



# 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	$\mu$ 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	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
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25\text{ °C}$	[1]	357	mW
			[2]	600	mW
$T_j$	junction temperature		-	150	°C
$T_{\text{amb}}$	ambient temperature		-55	150	°C
$T_{\text{stg}}$	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  $1\text{ cm}^2$ .

## 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  $1\text{ cm}^2$ .

[3] Soldering point of cathode tab.

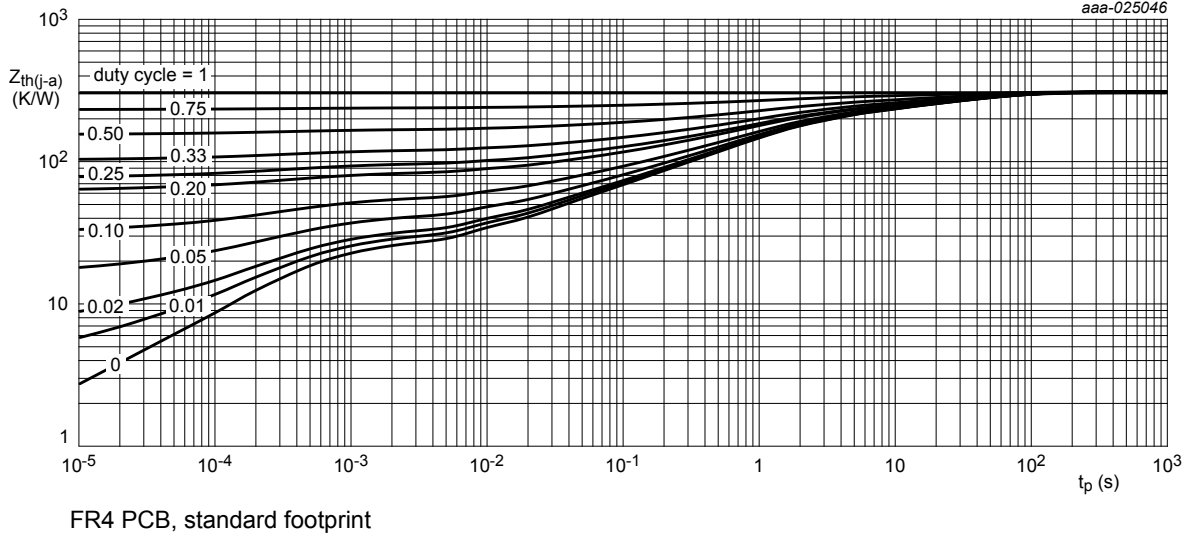


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

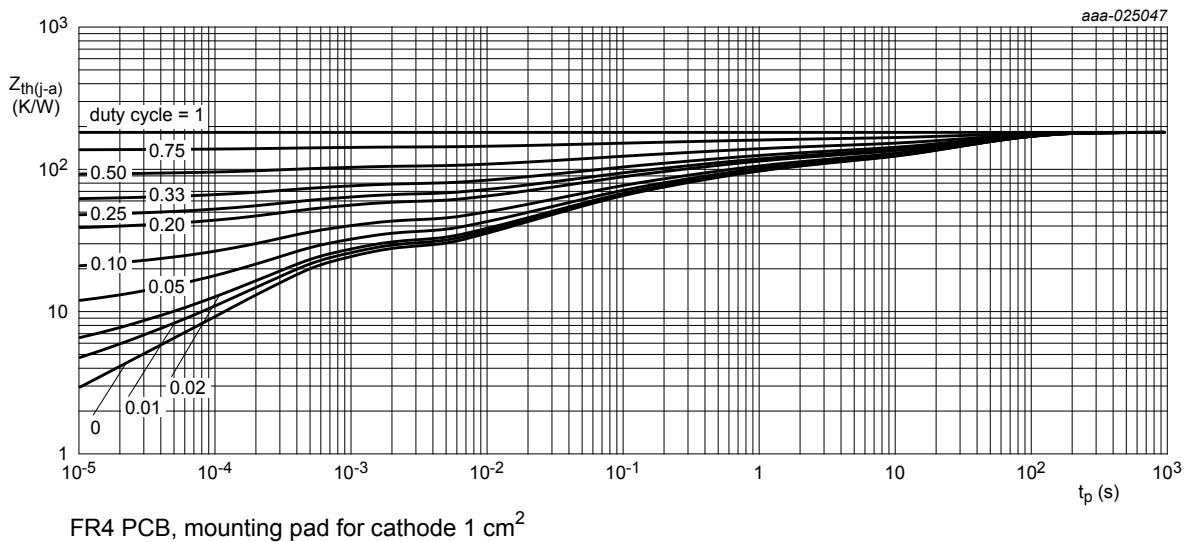
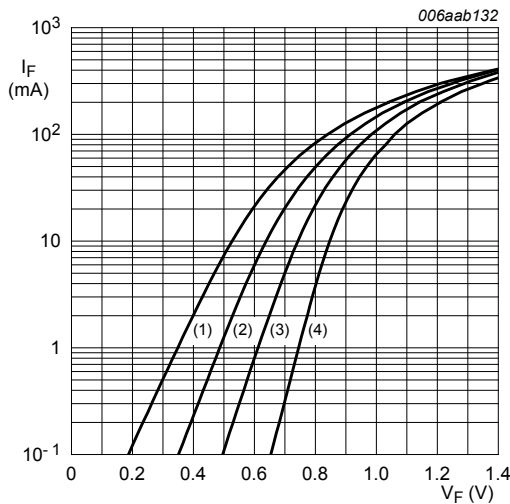


