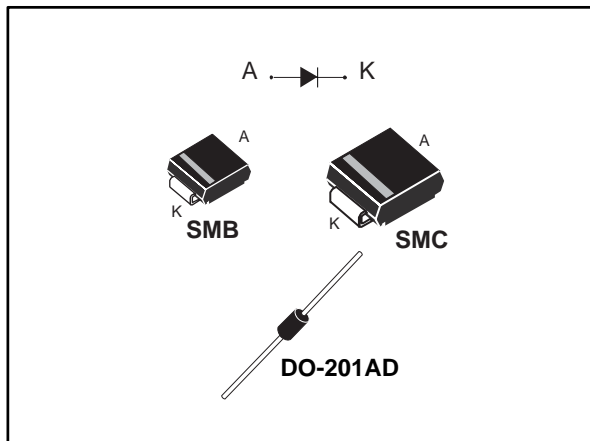


## Turbo 2 ultrafast high voltage rectifier

Datasheet - production data



### Features

- Ultrafast switching
- Low forward voltage drop
- Low thermal resistance
- Low leakage current (platinum doping)

### Description

This device uses ST Turbo 2 600 V technology, and is particularly suited as boost diode in discontinuous or critical mode power factor corrections.

It is also intended for use as a freewheeling diode in power supplies and other power switching applications.

**Table 1: Device summary**

Symbol	Value
$I_{F(AV)}$	3 A
$V_{RRM}$	600 V
$I_R$ (max.)	100 $\mu$ A
$T_j$ (max.)	175 °C
$V_F$ (typ.)	0.85 V
$t_{rr}$ (typ.)	60 ns

**Table 2: Order codes**

Part number	Marking
STTH3L06	STTH3L06
STTH3L06U	3L6U
STTH3L06S	S06

# 1 Characteristics

**Table 3: Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit	
V <sub>RRM</sub>	Repetitive peak reverse voltage		600	V	
I <sub>F(RMS)</sub>	Forward rms current		10	A	
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$ , square wave	DO-201AD/SMC	TI = 100 °C	3	A
		SMB	TI = 80 °C		
I <sub>FSM</sub>	Surge non repetitive forward current, t <sub>p</sub> = 10 ms sinusoidal	DO-201AD	70	A	
		SMB/SMC	60	A	
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C	
T <sub>j</sub>	Maximum operating junction temperature		+175	°C	

**Table 4: Thermal parameters**

Symbol	Parameter		Maximum	Unit
R <sub>th(j-l)</sub>	Junction to lead	DO-201AD L = 10 mm	20	°C/W
		SMB	25	
		SMC	20	
R <sub>th(j-a)</sub>	Junction to ambient	DO-201AD L = 10 mm	75	

**Table 5: Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>	-		3	μA
		T <sub>j</sub> = 150 °C		-	15	100	
V <sub>F</sub>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 3 A	-		1.3	V
		T <sub>j</sub> = 150 °C		-	0.85	1.05	

