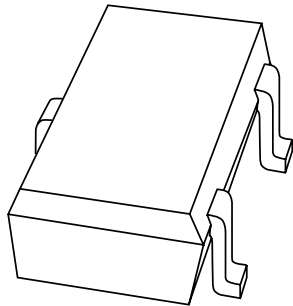


DATA SHEET



PMST4401 NPN switching transistor

Product data sheet
Supersedes data of 1997 May 07

1999 Apr 22

NPN switching transistor

PMST4401

FEATURES

- High current (max. 600 mA)
- Low voltage (max. 40 V).

APPLICATIONS

- General purpose switching and linear amplification, especially in portable equipment.

DESCRIPTION

NPN switching transistor in a SOT323 plastic package.
PNP complement: PMST4403.

MARKING

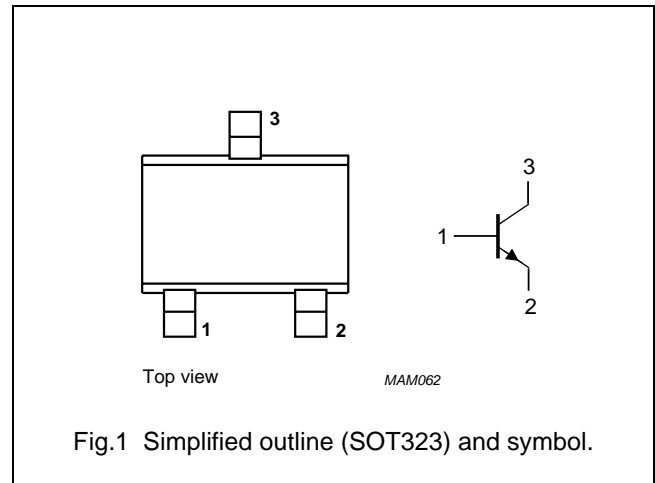
TYPE NUMBER	MARKING CODE ⁽¹⁾
PMST4401	*2X

Note

- * = - : 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	–	60	V
V _{CEO}	collector-emitter voltage	open base	–	40	V
V _{EBO}	emitter-base voltage	open collector	–	6	V
I _C	collector current (DC)		–	600	mA
I _{CM}	peak collector current		–	600	mA
I _{BM}	peak base current		–	200	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	–	200	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.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

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

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 60\text{ V}$	–	50	nA
		$I_E = 0; V_{CB} = 60\text{ V}; T_j = 150\text{ °C}$	–	10	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = 6\text{ V}$	–	50	nA
h_{FE}	DC current gain	$V_{CE} = 1\text{ V}$; (see Fig.2)			
		$I_C = 0.1\text{ mA}$	20	–	
		$I_C = 1\text{ mA}$	40	–	
		$I_C = 10\text{ mA}$	80	–	
		$I_C = 150\text{ mA}$; note 1	100	300	
	DC current gain	$I_C = 500\text{ mA}; V_{CE} = 2\text{ V}$; note 1	40	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 150\text{ mA}; I_B = 15\text{ mA}$; note 1	–	400	mV
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}$; note 1	–	750	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 150\text{ mA}; I_B = 15\text{ mA}$; note 1	–	950	mV
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}$; note 1	–	1.2	V
C_c	collector capacitance	$I_E = i_e = 0; V_{CB} = 5\text{ V}; f = 1\text{ MHz}$	–	8	pF
C_e	emitter capacitance	$I_E = i_e = 0; V_{EB} = 500\text{ mV}; f = 1\text{ MHz}$	–	30	pF
f_T	transition frequency	$I_C = 20\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	250	–	MHz
Switching times (between 10% and 90% levels); (see Fig.3)					
t_{on}	turn-on time	$I_{Con} = 150\text{ mA}; I_{Bon} = 15\text{ mA};$ $I_{Boff} = -15\text{ mA}$	–	35	ns
t_d	delay time		–	15	ns
t_r	rise time		–	20	ns
t_{off}	turn-off time		–	250	ns
t_s	storage time		–	200	ns
t_f	fall time		–	60	ns