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

## 10. Characteristics

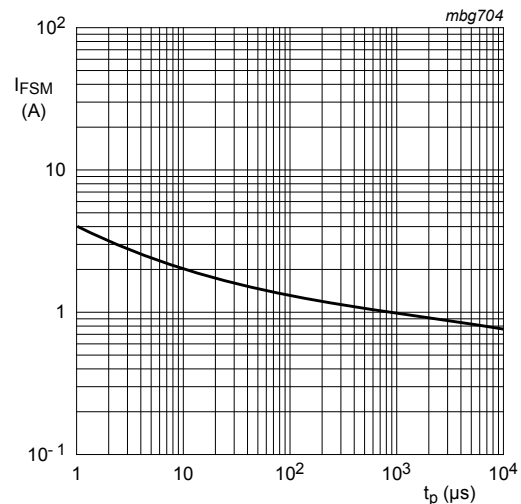
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <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	f = 1 MHz; V <sub>R</sub> = 0 V; 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>FR</sub>	forward recovery voltage	I <sub>F</sub> = 10 mA; t <sub>r</sub> = 20 ns	-	-	1.75	V



- (1) T<sub>amb</sub> = 150 °C
- (2) T<sub>amb</sub> = 85 °C
- (3) T<sub>amb</sub> = 25 °C
- (4) T<sub>amb</sub> = -40 °C

