SILICON PLANAR EPITAXIAL TRANSISTORS

P-N-P 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.

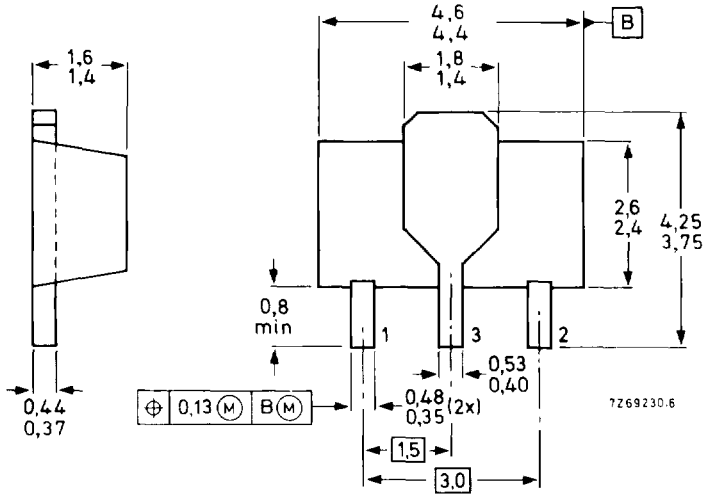
QUICK REFERENCE DATA

			BSR30	BSR31	BSR32	BSR33	
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 (d.c.)	$-I_C$	max.	1	1	1	1	A
Total power dissipation up to T_{amb} = 25 °C	P_{tot}	max.	1	1	1	1	W
Junction temperature	T_j	max.	150	150	150	150	°C
D.C. 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

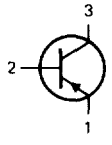
Fig. 1 SOT-89.



BOTTOM VIEW

Marking code

BSR30 = BR1
BSR31 = BR2
BSR32 = BR3
BSR33 = BR4



RATINGS

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

			BSR30	BSR31	BSR32	BSR33	
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 (d.c.)	$-I_C$	max.		1			A
Base current (d.c.)	$-I_B$	max.		0,1			A
Total power dissipation up to T_{amb} = 25 °C mounted on a ceramic substrate area = 2,5 cm²; thickness = 0,7 mm	P_{tot}	max.		1			W
Storage temperature	T_{stg}			−65 to +150			°C
Junction temperature	T_j	max.		150			°C

THERMAL RESISTANCE

From junction to collector tab	$R_{th\ j\text{-}tab}$	=	10	K/W
From junction to ambient in free air mounted on a ceramic substrate area = 2,5 cm²; thickness = 0,7 mm	$R_{th\ j\text{-}a}$	=	125	K/W

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

			BSR30	BSR31	BSR32	BSR33	
Breakdown voltages							
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
D.C. 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; δ < 0,01.

CHARACTERISTICS (continued)

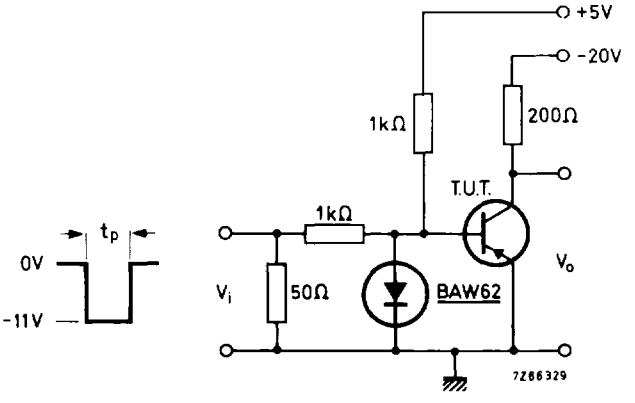
T_{amb} = 25 °C

Switching times

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

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

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		