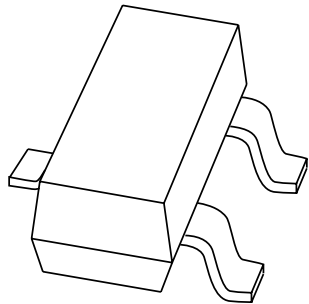


DATA SHEET



BSV52 NPN switching transistor

Product specification
Supersedes data of 1999 Apr 15

2004 Jan 14

NPN switching transistor

BSV52

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 12 V).

APPLICATIONS

- High speed saturated switching applications, especially in portable equipment.

DESCRIPTION

NPN switching transistor in a SOT23 plastic package.

MARKING

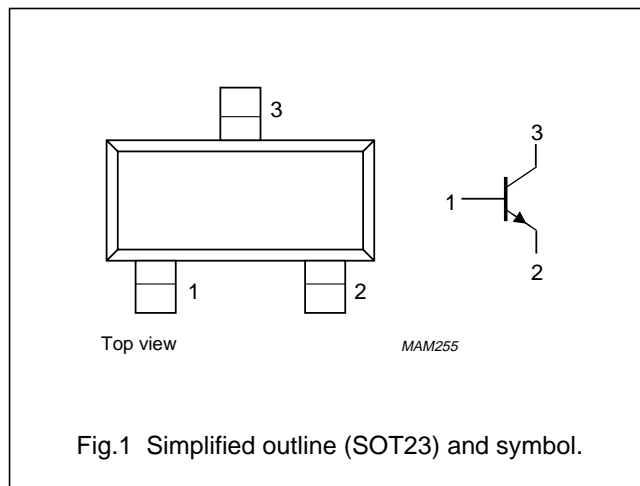
TYPE NUMBER	MARKING CODE ⁽¹⁾
BSV52	B2*

Note

- * = 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 NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BSV52	-	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_{CBO}	collector-base voltage	open emitter	-	20	V
V_{CEO}	collector-emitter voltage	open base	-	12	V
V_{EBO}	emitter-base voltage	open collector	-	5	V
I_C	collector current (DC)		-	100	mA
I_{CM}	peak collector current		-	200	mA
I_{BM}	peak base current		-	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	-	250	mW
T_{stg}	storage temperature		-65	+150	$^\circ\text{C}$
T_j	junction temperature		-	150	$^\circ\text{C}$
T_{amb}	operating ambient temperature		-65	+150	$^\circ\text{C}$

NPN switching transistor

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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.

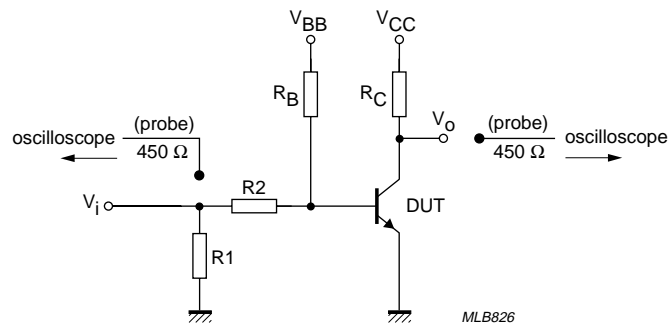
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 20\text{ V}$	–	–	400	nA
		$I_E = 0; V_{CB} = 20\text{ V}; T_j = 125\text{ °C}$	–	–	30	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = 4\text{ V}$	–	–	100	nA
h_{FE}	DC current gain	$V_{CE} = 1\text{ V}$				
		$I_C = 1\text{ mA}$	25	–	–	
		$I_C = 10\text{ mA}$	40	–	120	
		$I_C = 50\text{ mA}$	25	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 300\text{ }\mu\text{A}$	–	–	300	mV
		$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	–	–	250	mV
		$I_C = 50\text{ mA}; I_B = 5\text{ mA}$	–	–	400	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	700	–	850	mV
		$I_C = 50\text{ mA}; I_B = 5\text{ mA}$	–	–	1.2	V
C_c	collector capacitance	$I_E = i_e = 0; V_{CB} = 5\text{ V}; f = 1\text{ MHz}$	–	–	4	pF
C_e	emitter capacitance	$I_C = i_c = 0; V_{EB} = 1\text{ V}; f = 1\text{ MHz}$	–	–	4.5	pF
f_T	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	400	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

BSV52



$V_i = 0.5 \text{ V to } 4.2 \text{ V}$; $T = 500 \mu\text{s}$; $t_p = 10 \mu\text{s}$; $t_r = t_s \leq 3 \text{ ns}$.
 $R_1 = 56 \Omega$; $R_2 = 1 \text{ k}\Omega$; $R_B = 1 \text{ k}\Omega$; $R_C = 270 \Omega$.
 $V_{BB} = 0.2 \text{ V}$; $V_{CC} = 2.7 \text{ V}$.
Oscilloscope: input impedance $Z_i = 50 \Omega$.

