



# BAV99

## High-speed switching diode

1 July 2022

Product data sheet

### 1. General description

High-speed switching diode, encapsulated in a small SOT23 (TO-236AB) 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
- Small SMD plastic packages

### 3. Applications

- High-speed switching
- Reverse polarity protection
- General-purpose switching

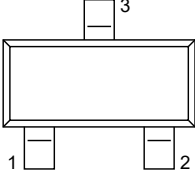
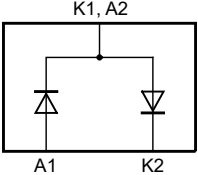
### 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_R$	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

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 <p style="text-align: center;"><b>SOT23</b></p>	 <p style="text-align: center;">006aaa763</p>
2	K2	cathode (diode 2)		
3	K1, A2	cathode (diode 1) and anode (diode 2)		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV99	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

## 7. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
BAV99	A7%

[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
<b>Per diode</b>						
$V_R$	reverse voltage			-	100	V
$V_{RRM}$	repetitive peak reverse voltage			-	100	V
$I_F$	forward current	single diode loaded		-	215	mA
		double diode loaded		-	125	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
<b>Per device; one diode loaded</b>						
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25 \text{ }^\circ\text{C}$	[1]	-	250	mW
$T_j$	junction temperature			-	150	$^\circ\text{C}$
$T_{\text{amb}}$	ambient temperature			-65	150	$^\circ\text{C}$
$T_{\text{stg}}$	storage temperature			-65	150	$^\circ\text{C}$

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 9. Thermal characteristics

**Table 6. Thermal characteristics**

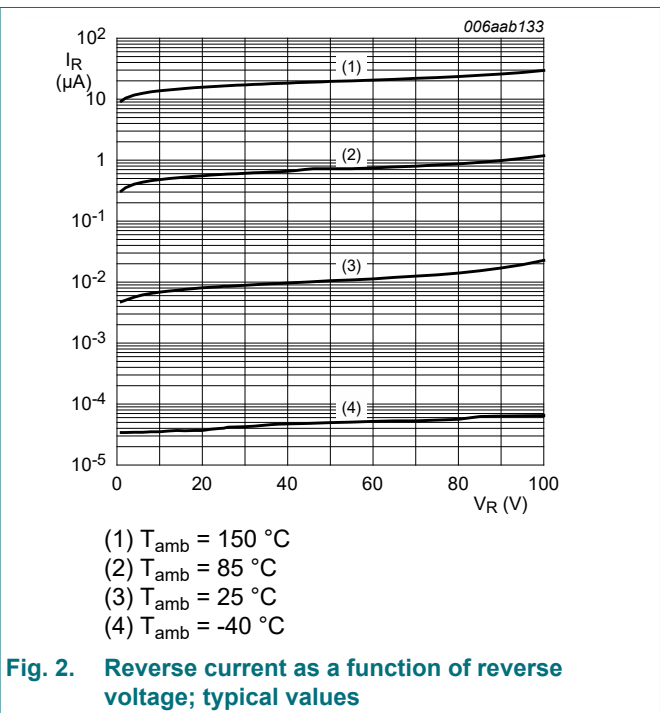
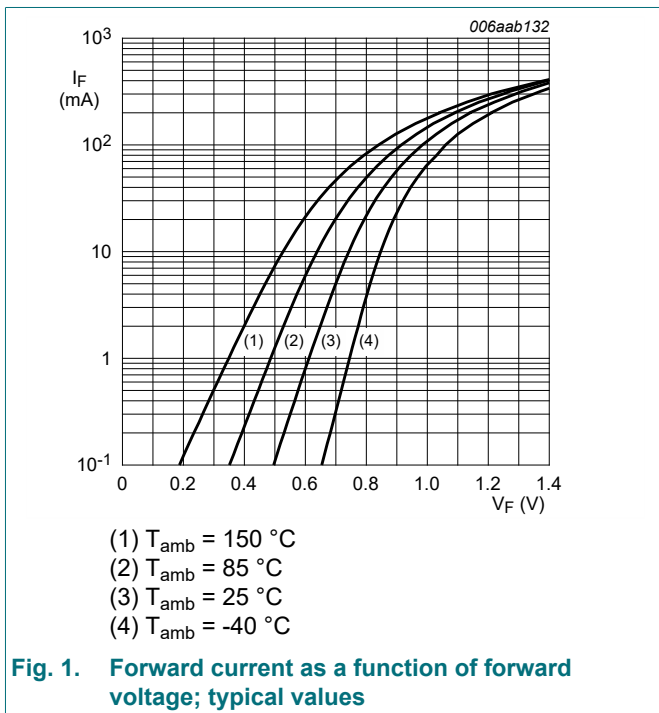
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{\text{th}(j-a)}$	thermal resistance from junction to ambient	single diode loaded; in free air	[1]	-	-	500	K/W
$R_{\text{th}(j-sp)}$	thermal resistance from junction to solder point			-	-	360	K/W

