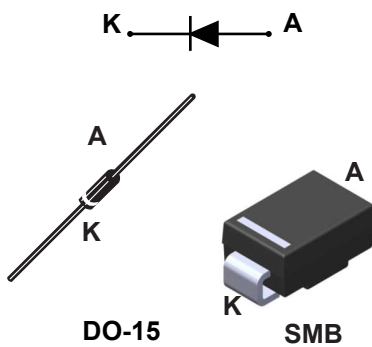


2 A, 800 V ultrafast recovery diode



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: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

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

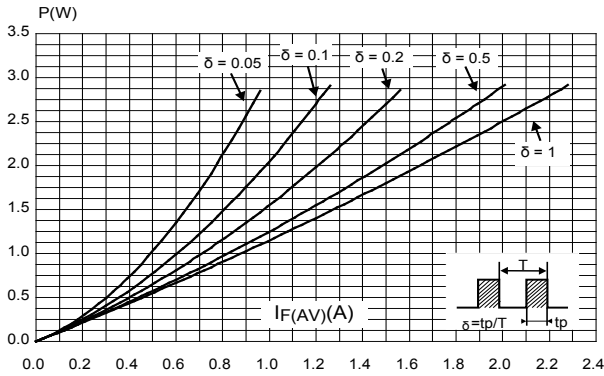


Figure 2. Forward voltage drop versus forward current

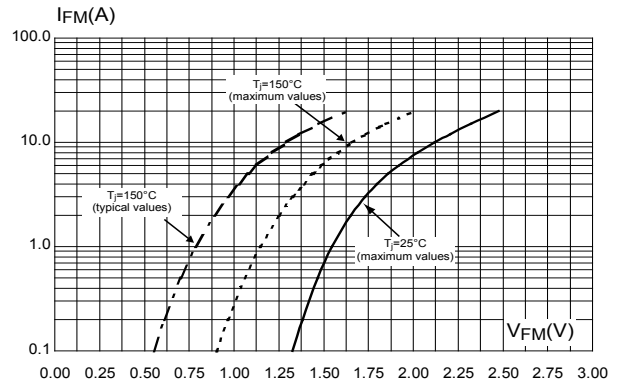


Figure 3. Relative variation of thermal impedance junction to lead versus pulse duration (DO-15)

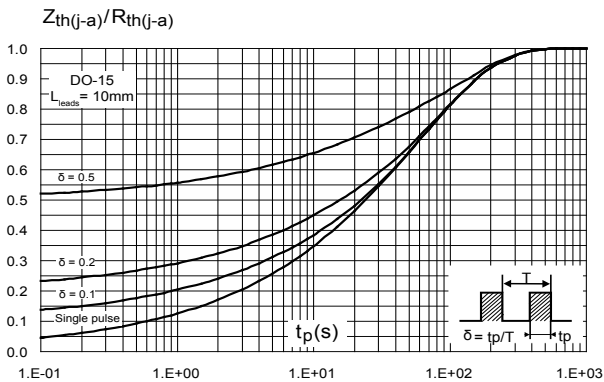


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration (SMB)

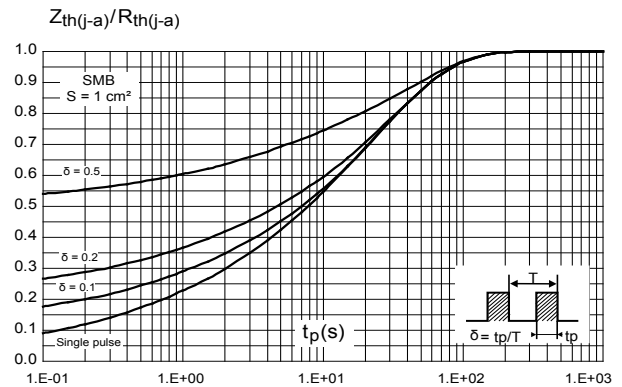


Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (typical values)

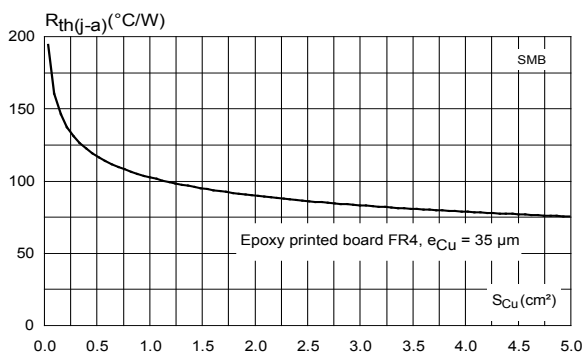
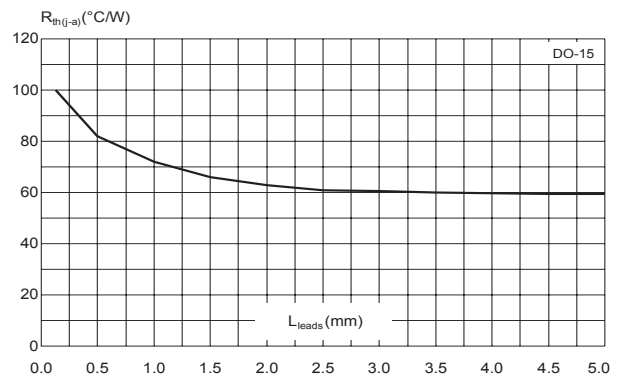


Figure 6. Thermal resistance junction to ambient versus lead length, DO-15



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. ECOPACK is an ST trademark.