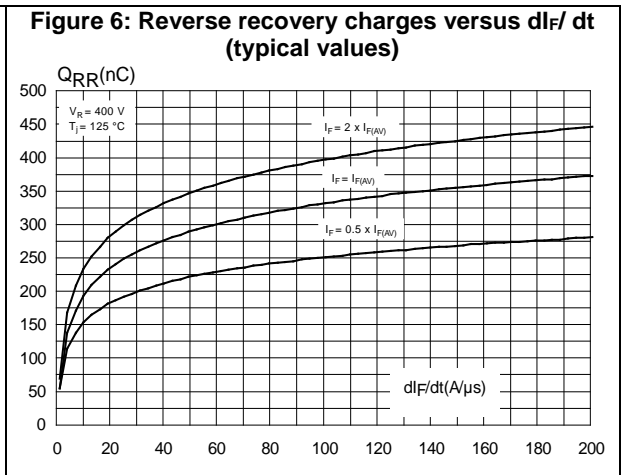
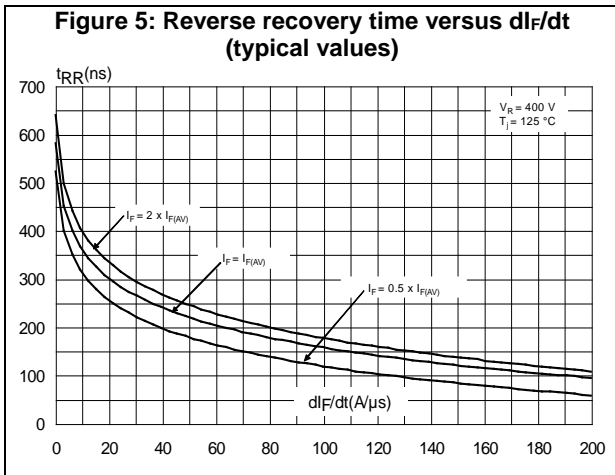
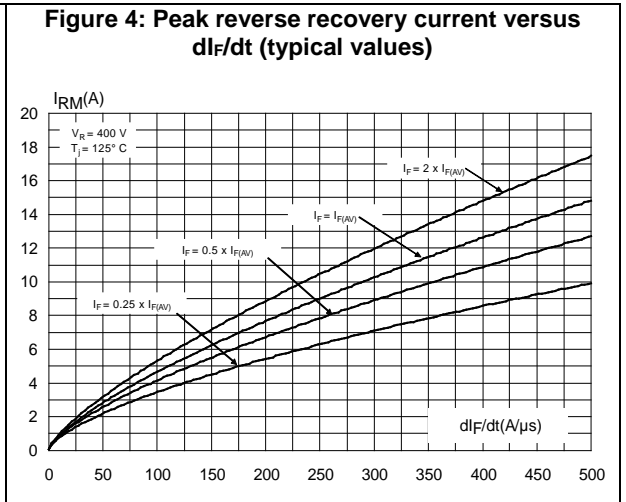
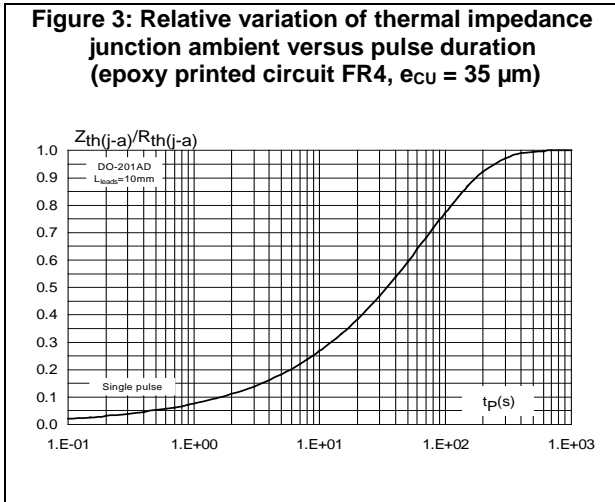
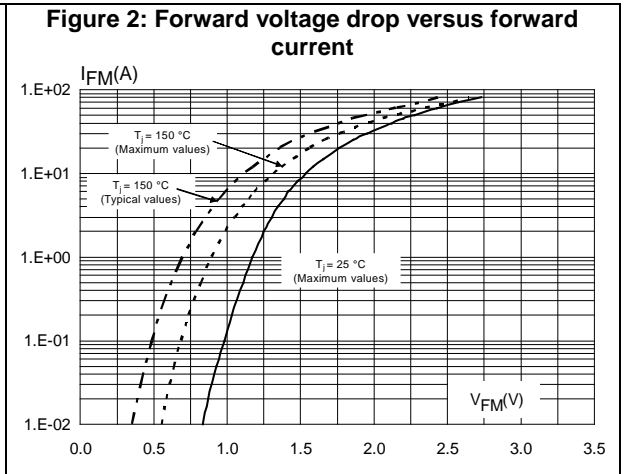
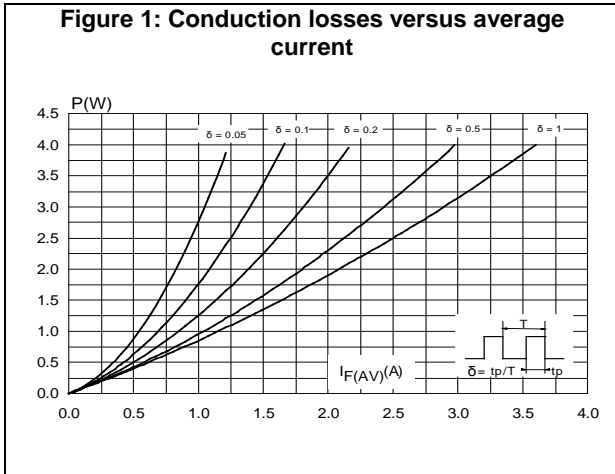
To evaluate the conduction losses use the following equation:

