SILICON PLANAR EPITAXIAL TRANSISTOR

PNP transistors in plastic TO-92 packages, primarily intended for industrial applications (e.g. Telecom).

QUICK REFERENCE DATA

Collector-base voltage (open emitter)	$-V_{CBO}$	max.	40 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	40 V
Collector current (DC)	$-I_C$	max.	200 mA
Total power dissipation at T_{amb} = 25 °C	P_{tot}	max.	500 mW
DC current gain $-I_C$ = 10 mA; $-V_{CE}$ = 1 V	h_{FE}	min. max.	100 300
Transition frequency at f = 100 MHz $-I_C$ = 10 mA; $-V_{CE}$ = 20 V	f_T	min.	150 MHz

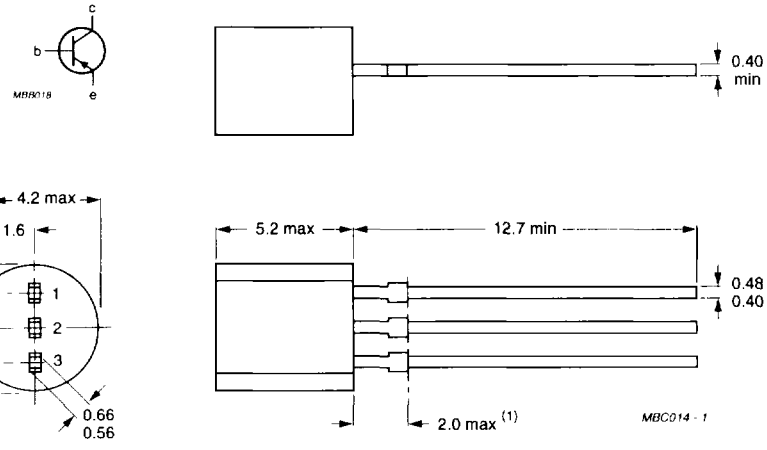
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92.

Pinning

1 = collector
2 = base
3 = emitter



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.	40 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	40 V
Emitter base voltage (open collector)	$-V_{EBO}$	max.	5 V
Collector current (DC)	$-I_C$	max.	200 mA
Total power dissipation at T_{amb} = 25 °C	P_{tot}	max.	500 mW
Storage temperature range	T_{stg}		−65 to +150 °C
Junction temperature	T_j	max.	150 °C

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j\text{-}a}$	=	250 K/W

CHARACTERISTICS

T_{amb} = 25 °C

Currents at reverse biased emitter junction			
$-V_{CE}$ = 30 V; $+V_{BE}$ = 3 V	$-I_{CEX}$	max.	50 nA
	$+I_{BEX}$	max.	50 nA
Saturation voltages (see note 1)			
$-I_C$ = 10 mA; $-I_B$ = 1 mA	$-V_{CEsat}$	max.	250 mV
	$-V_{BEsat}$		650 to 850 mV
$-I_C$ = 50 mA; $-I_B$ = 5 mA	$-V_{CEsat}$	max.	400 mV
	$-V_{BEsat}$	max.	950 mV
DC current gain (see note 1)			
$-I_C$ = 0.1 mA; V_{CE} = 1 V	h_{FE}	min.	60
$-I_C$ = 1 mA; V_{CE} = 1 V	h_{FE}	min.	80
$-I_C$ = 10 mA; V_{CE} = 1 V	h_{FE}	min.	100
		max.	300
$-I_C$ = 50 mA; V_{CE} = 1 V	h_{FE}	min.	60
$-I_C$ = 100 mA; V_{CE} = 1 V	h_{FE}	min.	30
Collector capacitance at 100 kHz ≤ f ≤ 1 MHz			
$I_E = I_e$ = 0; $-V_{CB}$ = 5 V	C_c	max.	5 pF
Emitter capacitance at 100 kHz ≤ f ≤ 1 MHz			
$I_C = I_c$ = 0; $-V_{EB}$ = 0.5 V	C_e	max.	15 pF
Transition frequency at f = 100 MHz			
$-I_C$ = 10 mA; $-V_{CE}$ = 20 V	f_T	min.	150 MHz
Noise figure at R_S = 1 kΩ			
$-I_C$ = 100 μA; $-V_{CE}$ = 5 V			
f = 10 Hz to 15.7 kHz	F	max.	4 dB

Note

1. Measured under pulse conditions: t_p = 300 μs; δ = 0.02.

SWITCHING CHARACTERISTICS

Delay time V_{CC} = 3.0 V DC, V_{BE}(off) = 0.5 V DC I_C = 10 mA DC, I_{B1} = 1 mA DC	t_d	max.	45 ns
Rise time V_{CC} = 3.0 V DC, V_{BE}(off) = 0.5 V DC I_C = 10 mA DC, I_{B1} = 1 mA DC	t_r	max.	55 ns
Storage time V_{CC} = 3.0 V DC, I_C = 10 mA DC I_{B1} = I_{B2} = 1 mA DC	t_{stg}	max.	600 ns
Fall time V_{CC} = 3.0 V DC, I_C = 10 mA DC I_{B1} = I_{B2} = 1 mA DC	t_f	max.	90 ns

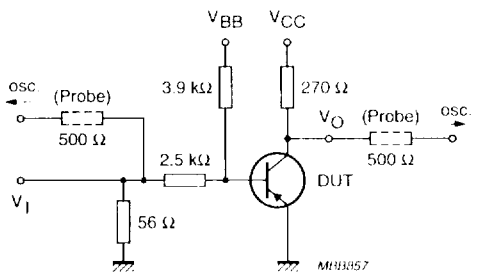


Fig. 2 Test circuit for switching times;
$V_1 = -5$ V; $t_p \geq 4\ \mu s$; $t_r = t_f \leq 3$ ns.