



BAP64-05W

Silicon PIN diode

Rev. 3.2 — 1 February 2019

Product data sheet

1 Product profile

1.1 General description

Two planar PIN diodes in common cathode configuration in a SOT323 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

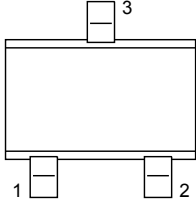
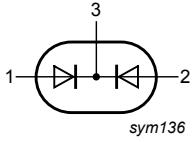
1.3 Applications

- RF attenuators and switches



2 Pinning information

Table 1. Discrete pinning

| Pin | Description | Simplified outline | Symbol |
|-----|----------------|--|---|
| 1 | anode (a1) |  <p>top view</p> |  |
| 2 | anode (a2) | | |
| 3 | common cathode | | |

3 Ordering information

Table 2. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAP64-05W | - | plastic surface-mounted package; 3 leads | SOT323 |

4 Marking

Table 3. Marking

| Type number | Marking | Description |
|-------------|---------|-------------------------|
| BAP64-05W | 5W% | % = t: made in Malaysia |
| | | % = W: made in China |

Table 4. Marking

| Type number | Marking code |
|-------------|--------------|
| BAP64-05W | 5W- |

5 Limiting values

Table 5. 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 | | - | 100 | V |
| I_F | forward current | | - | 100 | mA |
| P_{tot} | total power dissipation | $T_{sp} \leq 90\text{ }^\circ\text{C}$ | - | 240 | mW |
| T_{stg} | storage temperature | | -65 | +150 | $^\circ\text{C}$ |
| T_j | junction temperature | | -65 | +150 | $^\circ\text{C}$ |

6 Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Typ | Unit |
|----------------|--|------------|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | 250 | K/W |

7 Characteristics

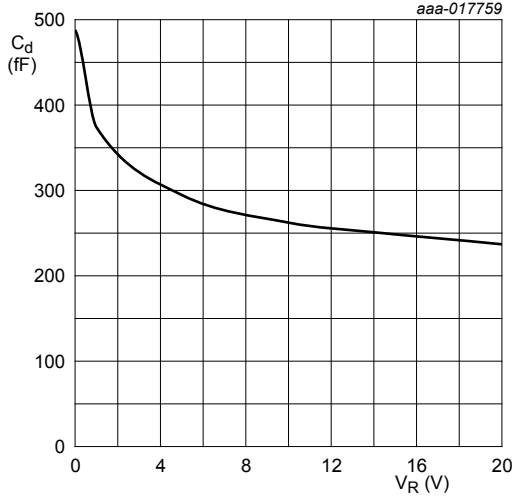
Table 7. Characteristics

Values are specified per diode; $T_j = 25\text{ }^\circ\text{C}$ 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 | $V_R = 60\text{ V}$ | - | - | 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 |
| 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 $I_R = 6\text{ mA}$; $R_L = 100\text{ }\Omega$; measured at $I_R = 3\text{ mA}$ | - | 1.55 | - | μs |
| L_S | series inductance | | - | 1.2 | - | nH |

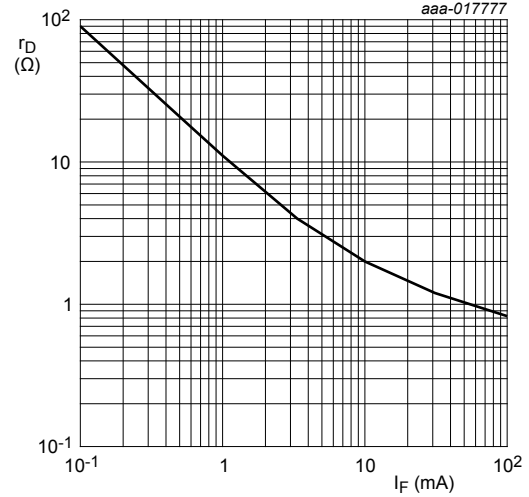
[1] Guaranteed on AQL basis: inspection level S4, AQL 1.0.

