



**THE DATASHEET OF  
BZX84-A9V1,215**





# BZX84 series

## Voltage regulator diodes

Rev. 6 — 6 March 2014

Product data sheet

## 1. Product profile

### 1.1 General description

Low-power voltage regulator diodes in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

The diodes are available in the normalized E24  $\pm 1\%$  (BZX84-A),  $\pm 2\%$  (BZX84-B) and approximately  $\pm 5\%$  (BZX84-C) tolerance range. The series includes 37 breakdown voltages with nominal working voltages from 2.4 V to 75 V.

### 1.2 Features and benefits

- Total power dissipation:  $\leq 250$  mW
- Working voltage range: nominal 2.4 V to 75 V (E24 range)
- Three tolerance series:  $\pm 1\%$ ,  $\pm 2\%$  and approximately  $\pm 5\%$
- Non-repetitive peak reverse power dissipation:  $\leq 40$  W
- AEC-Q101 qualified

### 1.3 Applications

- General regulation functions

### 1.4 Quick reference data

Table 1. Quick reference data

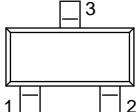
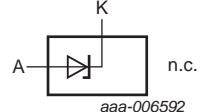
| Symbol    | Parameter               | Conditions           | Min | Typ | Max | Unit |
|-----------|-------------------------|----------------------|-----|-----|-----|------|
| $V_F$     | forward voltage         | $I_F = 10$ mA        | [1] | -   | 0.9 | V    |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C | [2] | -   | 250 | mW   |

[1] Pulse test:  $t_p \leq 100$   $\mu$ s;  $\delta \leq 0.02$

[2] Device mounted on a FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 2. Pinning information

Table 2. Pinning

| Pin | Symbol | Description   | Simplified outline  | Graphic symbol  |
|-----|--------|---------------|---|---|
| 1   | A      | anode         |  |  |
| 2   | n.c.   | not connected |   |   |
| 3   | K      | cathode       |   |   |

## 3. Ordering information

Table 3. Ordering information

| Type number                 | Package  |  | Version |
|-----------------------------|----------|--|---------|
|                             | Name     | Description                              |         |
| BZX84 series <sup>[1]</sup> | TO-236AB | plastic surface-mounted package; 3 leads | SOT23   |

[1] The series includes 37 breakdown voltages with nominal working voltages from 2.4 V to 75 V and  $\pm 1\%$ ,  $\pm 2\%$  and  $\pm 5\%$  tolerances.

## 4. Marking

Table 4. Marking codes

| Type number | Marking code <sup>[1]</sup> | Type number | Marking code <sup>[1]</sup> |
|-------------|-----------------------------|-------------|-----------------------------|
| BZX84-A2V4  | *50                         | BZX84-A18   | KF*                         |
| BZX84-A2V7  | *51                         | BZX84-A20   | *C2                         |
| BZX84-A3V0  | *52                         | BZX84-A22   | KG*                         |
| BZX84-A3V3  | *53                         | BZX84-A24   | KH*                         |
| BZX84-A3V6  | *C1                         | BZX84-A27   | *75                         |
| BZX84-A3V9  | *55                         | BZX84-A30   | KJ*                         |
| BZX84-A4V3  | *56                         | BZX84-A33   | KK*                         |
| BZX84-A4V7  | *57                         | BZX84-A36   | *C3                         |
| BZX84-A5V1  | *58                         | BZX84-A39   | *C4                         |
| BZX84-A5V6  | *59                         | BZX84-A43   | *C5                         |
| BZX84-A6V2  | *60                         | BZX84-A51   | *C6                         |
| BZX84-A6V8  | *61                         | BZX84-A75   | *86                         |
| BZX84-A7V5  | *62                         | BZX84-B2V4  | *Z0                         |
| BZX84-A8V2  | *63                         | BZX84-B2V7  | *Z1                         |
| BZX84-A9V1  | *64                         | BZX84-B3V0  | *S1                         |
| BZX84-A10   | *65                         | BZX84-B3V3  | *S2                         |
| BZX84-A11   | *04                         | BZX84-B3V6  | *S3                         |
| BZX84-A12   | *67                         | BZX84-B3V9  | *S4                         |
| BZX84-A13   | *C0                         | BZX84-B4V3  | *S7                         |
| BZX84-A15   | *69                         | BZX84-B4V7  | *S8                         |
| BZX84-A16   | KE*                         | BZX84-B5V1  | *R1                         |

