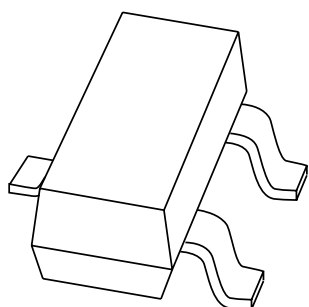


DATA SHEET



PMBT2369 NPN switching transistor

Product specification
Supersedes data of 1997 Jun 02

1999 Apr 27

NPN switching transistor

PMBT2369

FEATURES

- Low current (max. 200 mA)
- Low voltage (max. 15 V).

APPLICATIONS

- High-speed switching, especially in portable equipment.

DESCRIPTION

NPN switching transistor in a SOT23 plastic package.

MARKING

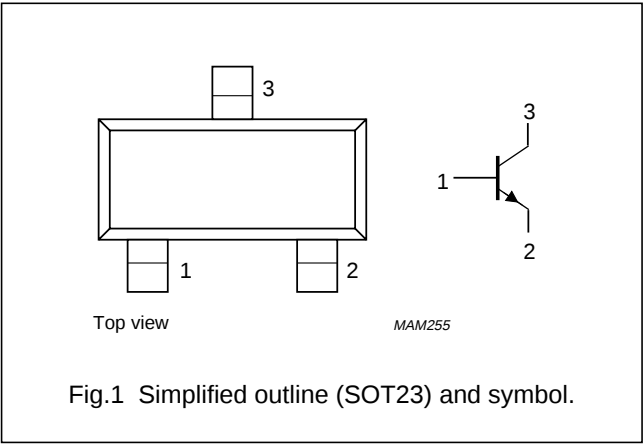
TYPE NUMBER	MARKING CODE ⁽¹⁾
PMBT2369	*1J

Note

1. * = p : Made in Hong Kong.
* = t : Made in Malaysia.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CBO}	collector-base voltage	open emitter	–	40	V
V _{CEO}	collector-emitter voltage	open base	–	15	V
V _{EBO}	emitter-base voltage	open collector	–	5	V
I _C	collector current (DC)		–	200	mA
I _{CM}	peak collector current		–	300	mA
I _{BM}	peak base current		–	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	–	250	mW
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C

Note

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

NPN switching transistor

PMBT2369

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.

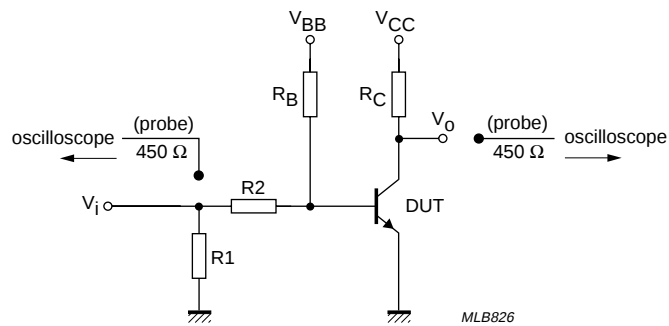
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 20\ \text{V}$	–	400	nA
		$I_E = 0; V_{CB} = 20\ \text{V}; T_j = 125\ ^\circ\text{C}$	–	30	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = 4\ \text{V}$	–	100	nA
h_{FE}	DC current gain	$I_C = 10\ \text{mA}; V_{CE} = 1\ \text{V}$	40	120	
		$I_C = 10\ \text{mA}; V_{CE} = 1\ \text{V}; T_{amb} = -55\ ^\circ\text{C}$	20	–	
		$I_C = 100\ \text{mA}; V_{CE} = 2\ \text{V}$	20	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\ \text{mA}; I_B = 1\ \text{mA}$	–	250	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\ \text{mA}; I_B = 1\ \text{mA}$	700	850	mV
C_c	collector capacitance	$I_E = I_C = 0; V_{CB} = 5\ \text{V}; f = 1\ \text{MHz}$	–	4	pF
f_T	transition frequency	$I_C = 10\ \text{mA}; V_{CE} = 10\ \text{V}; f = 100\ \text{MHz}$	500	–	MHz
Switching times (between 10% and 90% levels); (see Fig.2)					
t_{on}	turn-on time	$I_{Con} = 10\ \text{mA}; I_{Bon} = 3\ \text{mA};$ $I_{Boff} = -1.5\ \text{mA}$	–	10	ns
t_d	delay time		–	4	ns
t_r	rise time		–	6	ns
t_{off}	turn-off time		–	20	ns
t_s	storage time		–	10	ns
t_f	fall time		–	10	ns

NPN switching transistor

PMBT2369



$V_i = 0.5$ to 4.2 V; $T = 500$ μ s; $t_p = 10$ μ s; $t_r = t_f \leq 3$ ns.

$R_1 = 56$ Ω ; $R_2 = 1$ k Ω ; $R_B = 1$ k Ω ; $R_C = 270$ Ω .

$V_{BB} = 0.2$ V; $V_{CC} = 2.7$ V.

Oscilloscope input impedance $Z_i = 50$ Ω .

Fig.2 Test circuit for switching times.

NPN switching transistor

PMBT2369

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



NPN switching transistor

PMBT2369

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

NPN switching transistor

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