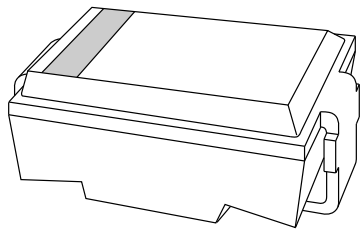


DATA SHEET



BZG03 series Voltage regulator diodes

Preliminary specification
Supersedes data of October 1993
File under Discrete Semiconductors, SC01

1996 Jun 07

Voltage regulator diodes

BZG03 series

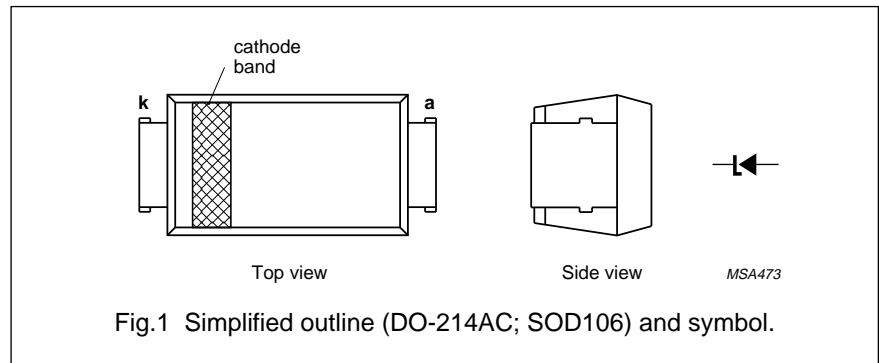
FEATURES

- Glass passivated
- High maximum operating temperature
- 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.

DESCRIPTION

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

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.



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 °C; see Fig.2 | – | 3.00 | W |
| P _{tot} | total power dissipation | T _{amb} = 50 °C; see Fig.2; device mounted on an Al ₂ O ₃ PCB (see Fig.5) | – | 1.25 | W |
| P _{ZSM} | non-repetitive peak reverse power dissipation | t _p = 100 μs; square pulse; T _j = 25 °C prior to surge; see Fig.3 | – | 600 | W |
| T _{stg} | storage temperature | | –65 | +175 | °C |
| T _j | junction temperature | | –65 | +175 | °C |

Voltage regulator diodes

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ELECTRICAL CHARACTERISTICS

Total series

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

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|--------|-----------------|----------------------------------|------|------|
| V_F | forward voltage | $I_F = 0.5\text{ A}$; see Fig.4 | 1.2 | V |