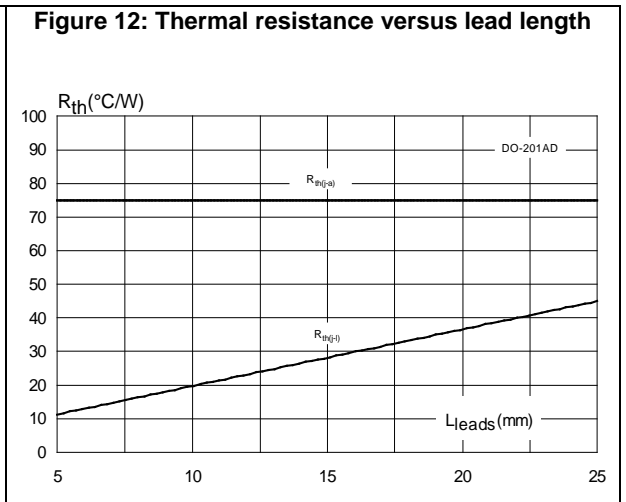
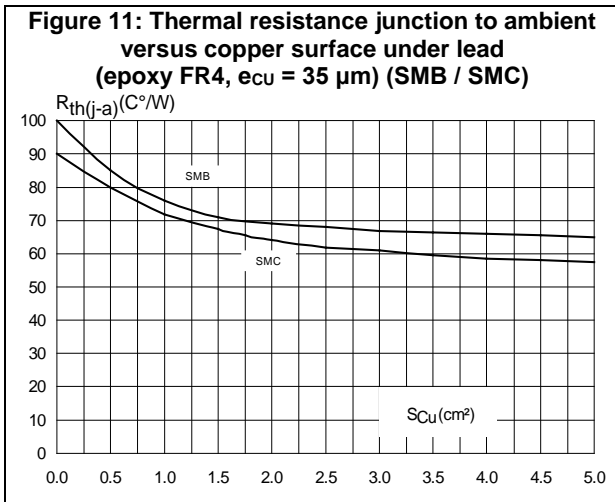
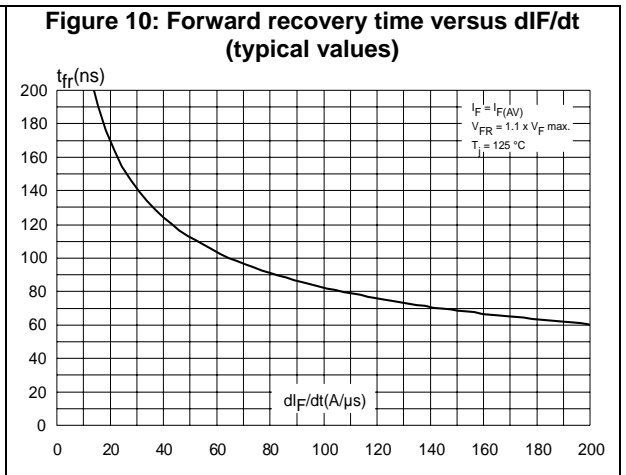
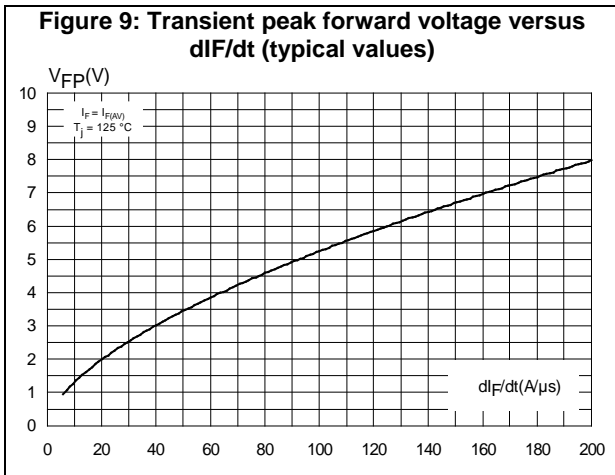