Table 4. Marking codes ...continued

| Type number | Marking code <sup>[1]</sup> | Type number | Marking code <sup>[1]</sup> |
|-------------|-----------------------------|-------------|-----------------------------|
| BZX84-B5V6  | *R2                         | BZX84-C3V9  | *B3                         |
| BZX84-B6V2  | *R5                         | BZX84-C4V3  | *B6                         |
| BZX84-B6V8  | *R6                         | BZX84-C4V7  | Z1*                         |
| BZX84-B7V5  | *R8                         | BZX84-C5V1  | Z2*                         |
| BZX84-B8V2  | *R9                         | BZX84-C5V6  | Z3*                         |
| BZX84-B9V1  | *T1                         | BZX84-C6V2  | Z4*                         |
| BZX84-B10   | *66                         | BZX84-C6V8  | Z5*                         |
| BZX84-B11   | *Z6                         | BZX84-C7V5  | Z6*                         |
| BZX84-B12   | *Z7                         | BZX84-C8V2  | Z7*                         |
| BZX84-B13   | *Z8                         | BZX84-C9V1  | Z8*                         |
| BZX84-B15   | *Z9                         | BZX84-C10   | Z9*                         |
| BZX84-B16   | *70                         | BZX84-C11   | Y1*                         |
| BZX84-B18   | *71                         | BZX84-C12   | Y2*                         |
| BZX84-B20   | *72                         | BZX84-C13   | Y3*                         |
| BZX84-B22   | *73                         | BZX84-C15   | Y4*                         |
| BZX84-B24   | *74                         | BZX84-C16   | Y5*                         |
| BZX84-B27   | *Z5                         | BZX84-C18   | Y6*                         |
| BZX84-B30   | *Z4                         | BZX84-C20   | Y7*                         |
| BZX84-B33   | *Y1                         | BZX84-C22   | Y8*                         |
| BZX84-B36   | *Y2                         | BZX84-C24   | Y9*                         |
| BZX84-B39   | *S0                         | BZX84-C27   | *T2                         |
| BZX84-B43   | *S5                         | BZX84-C30   | *T5                         |
| BZX84-B47   | *S6                         | BZX84-C33   | *T6                         |
| BZX84-B51   | *S9                         | BZX84-C36   | *T7                         |
| BZX84-B56   | *R0                         | BZX84-C39   | *T8                         |
| BZX84-B62   | *R3                         | BZX84-C43   | *B4                         |
| BZX84-B68   | *R4                         | BZX84-C47   | *B5                         |
| BZX84-B75   | *R7                         | BZX84-C51   | *B7                         |
| BZX84-C2V4  | *T3                         | BZX84-C56   | *B8                         |
| BZX84-C2V7  | *T4                         | BZX84-C62   | *B9                         |
| BZX84-C3V0  | *T9                         | BZX84-C68   | *B0                         |
| BZX84-C3V3  | *B1                         | BZX84-C75   | *A1                         |
| BZX84-C3V6  | *B2                         | -           | -                           |

[1] \* = placeholder for manufacturing site code

## 5. Limiting values

**Table 5. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol    | Parameter                                     | Conditions                  | Min   | Max  | Unit |
|-----------|---|-----------------------------|-------|------|------|
| $I_F$     | forward current                               |                             | -     | 200  | mA   |
| $P_{ZSM}$ | non-repetitive peak reverse power dissipation |                             | [1] - | 40   | W    |
| $P_{tot}$ | total power dissipation                       | $T_{amb} \leq 25\text{ °C}$ | [2] - | 250  | mW   |
| $T_{amb}$ | ambient temperature                           |                             | -     | 150  | °C   |
| $T_{stg}$ | storage temperature                           |                             | -55   | +150 | °C   |
| $T_j$     | junction temperature                          |                             | -65   | +150 | °C   |

[1]  $t_p = 100\ \mu\text{s}$ ; square wave;  $T_j = 25\text{ °C}$  before surge

[2] Device mounted on a FR4 PCB, single-sided copper, tin-plated and standard footprint.