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



Based on square wave currents.  
T<sub>j(initial)</sub> = 25 °C

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

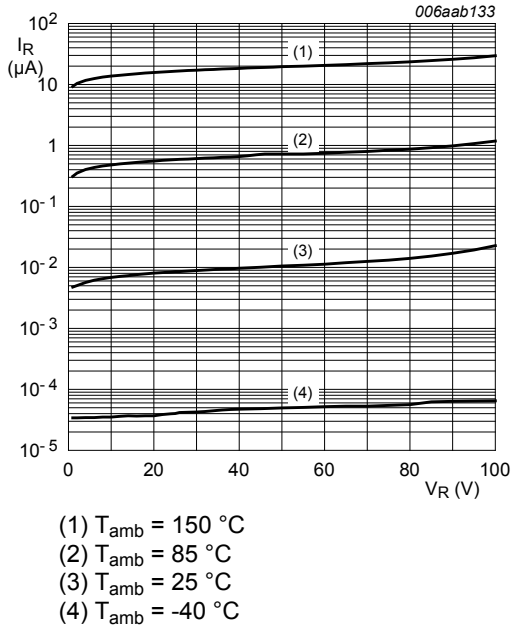


Fig. 5. Reverse current as a function of reverse voltage; typical values

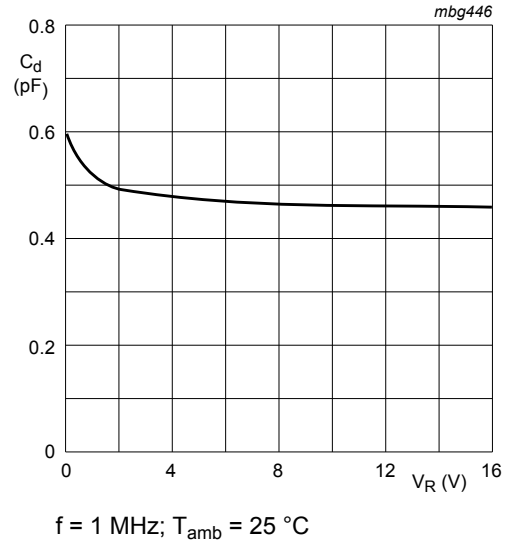


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

