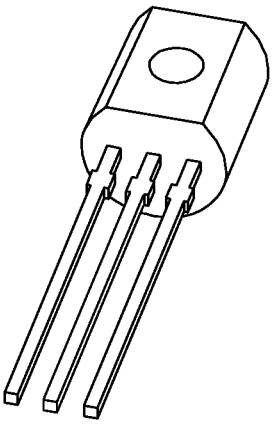
DATA SHEET



JC501
NPN general purpose transistor

Product specification
Supersedes data of September 1994
File under Discrete Semiconductors, SC04

1997 Mar 17

Philips
Semiconductors

PHILIPS

NPN general purpose transistor JC501

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 45 V).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

NPN transistor in a TO-92; SOT54 plastic package.
PNP complement: JA101.

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter

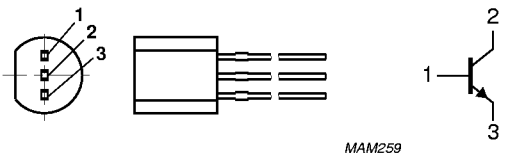


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–		50	V
V_{CEO}	collector-emitter voltage	open base	–		45	V
I_{CM}	peak collector current		–		200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	–		500	mW
h_{FE}	DC current gain	I_C = 1 mA; V_{CE} = 5 V	90		600	
f_T	transition frequency	I_C = 10 mA; V_{CE} = 5 V; f = 100 MHz	–	130	–	MHz

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	50	V
V_{CEO}	collector-emitter voltage	open base	–	45	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	100	mA
I_{CM}	peak collector current		–	200	mA
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	–	500	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	250	K/W

Note

1. Transistor mounted on an FR4 printed-circuit board.

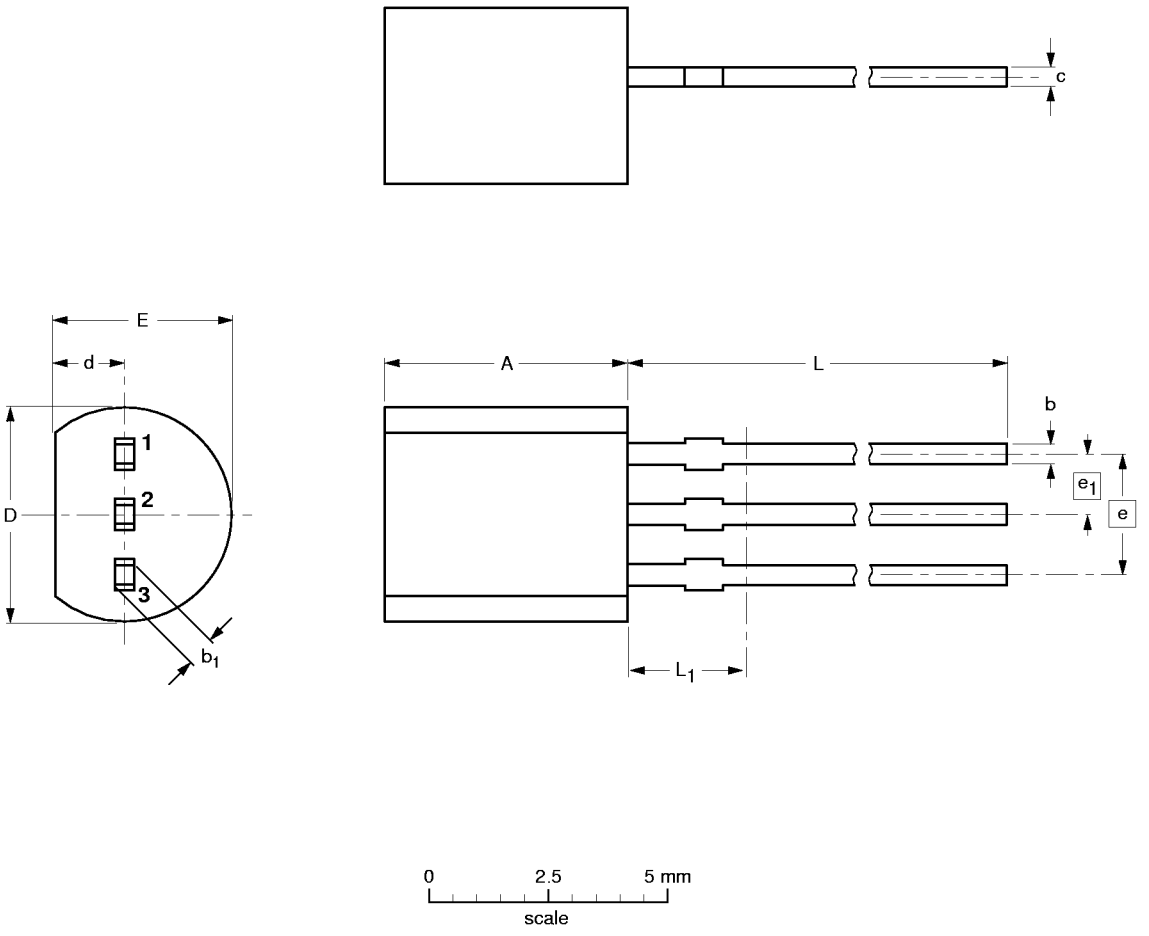
CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	I_E = 0; V_{CB} = 45 V	–	–	15	nA
		I_E = 0; V_{CB} = 45 V; T_j = 125 °C	–	–	4	μA
I_{EBO}	emitter cut-off current	I_C = 0; V_{EB} = 6 V	–	–	100	nA
h_{FE}	DC current gain	I_C = 1 mA; V_{CE} = 5 V	90	–	600	
h_{FE}	DC current gain	I_C = 1 mA; V_{CE} = 5 V				
	JC501O		90	–	180	
	JC501P		135	–	270	
	JC501Q		200	–	400	
	JC501R		300	–	600	
V_{CEsat}	collector-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA	–	–	200	mV
		I_C = 100 mA; I_B = 5 mA	–	–	600	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA	–	–	830	mV
		I_C = 100 mA; I_B = 5 mA	–	–	1.06	V
V_{BE}	base-emitter voltage	I_C = 2 mA; V_{CE} = 5 V	550	–	700	mV
C_c	collector capacitance	I_E = i_e = 0; V_{CB} = 10 V; f = 1 MHz	–	–	6	pF
C_e	emitter capacitance	I_C = i_c = 0; V_{EB} = 0.5 V; f = 1 MHz	–	11.5	–	pF
f_T	transition frequency	I_C = 10 mA; V_{CE} = 5 V; f = 100 MHz	–	130	–	MHz
F	noise figure	I_C = 200 μA; V_{CE} = 5 V; R_S = 2 kΩ; f = 1 kHz; B = 200 Hz	–	–	10	dB

PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads **SOT54**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b_1	c	D	d	E	e	e_1	L	L_1(1)
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

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

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT54		TO-92	SC-43			97-02-28