



# PMBS3906

40 V, 100 mA PNP general-purpose transistor

5 June 2018

Product data sheet

## 1. General description

PNP general-purpose transistor in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

NPN complement: PMBS3904

## 2. Features and benefits

- 100 mA collector current capability

## 3. Applications

- General-purpose switching and amplification

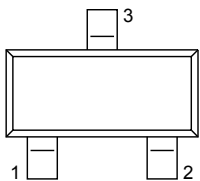
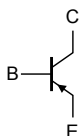
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CEO}$	collector-emitter voltage	open base	-	-	-40	V
$I_C$	collector current		-	-	-100	mA
$h_{FE}$	DC current gain	$V_{CE} = -1\text{ V}$ ; $I_C = -10\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	100	-	300	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 TO-236AB (SOT23)	 006aab259
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMBS3906	TO-236AB	plastic surface-mounted package; 3 leads	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PMBS3906	%O6

[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
V <sub>CBO</sub>	collector-base voltage	open emitter		-	-40	V
V <sub>CEO</sub>	collector-emitter voltage	open base		-	-40	V
V <sub>EBO</sub>	emitter-base voltage	open collector		-	-5	V
I <sub>C</sub>	collector current			-	-100	mA
I <sub>CM</sub>	peak collector current			-	-200	mA
I <sub>BM</sub>	peak base current			-	-200	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C		-	250	mW
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-65	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -30\text{ V}$ ; $I_E = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$	-	-	-50	nA
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}$ ; $I_C = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$	-	-	-50	nA
$h_{FE}$	DC current gain	$V_{CE} = -1\text{ V}$ ; $I_C = -0.1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	60	-	-	
		$V_{CE} = -1\text{ V}$ ; $I_C = -1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	80	-	-	
		$V_{CE} = -1\text{ V}$ ; $I_C = -10\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	100	-	300	
		$V_{CE} = -1\text{ V}$ ; $I_C = -50\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$	60	-	-	
		$V_{CE} = -1\text{ V}$ ; $I_C = -100\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$	30	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}$ ; $I_B = -1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	-	-	-250	mV
		$I_C = -50\text{ mA}$ ; $I_B = -5\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$	-	-	-400	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -10\text{ mA}$ ; $I_B = -1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	-	-	-850	mV
		$I_C = -50\text{ mA}$ ; $I_B = -5\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$	-	-	-950	mV
$t_d$	delay time	$I_C = -10\text{ mA}$ ; $I_{Bon} = -1\text{ mA}$ ; $I_{Boff} = 1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	-	-	50	ns
$t_r$	rise time		-	-	50	ns
$t_{on}$	turn-on time		-	-	100	ns
$t_s$	storage time		-	-	600	ns
$t_f$	fall time		-	-	100	ns
$t_{off}$	turn-off time		-	-	700	ns
$C_c$	collector capacitance	$V_{CB} = -5\text{ V}$ ; $I_E = 0\text{ A}$ ; $i_e = 0\text{ A}$ ; $f = 100\text{ MHz}$ ; $T_{amb} = 25\text{ °C}$	-	-	4.5	pF
$C_e$	emitter capacitance	$V_{EB} = -0.5\text{ V}$ ; $I_C = 0\text{ A}$ ; $i_c = 0\text{ A}$ ; $f = 100\text{ MHz}$ ; $T_{amb} = 25\text{ °C}$	-	-	12	pF
$f_T$	transition frequency	$V_{CE} = -20\text{ V}$ ; $I_C = -10\text{ mA}$ ; $f = 100\text{ MHz}$ ; $T_{amb} = 25\text{ °C}$	150	-	-	MHz
NF	noise figure	$V_{CE} = -5\text{ V}$ ; $I_C = -100\text{ }\mu\text{A}$ ; $R_S = 1\text{ k}\Omega$ ; $10\text{ Hz} < f < 15700\text{ Hz}$ ; $T_{amb} = 25\text{ °C}$	-	-	4	dB

