

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

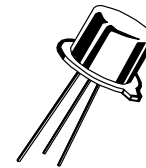
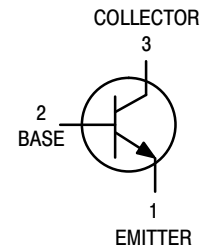
| Characteristic | Symbol | Max | Unit |
|--------------------------------------|-----------------|-----|--------------------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 50 | $^\circ\text{C/W}$ |

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.

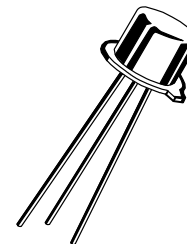


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TO-39
CASE 205AB
(2N2219, 2N2219A)



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_A = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|----------------------|------------------|----------------------|------------------------------|
| OFF CHARACTERISTICS | | | | |
| Collector – Emitter Breakdown Voltage (I _E = 10 mA) | V _{(BR)CEO} | 30 50 | – – | Vdc |
| Emitter – Base Cutoff Current (V _{EB} = 5.0 Vdc) (V _{EB} = 6.0 Vdc) (V _{EB} = 4.0 Vdc) | I _{EBO} | – – – | 10 10 10 | μAdc μAdc nAdc |
| Collector – Emitter Cutoff Current (V _{CE} = 30 Vdc) (V _{CE} = 50 Vdc) | I _{CES} | – – | 10 10 | nAdc nAdc |
| Collector – Base Cutoff Current (V _{CB} = 50 Vdc) (V _{CB} = 60 Vdc) (V _{CB} = 60 Vdc) (V _{CB} = 75 Vdc) | I _{CBO} | – – – – | 10 10 10 10 | nAdc μAdc nAdc μAdc |

ON CHARACTERISTICS (Note 1)

| | | | | |
|---|----------------------|------------|------------|-----|
| DC Current Gain (I _C = 0.1 mA, V _{CE} = 10 Vdc) | h _{FE} | 35 50 | – – | – |
| (I _C = 1.0 mA, V _{CE} = 10 Vdc) | | 50 75 | 325 325 | |
| (I _C = 10 mA, V _{CE} = 10 Vdc) | | 75 100 | – – | |
| (I _C = 150 mA, V _{CE} = 10 Vdc) | | 100 | 300 | |
| (I _C = 500 mA, V _{CE} = 10 Vdc) | | 30 | – | |
| Collector – Emitter Saturation Voltage (I _C = 150 mA, I _B = 15 mA) | V _{CE(sat)} | – – | 0.4 0.3 | Vdc |
| (I _C = 500 mA, I _B = 50 mA) | | – – | 1.6 1.0 | |
| Base – Emitter Saturation Voltage (I _C = 150 mA, I _B = 15 mA) | V _{BE(sat)} | 0.6 0.6 | 1.3 1.2 | Vdc |
| (I _C = 500 mA, I _B = 50 mA) | | – – | 2.6 2.0 | |

SMALL-SIGNAL CHARACTERISTICS

| | | | | |
|---|------------------|----------|--------|----|
| Magnitude of Small-Signal Current Gain (I _C = 20 mA, V _{CE} = 20 Vdc, f = 100 MHz) | h _{fe} | 2.5 | 12 | – |
| Small-Signal Current Gain (I _C = 1.0 mA, V _{CE} = 10 Vdc, f = 1 kHz) | h _{fe} | 50 75 | – – | – |
| Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz) | C _{obo} | – | 8.0 | pF |
| Input Capacitance (V _{EB} = 0.5 Vdc, I _C = 0, 100 kHz ≤ f ≤ 1.0 MHz) | C _{ibo} | – | 25 | pF |

SWITCHING CHARACTERISTICS

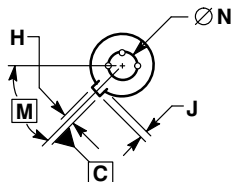
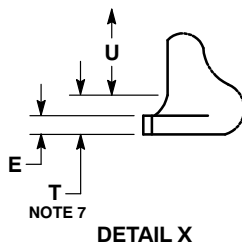
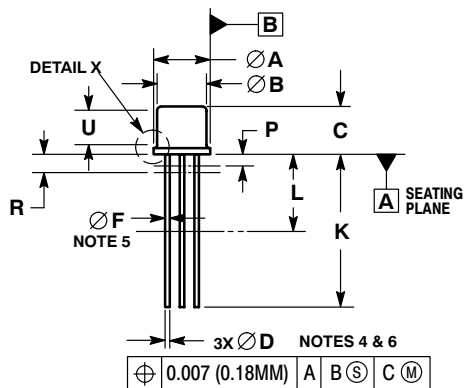
| | | | | |
|--|------------------|--------|------------|----|
| Turn-On Time (Reference Figure in MIL-PRF-19500/251) | t _{on} | – – | 40 35 | ns |
| Turn-Off Time (Reference Figure in MIL-PRF-19500/251) | t _{off} | – – | 250 300 | ns |

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 | --- |

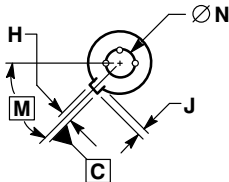
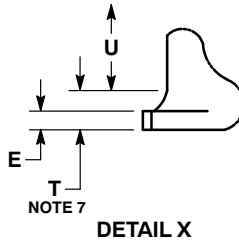
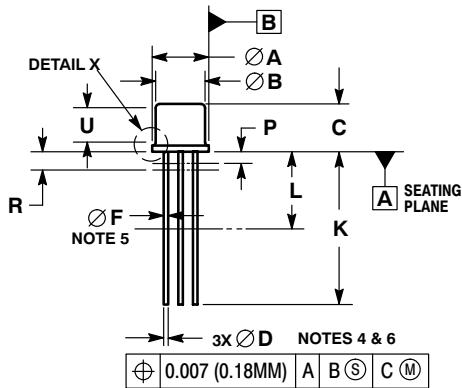
STYLE 1:

- PIN 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.
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 | 0.48 | 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:

1. EMITTER
2. BASE
3. COLLECTOR

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