

## Description

SEMICOA Corporation offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N5109J)
- JANTX level (2N5109JX)
- JANTXV level (2N5109JV)
- JANS level (2N5109JS)
- 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
- VHF-UHF amplifier transistor
- NPN silicon transistor



## Features

- Hermetically sealed TO-39 metal can
- Also available in chip configuration
- Chip geometry 1009
- Reference document: MIL-PRF-19500/453

## 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>	20	Volts
Collector-Base Voltage	V <sub>CB0</sub>	40	Volts
Emitter-Base Voltage	V <sub>EBO</sub>	3	Volts
Collector Current, Continuous	I <sub>C</sub>	400	mA
Power Dissipation, T <sub>A</sub> = 25°C Derate linearly above 25°C	P <sub>T</sub>	1 5.71	W mW/°C
Power Dissipation, T <sub>C</sub> = 25°C Derate linearly above 25°C	P <sub>T</sub>	2.9 16.6	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-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100 \mu\text{A}$	40			Volts
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 5 \text{ mA}$	20			Volts
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	$I_C = 5 \text{ mA}, R_{BE} = 10 \Omega$	40			Volts
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100 \mu\text{A}$	3			Volts
Collector-Emitter Cutoff Current	$I_{CEO1}$	$V_{CE} = 15 \text{ Volts}$			20	$\mu\text{A}$
	$I_{CEO2}$	$V_{CE} = 15 \text{ Volts}, T_A = 175^\circ\text{C}$			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	$h_{FE1}$	$I_C = 50 \text{ mA}, V_{CE} = 15 \text{ Volts}$	40		150	
	$h_{FE2}$	$I_C = 50 \text{ mA}, V_{CE} = 5 \text{ Volts}$ $T_A = -55^\circ\text{C}$	15			
Collector-Emitter Saturation Voltage	$V_{CEsat}$	$I_C = 100 \text{ mA}, I_B = 10 \text{ mA}$			0.5	Volts

### Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE1} $	$V_{CE} = 15 \text{ Volts}, f = 200 \text{ MHz},$ $I_C = 25 \text{ mA}$	5		10.0	
	$ h_{FE2} $	$I_C = 50 \text{ mA}$	6		11.0	
	$ h_{FE3} $	$I_C = 100 \text{ mA}$	5		10.5	
Open Circuit Output Capacitance	$C_{OBO}$	$V_{CB} = 5 \text{ Volts}, I_E = 0 \text{ mA},$ $100 \text{ kHz} < f < 1 \text{ MHz}$			3.5	pF
Power Gain (narrow band) current	$G_{PE}$	$V_{CC} = 15 \text{ Volts}, I_C = 50 \text{ mA},$ $f = 200 \text{ MHz}, P_{in} = -10 \text{ dB}$	11			dB
Cross Modulation	cm	$V_{CC} = 15 \text{ Volts}, I_C = 50 \text{ mA},$ 54 dB output			-57	dB
Noise Figure	NF	$V_{CC} = 15 \text{ Volts}, I_C = 10 \text{ mA},$ $f = 200 \text{ MHz}, P_{in} = -10 \text{ dB}$			3.5	dB
Voltage Gain (wideband)	G	$V_{CC} = 15 \text{ Volts}, I_C = 50 \text{ mA},$ $50 \text{ MHz} < f < 216 \text{ MHz},$ $P_{in} = -10\text{dB}$	11			dB