

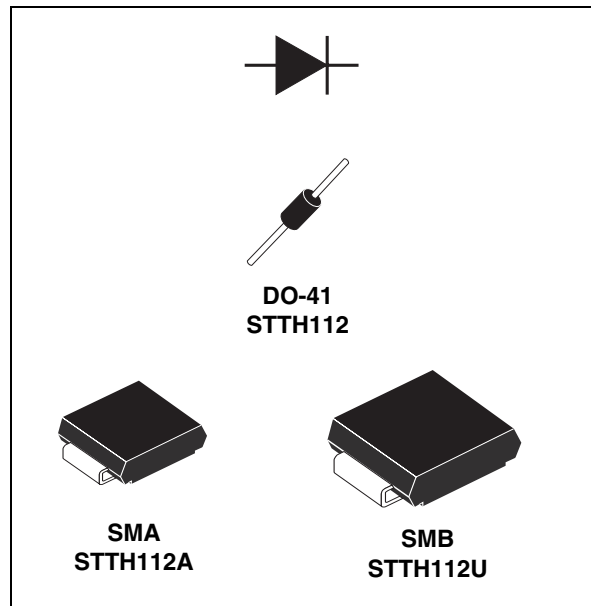
## High voltage ultrafast rectifier

### Features

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

### Description

The STTH112, 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
$V_{RRM}$	1200 V
$T_{j(max)}$	175 °C
$V_F(max)$	1.65 V

# 1 Electrical characteristics

## Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage			1200	V
$V_{(RMS)}$	Voltage rms			850	V
$I_{F(AV)}$	Average forward current	TI = 85°C $\delta = 0.5$	DO-41	1	A
		TI = 115°C $\delta = 0.5$	SMA		
		TI = 125°C $\delta = 0.5$	SMB		
$I_{FSM}$	Forward surge current $t = 8.3$ ms	DO-41		20	A
		SMA		18	
		SMB			
$T_{stg}$	Storage temperature range			- 50 + 175	°C
$T_j$	Maximum operating junction temperature			+ 175	°C

**Table 2. Thermal parameters**

Symbol	Parameter			Value	Unit
$R_{th(j-l)}$	Junction to lead	L = 10 mm	DO-41	45	°C/W
				30	
				25	
$R_{th(j-a)}$	Junction to ambient	L = 10 mm	DO-41	110	

**Table 3. Static electrical characteristics**

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R$	Reverse leakage current	$V_R = 1200$ V	$T_j = 25$ °C			5	$\mu$ A
			$T_j = 125$ °C			50	
$V_F$	Forward voltage drop	$I_F = 1$ A	$T_j = 25$ °C			1.9	V
			$T_j = 125$ °C		1.17	1.65	
			$T_j = 150$ °C		1.10	1.55	

**Table 4. Dynamic electrical characteristics**

Symbol	Parameter	Tests 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	$I_F = 1$ A $di_F/dt = 50$ A/ $\mu$ s $V_{FR} = 1.1 \times V_{Fmax}$	$T_j = 25$ °C			500	ns
$V_{FP}$	Forward recovery voltage					30	V

Figure 1. Conduction losses versus average current

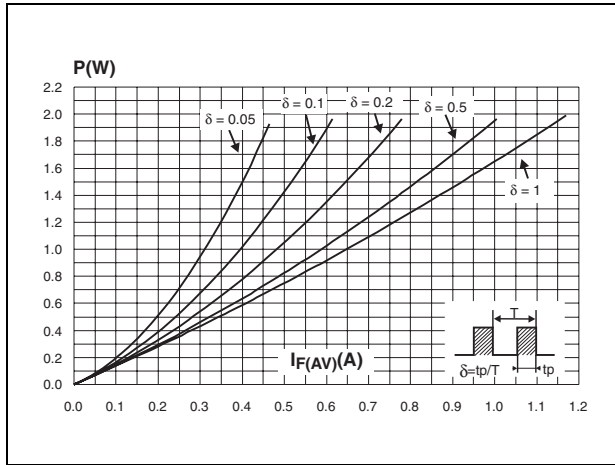


Figure 2. Forward voltage drop versus forward current

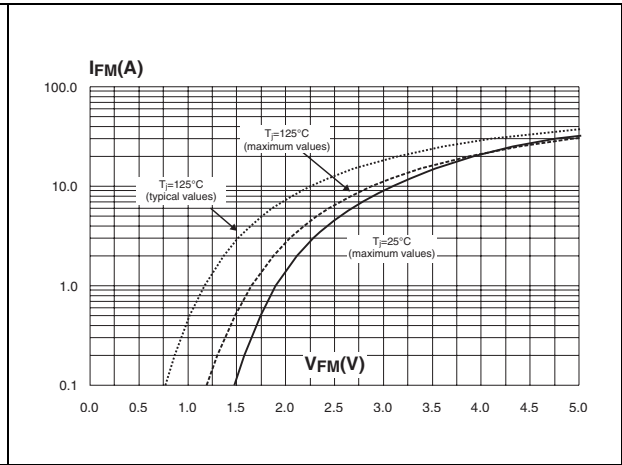


Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)

