



BAV199W

Low-leakage double diode

1 October 2022

Product data sheet

1. General description

Epitaxial, medium-speed switching, double diode in a small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package. The diodes are connected in series.

2. Features and benefits

- Small plastic SMD package
- Low leakage current: typ. 3 pA
- Switching time: typ. 0.8 μ s
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA

3. Applications

- Low-leakage current applications in surface mounted circuits

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_R	reverse voltage	$T_J = 25\text{ }^{\circ}\text{C}$	-	-	75	V
I_R	reverse current	$V_R = 75\text{ V}; T_J = 25\text{ }^{\circ}\text{C}$	-	0.003	5	nA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	SC-70 (SOT323)	aaa-032326
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
BAV199W	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]
BAV199W	JY%

[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	$T_j = 25\text{ °C}$		-	75	V
V_{RRM}	repetitive peak reverse voltage			-	85	V
I_F	forward current	single diode loaded; $T_{sp} = 90\text{ °C}$; $T_{amb} = 25\text{ °C}$	[1]	-	135	mA
		double diode loaded; $T_{sp} = 90\text{ °C}$; $T_{amb} = 25\text{ °C}$	[1]	-	110	mA
I_{FRM}	repetitive peak forward current	$T_j = 25\text{ °C}$		-	500	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1\text{ }\mu\text{s}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	4	A
		$t_p = 1\text{ ms}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	1	A
		$t_p = 1\text{ s}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	0.5	A
P_{tot}	total power dissipation	single diode loaded; $T_{sp} = 90\text{ °C}$	[1]	-	150	mW
		double diode loaded; $T_{sp} = 90\text{ °C}$		-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	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

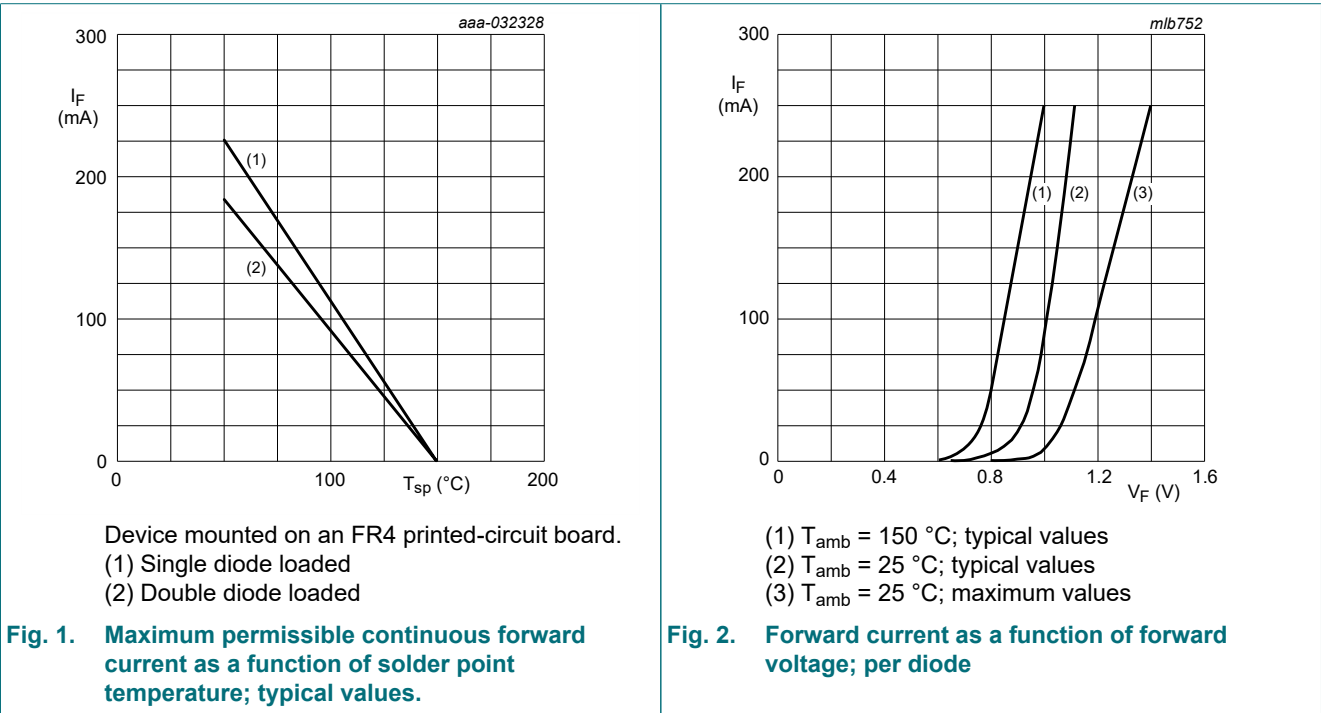
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point	$T_{sp} = 90\text{ °C}$	[2]	-	-	400	K/W

