

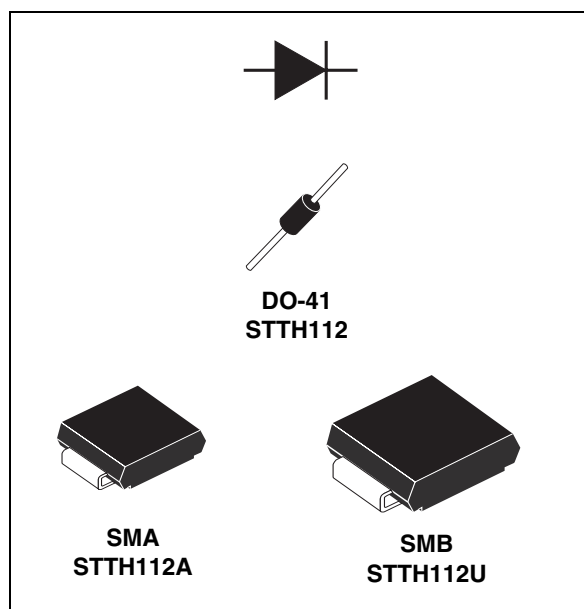
## High voltage ultrafast rectifier

### 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 <sub>RRM</sub>	Repetitive peak reverse voltage			1200	V
V <sub>(RMS)</sub>	Voltage rms			850	V
I <sub>F(AV)</sub>	Average forward current	TI = 85°C    δ =0.5	DO-41	1	A
		TI = 115°C    δ =0.5	SMA		
		TI = 125°C    δ =0.5	SMB		
I <sub>FSM</sub>	Forward surge current    t = 8.3 ms	DO-41		20	A
		SMA		18	
		SMB			
T <sub>stg</sub>	Storage temperature range			- 50 + 175	°C
T <sub>j</sub>	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
			SMA	30	
			SMB	25	
$R_{th(j-a)}$	Junction to ambient	L = 10 mm	DO-41	110	

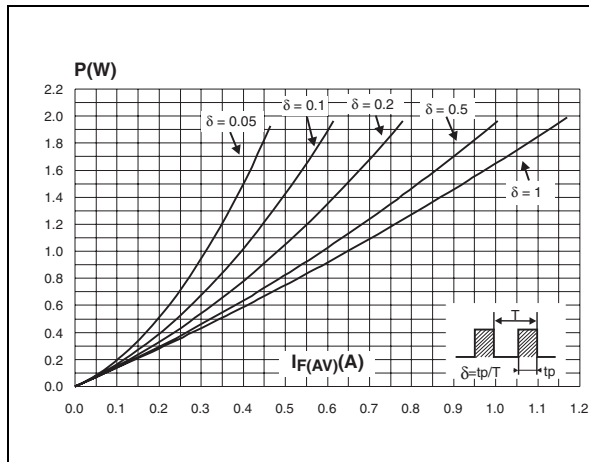
**Table 3. Static electrical characteristics**

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

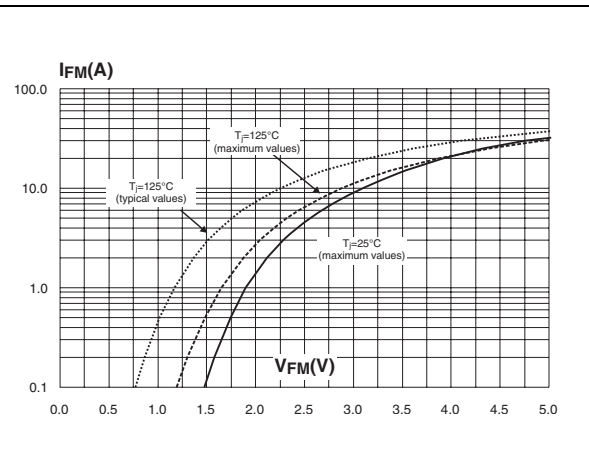
**Table 4. Dynamic electrical characteristics**

