STTH208U Datasheet

DiGi Electronics Part Number	STTH208U-DG
Manufacturer	STMicroelectronics
Manufacturer Product Number	STTH208U
Description	DIODE GEN PURP 800V 2A SMB
Detailed Description	Diode 800 V 2A Surface Mount SMB

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Manufacturer Product Number:	Manufacturer:
STTH208U	STMicroelectronics
Series:	Product Status:
-	Active
Technology:	Voltage - DC Reverse (Vr) (Max):
Standard	800 V
Current - Average Rectified (Io):	Voltage - Forward (Vf) (Max) @ If:
2A	1.65 V @ 2 A
Speed:	Reverse Recovery Time (trr):
Fast Recovery =< 500ns, > 200mA (Io)	75 ns
Current - Reverse Leakage @ Vr:	Capacitance @ Vr, F:
5 µA @ 800 V	-
Mounting Type:	Package / Case:
Surface Mount	DO-214AA, SMB
Supplier Device Package:	Operating Temperature - Junction:
SMB	175°C (Max)
Base Product Number:	
STTH208	

Environmental & Export classification

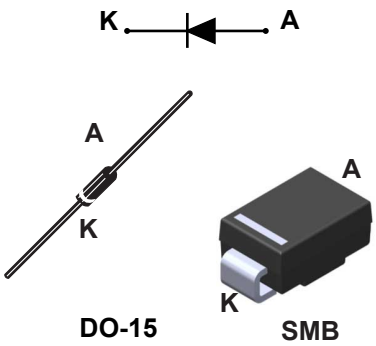
RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.10.0080	

life.augmented

STTH208

Datasheet

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 swiching applications

Description

The STTH208, 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.

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
trr(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 δ = 0.5, square wave	DO-15	T_L = 60 °C	2	A
		SMB	T_L = 100 °C		
I_{FSM}	Surge non repetitive forward current	DO-15	t_p = 8.3 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		SMB	25	°C/W
	Junction to lead	Lead length = 10 mm on infinite heatsink	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 °C	V_R = 800 V	-		5	µA
		T_j = 125 °C		-	5	50	µA
V_F (2)	Forward voltage drop	T_j = 25 °C	I_F = 2 A	-		1.65	V
		T_j = 150 °C		-	0.89	1.25	

1. *Pulse test: t_p = 5 ms, δ < 2%*
2. *Pulse test: t_p = 380 µs, δ < 2%*

To evaluate the conduction losses, use the following equation:

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

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 °C unless otherwise stated)

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

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

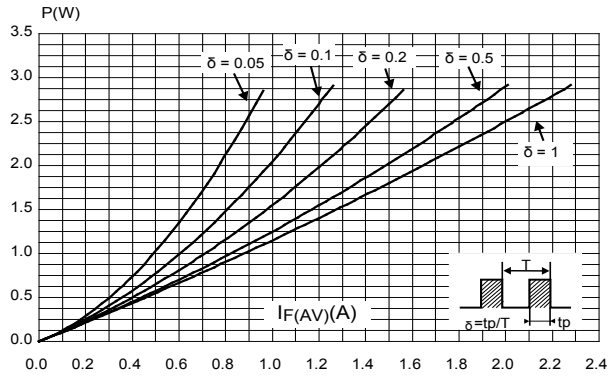


Figure 2. Forward voltage drop versus forward current

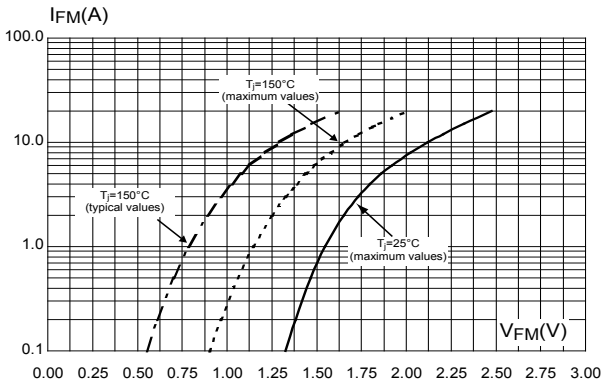


Figure 3. Relative variation of thermal impedance junction to lead versus pulse duration (DO-15)

