

SILICON PLANAR EPITAXIAL TRANSISTOR

N-P-N transistor in a plastic TO-92 package. It is primarily intended for general purpose switching and as driver for numerical indicator tubes.

QUICK REFERENCE DATA

Collector-base voltage (open emitter)	V_{CBO}	max.	120 V
Collector-emitter voltage (open base)	V_{CEO}	max.	100 V
Collector current (peak value)	I_{CM}	max.	250 mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.	500 mW
Junction temperature	T_j	max.	150 $^{\circ}\text{C}$
D.C. current gain $I_C = 4\text{ mA}; V_{CE} = 1\text{ V}$	h_{FE}	> typ.	20 80
Transition frequency at $f = 100\text{ MHz}$ $I_C = 4\text{ mA}; V_{CE} = 10\text{ V}$	f_T	>	60 MHz
Turn-off time $I_{Con} = 15\text{ mA}; I_{Bon} = 1\text{ mA}; -I_{Boff} = 1\text{ mA}$	t_{off}	<	1 μs

Note

The BSS38 may be operated in the breakdown region up to $V_{CE} = 160\text{ V}$, provided P_{tot} at $T_{amb} = 85\text{ }^{\circ}\text{C}$ does not exceed 100 mW.

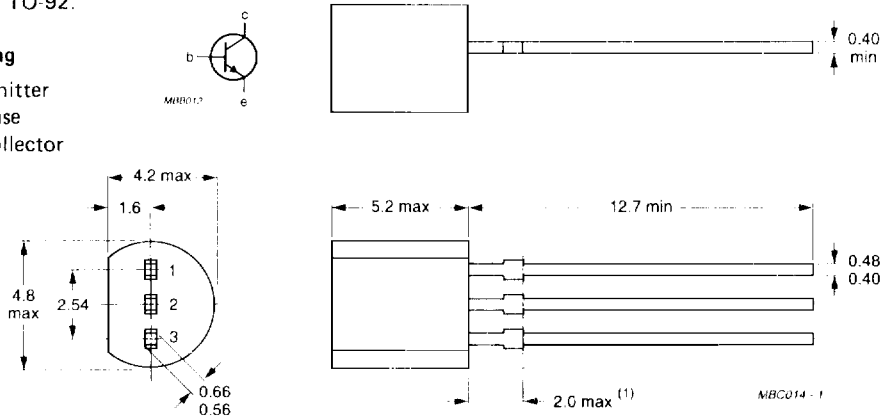
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92.

Pinning

- 1 = emitter
- 2 = base
- 3 = collector



Note (1) Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

RATINGS

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

Collector-base voltage (open emitter)	V_{CBO}	max.	120 V*
Collector-emitter voltage (open base)	V_{CEO}	max.	100 V*
Emitter-base voltage (open collector)	V_{EBO}	max.	5 V
Collector current (d.c. or averaged over any 20 ms period)	$I_{C(AV)}$	max.	100 mA
Collector current (peak value)	I_{CM}	max.	250 mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.	500 mW
Storage temperature	T_{stg}		-65 to + 150 $^{\circ}\text{C}$
Junction temperature	T_j	max.	150 $^{\circ}\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	0,25 (K/mW)
--------------------------------------	---------------	---	-------------

CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

Collector cut-off current $I_E = 0; V_{CB} = 90\text{ V}$	I_{CBO}	<	200 nA
$I_E = 0; V_{CB} = 90\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	I_{CBO}	<	50 μA
$V_{BE} = 0; V_{CE} = 80\text{ V}; T_j = 85\text{ }^{\circ}\text{C}$	I_{CES}	<	20 μA
Emitter cut-off current $I_C = 0; V_{EB} = 4\text{ V}$	I_{EBO}	<	200 nA
$I_C = 0; V_{EB} = 4\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	I_{EBO}	<	50 μA
Saturation voltages $I_C = 4\text{ mA}; I_B = 0,4\text{ mA}$	V_{CEsat}	<	0,7 V
$I_C = 50\text{ mA}; I_B = 15\text{ mA}$	V_{BEsat}	<	1,2 V
	V_{CEsat}	<	3,0 V
D.C. current gain $I_C = 4\text{ mA}; V_{CE} = 1\text{ V}$	h_{FE}	>	20
	h_{FE}	typ.	80
$I_C = 10\text{ mA}; V_{CE} = 1\text{ V}$	h_{FE}	typ.	80

* The BSS38 may be operated in the breakdown region up to $V_{CE} = 160\text{ V}$, provided P_{tot} at $T_{amb} = 85\text{ }^{\circ}\text{C}$ does not exceed 100 mW.

CHARACTERISTICS (continued)Transition frequency at $f = 100$ MHz

$$I_C = 4 \text{ mA}; V_{CE} = 10 \text{ V}$$

$$f_T > 60 \text{ MHz}$$

Collector capacitance at $f = 1$ MHz

$$I_E = I_e = 0; V_{CB} = 10 \text{ V}$$

$$C_C < 4,5 \text{ pF}$$

Emitter capacitance at $f = 1$ MHz

$$I_C = I_c = 0; V_{EB} = 0,5 \text{ V}$$

$$C_e < 17 \text{ pF}$$

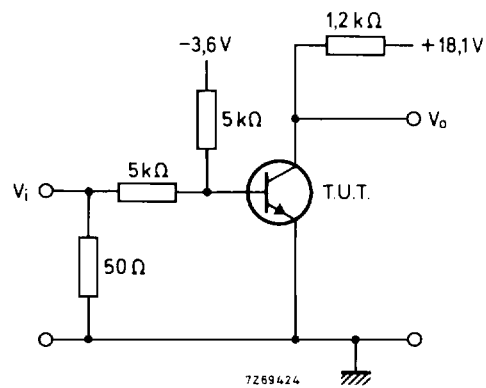
Switching time

Turn-off time when switched from

$$I_{Con} = 15 \text{ mA}; I_{BOn} = 1 \text{ mA to cut-off with } -I_{BOff} = 1 \text{ mA}$$

$$t_{off} < 1 \text{ } \mu\text{s}$$

Test circuit for measuring turn-off time:



Pulse generator:

Input voltage $V_i = +10 \text{ V}$

Pulse duration $t_p = 1 \text{ } \mu\text{s}$

Duty factor $\delta = 0,01$

Source impedance $Z_S = 50 \text{ } \Omega$