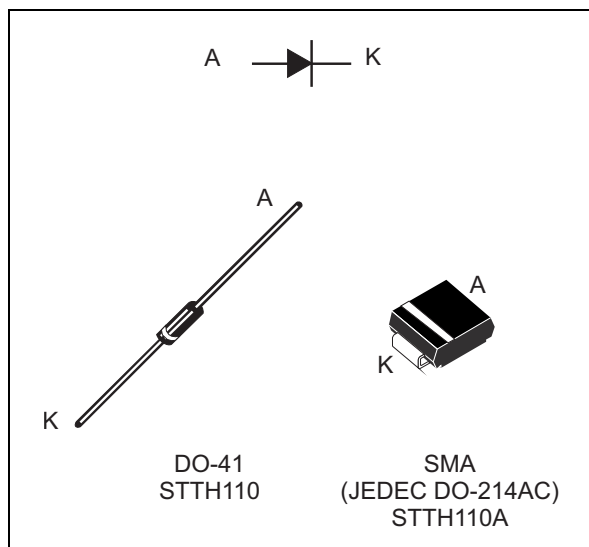


High voltage ultrafast rectifier

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 forward 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 $T_j = 25\text{ °C}$, 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	$T_L = 110\text{ °C } \delta = 0.5$	1	A
		DO-41	$T_L = 125\text{ °C } \delta = 0.5$	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	°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	DO-41	45	
$R_{th(j-a)}$	Junction to ambient	Lead length = 10 mm	DO-41	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	μA
		$T_j = 125\text{ °C}$				50	
V_F	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$			1.7	V
		$T_j = 150\text{ °C}$			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	$T_j = 25\text{ °C}$	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			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

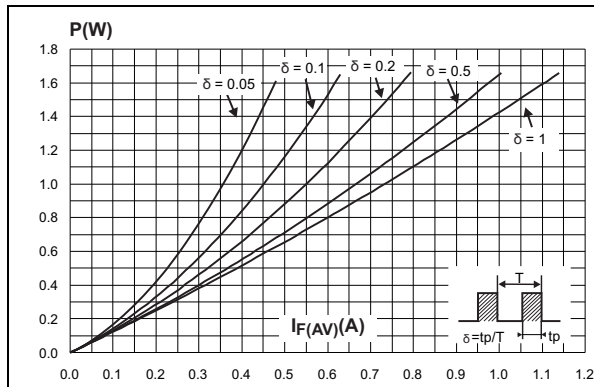


Figure 2. Forward voltage drop versus forward current (typical values)

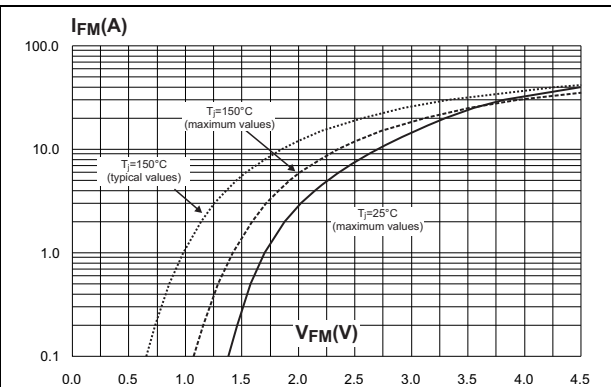


Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)

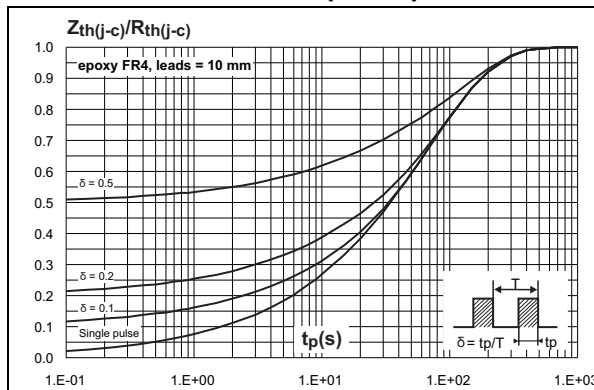


Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (SMA)

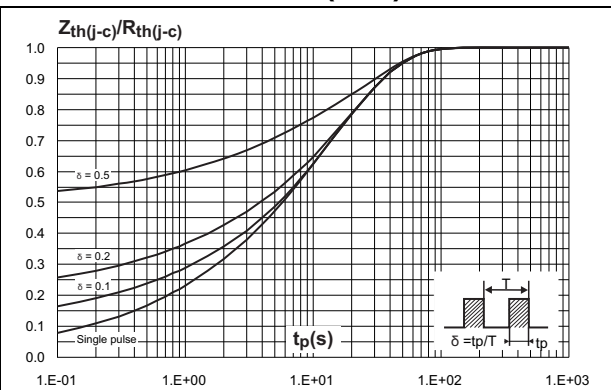


Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (DO-41)

