

**SEMICONDUCTOR
TECHNICAL DATA**

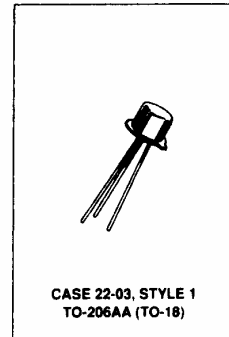
**2N3250A
2N3251A**

**PNP Silicon
Small-Signal Transistors**

designed for general-purpose switching and amplifier applications.

CRYSTALONCS
2805 Veterans Highway
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MAXIMUM RATINGS			
Rating	Symbol	Value	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	mA _{dc}
Power Dissipation	P _T	0.36	Watts
@ T _A = 25 C		2.06	mW/C
Derate above 25 C		1.2	Watts
@ T _C = 25 C		6.9	mW/C
Derate above 25 C			
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-65 to 200	C



ELECTRICAL CHARACTERISTICS (T _A = 25 C unless otherwise noted)				
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ⁽¹⁾ (I _C = 10 mA _{dc})	V _{(BR)CEO}	60	—	Vdc
Collector-Base Breakdown Voltage (I _C = 10 μA _{dc})	V _{(BR)CBO}	60	—	Vdc
Base-Emitter Voltage (I _E = 10 μA _{dc})	V _{(BR)EBO}	5.0	—	Vdc
Collector Cutoff Current (V _{CE} = 40 Vdc, V _{EB(off)} = 3.0 Vdc)	I _{CEX}	—	20	nA _{dc}
(V _{CE} = 40 Vdc, V _{EB} = 3.0 Vdc, T _A = 150 C)		—	20	μA _{dc}
Collector Cutoff Current (V _{CB} = 40 Vdc)	I _{CBO}	—	20	nA _{dc}
Emitter Cutoff Current (V _{EB} = 3.0 Vdc, V _{CE} = 40 Vdc)	I _{BEX}	—	50	nA _{dc}

⁽¹⁾ Pulsed Pulse Width 250 to 350 μs Duty Cycle 1.0 to 2.0%

Continued

2N3250AJAN, 2N3251AJAN SERIES

ELECTRICAL CHARACTERISTICS — continued (T _A = 25°C unless otherwise noted.)					
Characteristic	Symbol	Min	Max	Unit	
ON CHARACTERISTICS					
DC Current Gain (I _C = 0.1 mA, V _{CE} = 1.0 Vdc)	2N3250A 2N3251A	40	—	—	
		80	—	—	
	2N3250A 2N3251A	45	—	—	
		90	—	—	
	(I _C = 10 mA, V _{CE} = 1.0 Vdc) ⁽¹⁾	2N3250A 2N3251A	50 100	150 300	—
(I _C = 50 mA, V _{CE} = 1.0 Vdc) ⁽¹⁾	2N3250A 2N3251A	15	—	—	
		30	—	—	
(I _C = 1.0 mA, V _{CE} = 1.0 Vdc, T _A = -55°C)	2N3250A 2N3251A	20 40	—	—	
Collector-Emitter Saturation Voltage (I _C = 10 mA, I _B = 1.0 mA) (I _C = 50 mA, I _B = 5.0 mA) ⁽¹⁾	V _{CE(sat)}	—	0.25	Vdc	
		—	0.5	Vdc	
Base-Emitter Saturation Voltage (I _C = 10 mA, I _B = 1.0 mA) (I _C = 50 mA, I _B = 5.0 mA) ⁽¹⁾	V _{BE(sat)}	0.6	0.9	Vdc	
		—	1.2	Vdc	
SMALL-SIGNAL CHARACTERISTICS					
Current Gain (I _C = 1.0 mA, V _{CE} = 10 Vdc, f = 1.0 kHz)	2N3250A 2N3251A	50	200	—	
		100	400	—	
Small-Signal Current Transfer Ratio, Magnitude (I _C = 10 mA, V _{CE} = 20 Vdc, f = 100 MHz)	2N3250A 2N3251A	2.5	9.0	—	
		3.0	9.0	—	
Output Capacitance (V _{CB} = 10 Vdc, f = 0.1 to 1.0 MHz)	C _{obo}	—	6.0	pF	
Input Capacitance (V _{EB} = 1.0 Vdc, f = 0.1 to 1.0 MHz) (Output open circuited)	C _{ibo}	—	8.0	pF	
Collector-Base Time Constant (I _C = 10 mA, V _{CE} = 20 Vdc, f = 31.8 MHz)	t _b C _c	5.0	250	ps	
Noise Figure (I _C = 100 μA, V _{CE} = 5.0 Vdc, f = 100 Hz, R _G = 1.0 kohms)	NF	—	6.0	dB	
Voltage Feedback Ratio (I _C = 1.0 mA, V _{CE} = 10 Vdc, f = 1.0 kHz)	2N3250A 2N3251A	—	10	X 10 ⁻⁴	
		—	20	X 10 ⁻⁴	
Input Impedance (I _C = 1.0 mA, V _{CE} = 10 Vdc, f = 1.0 kHz)	2N3250A 2N3251A	1.0	6.0	kohms	
		2.0	12	kohms	
Output Admittance (I _C = 1.0 mA, V _{CE} = 10 Vdc, f = 1.0 kHz)	2N3250A 2N3251A	4.0	40	μmhos	
		10	60	μmhos	
SWITCHING CHARACTERISTICS (See Figure 30) (V _{CC} = 3.0 Vdc, I _C = 10 mA, I _B = 1.0 mA, V _{BE} = 0.5 Vdc)					
Delay Time (V _{BE} = 0.5 Vdc)	t _d	—	35	ns	
Rise Time (V _{BE} = 0.5 Vdc)	t _r	—	35	ns	
Storage Time	2N3250A 2N3251A	—	175	ns	
		—	200	ns	
Fall Time	t _f	—	50	ns	

⁽¹⁾ Pulsed Pulse Width 250 to 350 μs, Duty Cycle 1.0 to 2.0%

ASSURANCE TESTING (Pre/Post Burn-In)
Burn-In Conditions: T_A = 25 ± 3°C, V_{CB} = 25 Vdc, 10 Vdc for JANS
P_T = 360 mW

Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current (V _{CB} = 40 Vdc)	I _{CBO}	—	20	nAdc
DC Current Gain ⁽¹⁾ (I _C = 10 mA, V _{CE} = 1.0 Vdc)	2N3250A 2N3251A	50	150	—
		100	300	

Delta from Pre-Burn-In Measured Values	Symbol	Min	Max	Unit
Delta Collector Cutoff Current	ΔI _{CBO}	—	±100 or ±5.0 whichever is greater	% of Initial Value nAdc
Delta DC Current Gain ⁽¹⁾	Δh _{FE}	—	±15	% of Initial Value

⁽¹⁾ Pulsed Pulse Width 250 to 350 μs, Duty Cycle 1.0 to 2.0%