

DO-35



SOT-23

Pin 1 and 3 must be shorted together

## Features

- $V_{BO}$  : 32 V and 40 V
- Low breakover current
- Breakover voltage symmetry : 3V
- ECOPACK<sup>®</sup>2 compliant

## Applications

- Triggering device for Triac or SCR based motor / light dimmer
- 32 V trigger device for oscillator circuit
- Start up triggering in lighting ballast for CFL, TL or LED lamps

## Description

Functioning as a trigger diode with a fixed voltage reference, the DB3/DB4 series can be used in conjunction with triacs for simplified gate control circuits or as a starting element in fluorescent lamp ballasts.

The surface mount SOT23-3L package allows compact, SMD based designs for automated manufacturing.

### Product status link

[DB3](#)

[DB4](#)

[SMDB3](#)

### Product summary

Part number	$V_{BO}$
<b>SMDB3</b>	28 - 36 V
<b>DB3</b>	28 - 36 V
<b>DB4</b>	35 - 45 V

# 1 Characteristics

**Table 1. Absolute maximum ratings (limiting values),  $T_j = 25\text{ °C}$  unless otherwise specified**

Symbol	Parameter	Value	Unit	
$I_{TRM}$	Repetitive peak on-state current, $t_p = 20\ \mu\text{s}$ , $F = 120\ \text{Hz}$	SMDB3	1.00	A
		DB3 / DB4	2.00	A
$T_{stg}$	Storage junction temperature range	-40 to +125	$^{\circ}\text{C}$	
$T_j$	Operating junction temperature range	-40 to +125	$^{\circ}\text{C}$	

**Table 2. Electrical characteristics ( $T_j = 25\text{ °C}$  unless otherwise specified)**

Symbol	Parameter	Test conditions	SMDB3	DB3	DB4	Unit	
$V_{BO}$	Breakover voltage <sup>(1)</sup>	$C = 10\ \text{nF}$ <sup>(2)</sup>	Min.	28	28	35	V
			Typ.	32	32	40	
			Max.	36	36	45	
$ V_{BO1} - V_{BO2} $	Breakover voltage symmetry	$C = 10\ \text{nF}$ <sup>(2)</sup>	Max.	3	3	3	V
$\Delta V$	Dynamic breakover voltage <sup>(1)</sup>	$V_{BO}$ and $V_F$ at 10 mA	Min.	10	5	5	V
$V_O$	Output voltage <sup>(1)</sup>	See Figure 2. Test circuit, ( $R = 20\ \Omega$ )	Min.	10	5	5	V
$I_{BO}$	Breakover current <sup>(1)</sup>	$C = 10\ \text{nF}$ <sup>(2)</sup>	Max.	10	50	50	$\mu\text{A}$
$t_r$	Rise time <sup>(1)</sup>	See Figure 3. Rise time measurement	Max.	0.5	2	2	$\mu\text{s}$
$I_R$	Leakage current <sup>(1)</sup>	$V_R = 0.5 \times V_{BO}\ \text{max}$	Max.	1	10	10	$\mu\text{A}$
$I_P$	Peak current <sup>(1)</sup>	See Figure 2. Test circuit	Min.	1	0.30	0.30	A

1. Applicable to both forward and reverse directions.

2. Connected in parallel to the device

Figure 1. Voltage - current characteristic curve.



Figure 2. Test circuit

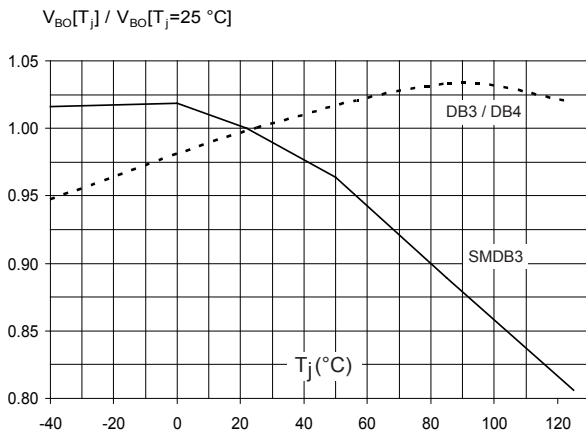


Figure 3. Rise time measurement

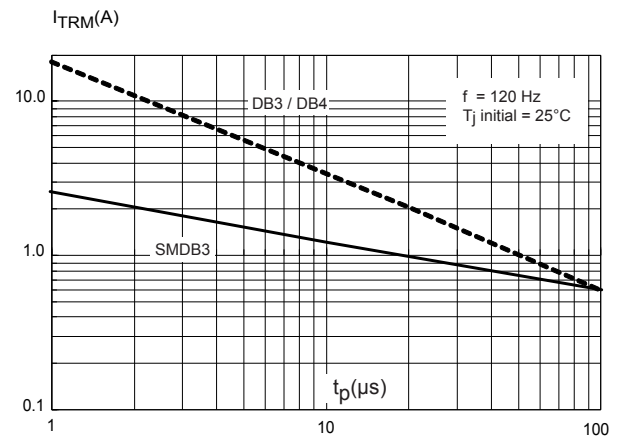


## 1.1 Characteristics curves

**Figure 4. Relative variation of VBO versus junction temperature (typical values)**



**Figure 5. On-state RMS current versus Triac gate current pulse duration  $t_p$**



**Figure 6. Triac gate current pulse duration  $t_p$  (to have  $I_p > 50$  mA) versus  $R_s$  and  $C$  values (typical values)**



