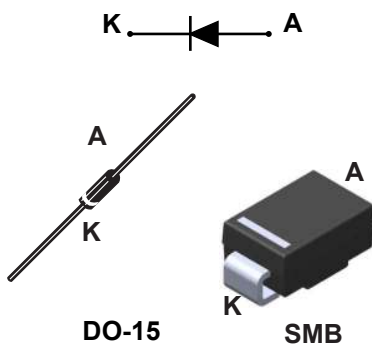


## 2 A, 800 V ultrafast recovery diode



### Features

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

### Applications

- Switching diode
- Power switching applications

### Description

The STTH208, 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.

Product status	
STTH208	
Product summary	
Symbol	Value
$I_{F(AV)}$	2 A
$V_{RRM}$	800 V
$T_{j(max.)}$	175 °C
$V_{F(typ.)}$	0.89 V
$t_{rr(max.)}$	75 ns

# 1 Characteristics

**Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		800	V	
$V_{RMS}$	RMS voltage		560	V	
$I_{F(AV)}$	Average forward current $\delta = 0.5$ , square wave	DO-15	$T_L = 60\text{ °C}$	2	A
		SMB	$T_L = 100\text{ °C}$		
$I_{FSM}$	Surge non repetitive forward current	DO-15	$t_p = 8.3\text{ ms sinusoidal}$	45	A
		SMB		35	
$T_{stg}$	Storage temperature range		-50 to +175	°C	
$T_j$	Maximum operating junction temperature		+175	°C	

**Table 2. Thermal resistance parameter**

Symbol	Parameter		Max. value	Unit	
$R_{th(j-l)}$	Junction to lead	Lead length = 10 mm on infinite heatsink	SMB	25	°C/W
	Junction to lead		DO-15	40	
$R_{th(j-a)}$	Junction to ambient			110	

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = 800\text{ V}$	-		5	μA
		$T_j = 125\text{ °C}$		-	5	50	μA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 2\text{ A}$	-		1.65	V
		$T_j = 150\text{ °C}$		-	0.89	1.25	

1. Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

2. Pulse test:  $t_p = 380\text{ μs}$ ,  $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

$$P = 0.5 \times I_{F(AV)} + 0.10 \times I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses :

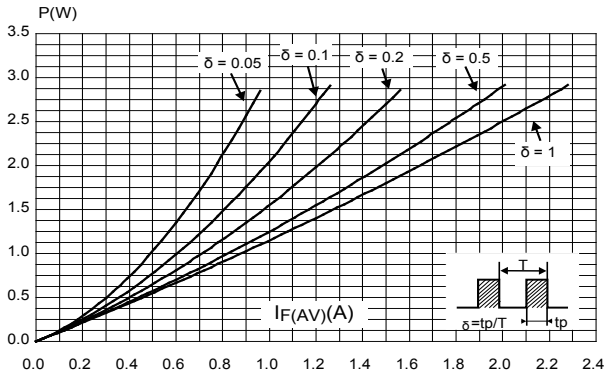
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

**Table 4. Dynamic characteristics ( $T_j = 25\text{ °C}$  unless otherwise stated)**

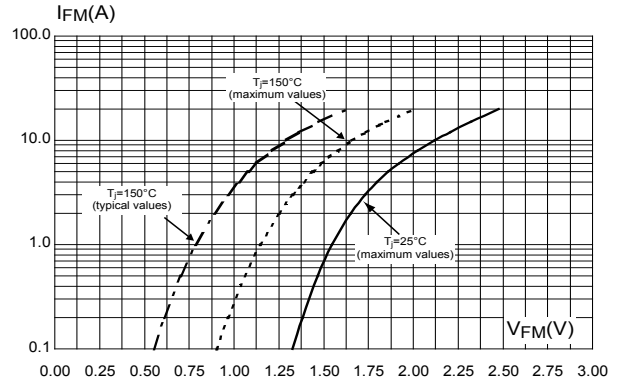
Symbol	Parameters	Test conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$I_F = 0.5\text{ A}$ , $I_{rr} = 0.25\text{ A}$ , $I_F = 1\text{ A}$	-	-	75	ns
$t_{fr}$	Forward recovery time	$I_F = 2\text{ A}$ , $di_F/dt = 50\text{ A}/\mu\text{s}$ , $V_{FR} = 1.1 \times V_{F(max.)}$	-	-	200	ns
$V_{FP}$	Forward recovery voltage		-	-	9	V

