



BAV23S-Q

Dual high-voltage switching diodes

2 February 2022

Product data sheet

1. General description

Dual high-voltage switching diodes, encapsulated in a small SOT23 (TO-236AB) 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: $V_{RRM} \leq 250$ V
- Low capacitance: $C_d \leq 2$ pF
- Small SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- High-speed switching at high voltage
- High-voltage general-purpose switching

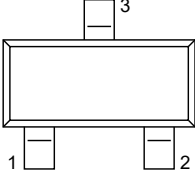
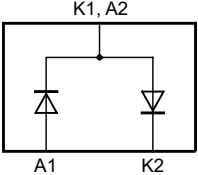
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
I_R	reverse current	$V_R = 200$ V	-	-	100	nA
V_R	reverse voltage		-	-	200	V
t_{rr}	reverse recovery time	$I_F = 10$ mA; $I_R = 10$ mA; $I_{R(meas)} = 1$ mA; $R_L = 100$ Ω ; $T_{amb} = 25$ °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
BAV23S-Q	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]
BAV23S-Q	%V5

[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_R	reverse voltage			-	200	V
V_{RRM}	repetitive peak reverse voltage			-	250	V
I_F	forward current	Single diode loaded	[1]	-	225	mA
			[2]	-	125	mA
I_{FRM}	repetitive peak forward current			-	625	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1 \mu\text{s}$; square wave	[3]	-	9	A
		$t_p = 100 \mu\text{s}$; square wave	[3]	-	3	A
		$t_p = 10 \text{ms}$; square wave	[3]	-	1.7	A
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	[4]	-	250	mW
T_j	junction temperature			-	150	$^\circ\text{C}$
T_{amb}	ambient temperature			-65	150	$^\circ\text{C}$
T_{stg}	storage temperature			-65	150	$^\circ\text{C}$

[1] Single diode loaded.

[2] Double diode loaded.

[3] $T_j = 25 \text{ }^\circ\text{C}$ prior to surge.

[4] 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
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	360	K/W

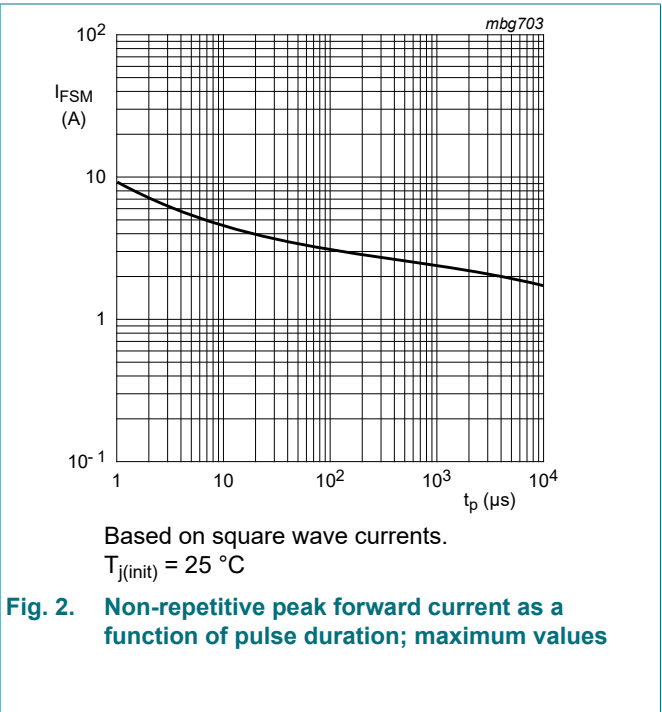
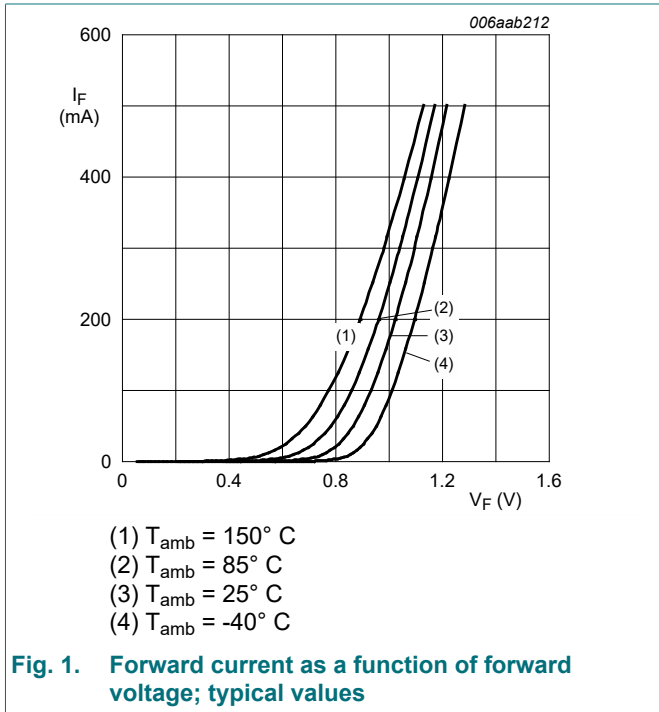
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

