



BAP64-02

Silicon PIN diode

Rev. 10 — 12 May 2015

Product data sheet

1. Product profile

1.1 General description

Planar PIN diode in a SOD523 ultra 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
- Very low series inductance
- For applications up to 6 GHz
- AEC-Q101 qualified

1.3 Applications

- RF attenuators and switches

2. Pinning information

Table 1. Discrete pinning

| Pin | Description | Simplified outline | Symbol |
|-----|------------------------|--------------------|------------|
| 1 | cathode ^[1] | | sym006 |
| 2 | anode | | |

[1] The marking bar indicates the cathode.

3. Ordering information

Table 2. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAP64-02 | - | plastic surface-mounted package; 2 leads | SOD523 |



4. Marking

Table 3. Marking

| Type number | Marking code |
|-------------|--------------|
| BAP64-02 | S |

5. Limiting values

Table 4. Limiting values

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|-------------------------|-------------------------|-----|------|------|
| V_R | reverse voltage | | - | 175 | V |
| I_F | forward current | | - | 100 | mA |
| P_{tot} | total power dissipation | $T_{sp} = 90\text{ °C}$ | - | 715 | 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 | | 85 | K/W |

7. Characteristics

Table 6. Characteristics

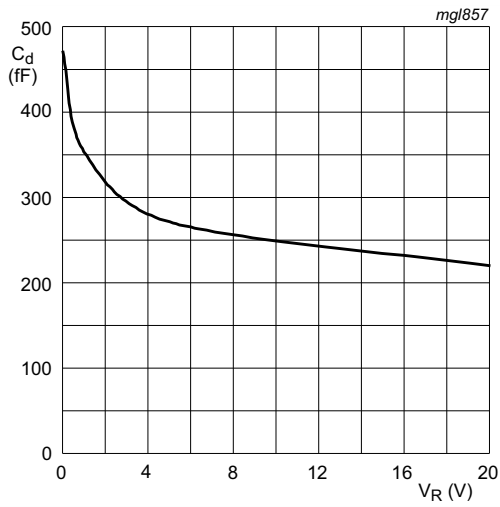
$T_j = 25\text{ °C}$ unless otherwise specified.

| 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 ; $f = 1\text{ MHz}$; | | | | |
| | | $V_R = 0\text{ V}$ | - | 0.48 | - | pF |
| | | $V_R = 1\text{ V}$ | - | 0.35 | - | pF |
| | | $V_R = 20\text{ V}$ | - | 0.23 | 0.35 | pF |

Table 6. Characteristics ...continued $T_j = 25\text{ °C}$ unless otherwise specified.

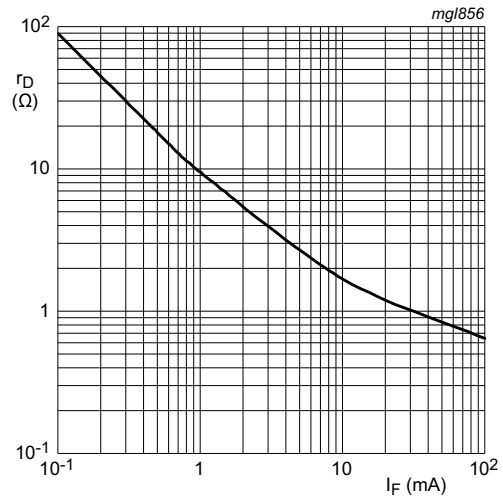
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------|--------------------------|--|-----|------|------|---------------|
| r_D | diode forward resistance | see Figure 2 ; $f = 100\text{ MHz}$; [1] | | | | |
| | | $I_F = 0.5\text{ mA}$ | - | 20 | 40 | Ω |
| | | $I_F = 1\text{ mA}$ | - | 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 | | - | 0.6 | - | nH |

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



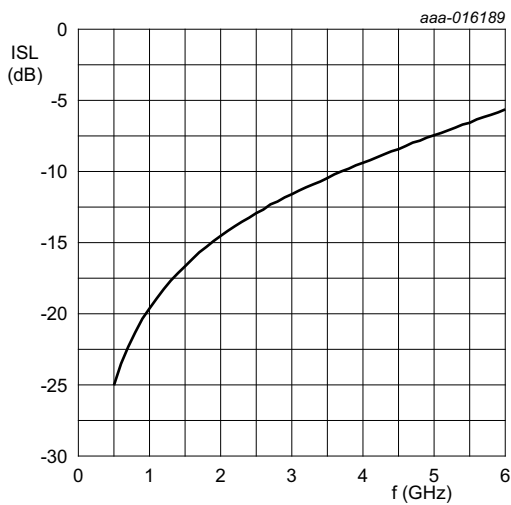
$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



