



# BAS16GW-Q

## High-speed switching diode

17 January 2025

Product data sheet

## 1. General description

High-speed switching diode, encapsulated in an SOD123 small Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Low leakage current
- Repetitive peak reverse voltage  $V_{RRM} \leq 100$  V
- Low capacitance
- Small SMD plastic package
- High-temperature applications up to 175 °C
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- High-speed switching at high voltage
- General-purpose switching



## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_R$	reverse voltage	$T_j = 25$ °C	-	-	100	V
$I_R$	reverse current	$V_R = 80$ V; pulsed; $T_j = 25$ °C	-	-	0.5	$\mu$ A
$t_{rr}$	reverse recovery time	$I_F = 10$ mA; $I_R = 10$ mA; $R_L = 100$ $\Omega$ ; $I_{R(meas)} = 1$ mA; Switched from $I_F = 10$ mA to $I_R = 10$ mA; $T_j = 25$ °C	-	-	4	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	Cathode	 SOD123	 sym001
2	A	Anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS16GW-Q	SOD123	plastic, surface-mounted package; 2 leads; 2.675 mm x 1.6 mm x 1.15 mm body	SOD123

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS16GW-Q	GA

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V <sub>RRM</sub>	repetitive peak reverse voltage	T <sub>j</sub> = 25 °C		-	100	V
V <sub>R</sub>	reverse voltage			-	100	V
I <sub>F</sub>	forward current			-	215	mA
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 1 µs; square wave; T <sub>j(init)</sub> = 25 °C		-	4	A
		t <sub>p</sub> = 1 ms; square wave; T <sub>j(init)</sub> = 25 °C		-	1	A
		t <sub>p</sub> = 1 s; square wave; T <sub>j(init)</sub> = 25 °C		-	0.5	A
I <sub>FRM</sub>	repetitive peak forward current	t <sub>p</sub> ≤ 0.5 ms; δ ≤ 0.25		-	500	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	357	mW
			[2]	-	600	mW
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-55	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated mounting pad for cathode 1cm<sup>2</sup>.

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]	-	-	350	K/W
			[2]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	58	K/W

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated mounting pad for cathode 1cm<sup>2</sup>.
- [3] Soldering point of cathode tab.