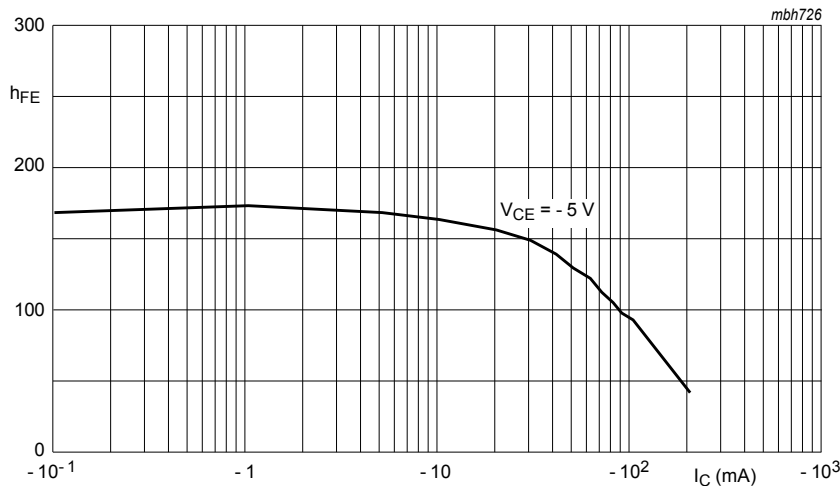


Fig. 1. DC current gain as a function of collector current; typical values

11. Test information

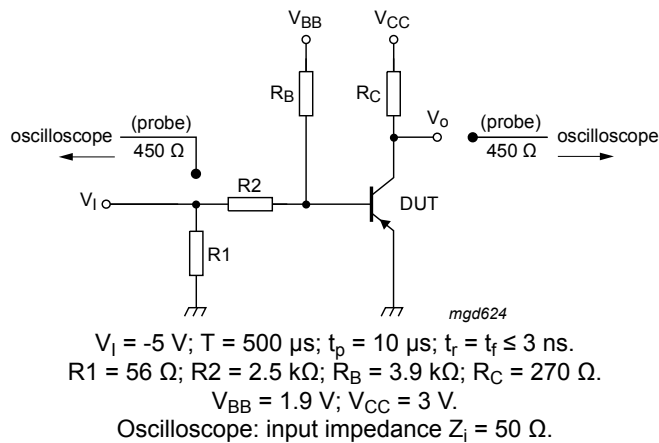
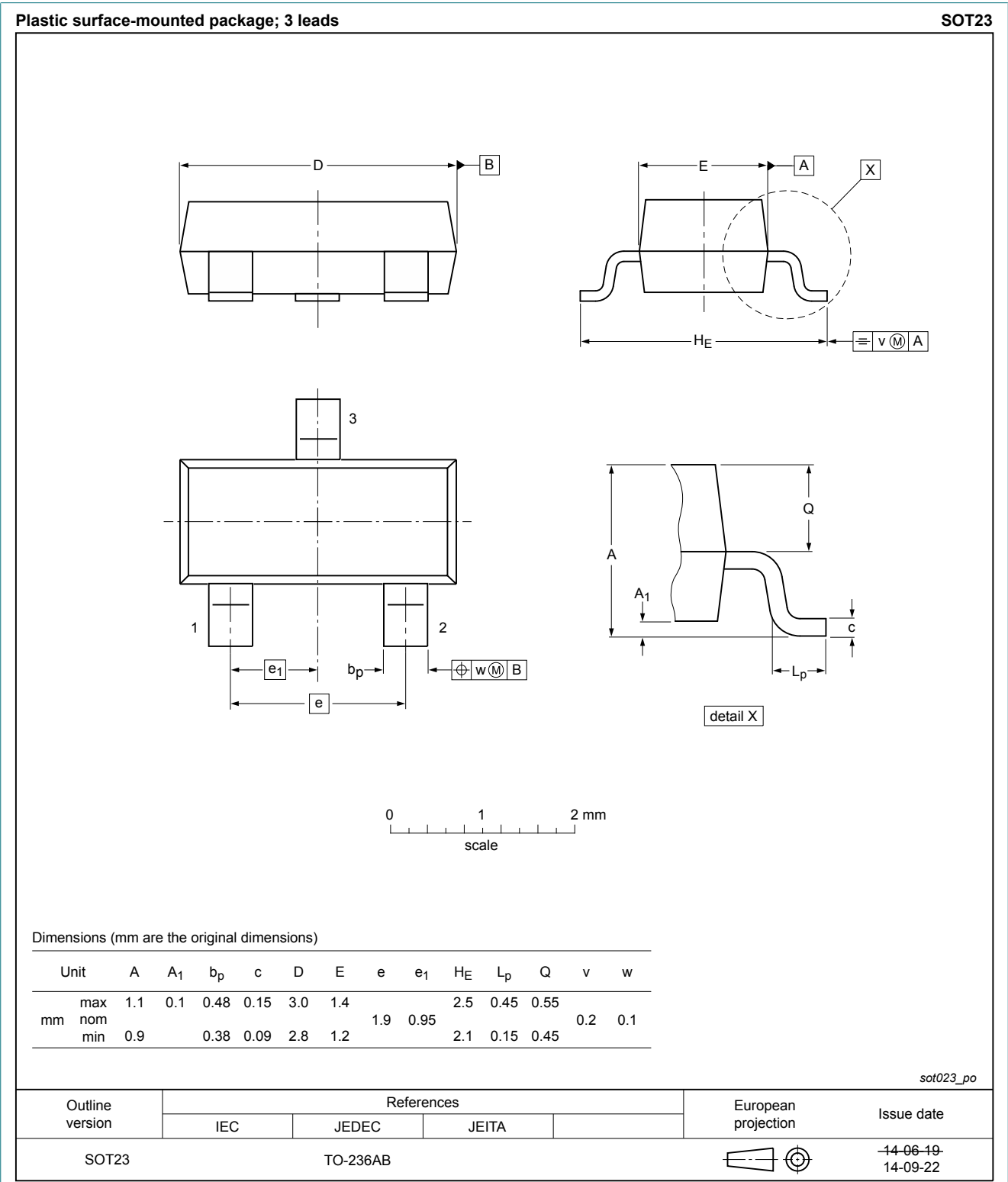