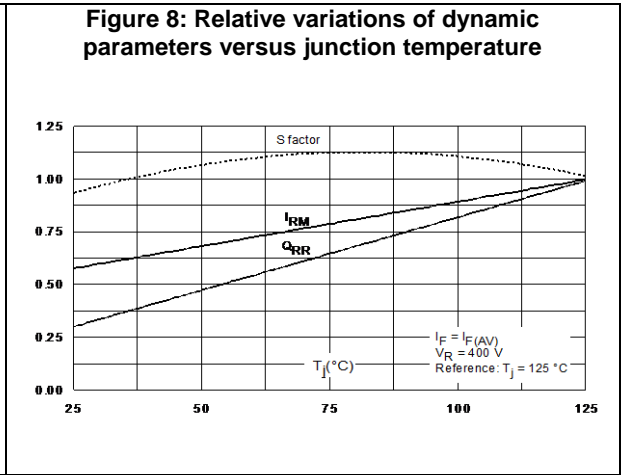
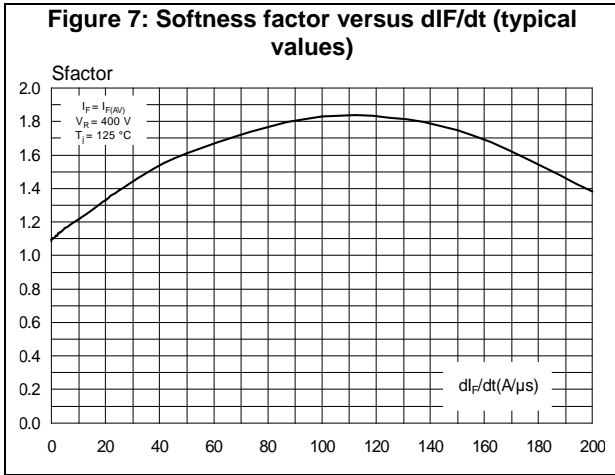
$$P = 0.89 \times I_{F(AV)} + 0.055 I_{F(RMS)}^2$$

