

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

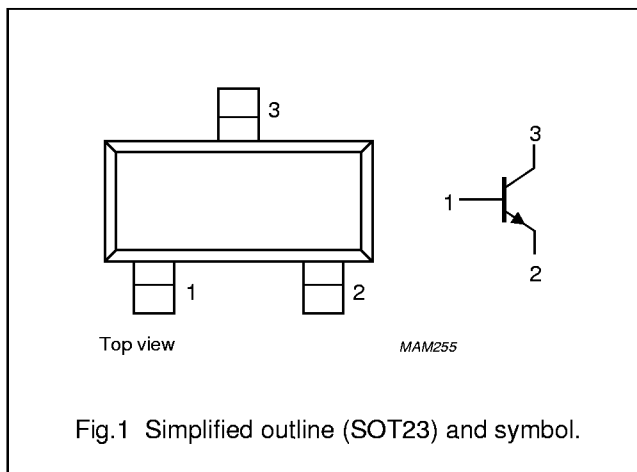
TYPE NUMBER	MARKING CODE ⁽¹⁾
BSV52	B2*

Note

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	–	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	$T_{amb} \leq 25\text{ °C}$	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

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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.

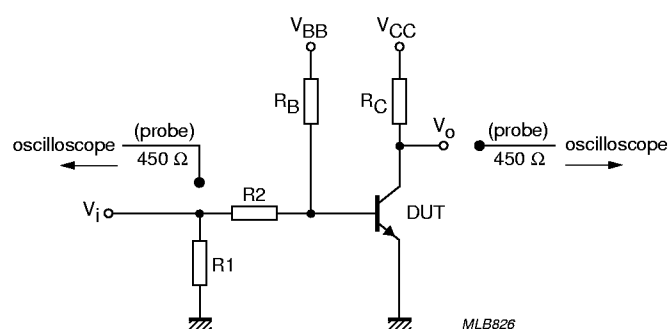
CHARACTERISTICS

$T_j = 25\text{ °C}$ 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	$I_E = I_C = 0; V_{CB} = 5\text{ V}; f = 1\text{ MHz}$	–	–	4	pF
C_e	emitter capacitance	$I_C = I_E = 0; V_{EB} = 1\text{ V}; f = 1\text{ MHz}$	–	–	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

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$V_i = 0.5 \text{ V to } 4.2 \text{ V}$; $T = 500 \mu\text{s}$; $t_p = 10 \mu\text{s}$; $t_r = t_s \leq 3 \text{ ns}$.

$R_1 = 56 \Omega$; $R_2 = 1 \text{ k}\Omega$; $R_B = 1 \text{ k}\Omega$; $R_C = 270 \Omega$.

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

Oscilloscope: input impedance $Z_i = 50 \Omega$.

Fig.2 Test circuit for switching times.

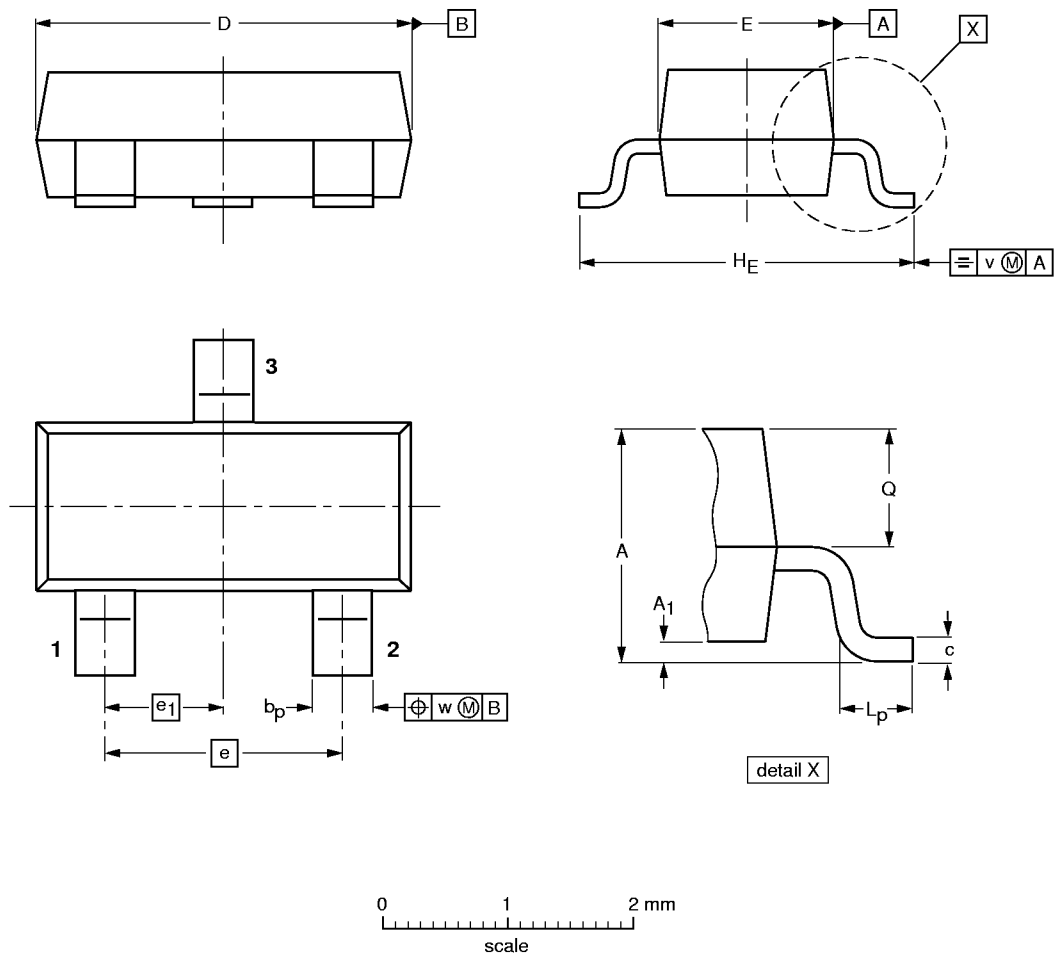
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23						97-02-28