

**SEMICONDUCTOR  
TECHNICAL DATA**

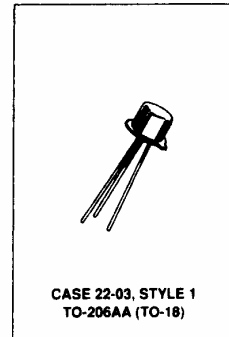
**2N3250A  
2N3251A**

**PNP Silicon  
Small-Signal Transistors**

designed for general-purpose switching and amplifier applications.

**CRYSTALONCS  
2805 Veterans Highway  
Suite 14  
Ronkonkoma, N.Y. 11779**

MAXIMUM RATINGS			
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	60	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	60	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	5.0	Vdc
Collector Current	I <sub>C</sub>	200	mA <sub>dc</sub>
Power Dissipation	P <sub>T</sub>	0.36	Watts
@ T <sub>A</sub> = 25 C		2.06	mW/C
Derate above 25 C		1.2	Watts
@ T <sub>C</sub> = 25 C		6.9	mW/C
Derate above 25 C			
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to 200	C



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 C unless otherwise noted)				
Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage <sup>(1)</sup> (I <sub>C</sub> = 10 mA <sub>dc</sub> )	V <sub>(BR)CEO</sub>	60	—	Vdc
Collector-Base Breakdown Voltage (I <sub>C</sub> = 10 μA <sub>dc</sub> )	V <sub>(BR)CBO</sub>	60	—	Vdc
Base-Emitter Voltage (I <sub>E</sub> = 10 μA <sub>dc</sub> )	V <sub>(BR)EBO</sub>	5.0	—	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 40 Vdc, V <sub>EB(off)</sub> = 3.0 Vdc)	I <sub>CEX</sub>	—	20	nA <sub>dc</sub>
(V <sub>CE</sub> = 40 Vdc, V <sub>EB</sub> = 3.0 Vdc, T <sub>A</sub> = 150 C)		—	20	μA <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = 40 Vdc)	I <sub>CBO</sub>	—	20	nA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = 3.0 Vdc, V <sub>CE</sub> = 40 Vdc)	I <sub>BEX</sub>	—	50	nA <sub>dc</sub>

<sup>(1)</sup> Pulsed Pulse Width 250 to 350 μs Duty Cycle 1.0 to 2.0%

Continued

**2N3250AJAN, 2N3251AJAN SERIES**

ELECTRICAL CHARACTERISTICS — continued (T <sub>A</sub> = 25°C unless otherwise noted.)					
Characteristic		Symbol	Min	Max	Unit
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 0.1 mA, V <sub>CE</sub> = 1.0 Vdc)	2N3250A	h <sub>FE</sub>	40	—	—
	2N3251A		80	—	
	2N3250A		45	—	
	2N3251A		90	—	
	(I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 1.0 Vdc) <sup>(1)</sup>		2N3250A	50	
	2N3251A	100	300		
(I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 1.0 Vdc) <sup>(1)</sup>	2N3250A	15	—		
	2N3251A	30	—		
(I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 1.0 Vdc, T <sub>A</sub> = -55°C)	2N3250A	20	—		
	2N3251A	40	—		
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 1.0 mA) (I <sub>C</sub> = 50 mA, I <sub>B</sub> = 5.0 mA) <sup>(1)</sup>		V <sub>CE(sat)</sub>	—	0.25 0.5	Vdc
Base-Emitter Saturation Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 1.0 mA) (I <sub>C</sub> = 50 mA, I <sub>B</sub> = 5.0 mA) <sup>(1)</sup>		V <sub>BE(sat)</sub>	0.6 —	0.9 1.2	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current Gain (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	2N3250A	h <sub>re</sub>	50	200	—
	2N3251A		100	400	
Small-Signal Current Transfer Ratio, Magnitude (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 20 Vdc, f = 100 MHz)	2N3250A	h <sub>re</sub>	2.5	9.0	—
	2N3251A		3.0	9.0	
Output Capacitance (V <sub>CB</sub> = 10 Vdc, f = 0.1 to 1.0 MHz)		C <sub>obo</sub>	—	6.0	pF
Input Capacitance (V <sub>EB</sub> = 1.0 Vdc, f = 0.1 to 1.0 MHz) (Output open circuited)		C <sub>ibo</sub>	—	8.0	pF
Collector-Base Time Constant (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 20 Vdc, f = 31.8 MHz)		t <sub>b</sub> C <sub>c</sub>	5.0	250	ps
Noise Figure (I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 Vdc, f = 100 Hz, R <sub>G</sub> = 1.0 kohms)		NF	—	6.0	dB
Voltage Feedback Ratio (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	2N3250A	h <sub>re</sub>	—	10	X 10 <sup>-4</sup>
	2N3251A		—	20	
Input Impedance (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	2N3250A	h <sub>ie</sub>	1.0	6.0	kohms
	2N3251A		2.0	12	
Output Admittance (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	2N3250A	h <sub>oe</sub>	4.0	40	μmhos
	2N3251A		10	60	
<b>SWITCHING CHARACTERISTICS (See Figure 30)</b> (V <sub>CC</sub> = 3.0 Vdc, I <sub>C</sub> = 10 mA, I <sub>B</sub> = 1.0 mA, V <sub>BE</sub> = 0.5 Vdc)					
Delay Time (V <sub>BE</sub> = 0.5 Vdc)		t <sub>d</sub>	—	35	ns
Rise Time (V <sub>BE</sub> = 0.5 Vdc)		t <sub>r</sub>	—	35	ns
Storage Time	2N3250A	t <sub>s</sub>	—	175	ns
	2N3251A		—	200	
Fall Time		t <sub>f</sub>	—	50	ns

<sup>(1)</sup> Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1.0 to 2.0%.

**ASSURANCE TESTING (Pre/Post Burn-In)**  
**Burn-In Conditions: T<sub>A</sub> = 25 ± 3°C, V<sub>CB</sub> = 25 Vdc, 10 Vdc for JANS**  
**P<sub>T</sub> = 360 mW**

Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current (V <sub>CB</sub> = 40 Vdc)	I <sub>CBO</sub>	—	20	nAdc
DC Current Gain <sup>(1)</sup> (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 1.0 Vdc)	h <sub>FE</sub>	50	150	—
		100	300	

Delta from Pre-Burn-In Measured Values		Min	Max	
Delta Collector Cutoff Current	ΔI <sub>CBO</sub>	—	±100 or ±5.0 whichever is greater	% of Initial Value nAdc
Delta DC Current Gain <sup>(1)</sup>	Δh <sub>FE</sub>	—	±15	% of Initial Value

<sup>(1)</sup> Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1.0 to 2.0%.