



BAV99S-Q

High-speed switching diode

2 February 2022

Product data sheet

1. General description

High-speed switching diode, encapsulated in a very small SOT363 (SC-88) 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

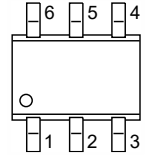
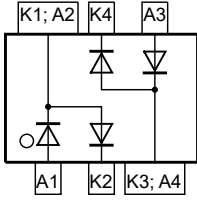
4. Quick reference data

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)	 <p>TSSOP6 (SOT363)</p>	 <p>006aab101</p>
2	K2	cathode (diode 2)		
3	K3; A4	cathode (diode 3), anode (diode 4)		
4	A3	anode (diode 3)		
5	K4	cathode (diode 4)		
6	K1; A2	cathode (diode 1), anode (diode 2)		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV99S-Q	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	SOT363

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAV99S-Q	K1%

[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	[1]	-	200	mA
I_{FRM}	repetitive peak forward current			-	500	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1 \mu\text{s}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	4	A
		$t_p = 1 \text{ ms}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	1	A
		$t_p = 1 \text{ s}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	0.5	A
P_{tot}	total power dissipation	$T_{sp} \leq 85 \text{ }^\circ\text{C}$	[2]	-	250	mW
Per device						
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] Soldering points at pins 2, 3, 5 and 6.

9. Thermal characteristics

Table 6. Thermal characteristics

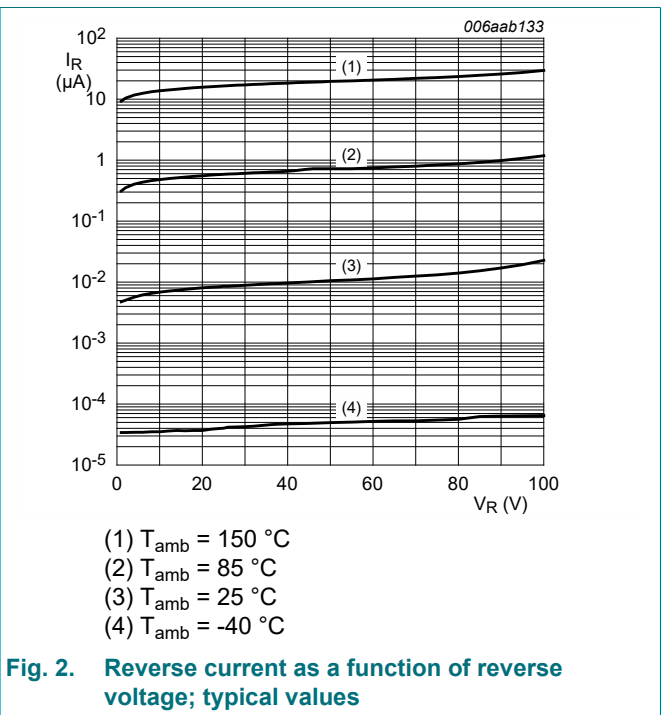
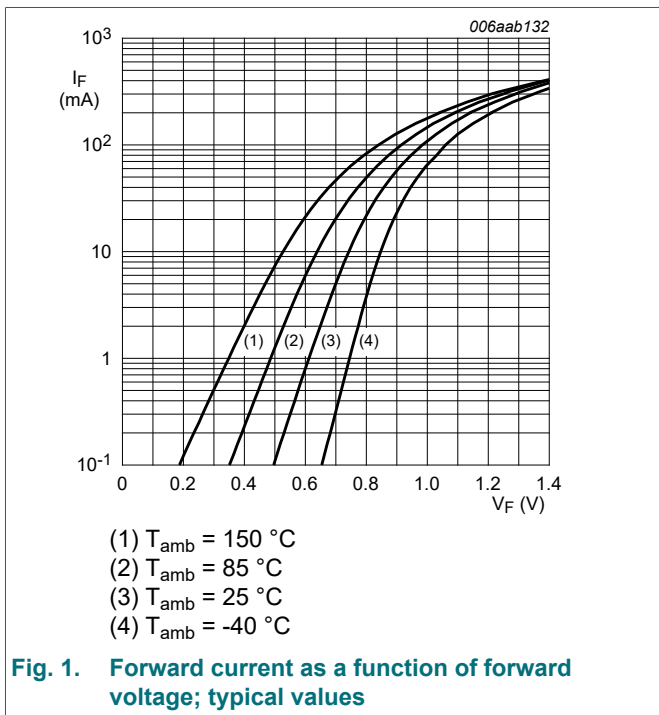
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{\text{th}(j\text{-sp})}$	thermal resistance from junction to solder point		[1]	-	-	260	K/W

