STTH112

High voltage ultrafast rectifier

Features

- Low forwarded 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, snubbering, demagnetization in power supplies and other power switching applications

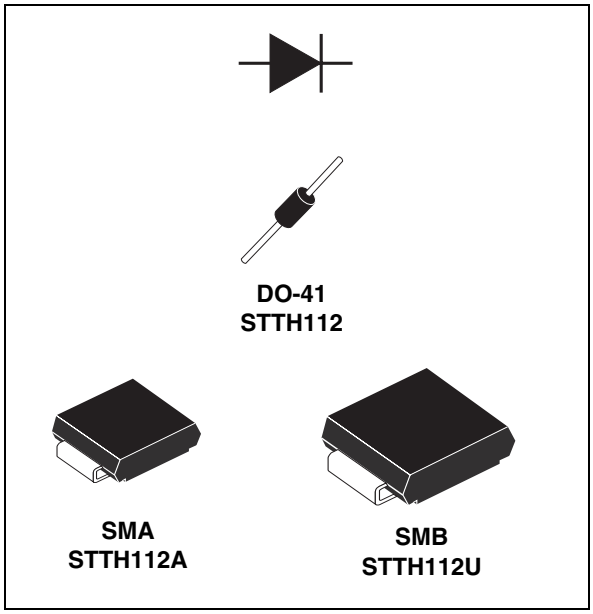


Table 1. Device summary

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	Tl = 85°C δ =0.5	DO-41	1	A
		Tl = 115°C δ =0.5	SMA		
		Tl = 125°C δ =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
			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 V	T_j = 25 °C			5	µA
			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 = 1A	T_j = 25 °C			75	ns
t_{fr}	Forward recovery time	I_F = 1 A dI_F/dt = 50 A/µs V_{FR} = 1.1 x V_{Fmax}	T_j = 25 °C			500	ns
V_{FP}	Forward recovery voltage					30	V

Figure 1. Conduction losses versus average current

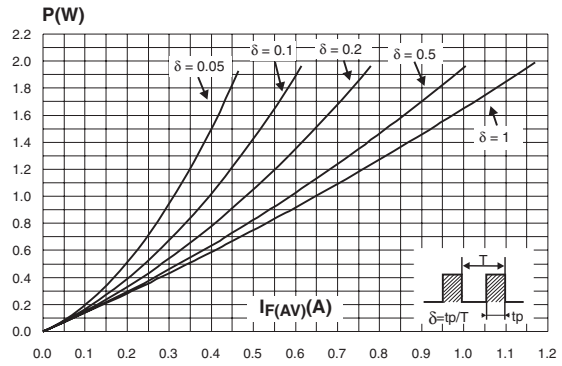


Figure 2. Forward voltage drop versus forward current

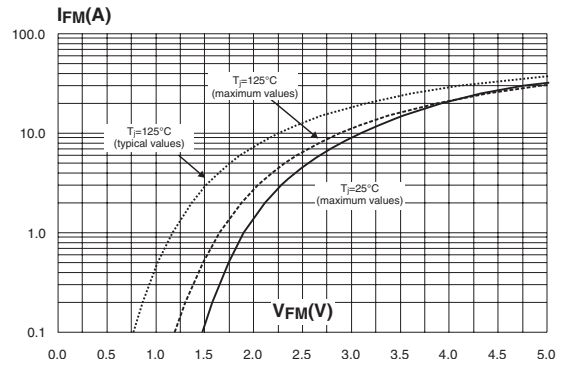


Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)

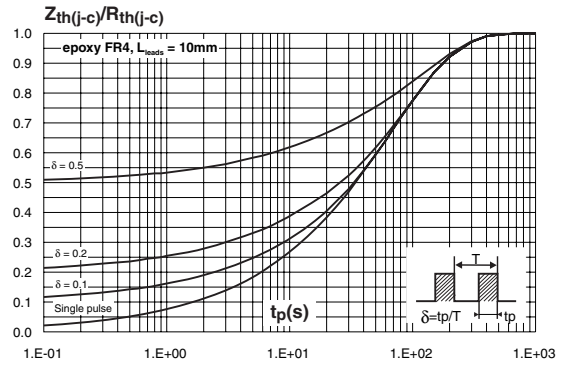


Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA)

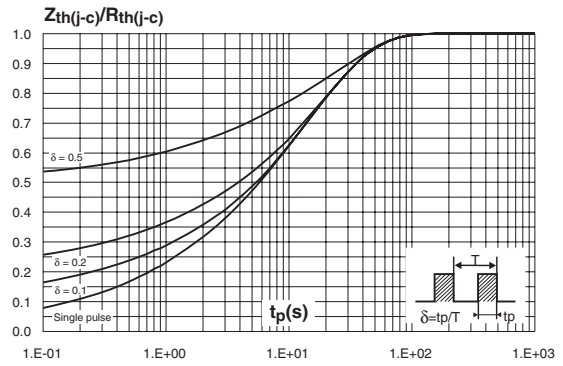


Figure 5. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4)(SMB)

