

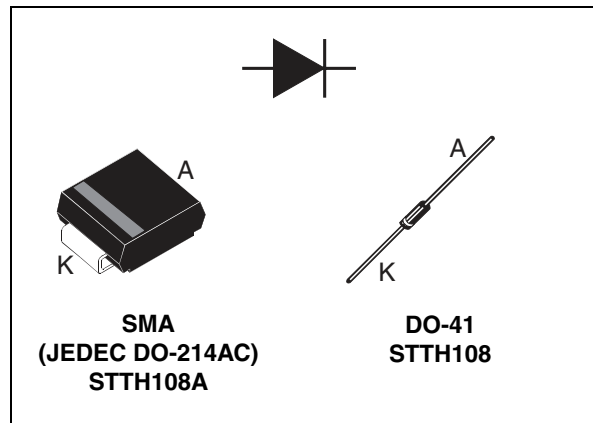
## High voltage ultrafast rectifier

### Features

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

### Description

The STTH108, 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
$V_{RRM}$	800 V
$T_j$ (max)	175 °C
$V_F$ (max)	1.25 V

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		800	V	
$V_{(RMS)}$	Voltage rms		560	V	
$I_{F(AV)}$	Average forward current	SMA	$T_L = 110\text{ °C}$ $\delta = 0.5$	1	A
		DO-41	$T_L = 130\text{ °C}$ $\delta = 0.5$		
$I_{FSM}$	Forward Surge current	$t = 8.3\text{ ms}$	SMA	20	A
			DO-41	25	
$T_{stg}$	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	$T_j = 25\text{ °C}$	$V_R = 800\text{ V}$			5	$\mu\text{A}$
		$T_j = 125\text{ °C}$			1	50	
$V_F$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$			1.65	V
		$T_j = 125\text{ °C}$			0.89	1.25	

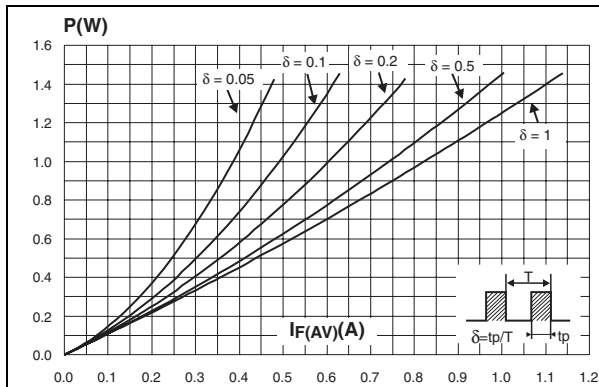
To evaluate the conduction losses use the following equation:

$$P = 1.05 \times I_{F(AV)} + 0.20 I_F^2(RMS)$$

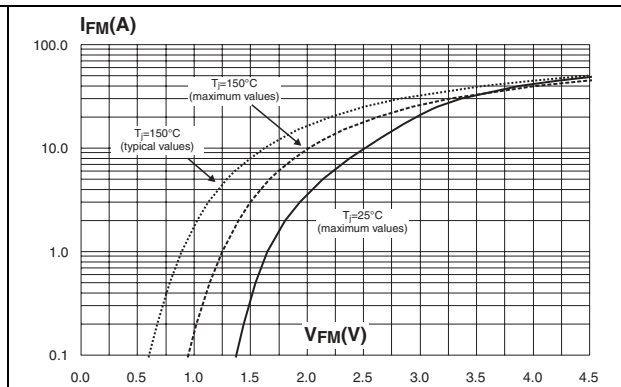
**Table 5. Dynamic electrical characteristics**

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$T_j = 25\text{ °C}$	$I_F = 0.5\text{ A}$ , $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			75	ns
$t_{fr}$	Forward recovery time	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$ , $di_F/dt = 50\text{ A/ms}$ $V_{FR} = 1.1 \times V_{Fmax}$			200	ns
$V_{FP}$	Forward recovery voltage	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$ , $di_F/dt = 50\text{ A/ms}$			12	V

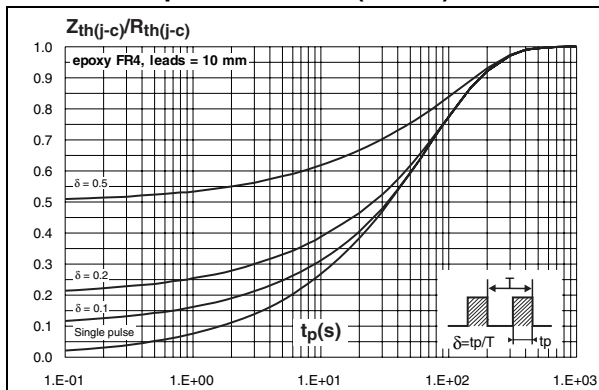
**Figure 1. Conduction losses versus average current**



