

# 2N2219, 2N2219A, 2N2219AL

## Small Signal Switching Transistor

### NPN Silicon

#### Features

- MIL-PRF-19500/251 Qualified
- Available as JAN, JANTX, and JANTXV

#### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	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 - Continuous	$I_C$	800	mAdc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_T$	0.8	W
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	$P_T$	3.0	W
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

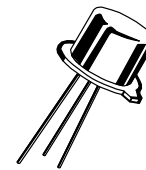
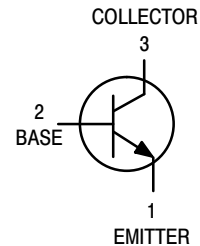
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	50	$^\circ\text{C/W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

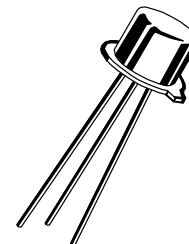


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TO-39  
CASE 205AB  
(2N2219, 2N2219A)



TO-5  
CASE 205AA  
(2N2219AL)

#### ORDERING INFORMATION

Device	Package	Shipping
JAN2N2219/A	TO-39	Bulk
JANTX2N2219/A		
JANTXV2N2219/A		
JAN2N2219AL	TO-5	Bulk
JANTX2N2219AL		
JANTXV2N2219AL		

## 2N2219, 2N2219A, 2N2219AL

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Breakdown Voltage (I <sub>E</sub> = 10 mAdc)	V <sub>(BR)CEO</sub>	30 50	– –	Vdc
Emitter–Base Cutoff Current (V <sub>EB</sub> = 5.0 Vdc) (V <sub>EB</sub> = 6.0 Vdc) (V <sub>EB</sub> = 4.0 Vdc)	I <sub>EBO</sub>	– – –	10 10 10	μAdc μAdc nAdc
Collector–Emitter Cutoff Current (V <sub>CE</sub> = 30 Vdc) (V <sub>CE</sub> = 50 Vdc)	I <sub>CES</sub>	– –	10 10	nAdc nAdc
Collector–Base Cutoff Current (V <sub>CB</sub> = 50 Vdc) (V <sub>CB</sub> = 60 Vdc) (V <sub>CB</sub> = 60 Vdc) (V <sub>CB</sub> = 75 Vdc)	I <sub>CBO</sub>	– – – –	10 10 10 10	nAdc μAdc nAdc μAdc

### ON CHARACTERISTICS (Note 1)

DC Current Gain (I <sub>C</sub> = 0.1 mAdc, V <sub>CE</sub> = 10 Vdc)	h <sub>FE</sub>	35 50	– –	–
(I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 10 Vdc)		50 75	325 325	
(I <sub>C</sub> = 10 mAdc, V <sub>CE</sub> = 10 Vdc)		75 100	– –	
(I <sub>C</sub> = 150 mAdc, V <sub>CE</sub> = 10 Vdc)		100	300	
(I <sub>C</sub> = 500 mAdc, V <sub>CE</sub> = 10 Vdc)		30	–	
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 150 mAdc, I <sub>B</sub> = 15 mAdc)	V <sub>CE(sat)</sub>	– –	0.4 0.3	Vdc
(I <sub>C</sub> = 500 mAdc, I <sub>B</sub> = 50 mAdc)		– –	1.6 1.0	
Base–Emitter Saturation Voltage (I <sub>C</sub> = 150 mAdc, I <sub>B</sub> = 15 mAdc)	V <sub>BE(sat)</sub>	0.6 0.6	1.3 1.2	Vdc
(I <sub>C</sub> = 500 mAdc, I <sub>B</sub> = 50 mAdc)		– –	2.6 2.0	

### SMALL-SIGNAL CHARACTERISTICS

Magnitude of Small–Signal Current Gain (I <sub>C</sub> = 20 mAdc, V <sub>CE</sub> = 20 Vdc, f = 100 MHz)	h <sub>fe</sub>	2.5	12	–
Small–Signal Current Gain (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 10 Vdc, f = 1 kHz)	h <sub>fe</sub>	50 75	– –	–
Output Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz)	C <sub>obo</sub>	–	8.0	pF
Input Capacitance (V <sub>EB</sub> = 0.5 Vdc, I <sub>C</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz)	C <sub>ibo</sub>	–	25	pF