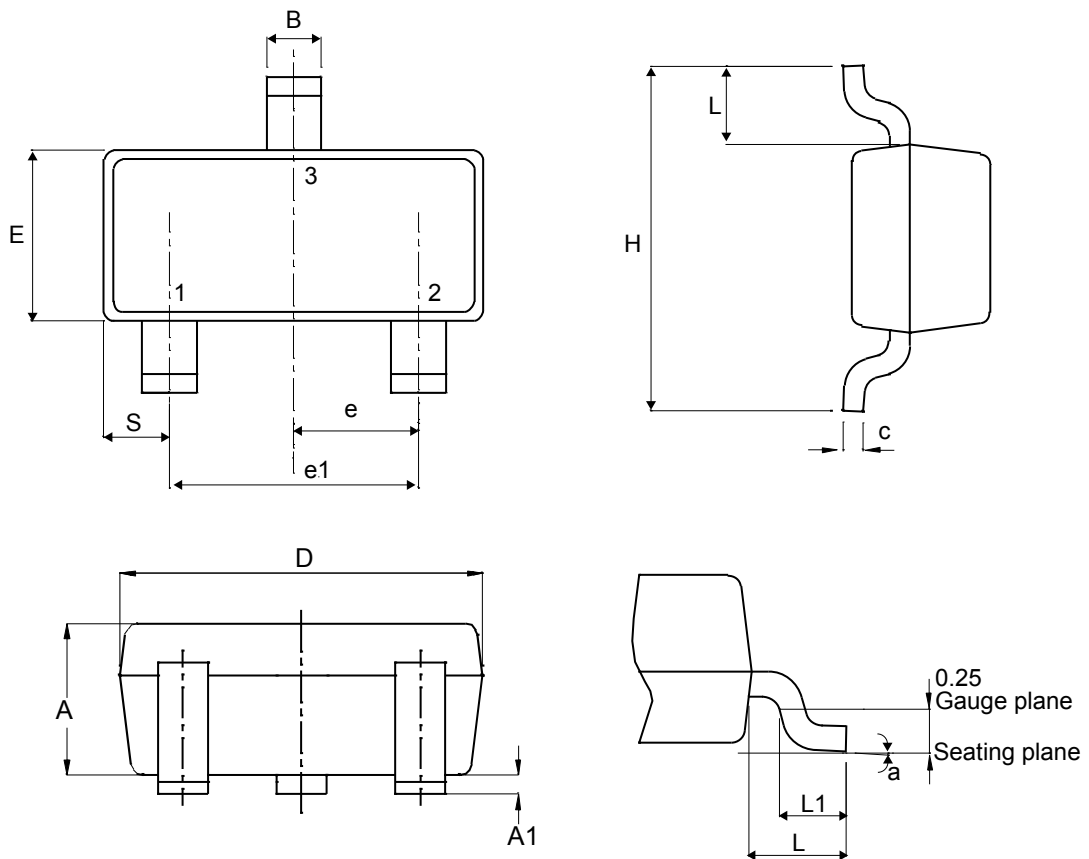
Note: according to Figure 2. Test circuit

