2N2219AJAN, JTX, JTXV, JANS

Processed per MIL–S–19500/251

NPN Silicon
Small–Signal Transistors

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

CPTO
Commercial Plus Technologies Operation

MAXIMUM RATINGS			
Rating	**Symbol**	**Value**	**Unit**
Collector–Emitter Voltage	V_{CEO}	50	Vdc
Collector–Base Voltage	V_{CBO}	75	Vdc
Emitter–Base Voltage	V_{EBO}	6.0	Vdc
Collector Current	I_C	800	mAdc
Device Dissipation @ T_A = 25°C Derate above 25°C @ T_C = 25°C Derate above 25°C	P_D	 0.8 4.6 3.0 17	 Watts mW/°C Watts mW/°C
Operating Junction and Storage Temperature Range	T_J, T_{stg}	– 65 to 200	°C

CASE 79-04, STYLE 1
TO-205AD (TO-39)

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, I_E = 0)	$V_{(BR)CEO}$	50	—	Vdc
Collector–Base Breakdown Voltage (I_C = 10 µAdc, I_E = 0)	$V_{(BR)CBO}$	75	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 µAdc)	$V_{(BR)EBO}$	6.0	—	Vdc
Collector Cutoff Current (V_{CB} = 50 Vdc)	I_{CES}	—	0.01	µAdc

(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**
OFF CHARACTERISTICS (continued)				
Collector Cutoff Current (V_{CB} = 60 Vdc) @ T_A = 150°C (V_{CB} = 60 Vdc)	I_{CBO}	— —	0.01 10	µAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	I_{EBO}	—	0.01	µAdc
ON CHARACTERISTICS				
DC Current Gain(1) (I_C = 0.1 mAdc, V_{CE} = 10 Vdc) (I_C = 1.0 mAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 10 Vdc) (I_C = 150 mAdc, V_{CE} = 10 Vdc) (I_C = 500 mAdc, V_{CE} = 10 Vdc)(1) (I_C = 10 mAdc, V_{CE} = 10 Vdc, T_A = –55°C)	h_{FE}	50 75 100 100 30 35	— 325 — 300 — —	—
Collector–Emitter Saturation Voltage(1) (I_C = 150 mAdc, I_B = 15 mAdc) (I_C = 500 mAdc, I_B = 50 mAdc)	$V_{CE(sat)}$	— —	0.3 1.0	Vdc
Base–Emitter Saturation Voltage(1) (I_C = 150 mAdc, I_B = 15 mAdc) (I_C = 500 mAdc, I_B = 50 mAdc)	$V_{BE(sat)}$	0.6 —	1.2 2.0	Vdc
SMALL–SIGNAL CHARACTERISTICS				
Output Capacitance (V_{CB} = 10 Vdc, f = 0.1 to 1.0 MHz)	C_{obo}	—	8.0	pF
Input Capacitance (V_{EB} = 0.5 Vdc, f = 0.1 to 1.0 MHz)	C_{ibo}	—	25	pF
Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{fe}	75	—	—
Small–Signal Current Transfer Ratio, Magnitude (I_C = 20 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)	$\|h_{fe}\|$	2.5	12	—
SWITCHING CHARACTERISTICS (See Figure 4) (V_{CC} = 30 Vdc, I_C = 150 mAdc, I_B = 15 mAdc)				
Turn–On Time	$t_{(on)}$	—	35	ns
Turn–Off Time	$t_{(off)}$	—	300	ns

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

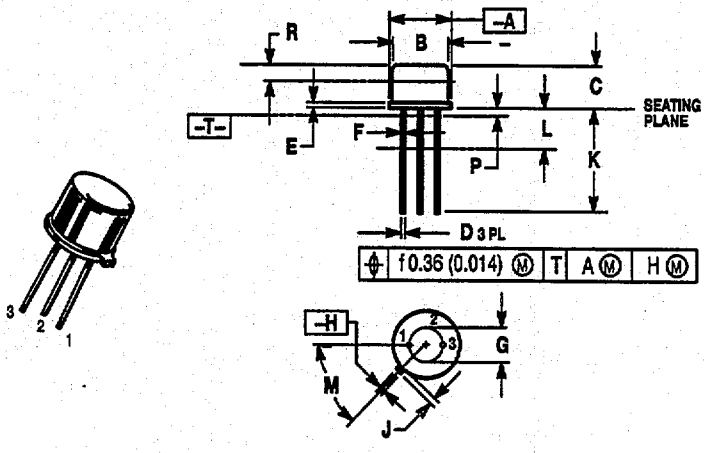
(continued)

ASSURANCE TESTING (Pre/Post Burn–In) Burn–In Conditions: T_A = 25 ±3°C, V_{CB} = 30 Vdc (10 Vdc JANS), P_D = 800 mW				
Characteristics Tested	**Symbol**	**Initial and End Point Limits**		**Unit**
		Min	**Max**	
Collector Cutoff Current (V_{CB} = 60 Vdc)	I_{CBO}	—	10	nAdc
DC Current Gain(1) (I_C = 150 mAdc, V_{CE} = 10 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



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
4. DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 2:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 3:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 4:
PIN 1. MAIN TERM. 1
2. GATE
3. MAIN TERM. 2

STYLE 5:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

STYLE 6:
PIN 1. SOURCE
2. GATE
3. DRAIN (CASE)

STYLE 7:
PIN 1. DRAIN
2. GATE
3. SOURCE

STYLE 8:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 9:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 10:
PIN 1. COLLECTOR
2. EMITTER
3. BASE

STYLE 11:
PIN 1. ANODE
2. OPEN
3. CATHODE

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.51	9.39	0.335	0.370
B	7.75	8.50	0.305	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.53	0.016	0.021
E	0.23	1.04	0.009	0.041
F	0.41	0.48	0.016	0.019
G	5.08 BSC		0.200 BSC	
H	0.72	0.86	0.028	0.034
J	0.74	1.14	0.029	0.045
K	12.70	19.05	0.500	0.750
L	6.35	–	0.250	–
M	45° BSC		45° BSC	
P	–	1.27	–	0.050
R	2.54	–	0.100	–

CASE 79–04
TO–205AD
(TO–39)

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