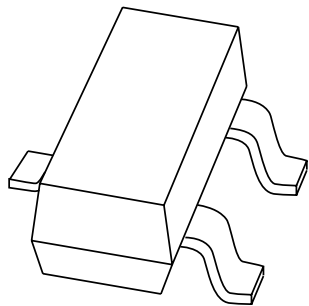


DATA SHEET



PMBT2907; PMBT2907A PNP switching transistors

Product specification
Supersedes data of 1999 Apr 27

2004 Jan 16

PNP switching transistors

PMBT2907; PMBT2907A

FEATURES

- High current (max. 600 mA)
- Low voltage (max. 60 V).

APPLICATIONS

- Switching and linear amplification.

DESCRIPTION

PNP switching transistor in a SOT23 plastic package.
NPN complements: PMBT2222 and PMBT2222A.

MARKING

TYPE NUMBER	MARKING CODE ⁽¹⁾
PMBT2907	*2B
PMBT2907A	*2F

Note

- * = p : Made in Hong Kong.
* = t : Made in Malaysia.
* = W: Made in China.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

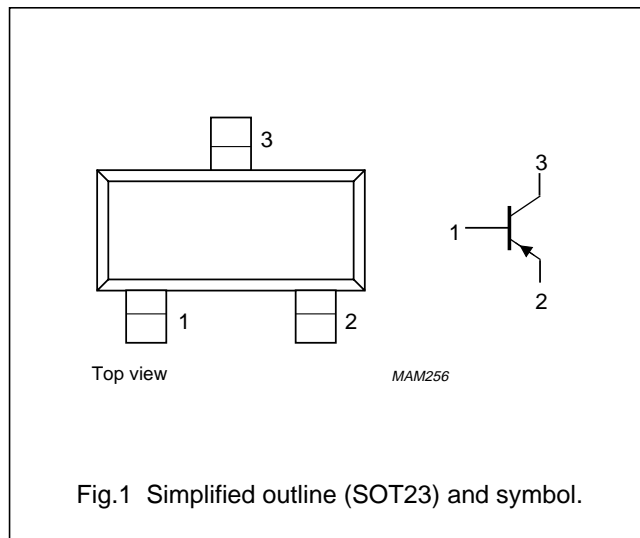


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PMBT2907	–	plastic surface mounted package; 3 leads	SOT23
PMBT2907A	–	plastic surface mounted package; 3 leads	SOT23

PNP switching transistors

PMBT2907; PMBT2907A

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	–	–60	V
V_{CEO}	collector-emitter voltage	open base	–	–40	V
	PMBT2907 PMBT2907A		–	–60	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–600	mA
I_{CM}	peak collector current		–	–800	mA
I_{BM}	peak base current		–	–200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Transistor mounted on an FR4 printed-circuit board.

PNP switching transistors

PMBT2907; PMBT2907A

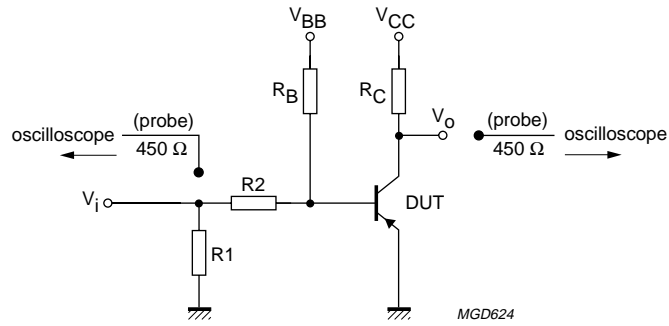
CHARACTERISTICS

$T_j = 25\text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector-base cut-off current PMBT2907	$I_E = 0; V_{CB} = -50\text{ V}$	–	–20	nA
	PMBT2907A		–	–10	nA
	collector-base cut-off current PMBT2907	$I_E = 0; V_{CB} = -50\text{ V}; T_j = 125\text{ °C}$	–	–20	μA
	PMBT2907A		–	–10	μA
I_{EBO}	emitter-base cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	–	–50	nA
h_{FE}	DC current gain PMBT2907	$I_C = -0.1\text{ mA}; V_{CE} = -10\text{ V}$	35	–	
	PMBT2907A		75	–	
	DC current gain PMBT2907	$I_C = -1\text{ mA}; V_{CE} = -10\text{ V}$	50	–	
	PMBT2907A		100	–	
	DC current gain PMBT2907	$I_C = -10\text{ mA}; V_{CE} = -10\text{ V}$	75	–	
PMBT2907A	100		–		
	DC current gain	$I_C = -150\text{ mA}; V_{CE} = -10\text{ V}$	100	300	
	DC current gain PMBT2907	$I_C = -500\text{ mA}; V_{CE} = -10\text{ V}$	30	–	
	PMBT2907A		50	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -150\text{ mA}; I_B = -15\text{ mA}$	–	–400	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}$	–	–1.6	V
V_{BEsat}	base-emitter saturation voltage	$I_C = -150\text{ mA}; I_B = -15\text{ mA}$	–	–1.3	V
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}$	–	–2.6	V
C_c	collector capacitance	$I_E = I_e = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	–	8	pF
C_e	emitter capacitance	$I_C = I_c = 0; V_{EB} = -2\text{ V}; f = 1\text{ MHz}$	–	30	pF
f_T	transition frequency	$I_C = -50\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}$	200	–	MHz
Switching times (between 10% and 90% levels); (see Fig.2)					
t_{on}	turn-on time	$I_{Con} = -150\text{ mA}; I_{Bon} = -15\text{ mA};$ $I_{Boff} = 15\text{ mA}$	–	40	ns
t_d	delay time		–	12	ns
t_r	rise time		–	30	ns
t_{off}	turn-off time		–	365	ns
t_s	storage time		–	300	ns
t_f	fall time		–	65	ns

