

## Small signal PNP transistor

### Features

- Miniature SOT-23 plastic package for surface mounting circuits
- Tape and reel packaging
- The NPN complementary type is MMBTA42

### Applications

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

### Description

The device is manufactured in Epitaxial Planar technology.

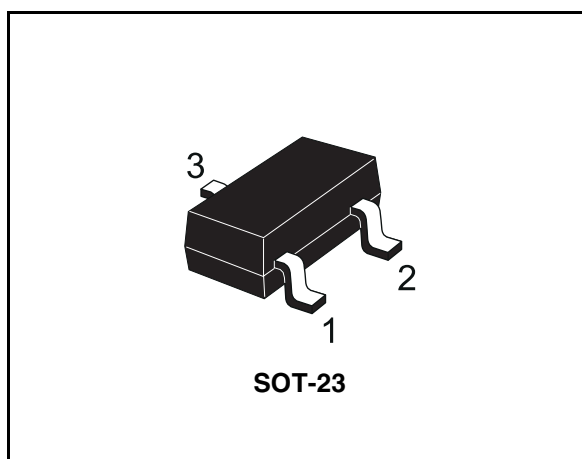


Figure 1. Internal schematic diagram

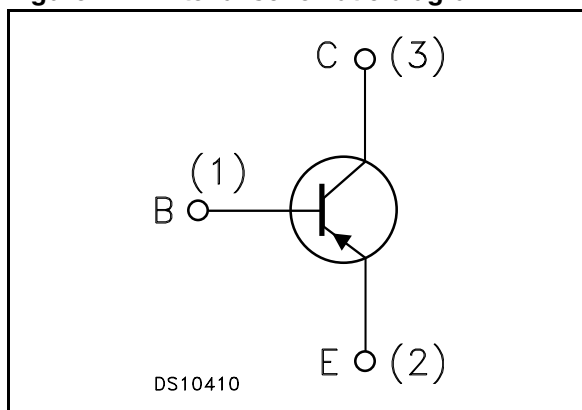


Table 1. Device summary

| Order code | Marking | Package | Packaging     |
|------------|---------|---------|---------------|
| MMBTA92    | A92     | SOT-23  | tape and reel |

# 1 Electrical characteristics

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

**Table 2. Absolute maximum rating**

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

**Table 3. Thermal data**

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

1. Device mounted on PCB area of 1 cm<sup>2</sup>.

## 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<br>( $I_{\text{E}} = 0$ )              | $V_{\text{CB}} = -200 \text{ V}$   |                |      | -100 | nA   |
| $V_{(\text{BR})\text{CBO}}$       | Collector-base<br>breakdown voltage<br>( $I_{\text{E}} = 0$ )    | $I_{\text{C}} = -100 \mu\text{A}$  | -300           |      |      | V    |
| $V_{(\text{BR})\text{CEO}}^{(2)}$ | Collector-emitter<br>breakdown voltage<br>( $I_{\text{B}} = 0$ ) | $I_{\text{C}} = -1 \text{ mA}$   | -300           |      |      | V    |
| $V_{(\text{BR})\text{EBO}}$       | Emitter-base breakdown<br>voltage<br>( $I_{\text{C}} = 0$ )      | $I_{\text{C}} = -100 \mu\text{A}$  | -5             |      |      | V    |
| $V_{\text{CE(sat)}}^{(2)}$        | Collector-emitter<br>saturation voltage                          | $I_{\text{C}} = -20 \text{ mA}$ $I_{\text{B}} = -2 \text{ mA}$   |                |      | -0.5 | V    |
| $V_{\text{BE(sat)}}^{(2)}$        | Base-emitter saturation<br>voltage                               | $I_{\text{C}} = -20 \text{ mA}$ $I_{\text{B}} = -2 \text{ mA}$   |                |      | -0.9 | V    |
| $h_{\text{FE}}^{(2)}$             | DC current gain  | $I_{\text{C}} = -1 \text{ mA}$ $V_{\text{CE}} = -10 \text{ V}$<br>$I_{\text{C}} = -10 \text{ mA}$ $V_{\text{CE}} = -10 \text{ V}$<br>$I_{\text{C}} = -30 \text{ mA}$ $V_{\text{CE}} = -10 \text{ V}$ | 25<br>40<br>40 |      |      |      |
| $f_{\text{T}}$                    | Transition frequency   | $I_{\text{C}} = -10 \text{ mA}$ $V_{\text{CE}} = -20 \text{ V}$<br>$f = 100 \text{ MHz}$   | 50             |      |      | MHz  |
| $C_{\text{CBO}}$                  | Collector-base<br>capacitance ( $I_{\text{E}} = 0$ )             | $V_{\text{CB}} = -20 \text{ V}$ $f = 1 \text{ MHz}$  |                | 6    |      | 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 |