### 1.1 Characteristics (curves)

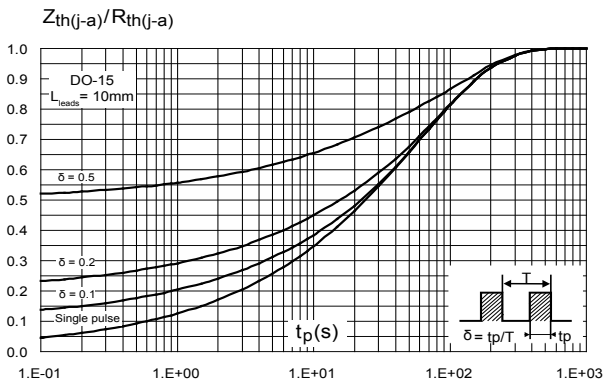
**Figure 1. Average forward power dissipation versus average forward current**



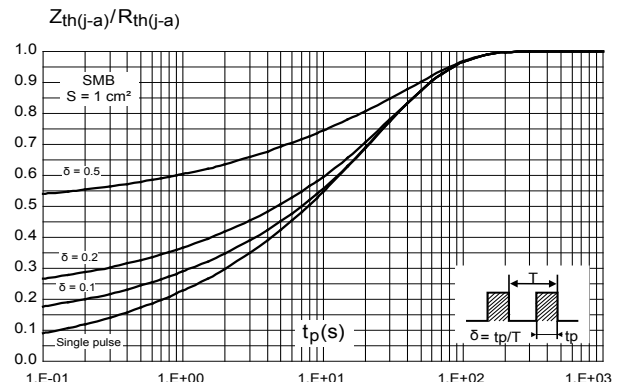
**Figure 2. Forward voltage drop versus forward current**



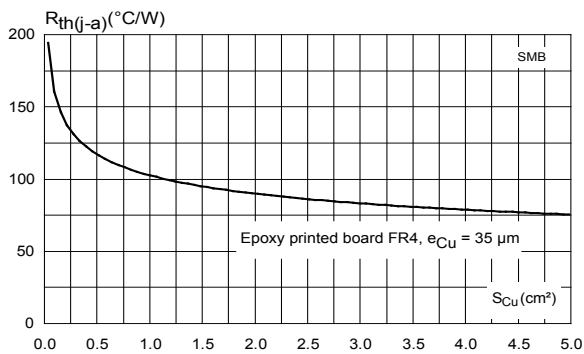
**Figure 3. Relative variation of thermal impedance junction to lead versus pulse duration (DO-15)**



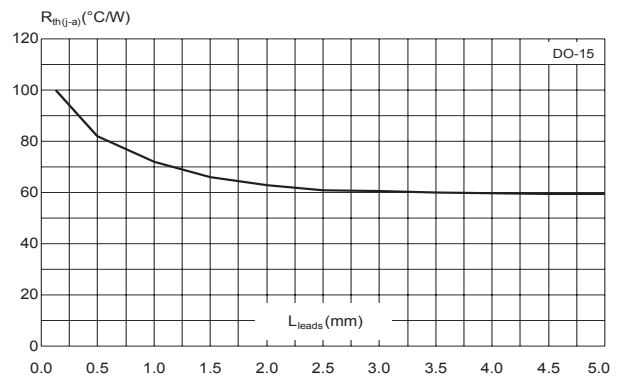
**Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration (SMB)**



**Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (typical values)**



**Figure 6. Thermal resistance junction to ambient versus lead length, DO-15**



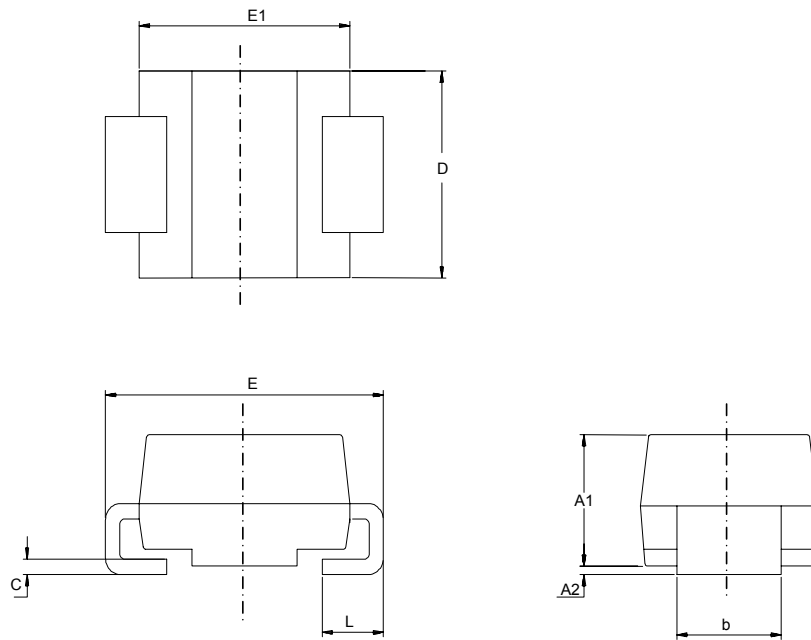
## 2 Package information

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](http://www.st.com). ECOPACK is an ST trademark.

