

## Small signal NPN transistor

Datasheet - production data

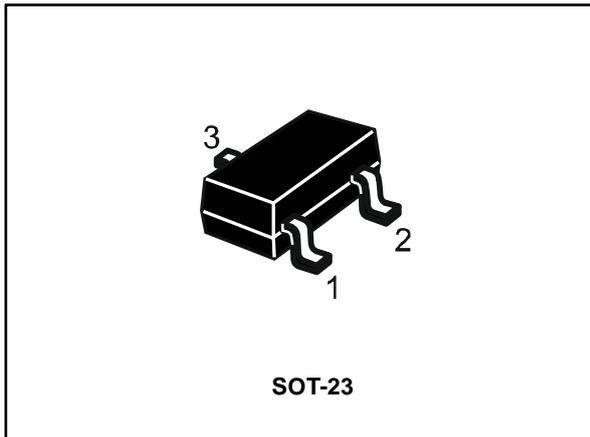
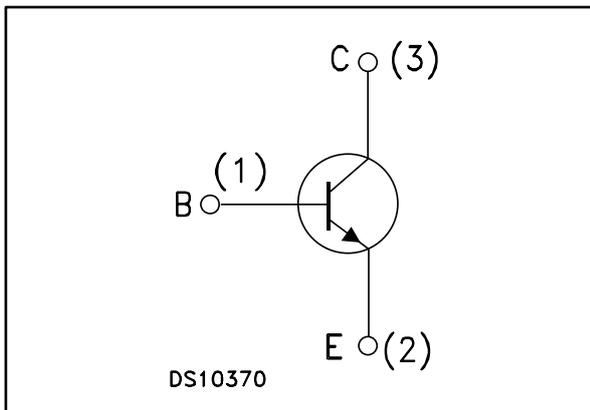


Figure 1: Internal schematic diagram



### Features

- Miniature SOT-23 plastic package for surface mounting circuits
- Tape and reel packaging
- The PNP complementary type is MMBTA92

### Applications

- Video amplifier circuits (rgb cathode current control)
- Telephone wireline interface (hook switches, dialer circuits)

### Description

The device is manufactured in Epitaxial Planar technology.

Table 1: Device summary

Order code	Marking	Package	Packaging
MMBTA42	A42	SOT-23	tape and reel

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## Contents

<b>1</b>	<b>Absolute maximum ratings.....</b>	<b>3</b>
<b>2</b>	<b>Electrical characteristics .....</b>	<b>4</b>
<b>3</b>	<b>Package mechanical data .....</b>	<b>5</b>
	3.1 SOT-23 mechanical data .....	5
<b>4</b>	<b>Revision history .....</b>	<b>7</b>

# 1 Absolute maximum ratings

( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise specified)

**Table 2: Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{\text{CBO}}$	Collector-base voltage ( $I_{\text{E}} = 0$ )	300	V
$V_{\text{CEO}}$	Collector-emitter voltage ( $I_{\text{B}} = 0$ )	300	V
$V_{\text{EBO}}$	Emitter-base voltage ( $I_{\text{C}} = 0$ )	6	V
$I_{\text{C}}$	Collector current	0.5	A
$I_{\text{CM}}$	Collector peak current ( $t_{\text{P}} < 5\text{ms}$ )	0.6	A
$P_{\text{tot}}$	Total dissipation at $T_{\text{amb}} = 25^{\circ}\text{C}$	350	mW
$T_{\text{stg}}$	Storage temperature	-65 to 150	$^{\circ}\text{C}$
$T_{\text{J}}$	Max. operating junction temperature	150	$^{\circ}\text{C}$

**Table 3: Thermal data**

Symbol	Parameter	Value	Unit
$R_{\text{thj-amb}}$	Thermal resistance junction-ambient <sup>(1)</sup>	357.1	$^{\circ}\text{C/W}$

**Notes:**

<sup>(1)</sup>Device mounted on PCB area of  $1\text{ cm}^2$ .

## 2 Electrical characteristics

( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise specified)

Table 4: Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = 200 \text{ V}$			100	$\mu\text{A}$
$V_{(\text{BR})\text{CBO}}$	Collector-base breakdown voltage ( $I_{\text{E}} = 0$ )	$I_{\text{C}} = 100 \mu\text{A}$	300			V
$V_{(\text{BR})\text{CEO}}^{(1)}$	Collector-emitter breakdown voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 1 \text{ mA}$	300			V
$V_{(\text{BR})\text{EBO}}$	Emitter-base breakdown voltage ( $I_{\text{C}} = 0$ )	$I_{\text{C}} = 100 \mu\text{A}$	6			V
$V_{\text{CE}(\text{sat})}$	Collector-emitter saturation voltage	$I_{\text{C}} = 20 \text{ mA};$ $I_{\text{B}} = 2 \text{ mA}$			0.5	V
$V_{\text{BE}(\text{sat})}$	Base-emitter saturation voltage	$I_{\text{C}} = 20 \text{ mA};$ $I_{\text{B}} = 2 \text{ mA}$			0.9	V
$h_{\text{FE}}$	DC current gain	$I_{\text{C}} = 1 \text{ mA},$ $V_{\text{CE}} = 10 \text{ V}$	25			
		$I_{\text{C}} = 10 \text{ mA},$ $V_{\text{CE}} = 10 \text{ V}$	40			
		$I_{\text{C}} = 30 \text{ mA},$ $V_{\text{CE}} = 10 \text{ V}$	40			
$f_{\text{T}}$	Transition frequency	$I_{\text{C}} = 10 \text{ mA},$ $V_{\text{CE}} = 20 \text{ V}$ $f = 100 \text{ MHz}$	50			MHz
$C_{\text{CBO}}$	Collector-base capacitance ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = 20 \text{ V};$ $f = 1 \text{ MHz}$		3		nC