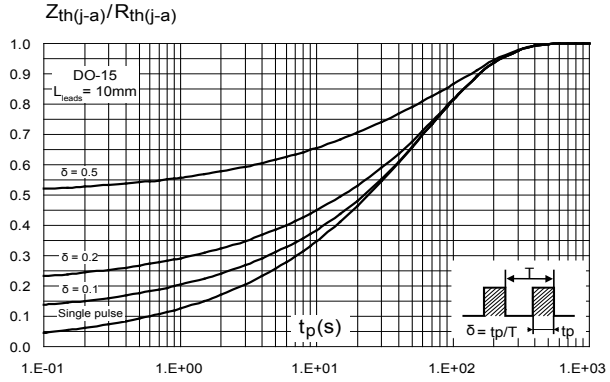


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration (SMB)

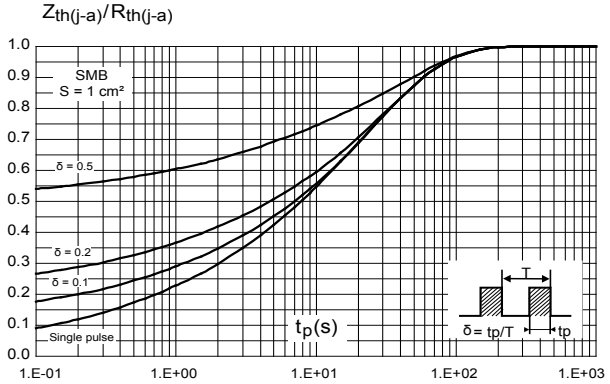


Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (typical values)

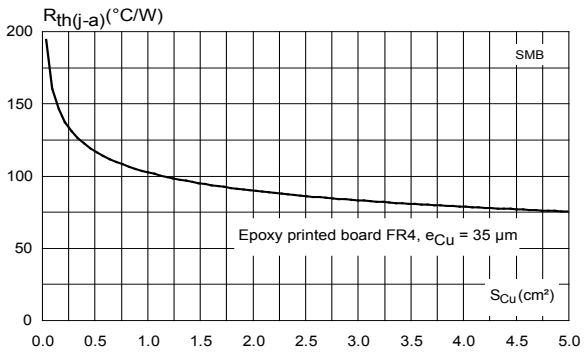
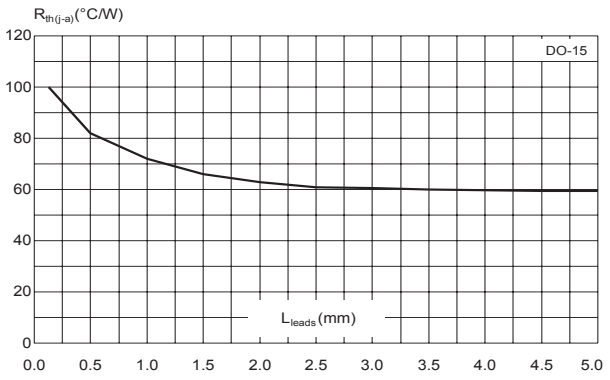


