2N3251AJAN, JTX

Processed per MIL–S–19500/323

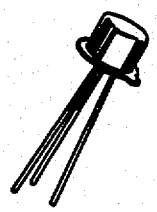
PNP Silicon
Small–Signal Transistors

CPTO
Commercial Plus Technologies Operation

. . .designed for general–purpose switching and amplifier applications.

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	mAdc
Power Dissipation @ T_A = 25°C Derate above 25°C @ T_C = 25°C Derate above 25°C	P_D	 0.36 2.06 1.2 6.9	 Watts mW/°C Watts mW/°C
Operating Junction and Storage Temperature Range	T_J, T_{stg}	– 65 to 200	°C



CASE 22–03, STYLE 1
TO–206AA (TO–18)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage(1) (I_C = 10 mAdc)	$V_{(BR)CEO}$	60	—	Vdc
Collector–Base Breakdown Voltage (I_C = 10 μAdc)	$V_{(BR)CBO}$	60	—	Vdc
Base–Emitter Voltage (I_E = 10 μAdc)	$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current (V_{CE} = 40 Vdc, $V_{EB(off)}$ = 3.0 Vdc) (V_{CE} = 40 Vdc, V_{EB} = 3.0 Vdc, T_A = 150°C)	I_{CEX}	 — —	 20 20	 nAdc μAdc
Collector Cutoff Current (V_{CB} = 40 Vdc)	I_{CBO}	—	20	nAdc
Emitter Cutoff Current (V_{EB} = 3.0 Vdc, V_{CE} = 40 Vdc)	I_{BEX}	—	50	nAdc

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

(continued)

ELECTRICAL CHARACTERISTICS — continued (T_A = 25°C unless otherwise noted.)				
Characteristic	**Symbol**	**Min**	**Max**	**Unit**
ON CHARACTERISTICS				
DC Current Gain (I_C = 0.1 mAdc, V_{CE} = 1.0 Vdc) (I_C = 1.0 mAdc) (I_C = 10 mAdc, V_{CE} = 1.0 Vdc)(1) (I_C = 50 mAdc, V_{CE} = 1.0 Vdc)(1) (I_C = 1.0 mAdc, V_{CE} = 1.0 Vdc, T_A = −55°C)	h_{FE}	 80 90 100 30 40	 — — 300 — —	—
Collector–Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc) (I_C = 50 mAdc, I_B = 5.0 mAdc)(1)	$V_{CE(sat)}$	 — —	 0.25 0.5	Vdc
Base–Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc) (I_C = 50 mAdc, I_B = 5.0 mAdc)(1)	$V_{BE(sat)}$	 0.6 —	 0.9 1.2	Vdc
SMALL–SIGNAL CHARACTERISTICS				
Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{fe}	50 100	200 400	—
Small–Signal Current Transfer Ratio, Magnitude (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)	$\|h_{fe}\|$	2.5 3.0	9.0 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 mAdc, V_{CE} = 20 Vdc, f = 31.8 MHz)	$r_b'C_c$	5.0	250	ps
Noise Figure (I_C = 100 µAdc, V_{CE} = 5.0 Vdc, f = 100 Hz, R_G = 1.0 kohms)	NF	—	6.0	dB
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{re}	— —	10 20	X 10^{-4}
Input Impedance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{ie}	2.0	12	kohms
Output Admittance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{oe}	10	60	µmhos
SWITCHING CHARACTERISTICS (See Section 4, Figure 12) (V_{CC} = 3.0 Vdc, I_C = 10 mAdc, I_B = 1.0 mAdc, 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	t_s	—	200	ns
Fall Time	t_f	—	50	ns

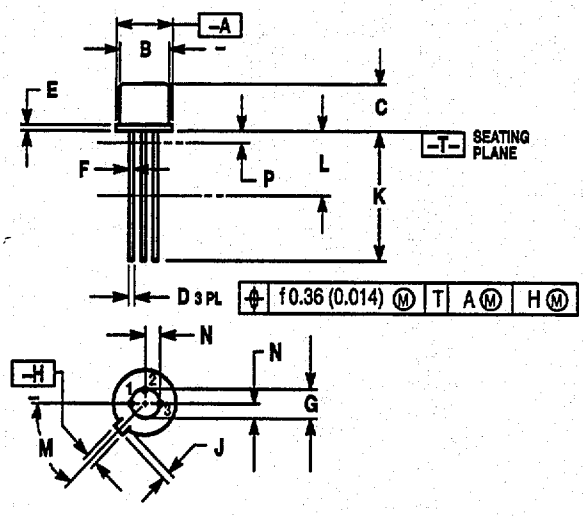
(1) Pulsed. Pulse Width 250 to 350 µs, Duty Cycle 1.0 to 2.0%.

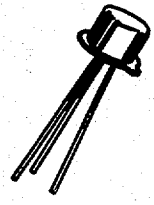
ASSURANCE TESTING (Pre/Post Burn–In) Burn–In Conditions: T_A = 25 ±3°C, V_{CB} = 25 Vdc, P_D = 360 mW				
Characteristics Tested	**Symbol**	**Initial and End Point Limits**		**Unit**
		Min	**Max**	
Collector Cutoff Current (V_{CB} = 40 Vdc)	I_{CBO}	—	20	nAdc
DC Current Gain(1) (I_C = 10 mAdc, V_{CE} = 1.0 Vdc)	h_{FE}	100	300	—

Delta from Pre–Burn–In Measured Values		**Min**	**Max**	
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%.

PACKAGE DIMENSIONS





CASE 22-03
TO-206AA
(TO-18)

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIM J MEASURED FROM DIM A MAXIMUM.
4. DIM F APPLIES BETWEEN DIM P AND L. DIM D APPLIES BETWEEN DIM L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIM P AND BEYOND DIM K MINIMUM.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.32	5.33	0.170	0.210
D	0.406	0.533	0.016	0.021
E	–	0.762	–	0.030
F	0.406	0.483	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.914	1.17	0.036	0.046
J	0.711	1.22	0.028	0.048
K	12.70	–	0.500	–
L	6.35	–	0.250	–
M	45° BSC		45° BSC	
N	1.27 BSC		0.050 BSC	
P	–	1.27	–	0.050

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