JAN level (2N3500J)

JANTX level (2N3500JX)

JANTXV level (2N3500JV)

# 2N3500

Silicon NPN Transistor

*Data Sheet*

## Description

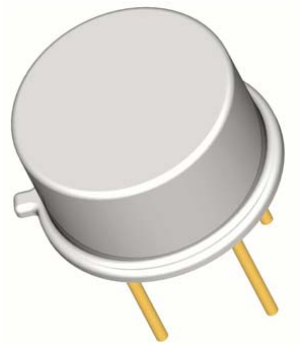
Semicoa Corporatoin offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N3500J)
- JANTX level (2N3500JX)
- JANTXV level (2N3500JV)
- QCI to the applicable level
- 100% die visual inspection per MIL-STD-750 method 2072 for JANTXV and JANS
- Radiation testing (total dose) upon request

Please contact Semicoa for special configurations
www.***SEMICOA***.com or (714) 979-1900

## Applications

- General purpose
- Low power
- NPN silicon transistor



## Features

- Hermetically sealed TO-39 metal can
- Also available in chip configuration
- Chip geometry 5620
- Reference document: MIL-PRF-19500/366

## Benefits

- Qualification Levels: JAN, JANTX, and JANTXV
- Radiation testing available

## Absolute Maximum Ratings

$T_C$ = 25°C unless otherwise specified

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 150 | Volts |
| Collector-Base Voltage | $V_{CBO}$ | 150 | Volts |
| Emitter-Base Voltage | $V_{EBO}$ | 6 | Volts |
| Collector Current, Continuous | $I_C$ | 300 | mA |
| Power Dissipation, $T_A$ = 25°C<br>Derate linearly above 25°C | $P_T$ | 1<br>5.71 | W<br>mW/°C |
| Thermal Resistance | $R_{\theta JA}$ | 175 | °C/W |
| Operating Junction Temperature | $T_J$ | -65 to +200 | °C |
| Storage Temperature | $T_{STG}$ | -65 to +200 | °C |

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## ELECTRICAL CHARACTERISTICS

characteristics specified at $T_A$ = 25°C

### Off Characteristics

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = 10 mA | 150 | | | Volts |
| Collector-Base Cutoff Current | $I_{CBO1}$<br>$I_{CBO2}$<br>$I_{CBO3}$ | $V_{CB}$ = 150 Volts<br>$V_{CB}$ = 75 Volts<br>$V_{CB}$ = 75 Volts, $T_A$ = 150°C | | | 10<br>50<br>50 | µA<br>nA<br>µA |
| Collector-Emitter Cutoff Current | $I_{CEO}$ | $V_{CE}$ = 120 Volts | | | 1 | µA |
| Emitter-Base Cutoff Current | $I_{EBO1}$<br>$I_{EBO2}$ | $V_{EB}$ = 6 Volts<br>$V_{EB}$ = 4 Volts | | | 10<br>25 | µA<br>nA |

### On Characteristics

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| DC Current Gain | $h_{FE1}$<br>$h_{FE2}$<br>$h_{FE3}$<br>$h_{FE4}$<br>$h_{FE5}$<br>$h_{FE7}$ | $I_C$ = 0.1 mA, $V_{CE}$ = 10 Volts<br>$I_C$ = 1.0 mA, $V_{CE}$ = 10 Volts<br>$I_C$ = 10 mA, $V_{CE}$ = 10 Volts<br>$I_C$ = 150 mA, $V_{CE}$ = 10 Volts<br>$I_C$ = 300 mA, $V_{CE}$ = 10 Volts<br>$I_C$ = 150 mA, $V_{CE}$ = 10 Volts<br>$T_A$ = -55°C | 20<br>25<br>35<br>40<br>15<br>22 | | 120 | |
| Base-Emitter Saturation Voltage | $V_{BEsat1}$<br>$V_{BEsat2}$ | $I_C$ = 10 mA, $I_B$ = 1 mA<br>$I_C$ = 150 mA, $I_B$ = 15 mA | | | 0.8<br>1.2 | Volts |
| Collector-Emitter Saturation Voltage | $V_{CEsat1}$<br>$V_{CEsat2}$ | $I_C$ = 10 mA, $I_B$ = 1 mA<br>$I_C$ = 150 mA, $I_B$ = 15 mA | | | 0.2<br>0.4 | Volts |

### Dynamic Characteristics

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio | $\|h_{FE}\|$ | $V_{CE}$ = 20 Volts, $I_C$ = 20 mA, f = 100 MHz | 1.5 | | 8 | |
| Small Signal Short Circuit Forward Current Transfer Ratio | $h_{FE}$ | $V_{CE}$ = 10 Volts, $I_C$ = 10 mA, f = 1 kHz | 35 | | 300 | |
| Open Circuit Output Capacitance | $C_{OBO}$ | $V_{CB}$ = 10 Volts, $I_E$ = 0 mA, 100 kHZ < f < 1 MHz | | | 8 | pF |
| Open Circuit Input Capacitance | $C_{IBO}$ | $V_{EB}$ = 0.5 Volts, $I_C$ = 0 mA, 100 kHZ < f < 1 MHz | | | 80 | pF |
| Noise Figure | $NF_1$<br><br><br>$NF_2$ | $V_{CE}$ = 10 Volts, $I_C$ = 0.5 mA, f = 1 kHz, $R_g$ = 1 kΩ<br>$V_{CE}$ = 10 Volts, $I_C$ = 0.5 mA, f = 10 kHz, $R_g$ = 1 kΩ | | | 16<br><br>6 | dB |

### Switching Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| Saturated Turn-On Time | $t_{ON}$ | $V_{EB}$ = 5 Volts, $I_C$ = 150 mA, $I_{B1}$ = 15 mA | | | 115 | ns |
| Saturated Turn-Off Time | $t_{OFF}$ | $I_C$ = 150 mA, $I_{B1}$=$I_{B2}$=15 mA | | | 1,150 | ns |




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