



PMBT3640

PNP 1 GHz switching transistor

Rev. 03 — 6 July 2004

Product data sheet

1. Product profile

1.1 General description

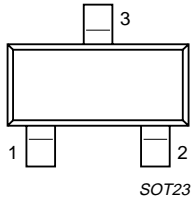
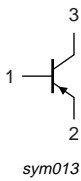
PNP general purpose switching transistor in a SOT23 package.

1.2 Features

- Volume delivery
- Short lead times
- Smallest packages.

2. Pinning information

Table 1: Discrete pinning

Pin	Description	Simplified outline	Symbol
1	base		
2	emitter		
3	collector		

3. Ordering information

Table 2: Ordering information

Type number	Package		
	Name	Description	Version
PMBT3640	-	plastic surface mounted package; 3 leads	SOT23

4. Marking

Table 3: Marking

Type number	Marking code
PMBT3640	51*

[1] * = p: Made in Hong Kong.

* = t: Made in Malaysia.

* = W: Made in China.

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5. Limiting values

Table 4: 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	-	-12	V
V_{CEO}	collector-emitter voltage	open base	-	-12	V
V_{EBO}	emitter-base voltage	open collector	-	-4	V
I_C	DC collector current		-	-80	mA
P_{tot}	total power dissipation	up to $T_s = 85\text{ °C}$	[1]	350	mW
T_{stg}	storage temperature		-55	+150	°C
T_j	junction temperature		-	175	°C

[1] T_s is the temperature at the soldering point of the collector tab.

6. Thermal characteristics

Table 5: Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-s)}$	from junction to soldering point of the collector tab		260	K/W

7. Characteristics

Table 6: Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Off characteristics						
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = -100\text{ }\mu\text{A}$; $I_E = 0\text{ A}$	-12	-	-	V
$V_{(BR)CES}$	collector-emitter breakdown voltage	$I_C = -100\text{ }\mu\text{A}$; $V_{BE} = 0\text{ V}$	-12	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_E = -100\text{ }\mu\text{A}$; $I_C = 0\text{ A}$	-4	-	-	V
I_{CES}	collector cut-off current	$V_{CE} = -6\text{ V}$; $V_{BE} = 0\text{ V}$	-	-	-0.01	μA
		$V_{CE} = -6\text{ V}$; $V_{BE} = 0\text{ V}$; $T_{amb} = 65\text{ °C}$	-	-	-1	μA
I_B	base current	$V_{CE} = -6\text{ V}$; $V_{BE} = 0\text{ V}$	-	-	-10	nA
On characteristics; pulse test: pulse width $\leq 300\text{ }\mu\text{s}$ and duty cycle $\leq 2\%$						
h_{FE}	DC current gain	$I_C = -10\text{ mA}$; $V_{CE} = -0.3\text{ V}$	30	-	120	
		$I_C = -50\text{ mA}$; $V_{CE} = -1\text{ V}$	20	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$	-	-	-0.2	V
		$I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$	-	-	-0.6	V
		$I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$; $T_{amb} = 65\text{ °C}$	-	-	-0.25	V

Table 6: Characteristics ...continued
 $T_j = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{BEsat}	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$	-0.75	-	-0.95	V
		$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	-0.8	-	-1	V
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	-	-	-1.5	V
Small-signal characteristics						
f_T	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V};$ $f = 100\text{ MHz}$	500	-	-	MHz
C_c	output capacitance	$I_E = 0\text{ A}; V_{CB} = -5\text{ V}; f = 1\text{ MHz}$	-	-	3.5	pF
C_e	input capacitance	$I_C = 0\text{ A}; V_{EB} = -0.5\text{ V};$ $f = 1\text{ MHz}$	-	-	3.5	pF
Switching times						
t_d	delay time	$V_{CC} = -6\text{ V}; I_C = -50\text{ mA};$ $V_{BE(off)} = -1.9\text{ V}; I_{B1} = -5\text{ mA}$			10	ns
t_s	storage time	$V_{CC} = -6\text{ V}; I_C = -50\text{ mA};$ $I_{B1} = I_{B2} = -5\text{ mA}$	-	-	20	ns
t_r	rise time	$V_{CC} = -6\text{ V}; I_C = -50\text{ mA};$ $V_{BE(off)} = -1.9\text{ V}; I_{B1} = -5\text{ mA}$	-	-	30	ns
t_f	fall time	$V_{CC} = -6\text{ V}; I_C = -50\text{ mA};$ $I_{B1} = I_{B2} = -5\text{ mA}$	-	-	12	ns
t_{on}	turn-on time	$V_{CC} = -6\text{ V}; I_C = -50\text{ mA};$ $V_{BE(off)} = -1.9\text{ V}; I_{B1} = -5\text{ mA}$	-	-	25	ns
		$V_{CC} = -1.5\text{ V}; I_C = -10\text{ mA};$ $I_{B1} = -0.5\text{ mA}$	-	-	60	ns
t_{off}	turn-off time	$V_{CC} = -6\text{ V}; I_C = -50\text{ mA};$ $V_{BE(off)} = -1.9\text{ V};$ $I_{B1} = I_{B2} = -5\text{ mA}$	-	-	35	ns
		$V_{CC} = -1.5\text{ V}; I_C = -10\text{ mA};$ $I_{B1} = I_{B2} = -0.5\text{ mA}$	-	-	75	ns

