



BAV99W-Q

High-speed switching diode

7 June 2021

Product data sheet

1. General description

High-speed switching double diode, encapsulated in a very small SOT323 (SC-70) 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
- Very small SMD plastic packages
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- High-speed switching
- Reverse polarity protection
- General-purpose switching

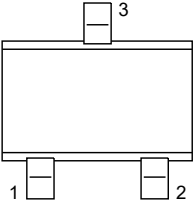
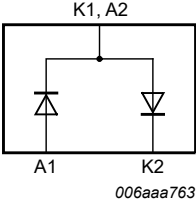
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
I_R	reverse current	$V_R = 80$ V; $T_{amb} = 25$ °C	-	-	0.5	μ A
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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 SC-70 (SOT323)	 006aaa763
2	K2	cathode (diode 2)		
3	K1, A2	cathode (diode 1) and anode (diode 2)		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV99W-Q	SC-70	plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body	SOT323

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAV99W-Q	A7%

[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			-	100	V
V _{RRM}	repetitive peak reverse voltage			-	100	V
I _F	forward current	single diode loaded		-	150	mA
		double diode loaded		-	130	mA
I _{FRM}	repetitive peak forward current			-	500	mA
I _{FSM}	non-repetitive peak forward current	t _p = 1 μs; square wave; T _{j(init)} = 25 °C		-	4	A
		t _p = 1 ms; square wave; T _{j(init)} = 25 °C		-	1	A
		t _p = 1 s; square wave; T _{j(init)} = 25 °C		-	0.5	A
Per device; one diode loaded						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	200	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

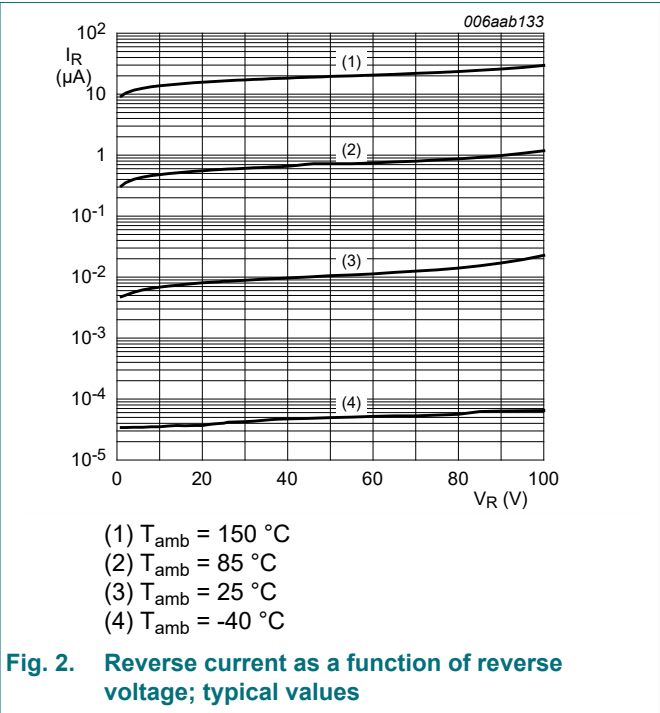
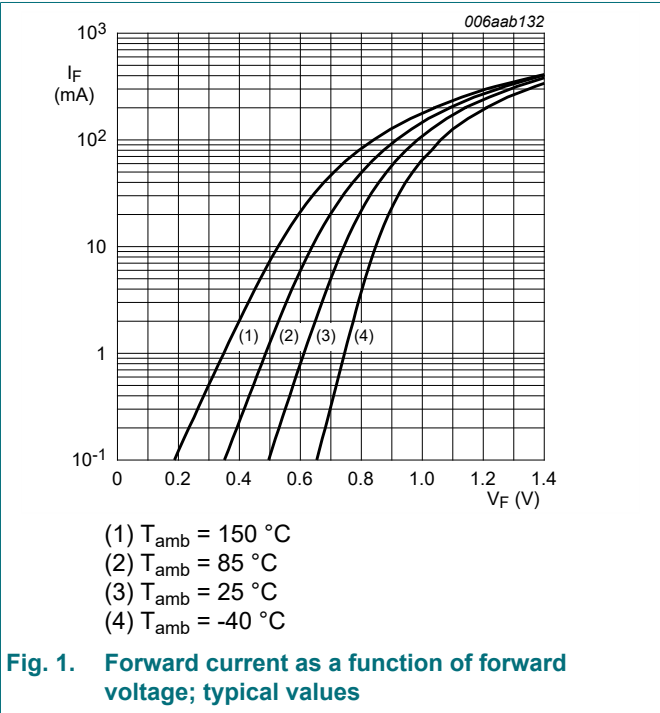
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	single diode loaded; in free air	[1]	-	-	625	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	300	K/W

