

Small signal NPN transistor

Datasheet - production data

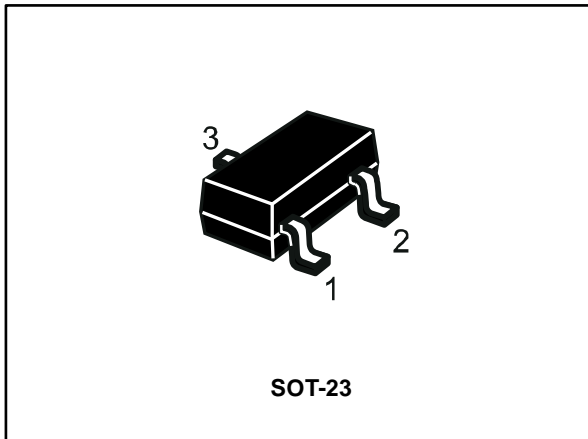
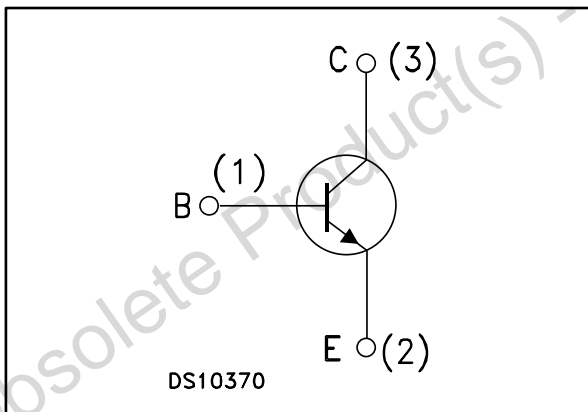


Figure 1: Internal schematic diagram


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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1 Absolute maximum ratings

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

Table 2: Absolute maximum rating

| Symbol | Parameter | Value | Unit |
|------------------|--|------------|--------------------|
| V_{CBO} | Collector-base voltage ($I_{\text{E}} = 0$) | 300 | V |
| V_{CEO} | Collector-emitter voltage ($I_{\text{B}} = 0$) | 300 | V |
| V_{EBO} | Emitter-base voltage ($I_{\text{C}} = 0$) | 6 | V |
| I_{C} | Collector current | 0.5 | A |
| I_{CM} | Collector peak current ($t_{\text{P}} < 5\text{ms}$) | 0.6 | A |
| P_{tot} | Total dissipation at $T_{\text{amb}} = 25^{\circ}\text{C}$ | 350 | mW |
| T_{stg} | Storage temperature | -65 to 150 | $^{\circ}\text{C}$ |
| T_{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 ⁽¹⁾ | 357.1 | $^{\circ}\text{C/W}$ |

Notes:

⁽¹⁾Device mounted on PCB area of 1 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_{CBO} | Collector cut-off current ($I_{\text{E}} = 0$) | $V_{\text{CB}} = 200 \text{ V}$ | | | 100 | μA |
| $V_{(\text{BR})\text{CBO}}$ | 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_{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_{T} | Transition frequency | $I_{\text{C}} = 10 \text{ mA},$ $V_{\text{CE}} = 20 \text{ V}$ $f = 100 \text{ MHz}$ | 50 | | | MHz |
| C_{CBO} | Collector-base capacitance ($I_{\text{E}} = 0$) | $V_{\text{CB}} = 20 \text{ V};$ $f = 1 \text{ MHz}$ | | 3 | | nC |

Notes:

⁽¹⁾Pulse test: pulse duration = 300 μs , duty cycle $\leq 1.5 \%$

3 Package mechanical data

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3.1 SOT-23 mechanical data

Figure 2: SOT-23 mechanical drawing

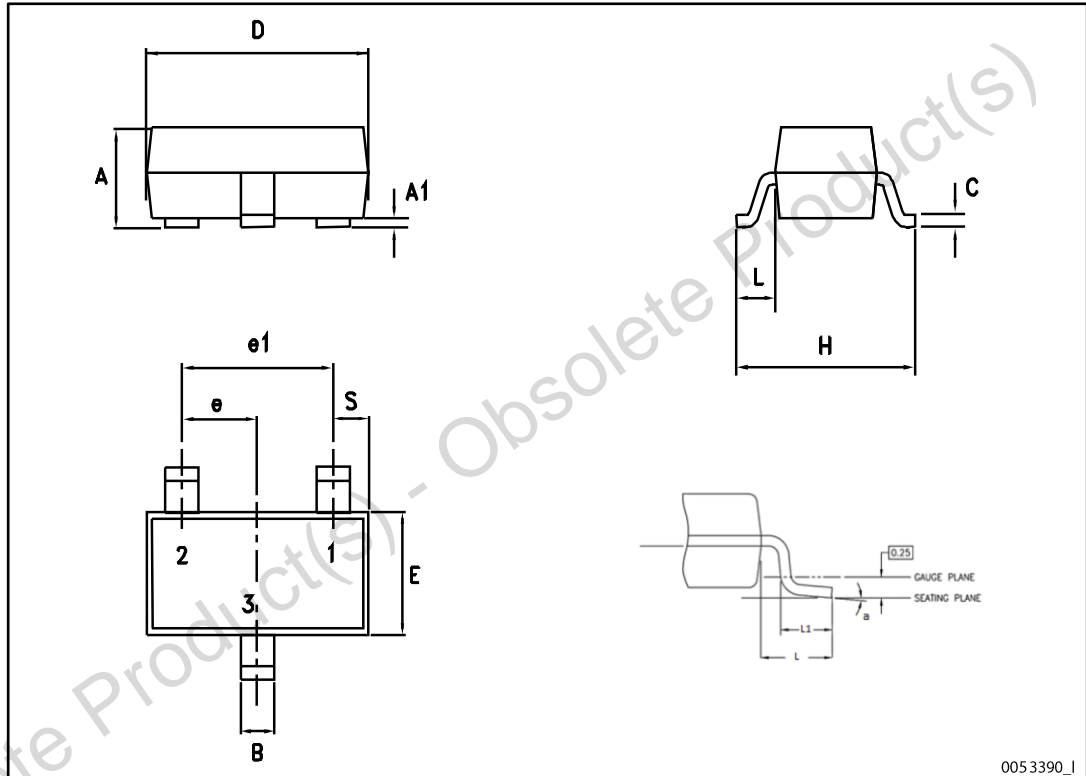
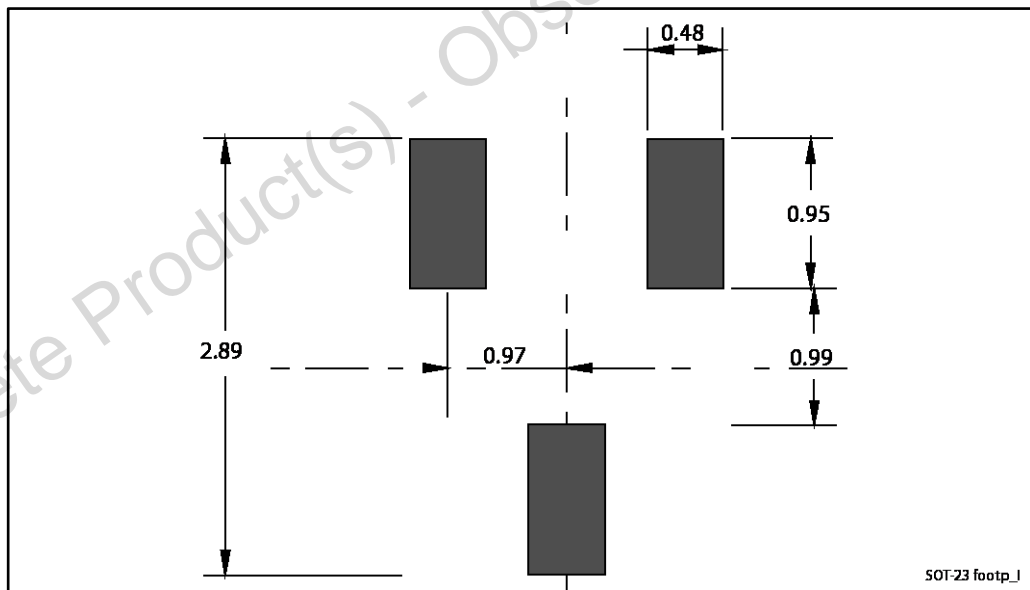


Table 5: SOT-23 mechanical data

| 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 Section 4: "Package mechanical data" . |

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