8. Package outline

Plastic surface mounted package; 3 leads

SOT23

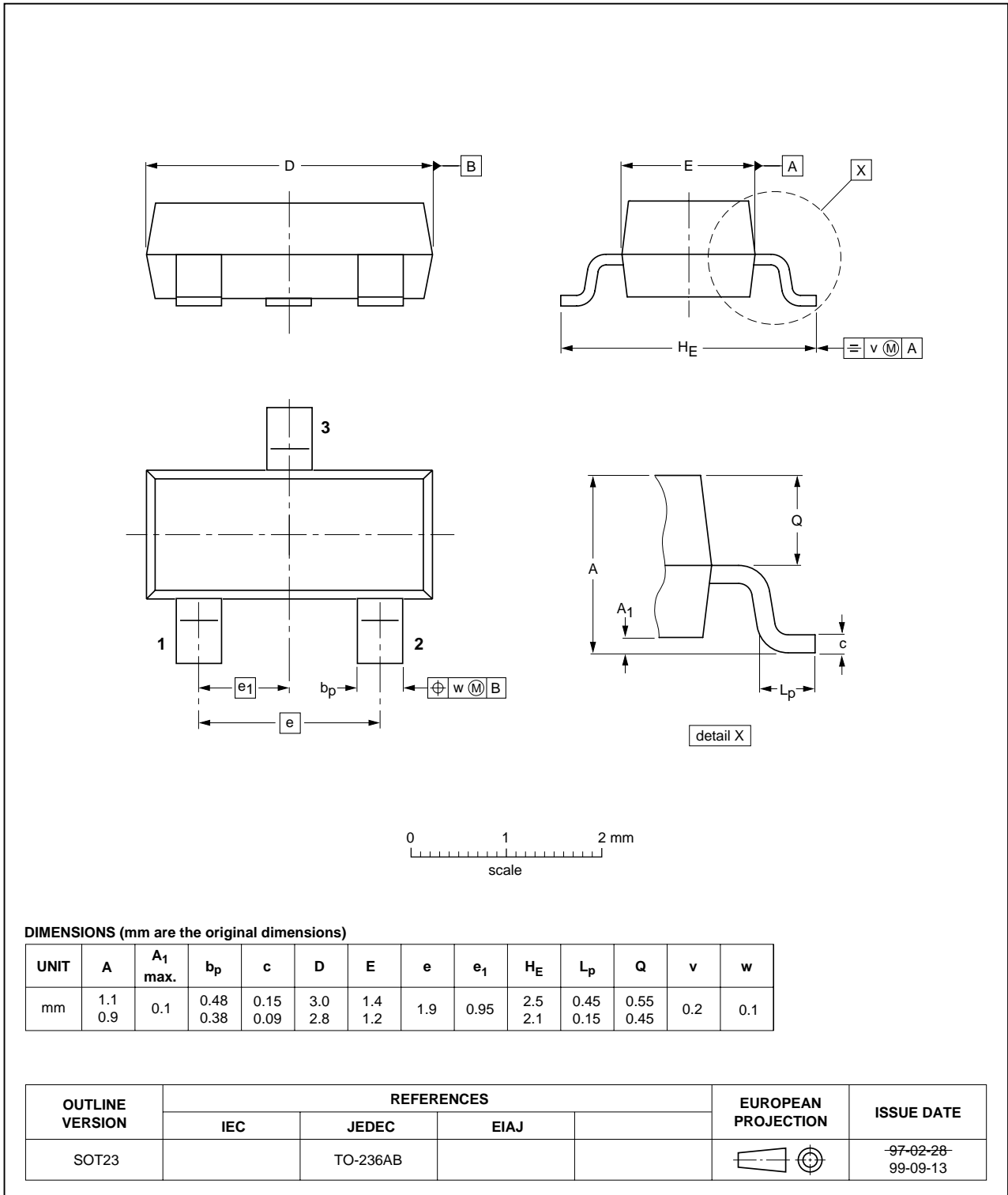


Fig 1. Package outline.

9. Revision history

Table 7: Revision history

Document ID	Release date	Data sheet status	Change notice	Order number	Supersedes
PMBT3640_3	20040706	Product data sheet	-	9397 750 13404	PMBT3640_CNV_2
Modifications:					
					<ul style="list-style-type: none">• The format of this data sheet has been redesigned to comply with the current presentation and information standard of Philips Semiconductors.• Table 3: Marking code changed.• Section 1.2: Feature list added.
PMBT3640_CNV_2	19950930	Product specification	-	-	-

10. 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.
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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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