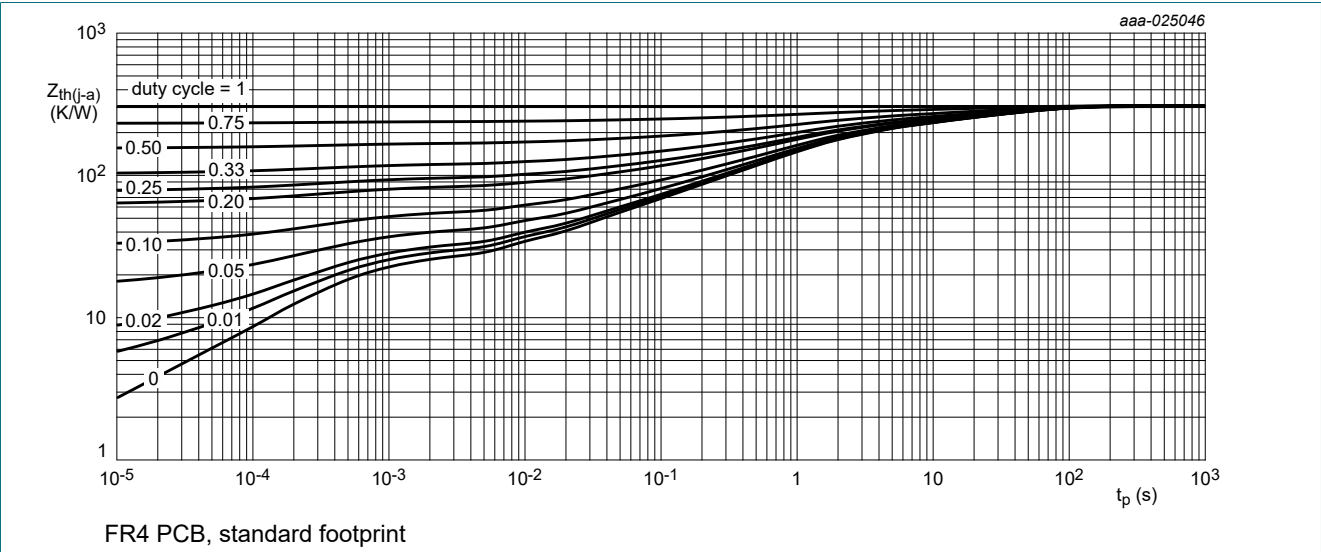


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

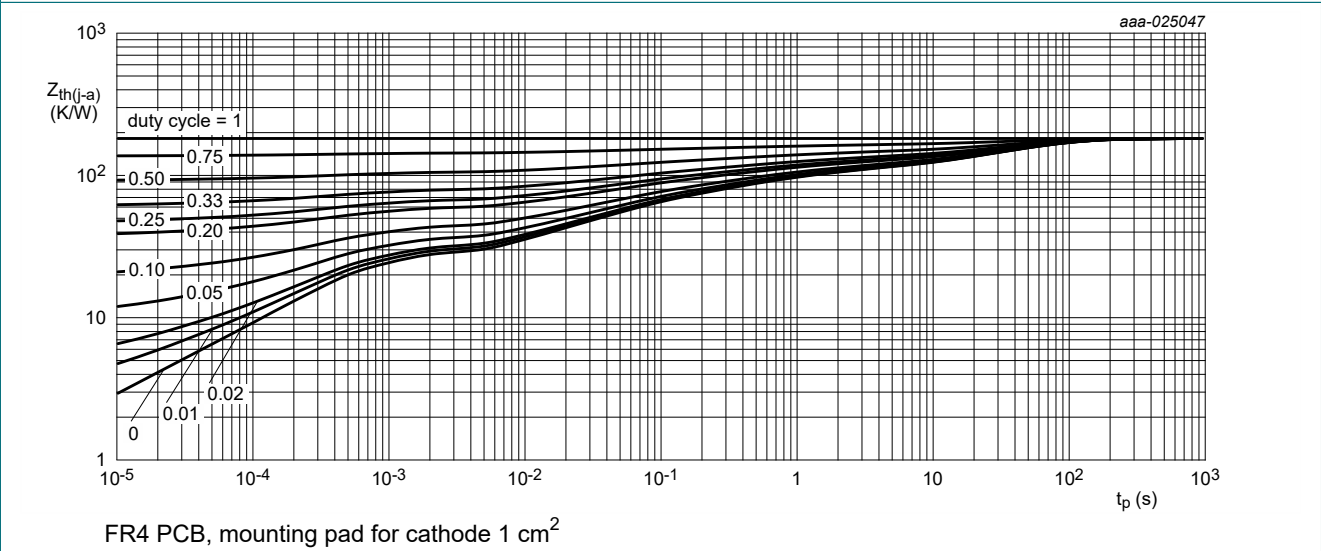
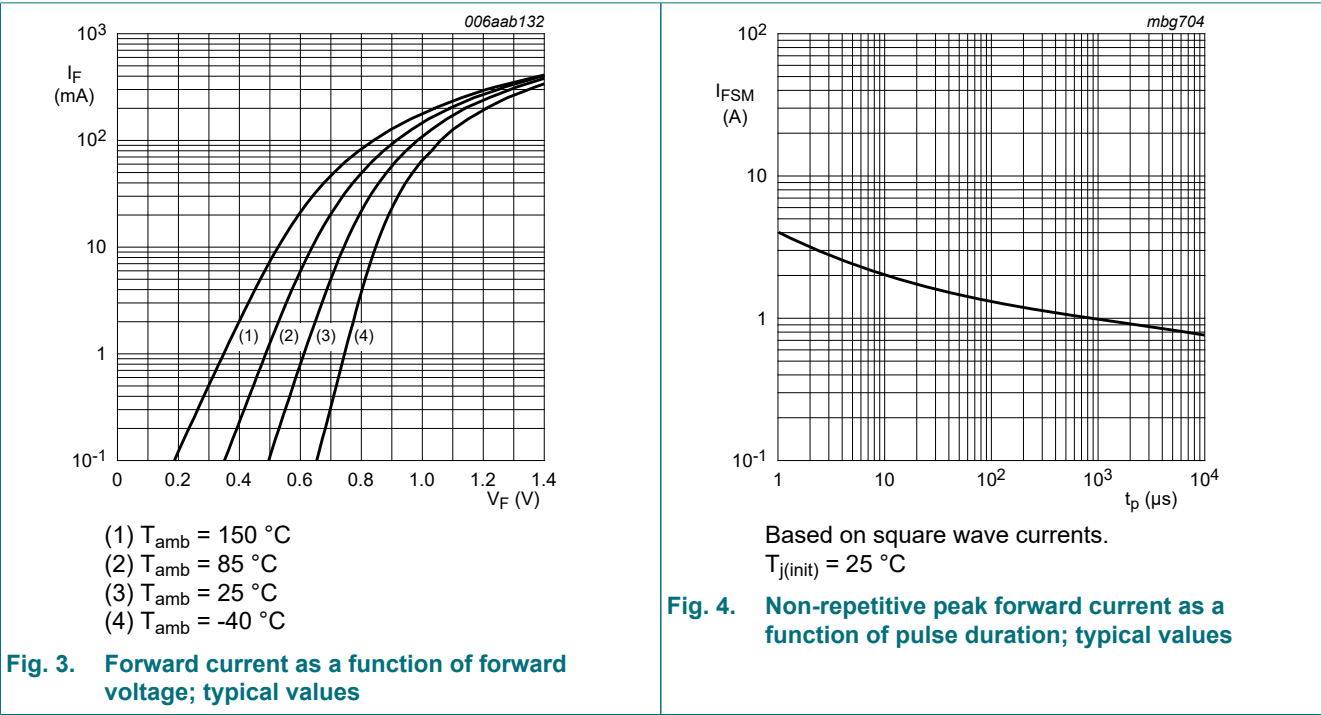


