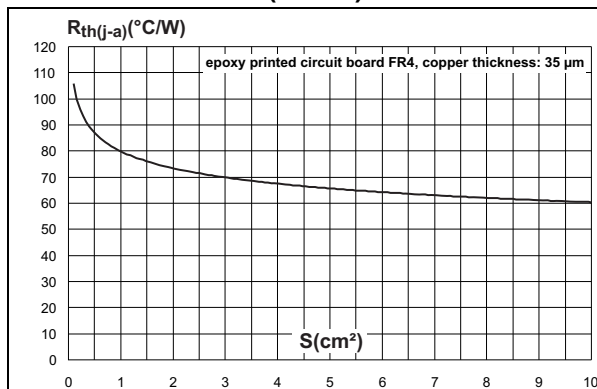
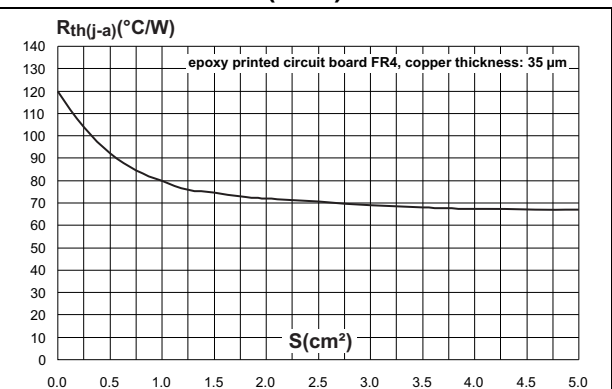


Figure 6. Thermal resistance junction to ambient versus copper surface under each lead (SMA)



## 2 Package information

- Epoxy meets UL94,V0
- Lead-free package
- Band indicates cathode
- Bending method (DO-41): see Application note AN1471

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

Figure 7. SMA dimensions definitions

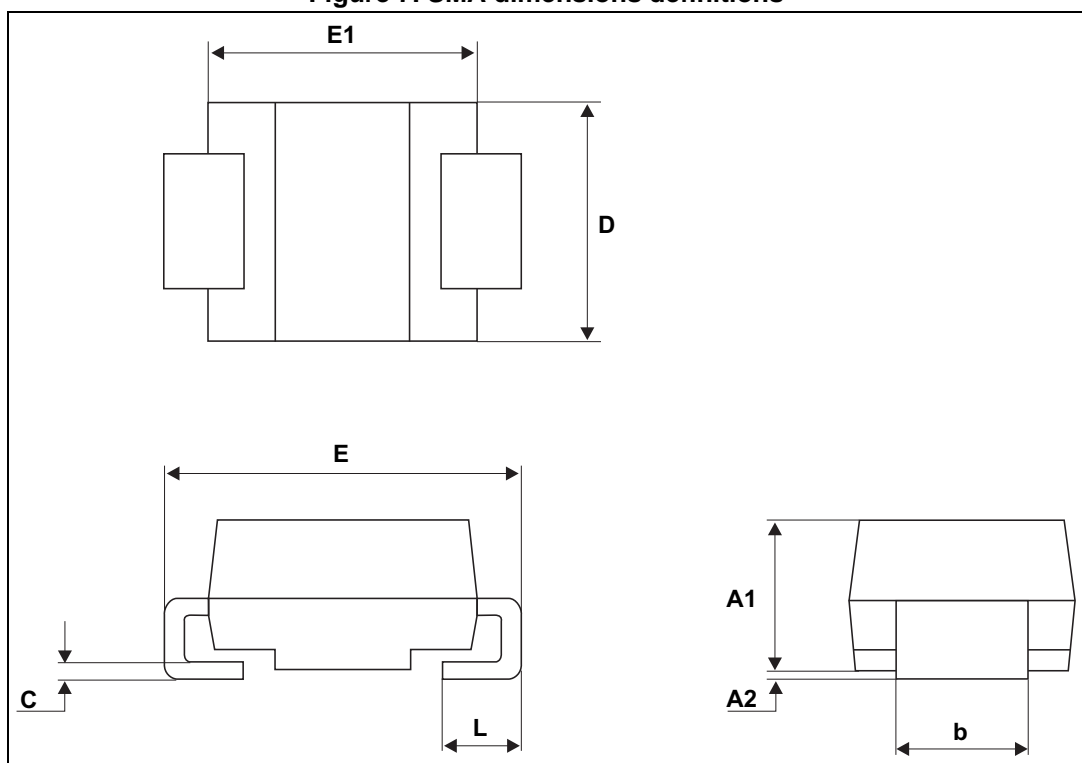


Table 6. SMA dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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 8. SMA footprint, dimensions in mm (inches)

