

# 1PS70SB15

## Dual Schottky barrier diode

17 December 2012

Product data sheet

### 1. General description

Dual Planar Schottky barrier diode in common cathode 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
- Line termination

### 4. Quick reference data

Table 1. Quick reference data

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

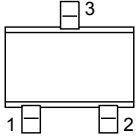
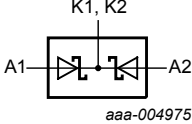


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## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description     | Simplified outline                                                                                  | Graphic symbol                                                                                    |
|-----|--------|-----------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1   | A1     | anode (diode 1) | <br>SC-70 (SOT323) | <br>aaa-004975 |
| 2   | A2     | anode (diode 2) |                                                                                                     |                                                                                                   |
| 3   | K1, K2 | common cathode  |                                                                                                     |                                                                                                   |

## 6. Ordering information

Table 3. Ordering information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| 1PS70SB15   | SC-70   | plastic surface-mounted package; 3 leads | SOT323  |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| 1PS70SB15   | 7%5          |

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

| Symbol           | Parameter           | Conditions |  | Min | Max | Unit |
|------------------|---------------------|------------|--|-----|-----|------|
| $T_{\text{stg}}$ | storage temperature |            |  | -65 | 150 | °C   |

## 9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol               | Parameter                                   | Conditions  |     | Min | Typ | Max | Unit |
|----------------------|---------------------------------------------|-------------|-----|-----|-----|-----|------|
| <b>Per device</b>    |                                             |             |     |     |     |     |      |
| $R_{\text{th(j-a)}}$ | 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          |
|------------------|-------------------|---------------------------------------------------------------------------------------------------------------------|--|-----|-----|-----|---------------|
| <b>Per diode</b> |                   |                                                                                                                     |  |     |     |     |               |
| $V_F$            | forward voltage   | $I_F = 0.1 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ °C}$                                                           |  | -   | -   | 240 | mV            |
|                  |                   | $I_F = 1 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ °C}$                                                             |  | -   | -   | 320 | mV            |
|                  |                   | $I_F = 10 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ °C}$                                                            |  | -   | -   | 400 | mV            |
|                  |                   | $I_F = 30 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ °C}$                                                            |  | -   | -   | 500 | mV            |
|                  |                   | $I_F = 100 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ °C}$                                                           |  | -   | -   | 800 | mV            |
| $I_R$            | reverse current   | $V_R = 25 \text{ V}$ ; pulsed; $t_p = 300 \text{ }\mu\text{s}$ ; $\delta = 0.02$ ; $T_{\text{amb}} = 25 \text{ °C}$ |  | -   | -   | 2   | $\mu\text{A}$ |
| $C_d$            | diode capacitance | $V_R = 1 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{\text{amb}} = 25 \text{ °C}$                                        |  | -   | -   | 10  | pF            |

