BAT120A

Schottky barrier double diodes

4 April 2025 Product data sheet

1. General description

Planar Schottky barrier double diodes encapsulated in a SOT223 Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Low switching losses
- Capability of absorbing very high surge current
- Fast recovery time
- Guard ring protected
- Plastic SMD package.
- AEC-Q101 qualified

3. Applications

- Low power switched-mode power supplies
- Rectification
- Polarity protection

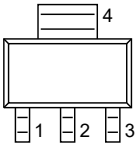
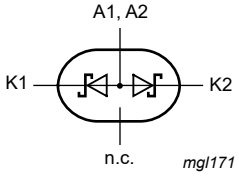
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_R	reverse voltage			-	-	25	V
I_R	reverse current	V_R = 20 V; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_j = 100 °C		-	-	10	mA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode (diode 1)		
2	n.c.	not connected		
3	K2	cathode (diode 2)		
4	A1, A2	common anode (diode 1 and diode 2)		

SC-73 (SOT223)

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT120A	SC-73	plastic, surface-mounted package with increased heatsink; 4 leads; 2.3 mm pitch; 6.5 mm x 3.5 mm x 1.65 mm body	SOT223

7. Marking

Table 4. Marking codes

Type number	Marking code
BAT120A	AT120A

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			-	25	V
I_F	forward current			-	1	A
I_{FSM}	non-repetitive peak forward current	half sine-wave pulse; $t_p \leq$ 10 ms; JEDEC method; $T_{j(init)}$ = 25 °C		-	10	A
I_{RSM}	non-repetitive peak reverse current	t_p = 100 µs		-	0.5	A
T_j	junction temperature			-	125	°C
T_{amb}	ambient temperature			-65	125	°C
T_{stg}	storage temperature			-65	150	°C

9. Thermal characteristics

Table 6. Thermal characteristics

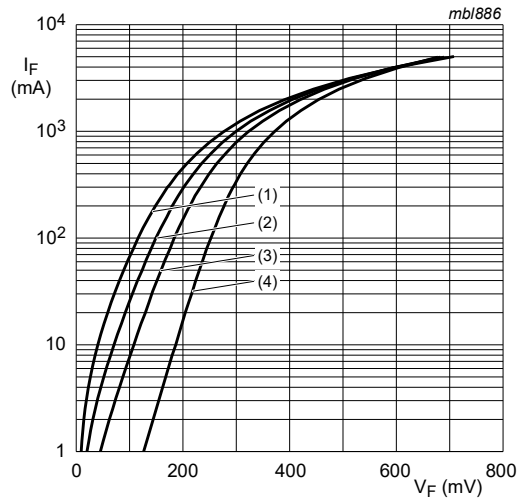
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	100	K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[2] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses.

10. Characteristics

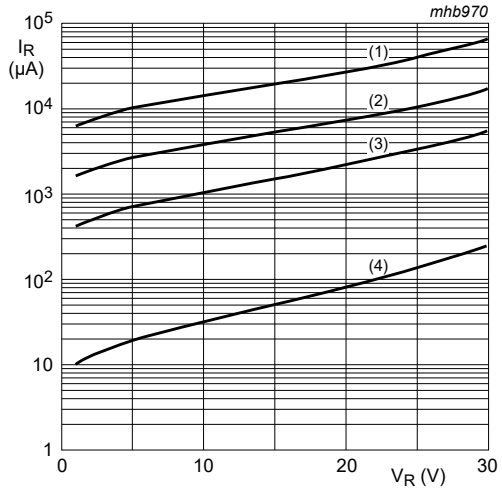
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 100 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	260	300	mV
		I_F = 1 A; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	400	450	mV
I_R	reverse current	V_R = 20 V; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	80	500	µA
		V_R = 25 V; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	1	mA
		V_R = 20 V; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_j = 100 °C		-	-	10	mA
C_d	diode capacitance	V_R = 4 V; f = 1 MHz; T_{amb} = 25 °C		-	100	-	pF



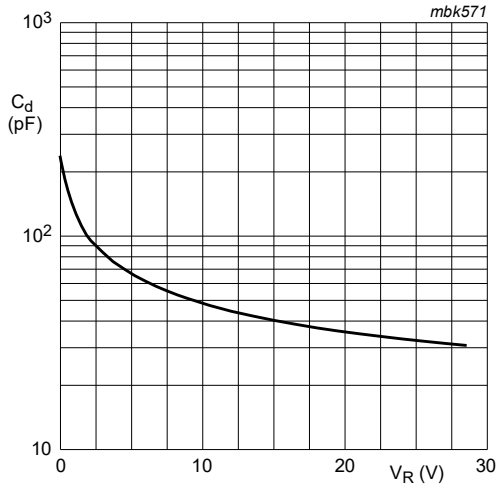
(1) T_j = 125 °C
(2) T_j = 100 °C
(3) T_j = 75 °C
(4) T_j = 25 °C

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



(1) T_j = 125 °C
(2) T_j = 100 °C
(3) T_j = 75 °C
(4) T_j = 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. Package outline

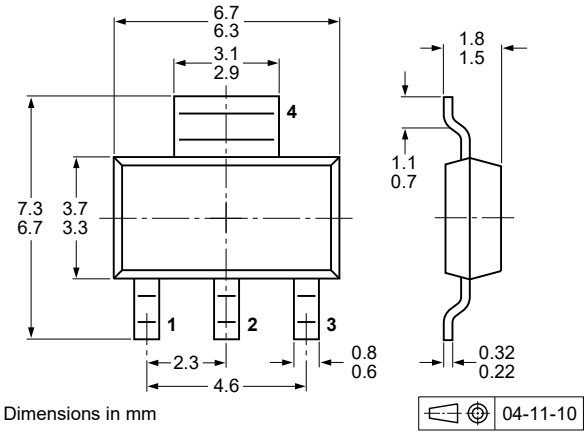


Fig. 4. Package outline SC-73 (SOT223)

