SILICON PLANAR EPITAXIAL TRANSISTORS

NPN transistors in plastic TO-92 variants, primarily intended for low-noise input stages in tape recorders, hi-fi amplifiers and other audio-frequency equipment.

QUICK REFERENCE DATA

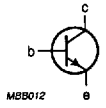
			JC549	JC550	
Collector-emitter voltage (V_{BE} = 0)	V_{CES}	max.	30	50	V
Collector-emitter voltage (open base)	V_{CEO}	max.	30	45	V
Collector current (peak value)	I_{CM}	max.	200	200	mA
Total power dissipation up to T_{amb} = 25 °C	P_{tot}	max.	500	500	mW
Junction temperature	T_j	max.	150	150	°C
DC current gain I_C = 2 mA; V_{CE} = 5 V	h_{FE}	min. max.	200 800	200 800	
Transition frequency I_C = 10 mA; V_{CE} = 5 V	f_T	typ.	300	300	MHz
Noise figure at R_S = 2 kΩ I_C = 200 μA; V_{CE} = 5 V					
f = 30 Hz to 15 kHz	F	typ. max.	1.4 4	1.4 3	dB dB
f = 1 kHz; B = 200 Hz	F	typ.	1.2	1	dB
f = 10 Hz to 50 Hz (equivalent noise voltage)	V_n	min.	–	0.135	μV

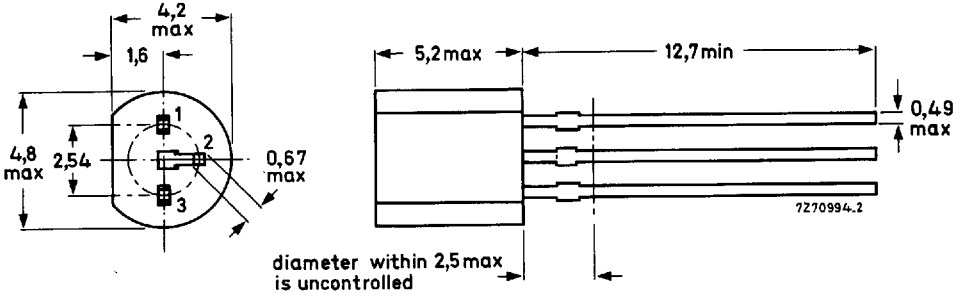
MECHANICAL DATA

Fig. 1 TO-92 variant.

Pinning:

1 = base
2 = collector
3 = emitter





Capability approved to CECC NECC-C-002

RATINGS

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

			JC549	JC550	
Collector-base voltage (open emitter)	V_{CBO}	max.	30	50	V
Collector-emitter voltage (V_{BE} = 0)	V_{CES}	max.	30	50	V
Collector-emitter voltage (open base)	V_{CEO}	max.	30	45	V
Emitter-base voltage (open collector)	V_{EBO}	max.	5	5	V
Collector current (DC)	I_C	max.	100		mA
Collector current (peak value)	I_{CM}	max.	200		mA
Emitter current (peak value)	$-I_{EM}$	max.	200		mA
Base current (peak value)	I_{BM}	max.	200		mA
Total power dissipation up to 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	$R_{th\ j\text{-}a}$	=	0.25	K/mW
From junction to case	$R_{th\ j\text{-}c}$	=	0.15	K/mW

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector cut-off current				
I_E = 0; V_{CB} = 30 V	I_{CBO}	max.	15	nA
I_E = 0; V_{CB} = 30 V; T_j = 150 °C	I_{CBO}	max.	5	μA
Base emitter voltage*				
I_C = 2 mA; V_{CE} = 5 V	V_{BE}	typ.	660	mV
			580 to 700	mV
I_C = 10 mA; V_{CE} = 5 V	V_{BE}	max.	770	mV
Saturation voltages **				
I_C = 10 mA; I_B = 0,5 mA	V_{CEsat}	typ.	90	mV
		max.	250	mV
	V_{BEsat}	typ.	700	mV
I_C = 100 mA; I_B = 5 mA	V_{CEsat}	typ.	200	mV
		max.	600	mV
	V_{BEsat}	typ.	900	mV

* V_{BE} decreases by about 2 mV/K with increasing temperature.
** V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.

Collector capacitance at f = 1 MHz $I_E = I_e = 0$; $V_{CB} = 10$ V	C_c	typ.	2.5 pF
Emitter capacitance at f = 1 MHz $I_C = I_c = 0$; $V_{EB} = 0{,}5$ V	C_e	typ.	9 pF
Transition frequency at f = 35 MHz $I_C = 10$ mA; $V_{CE} = 5$ V	f_T	typ.	300 MHz
Small signal current gain at f = 1 kHz $I_C = 2$ mA; $V_{CE} = 5$ V	h_{fe}		125 – 900

Noise figure at $R_S = 2$ kΩ $I_C = 200$ μA; $V_{CE} = 5$ V			JC549	JC550
f = 30 Hz to 15 kHz	F	typ.	1.4	1.4 dB
		max.	4	3 dB
f = 1 kHz; B = 200 Hz	F	typ.	1.2	1 dB
		max.	4	4 dB
Equivalent noise voltage at $R_S = 2$ kΩ $I_C = 200$ μA; $V_{CE} = 5$ V f = 10 Hz to 50 Hz; $T_{amb} = 25$ °C	V_n	max.	–	0.135 μV

			JC549B JC550B	JC549C JC550C
DC current gain $I_C = 10$ μA; $V_{CE} = 5$ V	h_{FE}	typ.	150	270
		min.	200	420
$I_C = 2$ mA; $V_{CE} = 5$ V	h_{FE}	typ.	290	520
		max.	450	800

Note

For characteristics graphs, see BC549/550, Figs 2 to 19.