1PS76SB21; BAT721 series

Schottky barrier diodes in small packages

Rev. 06 — 21 December 2006 Product data sheet

1. Product profile

1.1 General description

Planar Schottky barrier diodes with an integrated guard ring for stress protection. Encapsulated in small Surface-Mounted Device (SMD) plastic packages.

Table 1. Product overview

Type number	Package		Configuration
	NXP	JEITA	
1PS76SB21	SOD323	SC-76	single
BAT721	SOT23	-	single
BAT721A	SOT23	-	dual common anode
BAT721C	SOT23	-	dual common cathode
BAT721S	SOT23	-	dual series

1.2 Features

- Low forward voltage
- Small SMD plastic packages
- Low capacitance

1.3 Applications

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

1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_F	forward current			-	-	200	mA
V_R	reverse voltage			-	-	40	V
V_F	forward voltage	I_F = 200 mA	[1]	-	-	550	mV

[1] Pulse test: $t_p \leq 300\ \mu s$; $\delta \leq 0.02$.

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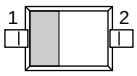
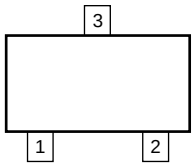
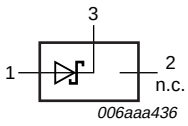
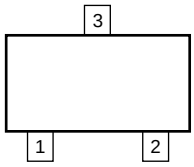
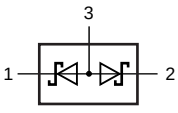
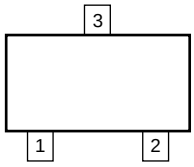
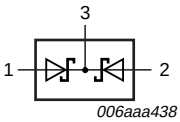
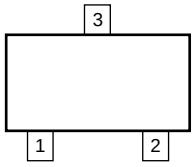
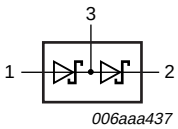
2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
1PS76SB21			
1	cathode [1]		
2	anode		sym001
BAT721			
1	anode		
2	not connected	006aaa144	006aaa436
3	cathode		
BAT721A			
1	cathode (diode 1)		
2	cathode (diode 2)	006aaa144	006aaa439
3	anode (diode 1), anode (diode 2)		
BAT721C			
1	anode (diode 1)		
2	anode (diode 2)	006aaa144	006aaa438
3	cathode (diode 1), cathode (diode 2)		
BAT721S			
1	anode (diode 1)		
2	cathode (diode 2)	006aaa144	006aaa437
3	cathode (diode 1), anode (diode 2)		

[1] The marking bar indicates the cathode.

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3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
1PS76SB21	SC-76	plastic surface-mounted package; 2 leads	SOD323
BAT721	-	plastic surface-mounted package; 3 leads	SOT23
BAT721A			
BAT721C			
BAT721S			

4. Marking

Table 5. Marking codes

Type number	Marking code[1]
1PS76SB21	S1
BAT721	L7*
BAT721A	L8*
BAT721C	L9*
BAT721S	L0*

[1] * = -: made in Hong Kong
* = p: made in Hong Kong
* = t: made in Malaysia
* = W: made in China

5. Limiting values

Table 6. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
Per diode					
V_R	reverse voltage		-	40	V
I_F	forward current		-	200	mA
I_{FSM}	non-repetitive peak forward current	half sine wave; JEDEC method; t_p = 8.3 ms	-	1	A
T_j	junction temperature		-	125	°C
T_{amb}	ambient temperature		–65	+150	°C
T_{stg}	storage temperature		–65	+150	°C

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6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]				
	1PS76SB21			-	-	450	K/W
	BAT721			-	-	500	K/W
	BAT721A			-	-	500	K/W
	BAT721C			-	-	500	K/W
	BAT721S			-	-	500	K/W

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

7. Characteristics

Table 8. Characteristics

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 10 mA	[1]	-	-	300	mV
		I_F = 100 mA	[1]	-	-	420	mV
		I_F = 200 mA	[1]	-	-	550	mV
I_R	reverse current	V_R = 30 V		-	-	15	µA
		V_R = 30 V; T_j = 100 °C		-	-	3	mA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	40	50	pF