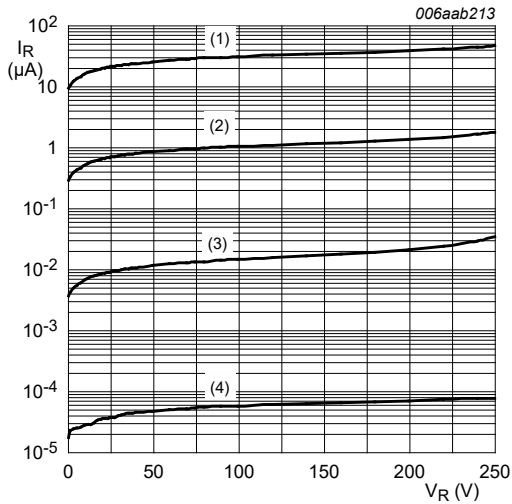
10. Characteristics

Table 7. Characteristics

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

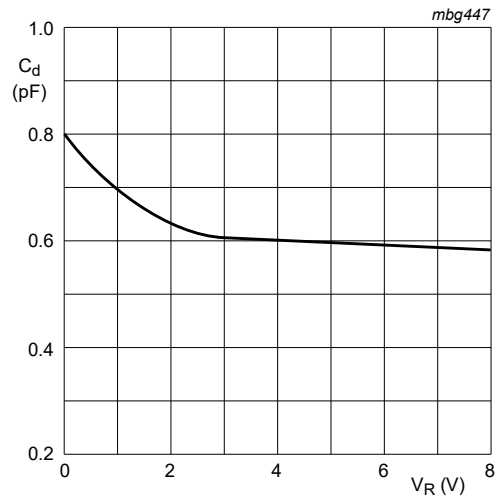
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_F	forward voltage	$I_F = 100\text{ mA}$	-	-	1	V
		$I_F = 200\text{ mA}$	-	-	1.25	V
I_R	reverse current	$V_R = 200\text{ V}$	-	-	100	nA
		$V_R = 200\text{ V}; T_J = 150\text{ °C}$	-	-	100	μA
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}$	-	-	2	pF
t_{rr}	reverse recovery time	$I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(\text{meas})} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_{amb} = 25\text{ °C}$	-	-	50	ns





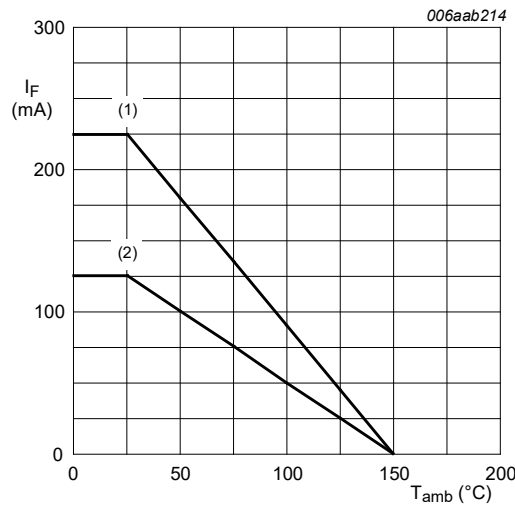
- (1) $T_{\text{amb}} = 150^\circ\text{C}$
- (2) $T_{\text{amb}} = 85^\circ\text{C}$
- (3) $T_{\text{amb}} = 25^\circ\text{C}$
- (4) $T_{\text{amb}} = -40^\circ\text{C}$

Fig. 3. Reverse current as a function of reverse voltage; typical values



$f = 1\text{ MHz}$
 $T_j = 25^\circ\text{C}$.

