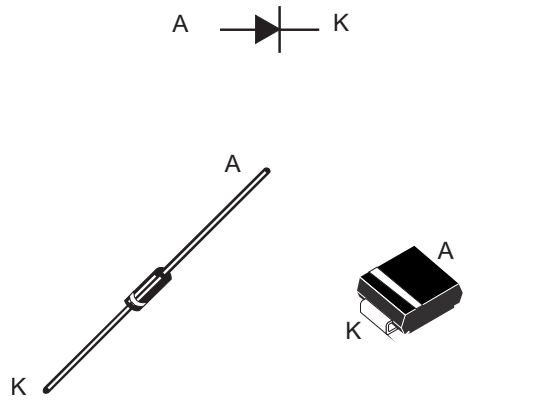
STTH110

High voltage ultrafast rectifier

Datasheet - production data



DO-41
STTH110

SMA
(JEDEC DO-214AC)
STTH110A

Description

The STTH110, which is using ST ultrafast high voltage planar technology, is especially suited for free-wheeling, clamping, snubbering, 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 °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 °C δ = 0.5		1	A
		DO-41	T_L = 125 °C δ = 0.5		1	
I_{FSM}	Forward Surge current t = 8.3 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 °C	V_R = 1000 V			10	µA
		T_j = 125 °C				50	
V_F	Forward voltage drop	T_j = 25 °C	I_F = 1 A			1.7	V
		T_j = 150 °C			0.98	1.42	

To evaluate the conduction losses use the following equation:

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

Table 5. Dynamic electrical characteristics

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

Figure 1. Conduction losses versus average current

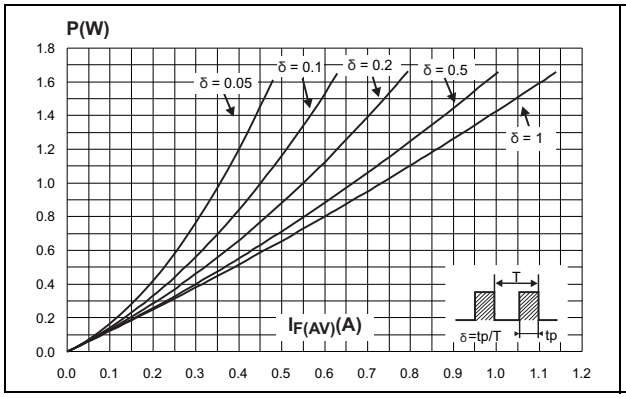


Figure 2. Forward voltage drop versus forward current (typical values)

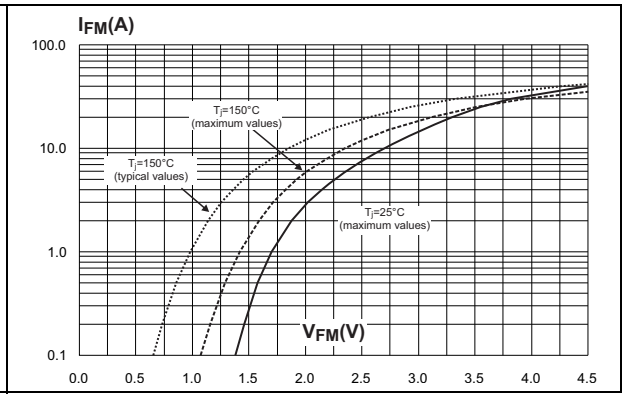


Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)

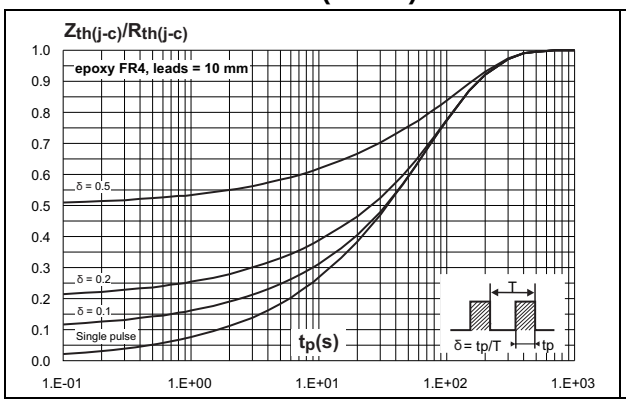


Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (SMA)

