

# Central<sup>TM</sup> Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors

2N4208  
2N4209

PNP SILICON TRANSISTOR

JEDEC TO-18 CASE

## DESCRIPTION

The CENTRAL SEMICONDUCTOR 2N4208, 2N4209 types are PNP Saturated Switching Transistors designed for high speed switching applications.

## MAXIMUM RATINGS (T<sub>A</sub>=25°C)

|                                               | SYMBOL                            | 2N4208      | 2N4209 | UNITS |
|-----------------------------------------------|-----------------------------------|-------------|--------|-------|
| Collector-Base Voltage                        | V <sub>CBO</sub>                  | 12          | 15     | V     |
| Collector-Emitter Voltage                     | V <sub>CEO</sub>                  | 12          | 15     | V     |
| Emitter-Base Voltage                          | V <sub>EBO</sub>                  | 4.5         |        | V     |
| Collector Current                             | I <sub>C</sub>                    | 200         |        | mA    |
| Power Dissipation                             | P <sub>D</sub>                    | 0.5         |        | W     |
| Power Dissipation (T <sub>C</sub> =25°C)      | P <sub>D</sub>                    | 1.2         |        | W     |
| Operating and Storage<br>Junction Temperature | T <sub>J</sub> , T <sub>stg</sub> | -65 to +200 |        | °C    |
| Thermal Resistance                            | θ <sub>JA</sub>                   | 350         |        | °C/W  |
| Thermal Resistance                            | θ <sub>JC</sub>                   | 146         |        | °C/W  |

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

| SYMBOL               | TEST CONDITIONS                                                    | 2N4208 |      | 2N4209 |      | UNITS |
|----------------------|--------------------------------------------------------------------|--------|------|--------|------|-------|
|                      |                                                                    | MIN    | MAX  | MIN    | MAX  |       |
| I <sub>CES</sub>     | V <sub>CE</sub> =6.0V                                              |        | 10   |        |      | nA    |
| I <sub>CES</sub>     | V <sub>CE</sub> =6.0V, T <sub>A</sub> =125°C                       |        | 5.0  |        |      | μA    |
| I <sub>CES</sub>     | V <sub>CE</sub> =8.0V                                              |        |      |        | 10   | nA    |
| I <sub>CES</sub>     | V <sub>CE</sub> =8.0V, T <sub>A</sub> =125°C                       |        |      |        | 5.0  | μA    |
| BV <sub>CBO</sub>    | I <sub>C</sub> =100μA                                              | 12     |      | 15     |      | V     |
| BV <sub>CES</sub>    | I <sub>C</sub> =100μA                                              | 12     |      | 15     |      | V     |
| BV <sub>CEO</sub>    | I <sub>C</sub> =3.0mA                                              | 12     |      | 15     |      | V     |
| BV <sub>EBO</sub>    | I <sub>E</sub> =100μA                                              | 4.5    |      | 4.5    |      | V     |
| V <sub>CE(SAT)</sub> | I <sub>C</sub> =1.0mA, I <sub>B</sub> =100μA                       |        | 0.13 |        | 0.15 | V     |
| V <sub>CE(SAT)</sub> | I <sub>C</sub> =10mA, I <sub>B</sub> =1.0mA                        |        | 0.15 |        | 0.18 | V     |
| V <sub>CE(SAT)</sub> | I <sub>C</sub> =50mA, I <sub>B</sub> =5.0mA                        |        | 0.50 |        | 0.60 | V     |
| V <sub>BE(SAT)</sub> | I <sub>C</sub> =1.0mA, I <sub>B</sub> =100μA                       |        | 0.80 |        | 0.80 | V     |
| V <sub>BE(SAT)</sub> | I <sub>C</sub> =10mA, I <sub>B</sub> =1.0mA                        | 0.78   | 0.95 | 0.78   | 0.95 | V     |
| V <sub>BE(SAT)</sub> | I <sub>C</sub> =50mA, I <sub>B</sub> =5.0mA                        |        | 1.5  |        | 1.5  | V     |
| h <sub>FE</sub>      | V <sub>CE</sub> =0.5V, I <sub>C</sub> =1.0mA                       | 15     |      | 35     |      |       |
| h <sub>FE</sub>      | V <sub>CE</sub> =0.3V, I <sub>C</sub> =10mA                        | 30     | 120  | 50     | 120  |       |
| h <sub>FE</sub>      | V <sub>CE</sub> =0.3V, I <sub>C</sub> =10mA, T <sub>A</sub> =-55°C | 12     |      | 20     |      |       |
| h <sub>FE</sub>      | V <sub>CE</sub> =1.0V, I <sub>C</sub> =50mA                        | 30     |      | 40     |      |       |

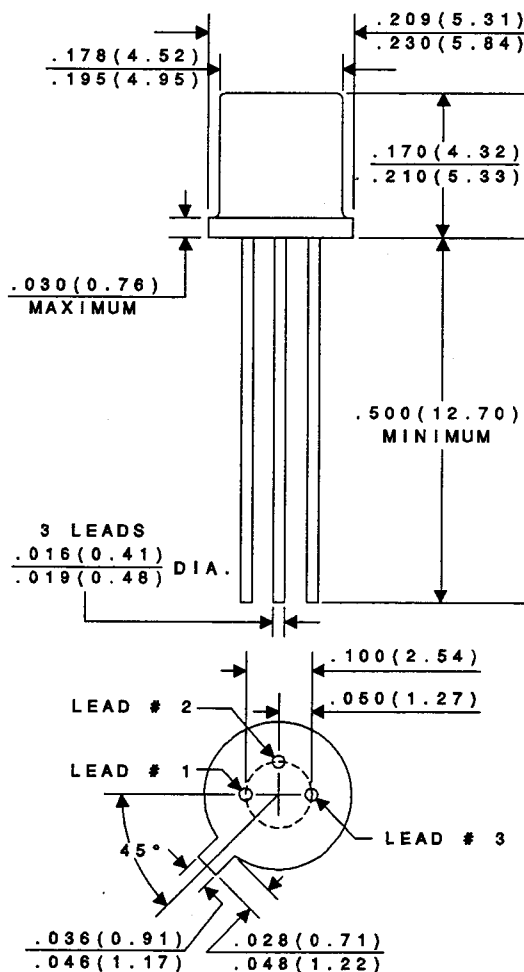
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# ELECTRICAL CHARACTERISTICS (Continued)

| SYMBOL    | TEST CONDITIONS                              | 2N4208 |     | 2N4209 |     | UNITS |
|-----------|----------------------------------------------|--------|-----|--------|-----|-------|
|           |                                              | MIN    | MAX | MIN    | MAX |       |
| $f_T$     | $V_{CE}=10V, I_C=10mA, f=100MHz$             | 700    |     | 850    |     | MHz   |
| $C_{ob}$  | $V_{CB}=5.0V, I_E=0$                         |        | 3.0 |        | 3.0 | pF    |
| $C_{ib}$  | $V_{BE}=0.5V, I_C=0$                         |        | 3.5 |        | 3.5 | pF    |
| $t_{on}$  | $V_{CC}=1.5V, I_C=10mA, I_{B1}=1.0mA$        |        | 15  |        | 15  | ns    |
| $t_{off}$ | $V_{CC}=1.5V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$ |        | 20  |        | 20  | ns    |
| $\tau_s$  | $V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=10mA$  |        | 20  |        | 20  | ns    |

## JEDEC TO-18 CASE - MECHANICAL OUTLINE



All Dimensions in Inches (mm).

Lead Code:

- 1) Emitter
- 2) Base
- 3) Collector

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