

2N3251A

Features

- Meets MIL-S-19500/323
- Collector-Base Voltage 60V
- Collector Current: 200 mA
- Fast Switching 370 nS

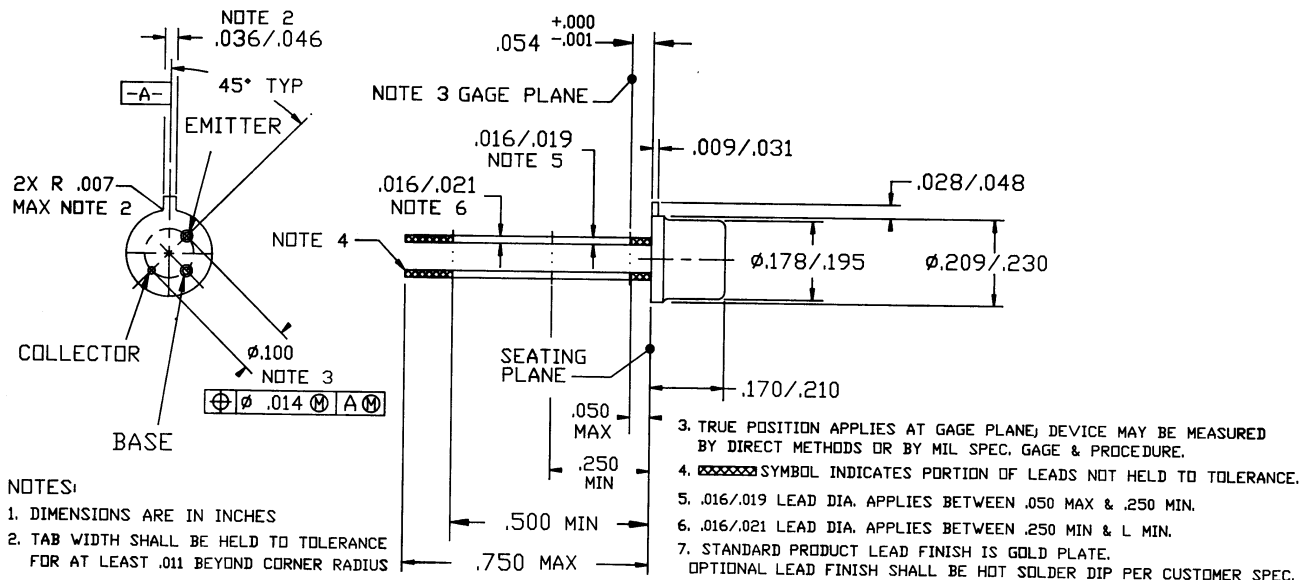
**60 Volts
200 mAmps**

**PNP
BIPOLAR
TRANSISTOR**

Maximum Ratings

RATING	SYMBOL	MAX.	UNIT
Collector-Emitter Voltage	V_{CEO}	-60	Vdc
Collector-Base Voltage	V_{CBO}	-60	Vdc
Emitter-Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current	I_C	-200	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	0.36 2.4	Watts mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.2 8	Watts mW/ $^\circ\text{C}$
Operating Temperature Range	T_J	-65 to +175	$^\circ\text{C}$
Storage Temperature Range	T_S	-65 to +175	$^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	146	$^\circ\text{C}/\text{W}$

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 mAdc)	BV_{CEO}	-60		--	Vdc
Collector-Base Breakdown Voltage (I _C = -10 μAdc)	BV_{CBO}	-60		--	Vdc
Emitter-Base Breakdown Voltage (I _E = -10 μAdc)	BV_{EBO}	-5.0		--	Vdc
Collector Cutoff Current (V _{CE} = -40 Vdc, V _{EB} = -3.0 Vdc) (at 150 C)	I_{CEx}	--		-20 -20	nA uA
Base Cutoff Current (V _{CE} = -40 Vdc, V _{EB} = -3.0 Vdc)	I_{BEx}	--		-50	nAdc
D.C. Current Gain (I _C = -0.1 mAdc, V _{CE} = -1.0 Vdc) (I _C = -1.0 mAdc, V _{CE} = -1.0 Vdc) (I _C = -1.0mAdc, V _{CE} = -1.0Vdc) @ -55C (I _C = -10 mAdc, V _{CE} = -1.0 Vdc)(1) (I _C = -50 mAdc, V _{CE} = -1.0 Vdc)(1)	h_{FE}	80 90 40 100 30		-- -- -- 300 --	--
Collector-Emitter Saturation Voltage(1) (I _C = -10 mAdc, I _B = -1.0 mAdc) (I _C = -50 mAdc, I _B = -5.0 mAdc)	V_{CE(Sat)}	-- --		-0.25 -0.5	Vdc
Base-Emitter Saturation Voltage(1) (I _C = -10 mAdc, I _B = -1.0 mAdc) (I _C = -50 mAdc, I _B = -5.0 mAdc)	V_{BE(Sat)}	-0.6 --		-0.9 -1.2	Vdc
Magnitude of common emitter small-signal short-circuit forward current transfer ratio (I _C = -10 mAdc, V _{CE} = -20 Vdc, f = 100MHz)	 h_{fe} 	3.0		9.0	
Output Capacitance (V _{CB} = -10 Vdc, I _E = 0, 100kHz ≤ f ≤ 1MHz)	C_{OBO}	--		6.0	pf
Input Capacitance (V _{EB} = -10 Vdc, I _C = 0, 100kHz ≤ f ≤ 1MHz)	C_{IBO}	--		8.0	pf
Input Impedance (I _C = -1.0 mA, V _{CE} = -10 V, f = 1.0 kHz)	h_{ie}	2.0		12	kohms
Voltage Feedback Ratio (I _C = -1.0 mA, V _{CE} = -10 V, f = 1.0 kHz)	h_{re}	--		20	x 10 ⁻⁴
Small—Signal Current Gain (I _C = -1.0 mA, V _{CE} = -10 V, f = 1.0 kHz)	h_{fe}	100		400	--
Output Admittance (I _C = -1.0 mA, V _{CE} = -10 V, f = 1.0 kHz)	h_{oe}	10		60	μmhos
Collector Base Time Constant (I _C = -10 mA, V _{CE} = -20 V, f = 31.8 MHz)	rb'C_C	5		250	ps
Noise Figure (I _C = -100 μA, V _{CE} = -5.0 V, R _S = 1.0kΩ, f = 100 Hz)	NF	--		6.0	dB
Switching Speeds (V _{CC} = -3.0 Vdc, V _{BE} = +0.5 Vdc I _C = -10 mAdc, I _{B1} = -1.0 mA)	ton	--		70	ns
(V _{CC} = -10 mAdc, I _{B1} = I _{B1} = -1.0 mAdc) (V _{CC} = -3.0 V)	t_{off}	--		300	ns

(1) Pulse Test: PW = 300 μs, Duty Cycle = 2.0%

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