7.1 Graphical data



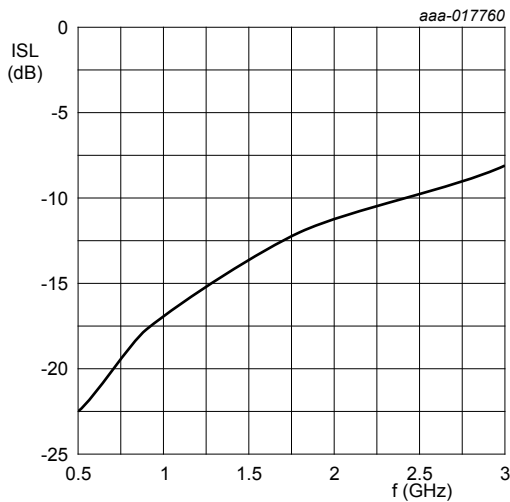
f = 1 MHz; T_j = 25 °C.

Figure 1. Diode capacitance as a function of reverse voltage; typical values



f = 100 MHz; T_j = 25 °C.

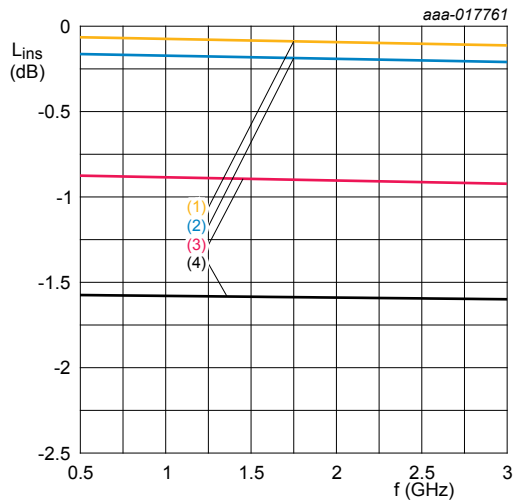
Figure 2. Forward resistance as a function of forward current; typical values



T_{amb} = 25 °C

Diode zero biased and inserted in series with a 50 Ω stripline circuit

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

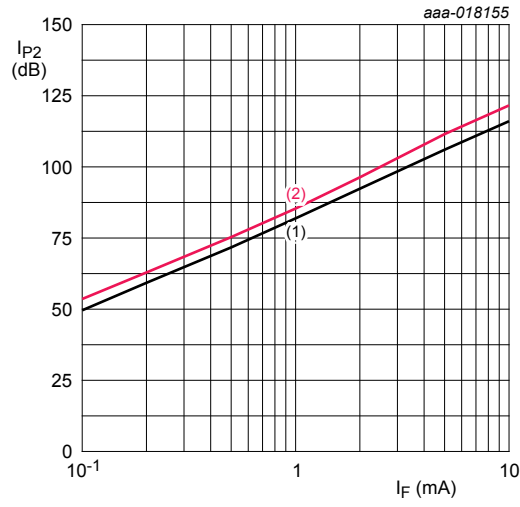


T_{amb} = 25 °C

- 1. I_F = 100 mA
- 2. I_F = 10 mA
- 3. I_F = 1 mA
- 4. I_F = 0.5 mA

Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer T-network

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



$T_{amb} = 25\text{ }^{\circ}\text{C}$

1. $f = 900\text{ MHz}$
2. $f = 1800\text{ MHz}$

Figure 5. Second-order intercept point as a function of forward current; typical values

