



BAS101S

High-voltage switching dual diode

5 April 2024

Product data sheet

1. General description

High-voltage switching dual diode, encapsulated in a SOT23 small Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- High switching speed: $t_{rr} \leq 50$ ns
- Low leakage current
- Repetitive peak reverse voltage: $V_{RRM} \leq 300$
- Low capacitance: $C_d \leq 2$ pF
- Reverse voltage: $V_R \leq 300$ V
- Small SMD plastic package
- AEC-Q101 qualified

3. Applications

- High-speed switching
- High-voltage switching
- Voltage clamping
- Reverse polarity protection

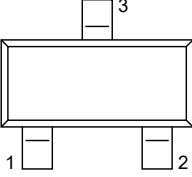
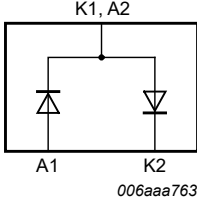
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
I_F	forward current		-	-	200	mA
I_R	reverse current	$V_R = 250$ V; $T_{amb} = 25$ °C	-	-	150	nA
V_R	reverse voltage		-	-	300	V
t_{rr}	reverse recovery time	When switched from $I_F = 30$ mA to $I_R = 30$ mA; $R_L = 100$ Ω; measured at $I_R = 3$ mA; $T_{amb} = 25$ °C	-	-	50	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 <p style="text-align: center;">SOT23</p>	 <p style="text-align: center;">006aaa763</p>
2	K2	cathode (diode 2)		
3	K1, A2	cathode (diode 1), anode (diode 2)		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS101S	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code ^[1]
BAS101S	%HR

[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
Per diode						
V _{RRM}	repetitive peak reverse voltage			-	300	V
		series connection		-	600	V
V _R	reverse voltage			-	300	V
		series connection		-	600	V
I _F	forward current			-	200	mA
		series connection		-	100	mA
I _{FSM}	non-repetitive peak forward current	t _p ≤ 1 μs; square wave; T _{j(init)} = 25 °C		-	9	A
I _{FRM}	repetitive peak forward current	t _p ≤ 1 ms; δ ≤ 0.25		-	1	A
Per device						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	250	mW
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-65	150	°C
T _{stg}	storage temperature			-65	150	°C

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

9. Thermal characteristics

Table 6. Thermal characteristics

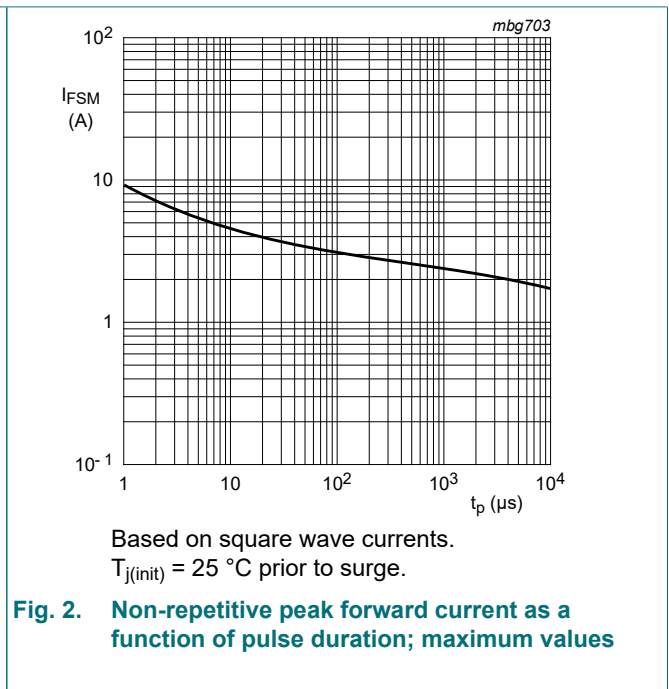
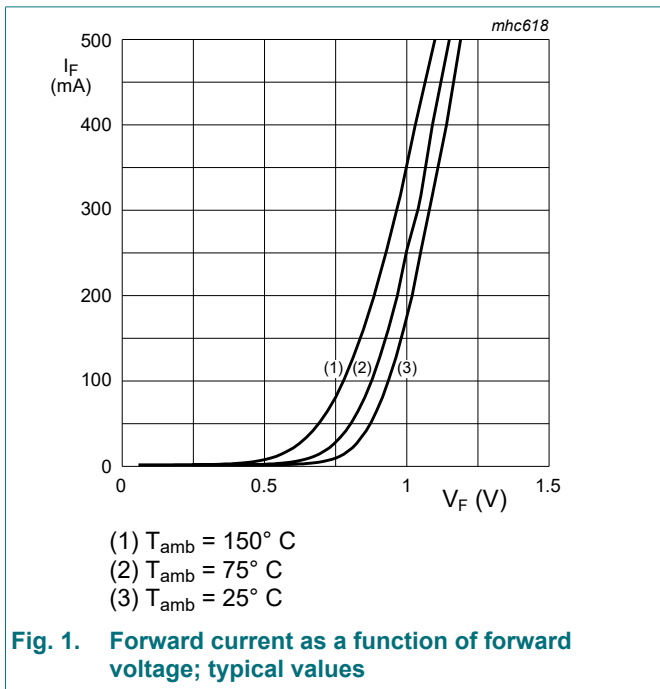
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per device							
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W

