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BAS16GW

High-speed switching diode

23 November 2016

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
- Reverse voltage $V_R \leq 100$ V
- Low capacitance: $C_d \leq 1.5$ pF
- Small SMD plastic package
- AEC-Q101 qualified

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	μ A
t_{rr}	reverse recovery time	$I_F = 10$ mA; $I_R = 10$ mA; $R_L = 100$ Ω ; $I_{R(meas)} = 1$ 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	SOD123	Plastic surface-mounted package; 2 leads	SOD123

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS16GW	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_{RRM}	repetitive peak reverse voltage	$T_j = 25\text{ °C}$	-	100	V	
V_R	reverse voltage		-	100	V	
I_F	forward current		-	215	mA	
I_{FRM}	repetitive peak forward current	$t_p \leq 0.5\text{ ms}$; $\delta \leq 0.25$	-	500	mA	
I_{FSM}	non-repetitive peak forward current	$t_p = 1\text{ }\mu\text{s}$; $T_{j(\text{init})} = 25\text{ °C}$; square wave	-	4	A	
		$t_p = 1\text{ ms}$; $T_{j(\text{init})} = 25\text{ °C}$; square wave	-	1	A	
		$t_p = 1\text{ s}$; $T_{j(\text{init})} = 25\text{ °C}$; square wave	-	0.5	A	
P_{tot}	total power dissipation	$T_{\text{amb}} \leq 25\text{ °C}$	[1]	-	357	mW
			[2]	-	600	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.

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated mounting pad for cathode 1 cm^2 .

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$R_{\text{th}(j-a)}$	thermal resistance from junction to ambient	In free air	[1]	-	-	350	K/W
			[2]	-	-	210	K/W
$R_{\text{th}(j-sp)}$	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 1 cm^2 .

[3] Soldering point of cathode tab.