[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	$I_F = 1\text{ mA}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	715	mV
		$I_F = 10\text{ mA}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	855	mV
		$I_F = 50\text{ mA}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	1	V
		$I_F = 150\text{ mA}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	1.25	V
I_R	reverse current	$V_R = 25\text{ V}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	30	nA
		$V_R = 80\text{ V}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	0.5	μA
		$V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	30	μA
		$V_R = 80\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	50	μA
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	1.5	pF
t_{rr}	reverse recovery time	$I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(\text{meas})} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	4	ns
V_{FRM}	peak forward recovery voltage	$I_F = 10\text{ mA}; t_r = 20\text{ ns}; T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	-	-	1.75	V



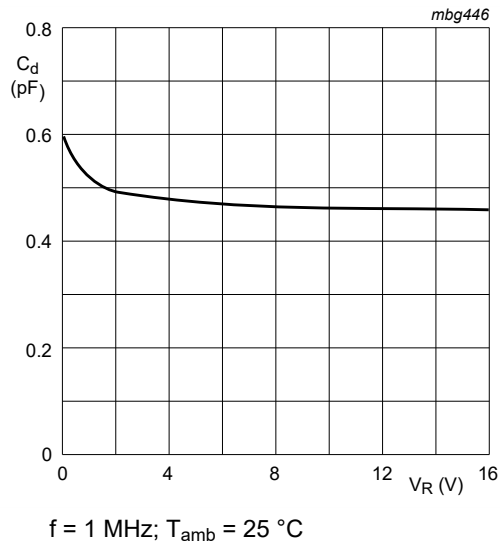


Fig. 3. Diode capacitance as a function of reverse voltage; typical values

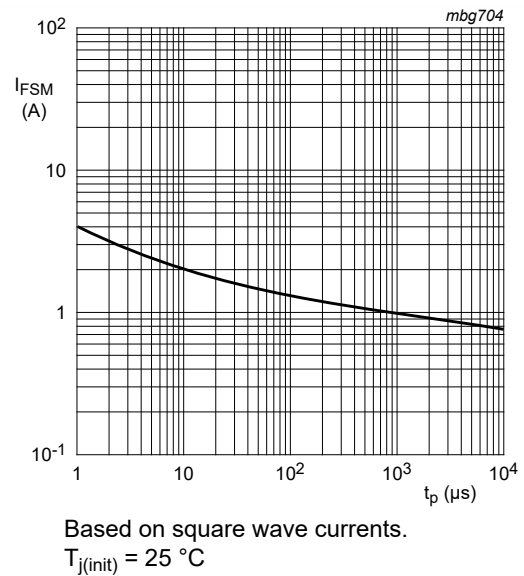


Fig. 4. Non-repetitive peak forward current as a function of pulse duration; typical values