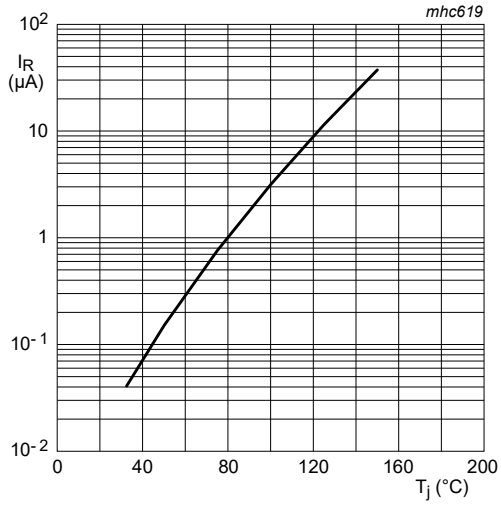
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

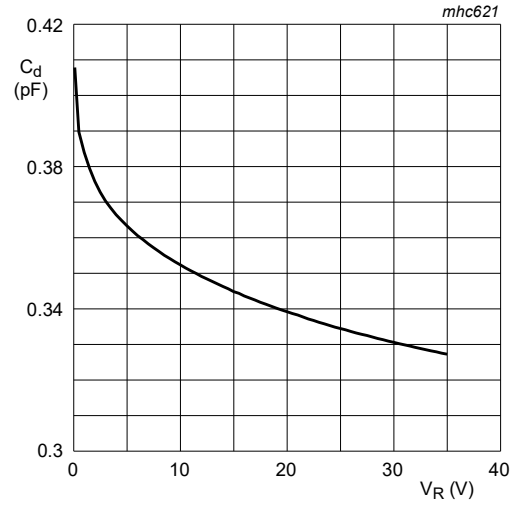
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_F	forward voltage	$I_F = 100 \text{ mA}$; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	1.1	V
I_R	reverse current	$V_R = 250 \text{ V}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	150	nA
		$V_R = 250 \text{ V}$; $T_j = 150 \text{ }^\circ\text{C}$	-	-	100	μA
C_d	diode capacitance	$V_R = 0 \text{ V}$; $f = 1 \text{ MHz}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	2	pF
t_{rr}	reverse recovery time	When switched from $I_F = 30 \text{ mA}$ to $I_R = 30 \text{ mA}$; $R_L = 100 \text{ }\Omega$; measured at $I_R = 3 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	50	ns





$V_R = 300 \text{ V}$

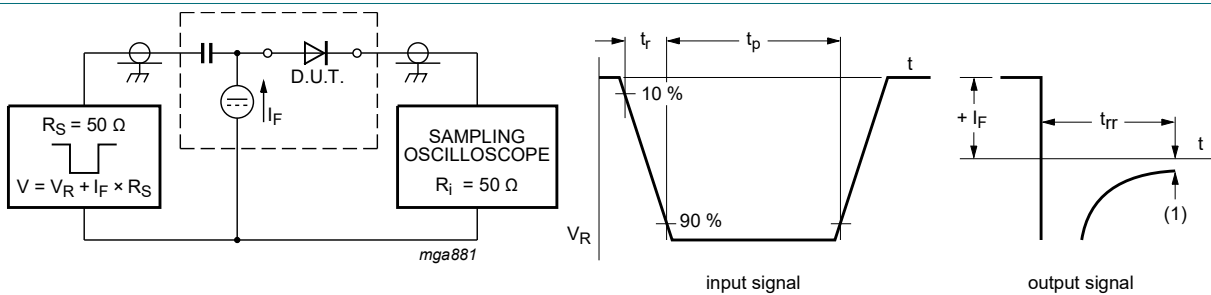
Fig. 3. Reverse current as a function of junction temperature; typical values