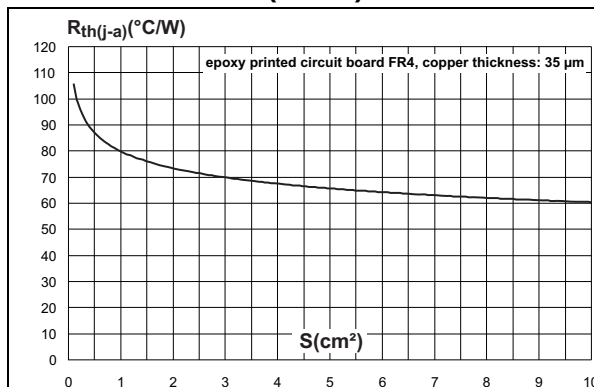
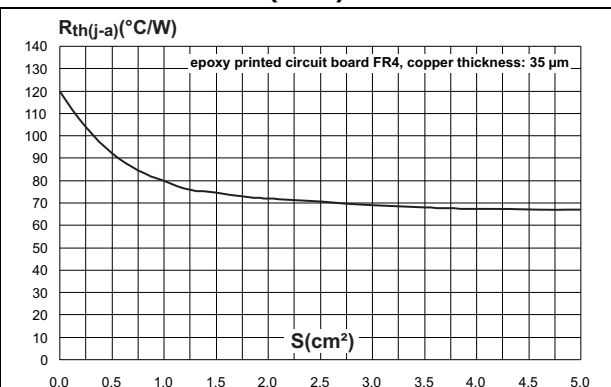


Figure 6. Thermal resistance junction to ambient versus copper surface under each lead (SMA)



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[®] 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.

Figure 7. SMA dimensions definitions

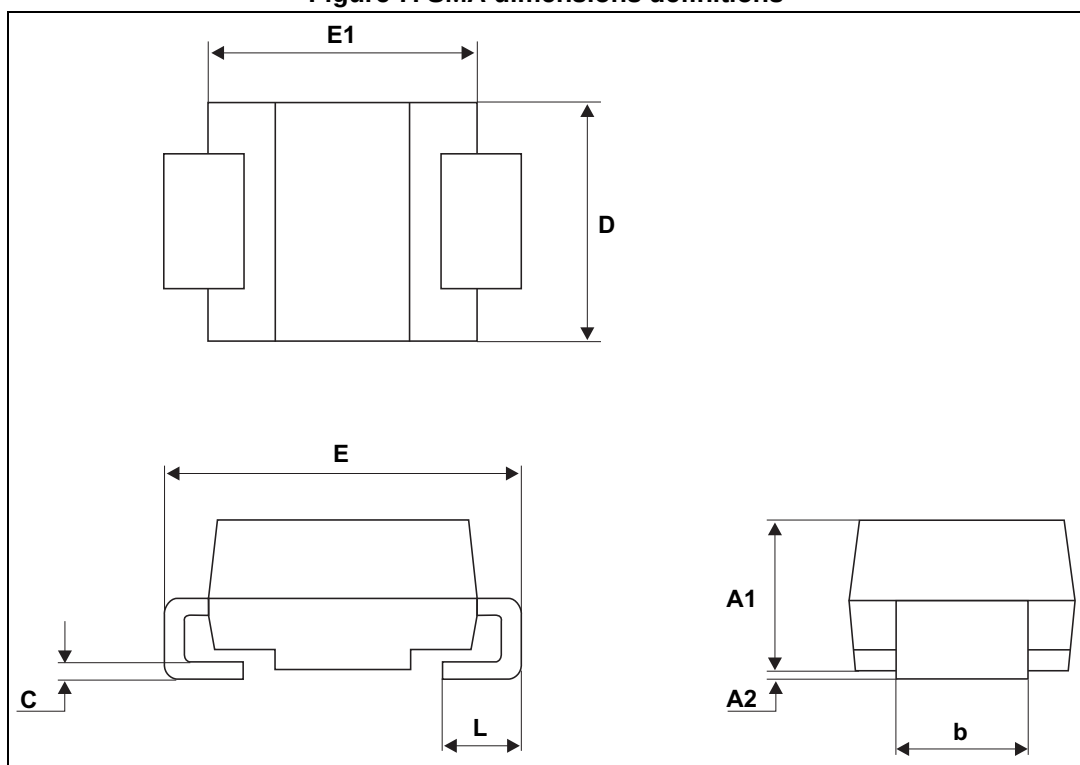


Table 6. SMA dimension values

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)

