

NPN MEDIUM POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/349

DEVICES

2N3506	2N3507
2N3506A	2N3507A
2N3506L	2N3507L
2N3506AL	2N3507AL

LEVELS

JAN
JANTX
JANTXV

ABSOLUTE MAXIMUM RATINGS ($T_C = +25^\circ\text{C}$ unless otherwise noted)

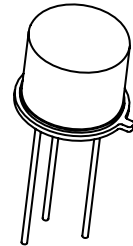
Parameters / Test Conditions	Symbol	2N3506	2N3507	Unit
Collector-Emitter Voltage	V_{CEO}	40	50	Vdc
Collector-Base Voltage	V_{CBO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Collector Current	I_C	3.0		A _{dc}
Total Power Dissipation	P_T	@ $T_A = 25^\circ\text{C}$ ⁽¹⁾	1.0	W
		@ $T_C = 25^\circ\text{C}$ ⁽²⁾	5.0	
Operating & Storage Temperature Range	T_{op}, T_{stg}	-65 to +200		$^\circ\text{C}$

Note:

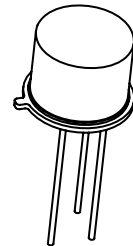
- Derate linearly 5.71 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$
- Derate linearly 55.5 mW/ $^\circ\text{C}$ for $T_C > +25^\circ\text{C}$

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage $I_C = 10\text{mA}$	$V_{(BR)CEO}$	40		Vdc
2N3506 2N3507		50		
Collector-Emitter Cutoff Current $V_{CE} = 40\text{Vdc}$ $V_{CE} = 60\text{Vdc}$	I_{CEX}		1.0	μA
2N3506 2N3507			1.0	
Collector-Base Breakdown Voltage $I_C = 100\mu\text{A}$	$V_{(BR)CBO}$	60		Vdc
		80		
Emitter-Base Breakdown Voltage $I_E = 10\mu\text{A}$	$V_{(BR)EBO}$	5		Vdc
ON CHARACTERISTICS ⁽³⁾				
Forward-Current Transfer Ratio $I_C = 500\text{mA}$, $V_{CE} = 1\text{Vdc}$	h_{FE}	50	250	
		2N3506 2N3507	35	
Forward-Current Transfer Ratio $I_C = 1.5\text{A}$, $V_{CE} = 2\text{Vdc}$	h_{FE}	40	200	
		2N3506 2N3507	30	
Forward-Current Transfer Ratio $I_C = 2.5\text{A}$, $V_{CE} = 3\text{Vdc}$	h_{FE}	30		
		25		



TO-5 (L-Versions)



TO-39 (TO-205-AD)

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽³⁾				
Forward-Current Transfer Ratio $I_C = 3.0\text{A dc}$, $V_{CE} = 5\text{V dc}$	2N3506 2N3507 h_{FE}	25 20		
Forward-Current Transfer Ratio $I_C = 500\text{mA dc}$, $V_{CE} = 1.0\text{V dc}$	2N3506 2N3507 h_{FE}	25 17		
Forward-Current Transfer Ratio $I_C = 500\text{mA dc}$, $V_{CE} = 2\text{V dc}$	2N3506A 2N3507A h_{FE}	25 17		
Collector-Emitter Saturation Voltage $I_C = 500\text{mA dc}$, $I_B = 50\text{mA dc}$	$V_{CE(sat)}$		0.5	Vdc
Collector-Emitter Saturation Voltage $I_C = 1.5\text{A dc}$, $I_B = 150\text{mA dc}$	$V_{CE(sat)}$		1.0	Vdc
Collector-Emitter Saturation Voltage $I_C = 2.5\text{A dc}$, $I_B = 250\text{mA dc}$	$V_{CE(sat)}$		1.5	Vdc
Base-Emitter Saturation Voltage $I_C = 500\text{mA dc}$, $I_B = 50\text{mA dc}$	$V_{BE(sat)}$		1.0	Vdc
Base-Emitter Saturation Voltage $I_C = 1.5\text{A dc}$, $I_B = 150\text{mA dc}$	$V_{BE(sat)}$	0.8	1.3	Vdc
Base-Emitter Saturation Voltage $I_C = 2.5\text{A dc}$, $I_B = 250\text{mA dc}$	$V_{BE(sat)}$		2.0	Vdc

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 100\text{mA dc}$, $V_{CE} = 5\text{V dc}$, $f = 20\text{MHz}$	$ h_{fe} $	3.0	15	
Output Capacitance $V_{CB} = 10\text{V dc}$, $I_E = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$	C_{obo}		40	pF
Input Capacitance $V_{EB} = 3.0\text{V dc}$, $I_C = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$	C_{ibo}		300	pF

SWITCHING CHARACTERISTICS (4)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Delay Time $I_C = 1.5\text{A dc}$, $I_{B1} = 150\text{mA dc}$	t_d		15	ns
Rinse Time $I_C = 1.5\text{A dc}$, $I_{B1} = 150\text{mA dc}$	t_r		30	ns
Storage Time $I_C = 1.5\text{A dc}$, $I_{B1} = I_{B2} = 150\text{mA dc}$	t_s		55	ns
Fall Time $I_C = 1.5\text{A dc}$, $I_{B1} = I_{B2} = 150\text{mA dc}$	t_f		35	ns

(3) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

(4) Consult MIL-PRF-19500/349 For Additional Information.