**Table 6: Dynamic characteristics**

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 1 A; dI <sub>F</sub> /dt = -50 A/μs; V <sub>R</sub> = 30 V	-	60	85	ns
t <sub>fr</sub>	Forward recovery time		I <sub>F</sub> = 3 A; dI <sub>F</sub> /dt = 100 A/μs; V <sub>FR</sub> = 1.1 x V <sub>Fmax</sub>	-		100	
V <sub>FP</sub>	Forward recovery voltage	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 3 A; dI <sub>F</sub> /dt = 100 A/μs	-		7.5	V

# 1.1 Characteristics (curves)





## 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.

- Epoxy meets UL94, V0
- Band indicated cathode (DO-201AD)
- Bending method: see application note AN1471 (DO-201AD)

### 2.1 DO-201AD package information

Figure 13: DO-201AD package outline

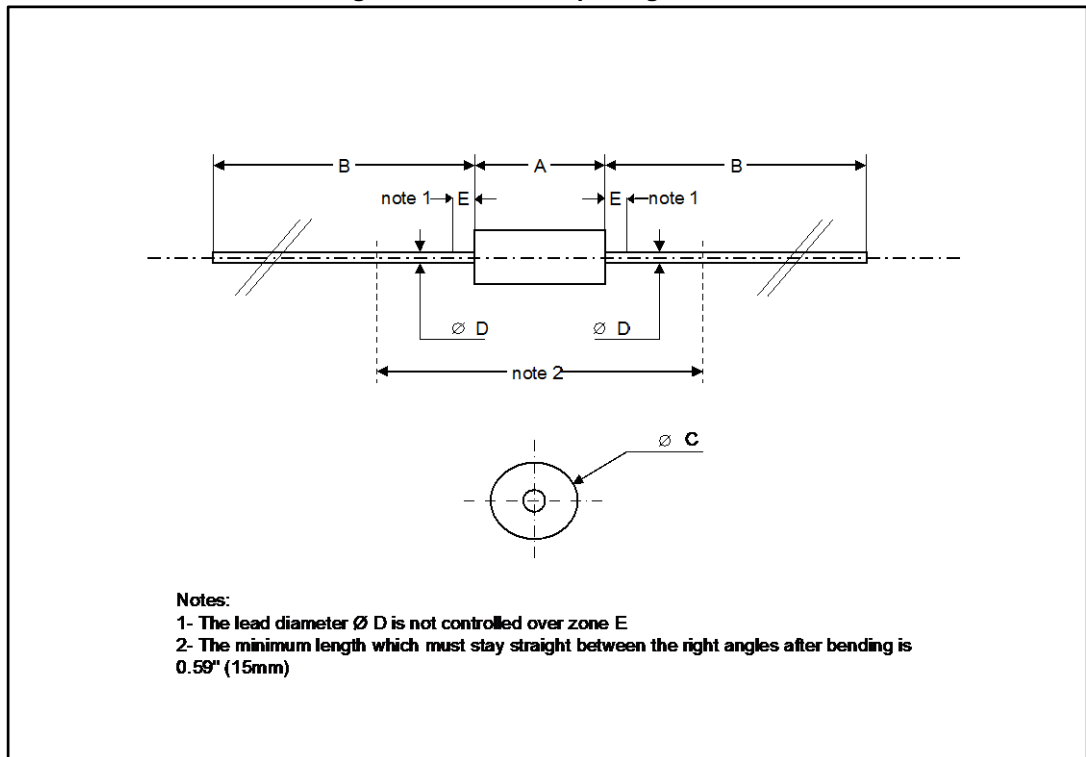


Table 7: DO-201AD package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		9.5		0.3740
B	25.4		1.000	
C		5.3		0.2087
D		1.3		0.0512
E		1.25		0.0492

