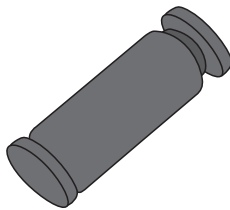


## Diac in MINIMELF package with tight $V_{BO}$


**MINIMELF**

### Features

- $V_{BO}$ : 32 V
- Low breakover voltage: 15  $\mu$ A max.
- Breakover voltage range: 30 to 34 V

### Applications

- General purpose AC line load switching
- Motor control circuits
- Home appliances
- Heating
- Lighting
- Inrush current limiting circuits
- Overvoltage crowbar protection

### Description

Functioning as a trigger diode with a fixed voltage reference, the **TMMDB3TG** can be used in conjunction with Triacs for simplified gate control circuits or as a starting element in fluorescent lamp ballasts.

#### Product status link

[TMMDB3TG](#)

#### Product summary

| Order code | $V_{BO}$  |
|------------|-----------|
| TMMDB3TG   | 30 - 34 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, $t_p = 20\ \mu s$ , $F = 120\text{ Hz}$ | 2           | 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                                   | Value | Unit |               |
|-----------------------|--|---|-------|------|---------------|
| $V_{BO}$              | Breakover voltage <sup>(1)</sup>         | $C = 10\text{ nF}^{(2)}$                          | Min.  | 30   | V             |
|                       |  |   | Typ.  | 32   |               |
|                       |  |   | Max.  | 34   |               |
| $ V_{BO1} - V_{BO2} $ | Breakover voltage symmetry               | $C = 10\text{ nF}^{(2)}$                          | Max.  | 2    | V             |
| $\Delta V$            | Dynamic breakover voltage <sup>(1)</sup> | $V_{BO}$ and $V_F$ at 10 mA                       | Min.  | 9    | V             |
| $V_O$                 | Output voltage <sup>(1)</sup>            | See Figure 2. Test circuit , ( $R = 20\ \Omega$ ) | Min.  | 5    | V             |
| $I_{BO}$              | Breakover current <sup>(1)</sup>         | $C = 10\text{ nF}^{(2)}$                          | Max.  | 15   | $\mu\text{A}$ |
| $t_r$                 | Rise time <sup>(1)</sup>                 | See Figure 3. Rise time measurement               | Max.  | 2    | $\mu\text{s}$ |
| $I_R$                 | Leakage current <sup>(1)</sup>           | $V_R = 0.5 \times V_{BO}\text{ max}$              | Max.  | 10   | $\mu\text{A}$ |
| $I_P$                 | Peak current <sup>(1)</sup>              | See Figure 2. Test circuit                        | Min.  | 0.30 | A             |

1. Applicable to both forward and reverse directions.
2. Connected in parallel to the device

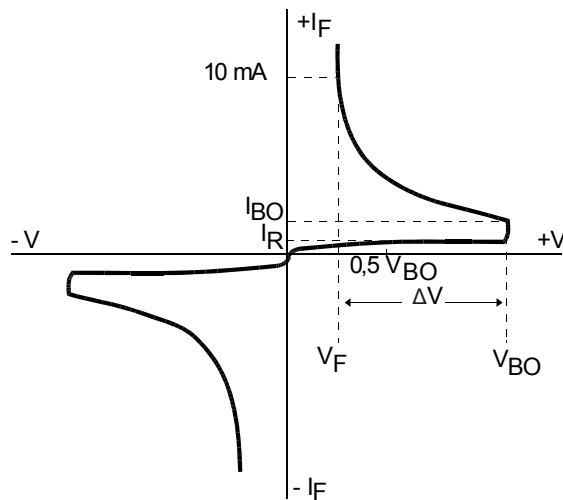
**Figure 1. Voltage - current characteristic curve.**