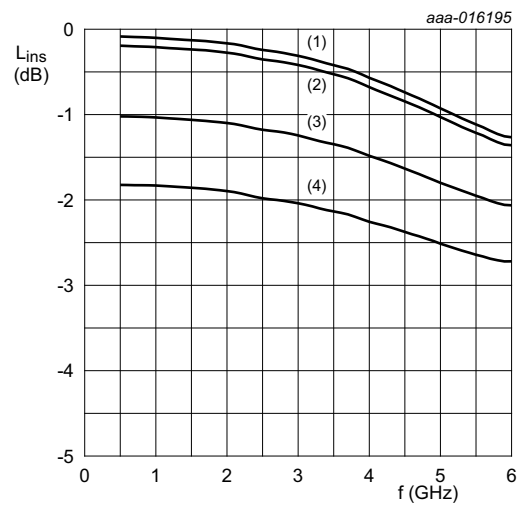
$f = 100 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



$T_{amb} = 25 \text{ }^\circ\text{C}$
 Diode zero biased and inserted in series with a $50 \text{ } \Omega$ 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 $50 \text{ } \Omega$ 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; 2 leads

SOD523

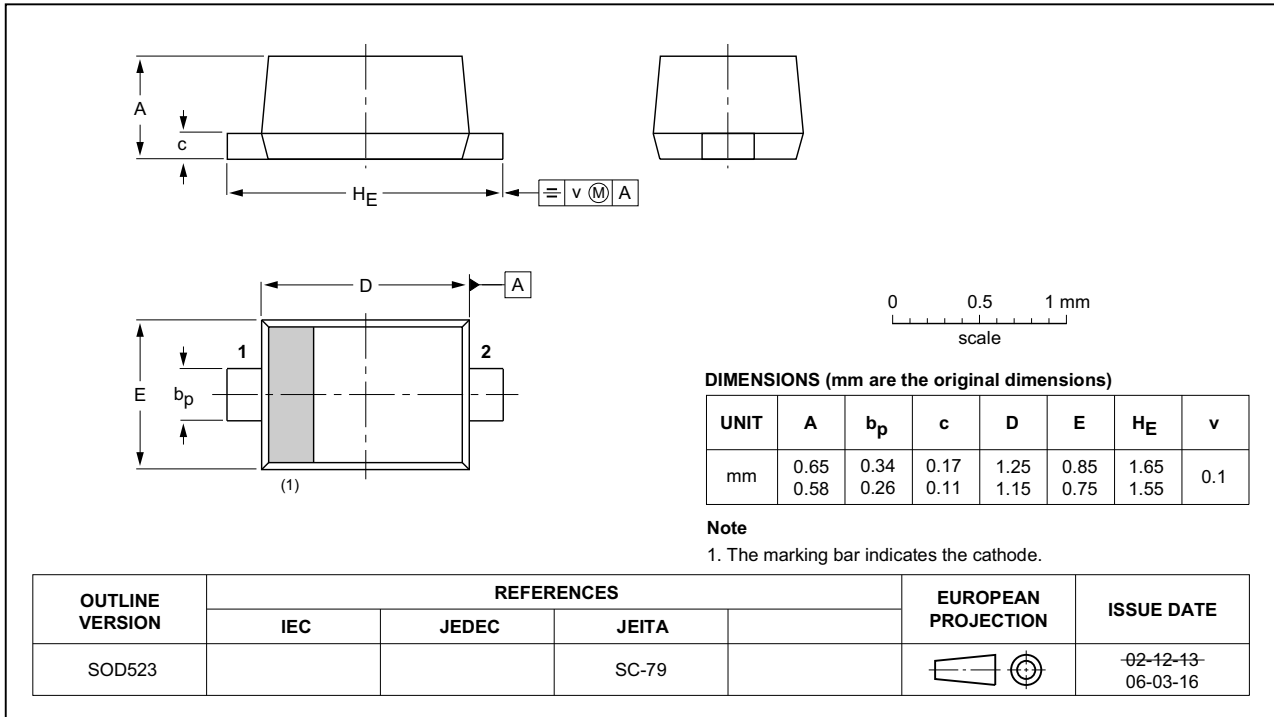


Fig 5. Package outline SOD523

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 |
|------------------------------------|--|---------------------------|---------------|----------------|
| BAP64-02 v.10 | 20150512 | Product data sheet | - | BAP64-02 v.9 |
| Modifications: | <ul style="list-style-type: none"> AEC-Q101 qualified | | | |
| BAP64-02 v.9 | 20141215 | Product data sheet | - | BAP64-02 v.8 |
| BAP64-02 v.8 | 20140428 | Product data sheet | - | BAP64-02 v.7 |
| BAP64-02 v.7 | 20140211 | Product data sheet | - | BAP64-02_N v.6 |
| BAP64-02_N v.6 | 20080109 | Product data sheet | - | BAP64-02 v.5 |
| BAP64-02 v.5 (9397 750 06912) | 20000323 | Product specification | - | BAP64-02 v.4 |
| BAP64-02 v.4 (9397 750 06418) | 19990921 | Preliminary specification | - | BAP64-02_N v.3 |
| BAP64-02_N v.3 (9397 750 06086) | 19990616 | Preliminary specification | - | BAP64-02 v.2 |
| BAP64-02 v.2 (9397 750 05556) | 19990510 | Objective specification | - | BAP64-02_N v.1 |
| BAP64-02_N v.1 (9397 750 05492) | 19981204 | Objective specification | - | - |

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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. |

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