Microsemi
Watertown, MA
Progress Powered by Technology

2N3251A

60 Volts
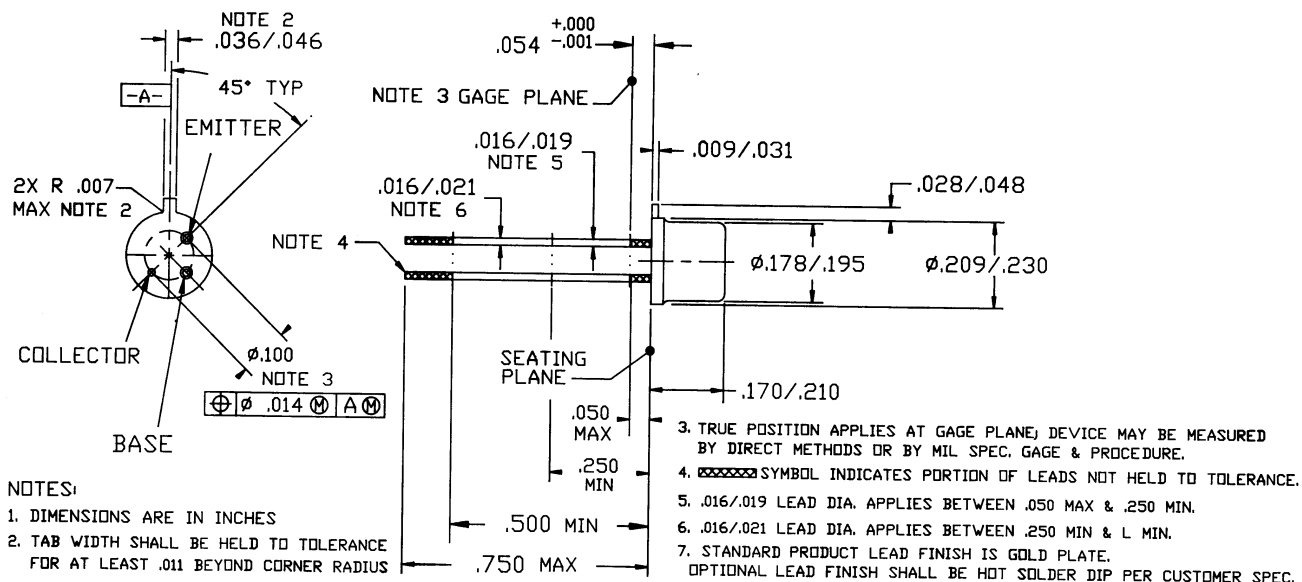## 200 mAmps

PNP
BIPOLAR
TRANSISTOR

Features

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

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 @ $T_A = 25^{o}$C Derate above 25°C	P_D	0.36 2.4	Watts mW/^{o}C
Total Device Dissipation @ $T_C = 25^{o}$C Derate above 25°C	P_D	1.2 8	Watts mW/^{o}C
Operating Temperature Range	T_J	-65 to +175	^{o}C
Storage Temperature Range	T_S	-65 to +175	^{o}C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	^{o}C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	146	^{o}C/W

Mechanical Outline

NOTES:
1. DIMENSIONS ARE IN INCHES
2. TAB WIDTH SHALL BE HELD TO TOLERANCE FOR AT LEAST .011 BEYOND CORNER RADIUS
3. TRUE POSITION APPLIES AT GAGE PLANE; DEVICE MAY BE MEASURED BY DIRECT METHODS OR BY MIL SPEC. GAGE & PROCEDURE.
4. ⬚⬚⬚⬚⬚ SYMBOL INDICATES PORTION OF LEADS NOT HELD TO TOLERANCE.
5. .016/.019 LEAD DIA. APPLIES BETWEEN .050 MAX & .250 MIN.
6. .016/.021 LEAD DIA. APPLIES BETWEEN .250 MIN & L MIN.
7. STANDARD PRODUCT LEAD FINISH IS GOLD PLATE. OPTIONAL LEAD FINISH SHALL BE HOT SOLDER DIP PER CUSTOMER SPEC.

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 $\le$ f $\le$ 1MHz)	**C$_{OBO}$** --			6.0	pf
Input Capacitance (V$_{EB}$ = -10 Vdc, I$_C$ = 0, 100kHz $\le$ f $\le$ 1MHz)	**C$_{IBO}$** --			8.0	pf
Input Impedance (I$_C$ = -1.0 mA, V$_{CE}$ = -10 V, f = 1.0 kHz)	**h$_{je}$** 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%