

## Description

Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N3997J)
- JANTX level (2N3997JX)
- JANTXV level (2N3997JV)
- QCI to the applicable level
- 100% die visual inspection per MIL-STD-750 method 2072 for JANTXV
- Radiation testing (total dose) upon request

Please contact Semicoa for special configurations  
[www.SEMICOA.com](http://www.SEMICOA.com) or (714) 979-1900

## Applications

- High-speed power switching
- Power transistor
- NPN silicon transistor

## Features

- Hermetically sealed TO-x metal can
- Also available in chip configuration
- Chip geometry 9201
- Reference document:  
MIL-PRF-19500/374

## Benefits

- Qualification Levels: JAN, JANTX, and JANTXV
- 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>CBO</sub>	100	Volts
Emitter-Base Voltage	V <sub>EBO</sub>	8	Volts
Collector Current, Continuous	I <sub>C</sub>	5	A
Power Dissipation, T <sub>A</sub> = 25°C Derate linearly above 25°C	P <sub>T</sub>	2 11.4	W mW/°C
Power Dissipation, T <sub>C</sub> = 25°C Derate linearly above 25°C	P <sub>T</sub>	30 300	W mW/°C
Thermal Resistance	R <sub>θJC</sub>	3.33	°C/W
Operating Junction Temperature	T <sub>J</sub>	-65 to +200	°C
Storage Temperature	T <sub>STG</sub>	-65 to +200	°C

**ELECTRICAL CHARACTERISTICS**

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

<b>Off Characteristics</b>						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10 \mu\text{A}$	100			Volts
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 50 \text{ mA}$	80			Volts
Collector-Emitter Cutoff Current	$I_{CEO}$	$V_{CE} = 60 \text{ Volts}$			10	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CES1}$	$V_{CE} = 80 \text{ Volts}$			200	nA
	$I_{CES1}$	$V_{CE} = 80 \text{ Volts}, T_A = 150^\circ\text{C}$			50	$\mu\text{A}$
Emitter-Base Cutoff Current	$I_{EBO1}$	$V_{EB} = 5 \text{ Volts}$			200	nA
	$I_{EBO2}$	$V_{EB} = 8 \text{ Volts}$			10	$\mu\text{A}$

<b>On Characteristics</b>			Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle $\leq 2.0\%$			
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
DC Current Gain	$h_{FE1}$	$I_C = 50 \text{ mA}, V_{CE} = 2 \text{ Volts}$	60		240	
	$h_{FE2}$	$I_C = 1 \text{ A}, V_{CE} = 2 \text{ Volts}$	80			
	$h_{FE3}$	$I_C = 5 \text{ A}, V_{CE} = 5 \text{ Volts}$	20			
	$h_{FE4}$	$I_C = 1 \text{ A}, V_{CE} = 2 \text{ Volts}$ $T_A = -55^\circ\text{C}$	20			
Base-Emitter Saturation Voltage	$V_{BEsat1}$	$I_C = 1 \text{ A}, I_B = 100 \text{ mA}$	0.6		1.2	Volts
	$V_{BEsat2}$	$I_C = 5 \text{ A}, I_B = 500 \text{ mA}$			1.6	
Collector-Emitter Saturation Voltage	$V_{CEsat1}$	$I_C = 1 \text{ A}, I_B = 100 \text{ mA}$			0.25	Volts
	$V_{CEsat2}$	$I_C = 5 \text{ A}, I_B = 500 \text{ mA}$			2	

<b>Dynamic Characteristics</b>						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} $	$V_{CE} = 5 \text{ Volts}, I_C = 1 \text{ A},$ $f = 10 \text{ MHz}$	3		12	
Open Circuit Output Capacitance	$C_{OBO}$	$V_{CB} = 10 \text{ Volts}, I_E = 0 \text{ mA},$ $100 \text{ kHz} < f < 1 \text{ MHz}$			150	pF

<b>Switching Characteristics</b>						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Delay Time	$t_d$				100	ns
Rise Time	$t_r$				240	ns
Storage Time	$t_s$				1.75	$\mu\text{s}$
Fall Time	$t_f$				300	ns
Saturated Turn-On Time	$t_{ON}$				300	ns
Saturated Turn-Off Time	$t_{OFF}$				2.0	$\mu\text{s}$