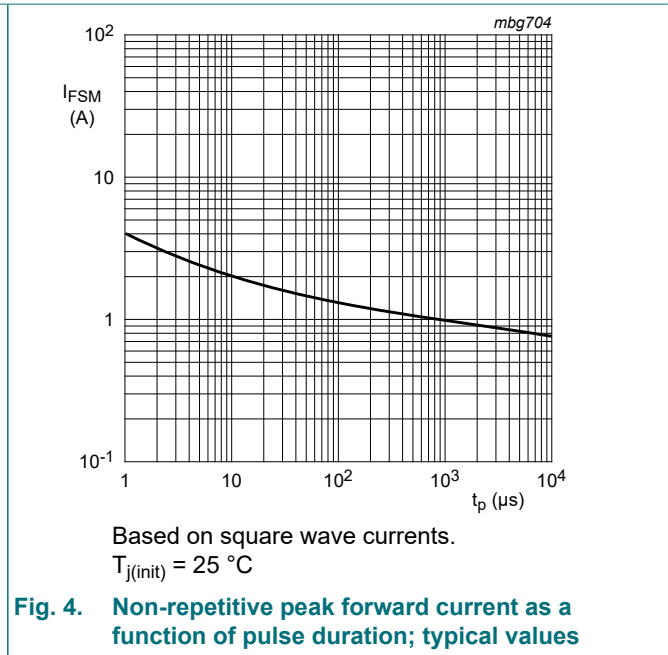
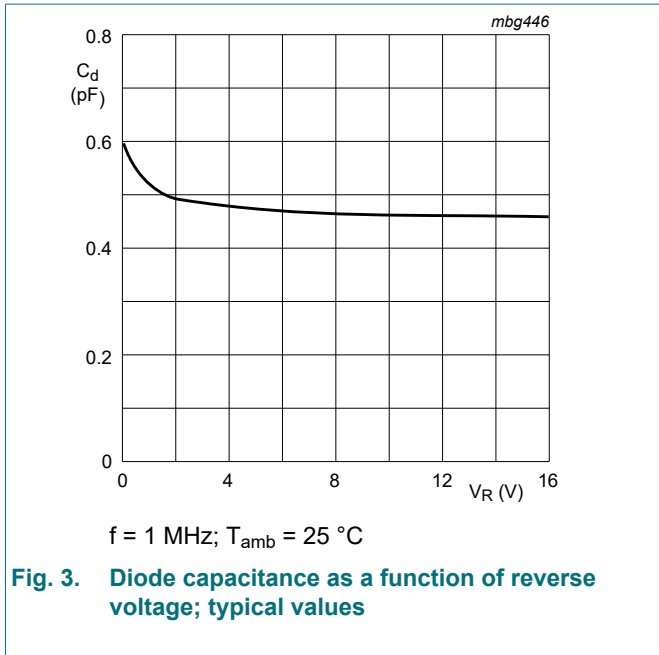
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## 10. Characteristics

