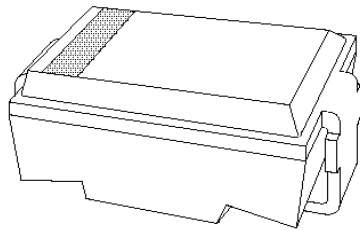


# DATA SHEET



## **SMA BZG01 series** Voltage regulator diodes

Product specification

1999 Dec 23

## Voltage regulator diodes

## SMA BZG01 series

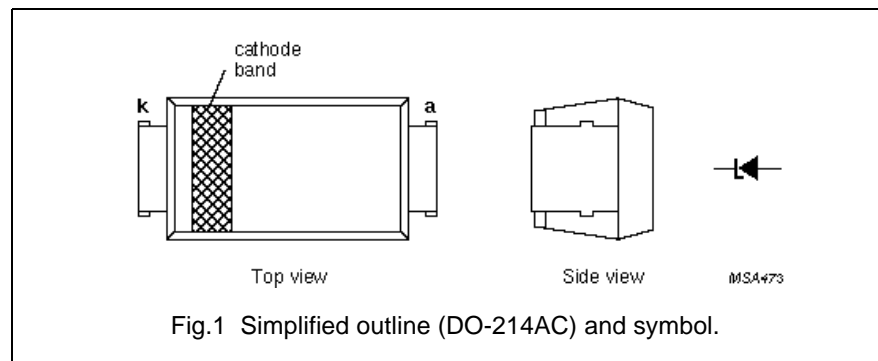
### FEATURES

- Glass passivated
- High maximum operating temperature
- Ideal for surface mount automotive applications
- Low leakage current
- Excellent stability
- UL 94V-O classified plastic package
- Zener working voltage range: 10 to 270 V for 35 types
- Supplied in 12 mm embossed tape and reel, 1500 and 7500 pieces
- Marking: cathode, date code, type name
- Easy pick and place.

### DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic. The small rectangular package has two J bent leads.



### LIMITING VALUES

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

| SYMBOL    | PARAMETER                                     | CONDITIONS   | MIN. | MAX. | UNIT               |
|-----------|---|--|------|------|--------------------|
| $P_{tot}$ | total power dissipation                       | $T_{tp} = 100\text{ }^{\circ}\text{C}$ ; see Fig.2   | –    | 2.50 | W                  |
| $P_{tot}$ | total power dissipation                       | $T_{amb} = 25\text{ }^{\circ}\text{C}$ ; see Fig.2; device mounted on an $\text{Al}_2\text{O}_3$ PCB (see Fig.5) | –    | 1.50 | W                  |
| $P_{ZSM}$ | non-repetitive peak reverse power dissipation | $t_p = 100\text{ }\mu\text{s}$ ; square pulse; $T_j = 25\text{ }^{\circ}\text{C}$ prior to surge; see Fig.3      | –    | 150  | W                  |
| $T_{stg}$ | storage temperature                           |  | –65  | +175 | $^{\circ}\text{C}$ |
| $T_j$     | junction temperature                          |  | –65  | +175 | $^{\circ}\text{C}$ |

## Voltage regulator diodes

## SMA BZG01 series

## ELECTRICAL CHARACTERISTICS

## Total series

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

| SYMBOL | PARAMETER       | CONDITIONS                       | MAX. | UNIT |
|--------|-----------------|----------------------------------|------|------|
| $V_F$  | forward voltage | $I_F = 0.1\text{ A}$ ; see Fig.4 | 1.2  | V    |