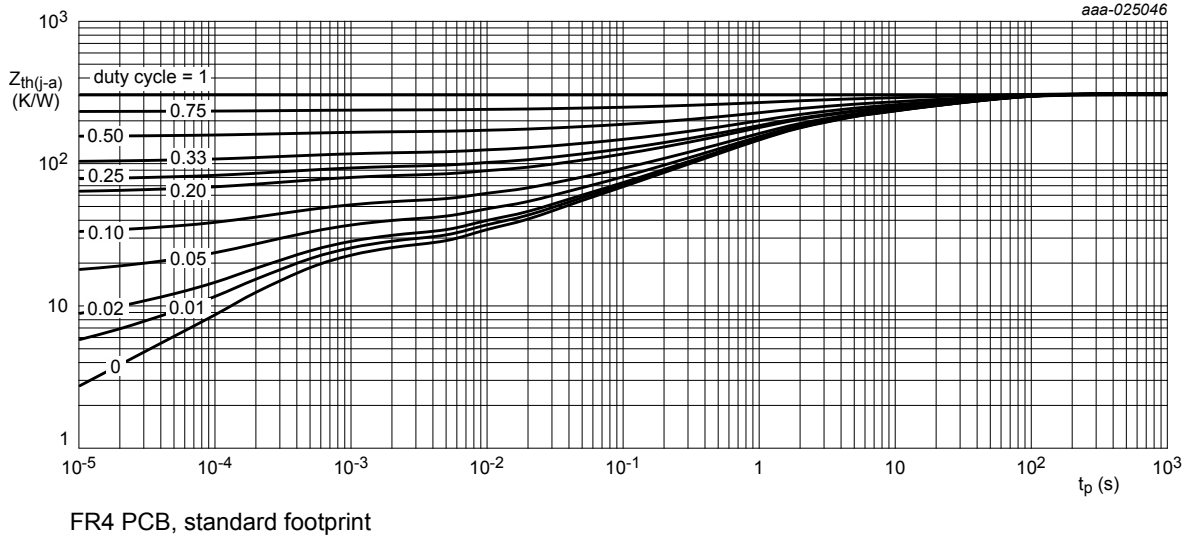


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

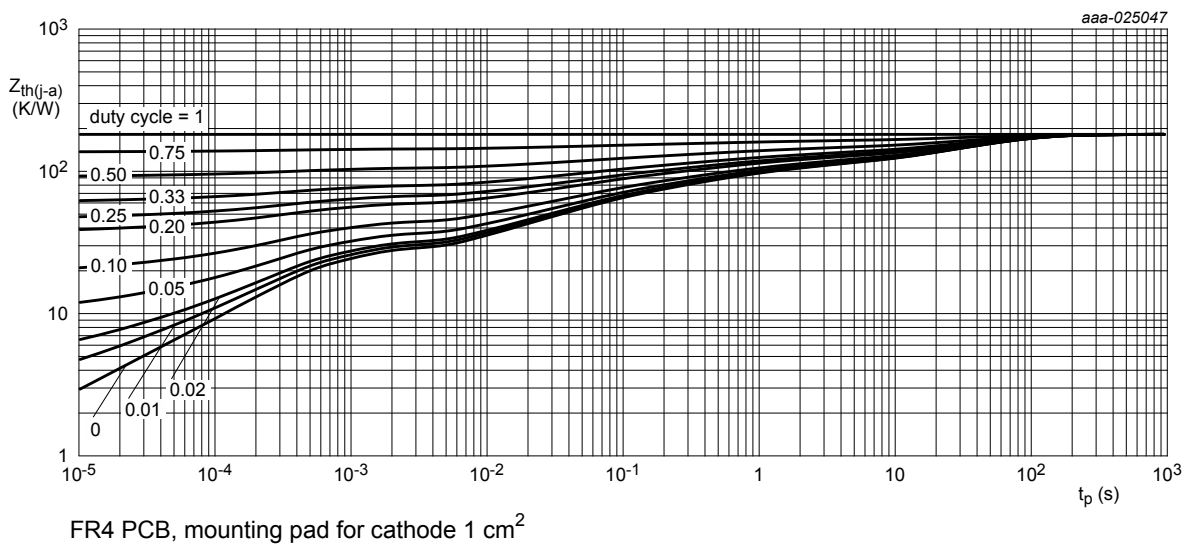
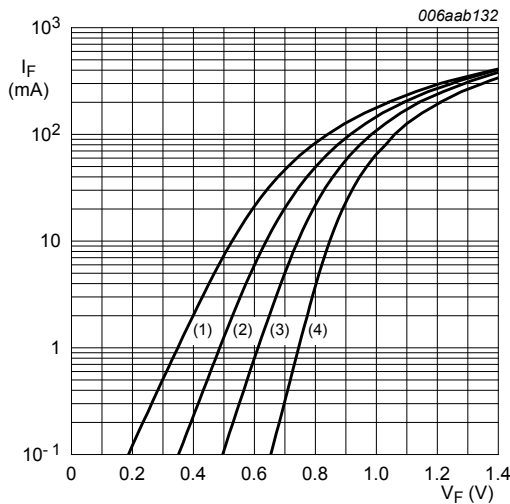


