

2N3501

MECHANICAL DATA Dimensions in mm (inches)



NPN SILICON TRANSISTOR

FEATURES

- NPN High Voltage Planar Transistor
- Hermetic TO39 Package
- Full Screening Options Available

TO39 PACKAGE

Underside View

Pin 1 = Emitter Pin 2 = Base Pin 3 = Collector

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V _{CBO}	Collector – Base Voltage	150V
V _{CEO}	Collector – Emitter Voltage (I _B = 0)	150V
V _{EBO}	Emitter – Base Voltage (I _B = 0)	6V
I _C	Collector Current	300mA
PD	Total Device Dissipation $T_A = 25 \text{ °C}$	1W
PD	Derate above 25°C	5.71mW / °C
T _{stg}	Storage Temperature	–65 to 200°C
R _{ja}	Thermal Resistance Junction to Ambient	175°C/W

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise stated)

	Farameter	Test Conditions		Min.	Тур.	Max.	Unit				
	OFF CHARACTERISTICS										
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage ¹	I _C = 10mA	I _B = 0	150			V				
V _{(BR)CBO}	Collector-Base Breakdown Voltage	I _C = 10μA	I _E = 0	150							
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	I _E = 10μΑ	$I_{\rm C} = 0$	6							
· ·	Collector Cutoff Current	V _{CB} = 75V	$I_E = 0$			0.05	μΑ				
I _{CBO}		V _{CB} = 75V	$I_E = 0$			50					
			$T_A = 150^{\circ}C$			50					
I _{EBO}	Emitter Cutoff Current	$V_{EB(off)} = 4V$	$I_{\rm C} = 0$			25	nA				
	ON CHARACTERISTICS										
		I _C = 0.1mA	$V_{CE} = 10V$	35							
		I _C = 1mA	$V_{CE} = 10V$	50							
h _{FE}	DC Current Gain	I _C = 10mA	$V_{CE} = 10V^{1}$	75							
		I _C = 150mA	$V_{CE} = 10V^{1}$	100		300					
		I _C = 300mA	$V_{CE} = 10V^{1}$	20							
	Collector-Emitter Saturation Voltage ¹	I _C = 10mA	I _B = 1mA			0.2	V				
V _{CE(SAT)}		I _C = 50mA	I _B = 5mA			0.25					
- (-)		I _C = 150mA	I _B = 15mA			0.4					
	Base-Emitter Saturation Voltage ¹	I _C = 10mA	I _B = 1mA			0.8	V				
V _{BE(SAT)}		I _C = 50mA	I _B = 5mA			0.9					
		I _C = 150mA	I _B = 15mA			1.2					
	SMALL SIGNAL CHARACTERIST	ics									
4	Current-Gain–Bandwidth Product ²	$V_{CE} = 20V$ I	I _C = 20mA	150							
Γ			f = 100MHz	150							
0	Output Capacitance	V _{CB} = 10V	I _E = 0			8					
C _{obo}			f = 1MHz								
0	Input Capacitance	$V_{EB} = 0.5V$	$I_{\rm C} = 0$		00	pF					
C _{ibo}			f = 1MHz		80	00					
	Input Impedance	V _{CE} = 10V	I _C = 10mA	0.25	1.05						
n _{ie}			f = 1KHz			1.20	52				
	Voltage Feedback Ratio	V _{CE} = 10V	I _C = 10mA		4	v10-4					
n _{re}			f = 1KHz			4					
	Small-Signal Current Gain	V _{CE} = 10V	I _C = 10mA			97E	—				
n _{fe}			f = 1KHz			3/3					
h	Output Admittance	V _{CE} = 10V	$I_{\rm C} = 10 {\rm mA}$		200						
h _{oe}			f = 1KHz			200	<u> </u>				

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ELECTRICAL CHARACTERISTICS Continued (T_A = 25°C unless otherwise stated)

	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
	SWITCHING CHARACTERISTICS					
^t d	Delay Time	$I_{C} = 150 \text{mA} \qquad I_{B1} = 15 \text{mA}$ $V_{CC} = 100 \text{V} \qquad V_{EB(off)} = -2 \text{V}$		20		ns
t _r	Rise Time	$I_{C} = 150 \text{mA} \qquad I_{B1} = 15 \text{mA}$ $V_{CC} = 100 \text{V} \qquad V_{EB(off)} = -2 \text{V}$		35		ns
t _s	Storage Time	$I_{C} = 150 \text{mA}$ $V_{CC} = 100 \text{V}$ $I_{B1} = I_{B2} = 15 \text{mA}$		800		ns
^t f	Fall Time	$I_{C} = 150 \text{mA}$ $V_{CC} = 100 \text{V}$ $I_{B1} = I_{B2} = 15 \text{mA}$		80		ns

1) Pulse test : Pulse Width < 300μ s ,Duty Cycle < 2%

2) f_t is defined as the frequency at which $|h_{fe}|.f_{test}$

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