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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 ($T_A$=25°C)

| | SYMBOL | 2N4208 | 2N4209 | UNITS |
|---|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 12 | 15 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 12 | 15 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 4.5 | | V |
| Collector Current | $I_C$ | 200 | | mA |
| Power Dissipation | $P_D$ | 0.5 | | W |
| Power Dissipation ($T_C$=25°C) | $P_D$ | 1.2 | | W |
| Operating and Storage Junction Temperature | $T_J, T_{stg}$ | -65 to +200 | | °C |
| Thermal Resistance | $\Theta_{JA}$ | 350 | | °C/W |
| Thermal Resistance | $\Theta_{JC}$ | 146 | | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_A$=25°C unless otherwise noted)

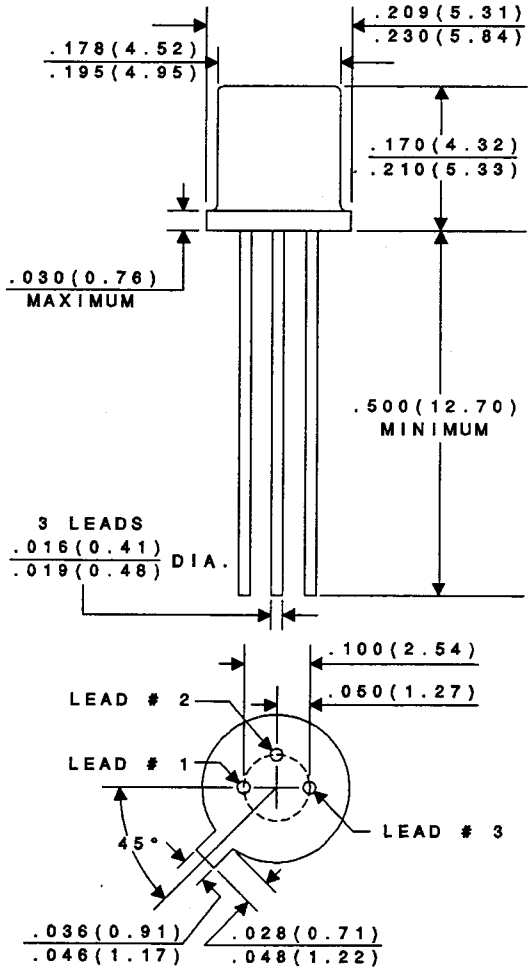
| | | 2N4208 | | 2N4209 | | |
|---|---|---|---|---|---|---|
| SYMBOL | TEST CONDITIONS | MIN | MAX | MIN | MAX | UNITS |
| $I_{CES}$ | $V_{CE}$=6.0V | | 10 | | | nA |
| $I_{CES}$ | $V_{CE}$=6.0V, $T_A$=125°C | | 5.0 | | | μA |
| $I_{CES}$ | $V_{CE}$=8.0V | | | | 10 | nA |
| $I_{CES}$ | $V_{CE}$=8.0V, $T_A$=125°C | | | | 5.0 | μA |
| $BV_{CBO}$ | $I_C$=100μA | 12 | | 15 | | V |
| $BV_{CES}$ | $I_C$=100μA | 12 | | 15 | | V |
| $BV_{CEO}$ | $I_C$=3.0mA | 12 | | 15 | | V |
| $BV_{EBO}$ | $I_E$=100μA | 4.5 | | 4.5 | | V |
| $V_{CE(SAT)}$ | $I_C$=1.0mA, $I_B$=100μA | | 0.13 | | 0.15 | V |
| $V_{CE(SAT)}$ | $I_C$=10mA, $I_B$=1.0mA | | 0.15 | | 0.18 | V |
| $V_{CE(SAT)}$ | $I_C$=50mA, $I_B$=5.0mA | | 0.50 | | 0.60 | V |
| $V_{BE(SAT)}$ | $I_C$=1.0mA, $I_B$=100μA | | 0.80 | | 0.80 | V |
| $V_{BE(SAT)}$ | $I_C$=10mA, $I_B$=1.0mA | 0.78 | 0.95 | 0.78 | 0.95 | V |
| $V_{BE(SAT)}$ | $I_C$=50mA, $I_B$=5.0mA | | 1.5 | | 1.5 | V |
| $h_{FE}$ | $V_{CE}$=0.5V, $I_C$=1.0mA | 15 | | 35 | | |
| $h_{FE}$ | $V_{CE}$=0.3V, $I_C$=10mA | 30 | 120 | 50 | 120 | |
| $h_{FE}$ | $V_{CE}$=0.3V, $I_C$=10mA, $T_A$=-55°C | 12 | | 20 | | |
| $h_{FE}$ | $V_{CE}$=1.0V, $I_C$=50mA | 30 | | 40 | | |

(Continued on Reverse Side)

ELECTRICAL CHARACTERISTICS (Continued)

| SYMBOL | TEST CONDITIONS | 2N4208 MIN | 2N4208 MAX | 2N4209 MIN | 2N4209 MAX | UNITS |
|---|---|---|---|---|---|---|
| $f_T$ | $V_{CE}$=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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