## 2.2 SMC package information

Figure 14: SMC package outline

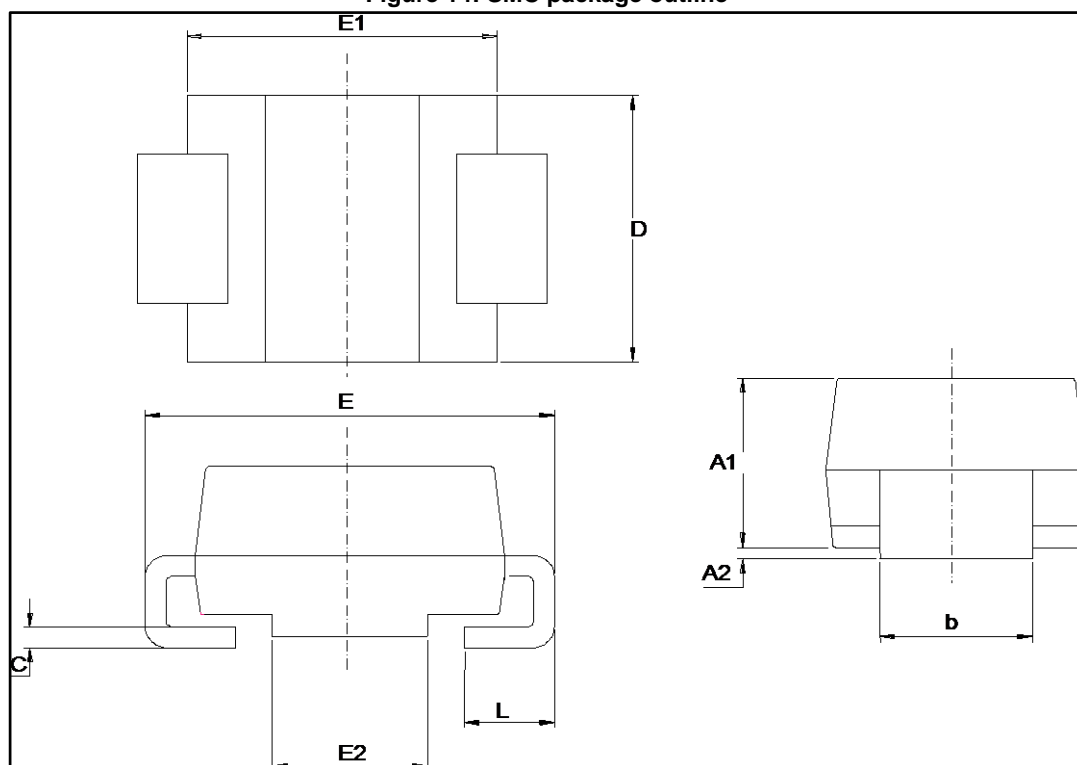
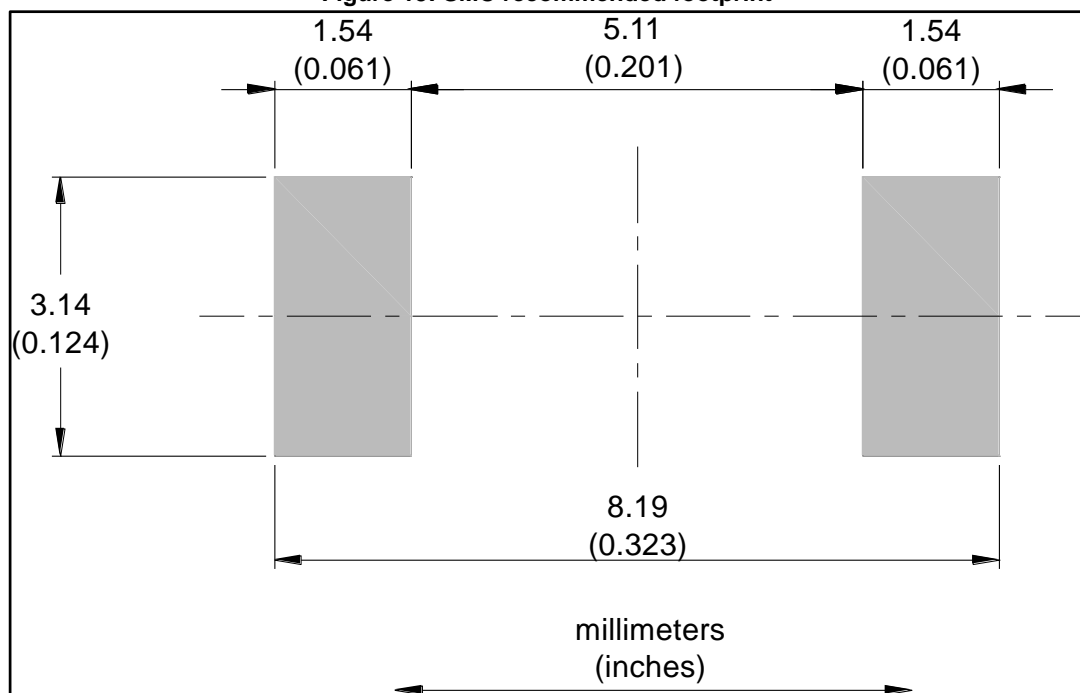


