SILICON PLANAR EPITAXIAL TRANSISTORS

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

QUICK REFERENCE DATA

			BSP30	BSP31	BSP32	BSP33	
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 °C	P_{tot}	max.	1,5	1,5	1,5	1,5	W
Junction temperature	T_j	max.	150	150	150	150	°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 = 100 MHz $-I_C$ = 50 mA; $-V_{CE}$ = 10 V	f_T	>	100	100	100	100	MHz

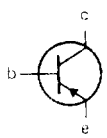
MECHANICAL DATA

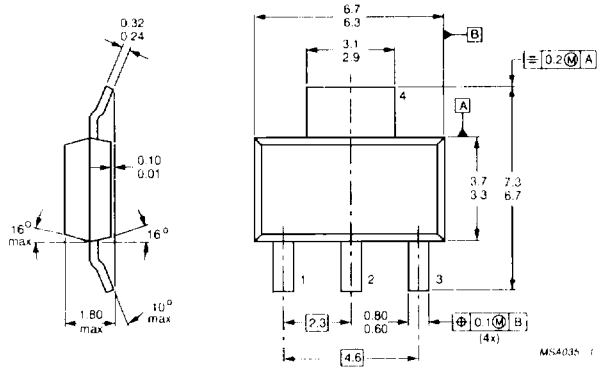
Dimensions in mm

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)

			BSP30	BSP31	BSP32	BSP33	
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 $T_{amb} = 25\ ^oC$ *	P_{tot}	max.		1,5			W
Storage temperature range	T_{stg}			−65 to +150			^oC
Junction temperature	T_j	max.		150			^oC

THERMAL RESISTANCE

From junction to collector tab	$R_{th\ j\text{-}tab}$	=	10	K/W
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 cm^2.

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			BSP30	BSP31	BSP32	BSP33	
$I_B = 0$; $-I_C = 10$ 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 = 100 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	<		20			pF
Emitter capacitance at f = 1 MHz							
$I_C = I_c = 0$; $-V_{EB} = 0{,}5$ V	C_e	<		120			pF

Switching times see next page.

* Measured under pulse conditions: $t_p = 300$ μs; $\delta < 0{,}01$.

CHARACTERISTICS (continued)

T_{amb} = 25 °C

Switching times

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

Turn-on time	t_{on}	500 ns
Turn-off time	t_{off}	650 ns

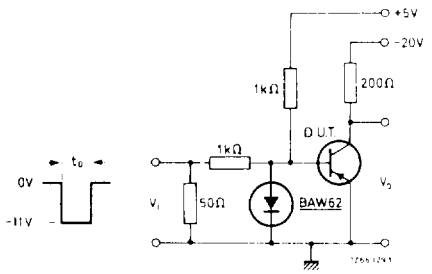


Fig. 2 Switching times test circuit.

Pulse generator:		Oscilloscope:	
Pulse duration	t_o = 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		