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 1 mA; t <sub>p</sub> ≤ 300 μs; δ = 0.02; T <sub>j</sub> = 25 °C	-	-	715	mV
		I <sub>F</sub> = 10 mA; t <sub>p</sub> ≤ 300 μs; δ = 0.02; T <sub>j</sub> = 25 °C	-	-	855	mV
		I <sub>F</sub> = 50 mA; t <sub>p</sub> ≤ 300 μs; δ = 0.02; T <sub>j</sub> = 25 °C	-	-	1	V
		I <sub>F</sub> = 150 mA; t <sub>p</sub> ≤ 300 μs; δ = 0.02; T <sub>j</sub> = 25 °C	-	-	1.25	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V; pulsed; T <sub>j</sub> = 25 °C	-	-	30	nA
		V <sub>R</sub> = 80 V; pulsed; T <sub>j</sub> = 25 °C	-	-	0.5	μA
		V <sub>R</sub> = 25 V; pulsed; T <sub>j</sub> = 150 °C	-	-	30	μA
		V <sub>R</sub> = 80 V; pulsed; T <sub>j</sub> = 150 °C	-	-	50	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz; T <sub>j</sub> = 25 °C	-	-	1.5	pF
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 10 mA; I <sub>R</sub> = 10 mA; R <sub>L</sub> = 100 Ω; I <sub>R(meas)</sub> = 1 mA; Switched from I <sub>F</sub> = 10 mA to I <sub>R</sub> = 10 mA; T <sub>j</sub> = 25 °C	-	-	4	ns
V <sub>FRM</sub>	peak forward recovery voltage	I <sub>F</sub> = 10 mA; t <sub>r</sub> = 20 ns	-	-	1.75	V