12. Soldering

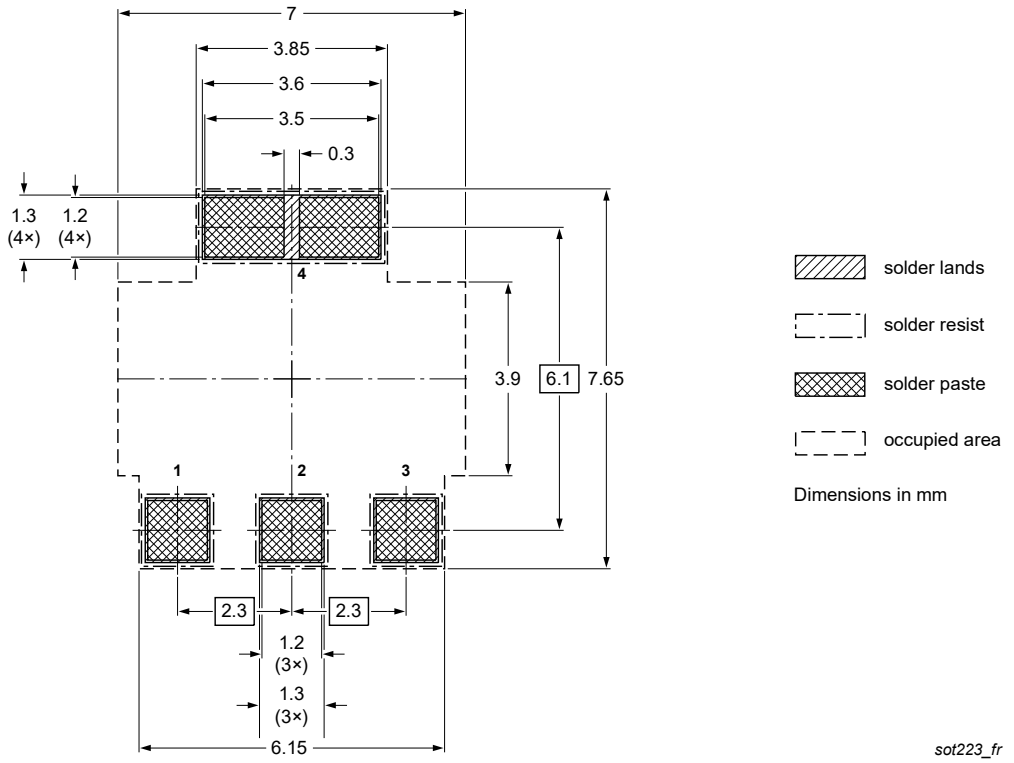


Fig. 5. Reflow soldering footprint for SC-73 (SOT223)

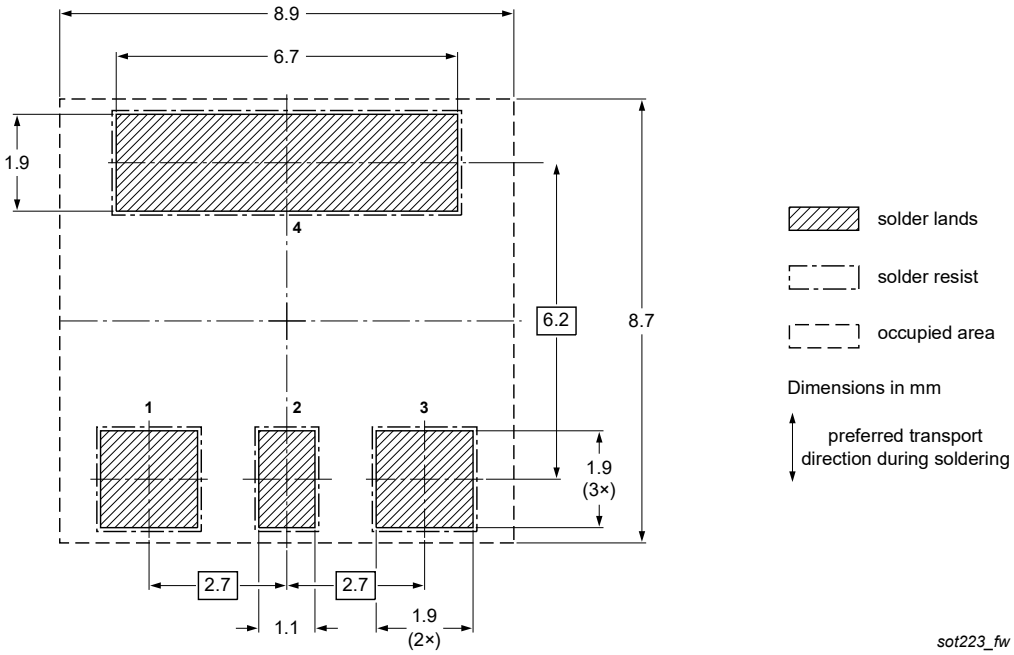


Fig. 6. Wave soldering footprint for SC-73 (SOT223)

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT120A v.3	20250404	Product data sheet	-	BAT120_SERIES v.2
Modifications:	• Family data sheet splitted to single type data sheets. • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate.			
BAT120_SERIES v.2	20030804	Product data sheet	-	BAT120_SERIES v.1
BAT120_SERIES v.1	20010827	Product data sheet	-	-

14. Legal information

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 https://www.nexperia.com.

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