

**Type 2N3506**  
**Geometry 1506**  
**Polarity NPN**  
**Qual Level: JAN - JANTXV**

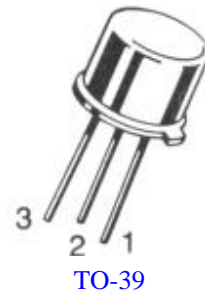
**Generic Part Number:**  
**2N3506**

**REF: MIL-PRF-19500/349**

**Features:**

[Request Quotation](#)

- General-purpose silicon transistor for switching and amplifier applications.
- Housed in [TO-39](#) case.
- Also available in chip form using the [1506](#) chip geometry.
- The Min and Max limits shown are per [MIL-PRF-19500/349](#) which Semicoa meets in all cases.



**Maximum Ratings**

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

Rating	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	V
Collector-Base Voltage	$V_{CBO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	5.0	V
Collector Current, Continuous	$I_C$	3.0	A
Power Dissipation, $T_A = 25^\circ\text{C}$	$P_T$	1.0	W
Derate above $25^\circ\text{C}$		5.71	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 $I_C = 10\ \mu\text{A}$	$V_{(BR)CBO}$	60	---	V
Collector-Emitter Breakdown Voltage $I_C = 10\ \text{mA}$	$V_{(BR)CEO}$	40	---	V
Emitter-Base Breakdown Voltage $I_E = 10\ \mu\text{A}$	$V_{(BR)EBO}$	5.0	---	V
Collector-Emitter Cutoff Current $V_{CE} = 40\ \text{V}, V_{EB} = 4\ \text{V}$	$I_{CEX1}$	---	1.0	$\mu\text{A}$
Collector-Emitter Cutoff Current $V_{CE} = 40\ \text{V}, V_{EB} = 4\ \text{V}, T_A = +150^\circ\text{C}$	$I_{CEX2}$	---	1.0	$\mu\text{A}$
Collector Current Continuous $V_{CB} = 50\ \text{V}$	$I_C$	3.0	---	A
ON Characteristics	Symbol	Min	Max	Unit
<b>DC Current Gain</b>				
$I_C = 500\ \text{mA}, V_{CE} = 1\ \text{V}$ (pulsed)	$h_{FE1}$	50	250	---
$I_C = 1.5\ \text{A}, V_{CE} = 2\ \text{V}$ (pulsed)	$h_{FE2}$	40	200	---
$I_C = 2.5\ \text{A}, V_{CE} = 3\ \text{V}$ (pulsed)	$h_{FE3}$	30	---	---
$I_C = 3.0\ \text{A}, V_{CE} = 5\ \text{V}$ (pulsed)	$h_{FE4}$	25	---	---
$I_C = 500\ \text{mA}, V_{CE} = 1\ \text{V}$ (pulsed), $T_A = -55^\circ\text{C}$	$h_{FE5}$	25	---	---
<b>Base-Emitter Saturation Voltage</b>				
$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}$ (pulsed)	$V_{BE(sat)1}$	---	1.0	V dc
$I_C = 1.5\ \text{A}, I_B = 150\ \text{mA}$ (pulsed)	$V_{BE(sat)2}$	0.9	1.4	V dc
$I_C = 2.5\ \text{A}, I_B = 250\ \text{mA}$ (pulsed)	$V_{BE(sat)3}$	---	2.0	V dc
<b>Collector-Emitter Saturation Voltage</b>				
$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}$ (pulsed)	$V_{CE(sat)1}$	---	0.5	V dc
$I_C = 1.5\ \text{A}, I_B = 150\ \text{mA}$ (pulsed)	$V_{CE(sat)2}$	---	1.0	V dc
$I_C = 2.5\ \text{A}, I_B = 250\ \text{mA}$ (pulsed)	$V_{CE(sat)3}$	---	1.5	V dc
Small Signal Characteristics	Symbol	Min	Max	Unit
<i>Magnitude of Common Emitter, Small Signal, Short Circuit</i>				
Forward Current Transfer Ratio $V_{CE} = 5\ \text{V}, I_C = 100\ \text{mA}, f = 20\ \text{MHz}$	$ h_{FE} $	3.0	15	---
<i>Open Circuit Output Capacitance</i>				
$V_{CB} = 10\ \text{V}, I_E = 0, 100\ \text{kHz} < f < 1\ \text{MHz}$	$C_{OBO}$	---	40	pF
<i>Input Capacitance, Output Open Circuited</i>				
$V_{EB} = 3\ \text{V}, I_C = 0, 100\ \text{kHz} < f < 1\ \text{MHz}$	$C_{IBO}$	---	300	pF
Pulse Response Characteristics	Symbol	Min	Max	Unit
<i>Delay Time</i>				
$I_C = 1.5\ \text{A}, I_{B1} = 150\ \text{mA}$	$t_d$	---	15	ns
<i>Rise Time</i>				
$I_C = 1.5\ \text{A}, I_{B1} = 150\ \text{mA}$	$t_r$	---	30	ns
<i>Storage Time</i>				
$I_C = 1.5\ \text{mA}, I_{B2} = I_{B1} = 150\ \text{mA}$	$t_s$	---	55	ns
<i>Fall Time</i>				
$I_C = 1.5\ \text{mA}, I_{B2} = I_{B1} = 150\ \text{mA}$	$t_f$	---	35	ns