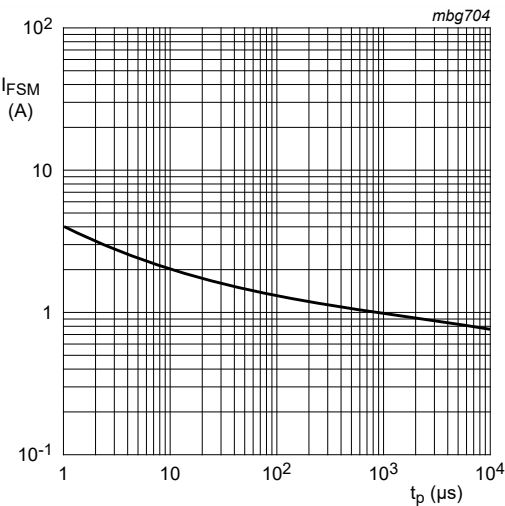
- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

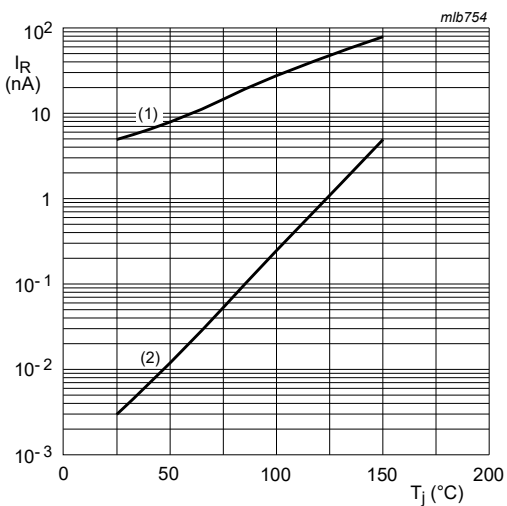
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	$I_F = 1\text{ mA}; T_j = 25\text{ °C}$		-	-	0.9	V
		$I_F = 10\text{ mA}; T_j = 25\text{ °C}$		-	-	1	V
		$I_F = 50\text{ mA}; T_j = 25\text{ °C}$		-	-	1.1	V
		$I_F = 150\text{ mA}; T_j = 25\text{ °C}$		-	-	1.25	V
I_R	reverse current	$V_R = 75\text{ V}; T_j = 25\text{ °C}$		-	0.003	5	nA
		$V_R = 75\text{ V}; T_j = 150\text{ °C}$		-	3	80	nA
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}; T_j = 25\text{ °C}$		-	2	-	pF
t_{rr}	reverse recovery time	$I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(meas)} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_j = 25\text{ °C};$ measured at $I_R = 1\text{ mA}$		-	0.8	3	μs





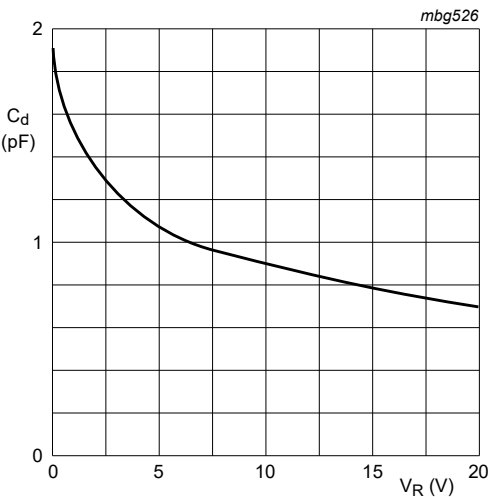
Based on square wave currents.
 $T_{j(init)} = 25\text{ }^{\circ}\text{C}$

Fig. 3. Non-repetitive peak forward current as a function of pulse duration; typical values