## Per type

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

| TYPE<br>No.<br>SUFFIX<br>(1) | WORKING VOLTAGE    |      |      | DIFFERENTIAL<br>RESISTANCE      |      | TEMPERATURE<br>COEFFICIENT |      | TEST<br>CURRENT<br><br>$I_Z$ (mA) | REVERSE CURRENT<br>at REVERSE VOLTAGE |           |
|------------------------------|--------------------|------|------|---------------------------------|------|----------------------------|------|-----------------------------------|---------------------------------------|-----------|
|                              | $V_Z$ (V) at $I_Z$ |      |      | $r_{dif}$ ( $\Omega$ ) at $I_Z$ |      | $S_Z$ (%/K) at $I_Z$       |      |                                   | $I_R$ ( $\mu\text{A}$ )               | $V_R$ (V) |
|                              | MIN.               | NOM. | MAX. | TYP.                            | MAX. | MIN.                       | MAX. | MAX.                              |                                       |           |
| C10                          | 9.4                | 10   | 10.6 | 2                               | 7    | 0.05                       | 0.09 | 25                                | 10                                    | 7.5       |
| C11                          | 10.4               | 11   | 11.6 | 3                               | 8    | 0.05                       | 0.10 | 20                                | 4                                     | 8.2       |
| C12                          | 11.4               | 12   | 12.7 | 3                               | 9    | 0.05                       | 0.10 | 20                                | 3                                     | 9.1       |
| C13                          | 12.4               | 13   | 14.1 | 3                               | 10   | 0.05                       | 0.10 | 20                                | 2                                     | 10        |
| C15                          | 13.8               | 15   | 15.6 | 5                               | 15   | 0.05                       | 0.10 | 15                                | 1                                     | 11        |
| C16                          | 15.3               | 16   | 17.1 | 5                               | 15   | 0.06                       | 0.11 | 15                                | 1                                     | 12        |
| C18                          | 16.8               | 18   | 19.1 | 7                               | 20   | 0.06                       | 0.11 | 15                                | 1                                     | 13        |
| C20                          | 18.8               | 20   | 21.2 | 8                               | 24   | 0.06                       | 0.11 | 10                                | 1                                     | 15        |
| C22                          | 20.8               | 22   | 23.3 | 8                               | 25   | 0.06                       | 0.11 | 10                                | 1                                     | 16        |
| C24                          | 22.8               | 24   | 25.6 | 8                               | 25   | 0.06                       | 0.11 | 10                                | 1                                     | 18        |
| C27                          | 25.1               | 27   | 28.9 | 10                              | 30   | 0.06                       | 0.11 | 8                                 | 1                                     | 20        |
| C30                          | 28                 | 30   | 32   | 10                              | 30   | 0.06                       | 0.11 | 8                                 | 1                                     | 22        |
| C33                          | 31                 | 33   | 35   | 12                              | 35   | 0.06                       | 0.11 | 8                                 | 1                                     | 24        |
| C36                          | 34                 | 36   | 38   | 13                              | 40   | 0.06                       | 0.11 | 8                                 | 1                                     | 27        |
| C39                          | 37                 | 39   | 41   | 17                              | 50   | 0.06                       | 0.11 | 6                                 | 1                                     | 30        |
| C43                          | 40                 | 43   | 46   | 17                              | 50   | 0.07                       | 0.12 | 6                                 | 1                                     | 33        |
| C47                          | 44                 | 47   | 50   | 30                              | 90   | 0.07                       | 0.12 | 4                                 | 1                                     | 36        |
| C51                          | 48                 | 51   | 54   | 40                              | 115  | 0.07                       | 0.12 | 4                                 | 1                                     | 39        |
| C56                          | 52                 | 56   | 60   | 40                              | 120  | 0.07                       | 0.12 | 4                                 | 1                                     | 43        |
| C62                          | 58                 | 62   | 66   | 40                              | 125  | 0.08                       | 0.13 | 4                                 | 1                                     | 47        |
| C68                          | 64                 | 68   | 72   | 40                              | 130  | 0.08                       | 0.13 | 4                                 | 1                                     | 51        |
| C75                          | 70                 | 75   | 79   | 40                              | 135  | 0.08                       | 0.13 | 4                                 | 1                                     | 56        |
| C82                          | 77                 | 82   | 87   | 70                              | 200  | 0.08                       | 0.13 | 2.7                               | 1                                     | 62        |
| C91                          | 85                 | 91   | 96   | 80                              | 250  | 0.09                       | 0.13 | 2.7                               | 1                                     | 68        |
| C100                         | 94                 | 100  | 106  | 120                             | 350  | 0.09                       | 0.13 | 2.7                               | 1                                     | 75        |
| C110                         | 104                | 110  | 116  | 150                             | 450  | 0.09                       | 0.13 | 2.7                               | 1                                     | 82        |

