

CentralTM Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors

2N3500
2N3501

NPN SILICON TRANSISTOR

JEDEC TO-39 CASE

DESCRIPTION

The CENTRAL SEMICONDUCTOR 2N3500 and 2N3501 types are Silicon NPN Epitaxial Planar Transistors designed for high voltage inductive load switching applications.

MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$)

| | <u>SYMBOL</u> | | <u>UNITS</u> |
|--|----------------|-------------|-----------------------------|
| Collector-Base Voltage | V_{CBO} | 150 | V |
| Collector-Emitter Voltage | V_{CEO} | 150 | V |
| Emitter-Base Voltage | V_{EBO} | 6.0 | V |
| Collector Current | I_C | 300 | mA |
| Power Dissipation | P_D | 1.0 | W |
| Power Dissipation ($T_C=25^{\circ}\text{C}$) | P_D | 5.0 | W |
| Operating and Storage Junction Temperature | T_J, T_{stg} | -65 to +200 | $^{\circ}\text{C}$ |
| Thermal Resistance | Θ_{JA} | 175 | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance | Θ_{JC} | 35 | $^{\circ}\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| <u>SYMBOL</u> | <u>TEST CONDITIONS</u> | <u>MIN</u> | <u>MAX</u> | <u>UNITS</u> |
|---------------|--|------------|------------|---------------|
| I_{CBO} | $V_{CB}=75\text{V}$ | | 50 | nA |
| I_{CBO} | $V_{CB}=75\text{V}, T_A=150^{\circ}\text{C}$ | | 50 | μA |
| I_{EBO} | $V_{EB}=4.0\text{V}$ | | 25 | nA |
| BV_{CBO} | $I_C=10\mu\text{A}$ | 150 | | V |
| BV_{CEO} | $I_C=10\text{mA}$ | 150 | | V |
| BV_{EBO} | $I_E=10\mu\text{A}$ | 6.0 | | V |
| $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$ | | 0.2 | V |
| $V_{CE(SAT)}$ | $I_C=50\text{mA}, I_B=5.0\text{mA}$ | | 0.25 | V |
| $V_{CE(SAT)}$ | $I_C=150\text{mA}, I_B=15\text{mA}$ | | 0.4 | V |
| $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$ | | 0.8 | V |
| $V_{BE(SAT)}$ | $I_C=50\text{mA}, I_B=5.0\text{mA}$ | | 0.9 | V |
| $V_{BE(SAT)}$ | $I_C=150\text{mA}, I_B=15\text{mA}$ | | 1.2 | V |

(Continued on Reverse Side)

ELECTRICAL CHARACTERISTICS (Continued)

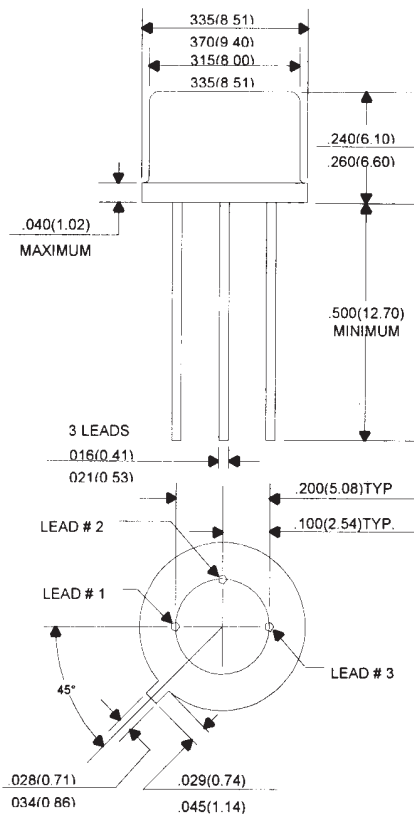
2N3500

2N3501

| <u>SYMBOL</u> | <u>TEST CONDITIONS</u> | <u>MIN</u> | <u>MAX</u> | <u>MIN</u> | <u>MAX</u> | <u>UNITS</u> |
|---------------|--|------------|------------|------------|------------|--------------|
| h_{FE} | $V_{CE}=10V, I_C=0.1mA$ | 20 | | 35 | | |
| h_{FE} | $V_{CE}=10V, I_C=1.0mA$ | 25 | | 50 | | |
| h_{FE} | $V_{CE}=10V, I_C=10mA$ | 35 | | 75 | | |
| h_{FE} | $V_{CE}=10V, I_C=150mA$ | 40 | 120 | 100 | 300 | |
| h_{FE} | $V_{CE}=10V, I_C=300mA$ | 15 | | 20 | | |
| f_T | $V_{CE}=20V, I_C=20mA, f=100MHz$ | 150 | | 150 | | MHz |
| C_{ob} | $V_{CB}=10V, I_E=0, f=100kHz$ | | 8.0 | | 8.0 | pF |
| C_{ib} | $V_{EB}=0.5V, I_C=0, f=100kHz$ | | 80 | | 80 | pF |
| t_d | $V_{CC}=100V, I_C=150mA, I_{B1}=15mA$ | 20 TYP | | 20 TYP | | ns |
| t_r | $V_{CC}=100V, I_C=150mA, I_{B1}=15mA$ | 35 TYP | | 35 TYP | | ns |
| t_s | $V_{CC}=100V, I_C=150mA, I_{B1}=I_{B2}=15mA$ | 800 TYP | | 800 TYP | | ns |
| t_f | $V_{CC}=100V, I_C=150mA, I_{B1}=I_{B2}=15mA$ | 80 TYP | | 80 TYP | | ns |

JEDEC TO-39 CASE - MECHANICAL OUTLINE

All Dimensions in Inches (mm).



Lead Code:

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