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$I_F = 0.5 \text{ A}$ $I_{rr} = 0.25 \text{ A}$ $I_R = 1 \text{ A}$	$T_j = 25 \text{ °C}$			75	ns
$t_{fr}$	Forward recovery time	$I_F = 1 \text{ A}$ $dI_F/dt = 50 \text{ A}/\mu\text{s}$	$T_j = 25 \text{ °C}$			500	ns
$V_{FP}$	Forward recovery voltage	$V_{FR} = 1.1 \times V_{Fmax}$				30	V

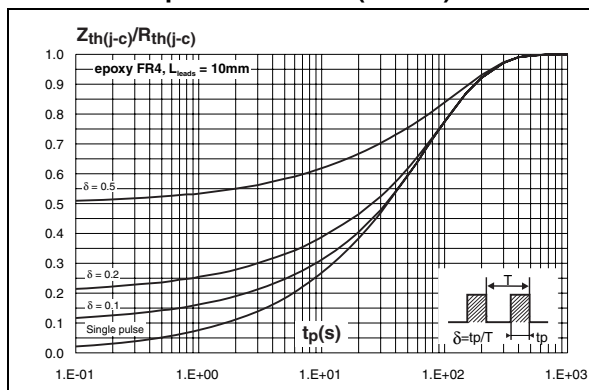
**Figure 1. Conduction losses versus average current**



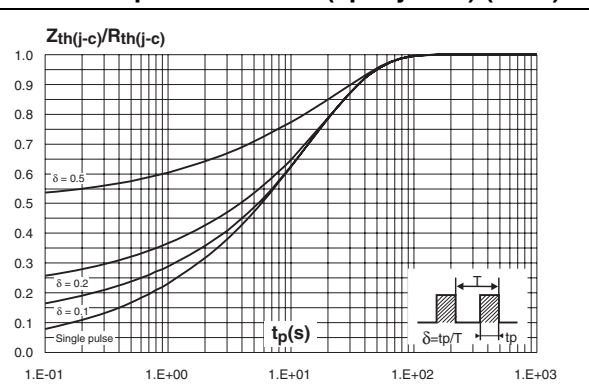
**Figure 2. Forward voltage drop versus forward current**



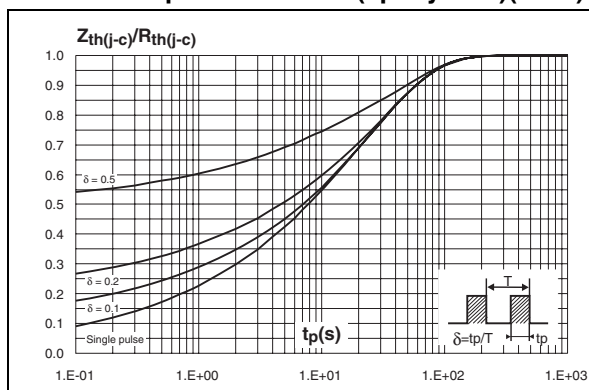
**Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)**



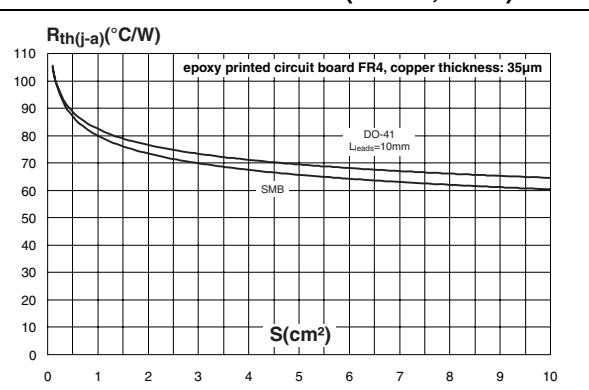
**Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA)**