Figure 2. Test circuit

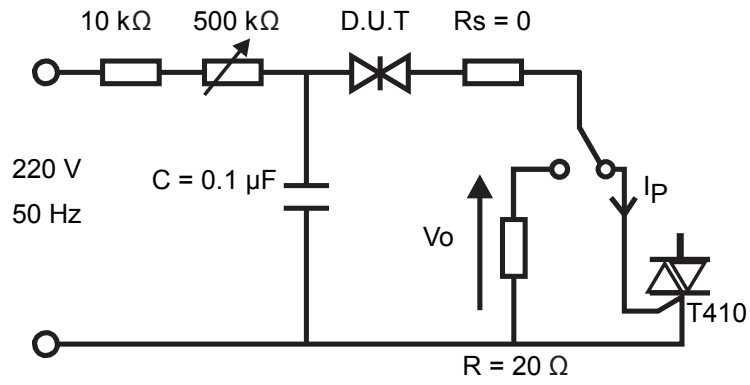
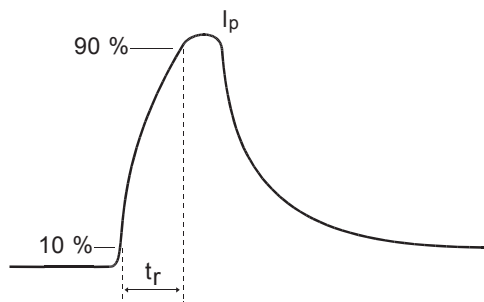
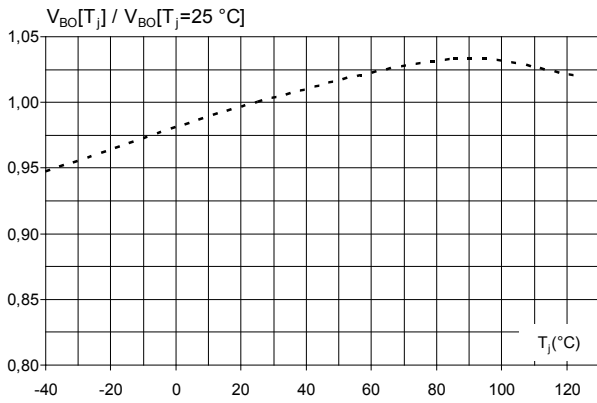


Figure 3. Rise time measurement

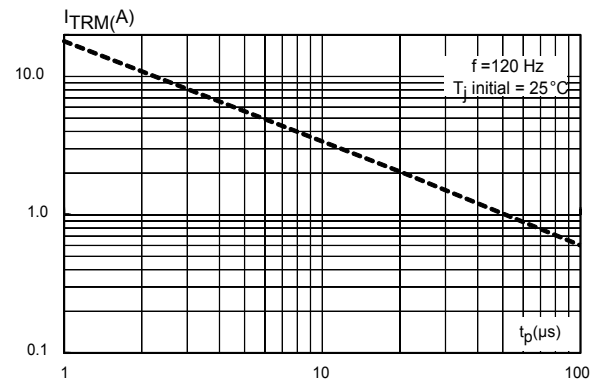


## 1.1 Characteristics (curves)

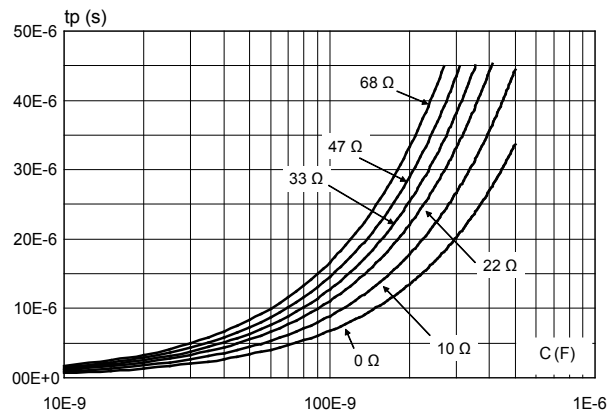
**Figure 4. Relative variation of  $V_{BO}$  versus junction temperature (typical values)**



**Figure 5. Peak on-state current versus Triac gate current pulse duration  $t_p$**



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



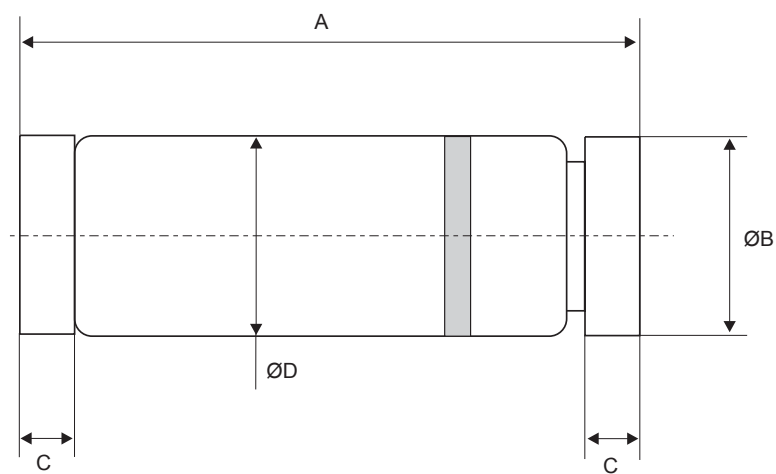
Note: according to Figure 2. Test circuit

