SILICON PLANAR EPITAXIAL TRANSISTORS

NPN transistors in miniature plastic envelopes intended for application in thick and thin-film circuits. They are intended for use in telephony and general industrial applications.

QUICK REFERENCE DATA

			BSP40	BSP41	BSP42	BSP43	
Collector-base voltage (open emitter)	V_{CBO}	max.	70	70	90	90	V
Collector-emitter voltage (open base)	V_{CEO}	max.	60	60	80	80	V
Collector current (DC)	I_C	max.	1	1	1	1	A
Total power dissipation up to $T_{amb} = 25\ ^oC$	P_{tot}	max.	1,5	1,5	1,5	1,5	W
Junction temperature	T_j	max.	150	150	150	150	^{o}C
DC current gain							
$I_C = 100$ mA; $V_{CE} = 5$ V	h_{FE}	>	40	100	40	100	
		<	120	300	120	300	
Transition frequency at f = 35 MHz							
$I_C = 50$ mA; $V_{CE} = 10$ V	f_T	>	100	100	100	100	MHz

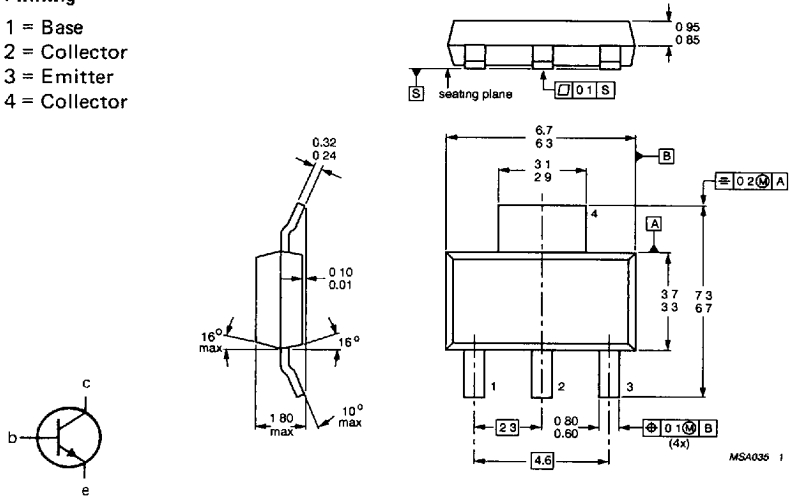
MECHANICAL DATA

Dimensions in mm

Fig. 1 SOT-223

Pinning

1 = Base
2 = Collector
3 = Emitter
4 = Collector



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			BSP40	BSP41	BSP42	BSP43	
Collector-base voltage (open emitter)	V_{CBO}	max.	70	70	90	90	V
Collector-emitter voltage (open base)	V_{CEO}	max.	60	60	80	80	V
Emitter-base voltage (open collector)	V_{EBO}	max.	5	5	5	5	V
Collector current (DC)	I_C	max.			1		A
Base current (DC)	I_B	max.			0,1		A
Total power dissipation up to T_{amb} = 25 °C*	P_{tot}	max.			1,5		W
Storage temperature range	T_{stg}				−65 to +150		°C
Junction temperature	T_j	max.			150		°C

THERMAL RESISTANCE

From junction to ambient*	$R_{th\ j\text{-}a}$	=	83,3	K/W

* Device mounted on an epoxy printed circuit board 40 mm x 40 mm x 1,5 mm; mounting pad for the collector lead min. 6 cm².

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified

Collector cut-off current

I_E = 0; V_{CB} = 60 V	I_{CBO}	<		100			nA
I_E = 0; V_{CB} = 60 V; T_j = 150 °C	I_{CBO}	<		50			μA

Breakdown voltages

			BSP40	BSP41	BSP42	BSP43	
I_B = 0; I_C = 10 mA	$V_{(BR)CEO}$	>	60	60	80	80	V
V_{BE} = 0; I_C = 10 μA	$V_{(BR)CES}$	>	70	70	90	90	V
I_C = 0; I_E = 10 μA	$V_{(BR)EBO}$	>	5	5	5	5	V

Saturation voltages *

I_C = 150 mA; I_B = 15 mA	V_{CEsat}	<	0,25	0,25	0,25	0,25	V
	V_{BEsat}	<	1,0	1,0	1,0	1,0	V
I_C = 500 mA; I_B = 50 mA	V_{CEsat}	<	0,5	0,5	0,5	0,5	V
	V_{BEsat}	<	1,2	1,2	1,2	1,2	V

DC current gain*

I_C = 100 μA; V_{CE} = 5 V	h_{FE}	>	10	30	10	30	
I_C = 100 mA; V_{CE} = 5 V	h_{FE}	>	40	100	40	100	
		<	120	300	120	300	
I_C = 500 mA; V_{CE} = 5 V	h_{FE}	>	30	50	30	50	

Transition frequency at f = 35 MHz

I_C = 50 mA; V_{CE} = 10 V	f_T	>	100		MHz

Collector capacitance at f = 1 MHz

$I_E = I_e$ = 0; V_{CB} = 10 V	C_c	<	12		pF

Emitter capacitance at f = 1 MHz

$I_C = I_c$ = 0; V_{EB} = 0,5 V	C_e	<	90		pF

Switching times see next page.

* Measured under pulse conditions: t_p = 300 μs; δ < 0,01.

CHARACTERISTICS (continued)

T_{amb} = 25 °C

Switching times

I_{Con} = 100 mA; I_{Bon} = $-I_{Boff}$ = 5 mA

Turn-on time	t_{on}	<	250 ns
Turn-off time	t_{off}	<	1000 ns

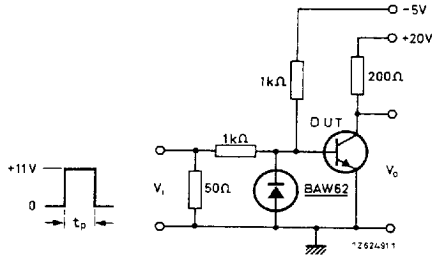


Fig. 2 Switching times test circuit.

Pulse generator:		Oscilloscope:	
Pulse duration	t_p = 10 μs	Rise time	$t_r \leqslant$ 15 ns
Rise time	$t_r \leqslant$ 15 ns	Input impedance	$Z_I \geqslant$ 100 kΩ
Fall time	$t_f \leqslant$ 15 ns		
Source impedance	Z_S = 50 Ω		