

1PS70SB20

Schottky barrier single diode

17 December 2012

Product data sheet

1. General description

Planar Schottky barrier diode 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

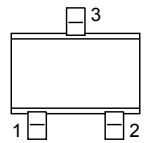
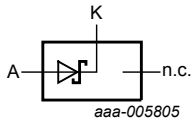
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_F	forward current		-	-	500	mA
V_R	reverse voltage		-	-	40	V
V_F	forward voltage	$I_F = 500 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	550	mV

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode	 SC-70 (SOT323)	 aaa-005805
2	n.c.	not connected		
3	K	cathode		



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6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
1PS70SB20	SC-70	plastic surface-mounted package; 3 leads	SOT323

7. Marking

Table 4. Marking codes

Type number	Marking code [1]
1PS70SB20	7%2

[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
V_R	reverse voltage		-	40	V
I_F	forward current		-	500	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 8.3$ ms; $T_{J(\text{init})} = 25$ °C; half sine wave	-	2	A
T_j	junction temperature		-	125	°C
T_{amb}	ambient temperature		-55	125	°C
T_{stg}	storage temperature		-65	150	°C

9. Thermal characteristics

Table 6. Thermal characteristics

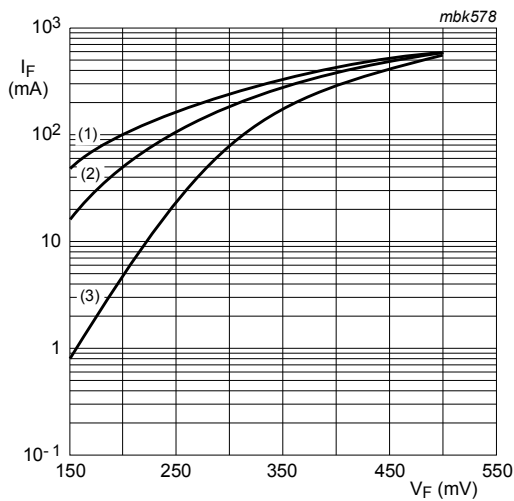
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{\text{th}(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	500	K/W

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

10. Characteristics

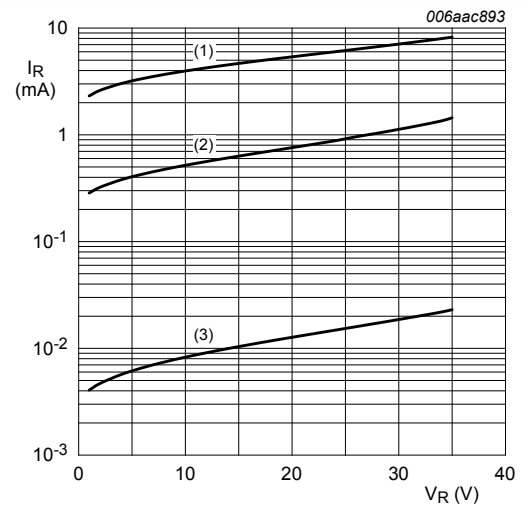
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 500 \text{ mA}$; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	550	mV
I_R	reverse current	$V_R = 35 \text{ V}$; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	100	μA
		$V_R = 35 \text{ V}$; pulsed; $t_p = 300 \text{ }\mu\text{s}$; $\delta = 0.02$; $T_j = 100 \text{ }^\circ\text{C}$	-	-	10	mA
C_d	diode capacitance	$V_R = 0 \text{ V}$; $f = 1 \text{ MHz}$; $T_{amb} = 25 \text{ }^\circ\text{C}$	60	-	90	pF



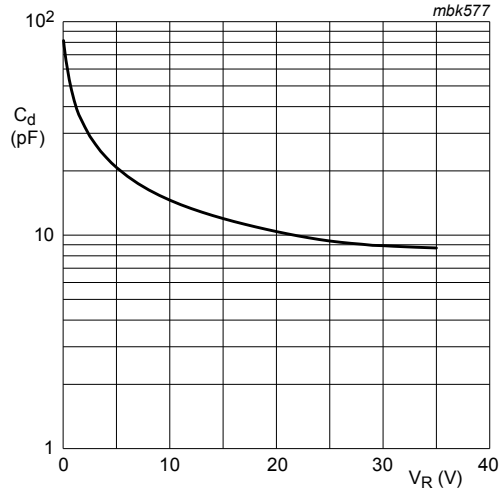
- (1) $T_{amb} = 125 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 85 \text{ }^\circ\text{C}$
- (3) $T_{amb} = 25 \text{ }^\circ\text{C}$

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



- (1) $T_{amb} = 125 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 85 \text{ }^\circ\text{C}$
- (3) $T_{amb} = 25 \text{ }^\circ\text{C}$