Fig.2 Test circuit for switching times.

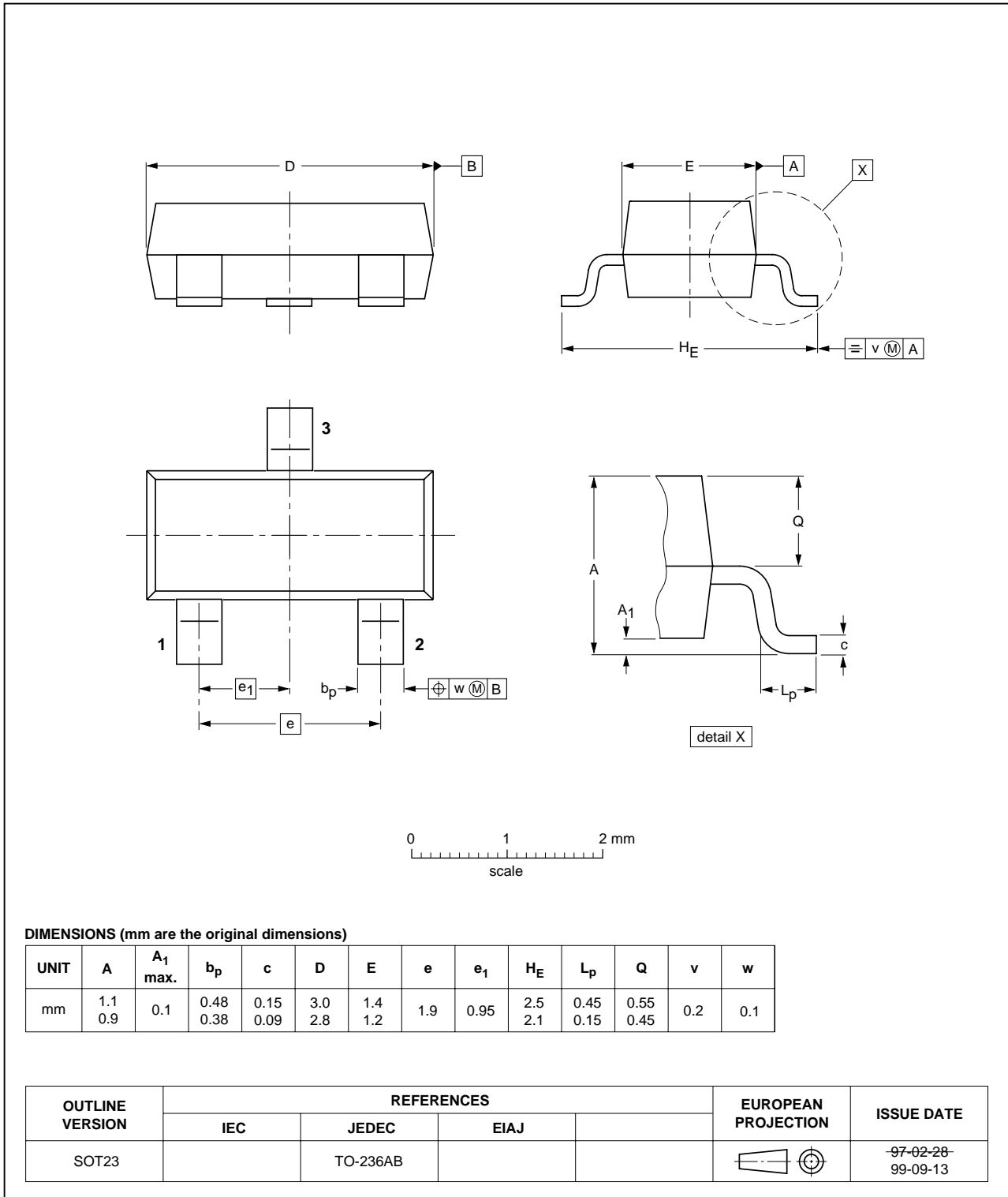
NPN switching transistor

BSV52

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



NPN switching transistor

BSV52

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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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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