Per type

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

| TYPE No. SUFFIX (1) | WORKING VOLTAGE | | | DIFFERENTIAL RESISTANCE | | TEMPERATURE COEFFICIENT | | TEST CURRENT I_Z (mA) | REVERSE CURRENT at REVERSE VOLTAGE | |
|------------------------------|--------------------|------|------|---------------------------------|------|----------------------------|------|-------------------------------|---------------------------------------|-----------|
| | V_Z (V) at I_Z | | | r_{dif} (Ω) at I_Z | | S_Z (%/K) at I_Z | | | I_R (μA) | V_R (V) |
| | MIN. | NOM. | MAX. | TYP. | MAX. | MIN. | MAX. | MAX. | | |
| C10 | 9.4 | 10 | 10.6 | 2 | 4 | 0.05 | 0.09 | 50 | 7 | 7.5 |
| C11 | 10.4 | 11 | 11.6 | 4 | 7 | 0.05 | 0.10 | 50 | 4 | 8.2 |
| C12 | 11.4 | 12 | 12.7 | 4 | 7 | 0.05 | 0.10 | 50 | 3 | 9.1 |
| C13 | 12.4 | 13 | 14.1 | 5 | 10 | 0.05 | 0.10 | 50 | 2 | 10 |
| C15 | 13.8 | 15 | 15.6 | 5 | 10 | 0.05 | 0.10 | 50 | 1 | 11 |
| C16 | 15.3 | 16 | 17.1 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 12 |
| C18 | 16.8 | 18 | 19.1 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 13 |
| C20 | 18.8 | 20 | 21.2 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 15 |
| C22 | 20.8 | 22 | 23.3 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 16 |
| C24 | 22.8 | 24 | 25.6 | 7 | 15 | 0.06 | 0.11 | 25 | 1 | 18 |
| C27 | 25.1 | 27 | 28.9 | 7 | 15 | 0.06 | 0.11 | 25 | 1 | 20 |
| C30 | 28 | 30 | 32 | 8 | 15 | 0.06 | 0.11 | 25 | 1 | 22 |
| C33 | 31 | 33 | 35 | 8 | 15 | 0.06 | 0.11 | 25 | 1 | 24 |
| C36 | 34 | 36 | 38 | 21 | 40 | 0.06 | 0.11 | 10 | 1 | 27 |
| C39 | 37 | 39 | 41 | 21 | 40 | 0.06 | 0.11 | 10 | 1 | 30 |
| C43 | 40 | 43 | 46 | 24 | 45 | 0.07 | 0.12 | 10 | 1 | 33 |
| C47 | 44 | 47 | 50 | 24 | 45 | 0.07 | 0.12 | 10 | 1 | 36 |
| C51 | 48 | 51 | 54 | 25 | 60 | 0.07 | 0.12 | 10 | 1 | 39 |
| C56 | 52 | 56 | 60 | 25 | 60 | 0.07 | 0.12 | 10 | 1 | 43 |
| C62 | 58 | 62 | 66 | 25 | 80 | 0.08 | 0.13 | 10 | 1 | 47 |
| C68 | 64 | 68 | 72 | 25 | 80 | 0.08 | 0.13 | 10 | 1 | 51 |
| C75 | 70 | 75 | 79 | 30 | 100 | 0.08 | 0.13 | 10 | 1 | 56 |
| C82 | 77 | 82 | 87 | 30 | 100 | 0.08 | 0.13 | 10 | 1 | 62 |
| C91 | 85 | 91 | 96 | 60 | 200 | 0.09 | 0.13 | 5 | 1 | 68 |
| C100 | 94 | 100 | 106 | 60 | 200 | 0.09 | 0.13 | 5 | 1 | 75 |
| C110 | 104 | 110 | 116 | 80 | 250 | 0.09 | 0.13 | 5 | 1 | 82 |
| C120 | 114 | 120 | 127 | 80 | 250 | 0.09 | 0.13 | 5 | 1 | 91 |

Voltage regulator diodes

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| TYPE No. SUFFIX (1) | WORKING VOLTAGE | | | DIFFERENTIAL RESISTANCE | | TEMPERATURE COEFFICIENT | | TEST CURRENT I_Z (mA) | REVERSE CURRENT at REVERSE VOLTAGE | |
|------------------------------|--------------------|------|------|---------------------------------|------|----------------------------|------|-----------------------------------|---------------------------------------|-----------|
| | V_Z (V) at I_Z | | | r_{dif} (Ω) at I_Z | | S_Z (%/K) at I_Z | | | I_R (μ A) | V_R (V) |
| | MIN. | NOM. | MAX. | TYP. | MAX. | MIN. | MAX. | MAX. | | |
| C130 | 124 | 130 | 141 | 110 | 300 | 0.09 | 0.13 | 5 | 1 | 100 |
| C150 | 138 | 150 | 156 | 130 | 300 | 0.09 | 0.13 | 5 | 1 | 110 |
| C160 | 153 | 160 | 171 | 150 | 350 | 0.09 | 0.13 | 5 | 1 | 120 |
| C180 | 168 | 180 | 191 | 180 | 400 | 0.09 | 0.13 | 5 | 1 | 130 |
| C200 | 188 | 200 | 212 | 200 | 500 | 0.09 | 0.13 | 5 | 1 | 150 |
| C220 | 208 | 220 | 233 | 350 | 750 | 0.09 | 0.13 | 2 | 1 | 160 |
| C240 | 228 | 240 | 256 | 400 | 850 | 0.09 | 0.13 | 2 | 1 | 180 |
| C270 | 251 | 270 | 289 | 450 | 1000 | 0.09 | 0.13 | 2 | 1 | 200 |

Note

- To complete the type number the suffix is added to the basic type number, e.g. BZG03-C130.