Fig. 2. Test circuit or switching times

12. Package outline



13. Soldering

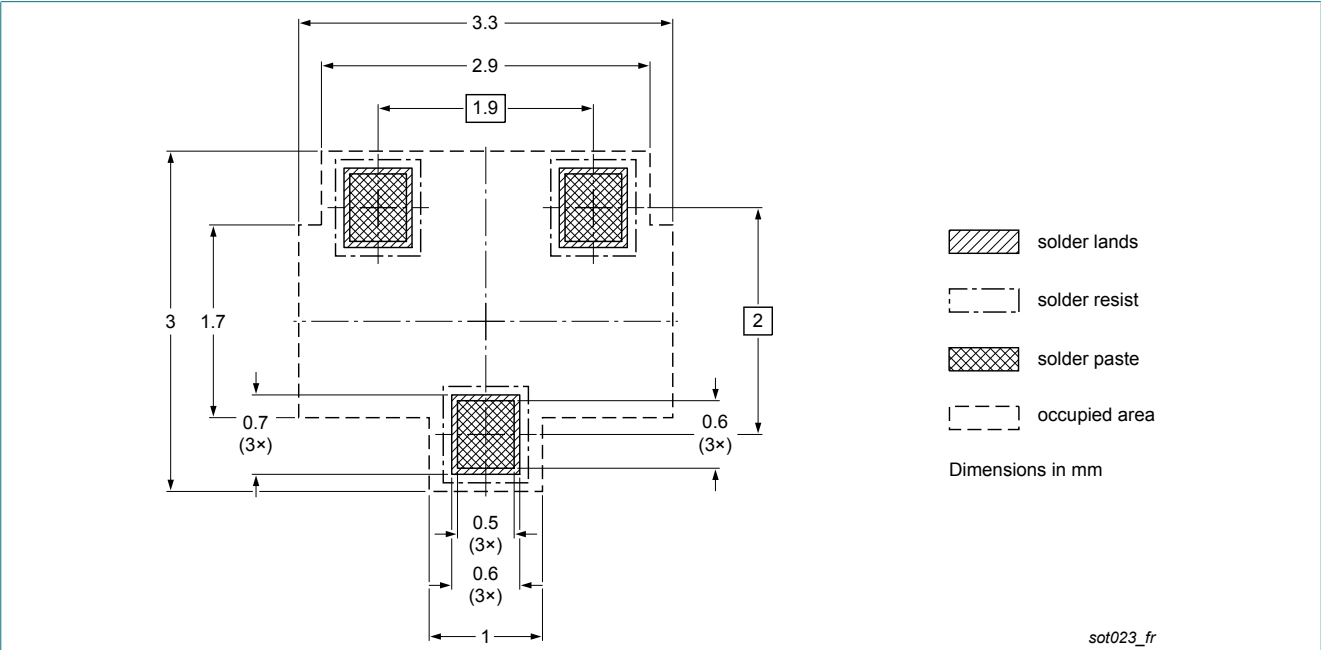


Fig. 4. Reflow soldering footprint for TO-236AB (SOT23)

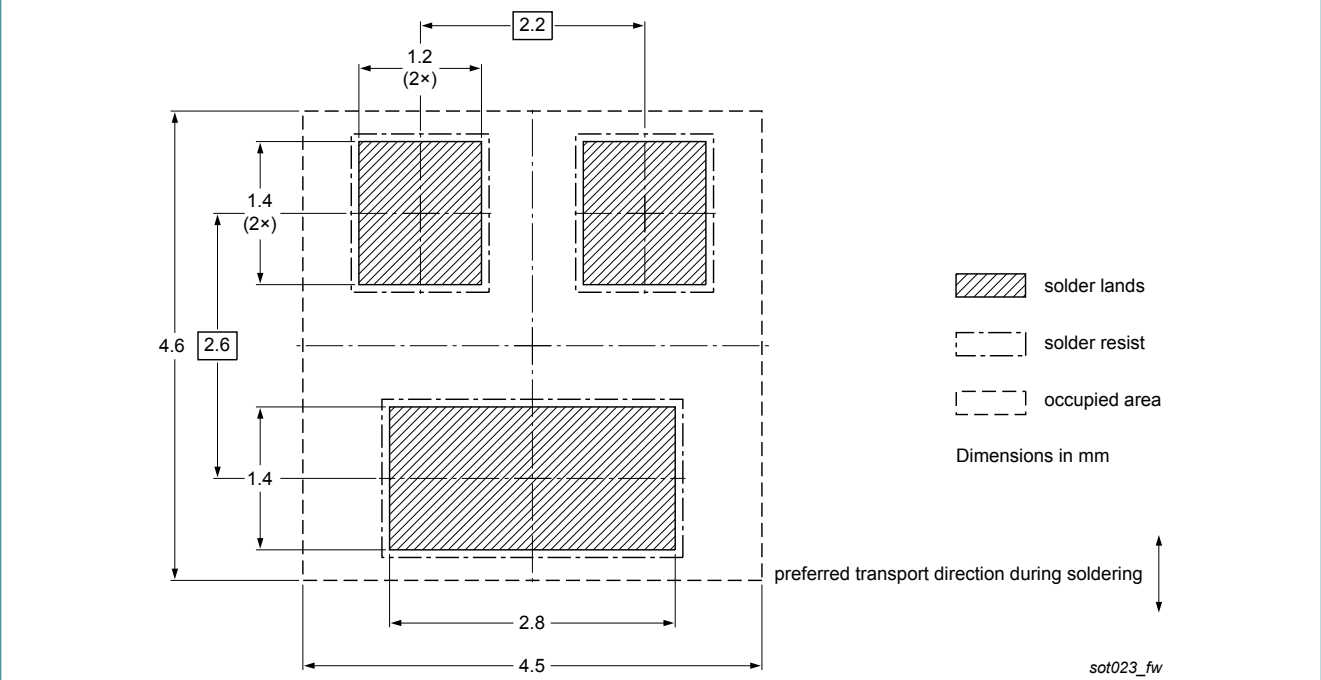


Fig. 5. Wave soldering footprint for TO-236AB (SOT23)

## 14. Revision history

**Table 8. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMBS3906 v.3	20180605	Product data sheet	-	PMBS3906 v.2
Modifications:	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul>			
PMBS3906 v.2	20040202	Product data sheet	-	PMBS3906 v.1
PMBS3906 v.1	19990422	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: 5 June 2018



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**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331