## 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.

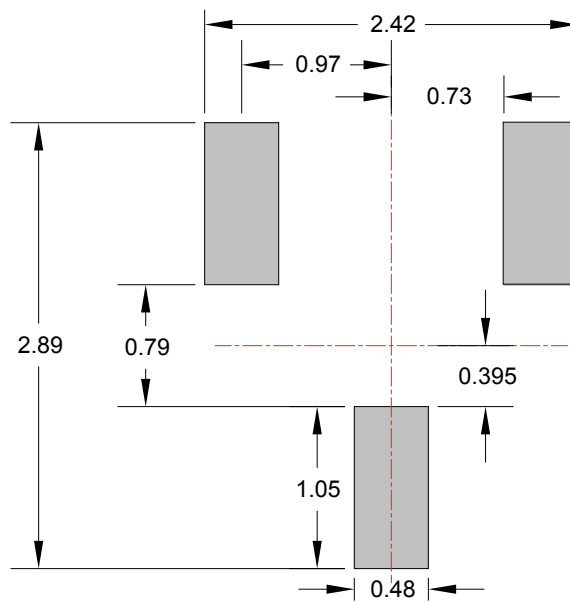
### 2.1 SOT23 package information

Figure 7. SOT23-3L package outline



**Table 3. SOT23-3L package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.89		1.40	0.0350		0.0551
A1	0.00		0.10	0.0000		0.0039
B	0.30		0.51	0.0118		0.0201
C	0.085		0.18	0.0033		0.0071
D	2.75		3.04	0.1083		0.1197
e	0.85		1.05	0.0335		0.0413
e1	1.70		2.10	0.0669		0.0827
E	1.20		1.75	0.0472		0.0689
H	2.10		3.00	0.0827		0.1181
L		0.60			0.0236	
S	0.35		0.65	0.0138		0.256
L1	0.25		0.55	0.0098		0.0217
a	0°		8°	0°		8°

**Figure 8. SOT23-3L footprint in mm**


## 2.2 DO-35 package information

Figure 9. DO-35 package outline

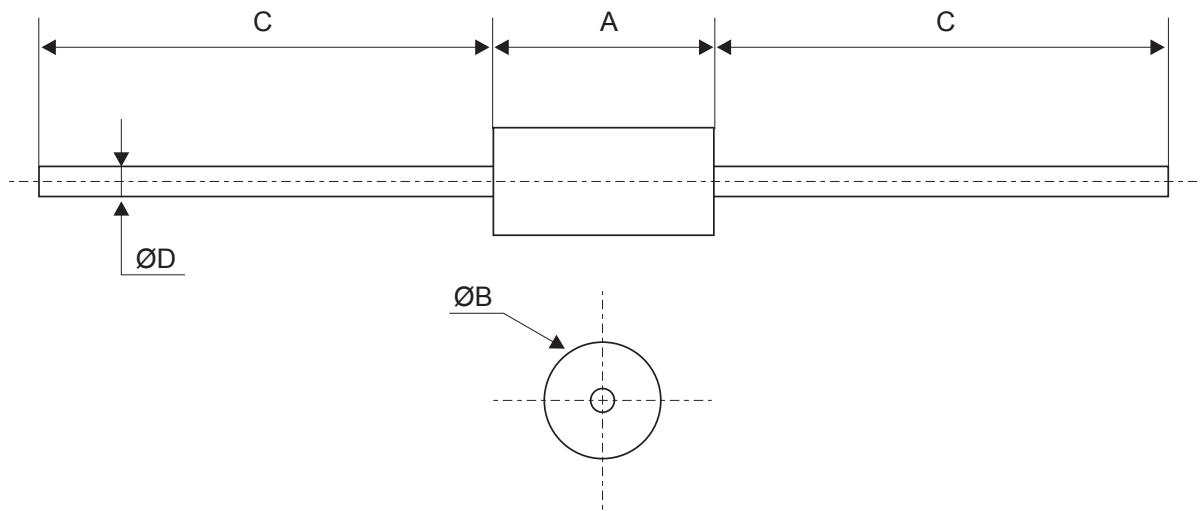
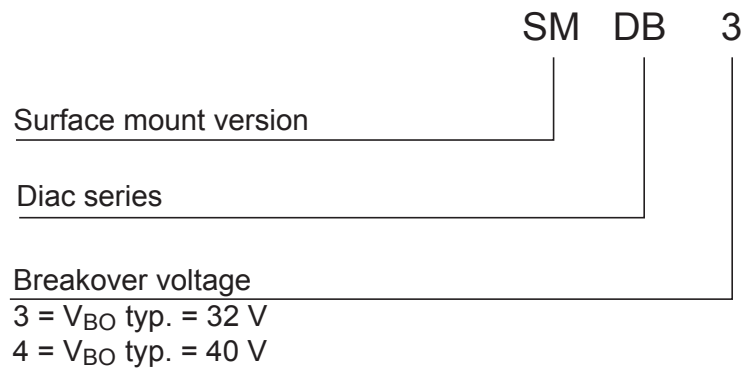


Table 4. DO-35 package mechanical data

Ref.	Dimensions			
	Millimeters		Inches (for reference only)	
	Min.	Max.	Min.	Max.
A	3.05	4.50	0.120	0.177
B	1.53	2.00	0.060	0.079
C	28.00	31.00	1.102	1.220
D	0.46	0.55	0.018	0.022



### 3 Ordering information

**Figure 10. Ordering information scheme**

**Table 5. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
SMDB3	DB3	SOT-23	0.01 g	3000	Tape and reel
DB3	DB3 (Blue Body Coat)	DO-35	0.15 g	5000	Tape and reel
DB4	DB4 (Blue Body Coat)		0.15 g	5000	Tape and reel

## Revision history

**Table 6. Document revision history**

Date	Version	Changes
18-Jun-2018	2	First release.
14-Dec-2018	3	Minor text change to improve readability.

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