## 6. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol         | Parameter  | Conditions  | Min   | Typ | Max | Unit |
|----------------|--|-------------|-------|-----|-----|------|
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1] - | -   | 500 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             | [2] - | -   | 330 | K/W  |

[1] Device mounted on a FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Soldering point of cathode tab.

## 7. Characteristics

**Table 7. Characteristics**

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

| Symbol | Parameter       | Conditions           | Min   | Typ | Max | Unit |
|--------|-----------------|----------------------|-------|-----|-----|------|
| $V_F$  | forward voltage | $I_F = 10\text{ mA}$ | [1] - | -   | 0.9 | V    |

[1] Pulse test:  $t_p \leq 100\ \mu\text{s}$ ;  $\delta \leq 0.02$

Table 8. Characteristics per type; BZX84-A2V4 to BZX84-C24

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

| BZX84-xxx | Sel | Working voltage $V_Z$ (V) |      | Differential resistance $r_{\text{dif}}$ ( $\Omega$ ) |     |                     |     | Reverse current $I_R$ ( $\mu\text{A}$ ) |           | Temperature coefficient $S_Z$ (mV/K) |      |     | Diode capacitance $C_d$ (pF) <sup>[1]</sup> | Non-repetitive peak reverse current $I_{ZSM}$ (A) <sup>[2]</sup> |
|-----------|-----|---------------------------|------|---|-----|---------------------|-----|---|-----------|--------------------------------------|------|-----|---|--|
|           |     | $I_Z = 5\text{ mA}$       |      | $I_Z = 1\text{ mA}$                                   |     | $I_Z = 5\text{ mA}$ |     | Max                                     | $V_R$ (V) | $I_Z = 5\text{ mA}$                  |      |     |   |  |
|           |     | Min                       | Max  | Typ   | Max | Typ                 | Max |   |           | Min                                  | Typ  | Max | Max   | Max  |
| 2V4       | A   | 2.37                      | 2.43 | 275   | 600 | 70                  | 100 | 50                                      | 1         | -3.5                                 | -1.6 | 0   | 450   | 6.0  |
|           | B   | 2.35                      | 2.45 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 2.2                       | 2.6  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 2V7       | A   | 2.67                      | 2.73 | 300   | 600 | 75                  | 100 | 20                                      | 1         | -3.5                                 | -2.0 | 0   | 450   | 6.0  |
|           | B   | 2.65                      | 2.75 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 2.5                       | 2.9  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 3V0       | A   | 2.97                      | 3.03 | 325   | 600 | 80                  | 95  | 10                                      | 1         | -3.5                                 | -2.1 | 0   | 450   | 6.0  |
|           | B   | 2.94                      | 3.06 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 2.8                       | 3.2  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 3V3       | A   | 3.26                      | 3.34 | 350   | 600 | 85                  | 95  | 5                                       | 1         | -3.5                                 | -2.4 | 0   | 450   | 6.0  |
|           | B   | 3.23                      | 3.37 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 3.1                       | 3.5  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 3V6       | A   | 3.56                      | 3.64 | 375   | 600 | 85                  | 90  | 5                                       | 1         | -3.5                                 | -2.4 | 0   | 450   | 6.0  |
|           | B   | 3.53                      | 3.67 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 3.4                       | 3.8  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 3V9       | A   | 3.86                      | 3.94 | 400   | 600 | 85                  | 90  | 3                                       | 1         | -3.5                                 | -2.5 | 0   | 450   | 6.0  |
|           | B   | 3.82                      | 3.98 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 3.7                       | 4.1  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 4V3       | A   | 4.25                      | 4.35 | 410   | 600 | 80                  | 90  | 3                                       | 1         | -3.5                                 | -2.5 | 0   | 450   | 6.0  |
|           | B   | 4.21                      | 4.39 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 4.0                       | 4.6  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 4V7       | A   | 4.65                      | 4.75 | 425   | 500 | 50                  | 80  | 3                                       | 2         | -3.5                                 | -1.4 | 0.2 | 300   | 6.0  |
|           | B   | 4.61                      | 4.79 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 4.4                       | 5.0  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 5V1       | A   | 5.04                      | 5.16 | 400   | 480 | 40                  | 60  | 2                                       | 2         | -2.7                                 | -0.8 | 1.2 | 300   | 6.0  |
|           | B   | 5.0                       | 5.2  |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 4.8                       | 5.4  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 5V6       | A   | 5.54                      | 5.66 | 80  | 400 | 15                  | 40  | 1                                       | 2         | -2.0                                 | 1.2  | 2.5 | 300   | 6.0  |
|           | B   | 5.49                      | 5.71 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 5.2                       | 6.0  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 6V2       | A   | 6.13                      | 6.27 | 40  | 150 | 6                   | 10  | 3                                       | 4         | 0.4                                  | 2.3  | 3.7 | 200   | 6.0  |
|           | B   | 6.08                      | 6.32 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 5.8                       | 6.6  |   |     |                     |     |   |           |                                      |      |     |   |  |
| 6V8       | A   | 6.73                      | 6.87 | 30  | 80  | 6                   | 15  | 2                                       | 4         | 1.2                                  | 3.0  | 4.5 | 200   | 6.0  |
|           | B   | 6.66                      | 6.94 |   |     |                     |     |   |           |                                      |      |     |   |  |
|           | C   | 6.4                       | 7.2  |   |     |                     |     |   |           |                                      |      |     |   |  |