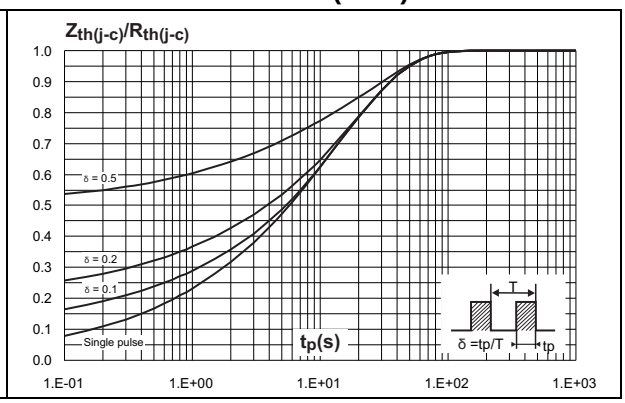


Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (DO-41)

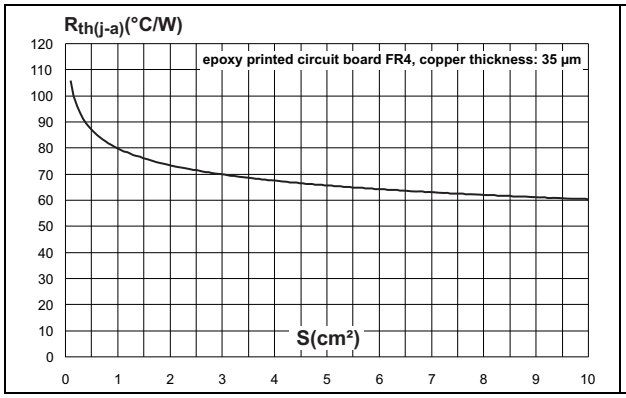
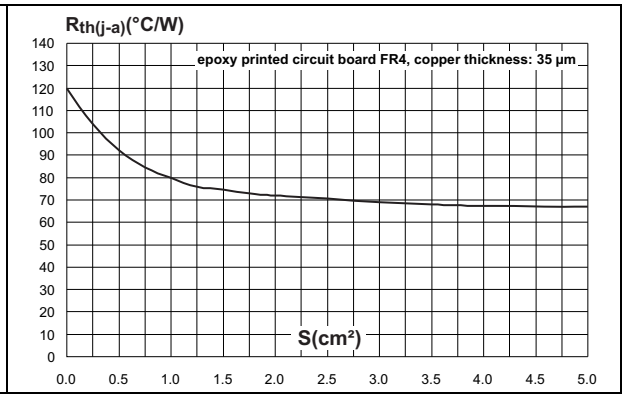


Figure 6. Thermal resistance junction to ambient versus copper surface under each lead (SMA)



2 Package information

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

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Figure 7. SMA dimensions definitions

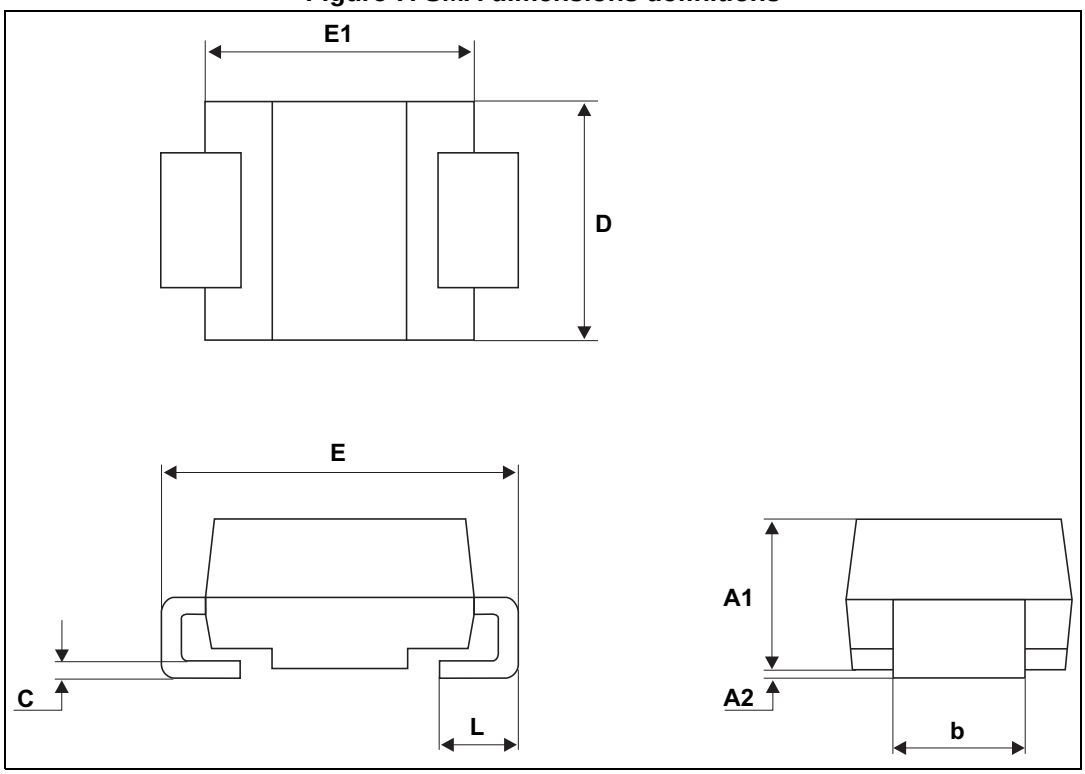

Table 6. SMA dimension values

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)