## 11. Test information

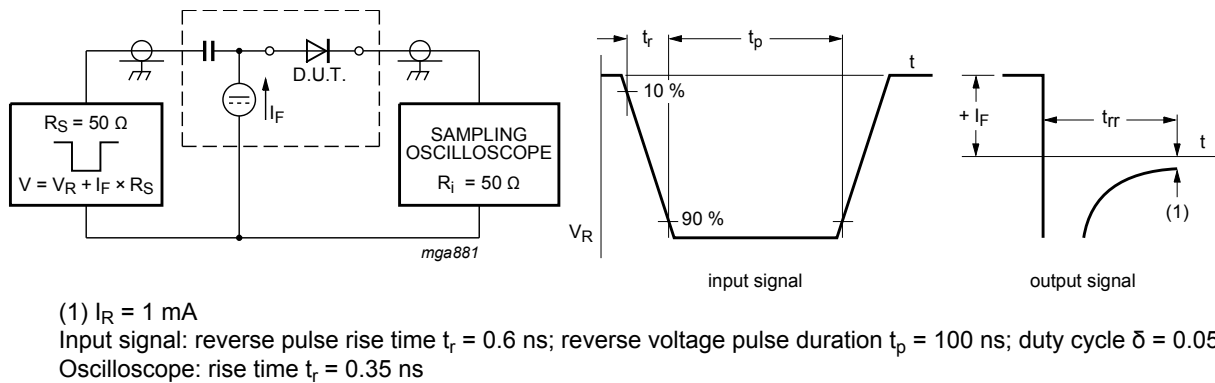


Fig. 7. Reverse recovery time test circuit and waveforms

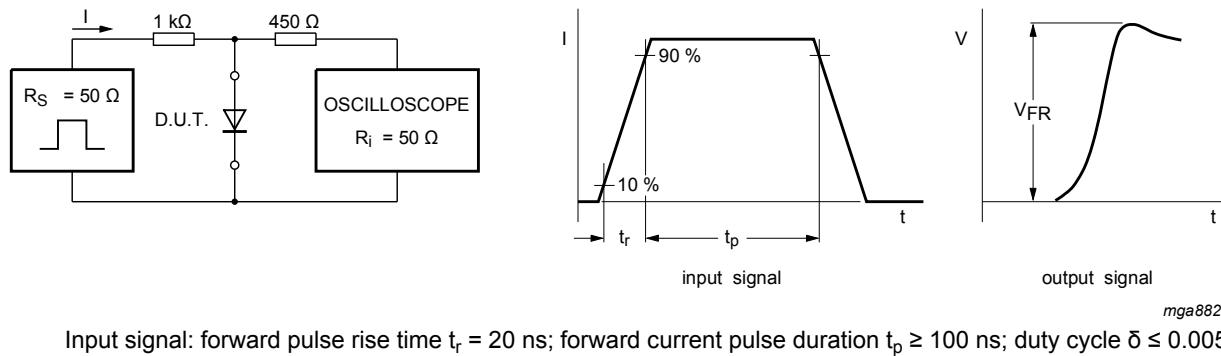


Fig. 8. Forward recovery voltage test circuit and waveforms

## 12. Package outline

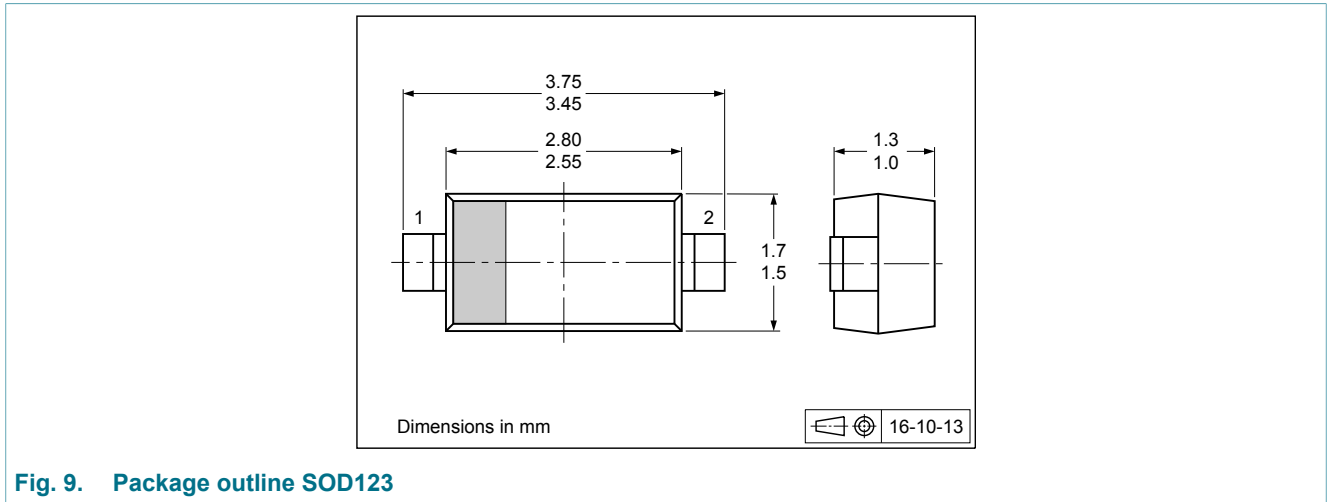


Fig. 9. Package outline SOD123

## 13. Soldering

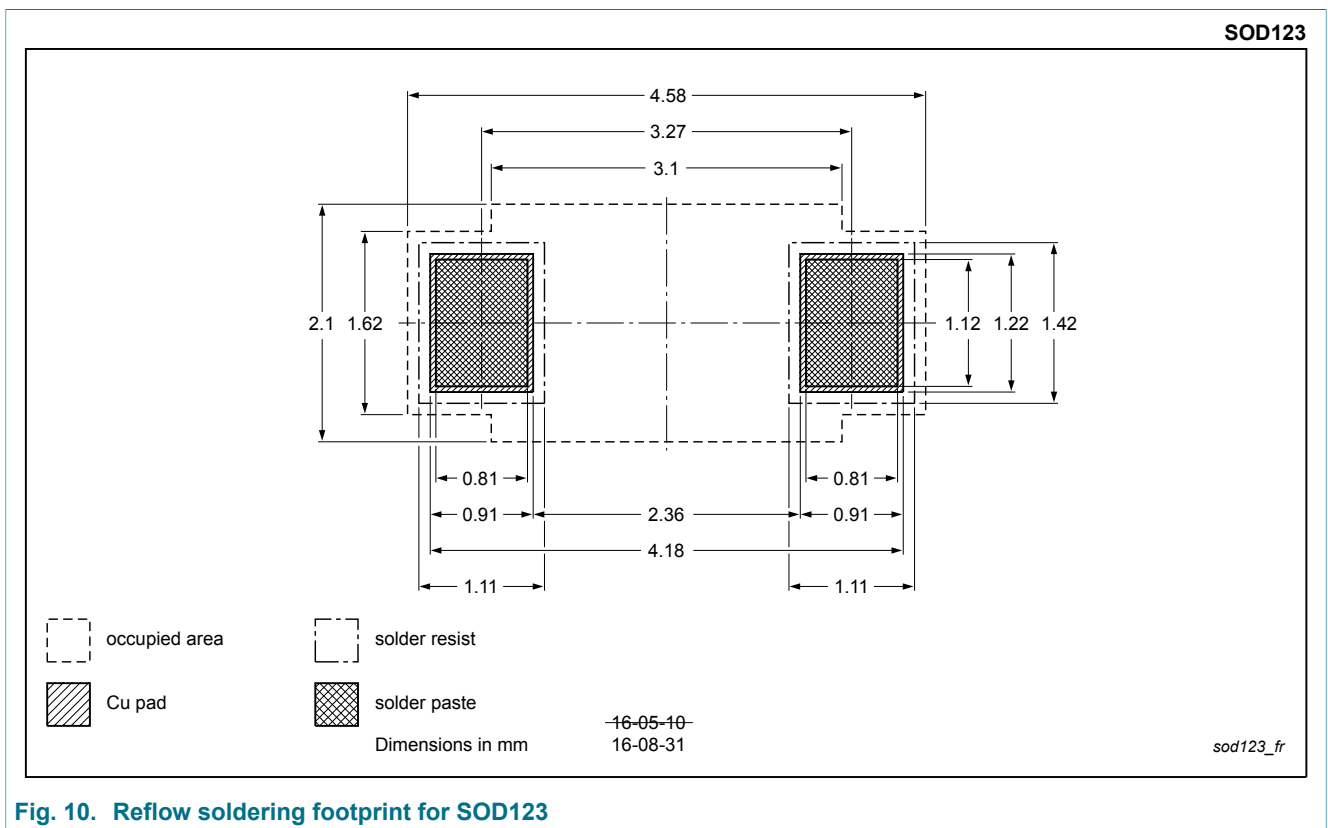


Fig. 10. Reflow soldering footprint for SOD123

SOD123