## Voltage regulator diodes

## SMA BZG01 series

| TYPE<br>No.<br>SUFFIX<br>(1) | WORKING VOLTAGE    |      |      | DIFFERENTIAL<br>RESISTANCE      |      | TEMPERATURE<br>COEFFICIENT |      | TEST<br>CURRENT<br><br>$I_Z$ (mA) | REVERSE CURRENT<br>at REVERSE VOLTAGE |           |
|------------------------------|--------------------|------|------|---------------------------------|------|----------------------------|------|-----------------------------------|---------------------------------------|-----------|
|                              | $V_Z$ (V) at $I_Z$ |      |      | $r_{dif}$ ( $\Omega$ ) at $I_Z$ |      | $S_Z$ (%/K) at $I_Z$       |      |                                   | $I_R$ ( $\mu$ A)                      | $V_R$ (V) |
|                              | MIN.               | NOM. | MAX. | TYP.                            | MAX. | MIN.                       | MAX. | MAX.                              |                                       |           |
| C120                         | 114                | 120  | 127  | 200                             | 550  | 0.09                       | 0.13 | 2                                 | 1                                     | 91        |
| C130                         | 124                | 130  | 141  | 250                             | 700  | 0.09                       | 0.13 | 2                                 | 1                                     | 100       |
| C150                         | 138                | 150  | 156  | 300                             | 1000 | 0.09                       | 0.13 | 2                                 | 1                                     | 110       |
| C160                         | 153                | 160  | 171  | 350                             | 1100 | 0.09                       | 0.13 | 1.5                               | 1                                     | 120       |
| C180                         | 168                | 180  | 191  | 400                             | 1200 | 0.09                       | 0.13 | 1.5                               | 1                                     | 130       |
| C200                         | 188                | 200  | 212  | 500                             | 1500 | 0.09                       | 0.13 | 1.5                               | 1                                     | 150       |
| C220                         | 208                | 220  | 233  | 700                             | 2250 | 0.09                       | 0.13 | 1                                 | 1                                     | 160       |
| C240                         | 228                | 240  | 256  | 800                             | 2550 | 0.09                       | 0.13 | 1                                 | 1                                     | 180       |
| C270                         | 251                | 270  | 289  | 1000                            | 3000 | 0.09                       | 0.13 | 1                                 | 1                                     | 200       |

**Note**

- To complete the type number the suffix is added to the basic type number, e.g. BZG01-C130.

**THERMAL CHARACTERISTICS**

| SYMBOL         | PARAMETER                                     | CONDITIONS | VALUE | UNIT |
|----------------|---|------------|-------|------|
| $R_{th\ j-tp}$ | thermal resistance from junction to tie-point |            | 30    | K/W  |
| $R_{th\ j-a}$  | thermal resistance from junction to ambient   | note 1     | 100   | K/W  |
|                |   | note 2     | 150   | K/W  |