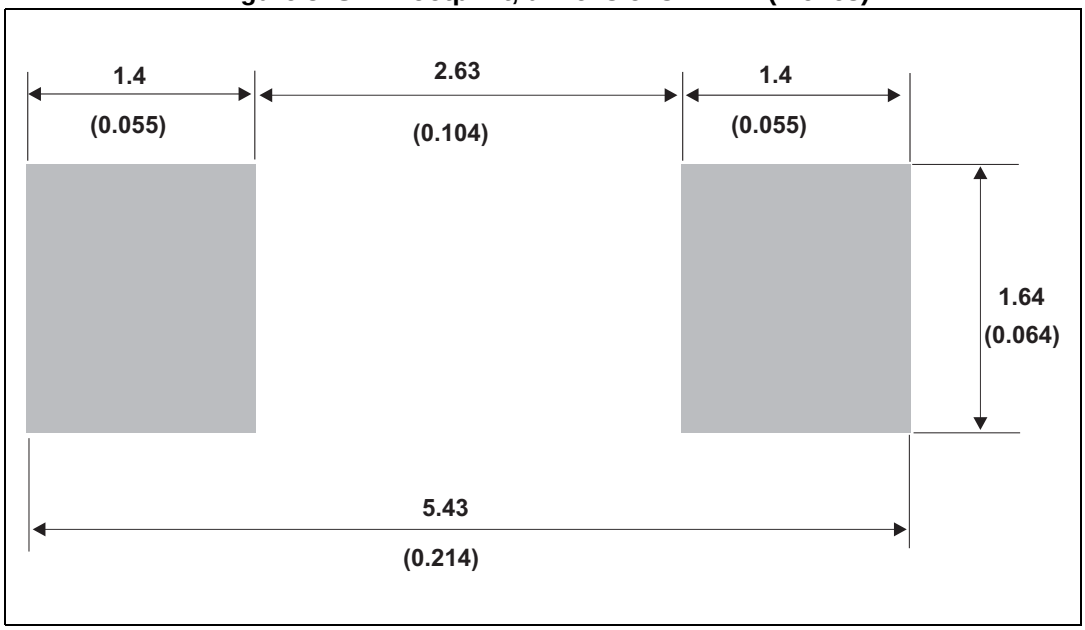

Figure 9. DO-41 (plastic) dimensions definitions

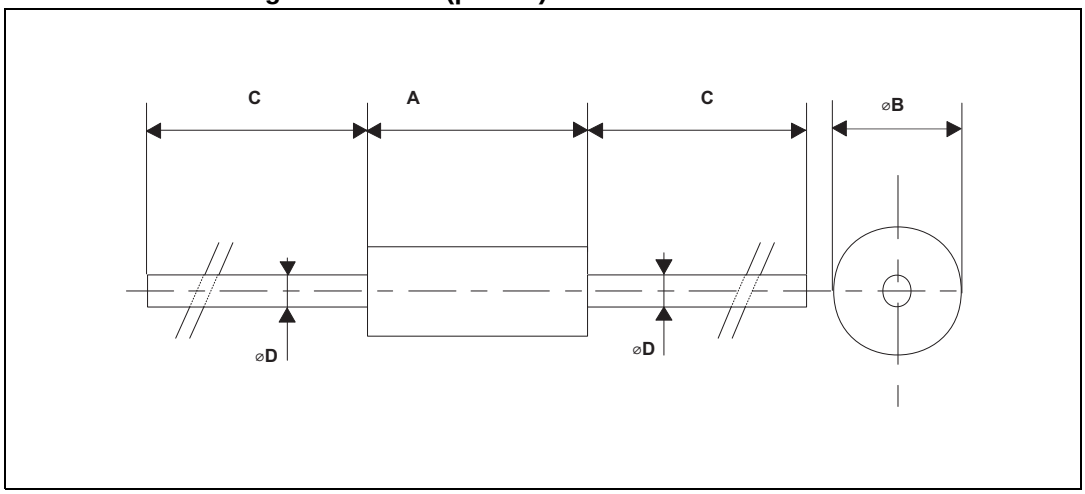

Table 7. DO-41 (plastic) dimension values

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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