Table 8. Characteristics per type; BZX84-A2V4 to BZX84-C24 ...continued

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

| BZX84-xxx | Sel | Working voltage $V_Z$ (V) |       | Differential resistance $r_{\text{dif}}$ ( $\Omega$ ) |     |                     |     | Reverse current $I_R$ ( $\mu\text{A}$ ) |           | Temperature coefficient $S_Z$ (mV/K) |      |      | Diode capacitance $C_d$ (pF) <sup>[1]</sup> | Non-repetitive peak reverse current $I_{ZSM}$ (A) <sup>[2]</sup> |
|-----------|-----|---------------------------|-------|---|-----|---------------------|-----|---|-----------|--------------------------------------|------|------|---|--|
|           |     | $I_Z = 5\text{ mA}$       |       | $I_Z = 1\text{ mA}$                                   |     | $I_Z = 5\text{ mA}$ |     | Max                                     | $V_R$ (V) | $I_Z = 5\text{ mA}$                  |      |      |   |  |
|           |     | Min                       | Max   | Typ   | Max | Typ                 | Max |   |           | Min                                  | Typ  | Max  | Max   | Max  |
| 7V5       | A   | 7.42                      | 7.58  | 30  | 80  | 6                   | 15  | 1                                       | 5         | 2.5                                  | 4.0  | 5.3  | 150   | 4.0  |
|           | B   | 7.35                      | 7.65  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 7.0                       | 7.9   |   |     |                     |     |   |           |                                      |      |      |   |  |
| 8V2       | A   | 8.11                      | 8.29  | 40  | 80  | 6                   | 15  | 0.7                                     | 5         | 3.2                                  | 4.6  | 6.2  | 150   | 4.0  |
|           | B   | 8.04                      | 8.36  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 7.7                       | 8.7   |   |     |                     |     |   |           |                                      |      |      |   |  |
| 9V1       | A   | 9                         | 9.2   | 40  | 100 | 6                   | 15  | 0.5                                     | 6         | 3.8                                  | 5.5  | 7.0  | 150   | 3.0  |
|           | B   | 8.92                      | 9.28  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 8.5                       | 9.6   |   |     |                     |     |   |           |                                      |      |      |   |  |
| 10        | A   | 9.9                       | 10.1  | 50  | 150 | 8                   | 20  | 0.2                                     | 7         | 4.5                                  | 6.4  | 8.0  | 90  | 3.0  |
|           | B   | 9.8                       | 10.2  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 9.4                       | 10.6  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 11        | A   | 10.8                      | 11.11 | 50  | 150 | 10                  | 20  | 0.1                                     | 8         | 5.4                                  | 7.4  | 9.0  | 85  | 2.5  |
|           | B   | 10.8                      | 11.2  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 10.4                      | 11.6  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 12        | A   | 11.88                     | 12.12 | 50  | 150 | 10                  | 25  | 0.1                                     | 8         | 6.0                                  | 8.4  | 10.0 | 85  | 2.5  |
|           | B   | 11.8                      | 12.2  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 11.4                      | 12.7  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 13        | A   | 12.87                     | 13.13 | 50  | 170 | 10                  | 30  | 0.1                                     | 8         | 7.0                                  | 9.4  | 11.0 | 80  | 2.5  |
|           | B   | 12.7                      | 13.3  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 12.4                      | 14.1  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 15        | A   | 14.85                     | 15.15 | 50  | 200 | 10                  | 30  | 0.05                                    | 10.5      | 9.2                                  | 11.4 | 13.0 | 75  | 2.0  |
|           | B   | 14.7                      | 15.3  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 13.8                      | 15.6  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 16        | A   | 15.84                     | 16.16 | 50  | 200 | 10                  | 40  | 0.05                                    | 11.2      | 10.4                                 | 12.4 | 14.0 | 75  | 1.5  |
|           | B   | 15.7                      | 16.3  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 15.3                      | 17.1  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 18        | A   | 17.82                     | 18.18 | 50  | 225 | 10                  | 45  | 0.05                                    | 12.6      | 12.4                                 | 14.4 | 16.0 | 70  | 1.5  |
|           | B   | 17.6                      | 18.4  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 16.8                      | 19.1  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 20        | A   | 19.8                      | 20.2  | 60  | 225 | 15                  | 55  | 0.05                                    | 14        | 14.4                                 | 16.4 | 18.0 | 60  | 1.5  |
|           | B   | 19.6                      | 20.4  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 18.8                      | 21.2  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 22        | A   | 21.78                     | 22.22 | 60  | 250 | 20                  | 55  | 0.05                                    | 15.4      | 16.4                                 | 18.4 | 20.0 | 60  | 1.25   |
|           | B   | 21.6                      | 22.4  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 20.8                      | 23.3  |   |     |                     |     |   |           |                                      |      |      |   |  |