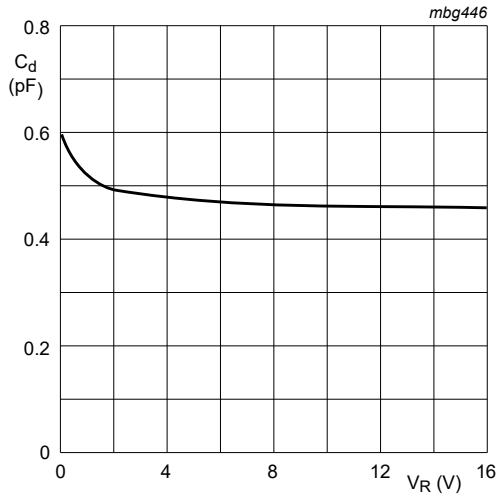
[1] Soldering points at pins 2, 3, 5 and 6.

10. Characteristics

Table 7. Characteristics

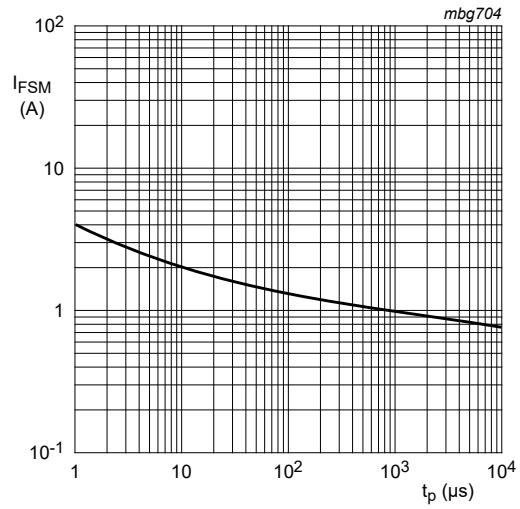
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_F	forward voltage	$I_F = 1 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	715	mV
		$I_F = 10 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	855	mV
		$I_F = 50 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	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





