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Team Nexperia

1PS70SB16

Dual Schottky barrier diode

17 December 2012

Product data sheet

1. General description

Dual Planar Schottky barrier diode in common anode configuration with an integrated guard ring for stress protection, encapsulated in a very small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Low forward voltage
- Low capacitance
- AEC-Q101 qualified

3. Applications

- Ultra high-speed switching
- Line termination
- Voltage clamping
- Reverse polarity protection

4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|-----------------|---|-----|-----|-----|------|
| Per diode | | | | | | |
| I_F | forward current | | - | - | 200 | mA |
| V_R | reverse voltage | | - | - | 30 | V |
| Per diode | | | | | | |
| V_F | forward voltage | $I_F = 10 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 400 | mV |

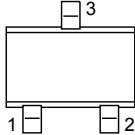
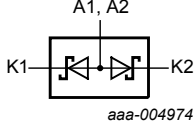


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5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------------|---|---|
| 1 | K1 | cathode (diode 1) |  <p>SC-70 (SOT323)</p> |  <p>aaa-004974</p> |
| 2 | K2 | cathode (diode 2) | | |
| 3 | A1, A2 | common anode | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| 1PS70SB16 | SC-70 | plastic surface-mounted package; 3 leads | SOT323 |

7. Marking

Table 4. Marking codes

| Type number | Marking code [1] |
|-------------|---------------------|
| 1PS70SB16 | 7%6 |

[1] % = placeholder for manufacturing site code

8. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------|-------------------------------------|--|-----|-----|------------------|
| Per diode | | | | | |
| V_R | reverse voltage | | - | 30 | V |
| I_F | forward current | | - | 200 | mA |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1 \text{ s}$; $\delta \leq 0.5$ | - | 300 | mA |
| I_{FSM} | non-repetitive peak forward current | $t_p < 10 \text{ ms}$; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ | - | 600 | mA |
| P_{tot} | total power dissipation | $T_{\text{amb}} < 25 \text{ }^\circ\text{C}$ | - | 200 | mW |
| T_j | junction temperature | | - | 150 | $^\circ\text{C}$ |
| T_{amb} | ambient temperature | | -55 | 150 | $^\circ\text{C}$ |

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------|---------------------|------------|-----|-----|------|
| T _{stg} | storage temperature | | -65 | 150 | °C |

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------------|---|-------------|-----|-----|-----|------|
| Per device | | | | | | |
| R _{th(j-a)} | thermal resistance from junction to ambient | in free air | [1] | - | 625 | K/W |

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

10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|-------------------|--|-----|-----|-----|------|
| Per diode | | | | | | |
| V _F | forward voltage | I _F = 0.1 mA; T _{amb} = 25 °C | - | - | 240 | mV |
| | | I _F = 1 mA; T _{amb} = 25 °C | - | - | 320 | mV |
| | | I _F = 10 mA; T _{amb} = 25 °C | - | - | 400 | mV |
| | | I _F = 30 mA; T _{amb} = 25 °C | - | - | 500 | mV |
| | | I _F = 100 mA; T _{amb} = 25 °C | - | - | 800 | mV |
| I _R | reverse current | V _R = 25 V; pulsed; t _p = 300 μs; δ = 0.02; T _{amb} = 25 °C | - | - | 2 | μA |
| C _d | diode capacitance | V _R = 1 V; f = 1 MHz; T _{amb} = 25 °C | - | - | 10 | pF |