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

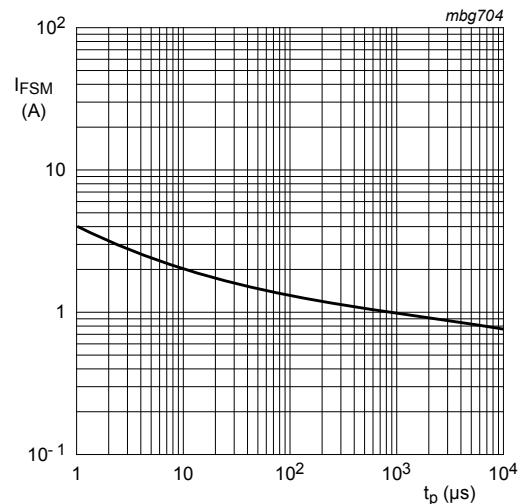
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _F	forward voltage	I _F = 1 mA; t _p ≤ 300 μs; δ = 0.02 ; T _j = 25 °C	-	-	715	mV
		I _F = 10 mA; t _p ≤ 300 μs; δ = 0.02 ; T _j = 25 °C	-	-	855	mV
		I _F = 50 mA; t _p ≤ 300 μs; δ = 0.02 ; T _j = 25 °C	-	-	1	V
		I _F = 150 mA; t _p ≤ 300 μs; δ = 0.02 ; T _j = 25 °C	-	-	1.25	V
I _R	reverse current	V _R = 25 V; pulsed; T _j = 25 °C	-	-	30	nA
		V _R = 80 V; pulsed; T _j = 25 °C	-	-	0.5	μA
		V _R = 25 V; pulsed; T _j = 150 °C	-	-	30	μA
		V _R = 80 V; pulsed; T _j = 150 °C	-	-	50	μA
C _d	diode capacitance	f = 1 MHz; V _R = 0 V; T _j = 25 °C	-	-	1.5	pF
t _{rr}	reverse recovery time	I _F = 10 mA; I _R = 10 mA; R _L = 100 Ω; I _{R(meas)} = 1 mA; Switched from I _F = 10 mA to I _R = 10 mA; T _j = 25 °C	-	-	4	ns
V _{FR}	forward recovery voltage	I _F = 10 mA; t _r = 20 ns	-	-	1.75	V