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|----------------|---|------------|-------|------|
| $R_{th\ j-tp}$ | thermal resistance from junction to tie-point | | 25 | K/W |
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1 | 100 | K/W |
| | | note 2 | 150 | K/W |

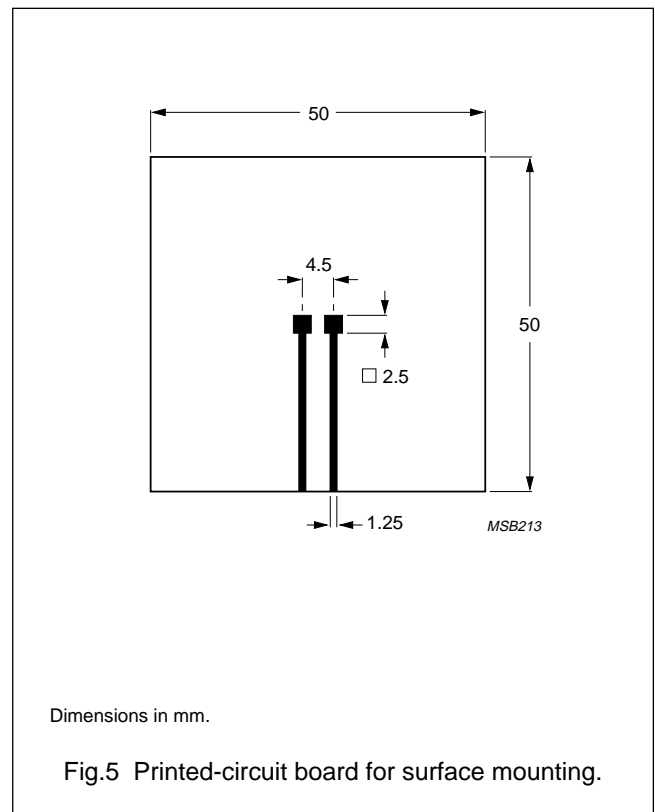
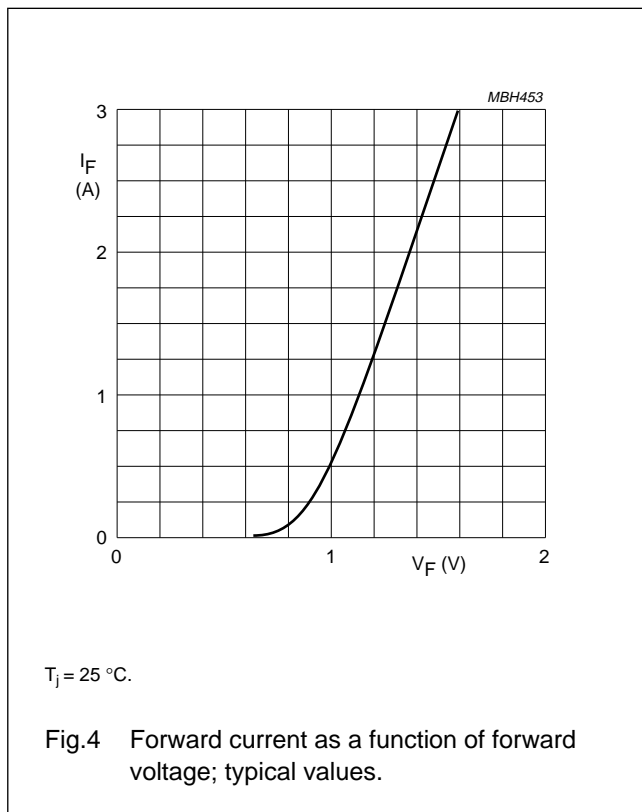
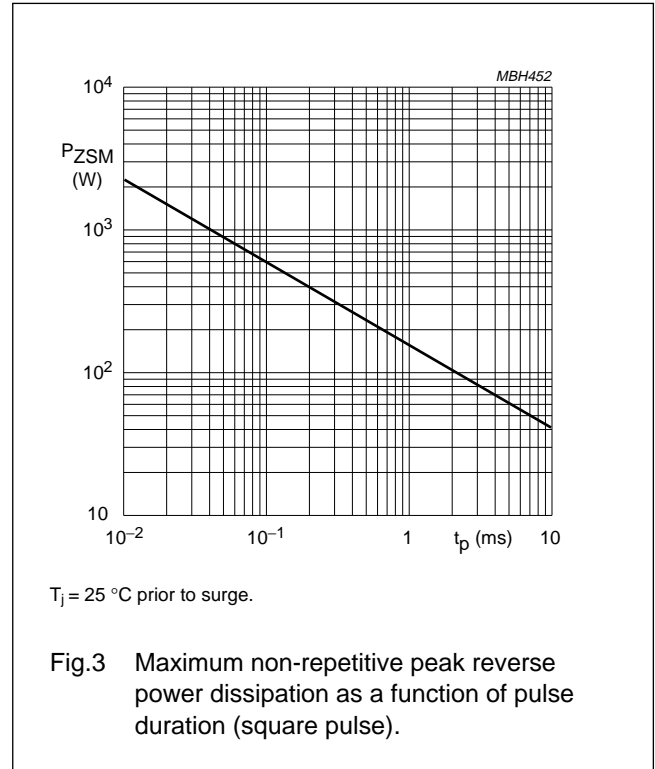
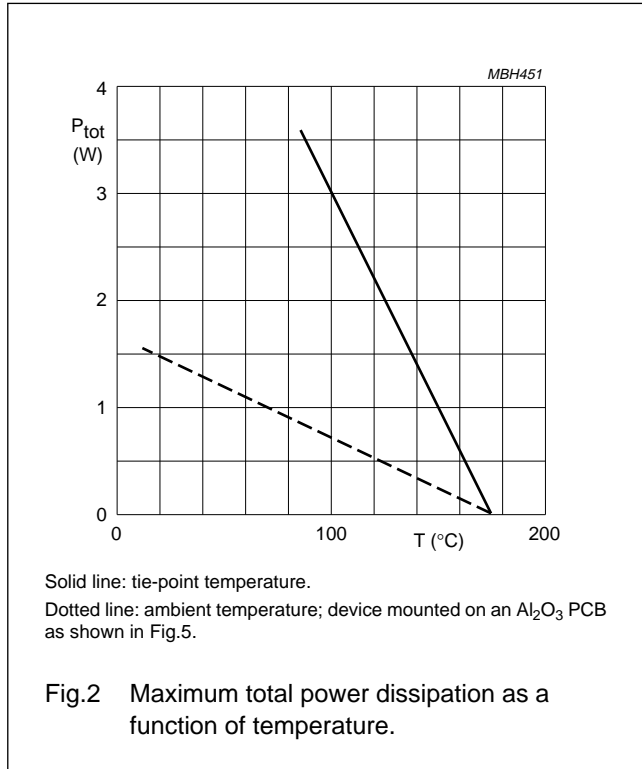
Notes

