

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

Generic Part Number:
2N3506

REF: MIL-PRF-19500/349

Features:

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- 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°C		5.71	$\text{mW}/^\circ\text{C}$
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	μA
Collector-Emitter Cutoff Current $V_{CE} = 40\ \text{V}, V_{EB} = 4\ \text{V}, T_A = +150^\circ\text{C}$	I_{CEX2}	---	1.0	μA
Collector Current Continuous $V_{CB} = 50\ \text{V}$	I_C	3.0	---	A
ON Characteristics	Symbol	Min	Max	Unit
DC Current Gain				
$I_C = 500\ \text{mA}, V_{CE} = 1\ \text{V}$ (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	---	---
Base-Emitter Saturation Voltage				
$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}$ (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
Collector-Emitter Saturation Voltage				
$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}$ (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
Magnitude of Common Emitter, Small Signal, Short Circuit Forward Current Transfer Ratio $V_{CE} = 5\ \text{V}, I_C = 100\ \text{mA}, f = 20\ \text{MHz}$	$ h_{FE} $	3.0	15	---
Open Circuit Output Capacitance $V_{CB} = 10\ \text{V}, I_E = 0, 100\ \text{kHz} < f < 1\ \text{MHz}$	C_{OBO}	---	40	pF
Input Capacitance, Output Open Circuited $V_{EB} = 3\ \text{V}, I_C = 0, 100\ \text{kHz} < f < 1\ \text{MHz}$	C_{IBO}	---	300	pF
Pulse Response Characteristics	Symbol	Min	Max	Unit
Delay Time $I_C = 1.5\ \text{A}, I_{B1} = 150\ \text{mA}$	t_d	---	15	ns
Rise Time $I_C = 1.5\ \text{A}, I_{B1} = 150\ \text{mA}$	t_r	---	30	ns
Storage Time $I_C = 1.5\ \text{mA}, I_{B2} = I_{B1} = 150\ \text{mA}$	t_s	---	55	ns
Fall Time $I_C = 1.5\ \text{mA}, I_{B2} = I_{B1} = 150\ \text{mA}$	t_f	---	35	ns