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

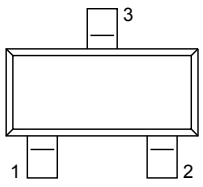
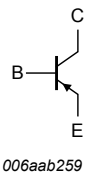
4. Quick reference data

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 V; I_C = -10 mA; T_{amb} = 25 °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_{CBO}	collector-base voltage	open emitter		-	-40	V
V_{CEO}	collector-emitter voltage	open base		-	-40	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I_C	collector current			-	-100	mA
I_{CM}	peak collector current			-	-200	mA
I_{BM}	peak base current			-	-200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C		-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

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]	-	-	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 V; I_E = 0 A; T_{amb} = 25 °C		-	-	-50	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	-50	nA
h_{FE}	DC current gain	V_{CE} = -1 V; I_C = -0.1 mA; T_{amb} = 25 °C		60	-	-	
		V_{CE} = -1 V; I_C = -1 mA; T_{amb} = 25 °C		80	-	-	
		V_{CE} = -1 V; I_C = -10 mA; T_{amb} = 25 °C		100	-	300	
		V_{CE} = -1 V; I_C = -50 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		60	-	-	
		V_{CE} = -1 V; I_C = -100 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		30	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -10 mA; I_B = -1 mA; T_{amb} = 25 °C		-	-	-250	mV
		I_C = -50 mA; I_B = -5 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	-400	mV
V_{BEsat}	base-emitter saturation voltage	I_C = -10 mA; I_B = -1 mA; T_{amb} = 25 °C		-	-	-850	mV
		I_C = -50 mA; I_B = -5 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	-950	mV
t_d	delay time	I_C = -10 mA; I_{Bon} = -1 mA; I_{Boff} = 1 mA; T_{amb} = 25 °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 V; I_E = 0 A; i_e = 0 A; f = 100 MHz; T_{amb} = 25 °C		-	-	4.5	pF
C_e	emitter capacitance	V_{EB} = -0.5 V; I_C = 0 A; i_c = 0 A; f = 100 MHz; T_{amb} = 25 °C		-	-	12	pF
f_T	transition frequency	V_{CE} = -20 V; I_C = -10 mA; f = 100 MHz; T_{amb} = 25 °C		150	-	-	MHz
NF	noise figure	V_{CE} = -5 V; I_C = -100 µA; R_S = 1 kΩ; 10 Hz < f < 15700 Hz; T_{amb} = 25 °C		-	-	4	dB

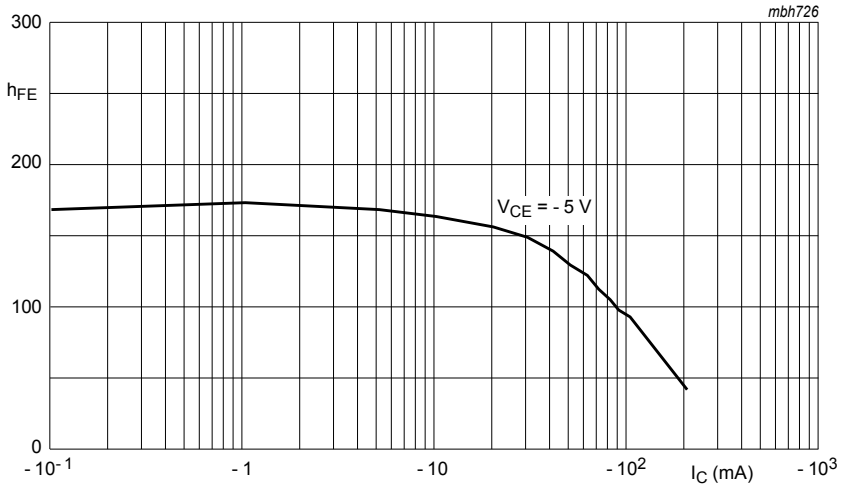
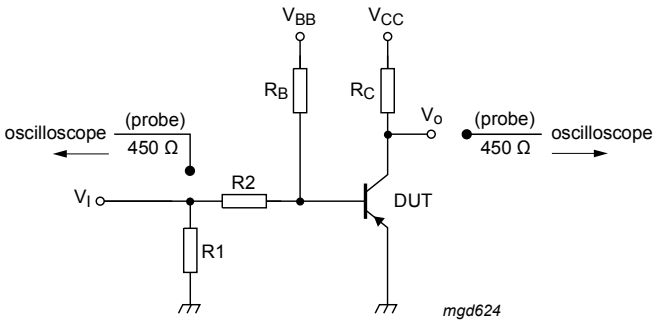