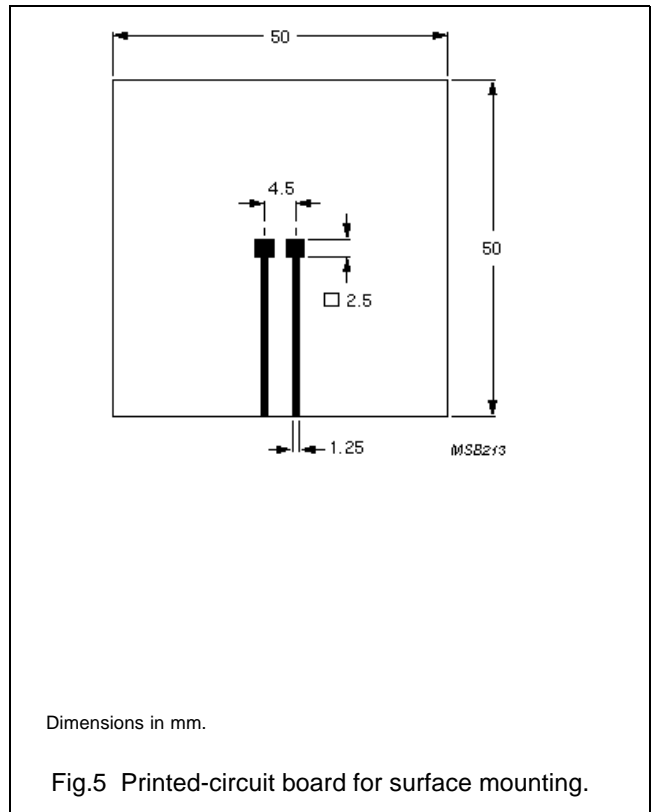
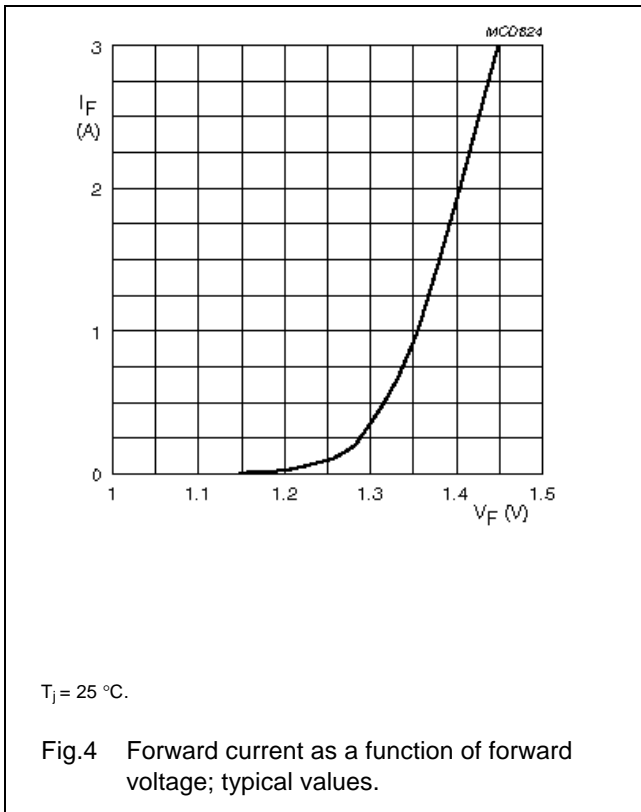
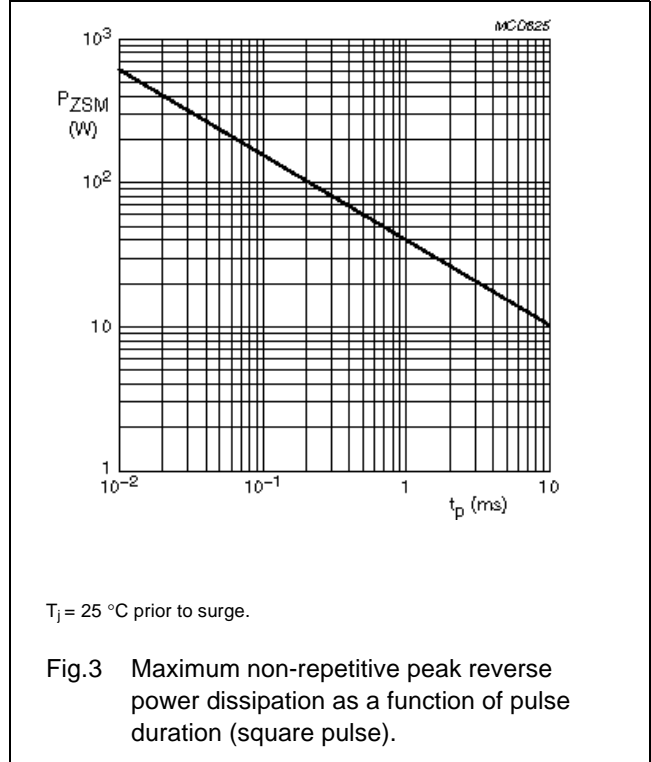
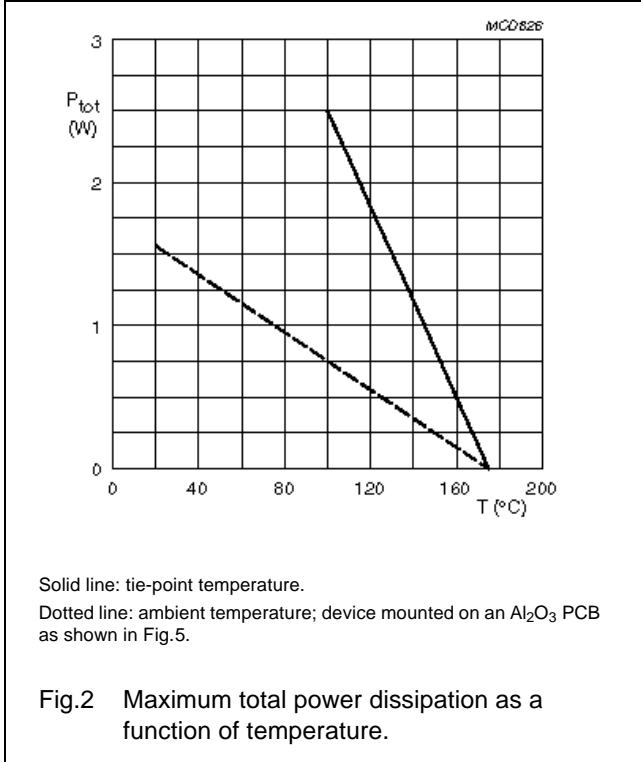
**Notes**