PNP switching transistors

PMBT2907; PMBT2907A



$V_i = -9.5 \text{ V}$; $T = 500 \text{ } \mu\text{s}$; $t_p = 10 \text{ } \mu\text{s}$; $t_r = t_f \leq 3 \text{ ns}$.
 $R_1 = 68 \text{ } \Omega$; $R_2 = 325 \text{ } \Omega$; $R_B = 325 \text{ } \Omega$; $R_C = 160 \text{ } \Omega$.
 $V_{BB} = 3.5 \text{ V}$; $V_{CC} = -29.5 \text{ V}$.
 Oscilloscope: input impedance $Z_i = 50 \text{ } \Omega$.

Fig.2 Test circuit for switching times.

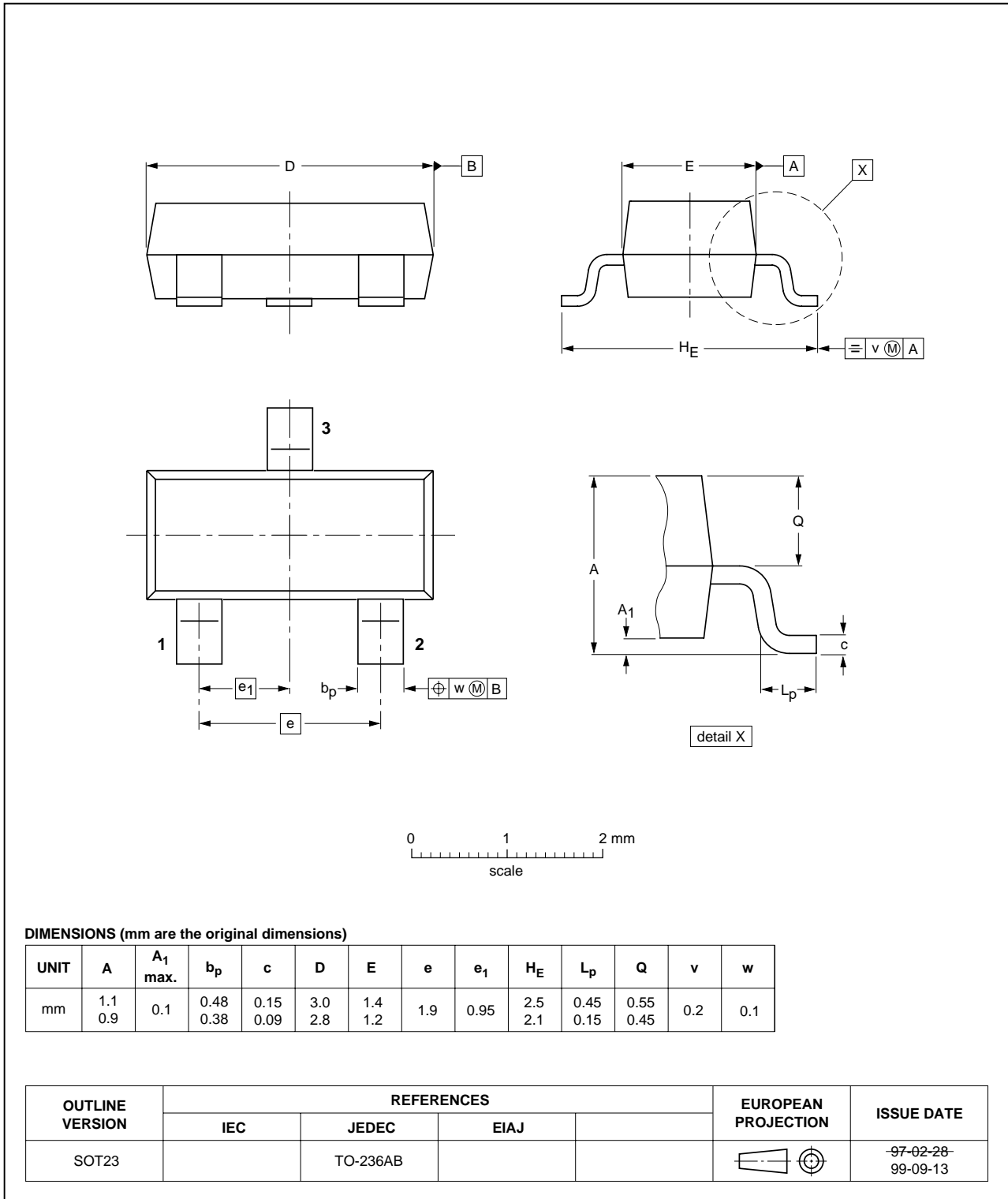
PNP switching transistors

PMBT2907; PMBT2907A

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



PNP switching transistors

PMBT2907; PMBT2907A

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

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2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.
3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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