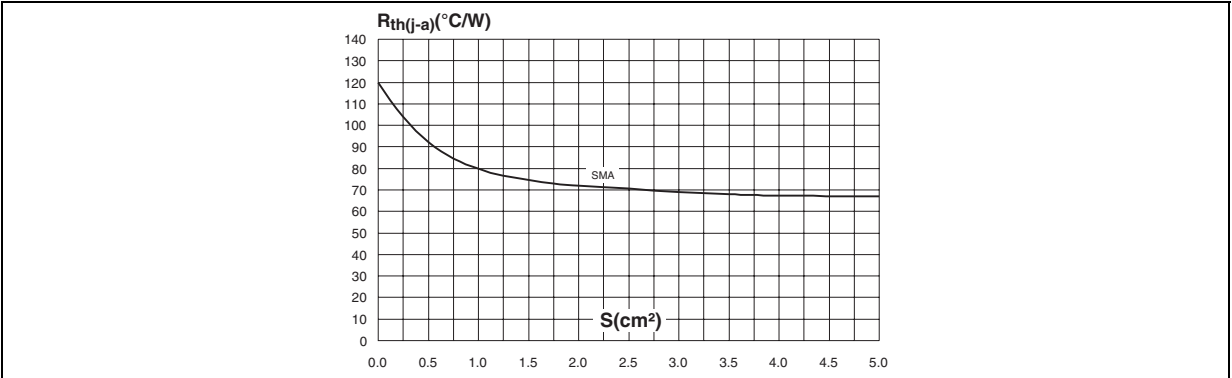
**Figure 5. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4)(SMB)**



**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

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**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)**

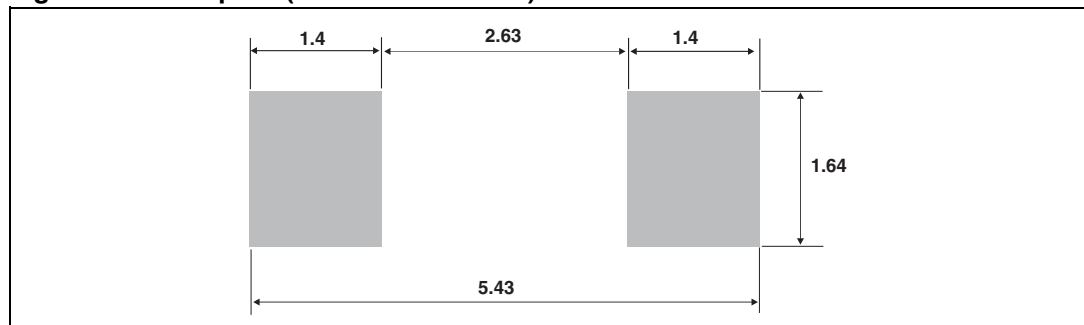


Table 6. SMB dimensions

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)

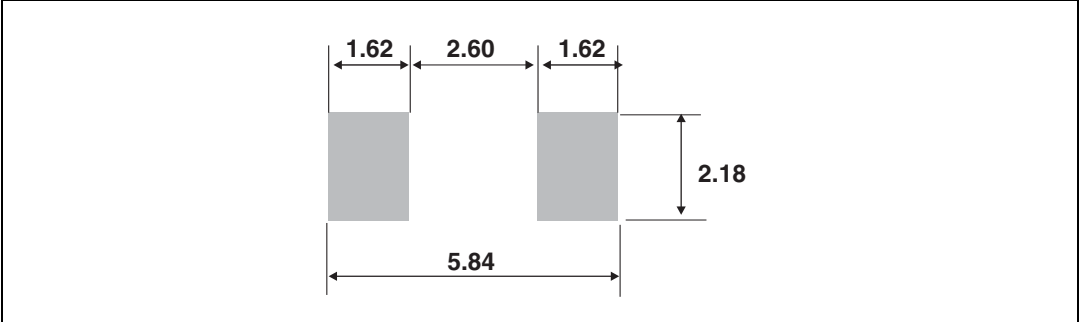


Table 7. DO-41 (plastic) dimensions

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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