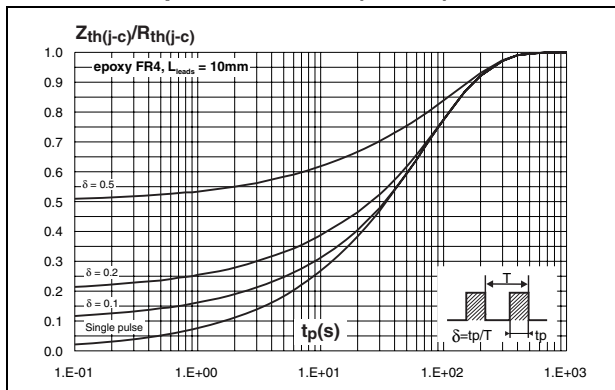


Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA)

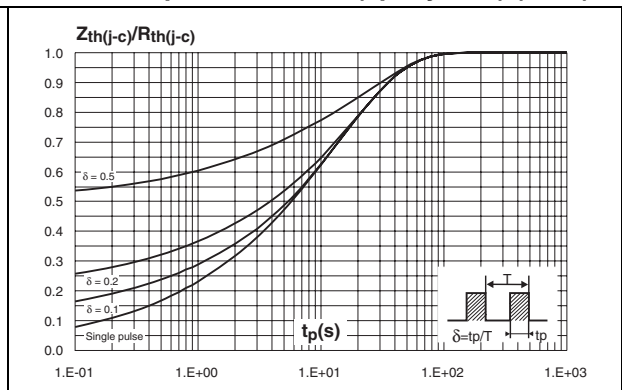


Figure 5. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4)(SMB)

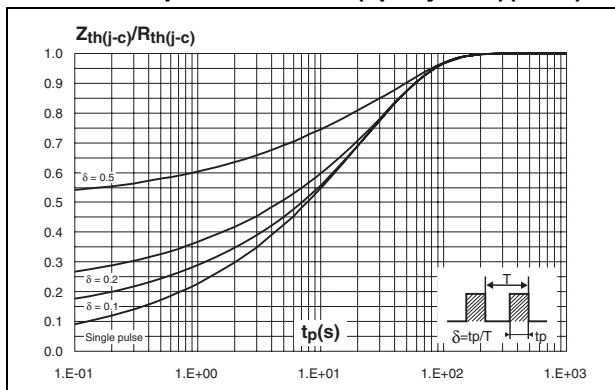
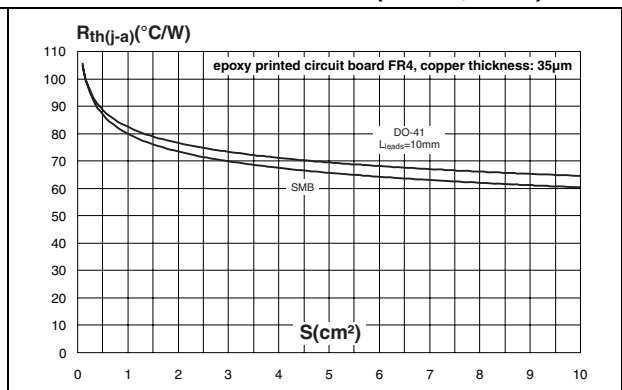
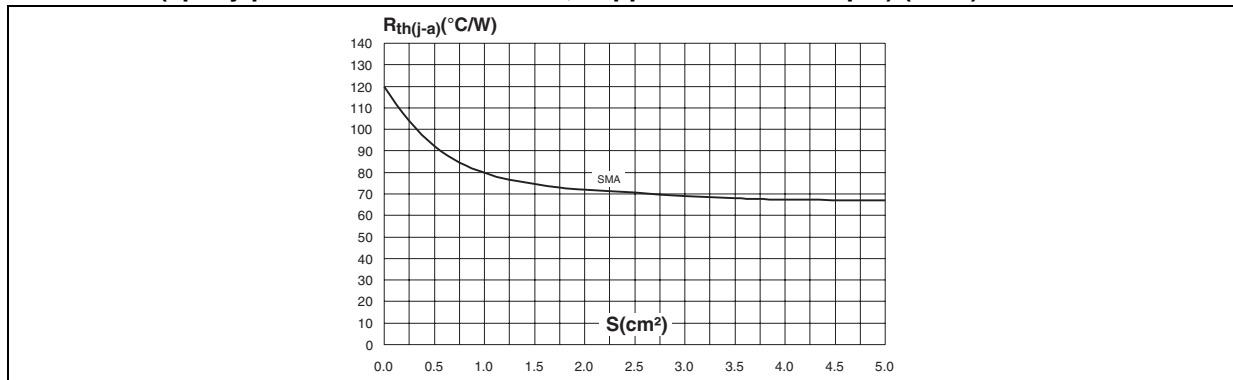


