



# 2N3507AL

Silicon NPN Transistor

Data Sheet

## Description

SEMICOA offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N3507ALJ)
- JANTX level (2N3507ALJX)
- JANTXV level (2N3507ALJV)
- JANS level (2N3507ALJS)
- QCI to the applicable level
- 100% die visual inspection per MIL-STD-750 method 2072 for JANTXV and JANS
- Radiation testing (total dose) upon request

Please contact SEMICOA for special configurations  
www.SEMICOA.com or (714) 979-1900

## Applications

- General purpose switching transistor
- Low power
- NPN silicon transistor



## Features

- Hermetically sealed TO-5 metal can
- Also available in chip configuration
- Chip geometry 1506
- Reference document: MIL-PRF-19500/349

## Benefits

- Qualification Levels: JAN, JANTX, JANTXV and JANS
- Radiation testing available

## Absolute Maximum Ratings

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

Parameter	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	50	Volts
Collector-Base Voltage	$V_{CBO}$	80	Volts
Emitter-Base Voltage	$V_{EBO}$	5	Volts
Collector Current, Continuous	$I_C$	3	A
Power Dissipation, $T_A = 25^\circ\text{C}$ Derate linearly above $25^\circ\text{C}$	$P_T$	1 5.71	W mW/ $^\circ\text{C}$
Power Dissipation, $T_C = 25^\circ\text{C}$ Derate linearly above $25^\circ\text{C}$	$P_T$	5 28.6	W mW/ $^\circ\text{C}$
Thermal Resistance	$R_{\theta JA}$	175	$^\circ\text{C}/\text{W}$
Operating Junction Temperature	$T_J$	-65 to +200	$^\circ\text{C}$
Storage Temperature	$T_{STG}$		



### ELECTRICAL CHARACTERISTICS

characteristics specified at  $T_A = 25^\circ\text{C}$

#### Off Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100 \mu\text{A}$	80			Volts
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10 \text{ mA}$	50			Volts
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10 \mu\text{A}$	5			Volts
Collector-Emitter Cutoff Current	$I_{CEX1}$	$V_{CE} = 60 \text{ Volts}, V_{EB} = 4 \text{ Volts}$			1	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CEX2}$	$V_{CE} = 60 \text{ Volts}, V_{EB} = 4 \text{ Volts}, T_A = 150^\circ\text{C}$			1.5	mA

#### On Characteristics

Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
DC Current Gain	$h_{FE1}$	$I_C = 500 \text{ mA}, V_{CE} = 1 \text{ Volts}$	35		175	
	$h_{FE2}$	$I_C = 1.5 \text{ A}, V_{CE} = 2 \text{ Volts}$	30		150	
	$h_{FE3}$	$I_C = 2.5 \text{ A}, V_{CE} = 3 \text{ Volts}$	25			
	$h_{FE4}$	$I_C = 3.0 \text{ A}, V_{CE} = 5 \text{ Volts}$	20			
	$h_{FE5}$	$I_C = 500 \text{ mA}, V_{CE} = 2 \text{ Volts}, T_A = -55^\circ\text{C}$	17			
Base-Emitter Saturation Voltage	$V_{BEsat1}$	$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$			0.5	Volts
	$V_{BEsat2}$	$I_C = 1.5 \text{ A}, I_B = 150 \text{ mA}$			1.0	
	$V_{BEsat3}$	$I_C = 2.5 \text{ A}, I_B = 250 \text{ mA}$			1.5	
Collector-Emitter Saturation Voltage	$V_{CEsat1}$	$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$	0.8		1.0	Volts
	$V_{CEsat2}$	$I_C = 1.5 \text{ A}, I_B = 150 \text{ mA}$		1.3		
	$V_{CEsat3}$	$I_C = 2.5 \text{ A}, I_B = 250 \text{ mA}$		2.0		

#### Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} $	$V_{CE} = 5 \text{ Volts}, I_C = 100 \text{ mA}, f = 20 \text{ MHz}$	3		15	
Open Circuit Output Capacitance	$C_{OBO}$	$V_{CB} = 10 \text{ Volts}, I_E = 0 \text{ mA}, 100 \text{ kHz} < f < 1 \text{ MHz}$			40	pF
Open Circuit Input Capacitance	$C_{IBO}$	$V_{EB} = 3 \text{ Volts}, I_C = 0 \text{ mA}, 100 \text{ kHz} < f < 1 \text{ MHz}$			300	pF
Delay Time	$t_d$	$I_C = 1.5 \text{ A}, I_{B1} = 150 \text{ mA}$			15	ns
Rise Time	$t_r$	$I_C = 1.5 \text{ A}, I_{B1} = 150 \text{ mA}$			30	ns

#### Switching Characteristics

Storage Time	$t_s$	$I_C = 1.5 \text{ A}, I_{B1}=I_{B2} = 150 \text{ mA}$			55	ns
Fall Time	$t_f$	$I_C = 1.5 \text{ A}, I_{B1}=I_{B2} = 150 \text{ mA}$			35	ns