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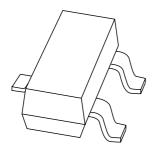
If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via **salesaddresses@nexperia.com**). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

# DISCRETE SEMICONDUCTORS

# DATA SHEET



# PMBT2369 NPN switching transistor

Product data sheet Supersedes data of 1999 Apr 27 2004 Jan 22



# **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		

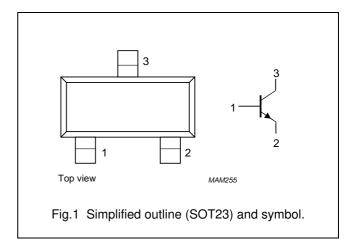
#### Note

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

\* = W : Made in China.

#### **PINNING**

PIN	DESCRIPTION
1	base
2	emitter
3	collector



#### **ORDERING INFORMATION**

TYPE	PACKAGE					
NUMBER	NAME	NAME DESCRIPTION VERSION				
PMBT2369	_	plastic surface mounted package; 3 leads SOT23				

#### **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	_	15	٧
V <sub>EBO</sub>	emitter-base voltage	open collector	_	5	٧
Ic	collector current (DC)		_	200	mA
I <sub>CM</sub>	peak collector current		_	300	mA
I <sub>BM</sub>	peak base current		_	100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	_	250	mW
T <sub>stg</sub>	storage temperature		-65	+150	°C
T <sub>j</sub>	junction temperature		_	150	°C
T <sub>amb</sub>	operating ambient temperature		-65	+150	°C

#### Note

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

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#### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	note 1	500	K/W

#### Note

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

#### **CHARACTERISTICS**

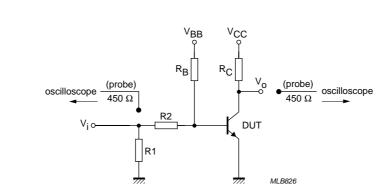
 $T_i = 25$  °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I <sub>CBO</sub>	collector cut-off current	I <sub>E</sub> = 0; V <sub>CB</sub> = 20 V	_	400	nA
		I <sub>E</sub> = 0; V <sub>CB</sub> = 20 V; T <sub>j</sub> = 125 °C	_	30	μΑ
I <sub>EBO</sub>	emitter cut-off current	I <sub>C</sub> = 0; V <sub>EB</sub> = 4 V	_	100	nA
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 1 V	40	120	
		$I_C = 10 \text{ mA}; V_{CE} = 1 \text{ V}; T_{amb} = -55 ^{\circ}\text{C}$	20	_	
		I <sub>C</sub> = 100 mA; V <sub>CE</sub> = 2 V	20	_	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = 10 mA; I <sub>B</sub> = 1 mA	_	250	mV
V <sub>BEsat</sub>	base-emitter saturation voltage	I <sub>C</sub> = 10 mA; I <sub>B</sub> = 1 mA	700	850	mV
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = I <sub>e</sub> = 0; V <sub>CB</sub> = 5 V; f = 1 MHz	_	4	pF
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 10 V; f = 100 MHz	500	_	MHz
Switching t	imes (between 10% and 90% levels	); (see Fig.2)			
t <sub>on</sub>	turn-on time	I <sub>Con</sub> = 10 mA; I <sub>Bon</sub> = 3 mA;	_	10	ns
t <sub>d</sub>	delay time	$I_{Boff} = -1.5 \text{ mA}$	_	4	ns
t <sub>r</sub>	rise time		_	6	ns
t <sub>off</sub>	turn-off time		_	20	ns
t <sub>s</sub>	storage time		_	10	ns
t <sub>f</sub>	fall time		_	10	ns

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$$\begin{split} &V_i=0.5\text{ to }4.2\text{ V; }T=500\text{ }\mu\text{s; }t_p=10\text{ }\mu\text{s; }t_r=t_f\leq 3\text{ ns.}\\ &R1=56\text{ }\Omega;\text{ }R2=1\text{ }k\Omega;\text{ }R_B=1\text{ }k\Omega;\text{ }R_C=270\text{ }\Omega.\\ &V_{BB}=0.2\text{ V; }V_{CC}=2.7\text{ V.}\\ &Oscilloscope input impedance }Z_i=50\text{ }\Omega. \end{split}$$

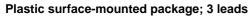
Fig.2 Test circuit for switching times.

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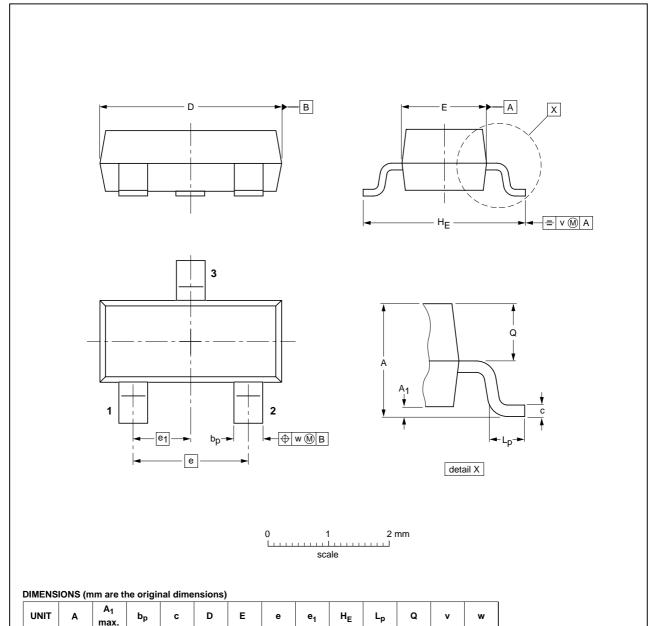
# NPN switching transistor

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#### **PACKAGE OUTLINE**



SOT23



OUTLINE		REFER	RENCES	EUROPEAN	ISSUE DATE
VERSION	IEC	JEDEC	JEITA	PROJECTION	ISSUE DATE
SOT23		TO-236AB			<del>-04-11-04</del> -06-03-16

0.45

0.55

0.1

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max

0.9

0.48

0.38

0.15

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#### **DATA SHEET STATUS**

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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## **NXP Semiconductors**

#### **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

#### **Contact information**

For additional information please visit: http://www.nxp.com

For sales offices addresses send e-mail to: salesaddresses@nxp.com

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Printed in The Netherlands R75/04/pp7 Date of release: 2004 Jan 22 Document order number: 9397 750 12458