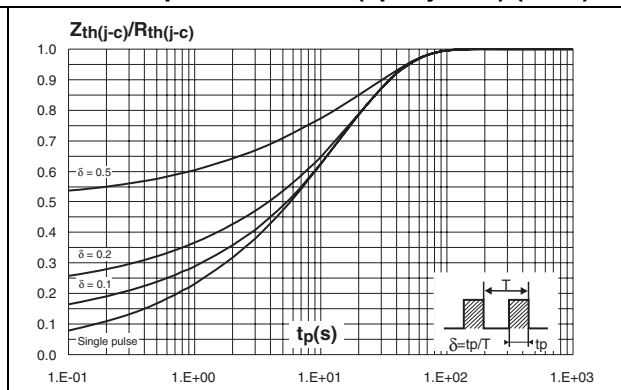
**Figure 2. Forward voltage drop versus forward current**



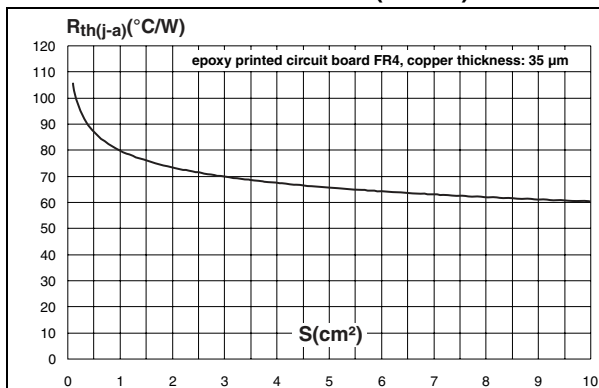
**Figure 3. Relative variation of thermal impedance junction ambient versus pulse duration (DO-41)**



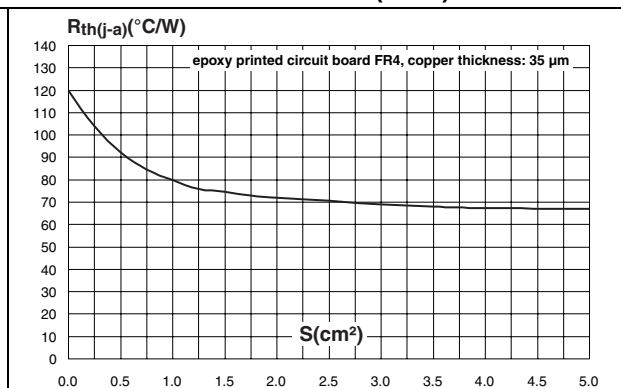
**Figure 4. Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA)**



**Figure 5. 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

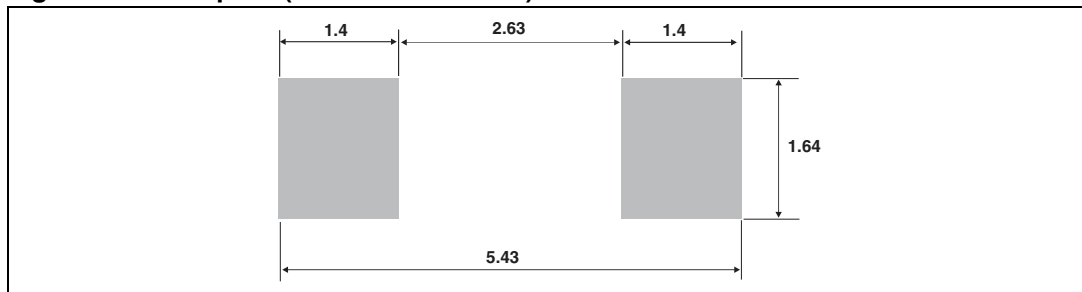
- Epoxy meets UL 94, V0
- Band indicates cathode
- Bending method (DO-41): see Application note AN1471

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 6. 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 7. Footprint (dimensions in mm)**



**Table 7. DO-41 (plastic) package 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
STTH108	STTH108	DO-41	0.34 g	2000	Ammopack
STTH108A	H08	SMA	0.068 g	5000	Tape and reel
STTH108RL	STTH108	DO-41	0.34 g	5000	Tape and reel

### 4 Revision history

**Table 9. Document revision history**

Date	Revision	Changes
Jan-2003	2	Last update.
30-Sep-2009	3	Updated table 7 package dimensions.

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