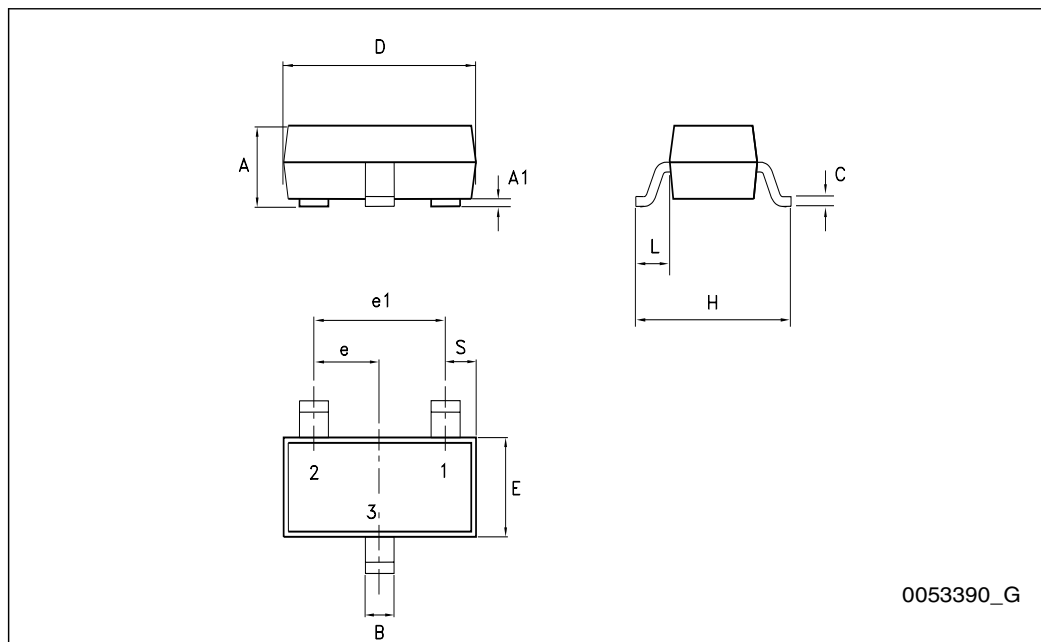
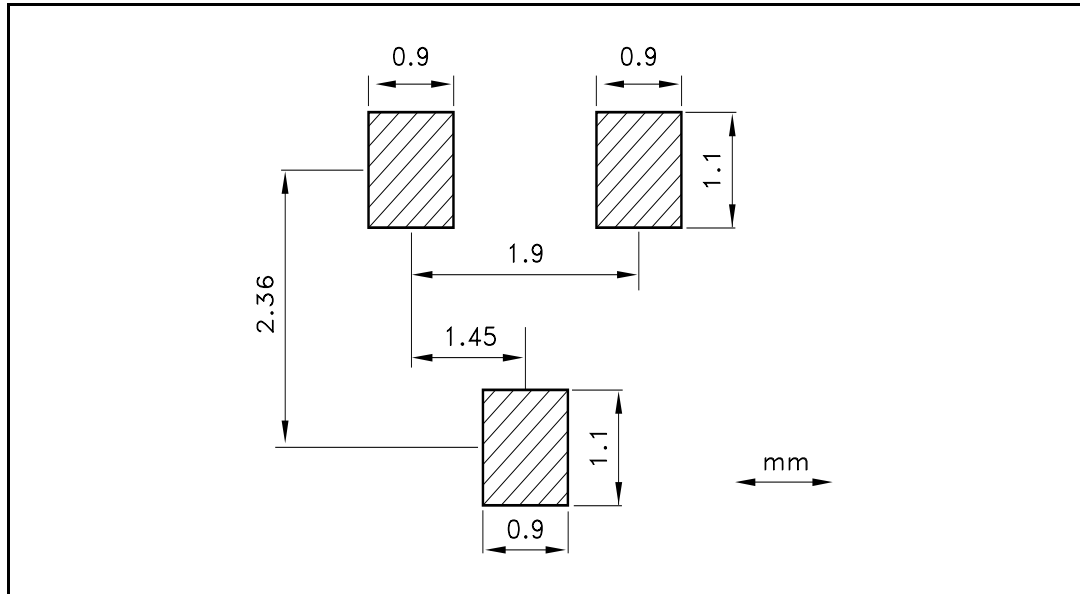


Figure 2. SOT-23 footprint



## 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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