



BAP64-04

Silicon PIN diode

Rev. 5 — 28 April 2015

Product data sheet

1. Product profile

1.1 General description

Two planar PIN diodes in series configuration in a SOT23 small plastic SMD package.

1.2 Features and benefits

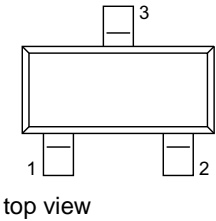
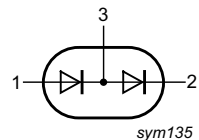
- High voltage, current controlled
- RF resistor for RF attenuators and switches
- Low diode capacitance
- Low diode forward resistance
- Low series inductance
- For applications up to 3 GHz
- AEC-Q101 qualified

1.3 Applications

- RF attenuators and switches

2. Pinning information

Table 1. Discrete pinning

| Pin | Description | Simplified outline | Symbol |
|-----|-------------------|--|---|
| 1 | anode |  |  |
| 2 | cathode | | |
| 3 | common connection | | |

3. Ordering information

Table 2. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAP64-04 | - | plastic surface-mounted package; 3 leads | SOT23 |



4. Marking

Table 3. Marking

| Type number | Marking | Description |
|-------------|---------|---|
| BAP64-04 | 4K* | * = t : made in Malaysia * = W : made in China |

5. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).
Values are specified per diode.

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|-------------------------|-------------------------|-----|------|------|
| V_R | reverse voltage | | - | 175 | V |
| I_F | forward current | | - | 100 | mA |
| P_{tot} | total power dissipation | $T_{sp} = 90\text{ °C}$ | - | 250 | mW |
| T_{stg} | storage temperature | | -65 | +150 | °C |
| T_j | junction temperature | | -65 | +150 | °C |

6. Thermal characteristics

Table 5. Thermal characteristics

| Symbol | Parameter | Conditions | Typ | Unit |
|----------------|--|------------|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | 220 | K/W |

7. Characteristics

Table 6. Characteristics

Values are specified per diode; $T_j = 25\text{ °C}$ unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-------------------|---|-----|------|------|---------------|
| V_F | forward voltage | $I_F = 50\text{ mA}$ | - | 0.95 | 1.1 | V |
| I_R | reverse current | $V_R = 175\text{ V}$ | - | - | 10 | μA |
| | | $V_R = 20\text{ V}$ | - | - | 1 | μA |
| C_d | diode capacitance | see Figure 1 ; $f = 1\text{ MHz}$; | | | | |
| | | $V_R = 0\text{ V}$ | - | 0.52 | - | pF |
| | | $V_R = 1\text{ V}$ | - | 0.37 | - | pF |
| | | $V_R = 20\text{ V}$ | - | 0.23 | 0.35 | pF |

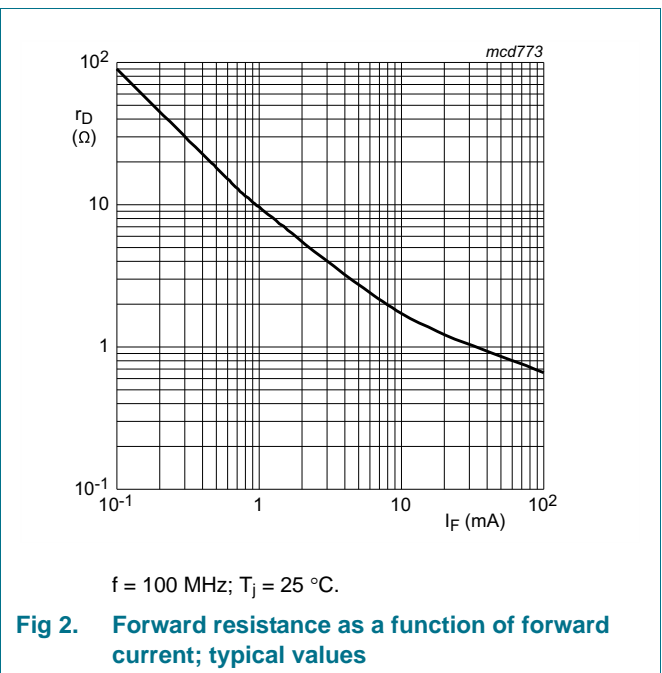
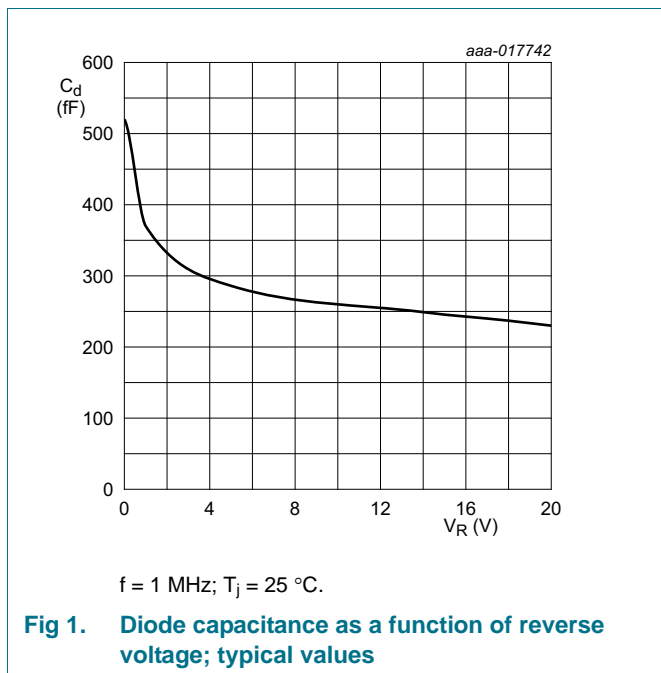
Table 6. Characteristics ...continued