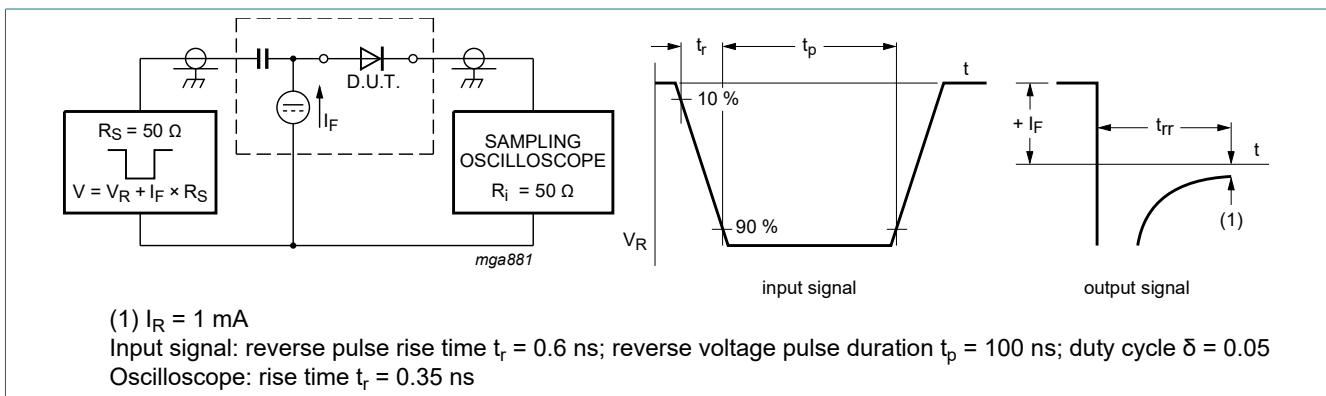
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	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	$\mu\text{A}$
		$V_R = 25 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	-	30	$\mu\text{A}$
		$V_R = 80 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	-	50	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 0 \text{ V}; f = 1 \text{ MHz}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	1.5	pF
$t_{\text{rr}}$	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
$V_{\text{FRM}}$	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