$f = 1 \text{ MHz}$
 $T_{\text{amb}} = 25 \text{ °C}$

Fig. 4. Diode capacitance as a function of reverse voltage; typical values

11. Test information



(1) $I_R = 3 \text{ mA}$

Fig. 5. Reverse recovery time test circuit and waveforms

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

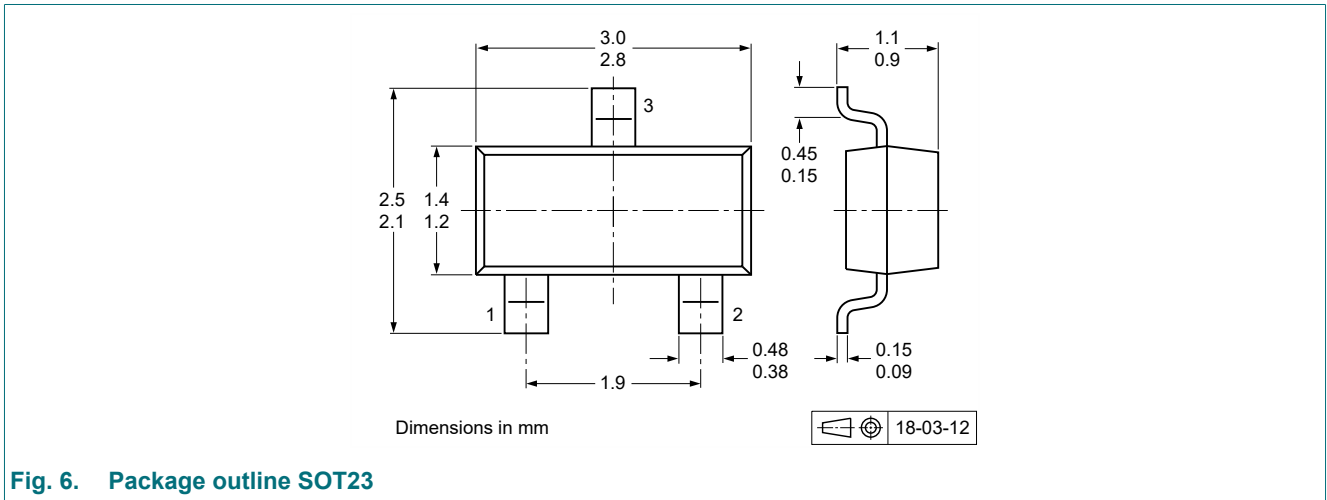


Fig. 6. Package outline SOT23

13. Soldering