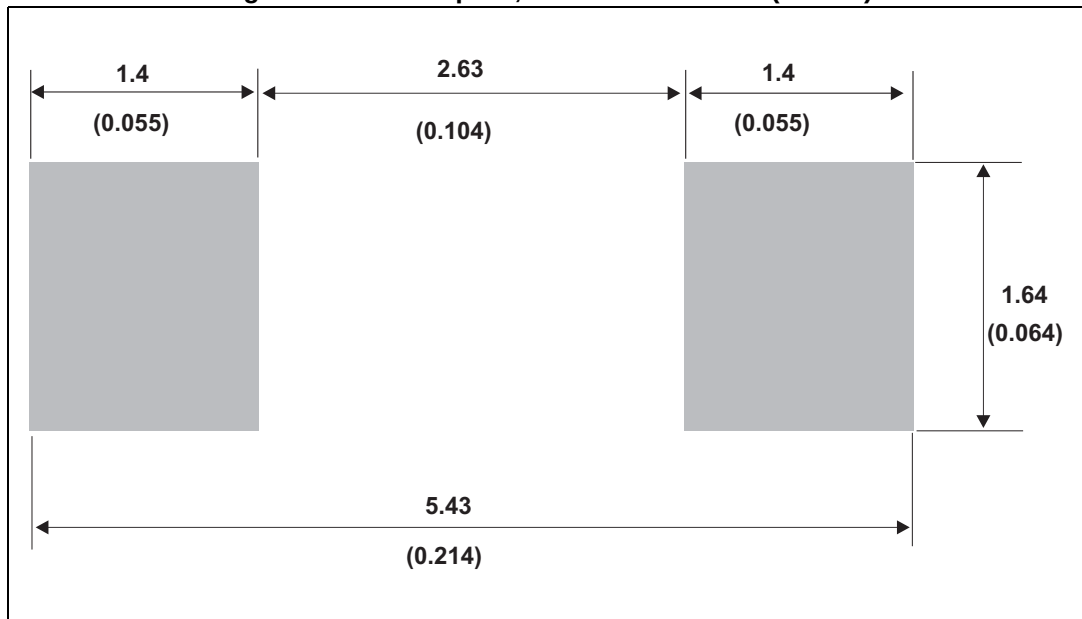


Figure 9. DO-41 (plastic) dimensions definitions

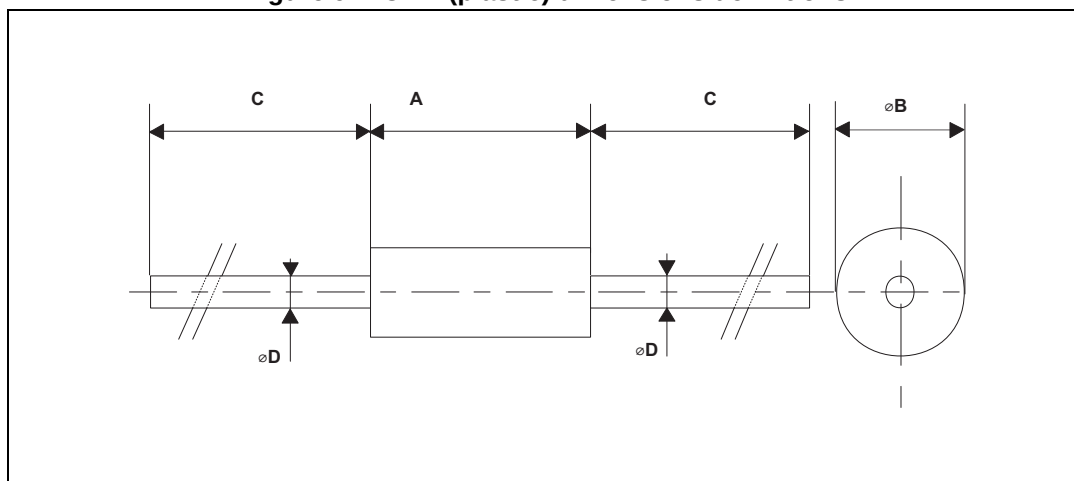


Table 7. DO-41 (plastic) dimension values

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 Table 8 .
20-Dec-2013	3	Updated Table 4 .

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