

BAV99S-Q

High-speed switching diode

14 July 2026 Product data sheet

1. General description

High-speed switching diode, encapsulated in a very small SOT363-3 (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

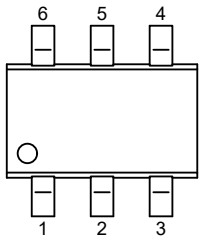
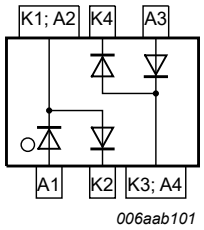
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_R	reverse current	V_R = 80 V; T_{amb} = 25 °C		-	-	0.5	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 **TSSOP6 (SOT363-3)**	
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	SOT363-3

7. Marking

Table 4. Marking codes

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

[1] % = placeholder for manufacturing site code

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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	single diode loaded	[1]	-	200	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
P_{tot}	total power dissipation	$T_{sp} \leq 85$ °C	[2]	-	250	mW
Per device						
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°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
$R_{th(j\text{-}sp)}$	thermal resistance from junction to solder point		[1]	-	-	260	K/W

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

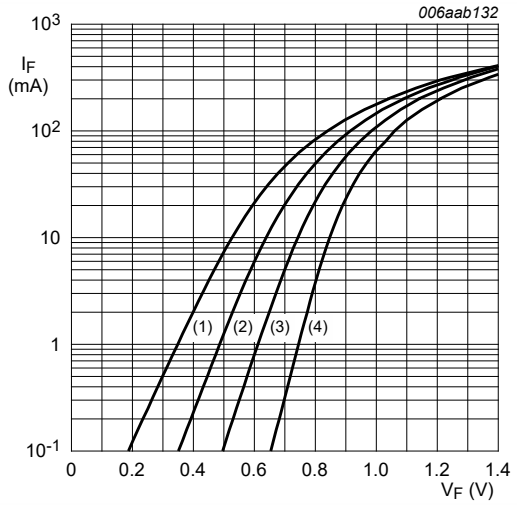
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10. Characteristics

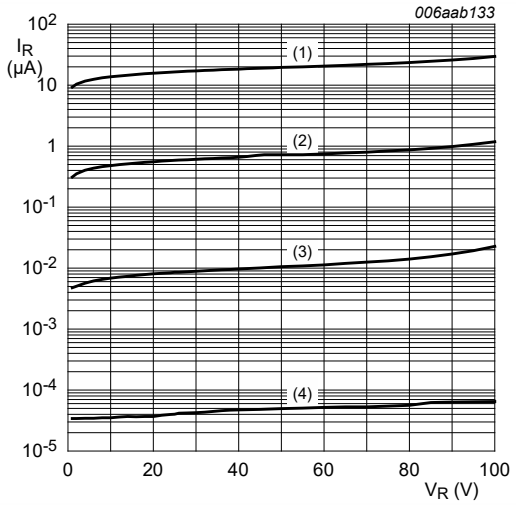
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 1 mA; T_{amb} = 25 °C		-	-	715	mV
		I_F = 10 mA; T_{amb} = 25 °C		-	-	855	mV
		I_F = 50 mA; T_{amb} = 25 °C		-	-	1	V
		I_F = 150 mA; T_{amb} = 25 °C		-	-	1.25	V
I_R	reverse current	V_R = 25 V; T_{amb} = 25 °C		-	-	30	nA
		V_R = 80 V; T_{amb} = 25 °C		-	-	0.5	µA
		V_R = 25 V; T_j = 150 °C		-	-	30	µA
		V_R = 80 V; T_j = 150 °C		-	-	50	µA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; T_{amb} = 25 °C		-	-	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; T_{amb} = 25 °C		-	-	1.75	V



