BAV70M

High-speed switching diode

1 July 2022 **Product data sheet**

1. General description

High-speed switching diode, encapsulated in an ultra small SOT883 (SC-101) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- High switching speed: $t_{rr} \leq 4$ ns
- Low capacitance: $C_d \leq 1.5$ pF
- Low leakage current
- Reverse voltage: $V_R \leq 100$ V
- Ultra small SMD plastic package

3. Applications

- High-speed switching
- 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 = 80 V		-	-	0.5	µA
V_R	reverse voltage			-	-	100	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		-	-	4	ns

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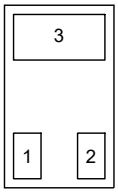
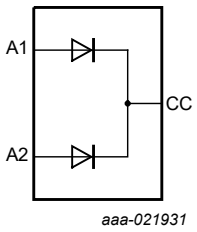
5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 Transparent top view **DFN1006-3 (SOT883)**	
2	A2	anode (diode 2)		
3	CC	common cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV70M	DFN1006-3	plastic, leadless ultra small package; 3 terminals; 0.35 mm pitch; 1 mm x 0.6 mm x 0.48 mm body	SOT883

7. Marking

Table 4. Marking codes

Type number	Marking code
BAV70M	S4

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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			-	100	V
V_{RRM}	repetitive peak reverse voltage			-	100	V
I_F	forward current	T_S = 90 °C		-	150	mA
I_{FRM}	repetitive peak forward current			-	500	mA
I_{FSM}	non-repetitive peak forward current	t_p = 1 µs; square wave	[1]	-	4	A
		t_p = 1 ms; square wave	[1]	-	1	A
		t_p = 1 s; square wave	[1]	-	0.5	A
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[2] [3]	-	250	mW
Per device						
I_F	forward current	T_S = 90 °C		-	75	A
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] t_j = 25 °C prior to surge
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[3] Reflow soldering is the only recommended soldering method.

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] [2]	-	-	500	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Reflow soldering is the only recommended soldering method.

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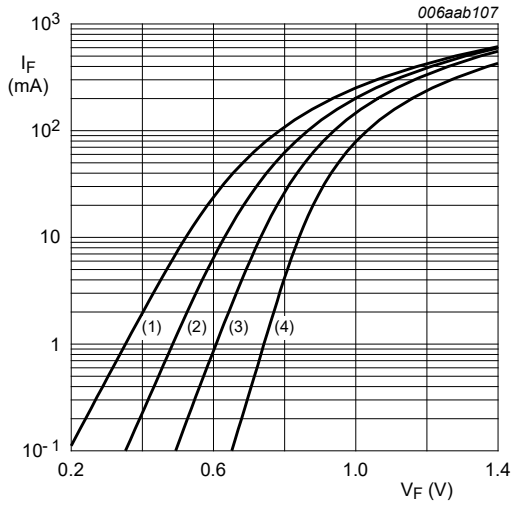
10. Characteristics

Table 7. Characteristics

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

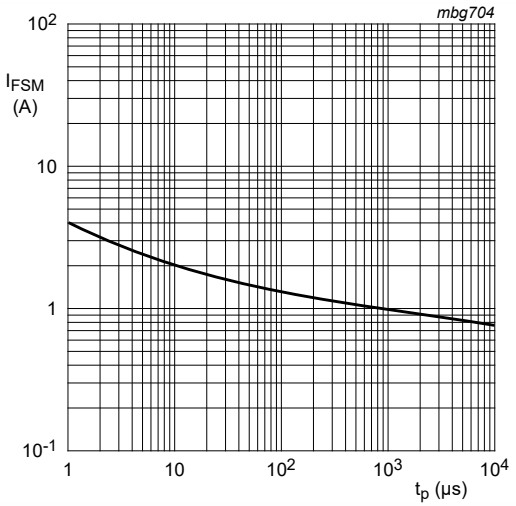
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 1 mA	[1]	-	-	715	mV
		I_F = 10 mA	[1]	-	-	855	mV
		I_F = 50 mA	[1]	-	-	1	V
		I_F = 150 mA	[1]	-	-	1.25	V
I_R	reverse current	V_R = 25 V		-	-	30	nA
		V_R = 80 V		-	-	0.5	µA
		V_R = 25 V; T_j = 150 °C		-	-	30	µA
		V_R = 80 V; T_j = 150 °C		-	-	100	µA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	-	1.5	pF
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		-	-	4	ns
V_{FRM}	peak forward recovery voltage	I_F = 10 mA; t_r = 20 ns		-	-	1.75	V

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



(1) T_j = 150 °C
(2) T_j = 85 °C
(3) T_j = 25 °C
(4) T_j = −40 °C

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



Based on square wave currents.
$T_{j(init)}$ = 25 °C

Fig. 2. Non-repetitive peak forward current as a function of pulse duration; typical values