Note

1. Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

NPN switching transistor

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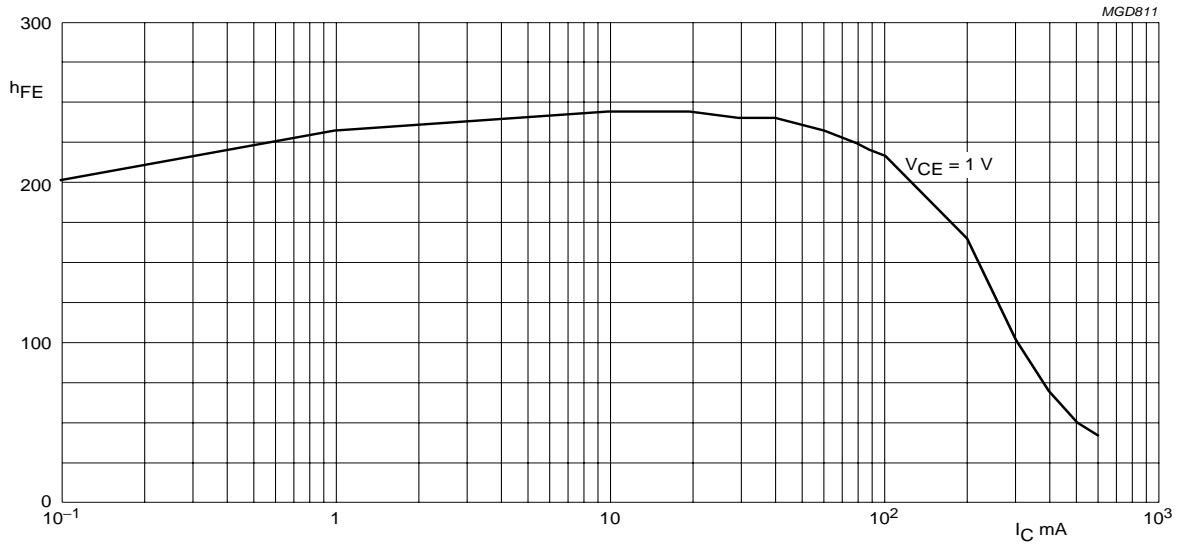
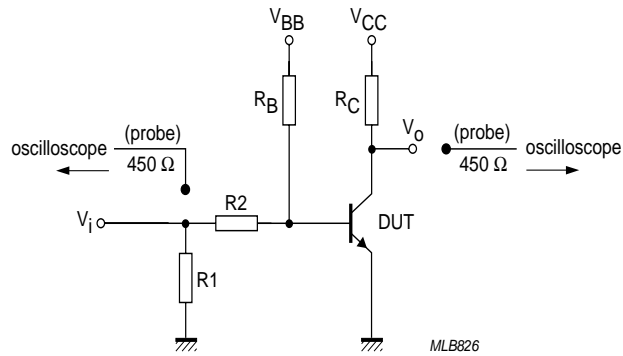


Fig.2 DC current gain; typical values.



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

Fig.3 Test circuit for switching times.

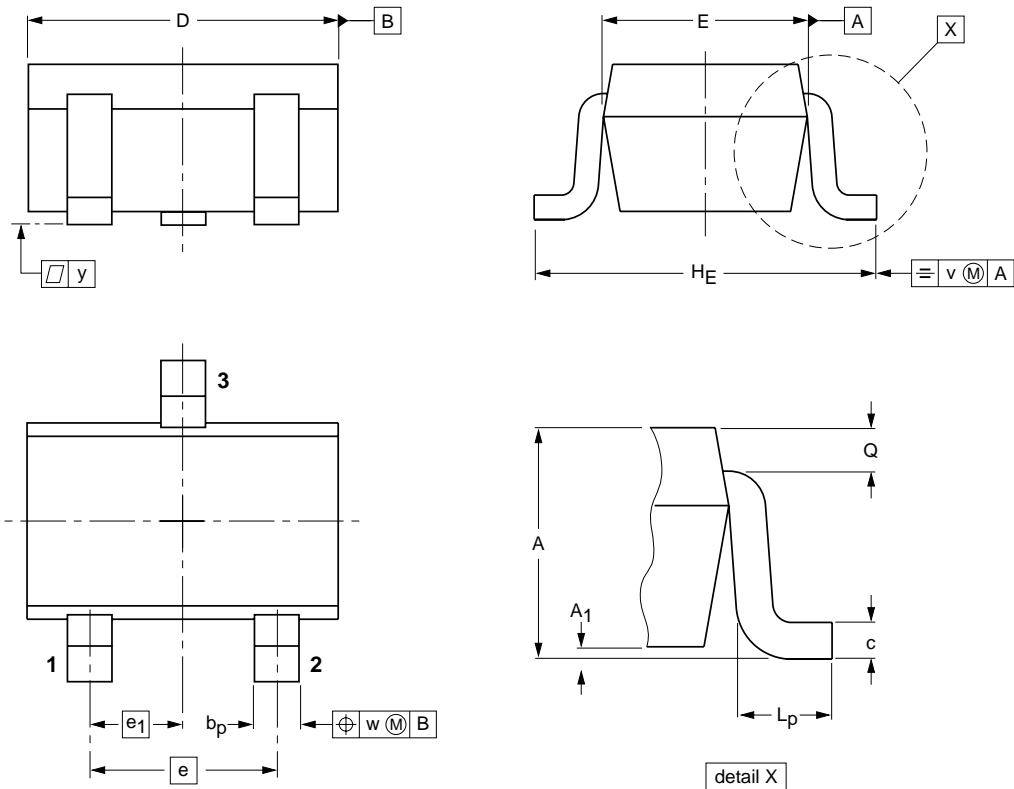
NPN switching transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

NPN switching transistor

PMST4401

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	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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Промышленная ул, дом № 19, литера Н,
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