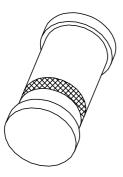
# DISCRETE SEMICONDUCTORS

# DATA SHEET



# **BZV80**; **BZV81**Voltage reference diodes

Product specification Supersedes data of April 1992 1996 Mar 21





Philips Semiconductors Product specification

# Voltage reference diodes

**BZV80; BZV81** 

# **FEATURES**

# • Reference voltage range: 5.89 to 6.51 V (nom. 6.20 V)

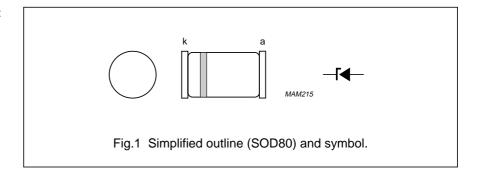
• Low temperature coefficient range: max. 0.005 to 0.01 %/K.

# **APPLICATION**

• Voltage reference sources.

# **DESCRIPTION**

Leadless voltage reference diode in a small glass SOD80 SMD package.



# **LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL           | PARAMETER                     | CONDITIONS                       | MIN. | MAX. | UNIT |
|------------------|-------------------------------|----------------------------------|------|------|------|
| I <sub>Z</sub>   | working current               |                                  | _    | 50   | mA   |
| P <sub>tot</sub> | total power dissipation       | T <sub>amb</sub> = 50 °C; note 1 | _    | 400  | mW   |
| T <sub>stg</sub> | storage temperature           |                                  | -65  | +200 | °C   |
| Tj               | junction temperature          |                                  | _    | 200  | °C   |
| T <sub>amb</sub> | operating ambient temperature |                                  | -20  | +80  | °C   |

# Note

1. Device mounted on a FR4 printed-circuit board.

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#### **ELECTRICAL CHARACTERISTICS**

 $T_i = 25$  °C unless otherwise specified.

| SYMBOL             | PARAMETER                   | CONDITIONS   | MIN. | NOM. | MAX.  | UNIT |
|--------------------|-----------------------------|--|------|------|-------|------|
| V <sub>ref</sub>   | reference voltage           | I <sub>Z</sub> = 7.5 mA                                    | 5.89 | 6.20 | 6.51  | V    |
| $ \Delta V_{ref} $ | reference voltage excursion | $I_Z = 7.5$ mA; test points for                            |      |      |       |      |
|                    | BZV80                       | T <sub>amb</sub> : –20; +25; +55; +80 °C;<br>notes 1 and 2 | _    | _    | 62    | mV   |
|                    | BZV81                       |  | _    | _    | 31    | mV   |
| Iszl               | temperature coefficient     | I <sub>Z</sub> = 7.5 mA: notes 1 and 2                     |      |      |       |      |
|                    | BZV80                       |  | _    | _    | 0.01  | %/K  |
|                    | BZV81                       |  | _    |      | 0.005 | %/K  |
| r <sub>dif</sub>   | differential resistance     | $I_Z = 7.5 \text{ mA}$                                     | -    | _    | 15    | Ω    |

#### **Notes**

- 1. The quoted values of  $\Delta V_{ref}$  are based on a constant current  $I_Z$ . Two factors can cause  $\Delta V_{ref}$  to change with  $I_Z$ , namely the differential resistance  $r_{dif}$  and the temperature coefficient  $S_Z$ .
  - a) Each change of  $I_Z$  can result in a maximum change of  $\Delta V_{ref}$  as follows:  $\Delta V_{ref}$  (mV) =  $\Delta I_Z$  (mA)  $\times$  15  $\Omega$  taking into account that  $r_{dif}$  is max. 15  $\Omega$ .
  - b) The temperature coefficient of the reference voltage  $S_Z$  is also a function of  $I_Z$ . However, for these reference diodes  $S_Z$  varies max.  $\pm 0.05$  mV/K or  $\pm 0.001$ %/K when  $I_Z$  is between 6 and 10 mA, so this effect can be neglected in practice for these types.
- 2. The temperature coefficient of the reference voltage is obtained from the following formula:

$$S_{Z} = \frac{V_{ref1} - V_{ref2}}{T_{amh2} - T_{amh1}} \times \frac{100}{V_{ref,nom}} \%/K$$

# THERMAL CHARACTERISTICS

| SYMBOL               | PARAMETER                                     | CONDITIONS | VALUE | UNIT |
|----------------------|---|------------|-------|------|
| R <sub>th j-tp</sub> | thermal resistance from junction to tie-point |            | 300   | K/W  |
| R <sub>th j-a</sub>  | thermal resistance from junction to ambient   | note 1     | 380   | K/W  |

#### Note

1. Device mounted on a FR4 printed-circuit board.

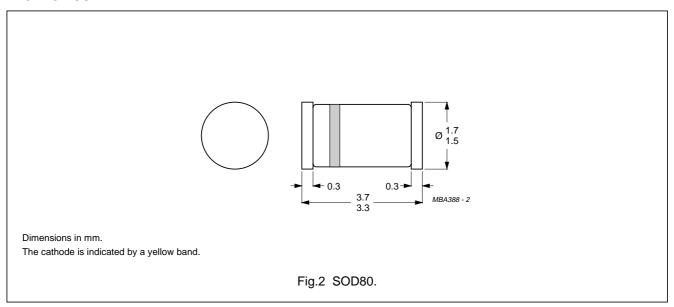
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#### **PACKAGE OUTLINE**



#### **DEFINITIONS**

| Data Sheet Status   |   |  |  |
|---|---|--|--|
| Objective specification   | Objective specification This data sheet contains target or goal specifications for product development. |  |  |
| Preliminary specification   | This data sheet contains preliminary data; supplementary data may be published later.                   |  |  |
| Product specification   | This data sheet contains final product specifications.  |  |  |
| Limiting values   |   |  |  |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. |   |  |  |

# **Application information**

Where application information is given, it is advisory and does not form part of the specification.

# LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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