11. Test information

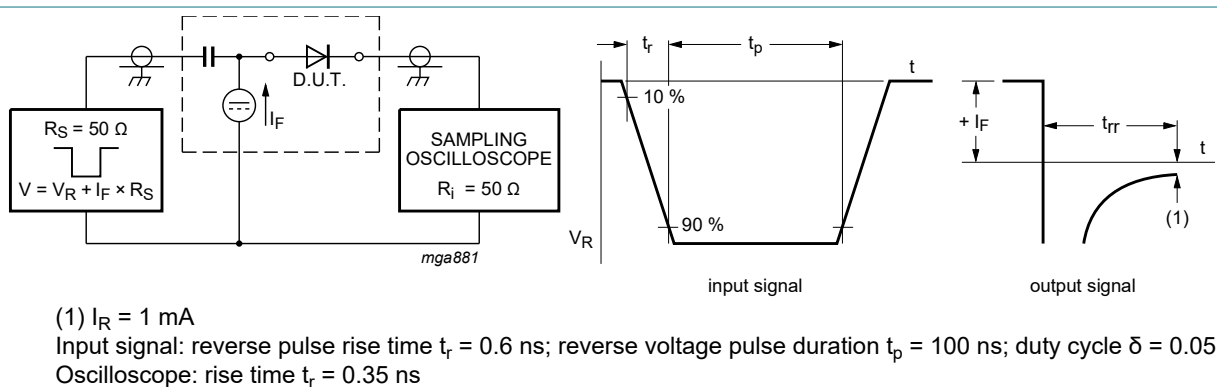


Fig. 5. Reverse recovery time test circuit and waveforms

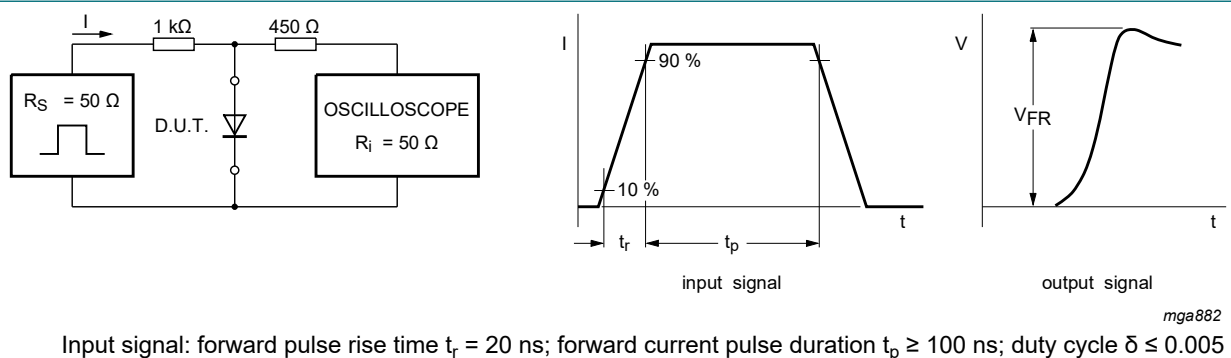
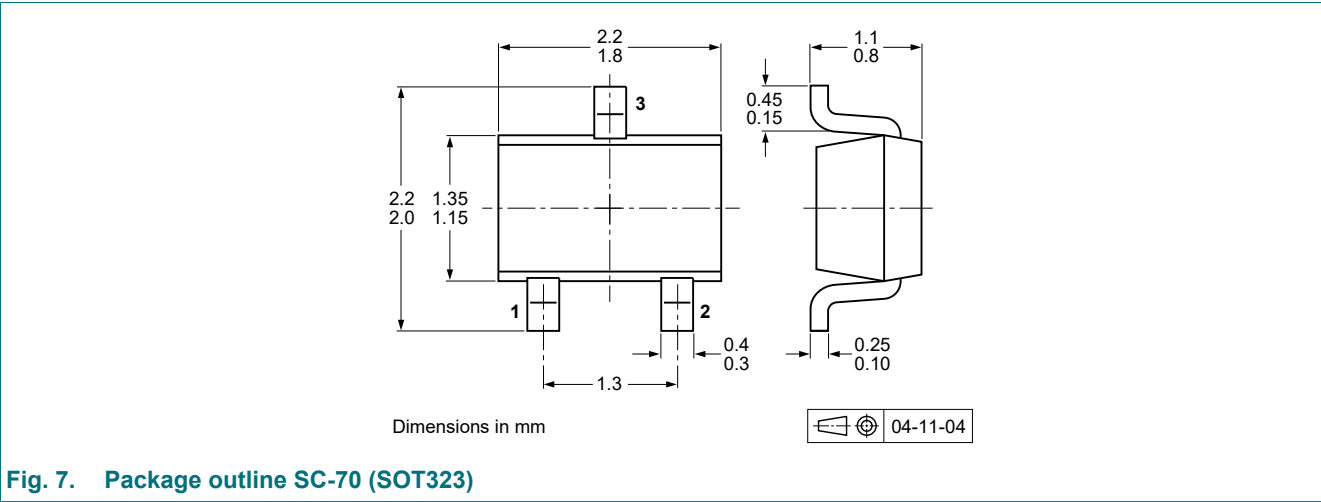