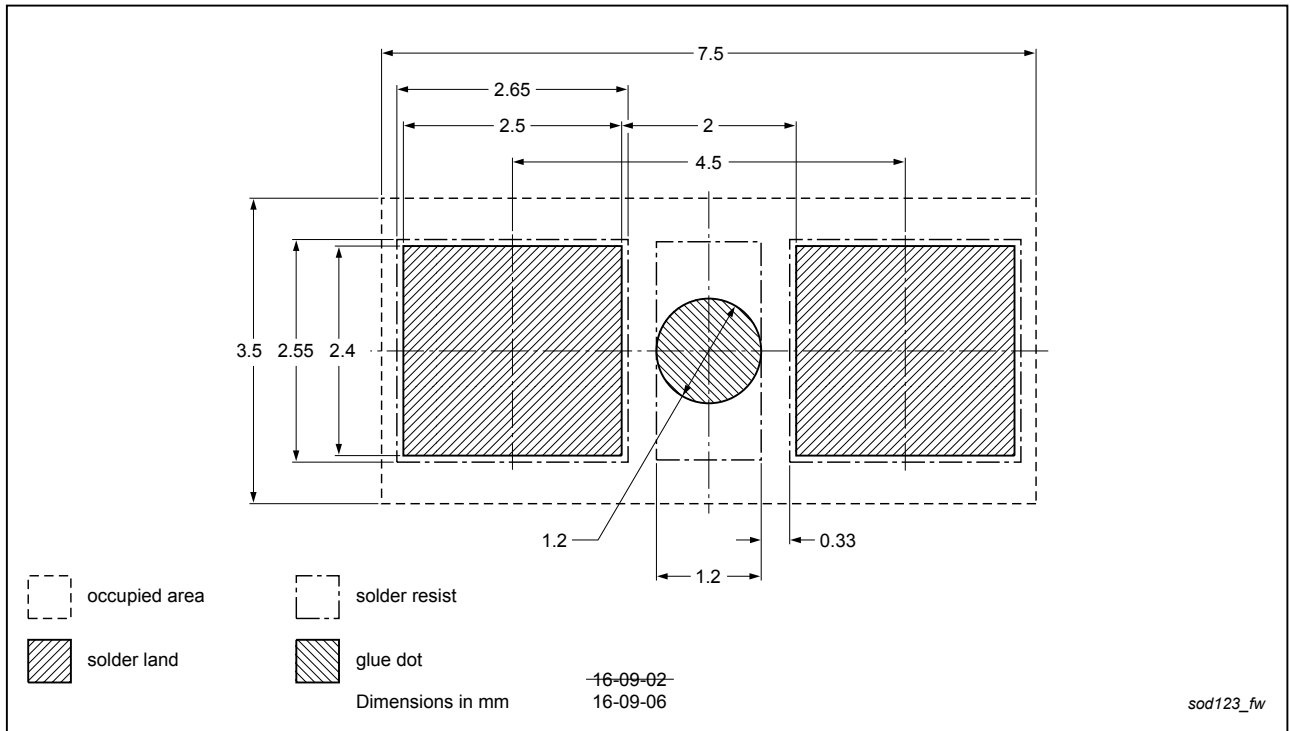


Fig. 11. Wave soldering footprint for SOD123



## 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 <sup>[1]</sup> <sup>[2]</sup>	Product status <sup>[3]</sup>	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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- [2] The term 'short data sheet' is explained in section "Definitions".
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