8 Package outline

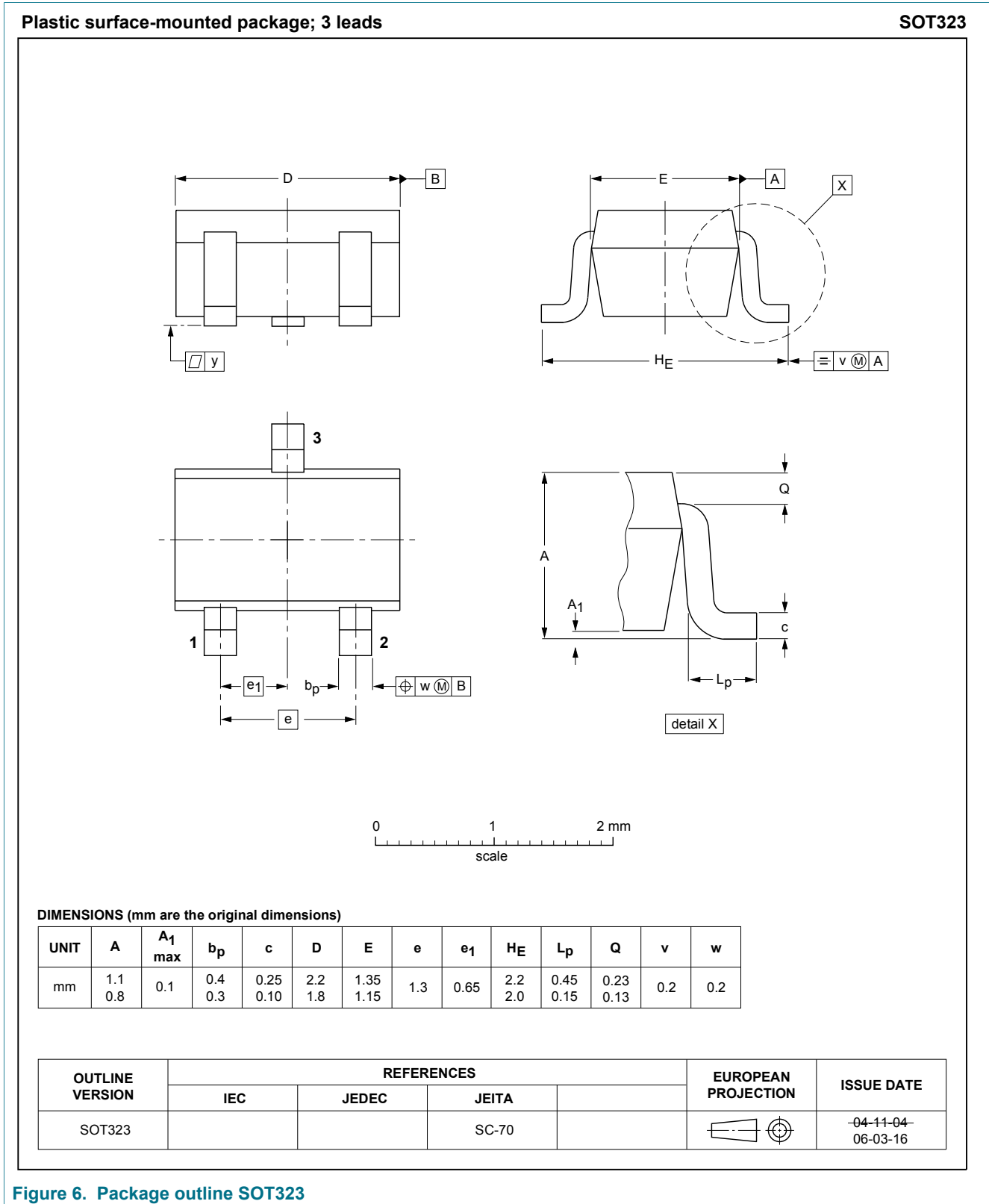


Figure 6. Package outline SOT323

9 Abbreviations

Table 8. 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 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|--------------------------------|---|-----------------------|---------------|-----------------|
| BAP64-05W v.3.2 | 20190201 | Product data sheet | - | BAP64-05W v.3.1 |
| Modifications | <ul style="list-style-type: none"> changed condition for reverse current for V_R from 100 V to 60 V | | | |
| BAP64-05W v.3.1 | 20181211 | Product data sheet | - | BAP64-05W v.3 |
| Modifications | <ul style="list-style-type: none"> adapted marking code | | | |
| BAP64-05W v.3 | 20180713 | Product data sheet | - | BAP64-05W v.2 |
| Modifications | <ul style="list-style-type: none"> changed I_R conditions at characteristics adapted the layout of the data sheet | | | |
| BAP64-05W v.2 | 20150428 | Product data sheet | - | BAP64-05W v.1 |
| 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 | | | |
| BAP64-05W v.1 (9397 750 07192) | 20000713 | Product 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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