MMBTA42

Small signal NPN transistor

Datasheet - production data

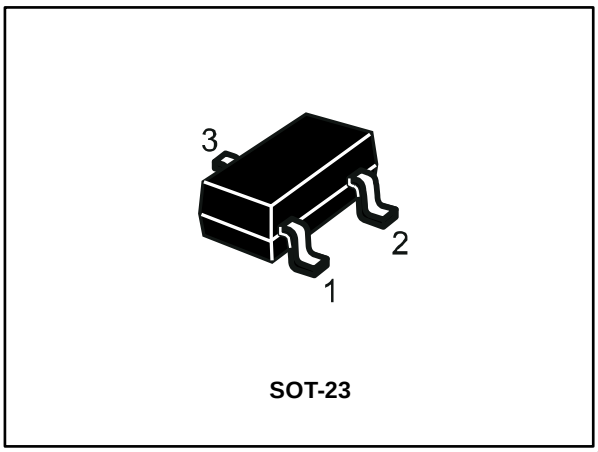
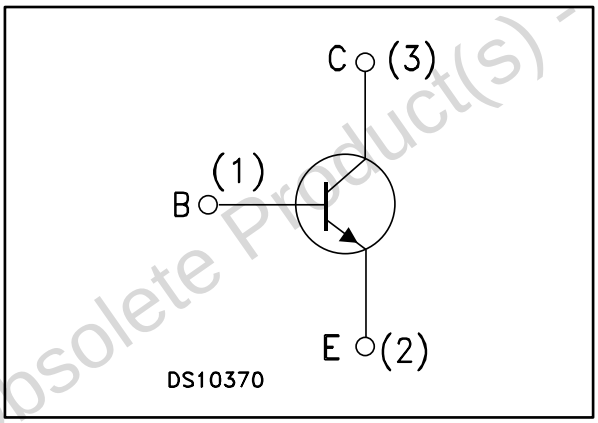


Figure 1: Internal schematic diagram



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

Contents

1 Absolute maximum ratings

(T_{case} = 25°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)	6	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°C	350	mW
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3: Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient max (1)	357.1	°C/W

Notes:

(1)Device mounted on PCB area of 1 cm^2.

2 Electrical characteristics

(T_{case} = 25°C unless otherwise specified)

Table 4: Electrical characteristics

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

Notes:

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

3 Package mechanical data

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

3.1 SOT-23 mechanical data

Figure 2: SOT-23 mechanical drawing

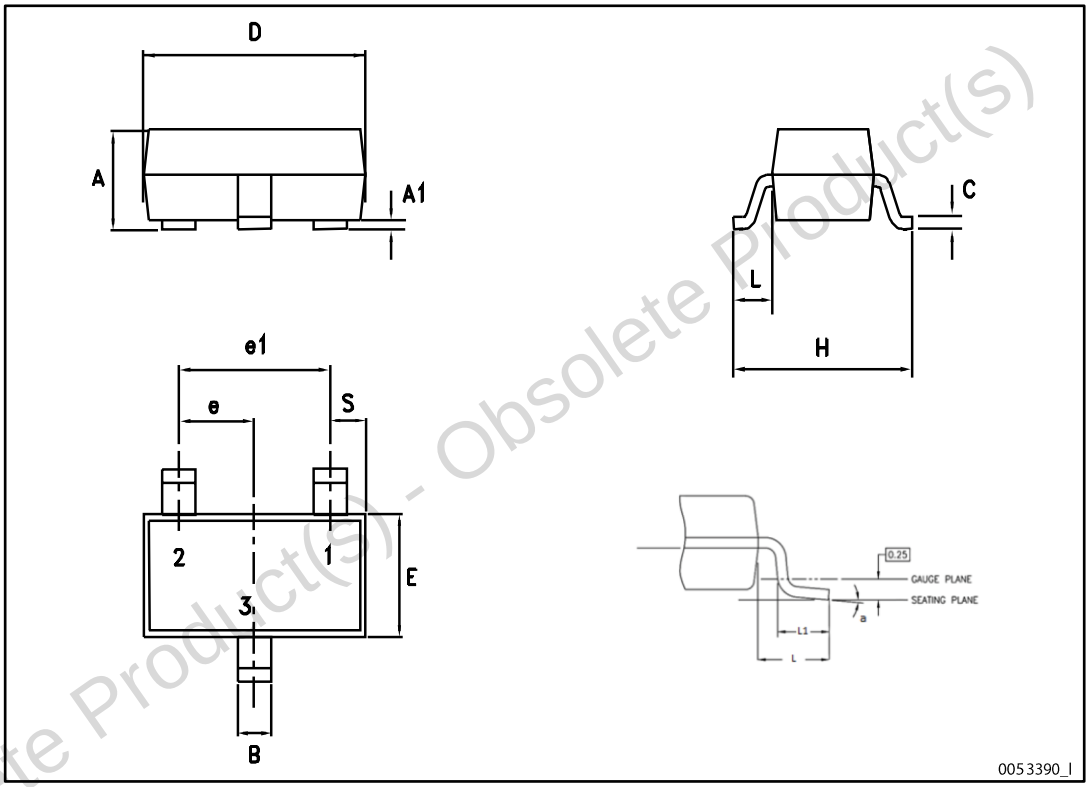
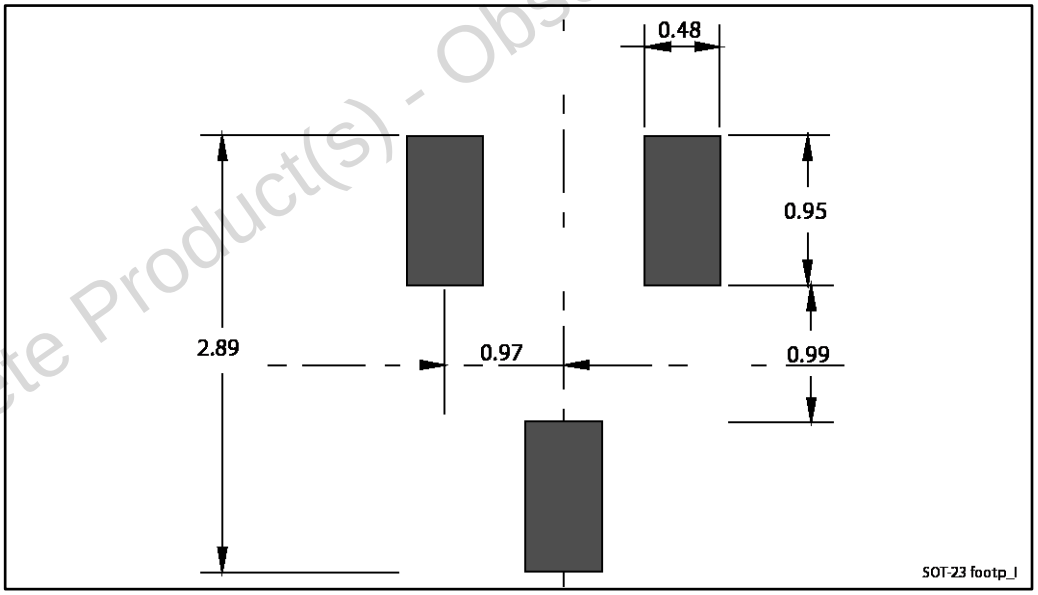


Table 5: SOT-23 mechanical data

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 *Section 4: "Package mechanical data"*.

Please Read Carefully

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

ST PRODUCTS ARE NOT DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER'S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR "AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL" INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.