**Table 8. Characteristics per type; BZX84-A2V4 to BZX84-C24 ...continued** $T_j = 25\text{ °C}$  unless otherwise specified.

| BZX84-xxx | Sel | Working voltage $V_Z$ (V) |       | Differential resistance $r_{\text{dif}}$ ( $\Omega$ ) |     |                     |     | Reverse current $I_R$ ( $\mu\text{A}$ ) |           | Temperature coefficient $S_Z$ (mV/K) |      |      | Diode capacitance $C_d$ (pF) <sup>[1]</sup> | Non-repetitive peak reverse current $I_{ZSM}$ (A) <sup>[2]</sup> |
|-----------|-----|---------------------------|-------|---|-----|---------------------|-----|---|-----------|--------------------------------------|------|------|---|--|
|           |     | $I_Z = 5\text{ mA}$       |       | $I_Z = 1\text{ mA}$                                   |     | $I_Z = 5\text{ mA}$ |     |   |           | $I_Z = 5\text{ mA}$                  |      |      |   |  |
|           |     | Min                       | Max   | Typ   | Max | Typ                 | Max | Max                                     | $V_R$ (V) | Min                                  | Typ  | Max  |   |  |
| 24        | A   | 23.76                     | 24.24 | 60  | 250 | 25                  | 70  | 0.05                                    | 16.8      | 18.4                                 | 20.4 | 22.0 | 55  | 1.25   |
|           | B   | 23.5                      | 24.5  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 22.8                      | 25.6  |   |     |                     |     |   |           |                                      |      |      |   |  |

[1]  $f = 1\text{ MHz}$ ;  $V_R = 0\text{ V}$ [2]  $t_p = 100\text{ }\mu\text{s}$ ; square wave;  $T_j = 25\text{ °C}$  before surge**Table 9. Characteristics per type; BZX84-A27 to BZX84-C75** $T_j = 25\text{ °C}$  unless otherwise specified.