## 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 Minimelf package information

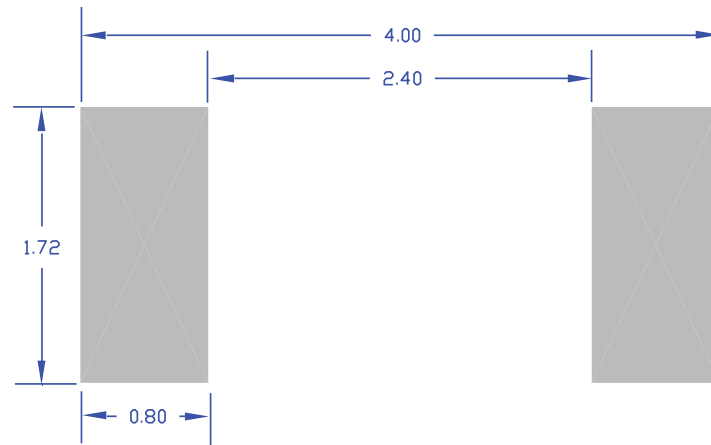
**Figure 7. MINIMELF package outline**



**Table 3. MINIMELF package mechanical data**

| Dim. | mm   |      |      |       |       |       |
|------|------|------|------|-------|-------|-------|
|      | Min. | Typ. | Max. | Min.  | Typ.  | Max.  |
| A    | 3.30 | 3.50 | 3.70 | 0.130 | 0.138 | 0.146 |
| B    | 1.59 | 1.65 | 1.70 | 0.063 | 0.065 | 0.067 |
| C    | 0.40 | 0.50 | 0.60 | 0.016 | 0.020 | 0.024 |
| D    |      | 1.50 |      |       | 0.059 |       |

Figure 8. MINIMELF recommended footprint (dimensions are in mm)



### 3 Ordering information

Figure 9. Ordering information scheme

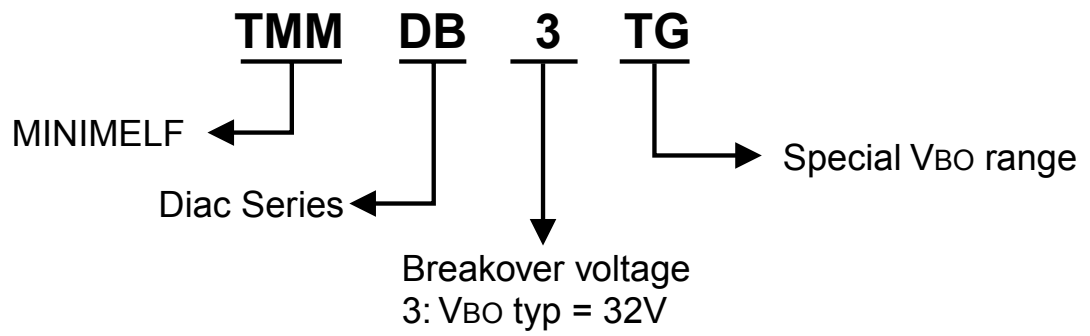


Table 4. Ordering information

| Order code | Marking | Package  | Weight | Base qty. | Delivery mode |
|------------|---------|----------|--------|-----------|---------------|
| TMMDB3TG   | (None)  | Minimelf | 0.04 g | 2500      | Tape and reel |

## Revision history

**Table 5. Document revision history**

| Date         | Version | Changes  |
|--------------|---------|--|
| January-2001 | 2       | Previous release.  |
| 07-May-2019  | 3       | Updated <a href="#">Section 1.1 Characteristics (curves)</a> and <a href="#">Table 3. MINIMELF package mechanical data</a> . Minor text change to improve readability. |



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