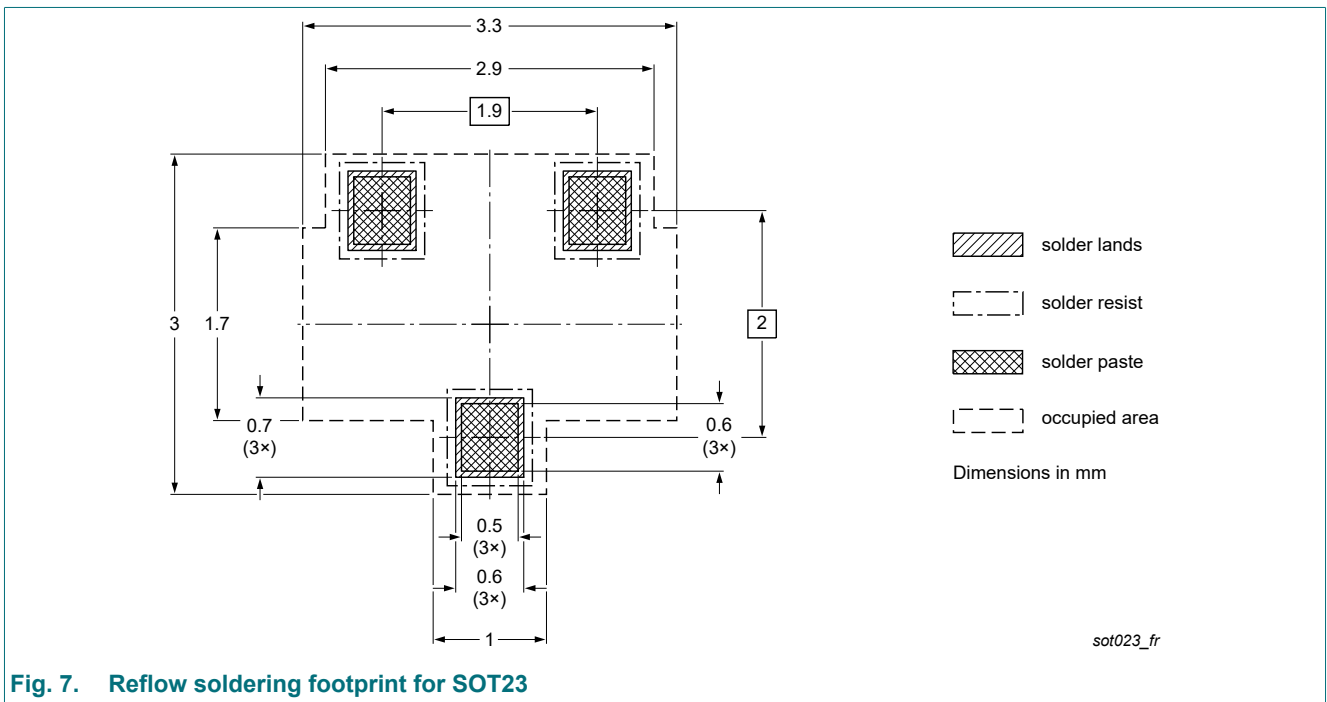


Fig. 7. Reflow soldering footprint for SOT23

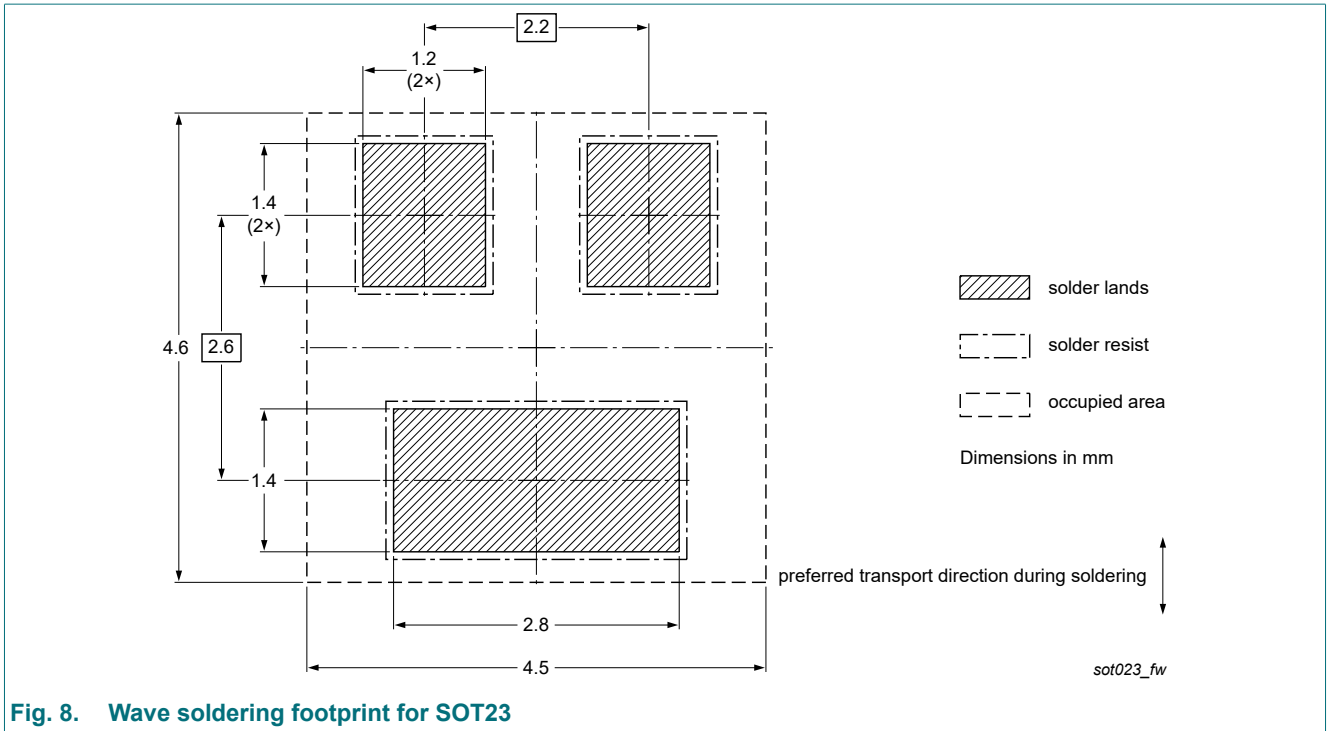


Fig. 8. Wave soldering footprint for SOT23

14. Mounting

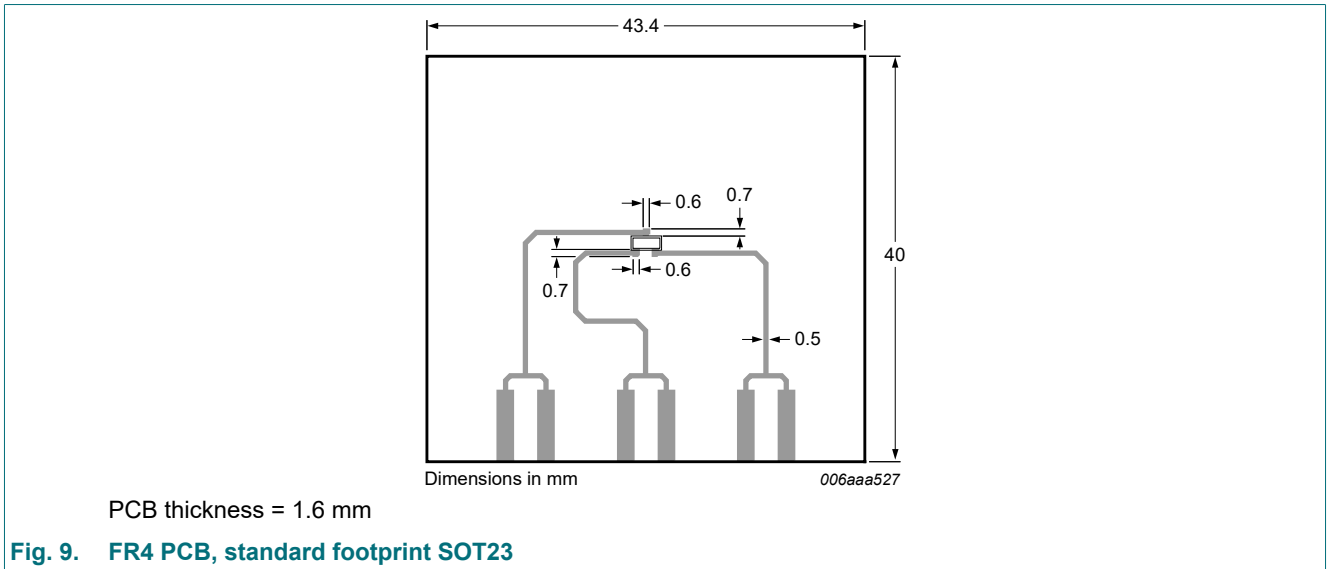


Fig. 9. FR4 PCB, standard footprint SOT23

15. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS101S v.3	20240405	Product data sheet	-	BAS101_BAS101S_2
Modifications:	<ul style="list-style-type: none">• Family data sheet splitted to single type data sheets.• Characteristics: Notes of Fig. 2 and 3 changed• Section "Packing information" removed.			
BAS101_BAS101S_2	20091214	Product data sheet	-	BAS101_BAS101S_1
BAS101_BAS101S_1	20060908	Product data sheet	-	-

16. 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".
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