Figure 6. Thermal resistance junction to ambient versus lead length, DO-15



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

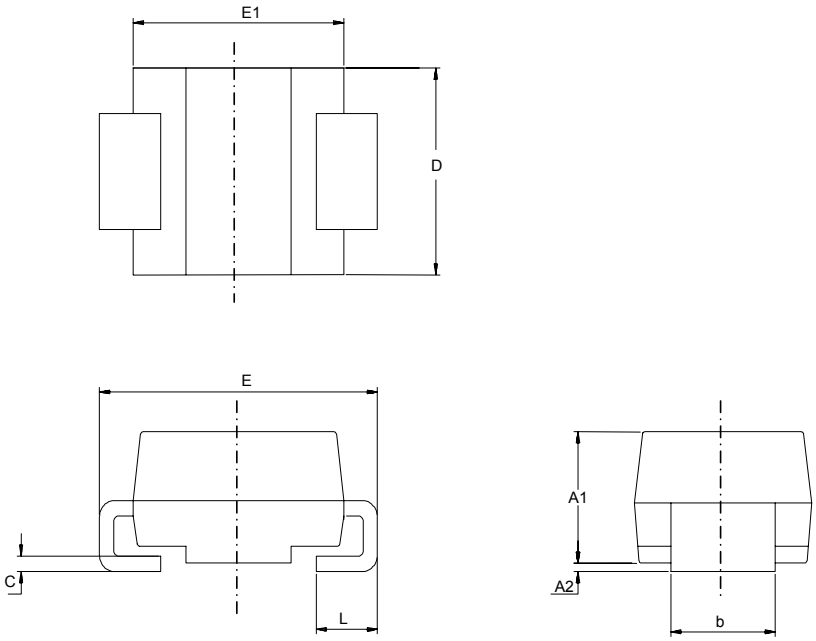
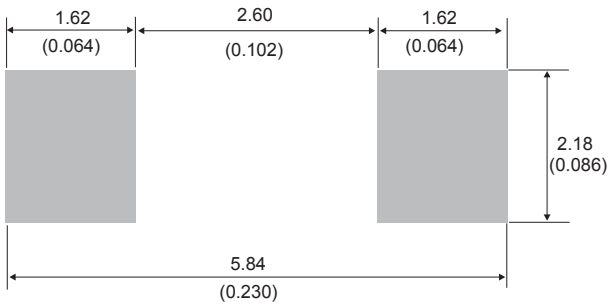


Table 5. SMB package mechanical data

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

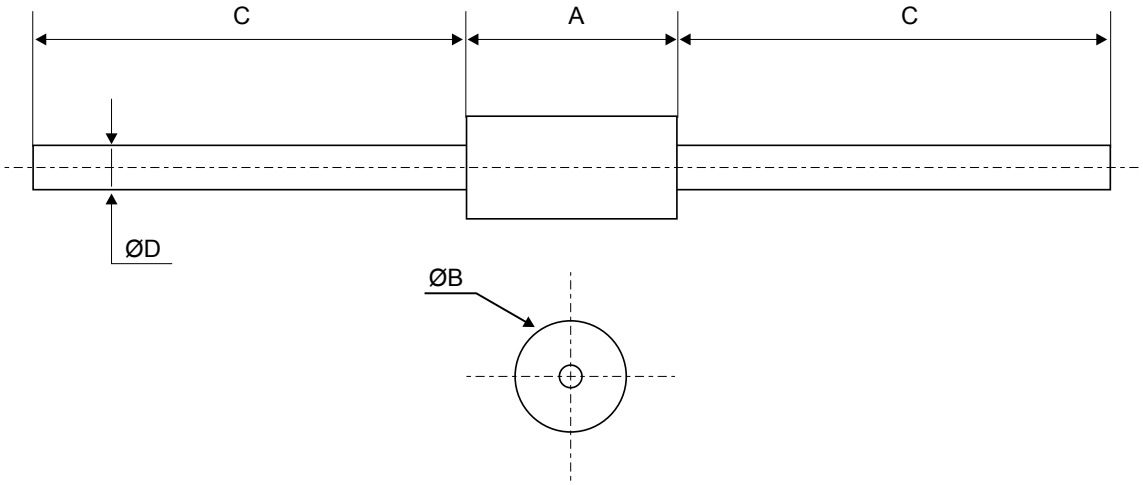


Table 6. DO-15 package mechanical data

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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