$V_R = 75\text{ V}$
(1) Maximum values
(2) Typical values

Fig. 4. Reverse current as a function of junction temperature



$f = 1\text{ MHz}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$

Fig. 5. Diode capacitance as a function of reverse voltage; typical values

11. Test information

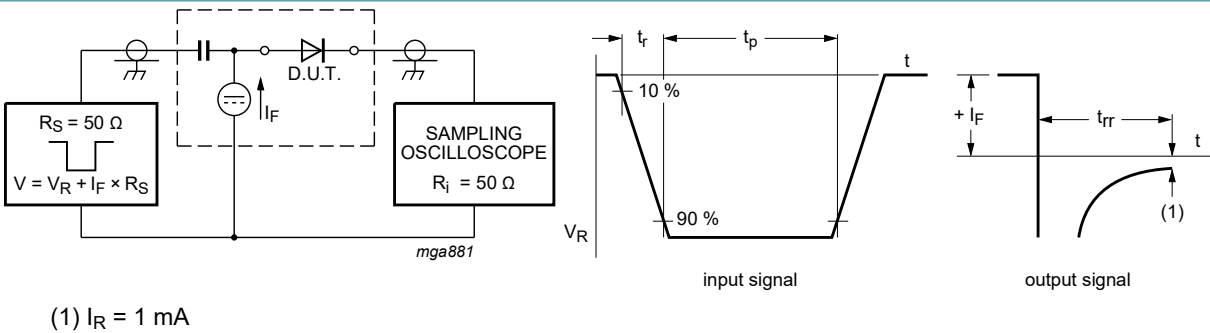


Fig. 6. Reverse recovery time test circuit and waveforms

12. Package outline

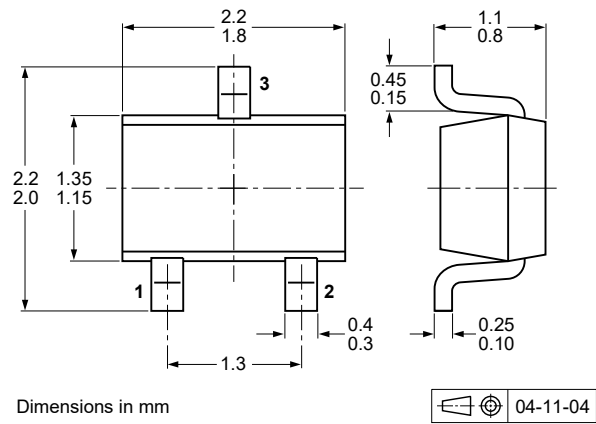


Fig. 7. Package outline SC-70 (SOT323)

13. Soldering

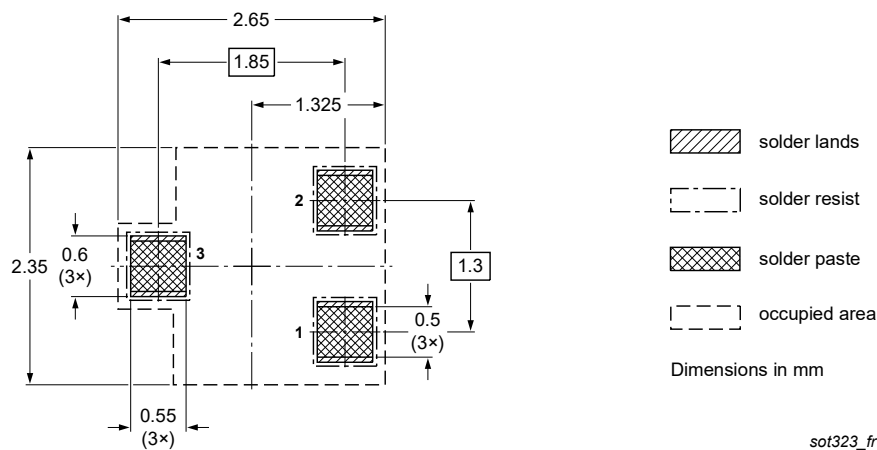


Fig. 8. Reflow soldering footprint for SC-70 (SOT323)

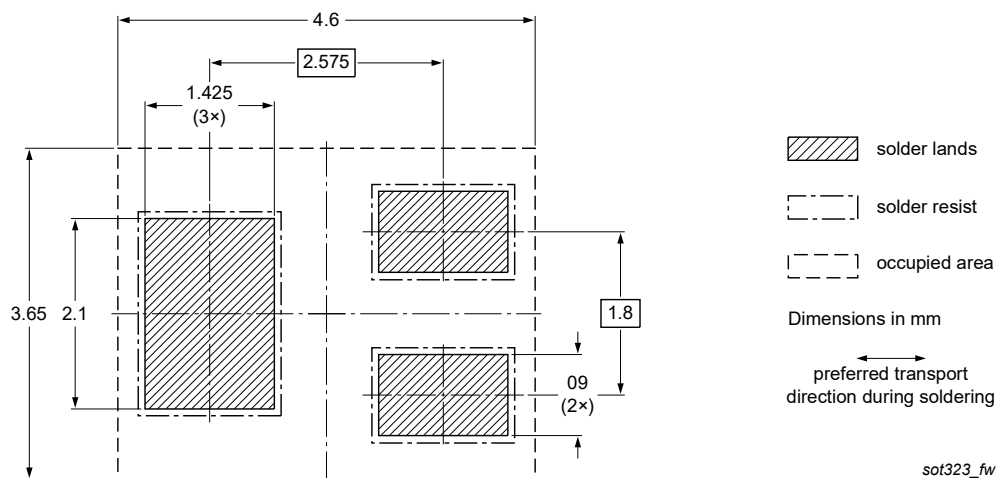


Fig. 9. Wave soldering footprint for SC-70 (SOT323)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV199W v.4	20221001	Product data sheet	-	BAV199W v.3
Modifications:	• Product changed to non automotive. Please refer to the automotive product(s) with -Q.			
BAV199W v.3	20201104	Product data sheet	-	BAV199W v.2
BAV199W v.2	19990511	Product data sheet	-	BAV199W v.1
BAV199W v.1	19980109	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.

- [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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