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

Fig. 3. Forward current as a function of forward voltage; typical values



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

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

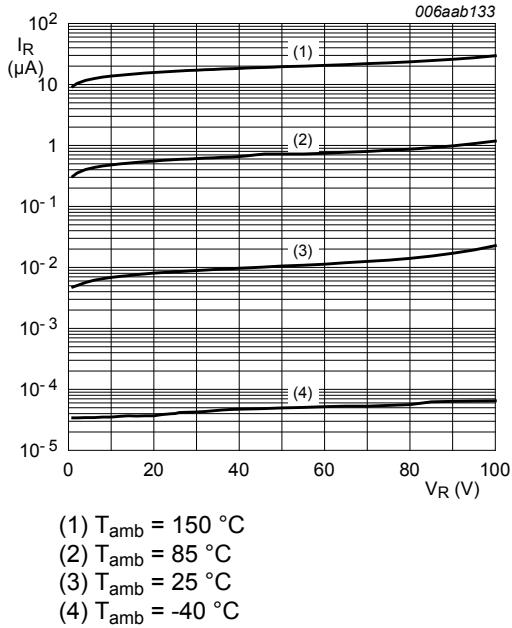


Fig. 5. Reverse current as a function of reverse voltage; typical values

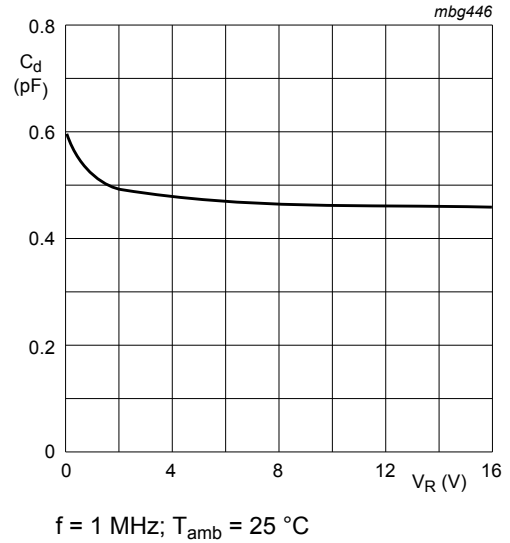


