

HIGH VOLTAGE ULTRAFAST RECTIFIER

MAIN PRODUCT CHARACTERISTICS

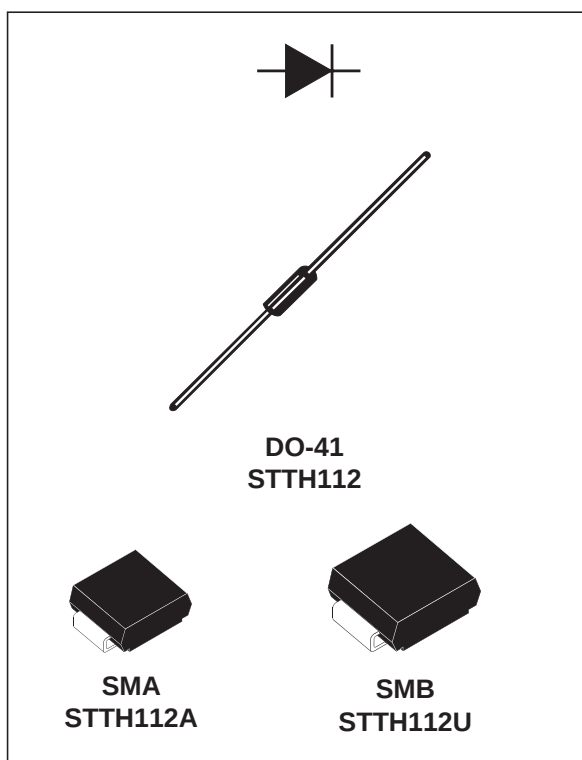
I_{F(AV)}	1 A
V_{RRM}	1200 V
T_j (max)	175 °C
V_F (max)	1.65 V

FEATURES AND BENEFITS

- 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.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			1200	V
V _(RMS)	RMS voltage			850	V
I _{F(AV)}	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 _{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

THERMAL PARAMETERS

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

STATIC ELECTRICAL CHARACTERISTICS

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

To evaluate the maximum conduction losses use the following equation :

$$P = 1.35 \times I_{F(AV)} + 0.3 \times I_F^2 (RMS)$$

DYNAMIC ELECTRICAL CHARACTERISTICS

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

Fig. 1: Conduction losses versus average current.

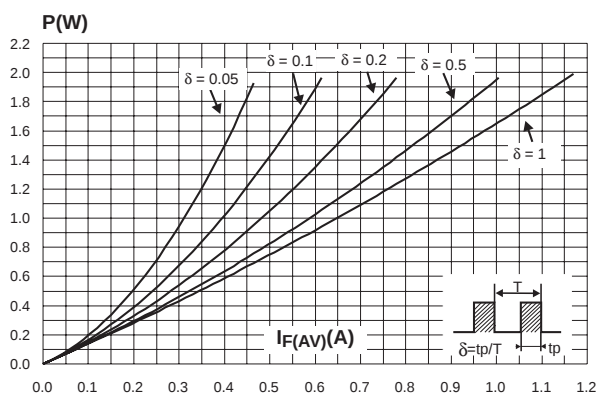


Fig. 2: Forward voltage drop versus forward current.

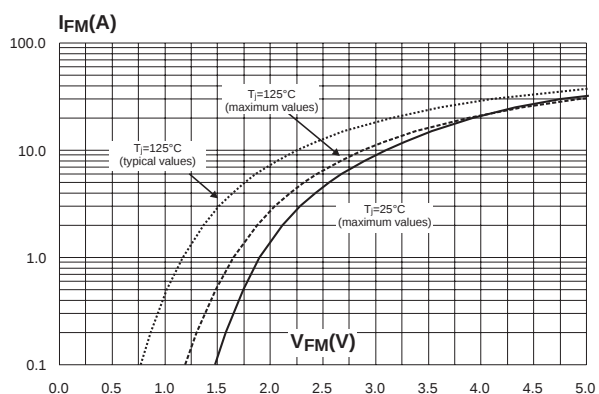


Fig. 3-1: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, $L_{\text{leads}} = 10\text{mm}$) (DO-41).

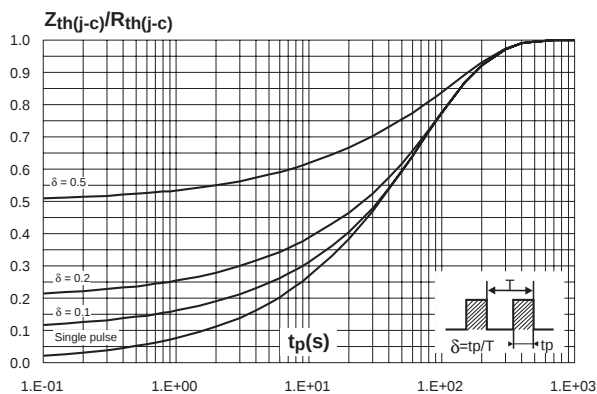


Fig. 3-2: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA).

