

## Small signal NPN transistor

### 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.

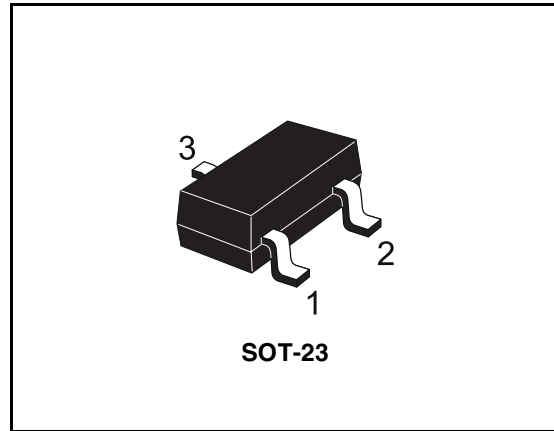


Figure 1. Internal schematic diagram

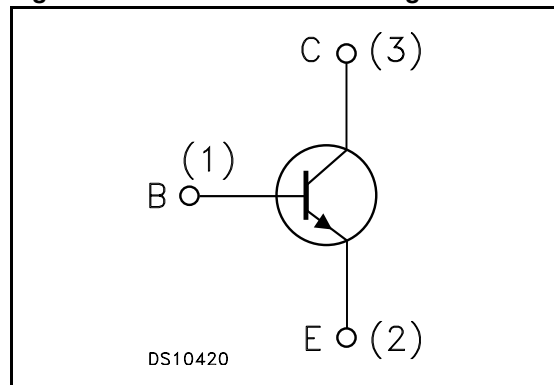


Table 1. Device summary

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

# 1 Electrical characteristics

( $T_{\text{case}} = 25^{\circ}\text{C}$  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> max	357.1	$^{\circ}\text{C/W}$

1. 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	nA
$V_{(\text{BR})\text{CBO}}$	Collector-base breakdown voltage ( $I_{\text{E}} = 0$ )	$I_{\text{C}} = 100 \mu\text{A}$	300			V
$V_{(\text{BR})\text{CEO}}^{(2)}$	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
$V_{\text{CE}(\text{sat})}^{(2)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 20 \text{ mA}$ $I_{\text{B}} = 2 \text{ mA}$			0.5	V
$V_{\text{BE}(\text{sat})}^{(2)}$	Base-emitter saturation voltage	$I_{\text{C}} = 20 \text{ mA}$ $I_{\text{B}} = 2 \text{ mA}$			0.9	V
$h_{\text{FE}}^{(2)}$	DC current gain	$I_{\text{C}} = 1 \text{ mA}$ $V_{\text{CE}} = 10 \text{ V}$ $I_{\text{C}} = 10 \text{ mA}$ $V_{\text{CE}} = 10 \text{ V}$ $I_{\text{C}} = 30 \text{ mA}$ $V_{\text{CE}} = 10 \text{ V}$	25 40 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		pF

Note (2) Pulsed 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 ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

## SOT-23 mechanical data

DIM.	mm.		
	min.	typ	max.
A	0.89		1.4
A1	0		0.1
B	0.3		0.51
C	0.085		0.18
D	2.75		3.04
e	0.85		1.05
e1	1.7		2.1
E	1.2		1.6
H	2.1		2.75
L		0.6	
S	0.35		0.65

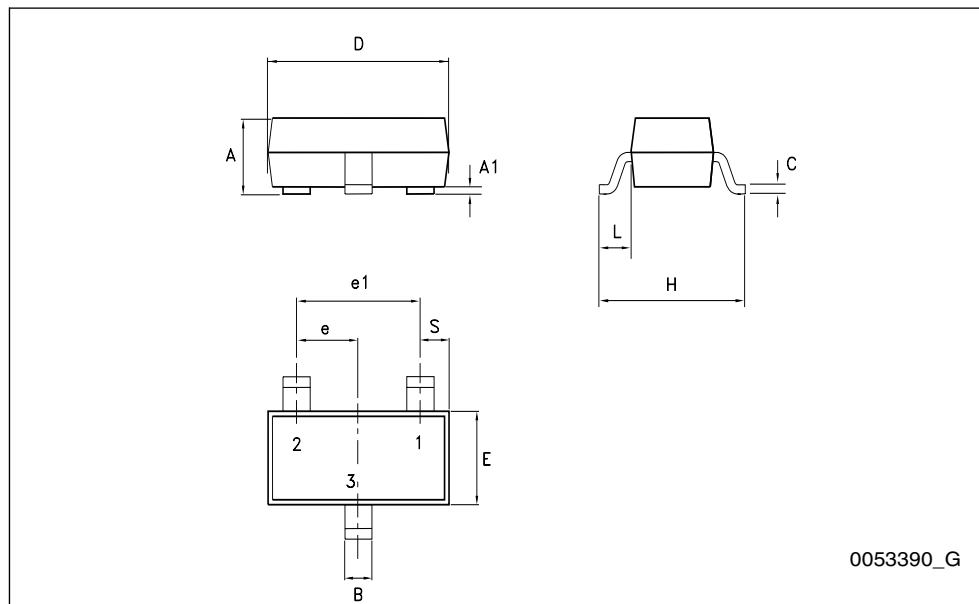
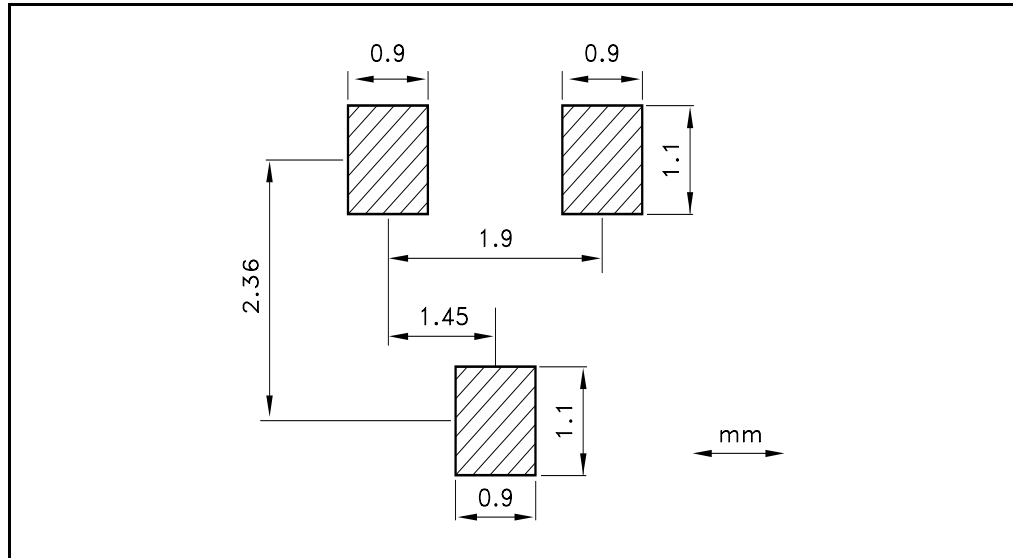


Figure 2. SOT-23 footprint



## 4 Revision history

Table 5. Document revision history

Date	Revision	Changes
06-Jan-2003	2	
08-Nov-2007	3	Updated mechanical data.

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