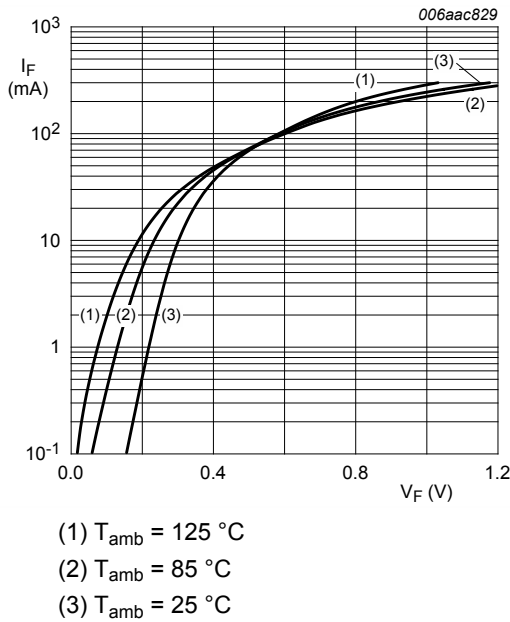


Fig. 1. Forward current as a function of forward voltage; typical values

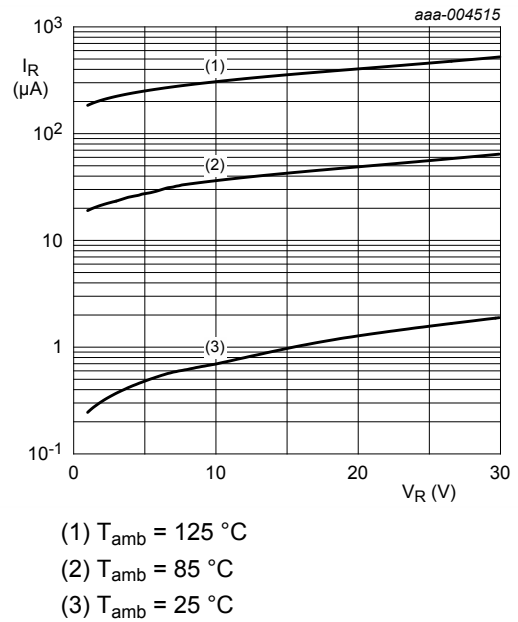


Fig. 2. Reverse current as a function of reverse voltage; typical values

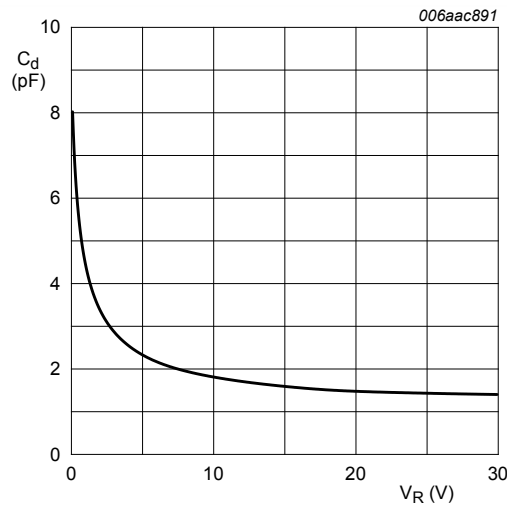


Fig. 3. Diode capacitance as a function of reverse voltage; typical values

11. Test information

11.1 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.

12. Package outline

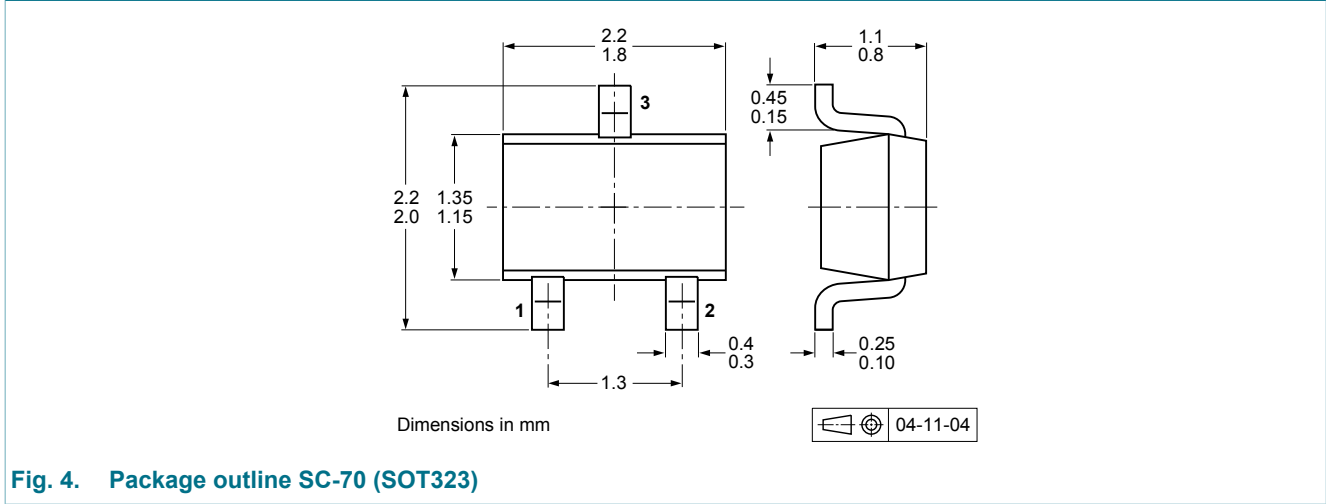


Fig. 4. Package outline SC-70 (SOT323)