Fig. 1. DC current gain as a function of collector current; typical values

11. Test information

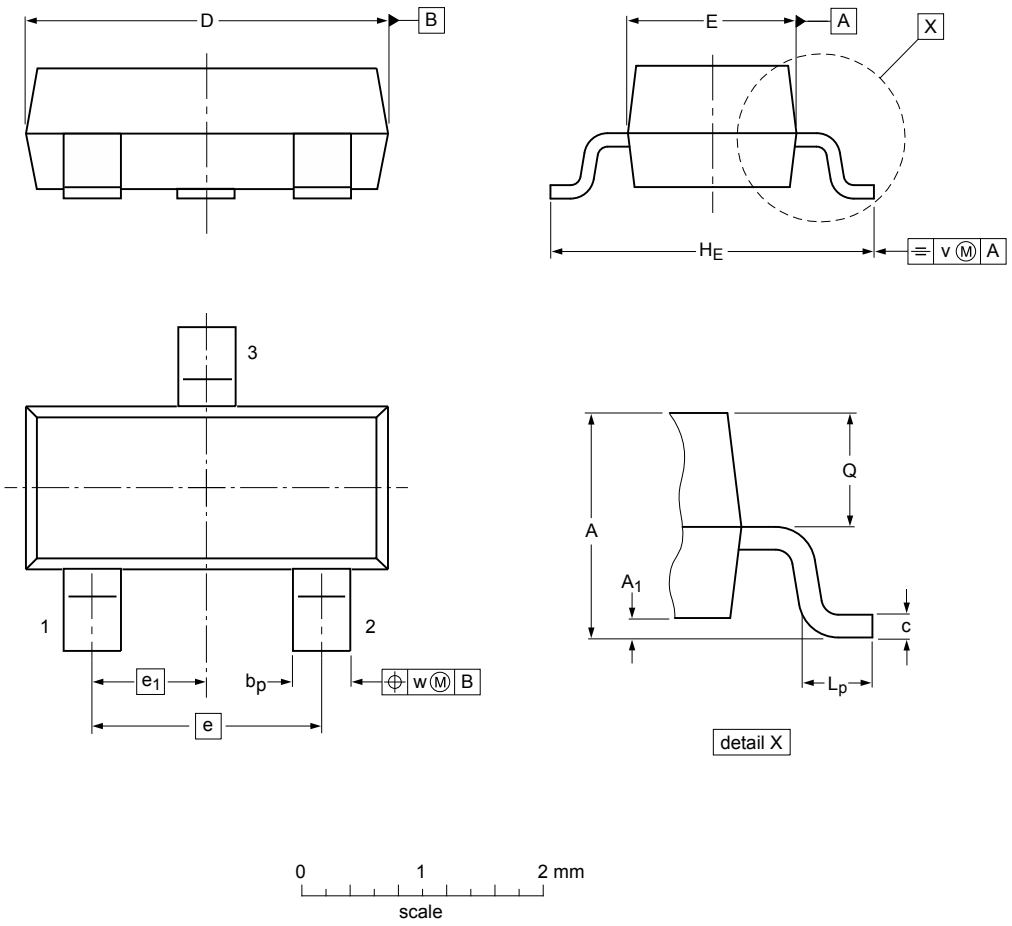


V_I = -5 V; T = 500 µs; t_p = 10 µs; t_r = t_f ≤ 3 ns.
R1 = 56 Ω; R2 = 2.5 kΩ; R_B = 3.9 kΩ; R_C = 270 Ω.
V_{BB} = 1.9 V; V_{CC} = 3 V.
Oscilloscope: input impedance Z_i = 50 Ω.

Fig. 2. Test circuit or switching times

12. Package outline

Plastic surface-mounted package; 3 leads **SOT23**



Dimensions (mm are the original dimensions)

Unit		A	A_1	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	max	1.1	0.1	0.48	0.15	3.0	1.4			2.5	0.45	0.55		
	nom							1.9	0.95				0.2	0.1
	min	0.9		0.38	0.09	2.8	1.2			2.1	0.15	0.45		

sot023_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				~~14-06-19~~ 14-09-22

Fig. 3. Package outline TO-236AB (SOT23)