2.1 SMB package information

- Epoxy meets UL94, V0
- Lead-free package

Figure 7. SMB package outline

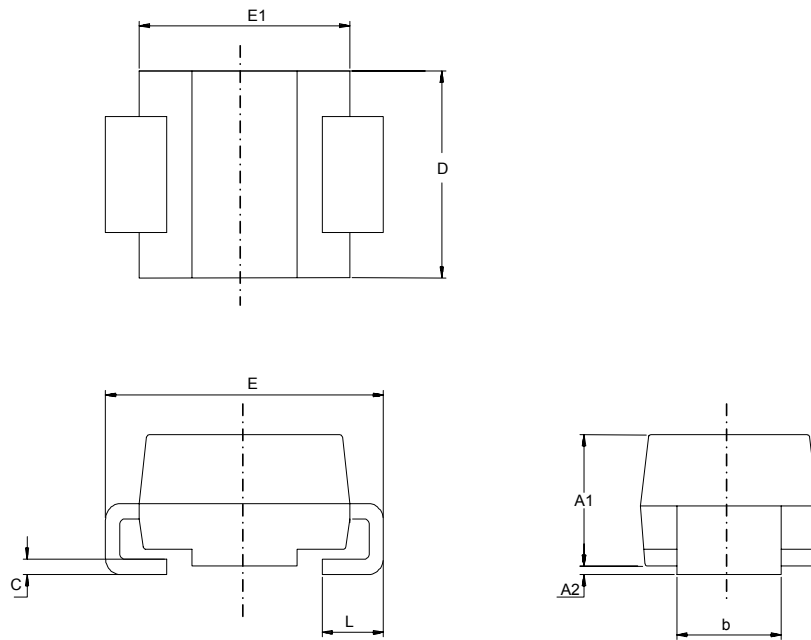
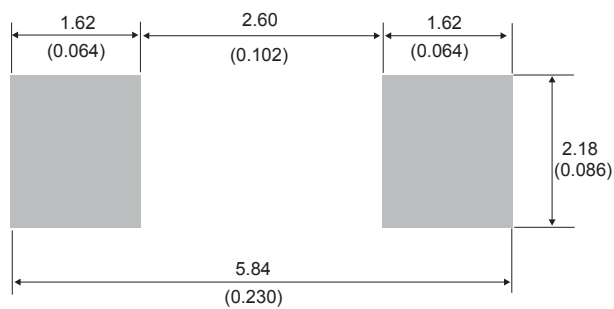


Table 5. SMB package mechanical data

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

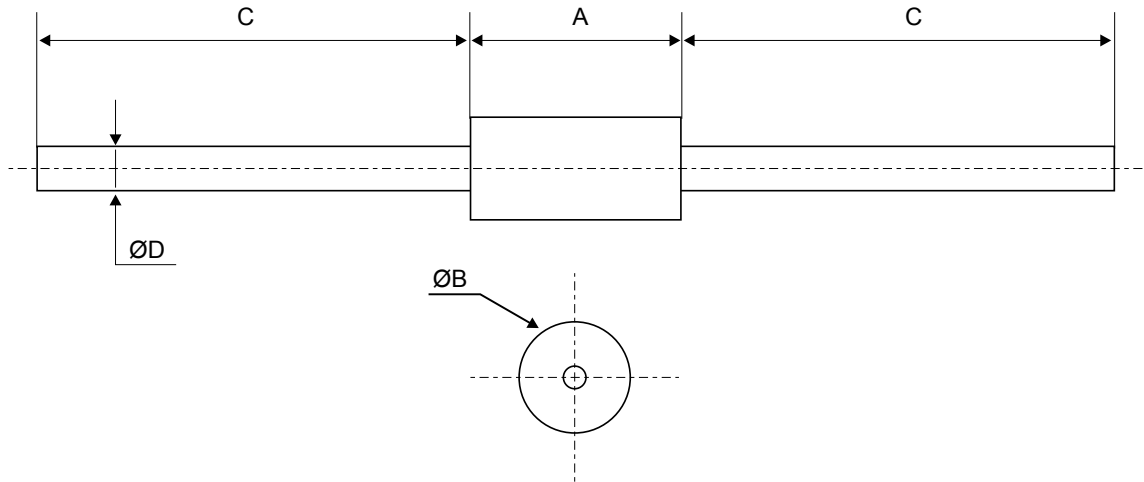


Table 6. DO-15 package mechanical data

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 Figure 4 and Figure 3 . Minor text changes.

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