

Small signal NPN transistor

Datasheet - production data

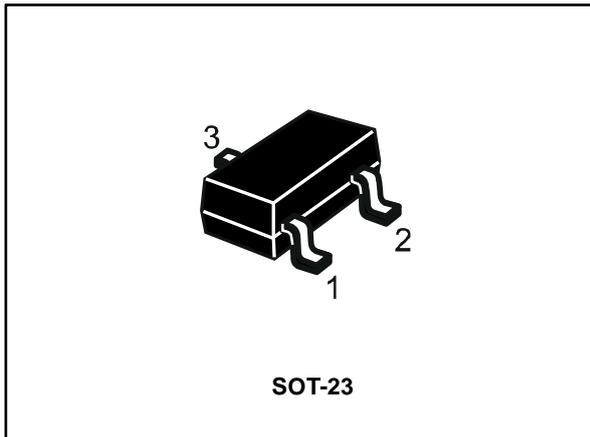
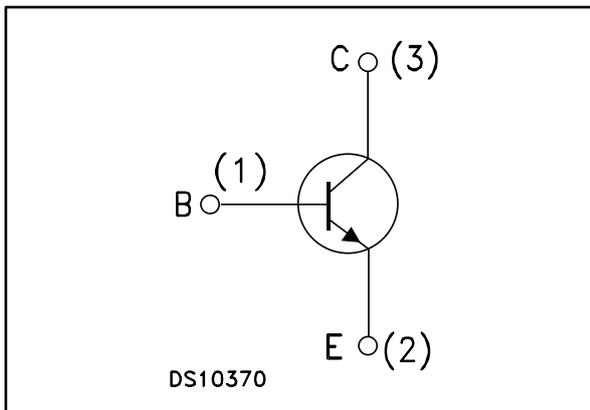


Figure 1: Internal schematic diagram



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
$V_{\text{CE(sat)}}$	Collector-emitter saturation voltage	$I_{\text{C}} = 20 \text{ mA};$ $I_{\text{B}} = 2 \text{ mA}$			0.5	V
$V_{\text{BE(sat)}}$	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

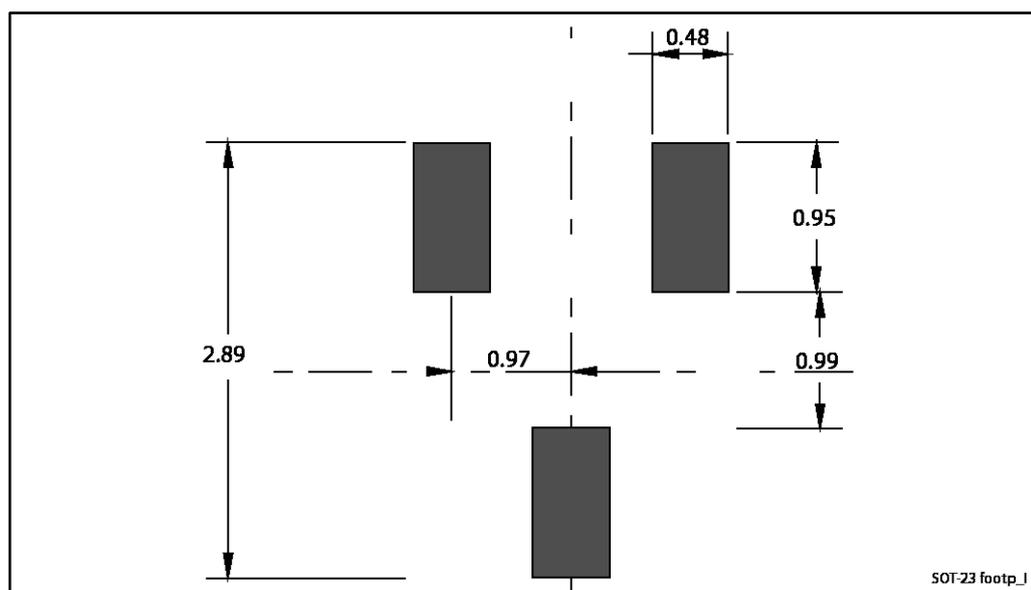
Notes:

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

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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