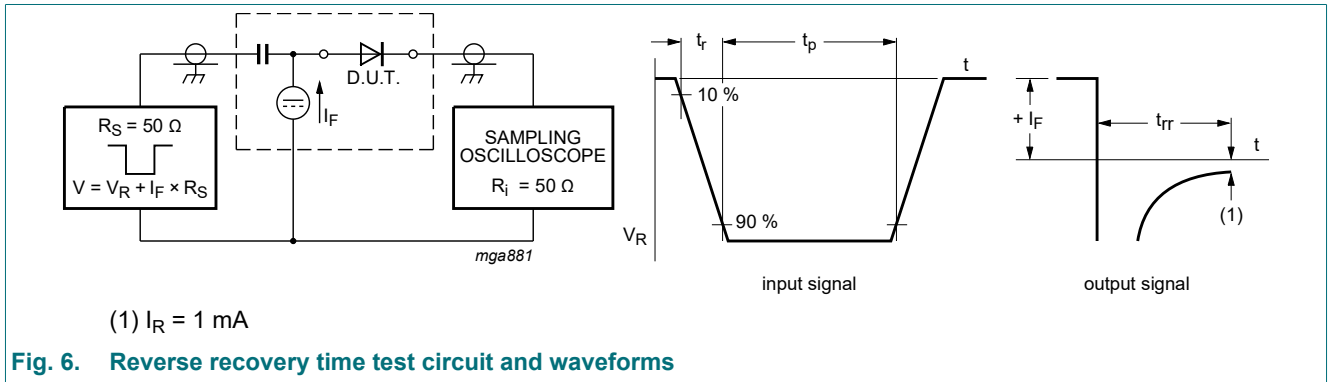
Fig. 4. Diode capacitance as a function of reverse voltage; typical values.



