

## Description

Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N3019SJ)
- JANTX level (2N3019SJX)
- JANTXV level (2N3019SJV)
- JANS level (2N3019SJS)
- 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](http://www.SEMICOA.com) or (714) 979-1900

## Applications

- General purpose
- Low power
- NPN silicon transistor



## Features

- Hermetically sealed TO-39 metal can
- Also available in chip configuration
- Chip geometry 4500
- Reference document: MIL-PRF-19500/391

## Benefits

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

Absolute Maximum Ratings		T <sub>C</sub> = 25°C unless otherwise specified	
Parameter	Symbol	Rating	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	80	Volts
Collector-Base Voltage	V <sub>CB0</sub>	140	Volts
Emitter-Base Voltage	V <sub>EBO</sub>	7	Volts
Collector Current, Continuous	I <sub>C</sub>	1	A
Power Dissipation, T <sub>A</sub> = 25°C Derate linearly above 60°C	P <sub>T</sub>	0.8 5.7	W mW/°C
Power Dissipation, T <sub>C</sub> = 25°C Derate linearly above 25°C	P <sub>T</sub>	5.0 28.6	W mW/°C
Thermal Resistance	R <sub>θJA</sub>	175	°C/W
Operating Junction Temperature Storage Temperature	T <sub>J</sub> T <sub>STG</sub>	-65 to +200	°C

## ELECTRICAL CHARACTERISTICS

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

Off Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 30 \text{ mA}$	80			Volts
Collector-Base Cutoff Current	$I_{CBO1}$	$V_{CB} = 140 \text{ Volts}$			10	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CES1}$	$V_{CE} = 90 \text{ Volts}$			10	nA
Collector-Emitter Cutoff Current	$I_{CES2}$	$V_{CE} = 90 \text{ Volts}, T_A = 150^\circ\text{C}$			10	$\mu\text{A}$
Emitter-Base Cutoff Current	$I_{EBO1}$	$V_{EB} = 7 \text{ Volts}$			10	$\mu\text{A}$
Emitter-Base Cutoff Current	$I_{EBO2}$	$V_{EB} = 5 \text{ Volts}$			10	nA

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	$h_{FE1}$	$I_C = 150 \text{ mA}, V_{CE} = 10 \text{ Volts}$	100		300	
	$h_{FE2}$	$I_C = 0.1 \text{ mA}, V_{CE} = 10 \text{ Volts}$	50		200	
	$h_{FE3}$	$I_C = 10 \text{ mA}, V_{CE} = 10 \text{ Volts}$	90			
	$h_{FE4}$	$I_C = 500 \text{ mA}, V_{CE} = 10 \text{ Volts}$	50		200	
	$h_{FE5}$	$I_C = 1 \text{ A}, V_{CE} = 10 \text{ Volts}$	15			
	$h_{FE6}$	$I_C = 150 \text{ mA}, V_{CE} = 10 \text{ Volts}$ $T_A = -55^\circ\text{C}$	40			
Base-Emitter Saturation Voltage	$V_{BEsat}$	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$			1.1	Volts
Collector-Emitter Saturation Voltage	$V_{CEsat1}$	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$			0.2	Volts
	$V_{CEsat2}$	$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$			0.5	Volts

Small Signal Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} $	$V_{CE} = 10 \text{ Volts}, I_C = 50 \text{ mA}, f = 20 \text{ MHz}$	5		20	
Small Signal Short Circuit Forward Current Transfer Ratio	$h_{FE}$	$V_{CE} = 5 \text{ Volts}, I_C = 1 \text{ mA}, f = 1 \text{ kHz}$	80		400	
Open Circuit Output Capacitance	$C_{OBO}$	$V_{CB} = 10 \text{ Volts}, I_E = 0 \text{ mA}, 100 \text{ kHz} < f < 1 \text{ MHz}$			12	pF
Open Circuit Input Capacitance	$C_{IBO}$	$V_{EB} = 0.5 \text{ Volts}, I_C = 0 \text{ mA}, 100 \text{ kHz} < f < 1 \text{ MHz}$			60	pF
Collector Base time constant	$\tau_b' C_C$	$V_{CB} = 10 \text{ Volts}, I_E = 10 \text{ mA}, f = 79.8 \text{ MHz}$			400	ps
Noise Figure	NF	$V_{CE} = 10 \text{ Volts}, I_C = 100 \mu\text{A}, f = 200 \text{ Hz}, R_g = 1 \text{ k}\Omega$			4	dB

Switching Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Saturated Turn-On Time	$t_{ON} + t_{OFF}$				30	ns