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

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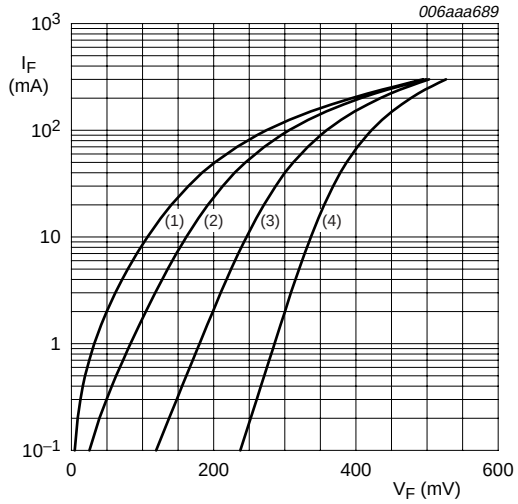
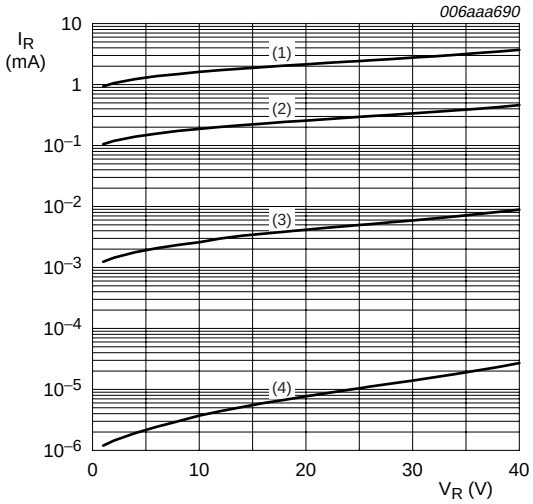


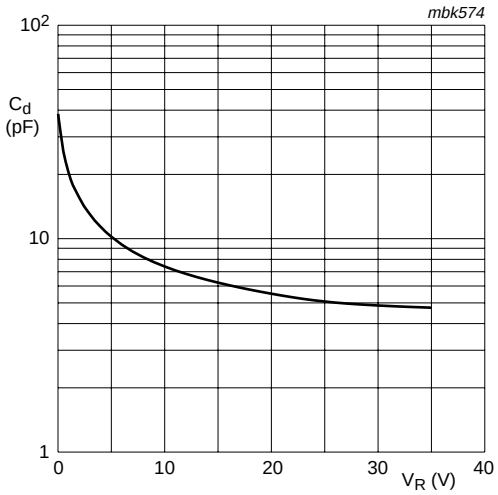
(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = –40 °C

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
(4) T_{amb} = –40 °C

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



T_{amb} = 25 °C; f = 1 MHz

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

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8. Package outline

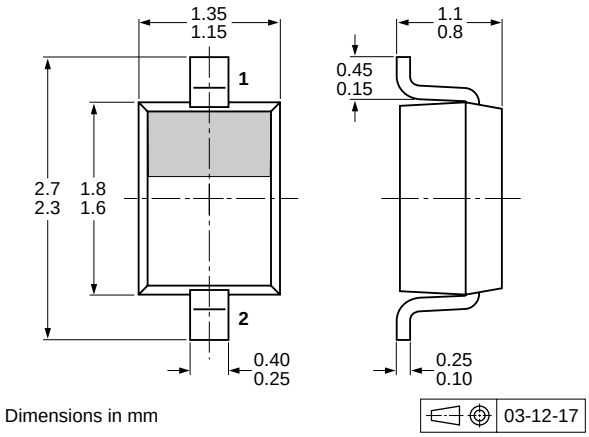

Fig 4. Package outline SOD323 (SC-76)