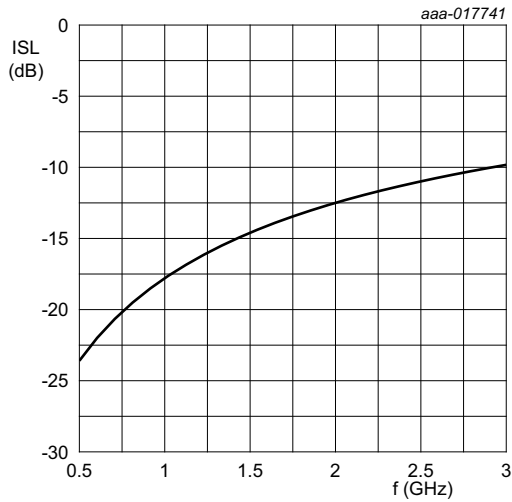
Values are specified per diode; $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------|--------------------------|--|-----|------|------|---------------|
| r_D | diode forward resistance | see Figure 2 ; $f = 100\text{ MHz}$; [1] | | | | |
| | | $I_F = 0.5\text{ mA}$ | - | 20 | 40 | Ω |
| | | $I_F = 1\text{ mA}$ | - | 10 | 20 | Ω |
| | | $I_F = 10\text{ mA}$ | - | 2.0 | 3.8 | Ω |
| | | $I_F = 100\text{ mA}$ | - | 0.7 | 1.35 | Ω |
| τ_L | charge carrier life time | when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$; $R_L = 100\ \Omega$; measured at $I_R = 3\text{ mA}$ | - | 1.55 | - | μs |
| L_S | series inductance | | - | 1.4 | - | nH |

[1] Guaranteed on AQL basis: inspection level S4, AQL 1.0.

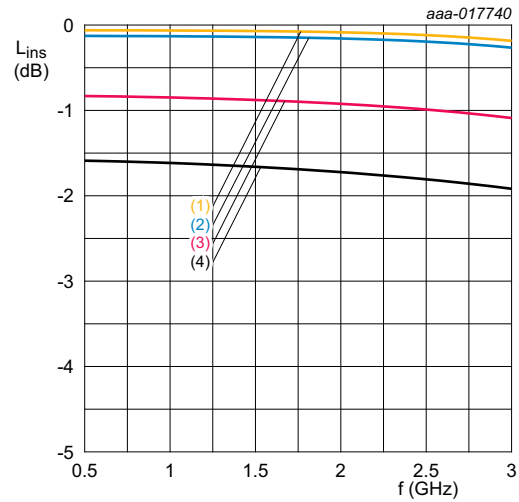
7.1 Graphical data





$T_{amb} = 25\text{ }^{\circ}\text{C}$
 Diode zero biased and inserted in series with a 50 Ω stripline circuit

Fig 3. Isolation of the diode as a function of frequency; typical values



$T_{amb} = 25\text{ }^{\circ}\text{C}$
 (1) $I_F = 100\text{ mA}$
 (2) $I_F = 10\text{ mA}$
 (3) $I_F = 1\text{ mA}$
 (4) $I_F = 0.5\text{ mA}$
 Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network

