

2N3250AJAN, JTX, JTXV
2N3251AJAN, JTX, JTXV
Processed per MIL-S-19500/323
PNP Silicon
Small-Signal Transistors

CRYSTALONCS
2805 Veterans Highway
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designed for general-purpose switching and amplifier applications.

MAXIMUM RATINGS			
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	60	Vdc
Collector-Base Voltage	V_{CB0}	60	Vdc
Emitter-Base Voltage	V_{EB0}	5.0	Vdc
Collector Current	I_C	200	mAdc
Power Dissipation	P_T		
@ $T_A = 25^\circ\text{C}$		0.36	Watts
Derate above 25°C		2.06	mW/°C
@ $T_C = 25^\circ\text{C}$		1.2	Watts
Derate above 25°C		6.9	mW/°C
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-65 to 200	°C



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)				
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 10\text{ mAdc}$)	$V_{(BR)CEO}$	60	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{Adc}$)	$V_{(BR)CBO}$	60	—	Vdc
Base-Emitter Voltage ($I_E = 10\text{ }\mu\text{Adc}$)	$V_{(BR)EB0}$	5.0	—	Vdc
Collector Cutoff Current ($V_{CE} = 40\text{ Vdc}$; $V_{EB(\text{off})} = 3.0\text{ Vdc}$)	I_{CEX}	—	20	nAdc
($V_{CE} = 40\text{ Vdc}$; $V_{EB} = 3.0\text{ Vdc}$; $T_A = 150^\circ\text{C}$)		—	20	μAdc
Collector Cutoff Current ($V_{CB} = 40\text{ Vdc}$)	I_{CBO}	—	20	nAdc
Emitter Cutoff Current ($V_{EB} = 3.0\text{ Vdc}$; $V_{CE} = 40\text{ Vdc}$)	I_{BEX}	—	50	nAdc

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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 _{dc} , V _{CE} = 1.0 V _{dc})	2N3250A 2N3251A	h _{FE}	40 80	—	—
(I _C = 1.0 mA _{dc})	2N3250A 2N3251A		45 90	—	—
(I _C = 10 mA _{dc} , V _{CE} = 1.0 V _{dc}) ⁽¹⁾	2N3250A 2N3251A		50 100	150 300	
(I _C = 50 mA _{dc} , V _{CE} = 1.0 V _{dc}) ⁽¹⁾	2N3250A 2N3251A		15 30	—	—
(I _C = 1.0 mA _{dc} , V _{CE} = 1.0 V _{dc} , T _A = -55°C)	2N3250A 2N3251A		20 40	—	—
Collector-Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc}) (I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc}) ⁽¹⁾		V _{CE(sat)}	—	0.25 0.5	V _{dc}
Base-Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc}) (I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc}) ⁽¹⁾		V _{BE(sat)}	0.6	0.9 1.2	V _{dc}
SMALL-SIGNAL CHARACTERISTICS					
Current Gain (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	2N3250A 2N3251A	h _{fe}	50 100	200 400	—
Small-Signal Current Transfer Ratio, Magnitude (I _C = 10 mA _{dc} , V _{CE} = 20 V _{dc} , f = 100 MHz)	2N3250A 2N3251A	(h _{fe})	2.5 3.0	9.0 9.0	—
Output Capacitance (V _{CB} = 10 V _{dc} , f = 0.1 to 1.0 MHz)		C _{obo}	—	8.0	pF
Input Capacitance (V _{EB} = 1.0 V _{dc} , f = 0.1 to 1.0 MHz) (Output open circuited)		C _{ibo}	—	8.0	pF
Collector-Base Time Constant (I _C = 10 mA _{dc} , V _{CE} = 20 V _{dc} , f = 31.8 MHz)		t _b C _c	5.0	250	ps
Noise Figure (I _C = 100 μA _{dc} , V _{CE} = 5.0 V _{dc} , f = 100 Hz, R _G = 1.0 kohms)		NF	—	6.0	dB
Voltage Feedback Ratio (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	2N3250A 2N3251A	h _{re}	—	10 20	X 10 ⁻⁴
Input Impedance (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	2N3250A 2N3251A	h _{ie}	1.0 2.0	6.0 12	kohms
Output Admittance (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	2N3250A 2N3251A	h _{oe}	4.0 10	40 60	μmhos
SWITCHING CHARACTERISTICS (See Figure 30) (V _{CC} = 3.0 V _{dc} , I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc} , V _{BE} = 0.5 V _{dc})					
Delay Time (V _{BE} = 0.5 V _{dc})		t _d	—	35	ns
Rise Time (V _{BE} = 0.5 V _{dc})		t _r	—	35	ns
Storage Time	2N3250A 2N3251A	t _s	—	175 200	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 V _{dc} , 10 V _{dc} for JANS				
P _T = 360 mW				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current (V _{CB} = 40 V _{dc})	I _{CBO}	—	20	nA _{dc}
DC Current Gain ⁽¹⁾ (I _C = 10 mA _{dc} , V _{CE} = 1.0 V _{dc})	h _{FE}	50 100	150 300	—
	2N3250A 2N3251A			
Delta from Pre-Burn-In Measured Values				
Delta Collector Cutoff Current	ΔI _{CBO}	—	±100 or ±5.0 whichever is greater	% of Initial Value nA _{dc}
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%.