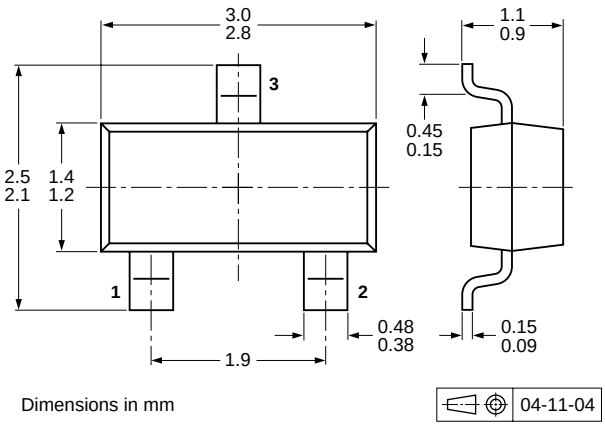

Fig 5. Package outline SOT23

9. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			3000	10000
1PS76SB21	SOD323	4 mm pitch, 8 mm tape and reel	-115	-135
BAT721	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235
BAT721A				
BAT721C				
BAT721S				

[1] For further information and the availability of packing methods, see Section 13.

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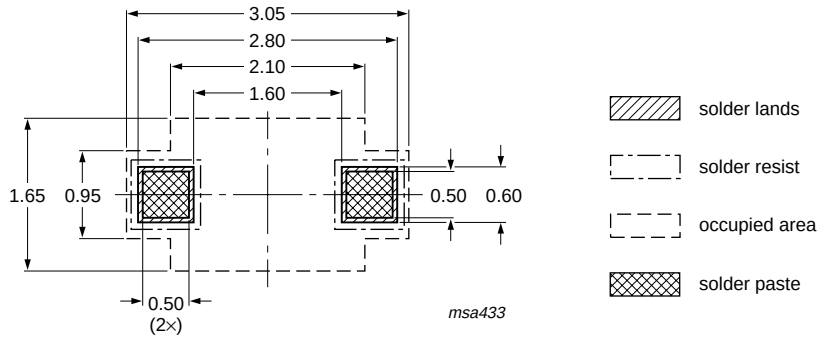
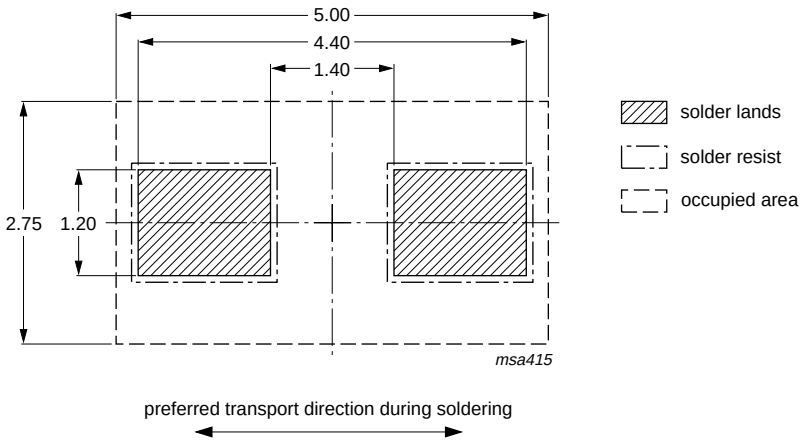
10. Soldering



Dimensions in mm

Fig 6. Reflow soldering footprint SOD323 (SC-76)



Dimensions in mm

Fig 7. Wave soldering footprint SOD323 (SC-76)