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

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

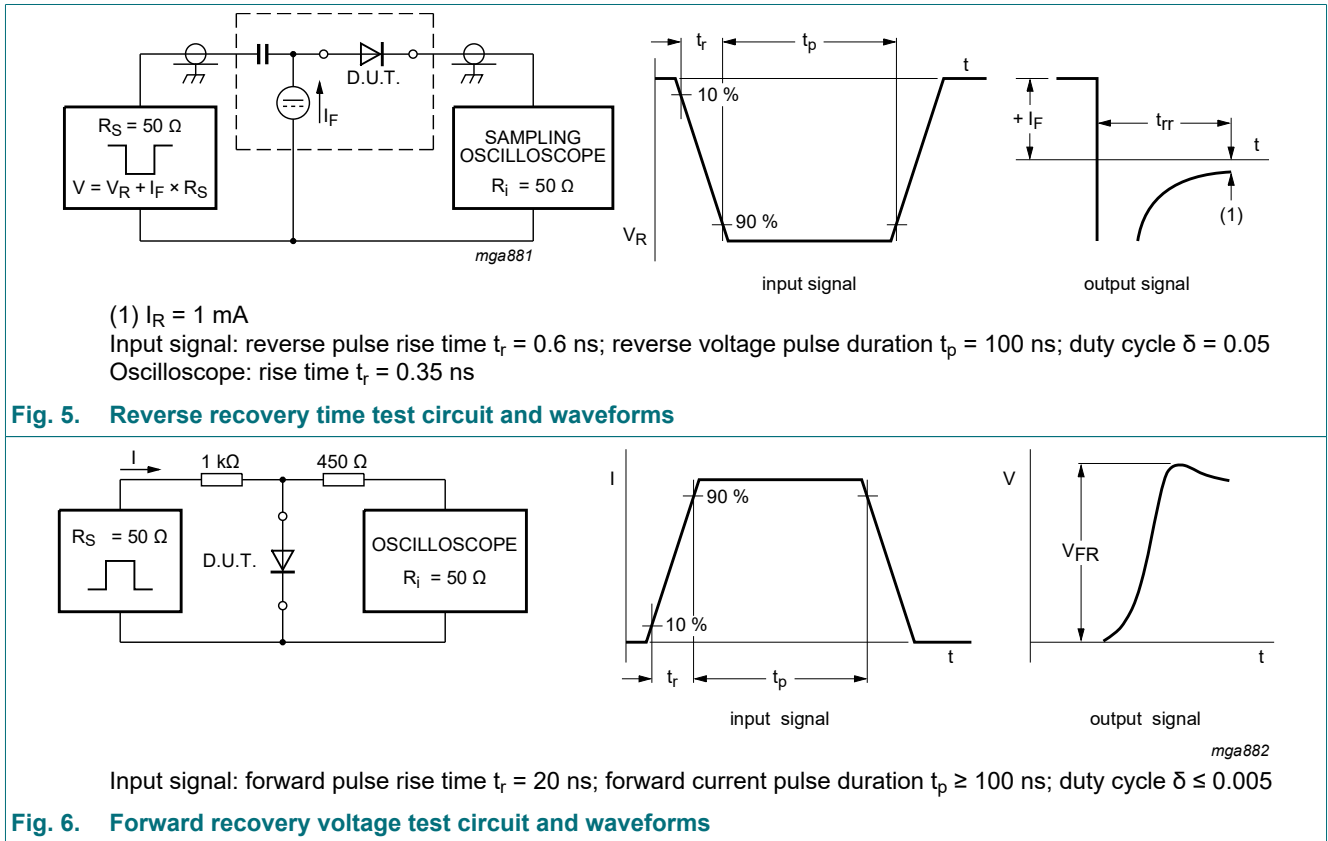


Based on square wave currents.