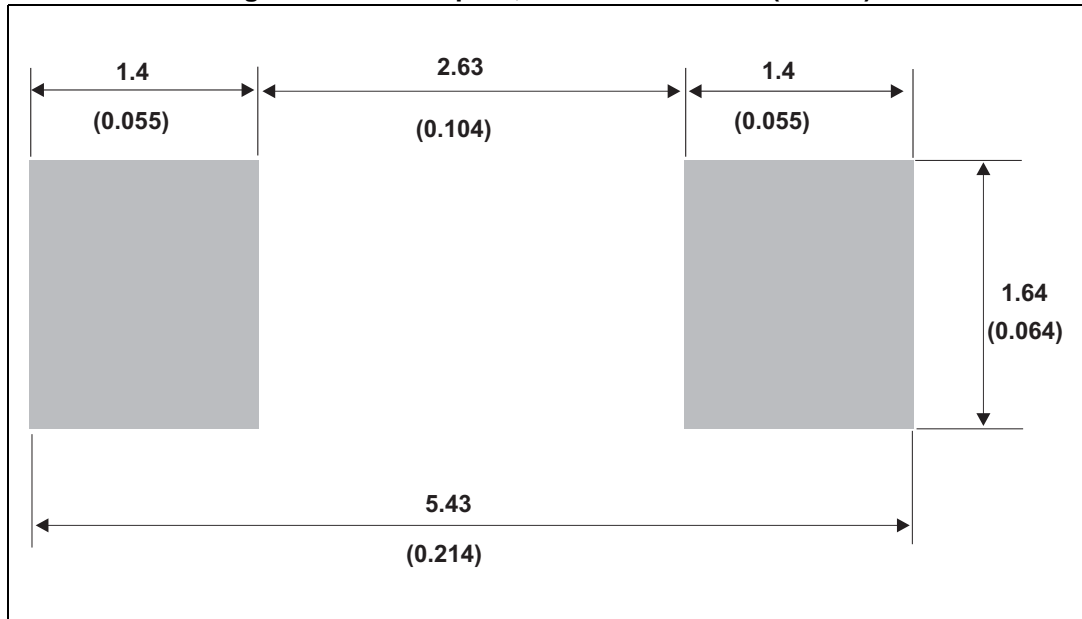


Figure 9. DO-41 (plastic) dimensions definitions

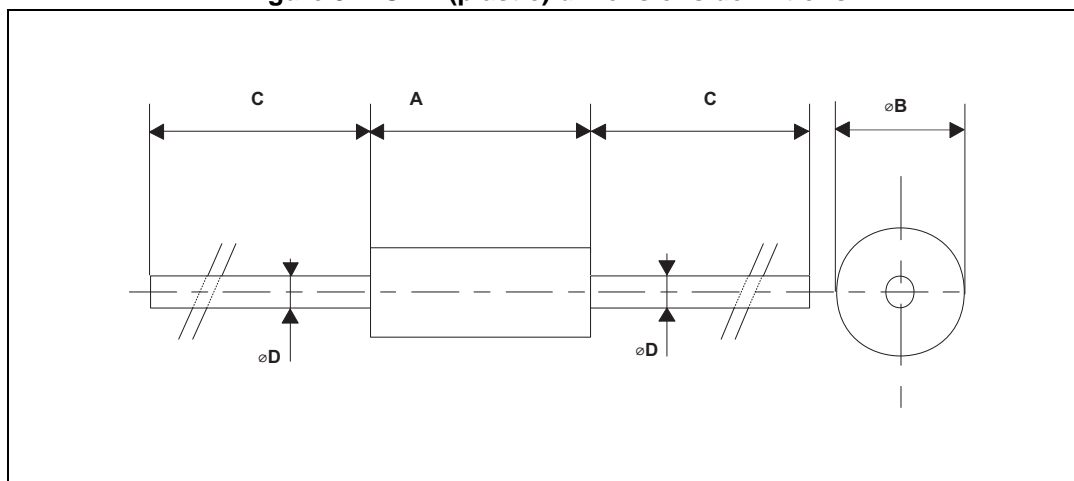


Table 7. DO-41 (plastic) dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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 codes	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 13"
STTH110RL	STTH110	DO-41	0,34 g	5000	Tape and reel 13"

### 4 Revision history

**Table 9. Document revision history**

Date	Revision	Changes
Jan-2003	1	Initial release.
30-Sept-2009	2	Updated <a href="#">Table 8</a> .
20-Dec-2013	3	Updated <a href="#">Table 4</a> .

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