13. Soldering

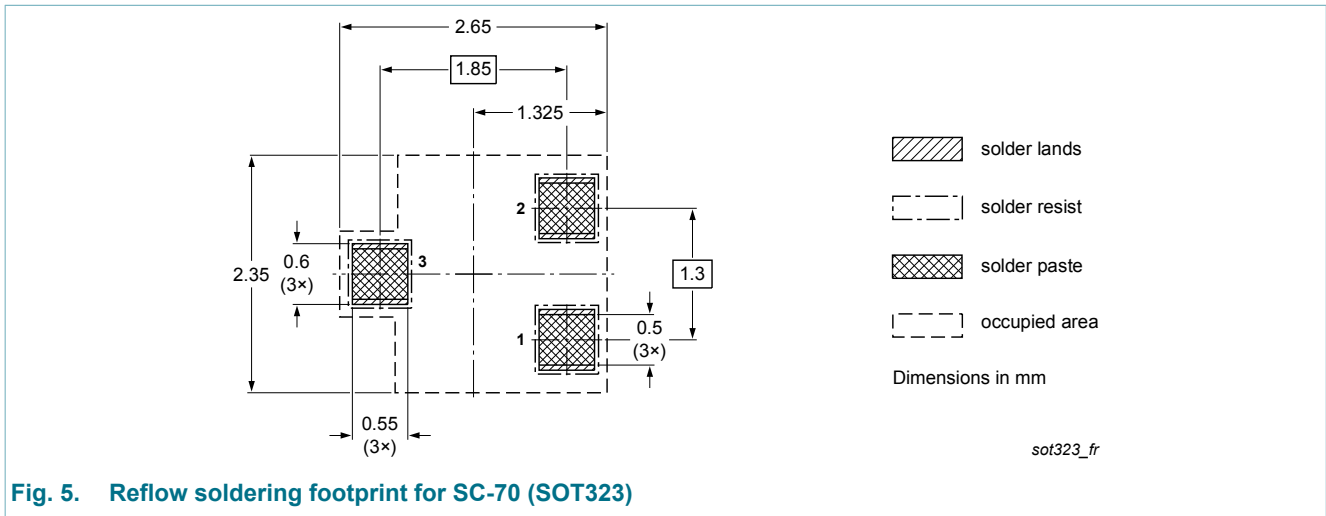


Fig. 5. Reflow soldering footprint for SC-70 (SOT323)

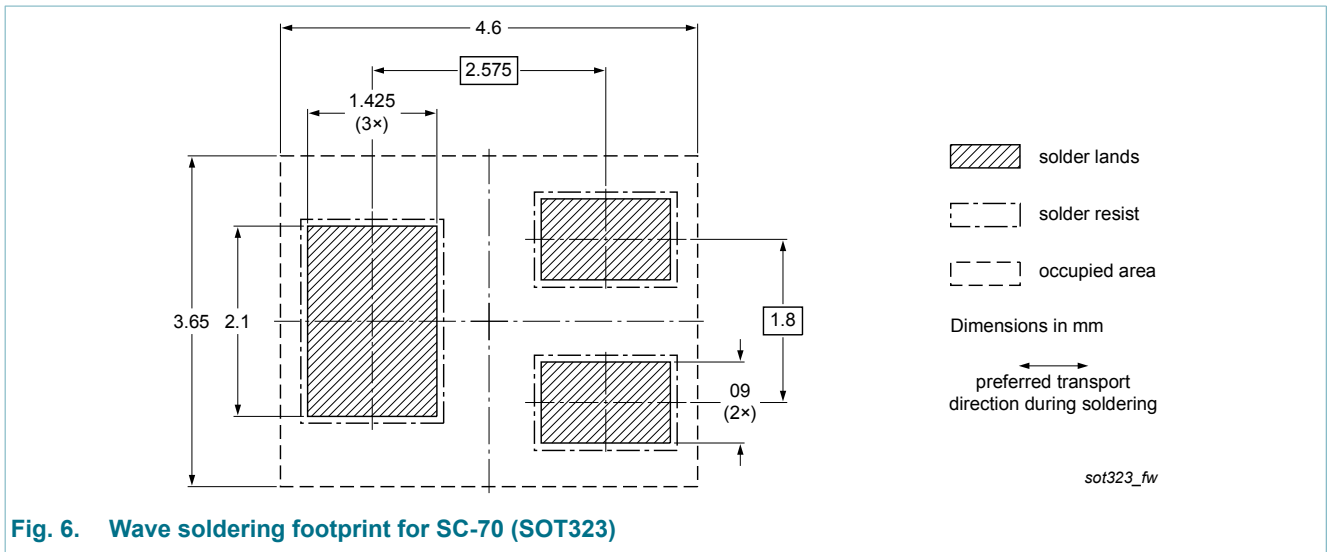


Fig. 6. Wave soldering footprint for SC-70 (SOT323)

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|------------------------|--|--------------------|---------------|------------------------|
| 1PS70SB16 v.2 | 20121217 | Product data sheet | - | 1PS70SB10_14_15_16 v.1 |
| Modifications: | <ul style="list-style-type: none"> The format of this document 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. Sections 1 to 3 updated Section 4 "Quick reference data" added Section 6 "Ordering information" added Section 7 "Marking" updated Table 5 "Limiting values": ambient temperature T_{amb} and junction temperature T_j updated Figures 1, 2 and 3 updated Section 11 "Test information" added Figure 4: superseded by minimized package outline drawing Section 13 "Soldering" added Section 14 "Legal information" updated | | | |
| 1PS70SB10_14_15_16 v.1 | 19990426 | Product data sheet | - | - |

15. Legal information

15.1 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. |
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| 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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Date of release: 17 December 2012