**Notes:**

<sup>(1)</sup>Pulse test: pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5 \%$

### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

#### 3.1 SOT-23 mechanical data

Figure 2: SOT-23 mechanical drawing

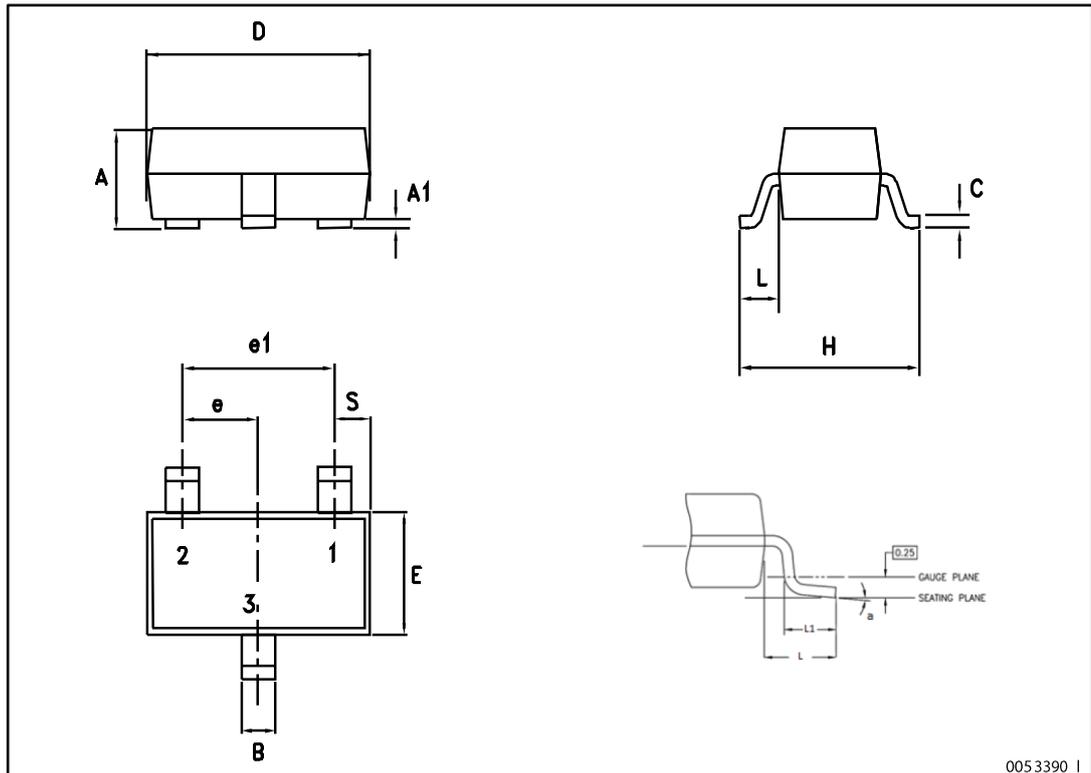
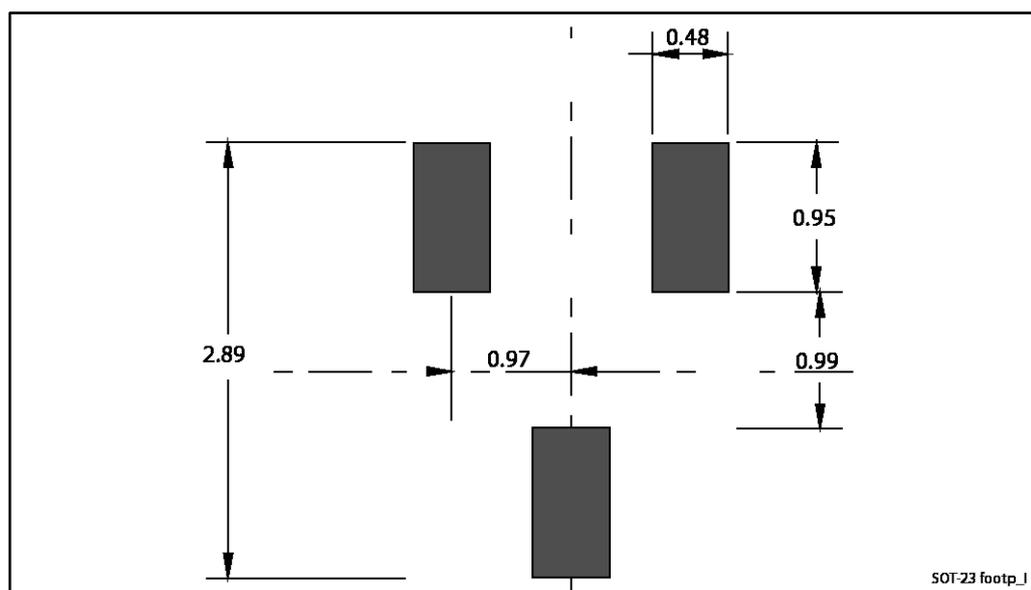


Table 5: SOT-23 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.89		1.40
A1	0		0.10
B	0.30		0.51
C	0.085		0.18
D	2.75		3.04
e	0.85		1.05
e1	1.70		2.10
E	1.20		1.75
H	2.10		3.00
L		0.60	
S	0.35		0.65
L1	0.25		0.55
a	0°		8°

Figure 3: SOT-23 recommended footprint



Dimensions are in mm.

## 4 Revision history

Table 6: Document revision history

Date	Revision	Changes
06-Jan-2003	2	
08-Nov-2007	3	Updated mechanical data.
07-May-2014	4	Updated <a href="#">Section 4: "Package mechanical data"</a> .

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