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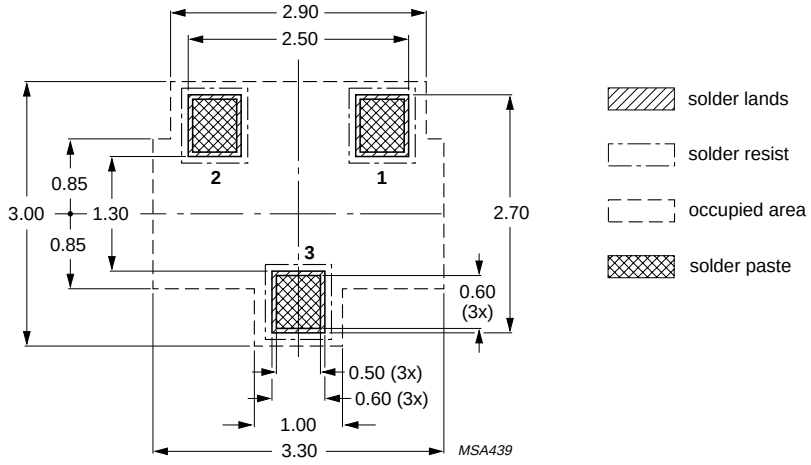
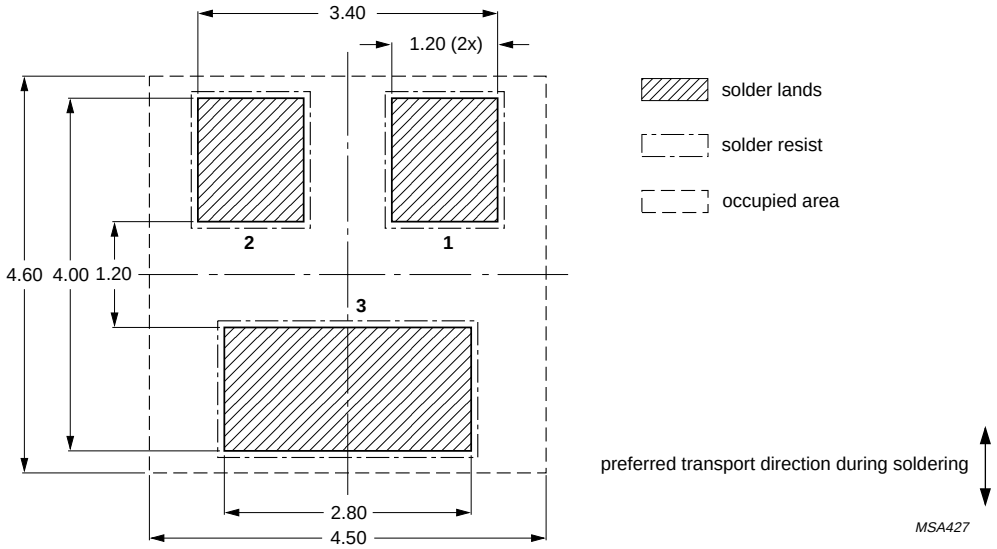


Dimensions in mm

Fig 8. Reflow soldering footprint SOT23



Dimensions in mm

Fig 9. Wave soldering footprint SOT23

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11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
1PS76SB21_BAT721_SER_6	20061221	Product data sheet	-	1PS76SB21_BAT721 _SER_5
Modifications:	• Amended Table 10 “Revision history”			
1PS76SB21_BAT721_SER_5	20061205	Product data sheet	-	BAT721_SERIES_4 1PS76SB21_3
Modifications:	• The format of this data sheet 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. • This data sheet is a combination of data sheets BAT721_SERIES_4 and 1PS76SB21_3. • Table 1 “Product overview”: added • Section 1.2 “Features”: amended • Section 1.3 “Applications”: amended • Table 2 “Quick reference data”: added • Table 5 “Marking codes”: for 1PS76SB21 amended • Table 5 “Marking codes”: enhanced table note section • Table 6 “Limiting values”: indication per diode added • Table 6 “Limiting values”: for 1PS76SB21 I_{FSM} condition amended • Table 6 “Limiting values”: T_{amb} ambient temperature added • Table 7 “Thermal characteristics”: indication per diode added • Table 7: $R_{th(j-a)}$ thermal resistance from junction to ambient condition amended • Table 8 “Characteristics”: indication per diode added • Table 8 “Characteristics”: reference to Table note 1 amended • Table 8: for 1PS76SB21 C_d minimum value changed to typical value • Figure 1 and 2: amended • Figure 4 and 5: superseded by minimized package outlines • Section 9 “Packing information”: added • Section 10 “Soldering”: added • Section 12 “Legal information”: updated			
BAT721_SERIES_4	20040315	Product specification	-	BAT721_SERIES_3
1PS76SB21_3	20040126	Product specification	-	1PS76SB21_2

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12. Legal information

12.1 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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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14. Contents

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