(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

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

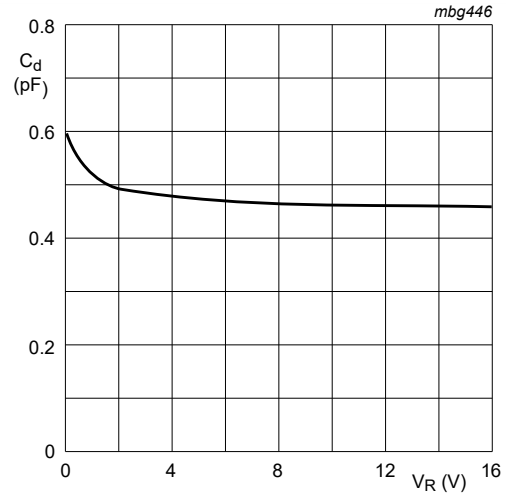


(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

Fig. 2. Reverse current as a function of reverse voltage; typical values

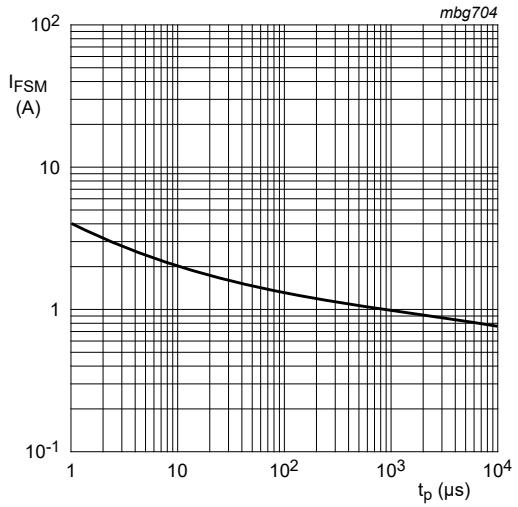
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f = 1 MHz; T_{amb} = 25 °C

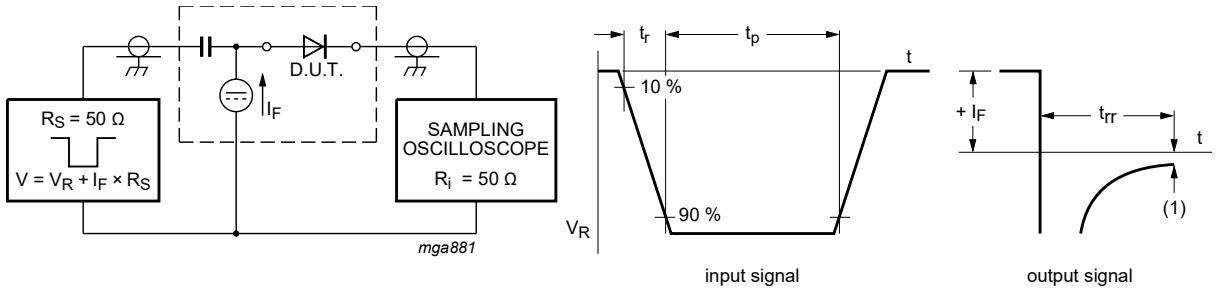
Fig. 3. Diode capacitance as a function of reverse voltage; typical values



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

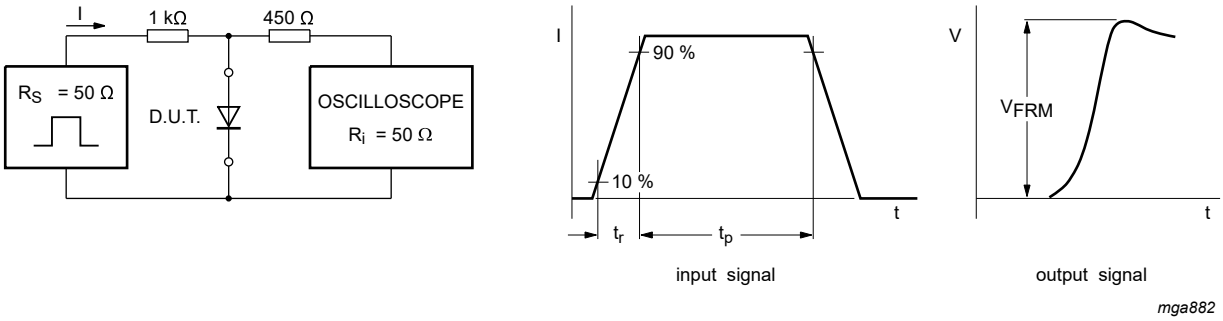
Fig. 4. Non-repetitive peak forward current as a function of pulse duration; typical values

11. Test information



(1) I_R = 1 mA
Input signal: reverse pulse rise time t_r = 0.6 ns; reverse voltage pulse duration t_p = 100 ns; duty cycle δ = 0.05
Oscilloscope: rise time t_r = 0.35 ns

Fig. 5. Reverse recovery time test circuit and waveforms



Input signal: forward pulse rise time t_r = 20 ns; forward current pulse duration t_p ≥ 100 ns; duty cycle δ ≤ 0.005

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.