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

11. Test information

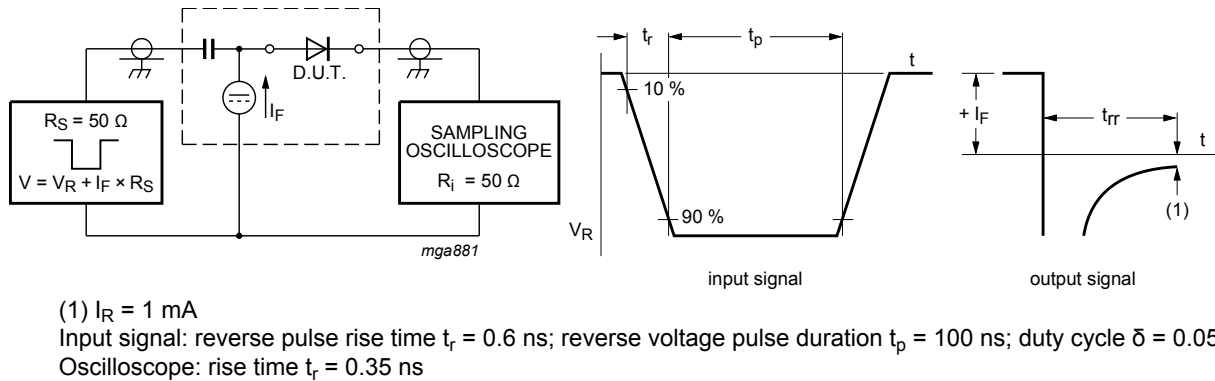


Fig. 7. Reverse recovery time test circuit and waveforms

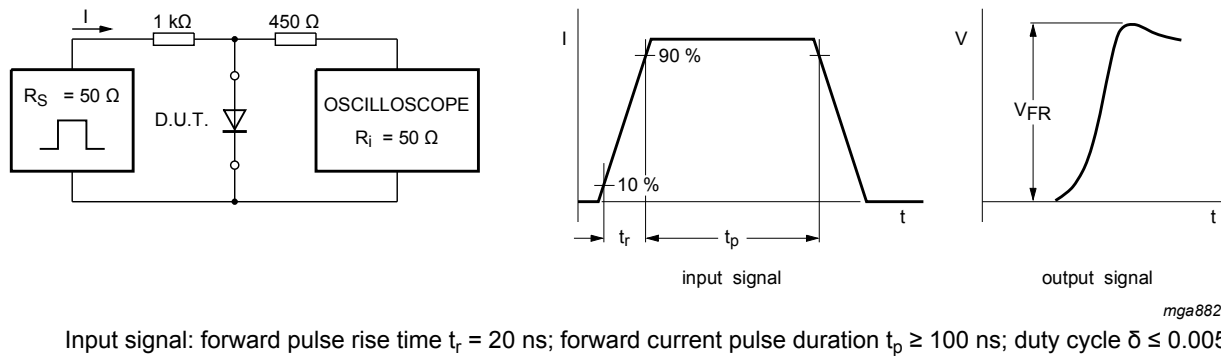


Fig. 8. Forward recovery voltage test circuit and waveforms

12. Package outline

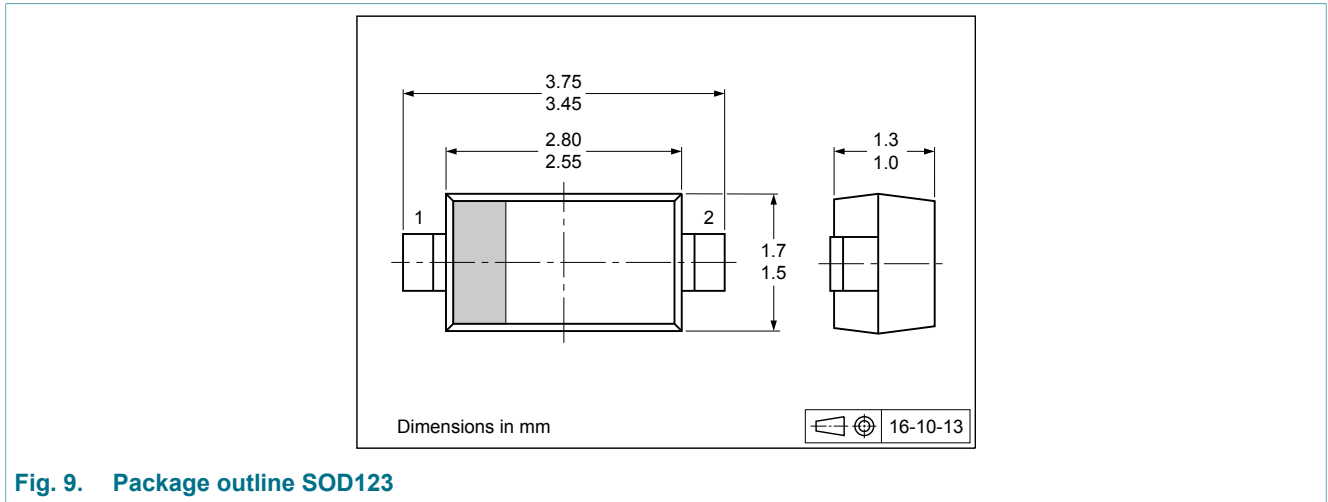


Fig. 9. Package outline SOD123

13. Soldering