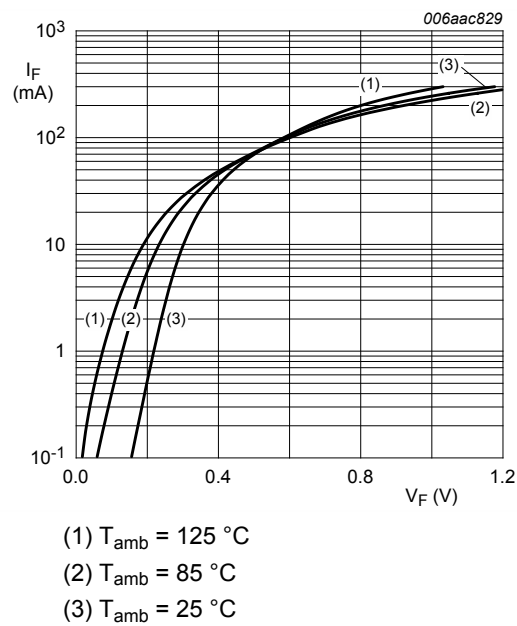


Fig. 1. Forward current as a function of forward voltage; typical values

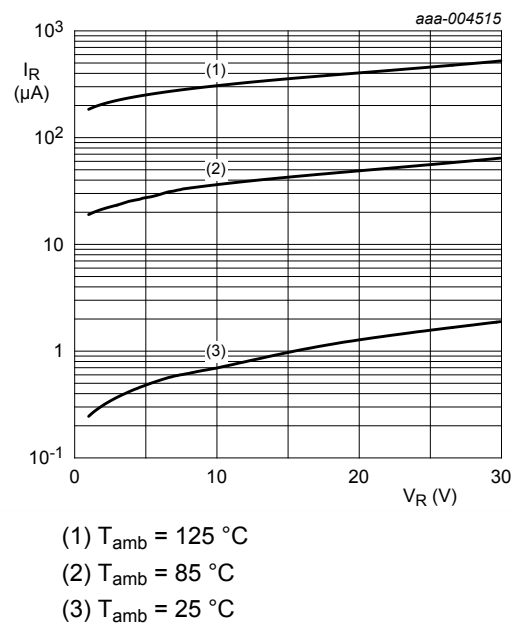
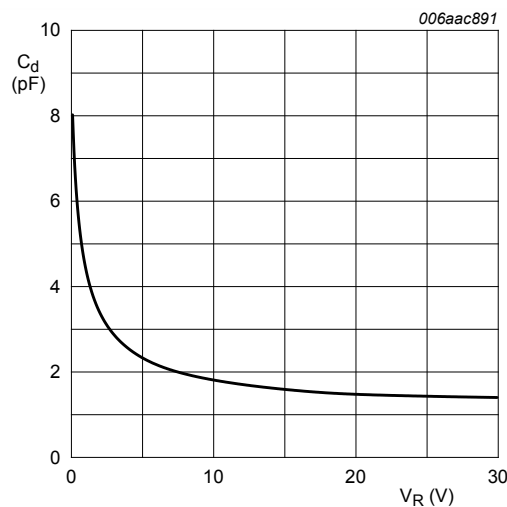


Fig. 2. Reverse current as a function of reverse voltage; typical values



$T_{amb} = 25^\circ\text{C}$ ;  $f = 1\text{ MHz}$

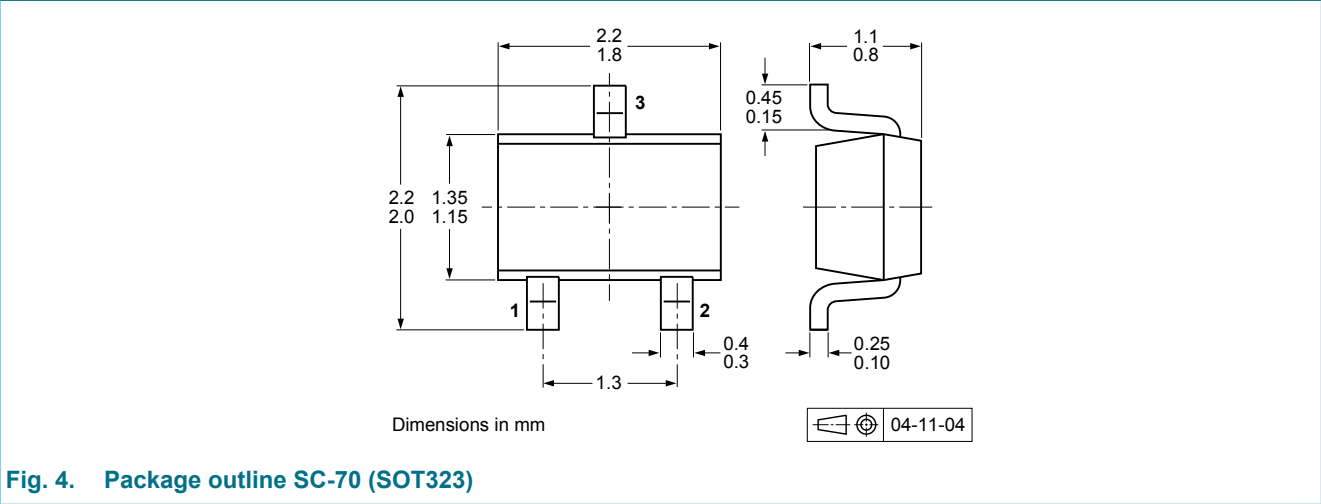
Fig. 3. Diode capacitance as a function of reverse voltage; typical values