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



f = 1 MHz; T_{amb} = 25 °C

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

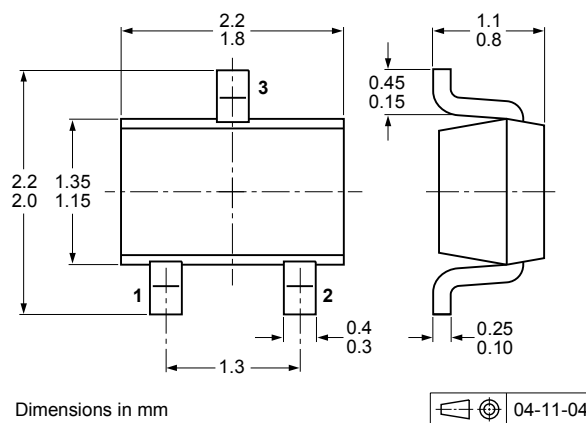


Fig. 4. Package outline SC-70 (SOT323)

13. Soldering

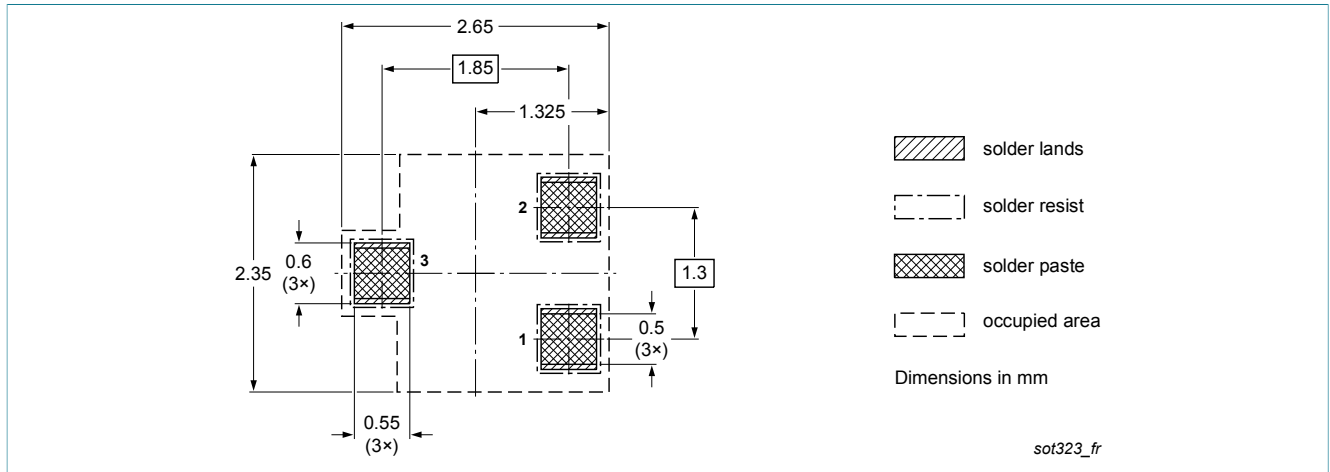


Fig. 5. Reflow soldering footprint for SC-70 (SOT323)

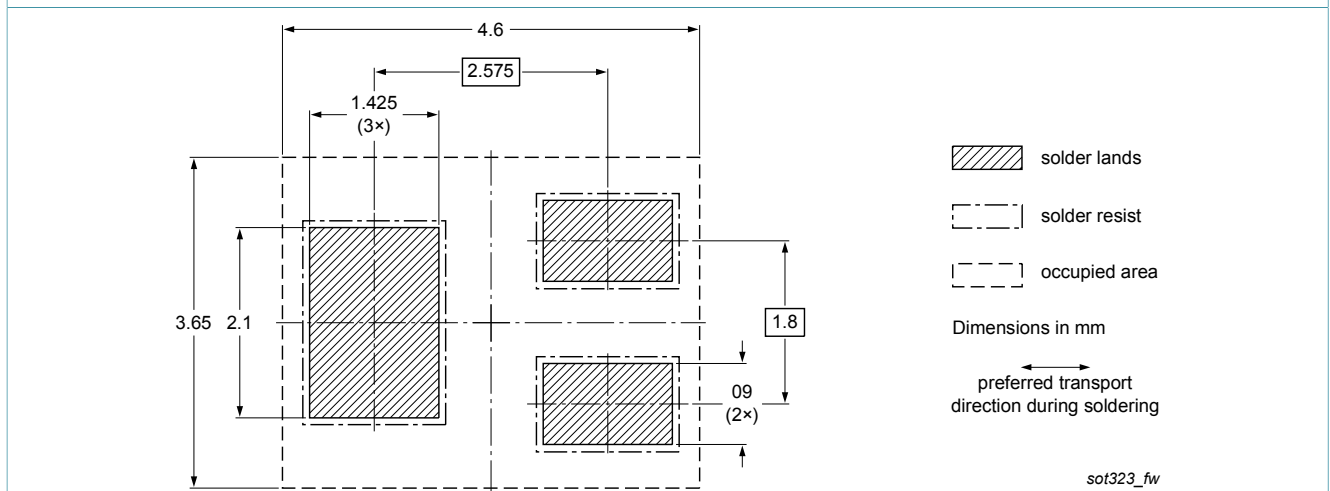


Fig. 6. Wave soldering footprint for SC-70 (SOT323)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
1PS70SB20 v.2	20121217	Product data sheet	-	1PS70SB20 v.1

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
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} added• Figure 2 updated• Section 11 "Test information" added• Figure 4: superseded by minimized package outline drawing• Section 13 "Soldering" added• Section 14 "Legal information" updated			
1PS70SB20 v.1	20010316	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.
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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