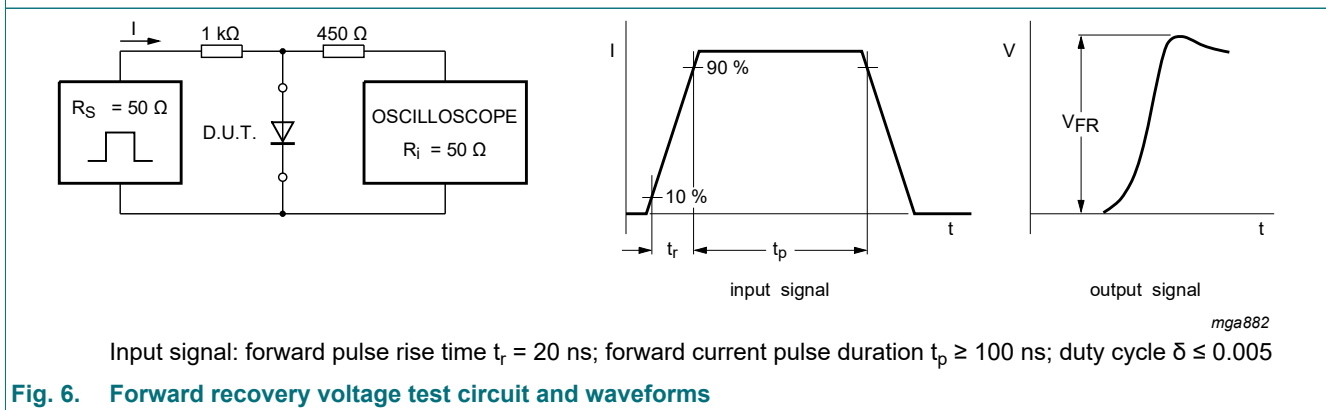




## 11. Test information



**Fig. 5. Reverse recovery time test circuit and waveforms**



**Fig. 6. Forward recovery voltage test circuit and waveforms**

## 12. Package outline

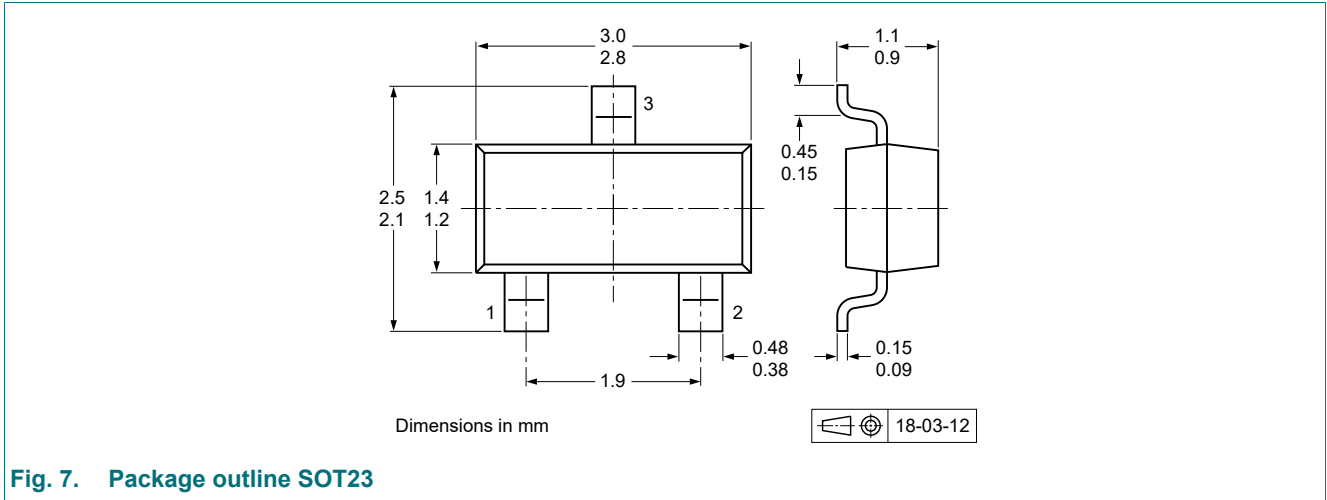


Fig. 7. Package outline SOT23

### 13. Soldering

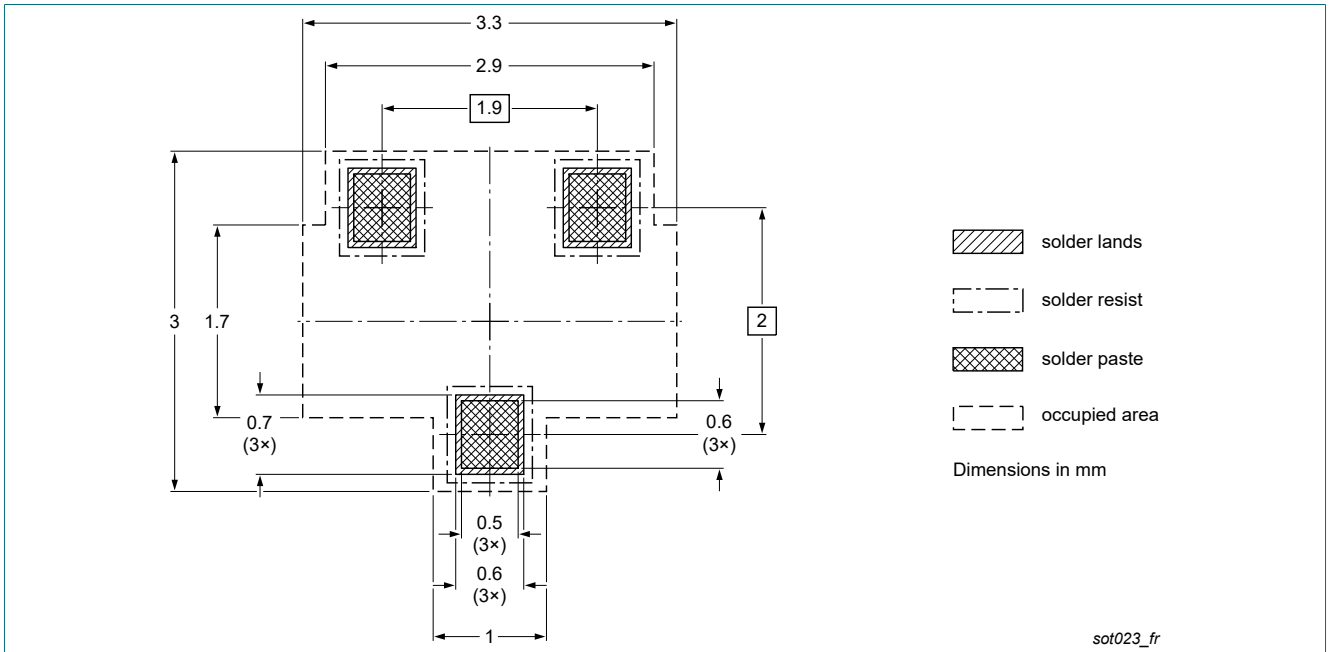


Fig. 8. Reflow soldering footprint for SOT23

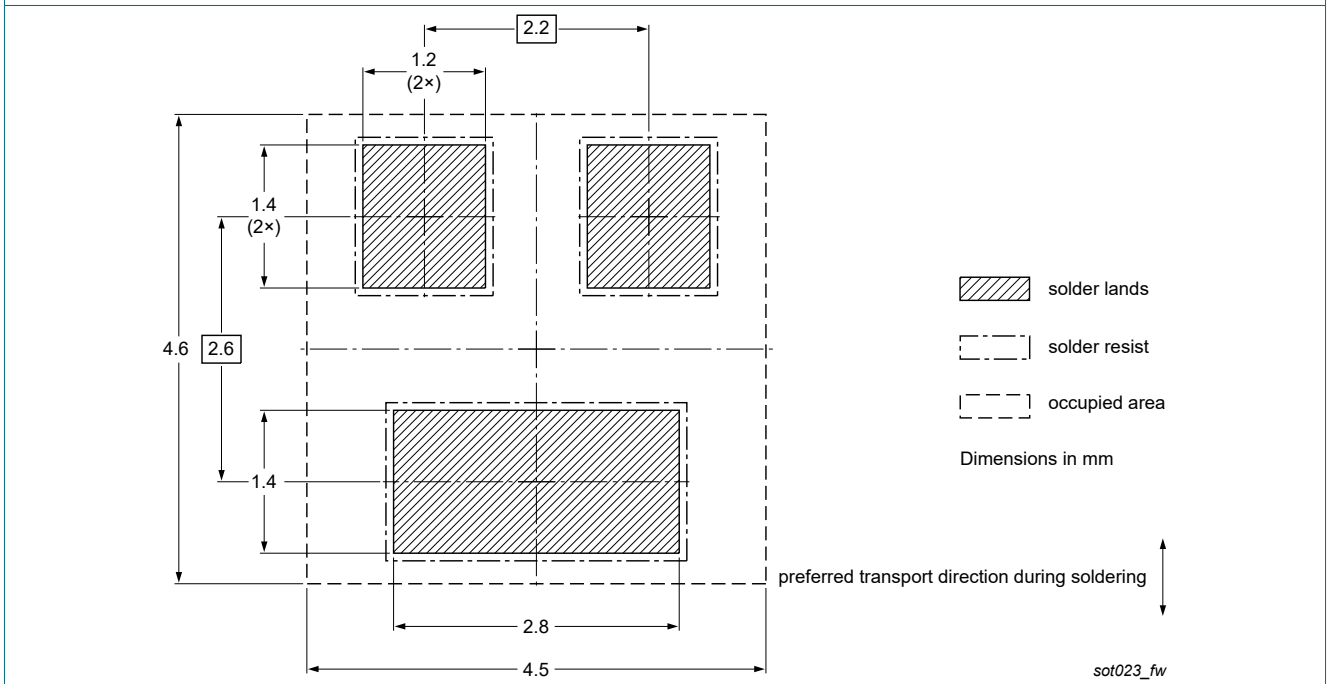


Fig. 9. Wave soldering footprint for SOT23

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV99 v.9	20220701	Product data sheet	-	BAV99_SER_8
Modification:	<ul style="list-style-type: none"> <li>Family data sheet reduced to single type data sheet.</li> <li>Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li> <li>Packing information removed.</li> </ul>			
BAV99_SER_8	20101118	Product data sheet	-	BAV99_SER_7
BAV99_SER_7	20100414	Product data sheet	-	BAV99_SER_6
BAV99_SER_6	20100310	Product data sheet	-	BAV99_SER_5
BAV99_SER_5	20080820	Product data sheet	-	BAV99_4 BAV99S_3 BAV99W_4
BAV99_4	20011015	Product specification	-	BAV99_3
BAV99S_3	20010514	Product specification	-	BAV99S_N_2
BAV99W_4	19990511	Product specification	-	BAV99W_3



## 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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## Contents

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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.....	5
12. Package outline.....	6
13. Soldering.....	7
14. Revision history.....	8
15. Legal information.....	9

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