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

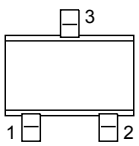
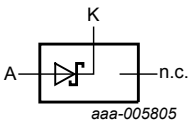
4. Quick reference data

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 mA; T_{amb} = 25 °C		-	-	550	mV

5. Pinning information

Table 2. Pinning information

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

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; $T_{j(init)}$ = 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

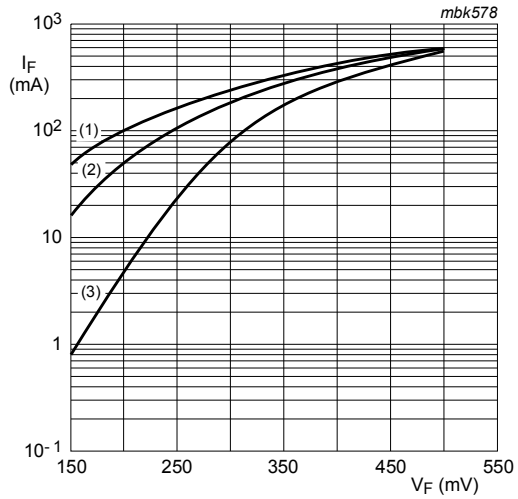
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W

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

10. Characteristics

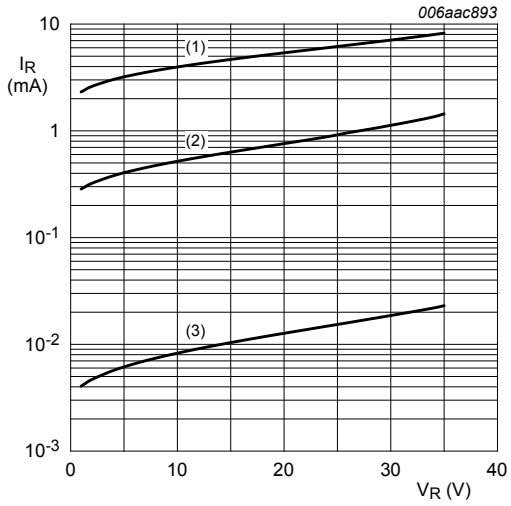
Table 7. Characteristics

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



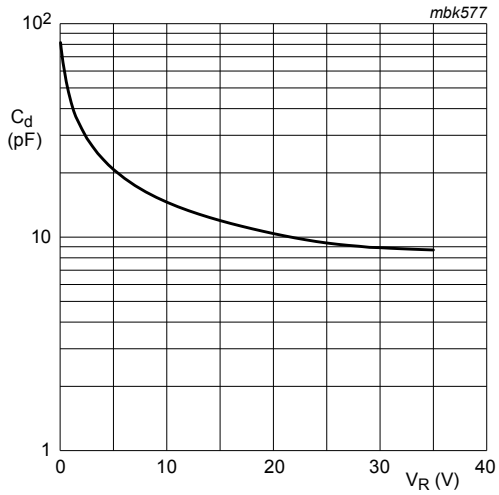
(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

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



(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °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

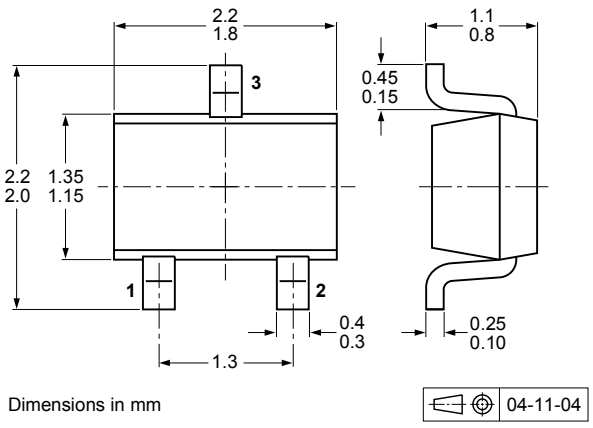


Fig. 4. Package outline SC-70 (SOT323)

13. Soldering

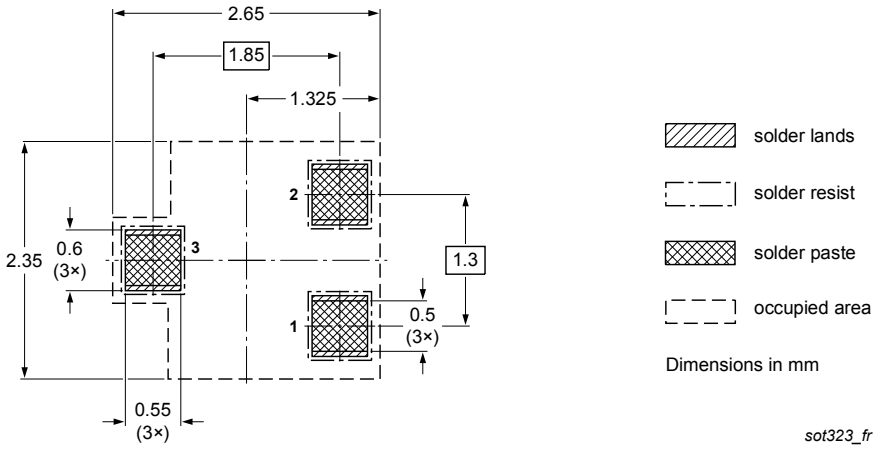


Fig. 5. Reflow soldering footprint for SC-70 (SOT323)

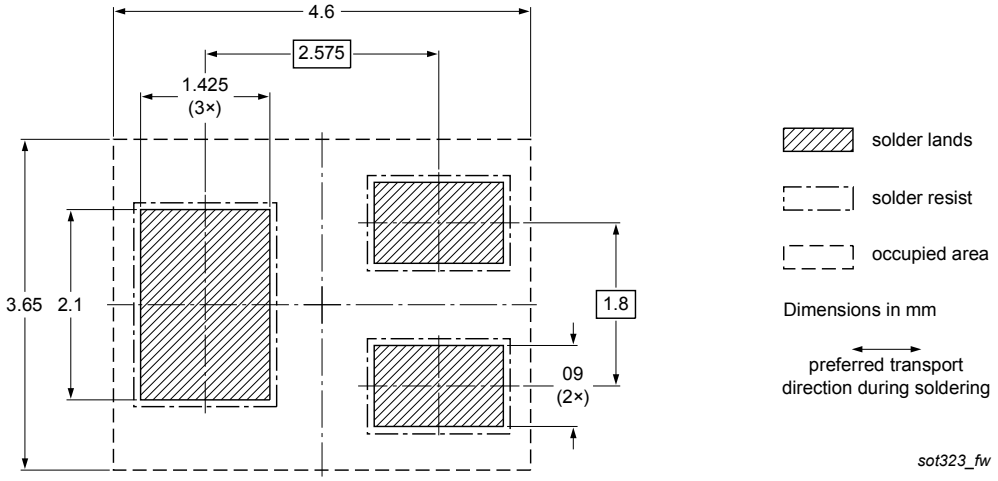


Fig. 6. Wave soldering footprint for SC-70 (SOT323)

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:	• 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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