FR4 PCB, standard footprint
 (1) Single diode loaded
 (2) Double diode loaded

Fig. 5. Forward current as a function of ambient temperature; derating curves

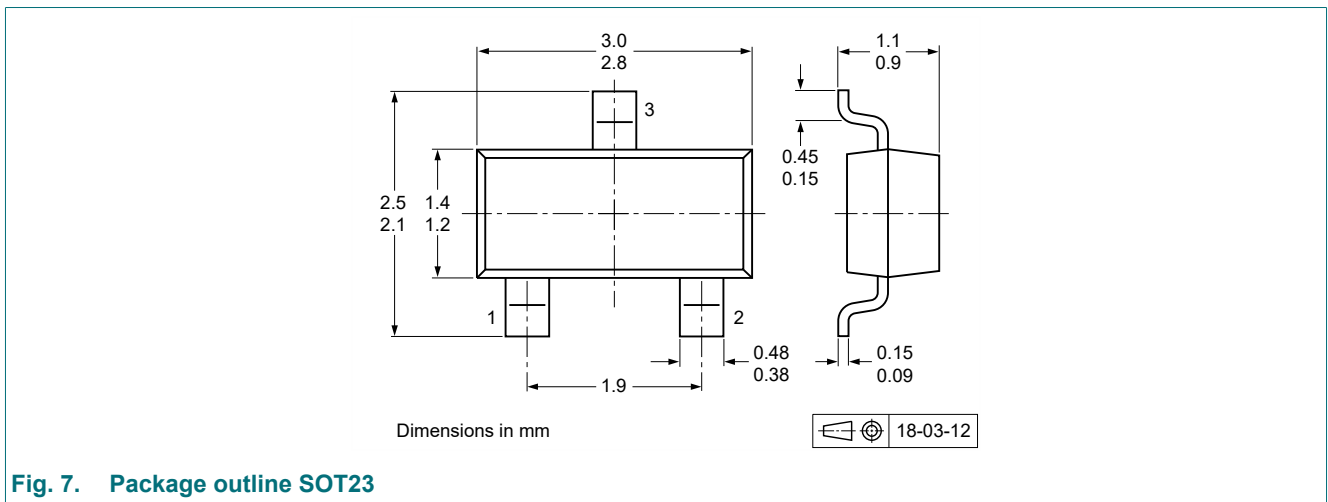
11. Test information



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



13. Soldering

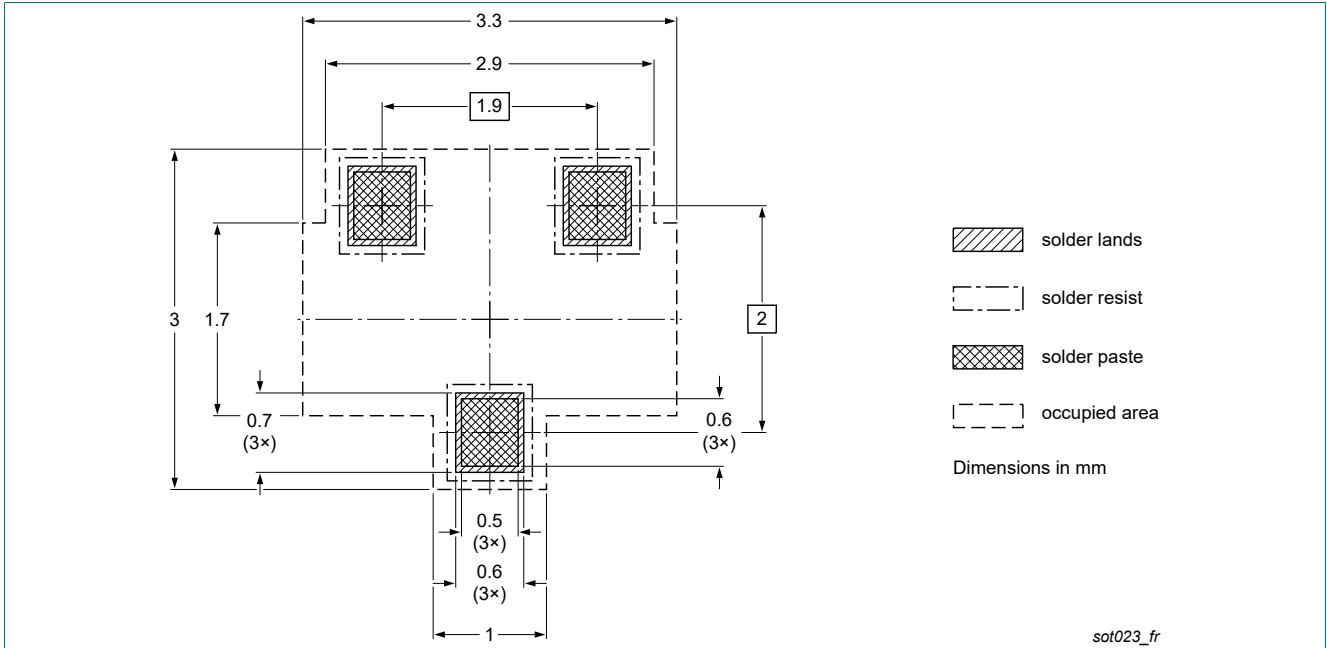


Fig. 8. Reflow soldering footprint for SOT23

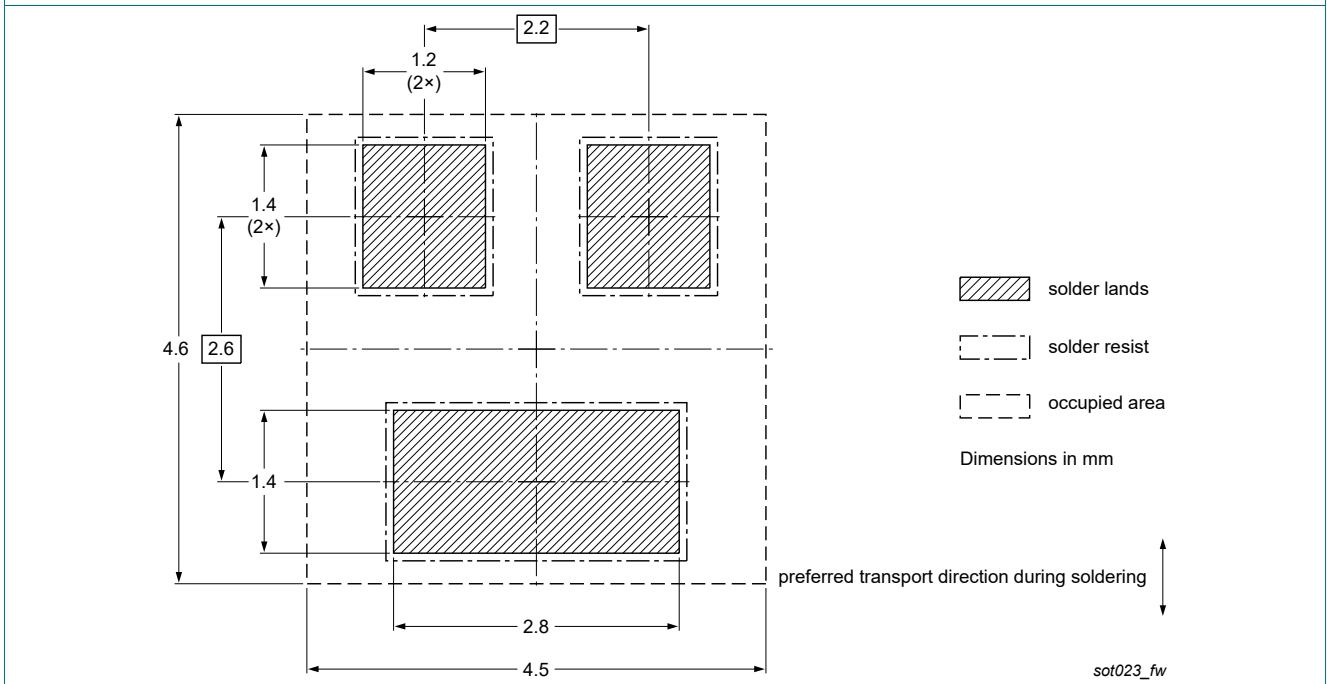


Fig. 9. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV23S-Q v.1	20220202	Product data sheet	-	-

15. 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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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