Fig. 6. Forward recovery voltage test circuit and waveforms

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



13. Soldering

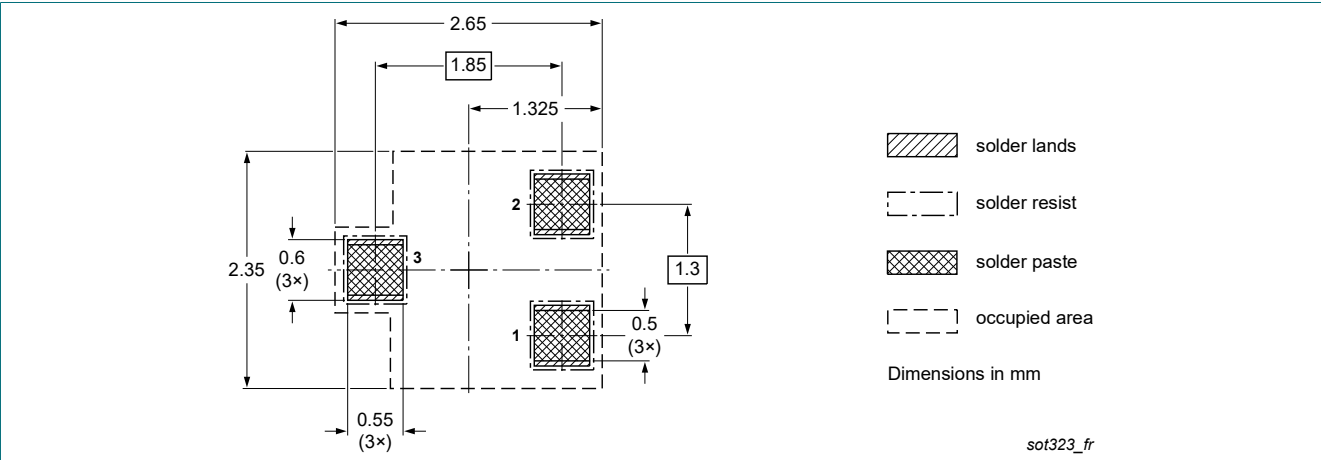


Fig. 8. Reflow soldering footprint for SC-70 (SOT323)

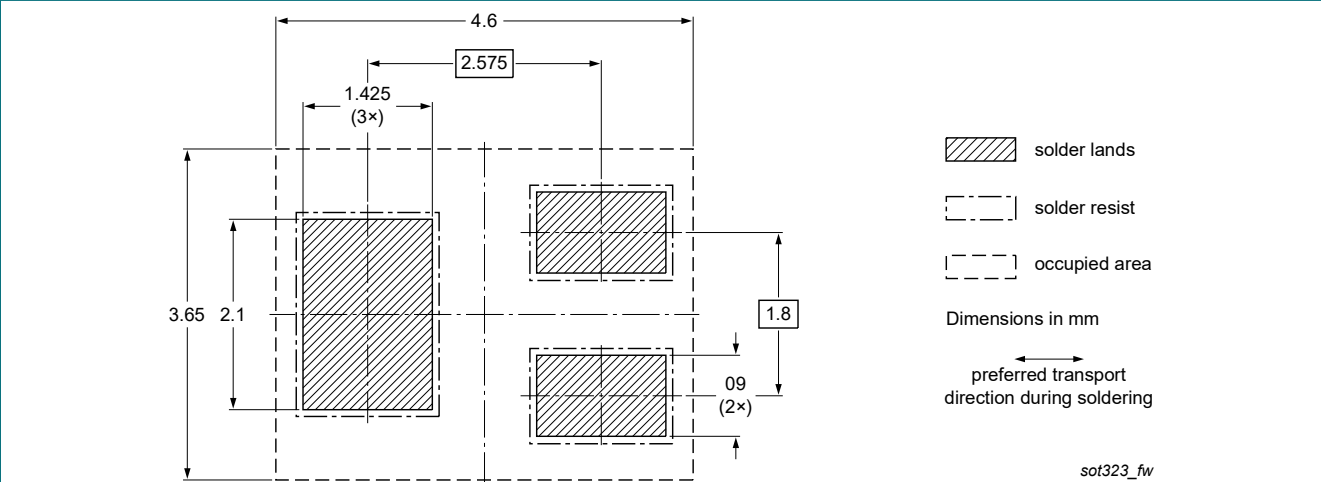


Fig. 9. Wave soldering footprint for SC-70 (SOT323)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV99W-Q v.1	20210607	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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