- 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 Handbook SC01'.

Voltage regulator diodes

BZG03 series

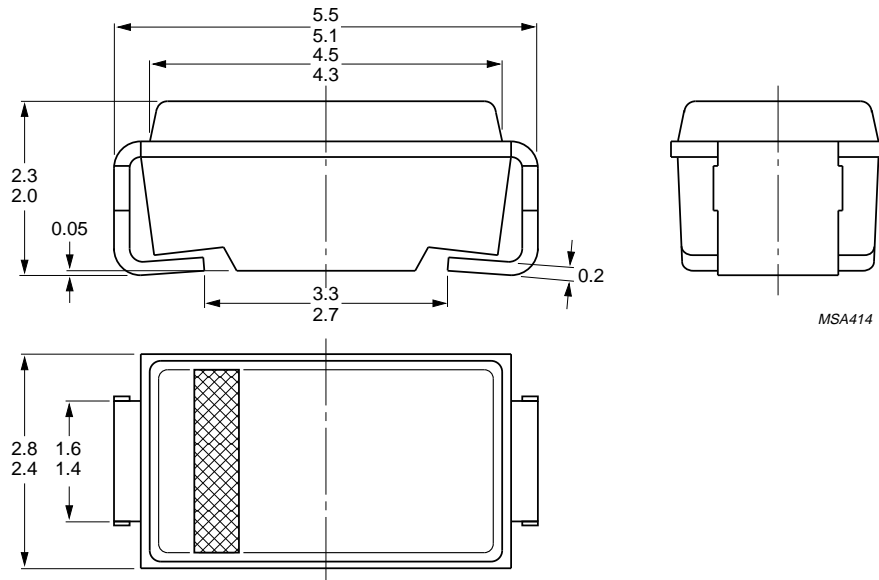
GRAPHICAL DATA



Voltage regulator diodes

BZG03 series

PACKAGE OUTLINE



Dimensions in mm.
The marking band indicates the cathode.

Fig.6 DO-214AC; SOD106.

Voltage regulator diodes

BZG03 series

DEFINITIONS

| | |
|---|---|
| Data sheet status | |
| 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.