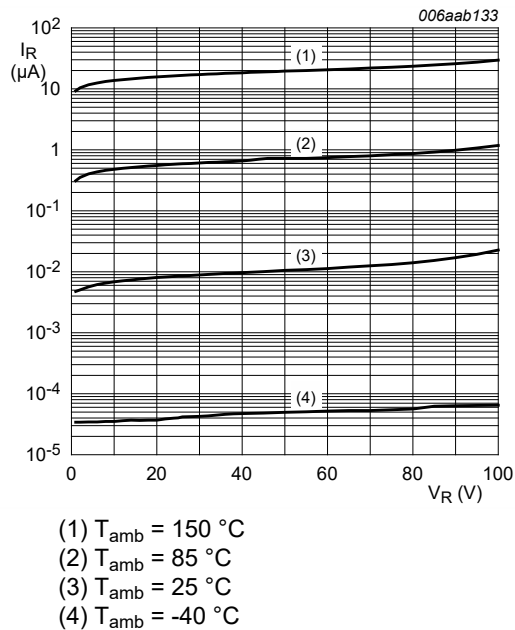


Fig. 5. Reverse current as a function of reverse voltage; typical values

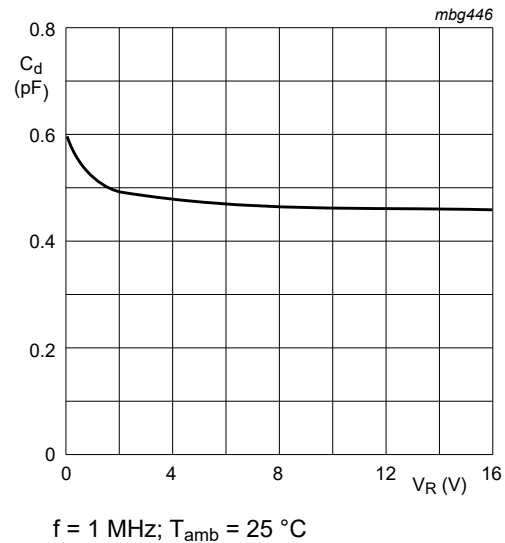
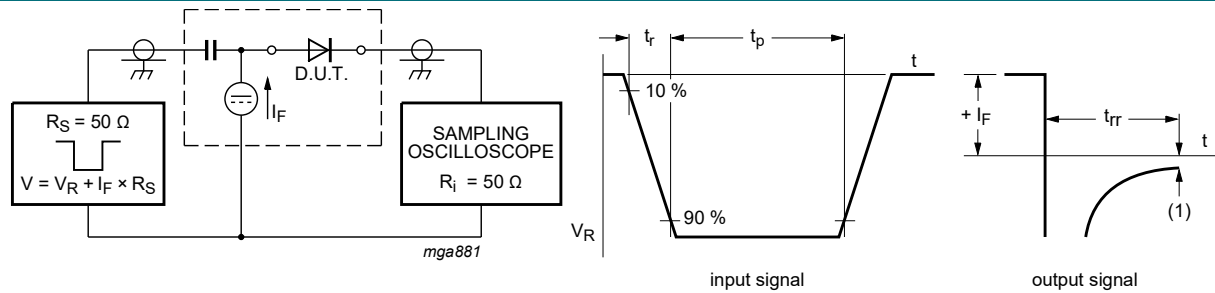


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

## 11. Test information

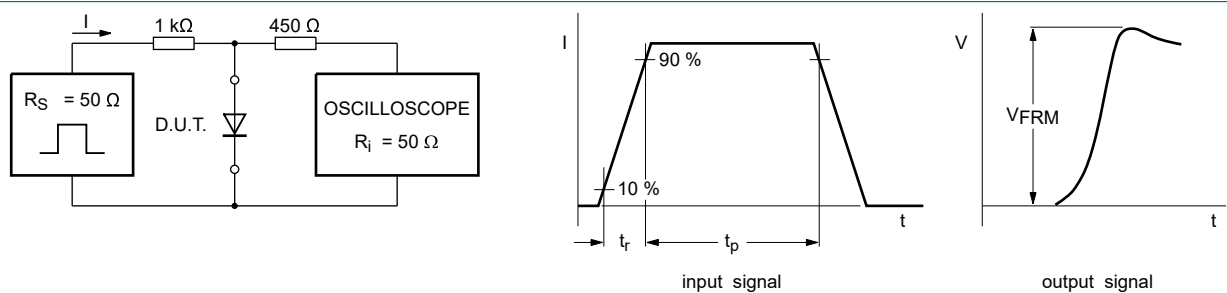


(1)  $I_R = 1 \text{ mA}$

Input signal: reverse pulse rise time  $t_r = 0.6$  ns; reverse voltage pulse duration  $t_p = 100$  ns; duty cycle  $\delta = 0.05$