| BZX84-xxx | Sel | Working voltage $V_Z$ (V) |       | Differential resistance $r_{\text{dif}}$ ( $\Omega$ ) |     |                     |     | Reverse current $I_R$ ( $\mu\text{A}$ ) |           | Temperature coefficient $S_Z$ (mV/K) |      |      | Diode capacitance $C_d$ (pF) <sup>[1]</sup> | Non-repetitive peak reverse current $I_{ZSM}$ (A) <sup>[2]</sup> |
|-----------|-----|---------------------------|-------|---|-----|---------------------|-----|---|-----------|--------------------------------------|------|------|---|--|
|           |     | $I_Z = 2\text{ mA}$       |       | $I_Z = 0.5\text{ mA}$                                 |     | $I_Z = 2\text{ mA}$ |     |   |           | $I_Z = 2\text{ mA}$                  |      |      |   |  |
|           |     | Min                       | Max   | Typ   | Max | Typ                 | Max | Max                                     | $V_R$ (V) | Min                                  | Typ  | Max  |   |  |
| 27        | A   | 26.73                     | 27.27 | 65  | 300 | 25                  | 80  | 0.05                                    | 18.9      | 21.4                                 | 23.4 | 25.3 | 50  | 1.0  |
|           | B   | 26.5                      | 27.5  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 25.1                      | 28.9  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 30        | A   | 29.7                      | 30.30 | 70  | 300 | 30                  | 80  | 0.05                                    | 21        | 24.4                                 | 26.6 | 29.4 | 50  | 1.0  |
|           | B   | 29.4                      | 30.6  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 28.0                      | 32.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 33        | A   | 32.67                     | 33.33 | 75  | 325 | 35                  | 80  | 0.05                                    | 23.1      | 27.4                                 | 29.7 | 33.4 | 45  | 0.9  |
|           | B   | 32.3                      | 33.7  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 31.0                      | 35.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 36        | A   | 35.64                     | 36.36 | 80  | 350 | 35                  | 90  | 0.05                                    | 25.2      | 30.4                                 | 33.0 | 37.4 | 45  | 0.8  |
|           | B   | 35.3                      | 36.7  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 34.0                      | 38.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 39        | A   | 38.61                     | 39.39 | 80  | 350 | 40                  | 130 | 0.05                                    | 27.3      | 33.4                                 | 36.4 | 41.2 | 45  | 0.7  |
|           | B   | 38.2                      | 39.8  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 37.0                      | 41.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 43        | A   | 42.57                     | 43.43 | 85  | 375 | 45                  | 150 | 0.05                                    | 30.1      | 37.6                                 | 41.2 | 46.6 | 40  | 0.6  |
|           | B   | 42.1                      | 43.9  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 40.0                      | 46.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 47        | B   | 46.1                      | 47.9  | 85  | 375 | 50                  | 170 | 0.05                                    | 32.9      | 42.0                                 | 46.1 | 51.8 | 40  | 0.5  |
|           | C   | 44.0                      | 50.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 51        | A   | 50.49                     | 51.51 | 90  | 400 | 60                  | 180 | 0.05                                    | 35.7      | 46.6                                 | 51.0 | 57.2 | 40  | 0.4  |
|           | B   | 50.0                      | 52.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 48.0                      | 54.0  |   |     |                     |     |   |           |                                      |      |      |   |  |

Table 9. Characteristics per type; BZX84-A27 to BZX84-C75 ...continued

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

| BZX84-xxx | Sel | Working voltage $V_Z$ (V) |       | Differential resistance $r_{\text{dif}}$ ( $\Omega$ ) |     |                     |     | Reverse current $I_R$ ( $\mu\text{A}$ ) |           | Temperature coefficient $S_Z$ (mV/K) |      |      | Diode capacitance $C_d$ (pF) <sup>[1]</sup> | Non-repetitive peak reverse current $I_{ZSM}$ (A) <sup>[2]</sup> |
|-----------|-----|---------------------------|-------|---|-----|---------------------|-----|---|-----------|--------------------------------------|------|------|---|--|
|           |     | $I_Z = 2\text{ mA}$       |       | $I_Z = 0.5\text{ mA}$                                 |     | $I_Z = 2\text{ mA}$ |     | Max                                     | $V_R$ (V) | $I_Z = 2\text{ mA}$                  |      |      |   |  |
|           |     | Min                       | Max   | Typ   | Max | Typ                 | Max |   |           | Min                                  | Typ  | Max  |   |  |
| 56        | B   | 54.9                      | 57.1  | 100   | 425 | 70                  | 200 | 0.05                                    | 39.2      | 52.2                                 | 57.0 | 63.8 | 40  | 0.3  |
|           | C   | 52.0                      | 60.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 62        | B   | 60.8                      | 63.2  | 120   | 450 | 80                  | 215 | 0.05                                    | 43.4      | 58.8                                 | 64.4 | 71.6 | 35  | 0.3  |
|           | C   | 58.0                      | 66.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 68        | B   | 66.6                      | 69.4  | 150   | 475 | 90                  | 240 | 0.05                                    | 47.6      | 65.6                                 | 71.7 | 79.8 | 35  | 0.25   |
|           | C   | 64.0                      | 72.0  |   |     |                     |     |   |           |                                      |      |      |   |  |
| 75        | A   | 74.25                     | 75.75 | 170   | 500 | 95                  | 255 | 0.05                                    | 52.5      | 73.4                                 | 80.2 | 88.6 | 35  | 0.20   |
|           | B   | 73.5                      | 76.5  |   |     |                     |     |   |           |                                      |      |      |   |  |
|           | C   | 70.0                      | 79.0  |   |     |                     |     |   |           |                                      |      |      |   |  |