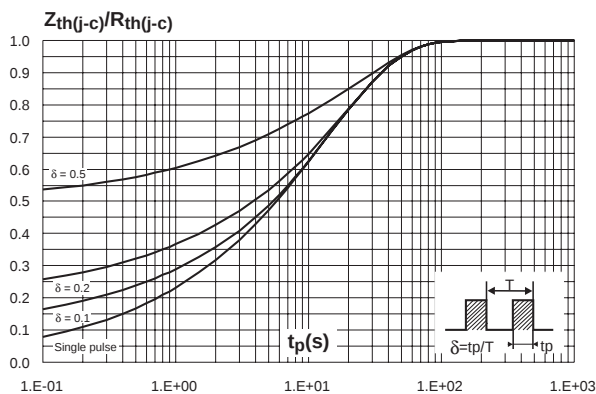


Fig. 3-3: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4)(SMB).

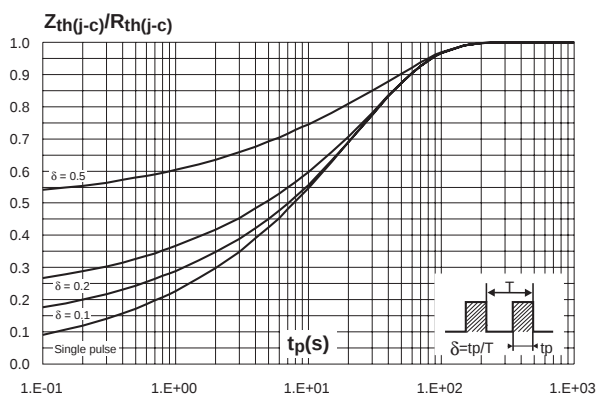


Fig. 4-1: Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: $35\mu\text{m}$) (DO-41, SMB).

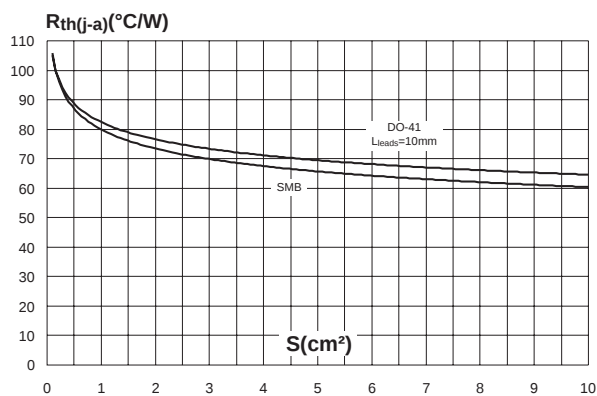
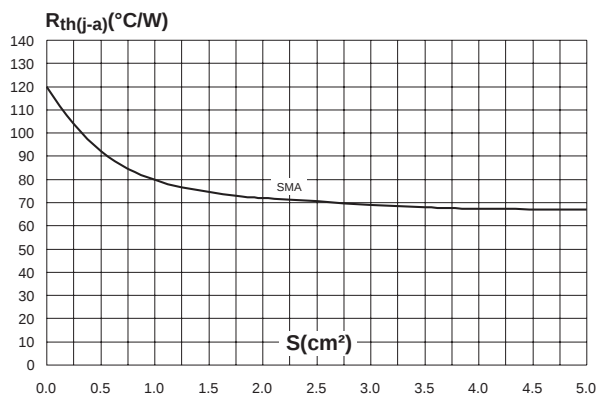


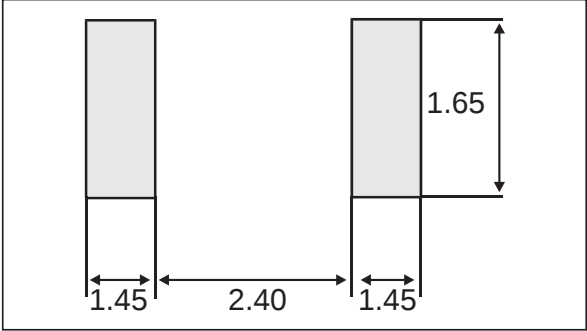
Fig. 4-2: Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: $35\mu\text{m}$) (SMA).



PACKAGE MECHANICAL DATA
SMA

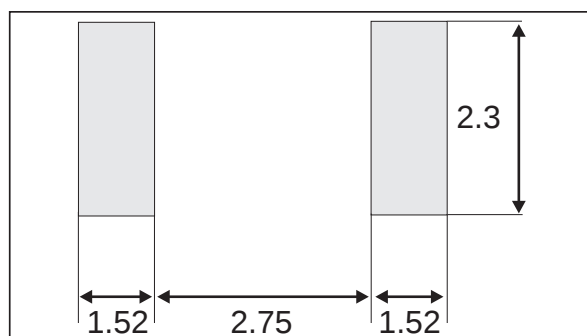
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

FOOTPRINT (in millimeters)



PACKAGE MECHANICAL DATA
SMB

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	0.41	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.60	0.030	0.063

FOOTPRINT (in millimeters)


PACKAGE MECHANICAL DATA

DO-41

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	28		1.102	
D	0.712	0.863	0.028	0.034

Ordering 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 & reel
STTH112U	U12	SMB	0.11 g	2500	Tape & reel
STTH112RL	STTH112	DO-41	0.34 g	5000	Tape & reel

- Epoxy meets UL 94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2003 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany
Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore
Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>