

## NPN MEDIUM POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/349

### DEVICES

<b>2N3506</b>	<b>2N3507</b>
<b>2N3506A</b>	<b>2N3507A</b>
<b>2N3506L</b>	<b>2N3507L</b>
<b>2N3506AL</b>	<b>2N3507AL</b>

### LEVELS

**JAN**  
**JANTX**  
**JANTXV**

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

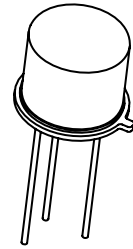
Parameters / Test Conditions	Symbol	2N3506	2N3507	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	50	Vdc
Collector-Base Voltage	$V_{CBO}$	60	80	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0		Vdc
Collector Current	$I_C$	3.0		Adc
Total Power Dissipation	$P_T$	@ $T_A = 25^\circ\text{C}$ (1)	1.0	W
		@ $T_C = 25^\circ\text{C}$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

#### Note:

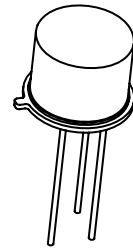
- Derate linearly 5.71 mW/ $^\circ\text{C}$  for  $T_A > +25^\circ\text{C}$
- Derate linearly 55.5 mW/ $^\circ\text{C}$  for  $T_C > +25^\circ\text{C}$

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
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	$\mu\text{Adc}$
2N3506 2N3507			1.0	
Collector-Base Breakdown Voltage $I_C = 100\mu\text{Adc}$	$V_{(BR)CBO}$	60		Vdc
		80		
Emitter-Base Breakdown Voltage $I_E = 10\mu\text{Adc}$	$V_{(BR)EBO}$	5		Vdc
<b>ON CHARACTERISTICS (3)</b>				
Forward-Current Transfer Ratio $I_C = 500\text{mA}$ , $V_{CE} = 1\text{Vdc}$	$h_{FE}$	50	250	
		35	175	
Forward-Current Transfer Ratio $I_C = 1.5\text{Adc}$ , $V_{CE} = 2\text{Vdc}$	$h_{FE}$	40	200	
		30	150	
Forward-Current Transfer Ratio $I_C = 2.5\text{Adc}$ , $V_{CE} = 3\text{Vdc}$	$h_{FE}$	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
<b>ON CHARACTERISTICS <sup>(3)</sup></b>				
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 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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