### SWITCHING CHARACTERISTICS

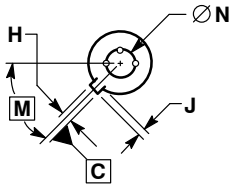
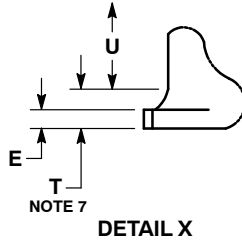
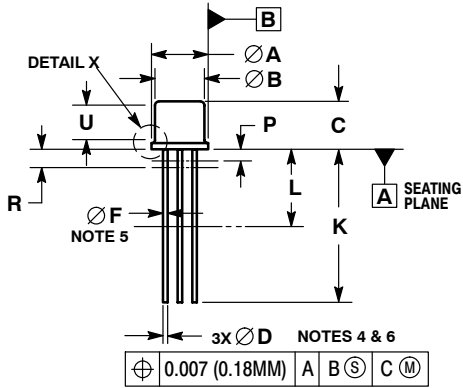
Turn–On Time (Reference Figure in MIL–PRF–19500/251)	t <sub>on</sub>	– –	40 35	ns
Turn–Off Time (Reference Figure in MIL–PRF–19500/251)	t <sub>off</sub>	– –	250 300	ns

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

# 2N2219, 2N2219A, 2N2219AL

## PACKAGE DIMENSIONS

TO-5 3-Lead  
CASE 205AA  
ISSUE B



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION J MEASURED FROM DIAMETER A TO EDGE.
4. LEAD TRUE POSITION TO BE DETERMINED AT THE GAUGE PLANE DEFINED BY DIMENSION R.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L.
6. DIMENSION D APPLIES BETWEEN DIMENSION L AND K.
7. BODY CONTOUR OPTIONAL WITHIN ZONE DEFINED BY DIMENSIONS A, B, AND T.
8. DIMENSION B SHALL NOT VARY MORE THAN 0.010 IN ZONE P.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.89	9.40	0.350	0.370
B	8.00	8.51	0.315	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.53	0.016	0.021
E	0.23	3.18	0.009	0.125
F	0.41	0.48	0.016	0.019
H	0.71	0.86	0.028	0.034
J	0.73	1.02	0.029	0.040
K	38.10	44.45	1.500	1.750
L	6.35	---	0.250	---
M	45° BSC		45° BSC	
N	5.08 BSC		0.200 BSC	
P	---	1.27	---	0.050
R	1.37 BSC		0.054 BSC	
T	---	0.76	---	0.030
U	2.54	---	0.100	---

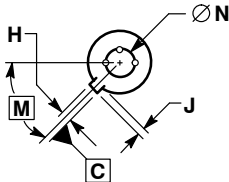
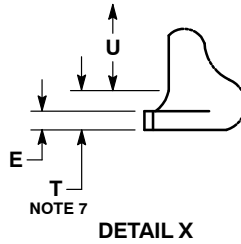
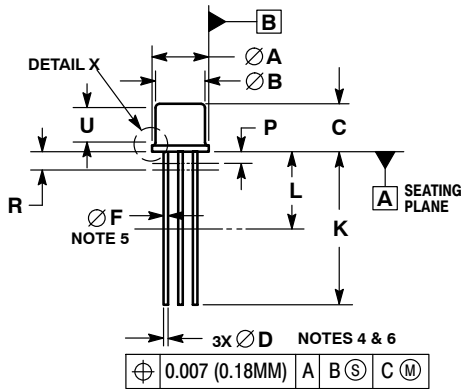
STYLE 1:

1. EMITTER
2. BASE
3. COLLECTOR

# 2N2219, 2N2219A, 2N2219AL

## PACKAGE DIMENSIONS

### TO-39 3-Lead CASE 205AB ISSUE A



#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION J MEASURED FROM DIAMETER A TO EDGE.
4. LEAD TRUE POSITION TO BE DETERMINED AT THE GAUGE PLANE DEFINED BY DIMENSION R.
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7. BODY CONTOUR OPTIONAL WITHIN ZONE DEFINED BY DIMENSIONS A, B, AND T.
8. DIMENSION B SHALL NOT VARY MORE THAN 0.010 IN ZONE P.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.89	9.40	0.350	0.370
B	8.00	8.51	0.315	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.48	0.016	0.019
E	0.23	3.18	0.009	0.125
F	0.41	0.48	0.016	0.019
H	0.71	0.86	0.028	0.034
J	0.73	1.02	0.029	0.040
K	12.70	14.73	0.500	0.580
L	6.35	---	0.250	---
M	45° BSC	---	45° BSC	---
N	5.08 BSC	---	0.200 BSC	---
P	---	1.27	---	0.050
R	1.37 BSC	---	0.054 BSC	---
T	---	0.76	---	0.030
U	2.54	---	0.100	---

#### STYLE 1:

- PIN 1. EMITTER
2. BASE
3. COLLECTOR

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