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12. Package outline

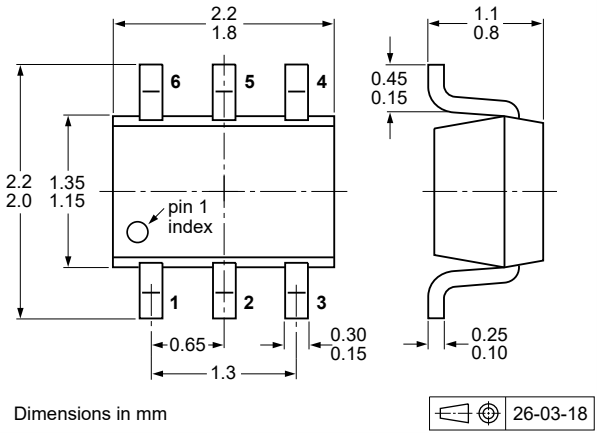


Fig. 7. Package outline TSSOP6 (SOT363-3)

13. Soldering

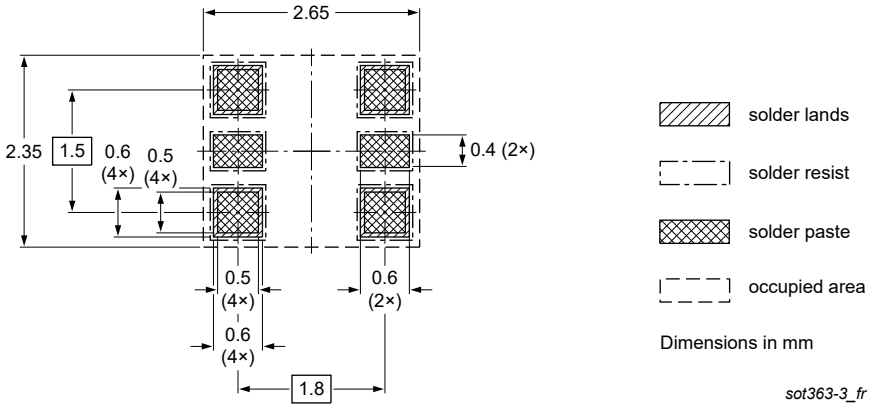


Fig. 8. Reflow soldering footprint for TSSOP6 (SOT363-3)

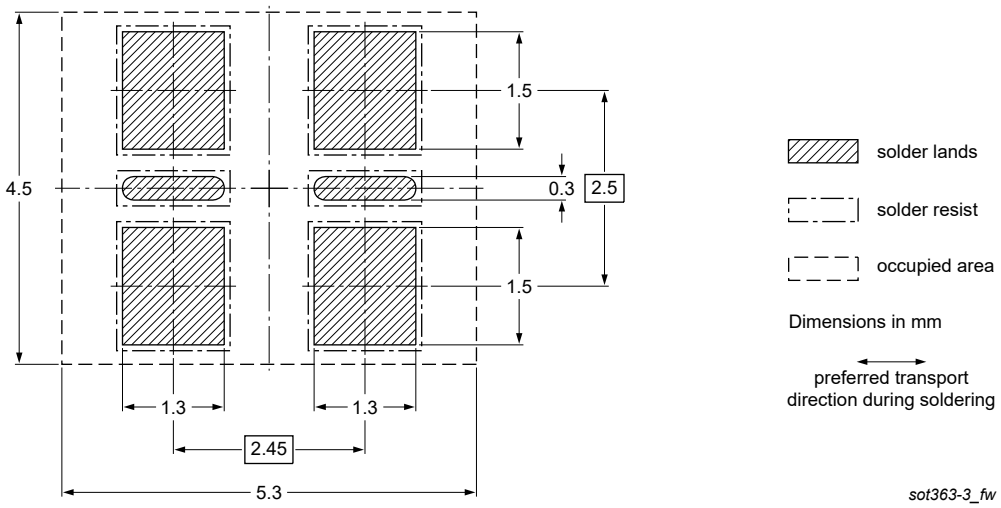


Fig. 9. Wave soldering footprint for TSSOP6 (SOT363-3)

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14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV99S-Q v.2	20260714	Product data sheet	-	BAV99S-Q v.1
Modification:	• Package changed from SOT363 to SOT363-3			
BAV99S-Q v.1	20220202	Product data sheet	-	-

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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.
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