Fig 4. Insertion loss of the diode as a function of frequency; typical values

8. Package outline

Plastic surface-mounted package; 3 leads

SOT23

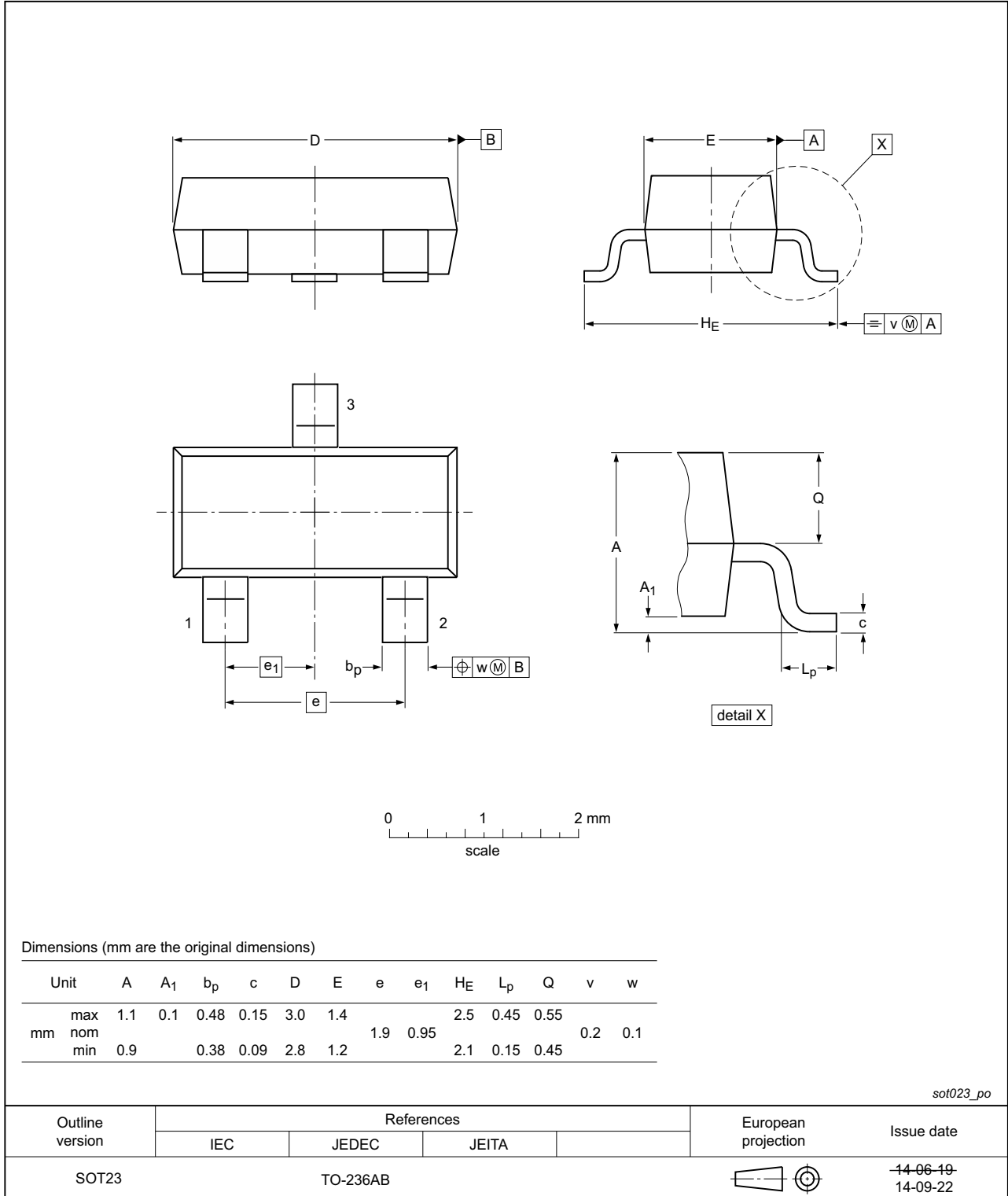


Fig 5. Package outline SOT23

9. Abbreviations

Table 7. Abbreviations

| Acronym | Description |
|---------|----------------------------|
| AQL | Acceptable Quality Level |
| PIN | P-type, Intrinsic, N-type |
| SMD | Surface Mounted Device |
| S4 | Special inspection level 4 |

10. Revision history

Table 8. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|------------------------------------|---|---------------------------|---------------|----------------|
| BAP64-04 v.5 | 20150428 | Product data sheet | - | BAP64-04 v.4 |
| Modifications: | <ul style="list-style-type: none"> The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. Legal texts have been adapted to the new company name where appropriate. AEC-Q101 qualified | | | |
| BAP64-04 v.4 (9397 750 06424) | 19990921 | Product specification | - | BAP64-04 v.3 |
| BAP64-04 v.3 (9397 750 06282) | 19990827 | Product specification | - | BAP64-04_N v.2 |
| BAP64-04_N v.2 (9397 750 06088) | 19990616 | Preliminary specification | - | BAP64-04 v.1 |
| BAP64-04 v.1 (9397 750 05559) | 19990510 | Objective specification | - | - |

11. Legal information

11.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | 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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