$T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$

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

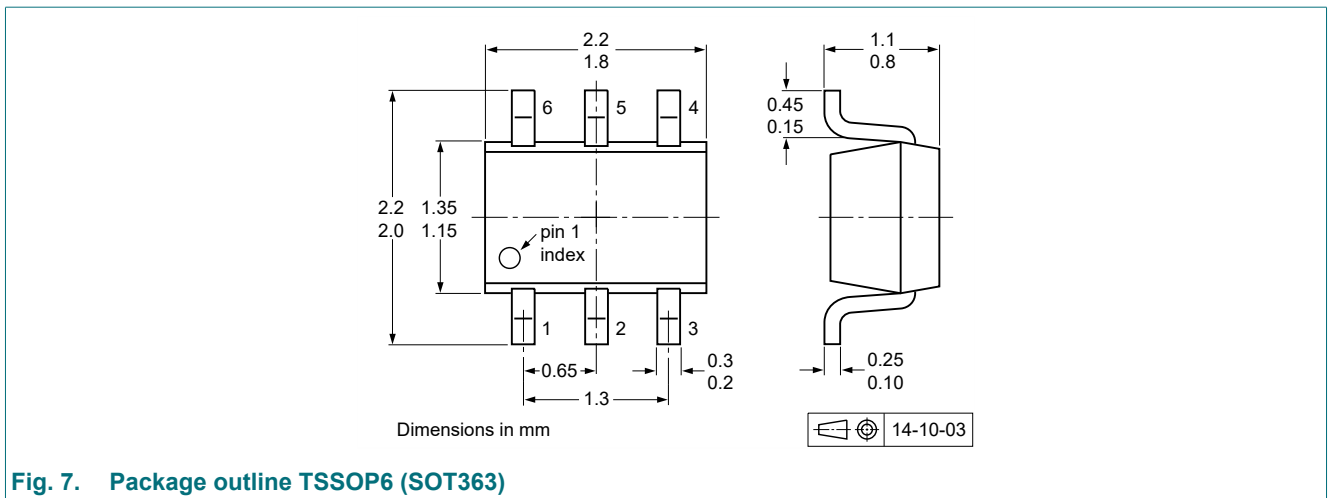
11. Test information



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

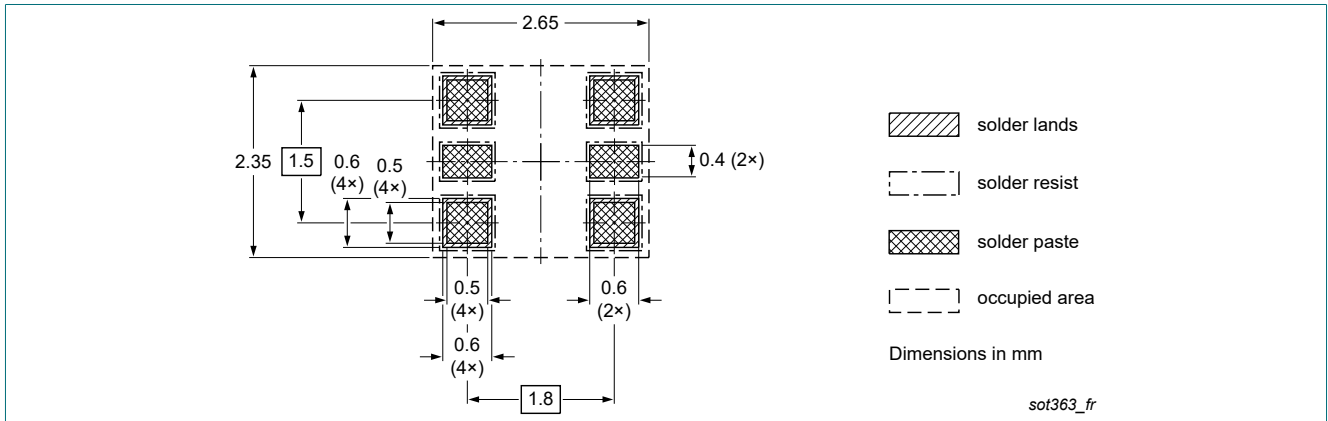


Fig. 8. Reflow soldering footprint for TSSOP6 (SOT363)

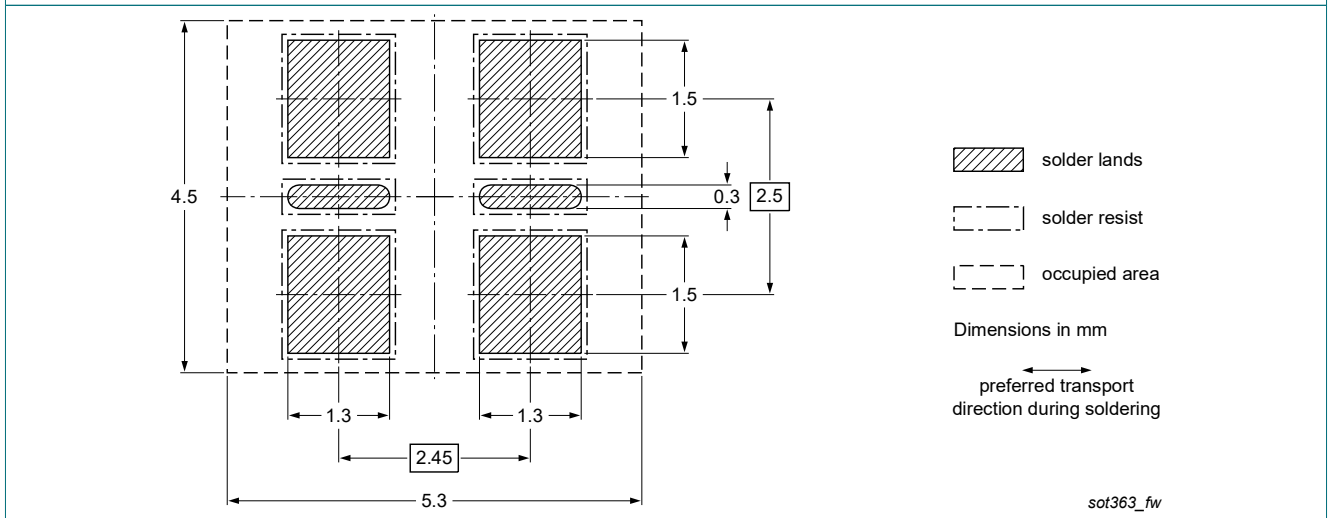


Fig. 9. Wave soldering footprint for TSSOP6 (SOT363)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV99S-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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Contents

1. General description.....	1
2. Features and benefits.....	1
3. Applications.....	1
4. Quick reference data.....	1
5. Pinning information.....	2
6. Ordering information.....	2
7. Marking.....	2
8. Limiting values.....	3
9. Thermal characteristics.....	3
10. Characteristics.....	4
11. Test information.....	6
12. Package outline.....	6
13. Soldering.....	7
14. Revision history.....	8
15. Legal information.....	9

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