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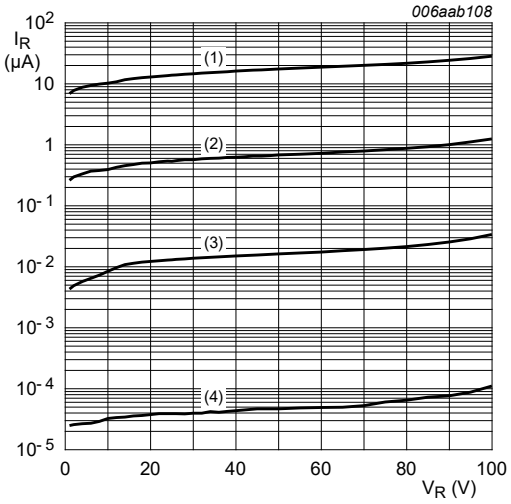
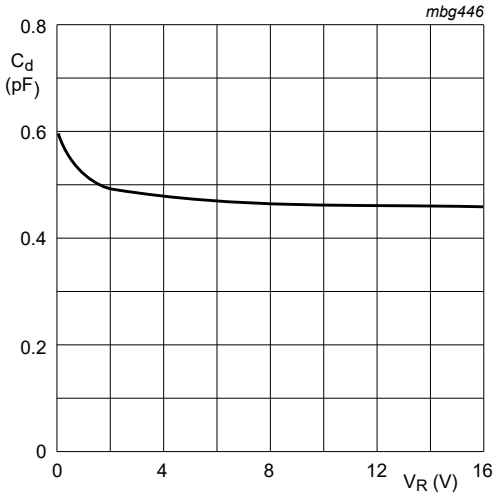


(1) T_j = 150 °C
(2) T_j = 85 °C
(3) T_j = 25 °C
(4) T_j = −40 °C

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



f = 1 MHz; T_{amb} = 25 °C

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

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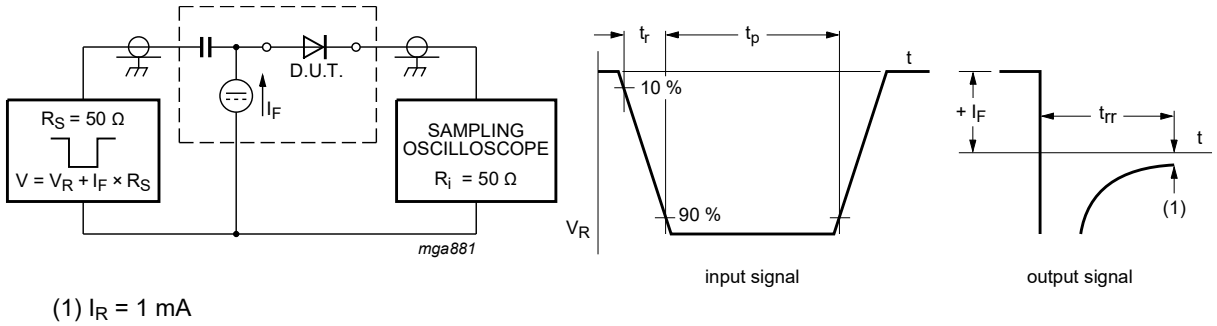
11. Test information



(1) I_R = 1 mA

Fig. 5. Reverse recovery time test circuit and waveforms

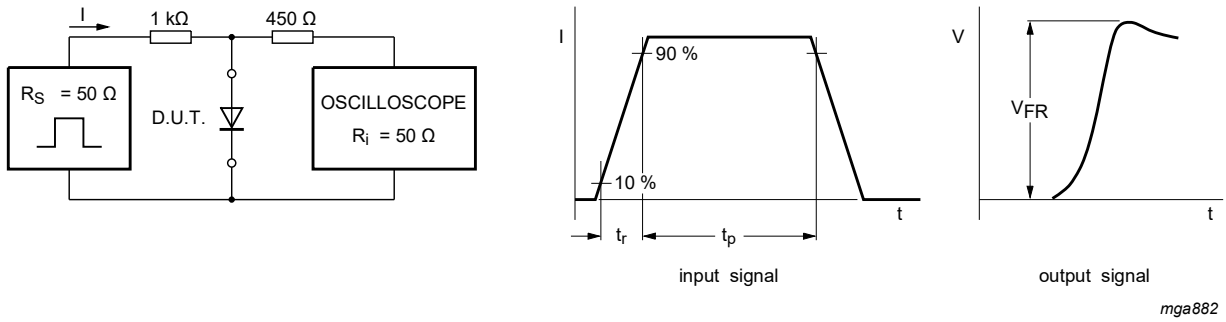


Fig. 6. Forward recovery voltage test circuit and waveforms

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12. Package outline

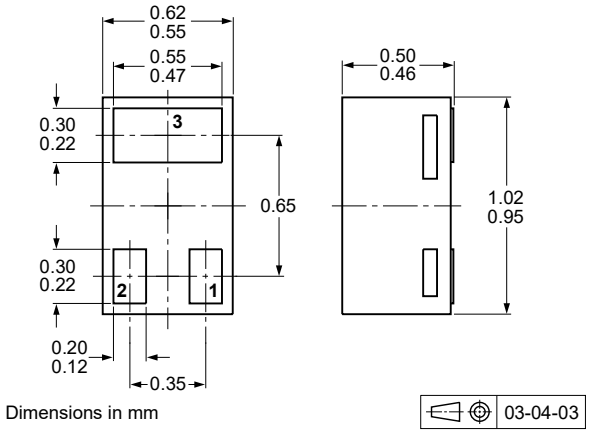

Fig. 7. Package outline DFN1006-3 (SOT883)

