

2N3501

Features

- Meets MIL-S-19500/366
- Collector-Base Voltage 150V
- Collector Current: 500 mA
- Fast Switching 1265 nS

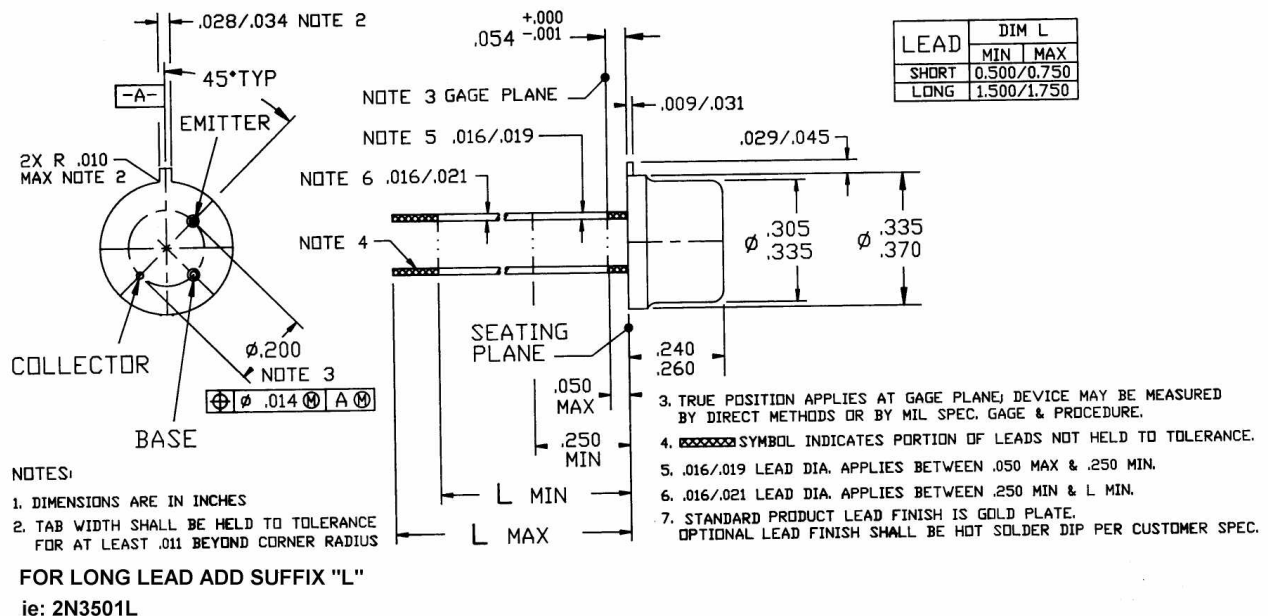
**150 Volts
500mAmps**

**NPN
BIPOLAR
TRANSISTOR**

Maximum Ratings

RATING	SYMBOL	MAX.	UNIT
Collector-Emitter Voltage	V_{CEO}	150	Vdc
Collector-Base Voltage	V_{CBO}	150	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Collector Current—Continuous	I_C	300	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 5.71	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	5.0 28.6	Watts mW/ $^\circ\text{C}$
Operating Temperature Range	T_J	-55 to +200	$^\circ\text{C}$
Storage Temperature Range	T_S	-55 to +200	$^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	175	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	35	$^\circ\text{C/W}$

Mechanical Outline



Electrical Parameters (T_A @ 25°C unless otherwise specified)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Off Characteristics					
Collector-Emitter Breakdown Voltage(1) (I _C = 10 mA _{dc} , I _B = 0)	BV _{CEO}	150	--	--	V _{dc}
Collector-Base Breakdown Voltage (I _C = 10 μA _{dc} , I _E = 0)	BV _{CBO}	150	--	--	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 10 μA _{dc} , I _C = 0)	BV _{EBO}	6.0	--	--	V _{dc}
Collector Cutoff Current (V _{CB} = 75 V _{dc} , I _E = 0) (V _{CB} = 75 V _{dc} , I _E = 0, T _A = 150°C)	I _{CBO}	--	--	0.05 50	μA _{dc}
Emitter Cutoff Current (V _{EB(off)} = 4.0 V _{dc} , I _C = 0)	I _{EBO}	--	--	25	nA _{dc}
D.C. Current Gain (I _C = 0.1 mA _{dc} , V _{CE} = 10 V _{dc}) (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc}) (I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc})(1) (I _C = 150 mA _{dc} , V _{CE} = 10 V _{dc})(1) (I _C = 150 mA _{dc} , V _{CE} = 10V _{dc}) @ 55°C (I _C = 300 mA _{dc} , V _{CE} = 10 V _{dc})(1)	h _{FE}	35 50 75 100 45 20	-- -- -- -- -- --	-- -- -- 300 -- --	--
Collector-Emitter Saturation Voltage(1) (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc}) (I _C = 150 mA _{dc} , I _B = 15 mA _{dc})	V _{CE(Sat)}	-- --	-- --	0.2 0.4	V _{dc}
Base-Emitter Saturation Voltage(1) (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc}) (I _C = 150 mA _{dc} , I _B = 15 mA _{dc})	V _{BE(Sat)}	-- --	-- --	0.8 1.2	V _{dc}
Magnitude of common emitter small-signal short-circuit forward current transfer ratio (V _{CE} = 20 V _{dc} , I _C = 20 mA _{dc} , f = 100 MHz)	h _{fe}	1.5	--	8 --	
Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, 100kHz ≤ f ≤ 1MHz)	C _{OBO}	--	--	8.0	pf
Input Capacitance (V _{EB} = 0.5 V _{dc} , I _C = 0, 100kHz ≤ f ≤ 100MHz)	C _{IBo}	--	--	80	pf
Small -signal Current Gain (I _C = 10mA _{dc} , V _{CE} = 10V _{dc} , f = 1.0 kHz)	h _{fe}	75	--	300	
Noise figure (V _{CE} = 10V _{dc} , I _C = 0.5mA _{dc} ; R _g = 1kohms, f = 1MHz)	NF			16	dB
Noise figure (V _{CE} = 10V _{dc} , I _C = 0.5mA _{dc} ; R _g = 1kohms, f = 1MHz)	NF			6	dB
Turn - on time (V _{EB} = 12V _{dc} , I _C = 150mA _{dc} , I _{B1} = 15mA _{dc})	t _{on}			115	nS
Turn - off time (I _C = 150mA _{dc} , I _{B1} = I _{B2} = -15mA _{dc})	t _{off}			1150	nS

(1) Pulse Test: Pulse Width ≤ 300 ms, Duty Cycle ≤ 2.0%