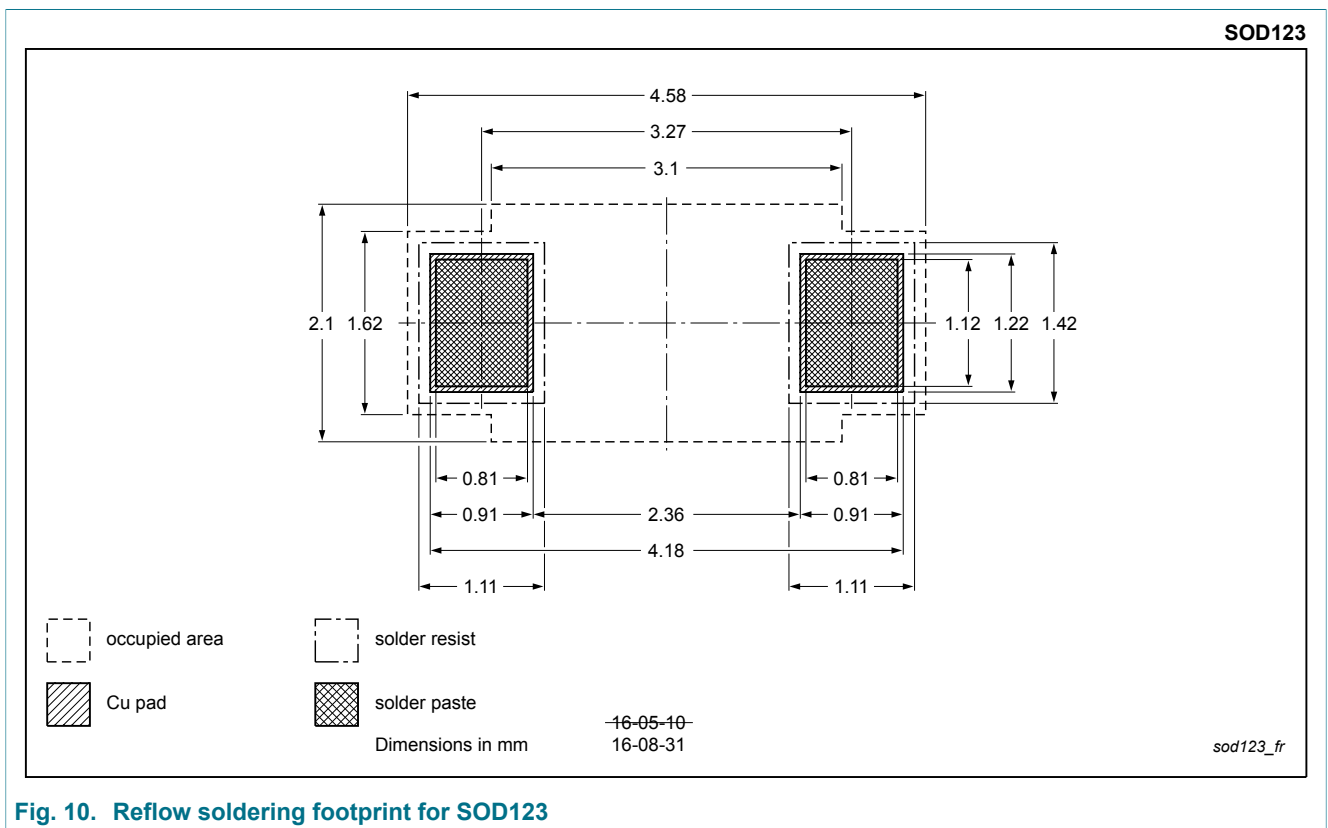


Fig. 10. Reflow soldering footprint for SOD123

SOD123

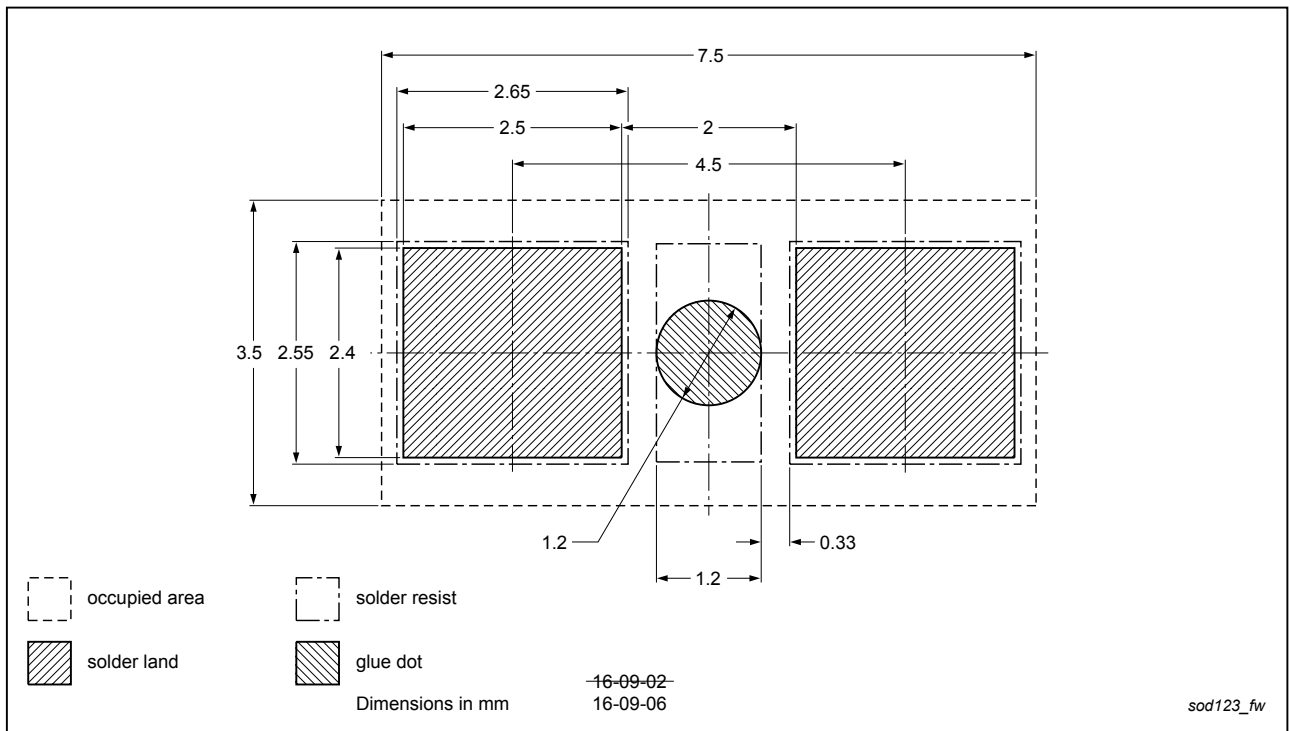


Fig. 11. Wave soldering footprint for SOD123

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS16GW v.1	20161123	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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Date of release: 23 November 2016