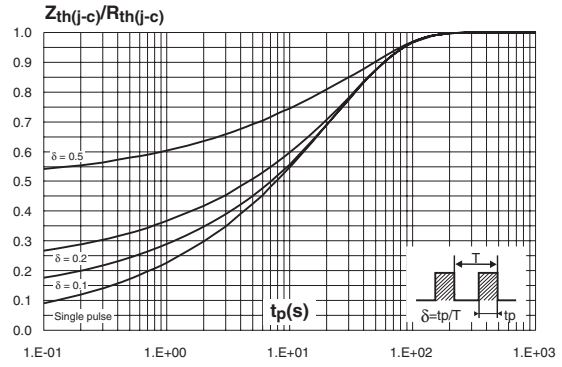


Figure 6. Thermal resistance junction to ambient versus copper surface under each lead (DO-41, SMB)

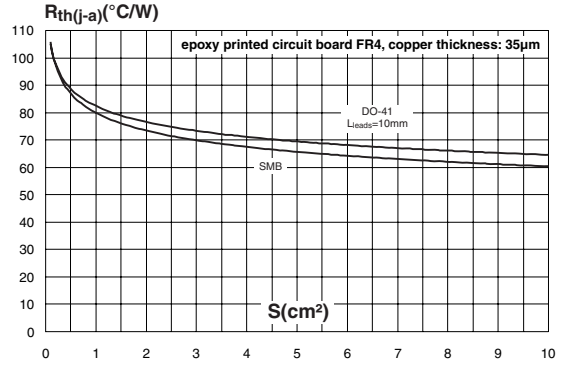
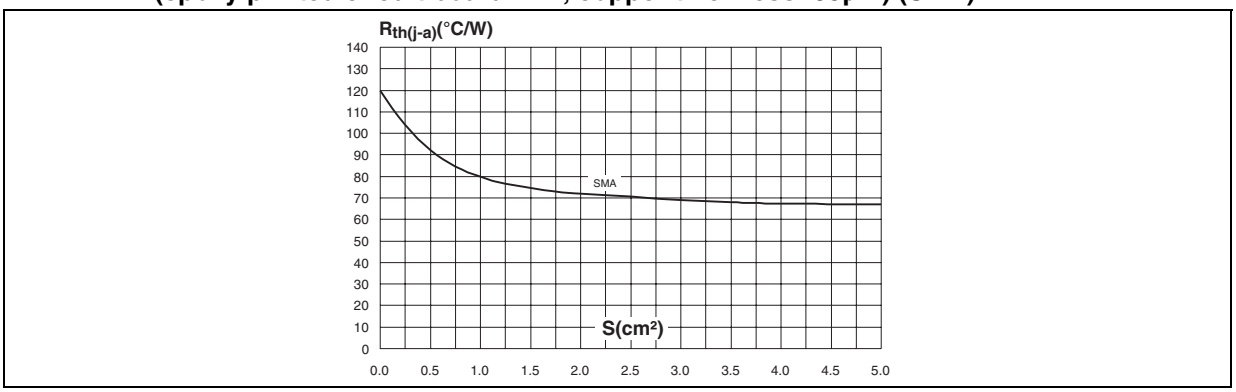


Figure 7. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)

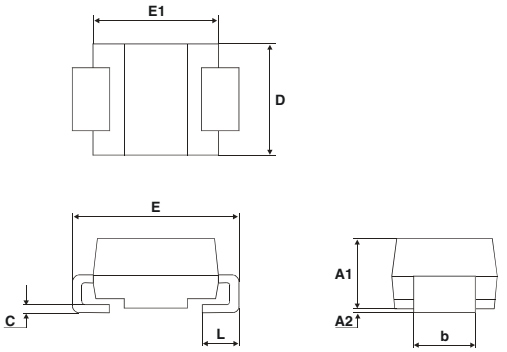


2 Package information

- 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® 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.

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)

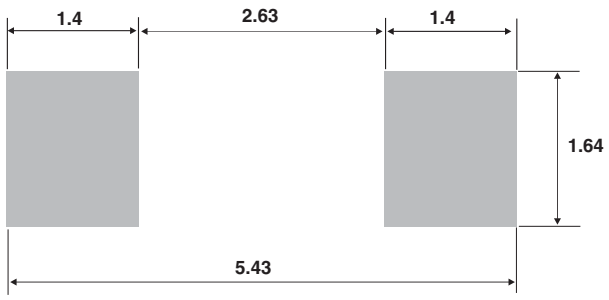
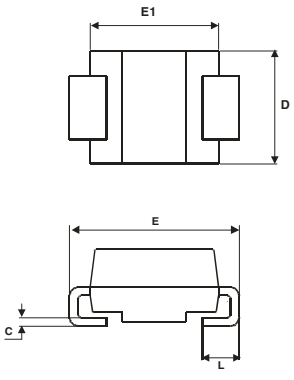


Table 6. SMB dimensions



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)

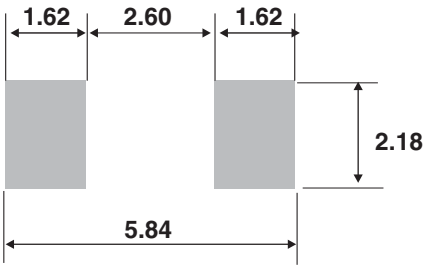
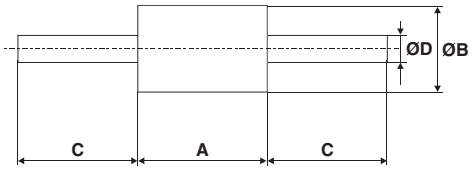


Table 7. DO-41 (plastic) dimensions



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 °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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