## 11. Test information

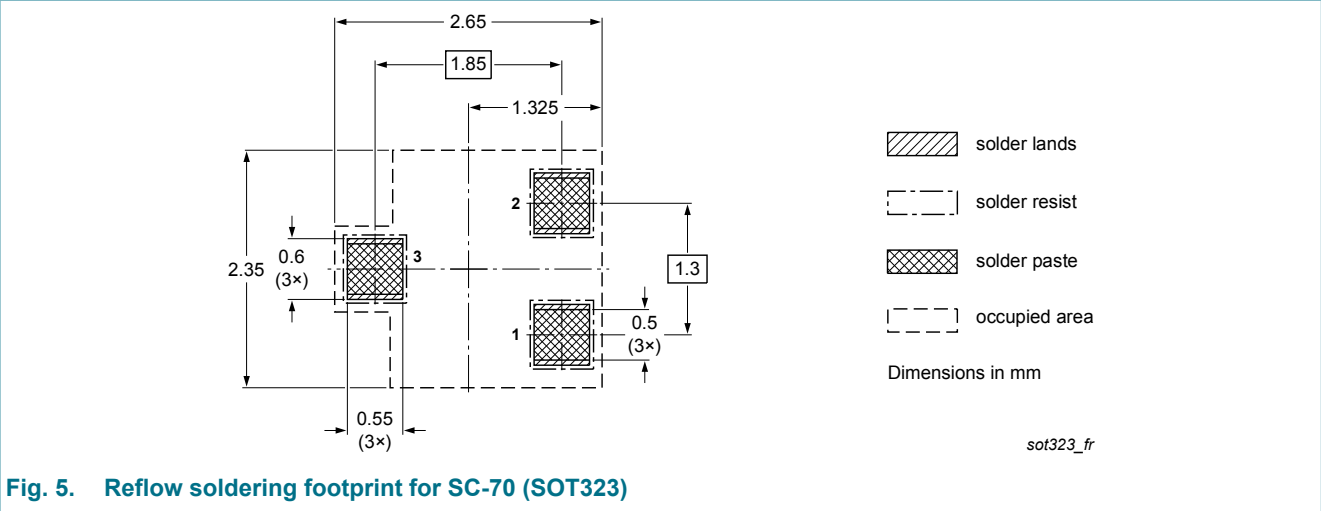
### 11.1 Quality information

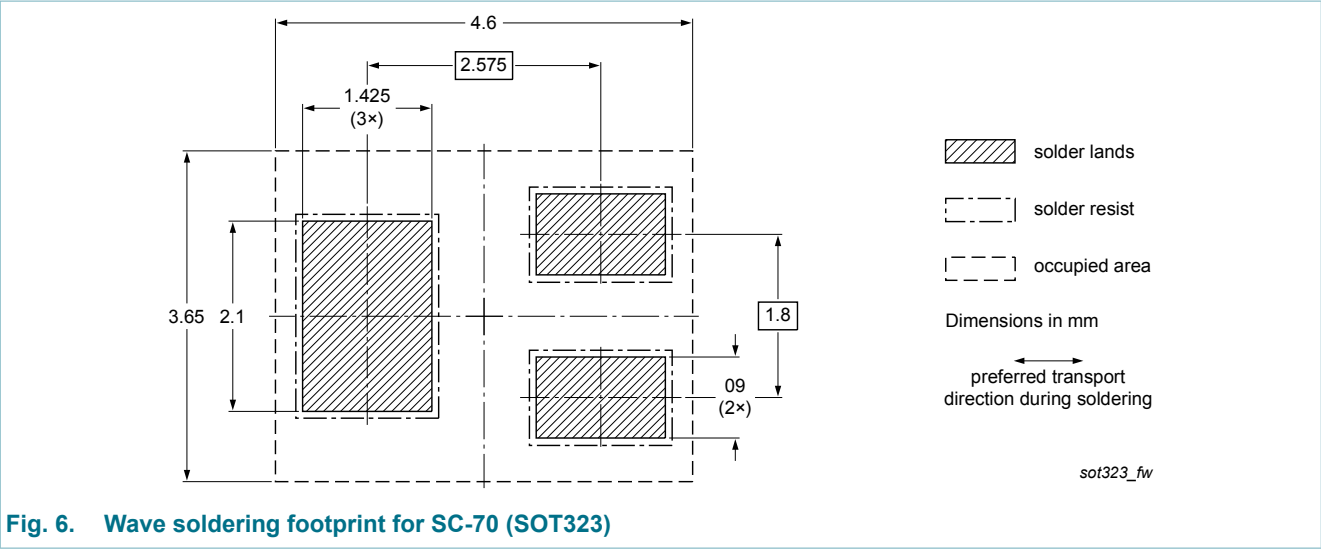
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

12. Package outline



13. Soldering





14. Revision history

Table 8. Revision history

| Data sheet ID          | Release date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Data sheet status  | Change notice | Supersedes             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|------------------------|
| 1PS70SB15 v.2          | 20121217                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Product data sheet | -             | 1PS70SB10_14_15_16 v.1 |
| Modifications:         | <ul style="list-style-type: none"><li>• The format of this document has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li><li>• Sections 1 to 3 updated</li><li>• Section 4 "Quick reference data" added</li><li>• Section 6 "Ordering information" added</li><li>• Section 7 "Marking" updated</li><li>• Table 5 "Limiting values": ambient temperature <math>T_{amb}</math> and junction temperature <math>T_j</math> updated</li><li>• Figures 1, 2 and 3 updated</li><li>• Section 11 "Test information" added</li><li>• Figure 4: superseded by minimized package outline drawing</li><li>• Section 13 "Soldering" added</li><li>• Section 14 "Legal information" updated</li></ul> |                    |               |                        |
| 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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