Figure 6. Thermal resistance junction to ambient versus copper surface under each lead (DO-41, SMB)



**Figure 7. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)**



## 2 Package information

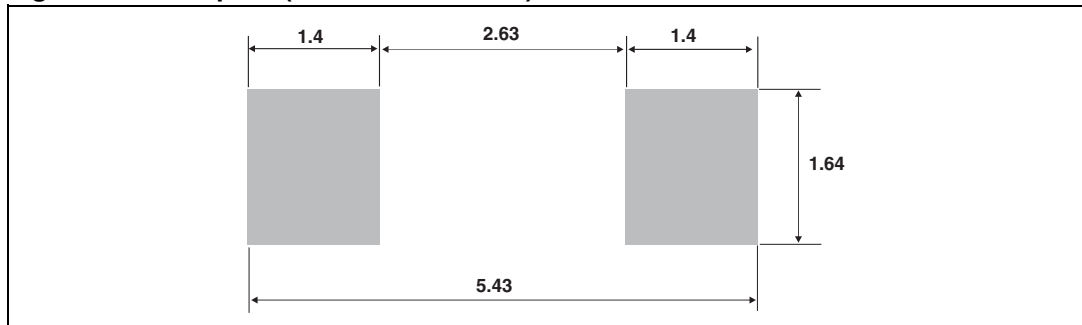
- Epoxy meets UL 94, V0
- Band indicates cathode
- Bending method (DO-41): see Application note AN1471

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.

**Table 5. 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

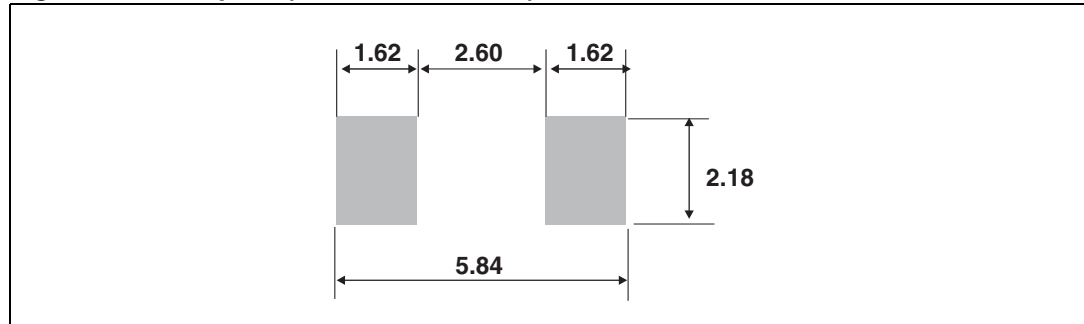
**Figure 8. Footprint (dimensions in mm)**



**Table 6. SMB 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	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
D	3.30	3.95	0.130	0.156
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
L	0.75	1.50	0.030	0.059

**Figure 9. Footprint (dimensions in mm)**



**Table 7. DO-41 (plastic) 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
STTH112	STTH112	DO-41	0.34 g	2000	Ammopack
STTH112A	H12	SMA	0.068 g	5000	Tape and reel
STTH112U	U12	SMB	0.11 g	2500	Tape and reel
STTH112RL	STTH112	DO-41	0.34 g	5000	Tape and reel

### 4 Revision history

**Table 9. Document revision history**

Date	Revision	Changes
Jan-2003	2	Initial release.
22-Jun-2005	3	New value of $T_j = 150\text{ °C}$ added to table 2. Dimensions A1 E and D updated in Table 4. Data sheet reformatted. No other technical changes.
20-Mar-2007	4	Reformatted to current standards. Updated dimensions and footprints for SMA and SMB packages.
30-Sep-2009	5	Updated table 7 package dimensions.

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