- Device mounted on an  $Al_2O_3$  printed-circuit board, 0.7 mm thick; thickness of Cu-layer  $\geq 35\ \mu$ m, see Fig.5.
- Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer  $\geq 40\ \mu$ m, see Fig.5.  
For more information please refer to the 'General Part of associated Handbook'.

Voltage regulator diodes

SMA BZG01 series

GRAPHICAL DATA



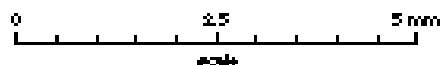
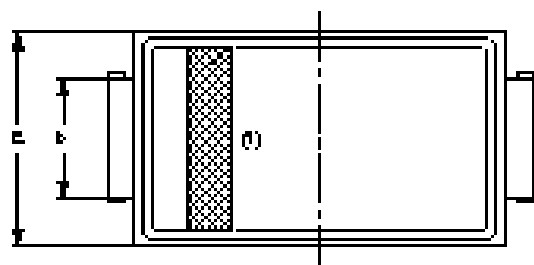
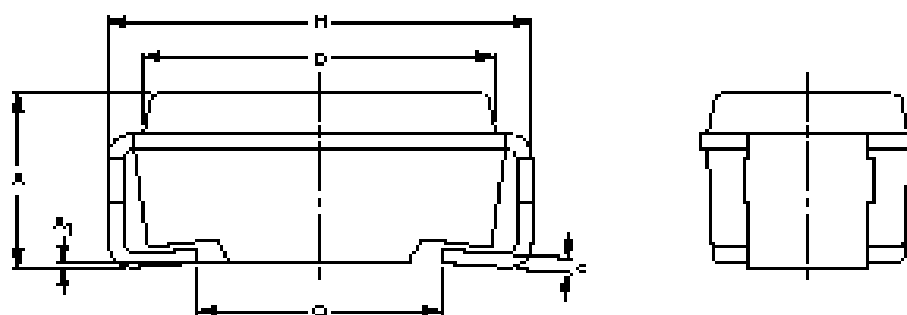
Voltage regulator diodes

SMA BZG01 series

PACKAGE OUTLINE

Transfer-moulded thermo-setting plastic small rectangular surface mounted package;  
2 connectors

SOD124



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub> | b          | c   | D          | E          | H          | G          |
|------|------------|----------------|------------|-----|------------|------------|------------|------------|
| mm   | 2.3<br>2.0 | 0.05           | 1.6<br>1.4 | 0.2 | 4.5<br>4.3 | 2.3<br>2.4 | 5.5<br>5.1 | 3.3<br>2.7 |

Notes

1. The marking band indicates the cathode.

| OUTLINE<br>VERSION | REFERENCES |         |      |  | EUROPEAN<br>PROJECTION | ISSUE DATE |
|--------------------|------------|---------|------|--|------------------------|------------|
|                    | EO         | JEDEC   | EIAJ |  |                        |            |
| SOD124             |            | DO-214A |      |  |                        | 29-10-22   |

## Voltage regulator diodes

## SMA BZG01 series

**DEFINITIONS**

| <b>Data sheet status</b>  |   |
|---|---|
| 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.                                |
| <b>Limiting values</b>  |   |
| 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. |   |
| <b>Application information</b>  |   |
| 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.