13. Soldering

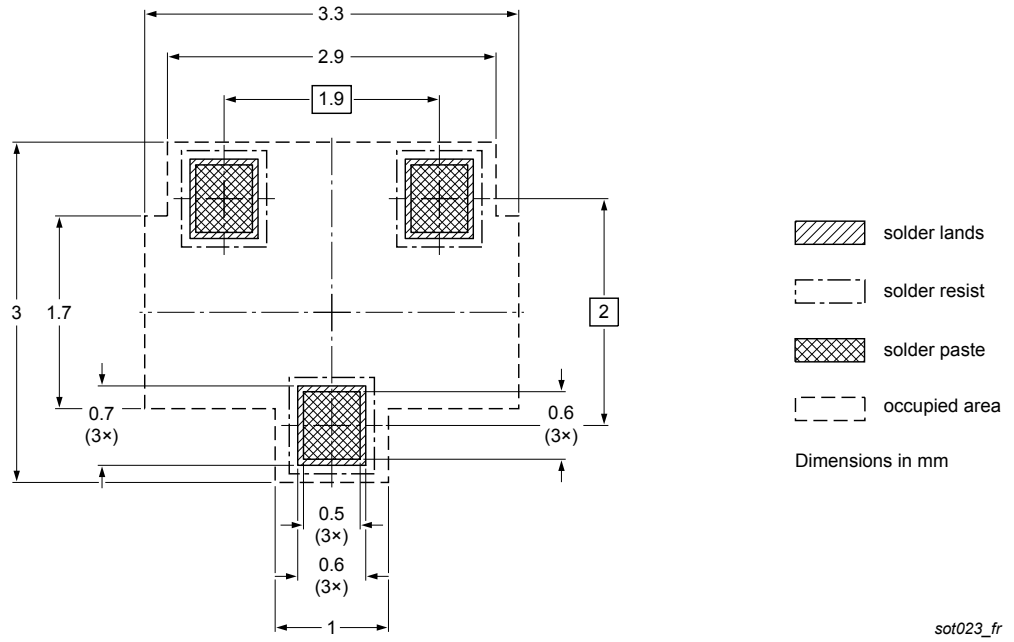


Fig. 4. Reflow soldering footprint for TO-236AB (SOT23)

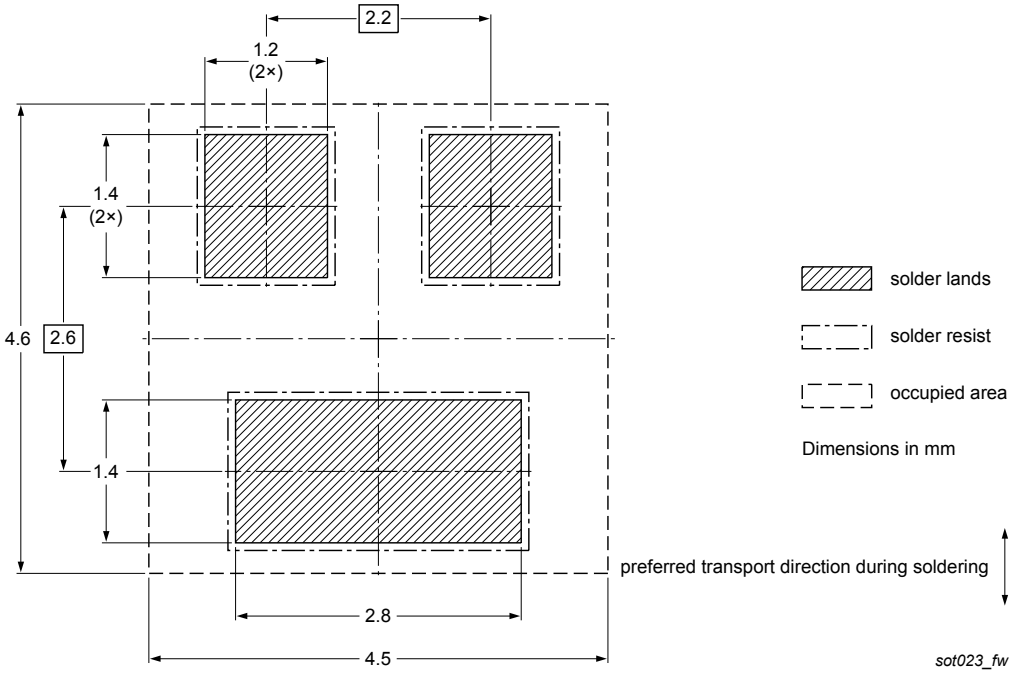


Fig. 5. Wave soldering footprint for TO-236AB (SOT23)

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:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate.			
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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