

Type 2N3500
Geometry 5620
Polarity NPN
Qual Level: JAN - JANTXV

Generic Part Number:
2N3500

REF: MIL-PRF-19500/366

Features:
[Request Quotation](#)

- General-purpose silicon transistor for switching and amplifier applications.
- Housed in TO-39 case.
- Also available in chip form using the 5620 chip geometry.
- The Min and Max limits shown are per MIL-PRF-19500/366 which Semicoa meets in all cases.


Maximum Ratings
 $T_C = 25^{\circ}\text{C}$ unless otherwise specified

Rating	Symbol	Rating	Unit
Collector-Emitter voltage	V_{CEO}	150	V
Collector-Base Voltage	V_{CBO}	150	V
Emitter-Base voltage	V_{EBO}	6.0	V
Collector Current, Continuous	I_C	300	mA
Power Dissipation, $T_A = 25^{\circ}\text{C}$	P_D	5.0	mW
Derate above 25°C		28.8	mW/ $^{\circ}\text{C}$
Operating Junction Temperature	T_J	-65 to +200	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65 to +200	$^{\circ}\text{C}$

Electrical Characteristics
 $T_C = 25^\circ\text{C}$ unless otherwise specified

OFF Characteristics	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage $I_C = 10\ \mu\text{A}$	$V_{(BR)CBO}$	150	---	V
Collector-Emitter Breakdown Voltage $I_C = 10\ \text{mA}$	$V_{(BR)CEO}$	150	---	V
Emitter-Base Breakdown Voltage $I_E = 10\ \mu\text{A}$	$V_{(BR)EBO}$	6.0	---	V
Collector-Base Cutoff Current $V_{CB} = 75\ \text{V}$	I_{CBO}	---	50	nA
Emitter-Base Cutoff Current $V_{EB} = 4\ \text{V}$	I_{EBO}	---	25	nA

ON Characteristics	Symbol	Min	Max	Unit
Forward Current Transfer Ratio				
$I_C = 100\ \mu\text{A}$, $V_{CE} = 10\ \text{V}$ (pulsed)	h_{FE1}	20	---	---
$I_C = 1.0\ \text{mA}$, $V_{CE} = 10\ \text{V}$ (pulsed)	h_{FE2}	25	---	---
$I_C = 10\ \text{mA}$, $V_{CE} = 10\ \text{V}$ (pulsed)	h_{FE3}	35	---	---
$I_C = 150\ \text{mA}$, $V_{CE} = 10\ \text{V}$ (pulsed)	h_{FE4}	40	120	---
$I_C = 300\ \text{mA}$, $V_{CE} = 10\ \text{V}$ (pulsed)	h_{FE6}	15	---	---
Base-Emitter Saturation Voltage				
$I_C = 10\ \text{mA}$, $I_B = 1.0\ \text{mA}$	$V_{BE(sat)1}$	---	0.8	V dc
$I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$	$V_{BE(sat)2}$	---	1.2	V dc
Collector-Emitter Saturation Voltage				
$I_C = 10\ \text{mA}$, $I_B = 1.0\ \text{mA}$	$V_{CE(sat)1}$	---	0.2	V dc
$I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$	$V_{CE(sat)2}$	---	0.4	V dc

Small Signal Characteristics	Symbol	Min	Max	Unit
Short Circuit Forward Current Transfer Ratio $I_C = 10\ \text{mA}$, $V_{CE} = 10\ \text{V}$, $f = 1\ \text{kHz}$	AC h_{FE}	75	375	---
Magnitude of Common Emitter, Small Signal, Short Circuit Forward Current Transfer Ratio $V_{CE} = 20\ \text{V}$, $I_C = 20\ \text{mA}$, $f = 100\ \text{MHz}$	$ h_{FE} $	1.5	8.0	---
Open Circuit Output Capacitance $V_{CB} = 10\ \text{V}$, $I_E = 0$, $100\ \text{kHz} < f < 1\ \text{MHz}$	C_{OBO}	---	8.0	pF
Input Capacitance, Output Open Circuited $V_{EB} = 0.5\ \text{V}$, $I_C = 0$, $100\ \text{kHz} < f < 1\ \text{MHz}$	C_{IBO}	---	80	pF
Noise Figure $V_{CE} = 10\ \text{V}$, $I_C = 0.5\ \text{mA}$, $R_g = 1\ \text{k}\Omega$, $1\ \text{kHz}$	NF	---	16	dB
Noise Figure $V_{CE} = 10\ \text{V}$, $I_C = 0.5\ \text{mA}$, $R_g = 1\ \text{k}\Omega$, $1\ \text{kHz}$	NF	---	6.0	dB

Switching Characteristics	Symbol	Min	Max	Unit
Saturated Turn On Switching time to 90% $I_C = 150\ \text{mA}$, $I_{B1} = 15\ \text{mA}$, $V_{EB} = 2\ \text{V}$	t_{ON}	---	115	ns
Saturated Turn Off Switching time to 10% $I_C = 150\ \text{mA}$, $I_{B2} = -I_{B1} = 15\ \text{mA}$	t_{OFF}	---	1150	ns