[1]  $f = 1\text{ MHz}$ ;  $V_R = 0\text{ V}$ [2]  $t_p = 100\text{ }\mu\text{s}$ ; square wave;  $T_j = 25\text{ °C}$  before surge



- (1)  $T_j = 25^\circ\text{C}$  (before surge)
- (2)  $T_j = 150^\circ\text{C}$  (before surge)

**Fig 1. Non-repetitive peak reverse power dissipation as a function of pulse duration; maximum values**



$T_j = 25^\circ\text{C}$

**Fig 2. Forward current as a function of forward voltage; typical values**



BZX84-A/B/C2V4 to BZX84-A/B/C4V3  
 $T_j = 25^\circ\text{C}$  to  $150^\circ\text{C}$

**Fig 3. Temperature coefficient as a function of working current; typical values**



BZX84-A/B/C4V7 to BZX84-A/B/C12  
 $T_j = 25^\circ\text{C}$  to  $150^\circ\text{C}$

**Fig 4. Temperature coefficient as a function of working current; typical values**



BZX84-A/B/C2V4 to BZX84-A/B/C6V8  
 $T_{amb} = 25\text{ }^{\circ}\text{C}$

**Fig 5. Reverse current as a function of reverse voltage; typical values**



BZX84-A/B/C7V5 to BZX84-A/B/C24  
 $T_{amb} = 25\text{ }^{\circ}\text{C}$

**Fig 6. Reverse current as a function of reverse voltage; typical values**



BZX84-A/B/C27 to BZX84-A/B/C75  
 $T_{amb} = 25\text{ }^{\circ}\text{C}$

**Fig 7. Reverse current as a function of reverse voltage; typical values**

## 8. Test information

### 8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 9. Package outline



Fig 8. Package outline SOT23 (TO-236AB)

## 10. Packing information

**Table 10. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

| Type number                 | Package             | Description                    | Packing quantity |       |
|-----------------------------|---------------------|--------------------------------|------------------|-------|
|                             |                     |                                | 3000             | 10000 |
| BZX84 series <sup>[2]</sup> | SOT23<br>(TO-236AB) | 4 mm pitch, 8 mm tape and reel | -215             | -235  |

[1] For further information and the availability of packing methods, see [Section 14](#).

[2] The series includes 37 breakdown voltages with nominal working voltages from 2.4 V to 75 V and  $\pm 1\%$ ,  $\pm 2\%$  and  $\pm 5\%$  tolerances.

**11. Soldering**



**Fig 9. Reflow soldering footprint SOT23 (TO-236AB)**



**Fig 10. Wave soldering footprint SOT23 (TO-236AB)**

## 12. Revision history

Table 11. Revision history

| Document ID      | Release date                                  | Data sheet status     | Change notice | Supersedes       |
|------------------|---|-----------------------|---------------|------------------|
| BZX84_SER v.6    | 20140306                                      | Product data sheet    | -             | BZX84_SER v.5    |
| Modifications:   | • Descriptive title of the document corrected |                       |               |                  |
| BZX84_SER v.5    | 20130918                                      | Product data sheet    | -             | BZX84_SER v.4    |
| BZX84_SER v.4    | 20130322                                      | Product data sheet    | -             | BZX84_SERIES v.3 |
| BZX84_SERIES v.3 | 20030410                                      | Product data sheet    | -             | BZX84 v.2        |
| BZX84 v.2        | 19990518                                      | Product specification | -             | BZX84 v.1        |
| BZX84 v.1        | 19960426                                      | Product specification | -             | -                |

## 13. Legal information

### 13.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition  |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet      | Development                   | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet    | Qualification                 | This document contains data from the preliminary specification.                       |
| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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