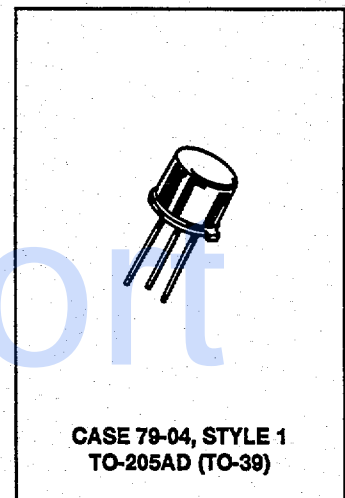


**2N2219AJAN, JTX, JTXV, JANS**  
Processed per MIL-S-19500/251  
**NPN Silicon**  
**Small-Signal Transistors**

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



MAXIMUM RATINGS			
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CE0}$	50	Vdc
Collector-Base Voltage	$V_{CB0}$	75	Vdc
Emitter-Base Voltage	$V_{EB0}$	6.0	Vdc
Collector Current	$I_C$	800	mAdc
Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	0.8 4.6 3.0 17	Watts mW/ $^\circ\text{C}$ Watts mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 65 to 200	$^\circ\text{C}$



ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = 10\text{ mAdc}, I_E = 0$ )	$V_{(BR)CE0}$	50	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 10\text{ }\mu\text{Adc}, I_E = 0$ )	$V_{(BR)CB0}$	75	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10\text{ }\mu\text{Adc}$ )	$V_{(BR)EB0}$	6.0	—	Vdc
Collector Cutoff Current ( $V_{CB} = 50\text{ Vdc}$ )	$I_{CES}$	—	0.01	$\mu\text{Adc}$

(1) Pulsed. Pulse Width 250 to 350  $\mu\text{s}$ , Duty Cycle 1.0 to 2.0%.

(continued)

ELECTRICAL CHARACTERISTICS — continued ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS (continued)</b>				
Collector Cutoff Current ( $V_{CB} = 60\text{ Vdc}$ ) @ $T_A = 150^\circ\text{C}$ ( $V_{CB} = 60\text{ Vdc}$ )	$I_{CBO}$	—	0.01	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 4.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	0.01	$\mu\text{Adc}$
<b>ON CHARACTERISTICS</b>				
DC Current Gain <sup>(1)</sup> ( $I_C = 0.1\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 1.0\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 10\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 150\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 500\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) <sup>(1)</sup> ( $I_C = 10\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $T_A = -55^\circ\text{C}$ )	$h_{FE}$	50 75 100 100 30 35	— 325 — 300 — —	—
Collector-Emitter Saturation Voltage <sup>(1)</sup> ( $I_C = 150\text{ mAdc}$ , $I_B = 15\text{ mAdc}$ ) ( $I_C = 500\text{ mAdc}$ , $I_B = 50\text{ mAdc}$ )	$V_{CE(sat)}$	— —	0.3 1.0	Vdc
Base-Emitter Saturation Voltage <sup>(1)</sup> ( $I_C = 150\text{ mAdc}$ , $I_B = 15\text{ mAdc}$ ) ( $I_C = 500\text{ mAdc}$ , $I_B = 50\text{ mAdc}$ )	$V_{BE(sat)}$	0.6 —	1.2 2.0	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $f = 0.1$ to $1.0\text{ MHz}$ )	$C_{obo}$	—	8.0	pF
Input Capacitance ( $V_{EB} = 0.5\text{ Vdc}$ , $f = 0.1$ to $1.0\text{ MHz}$ )	$C_{ibo}$	—	25	pF
Current Gain ( $I_C = 1.0\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{fe}$	75	—	—
Small-Signal Current Transfer Ratio, Magnitude ( $I_C = 20\text{ mAdc}$ , $V_{CE} = 20\text{ Vdc}$ , $f = 100\text{ MHz}$ )	$ h_{fe} $	2.5	12	—
<b>SWITCHING CHARACTERISTICS (See Figure 4)</b> ( $V_{CC} = 30\text{ Vdc}$ , $I_C = 150\text{ mAdc}$ , $I_B = 15\text{ mAdc}$ )				
Turn-On Time	$t_{(on)}$	—	35	ns
Turn-Off Time	$t_{(off)}$	—	300	ns

(1) Pulsed. Pulse Width 250 to 350  $\mu\text{s}$ , Duty Cycle 1.0 to 2.0%.

(continued)

2N2219A

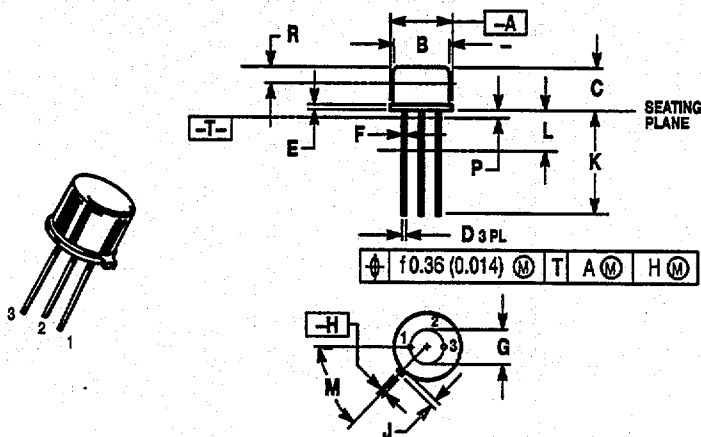
ASSURANCE TESTING (Pre/Post Burn-In)				
Burn-In Conditions: $T_A = 25 \pm 3^\circ\text{C}$ , $V_{CB} = 30 \text{ Vdc}$ (10 Vdc JANS), $P_D = 800 \text{ mW}$				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current ( $V_{CB} = 60 \text{ Vdc}$ )	$I_{CBO}$	—	10	nAdc
DC Current Gain(1) ( $I_C = 150 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ )	$h_{FE}$	100	300	—

Delta from Pre-Burn-In Measured Values		Min	Max	
Delta Collector Cutoff Current	$\Delta I_{CBO}$	—	$\pm 100$ or $\pm 5.0$ whichever is greater	% of Initial Value nAdc
Delta DC Current Gain(1)	$\Delta h_{FE}$	—	$\pm 15$	% of Initial Value

(1) Pulsed. Pulse Width 250 to 350  $\mu\text{s}$ , Duty Cycle 1.0 to 2.0%.

ARCHIVE DOCUMENT - NOT FOR NEW DESIGN

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

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

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

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

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

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

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

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

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

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	0.88	0.028	0.034
J	0.74	1.14	0.029	0.045
K	12.70	19.05	0.500	0.750
L	8.35	-	0.260	-
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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