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13. Soldering

Footprint information for reflow soldering of DFN1006-3 (SOT883) package **SOT883**

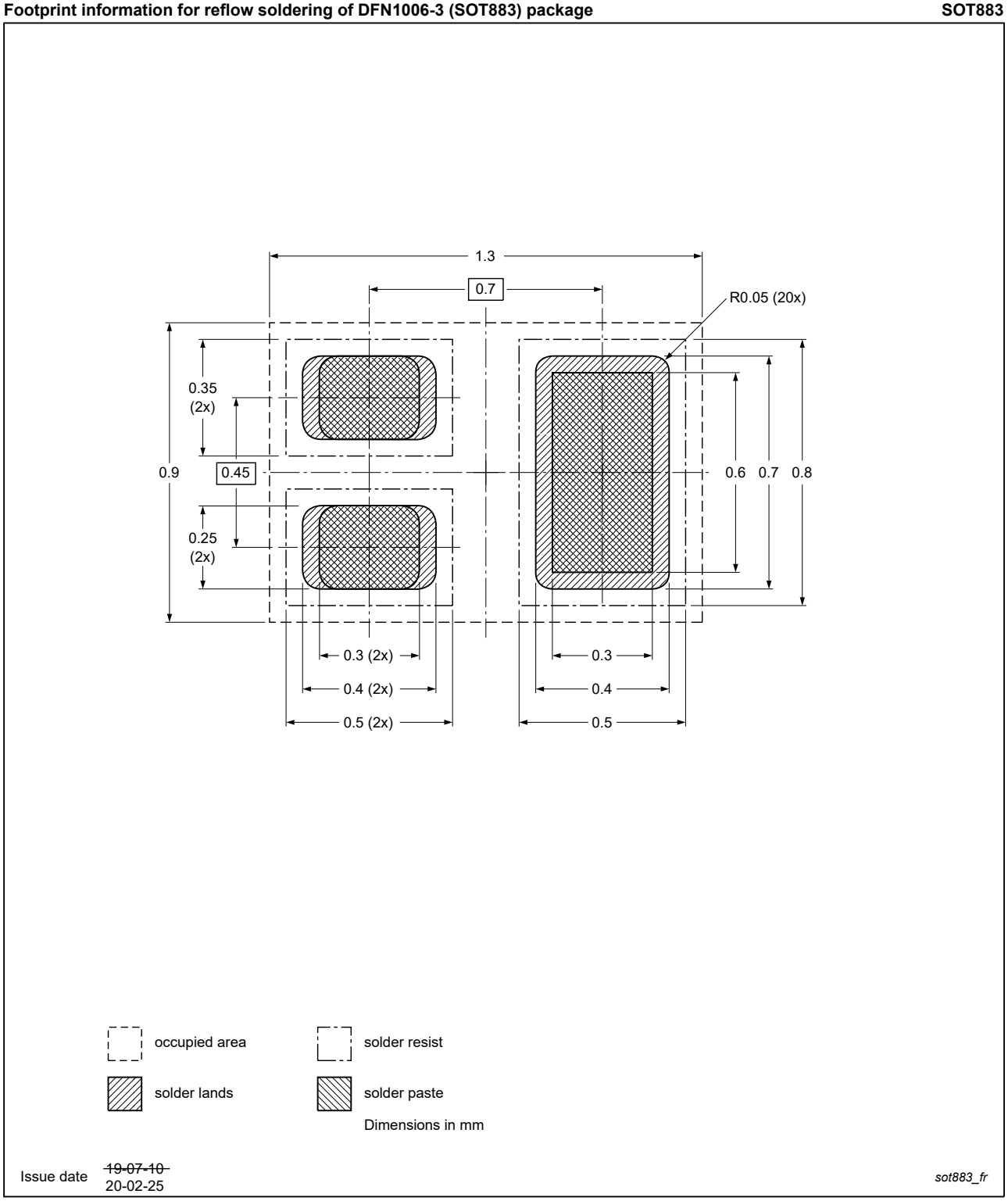

Fig. 8. Reflow soldering footprint for DFN1006-3 (SOT883)

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14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV70M v.9	20220701	Product data sheet	-	BAV70_SER v.8
Modification:	• Family data sheet reduced to single type data sheet. • Packing information removed.			
BAV70_SER v.8	20150318	Product data sheet	-	BAV70_SER_7
BAV70_SER_7	20071127	Product data sheet	-	BAV70_6 BAV70S_2 BAV70T_3 BAV70W_6
BAV70_6	20020403	Product specification	-	BAV70_5
BAV70S_2	19971021	Product specification	-	BAV70S_1
BAV70T_3	20040204	Product specification	-	BAV70T_2
BAV70W_6	20020405	Product specification	-	BAV70W_5

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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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