Oscilloscope: rise time  $t_r = 0.35$  ns

**Fig. 7. Reverse recovery time test circuit and waveforms**



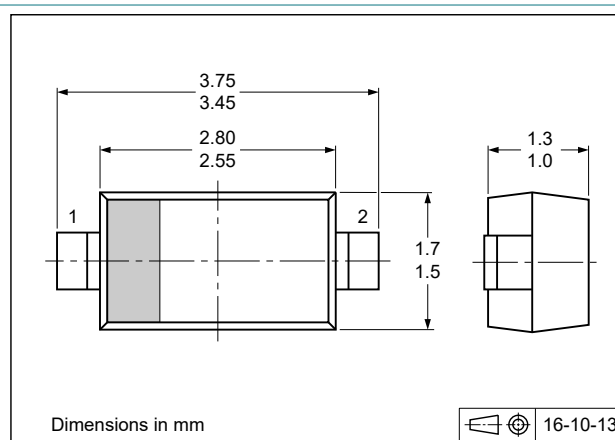
Input signal: forward pulse rise time  $t_r = 20$  ns; forward current pulse duration  $t_p \geq 100$  ns; duty cycle  $\delta \leq 0.005$

**Fig. 8. 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



**Fig. 9. Package outline SOD123**

13. Soldering

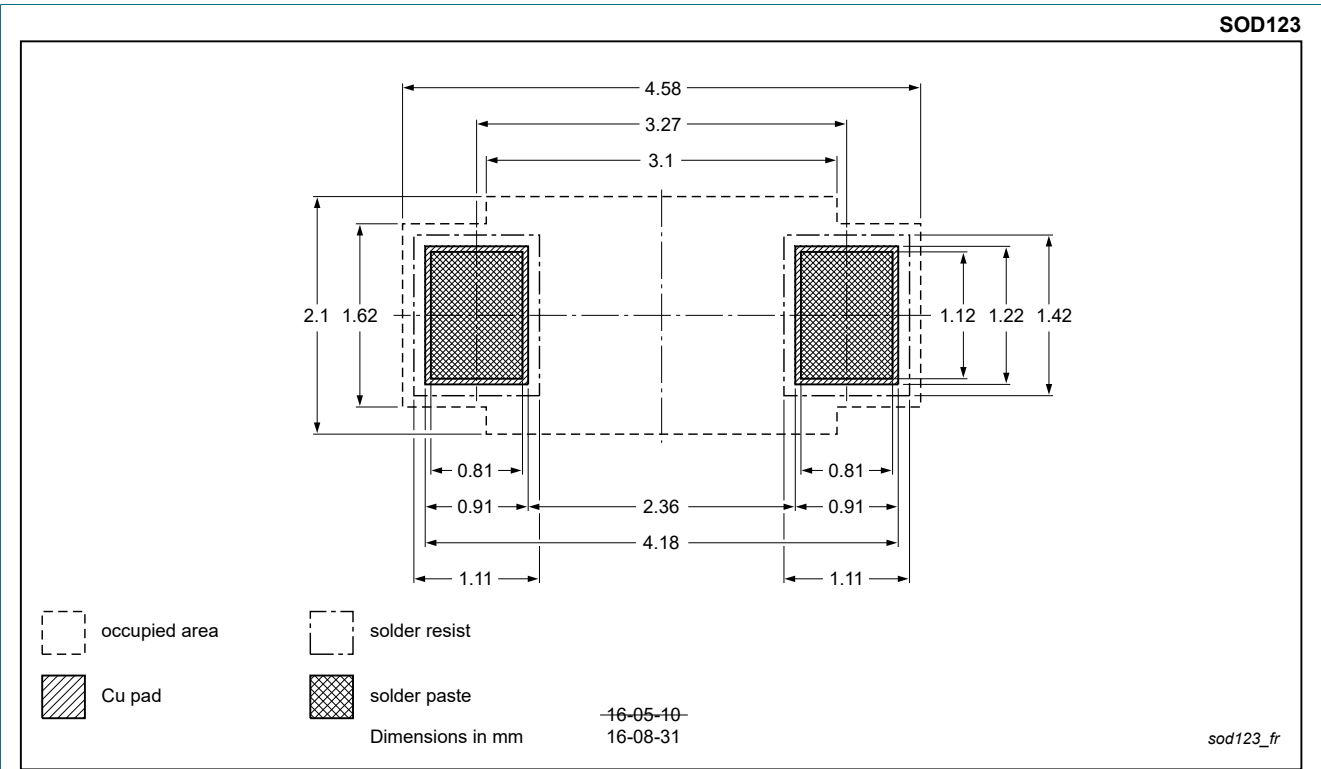


Fig. 10. Reflow soldering footprint for SOD123

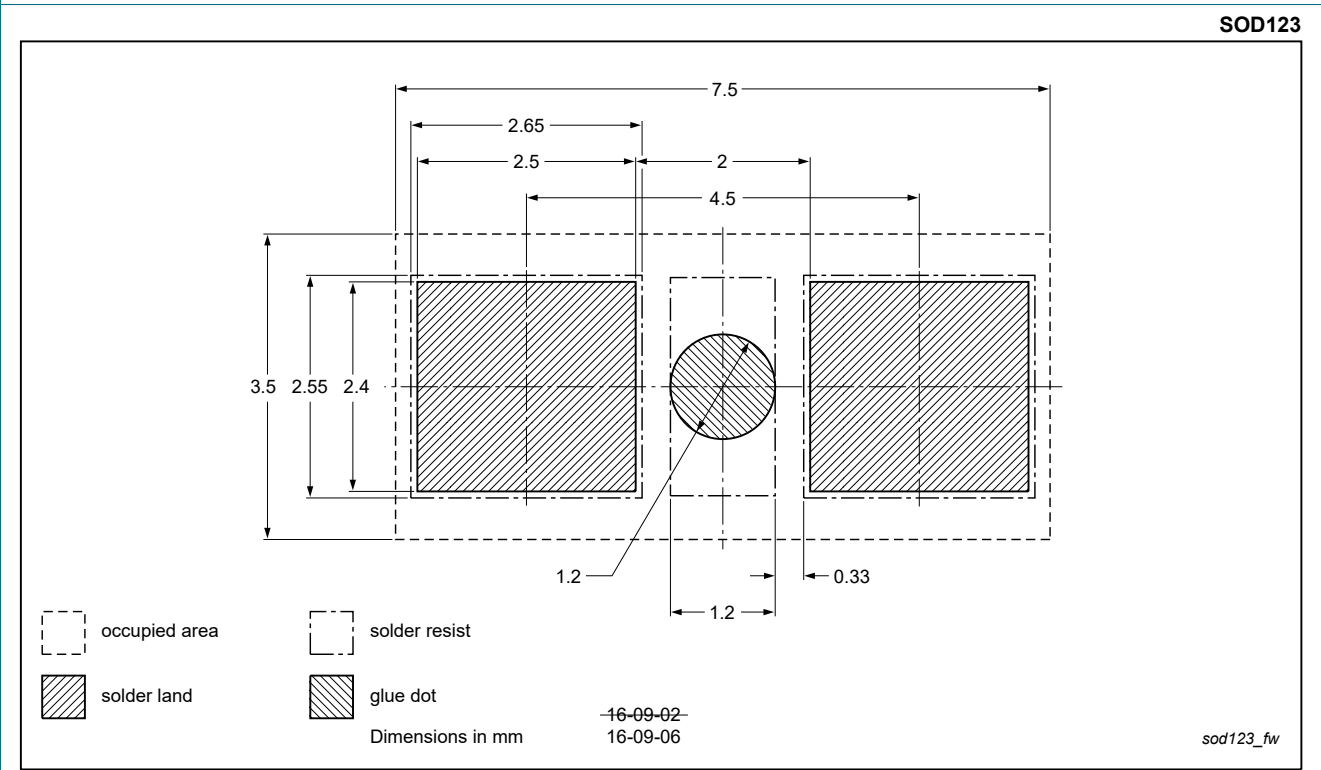


Fig. 11. Wave soldering footprint for SOD123

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS16GW-Q v.1	20250117	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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