Table 8: SMC package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.0748	0.0965
A2	0.05	0.20	0.0020	0.0079
b	2.90	3.20	0.1142	0.1260
c	0.15	0.40	0.0059	0.0157
D	5.55	6.25	0.2185	0.2461
E	7.75	8.15	0.3051	0.3209
E1	6.60	7.15	0.2598	0.2815
E2	4.40	4.70	0.1732	0.1850
L	0.75	1.50	0.0295	0.0591

Figure 15: SMC recommended footprint



### 2.3 SMB package information

Figure 16: SMB package outline

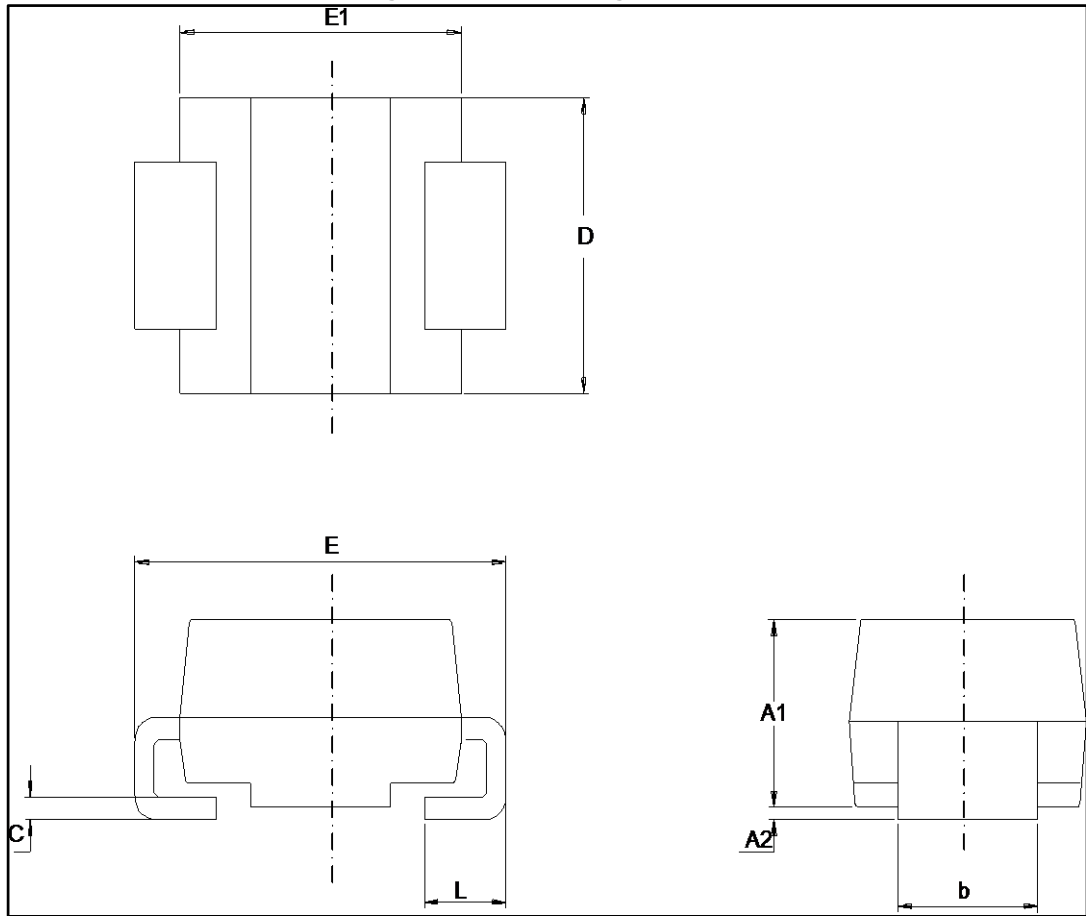
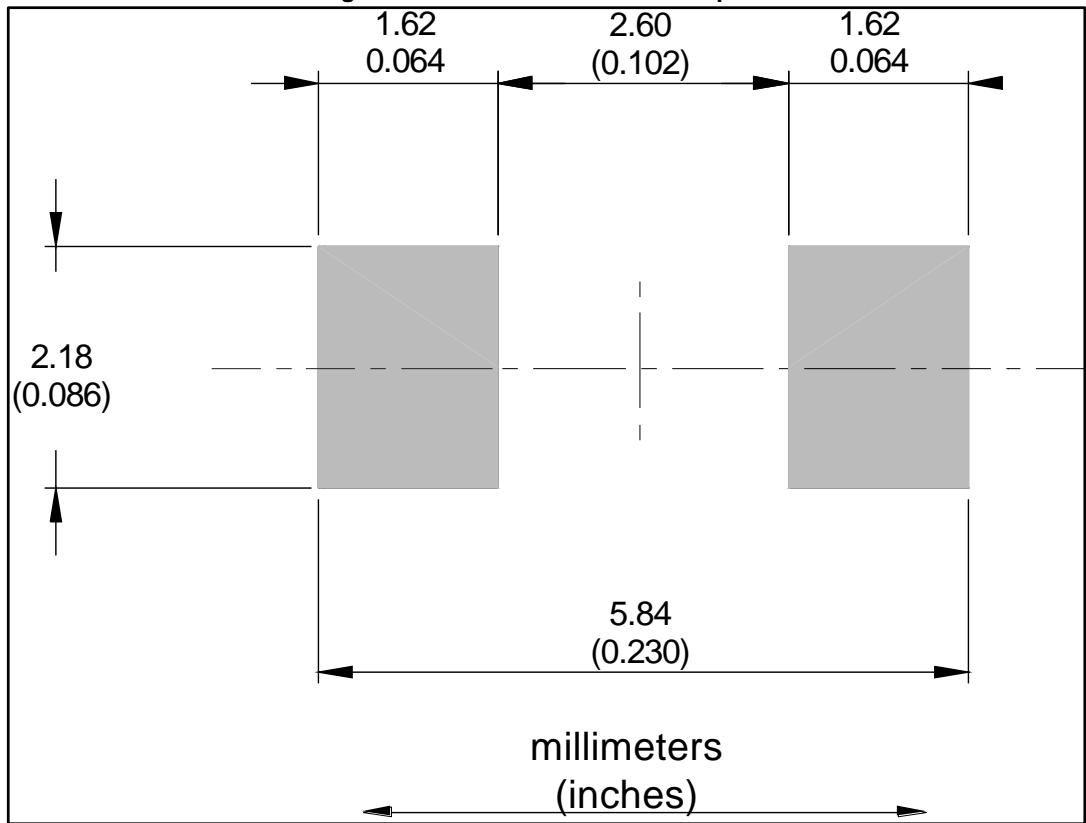


Table 9: SMB package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.0748	0.0965
A2	0.05	0.20	0.0020	0.0079
b	1.95	2.20	0.0768	0.0867
c	0.15	0.40	0.0059	0.0157
D	3.30	3.95	0.1299	0.1556
E	5.10	5.60	0.2008	0.2205
E1	4.05	4.60	0.1594	0.1811
L	0.75	1.50	0.0295	0.0591



Figure 17: SMB recommended footprint



### 3 Ordering information

Table 10: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH3L06	STTH3L06	DO-201AD	1.12 g	600	Ammopack
STTH3L06-RL	STTH3L06			1900	Tape and reel
STTH3L06U	3L6U	SMB	0.11 g	2500	Tape and reel
STTH3L06S	S06	SMC	0.243 g	2500	Tape and reel

### 4 Revision history

Table 11: Document revision history

Date	Revision	Changes
October-2001	1	First issue
07-Sep-2004	2	SMB, SMC and DPAK packages added.
14-Oct-2005	3	Changed marking of STTH3L06U from 3L06U to 3L6U. Added ECOPACK statement.
29-Apr-2016	4	Removed DPAK package information. Minor text changes

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