

## Description

Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N2904J)
- JANTX level (2N2904JX)
- JANTXV level (2N2904JV)
- 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

- General purpose
- Low power
- PNP silicon transistor



## Features

- Hermetically sealed TO-39 metal can
- Also available in chip configuration
- Chip geometry 0600
- Reference document: MIL-PRF-19500/290

## 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>	40	Volts
Collector-Base Voltage	V <sub>CB0</sub>	60	Volts
Emitter-Base Voltage	V <sub>EBO</sub>	5	Volts
Collector Current, Continuous	I <sub>C</sub>	600	mA
Power Dissipation, T <sub>A</sub> = 25 °C Derate above 60 °C	P <sub>T</sub>	0.8 5.7	W mW/°C
Power Dissipation, T <sub>C</sub> = 25 °C Derate above 25 °C	P <sub>T</sub>	3.0 17.2	W mW/°C
Thermal Resistance	R <sub>θJA</sub>	175	°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  $T_A = 25^\circ\text{C}$

Off Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{ mA}$	40			Volts
Collector-Base Cutoff Current	$I_{CBO1}$	$V_{CB} = 60\text{ Volts}$			10	$\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO2}$	$V_{CB} = 50\text{ Volts}$			20	nA
Collector-Base Cutoff Current	$I_{CBO3}$	$V_{CB} = 50\text{ Volts}, T_A = 150^\circ\text{C}$			20	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CES}$	$V_{CE} = 40\text{ Volts}$			1	$\mu\text{A}$
Emitter-Base Cutoff Current	$I_{EBO1}$	$V_{EB} = 5\text{ Volts}$			10	$\mu\text{A}$
Emitter-Base Cutoff Current	$I_{EBO2}$	$V_{EB} = 3.5\text{ Volts}$			50	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	$h_{FE1}$	$I_C = 0.1\text{ mA}, V_{CE} = 10\text{ Volts}$	20		175	
	$h_{FE2}$	$I_C = 1.0\text{ mA}, V_{CE} = 10\text{ Volts}$	25			
	$h_{FE3}$	$I_C = 10\text{ mA}, V_{CE} = 10\text{ Volts}$	35			
	$h_{FE4}$	$I_C = 150\text{ mA}, V_{CE} = 10\text{ Volts}$	40			
	$h_{FE5}$	$I_C = 500\text{ mA}, V_{CE} = 10\text{ Volts}$	20			
	$h_{FE6}$	$I_C = 10\text{ mA}, V_{CE} = 10\text{ Volts}$ $T_A = -55^\circ\text{C}$	15			
Base-Emitter Saturation Voltage	$V_{BEsat1}$	$I_C = 150\text{ mA}, I_B = 15\text{ mA}$			1.3	Volts
	$V_{BEsat2}$	$I_C = 500\text{ mA}, I_B = 50\text{ mA}$			2.6	
Collector-Emitter Saturation Voltage	$V_{CEsat1}$	$I_C = 150\text{ mA}, I_B = 15\text{ mA}$			0.4	Volts
	$V_{CEsat2}$	$I_C = 500\text{ mA}, I_B = 50\text{ mA}$			1.6	
Dynamic Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} $	$V_{CE} = 20\text{ Volts}, I_C = 50\text{ mA}, f = 100\text{ MHz}$	2.0			
Small Signal Short Circuit Forward Current Transfer Ratio	$h_{FE}$	$V_{CE} = 10\text{ Volts}, I_C = 1\text{ mA}, f = 1\text{ kHz}$	25			
Open Circuit Output Capacitance	$C_{OBO}$	$V_{CB} = 10\text{ Volts}, I_C = 0\text{ mA}, 100\text{ kHz} < f < 1\text{ MHz}$			8	pF
Open Circuit Input Capacitance	$C_{IBO}$	$V_{EB} = 2.0\text{ Volts}, I_E = 0\text{ mA}, 100\text{ kHz} < f < 1\text{ MHz}$			30	pF
Switching Characteristics						
Saturated Turn-On Time	$t_{on}$				45	ns
Saturated Turn-Off Time	$t_{off}$				300	ns