### 2.1 SMB package information

- Epoxy meets UL94, V0
- Lead-free package

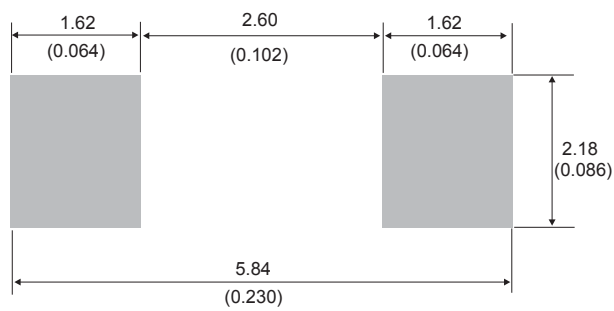
Figure 7. SMB package outline



**Table 5. SMB package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches (for reference only)	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.074	0.097
A2	0.05	0.20	0.001	0.008
b	1.95	2.20	0.076	0.087
c	0.15	0.40	0.005	0.016
D	3.30	3.95	0.129	0.156
E	5.10	5.60	0.200	0.221
E1	4.05	4.60	0.159	0.182
L	0.75	1.50	0.029	0.060

**Figure 8. SMB recommended footprint**



## 2.2 DO-15 package information

- Epoxy meets UL 94, V0

Figure 9. DO-15 package outline

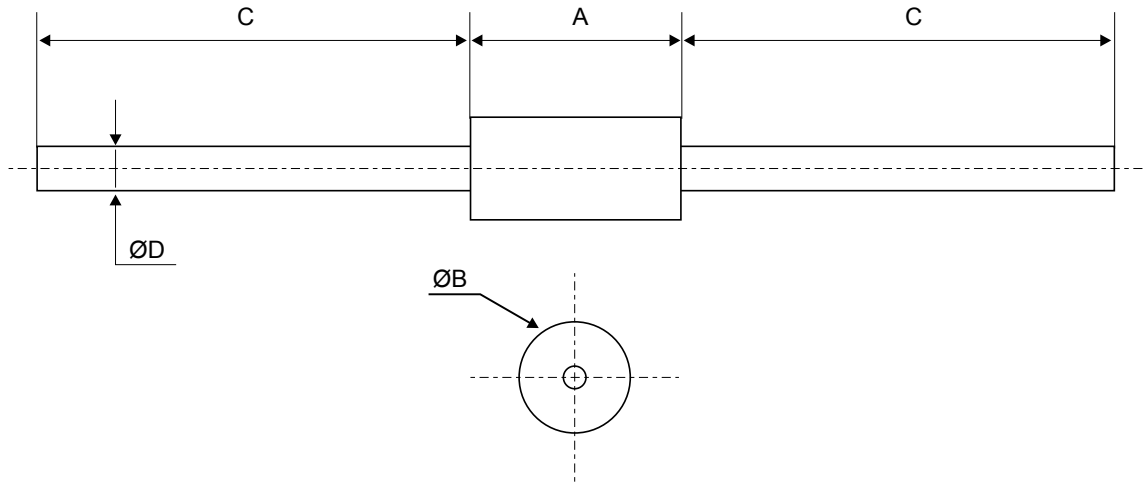


Table 6. DO-15 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.05	-	6.75	0.238	-	0.266
B	2.95	-	3.53	0.116	-	0.139
C	26.00	-	31.00	1.024	-	1.220
D	0.71	-	0.88	0.028	-	0.0035

### 3 Ordering information

**Table 7. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH208U	U08	SMB	0.107 g	2500	Tape and reel
STTH208	STTH208	DO-15	0.400 g	6000	Tape and reel



## Revision history

**Table 8. Document revision history**

Date	Revision	Changes
2003	1	First issue.
01-Apr-2020	2	Updated <a href="#">Figure 4</a> and <a href="#">Figure 3</a> . Minor text changes.

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