

## Description

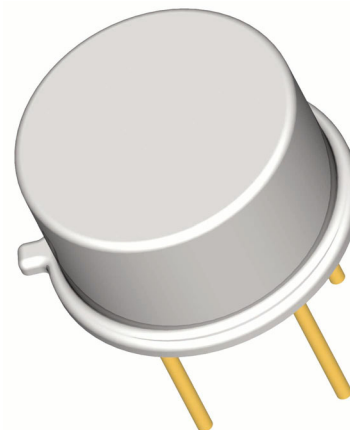
Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N5151J)
- JANTX level (2N5151JX)
- JANTXV level (2N5151JV)
- JANS level (2N5151JS)
- 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

- High-speed power switching
- Low power
- PNP silicon transistor



## Features

- Hermetically sealed TO-39 metal can
- Also available in chip configuration
- Chip geometry 9702
- Reference document:  
MIL-PRF-19500/545

## 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>CBO</sub>                     | 100                                              | Volts      |
| Emitter-Base Voltage                                                   | V <sub>EBO</sub>                     | 5.5                                              | Volts      |
| Collector Current, Continuous                                          | I <sub>C</sub>                       | 2                                                | A          |
| Power Dissipation, T <sub>A</sub> = 25°C<br>Derate linearly above 25°C | P <sub>T</sub>                       | 1<br>5.7                                         | W<br>mW/°C |
| Power Dissipation, T <sub>C</sub> = 25°C<br>Derate linearly above 25°C | P <sub>T</sub>                       | 11.8<br>66.7                                     | W<br>mW/°C |
| Thermal Resistance                                                     | R <sub>θJA</sub><br>R <sub>θJC</sub> | 175<br>15                                        | °C/W       |
| Operating Junction Temperature<br>Storage Temperature                  | T <sub>J</sub><br>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 | $V_{(BR)CEO}$ | $I_C = 100\text{ mA}$                                                                 | 80  |     |     | Volts         |
| Collector-Emitter Cutoff Current    | $I_{CES1}$    | $V_{CE} = 60\text{ Volts}$                                                            |     |     | 1   | $\mu\text{A}$ |
| Collector-Emitter Cutoff Current    | $I_{CES2}$    | $V_{CE} = 100\text{ Volts}$                                                           |     |     | 1   | mA            |
| Collector-Emitter Cutoff Current    | $I_{CEO}$     | $V_{CE} = 40\text{ Volts}$                                                            |     |     | 50  | $\mu\text{A}$ |
| Collector-Emitter Cutoff Current    | $I_{CEX}$     | $V_{CE} = 60\text{ Volts}$ , $V_{EB} = 2\text{ Volts}$ ,<br>$T_A = 150^\circ\text{C}$ |     |     | 500 | nA            |
| Emitter-Base Cutoff Current         | $I_{EBO1}$    | $V_{EB} = 4\text{ Volts}$                                                             |     |     | 1   | $\mu\text{A}$ |
| Emitter-Base Cutoff Current         | $I_{EBO1}$    | $V_{EB} = 5.5\text{ Volts}$                                                           |     |     | 1   | 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                      | $h_{FE1}$    | $I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ Volts}$  | 20  |     | 90   |       |
|                                      | $h_{FE2}$    | $I_C = 2.5\text{ A}$ , $V_{CE} = 5\text{ Volts}$  | 30  |     |      |       |
|                                      | $h_{FE3}$    | $I_C = 5\text{ A}$ , $V_{CE} = 5\text{ Volts}$    | 20  |     |      |       |
|                                      | $h_{FE4}$    | $I_C = 2.5\text{ A}$ , $V_{CE} = 5\text{ Volts}$  | 15  |     |      |       |
|                                      |              | $T_A = -55^\circ\text{C}$                         |     |     |      |       |
| Base-Emitter Voltage                 | $V_{BE}$     | $V_{CE} = 5\text{ Volts}$ , $I_C = 2.5\text{ mA}$ |     |     | 1.45 | Volts |
| Base-Emitter Saturation Voltage      | $V_{BEsat1}$ | $I_C = 2.5\text{ A}$ , $I_B = 250\text{ mA}$      |     |     | 1.45 | Volts |
|                                      | $V_{BEsat2}$ | $I_C = 5\text{ A}$ , $I_B = 500\text{ mA}$        |     |     | 2.20 |       |
| Collector-Emitter Saturation Voltage | $V_{CEsat1}$ | $I_C = 2.5\text{ A}$ , $I_B = 250\text{ mA}$      |     |     | 0.75 | Volts |
|                                      | $V_{CEsat2}$ | $I_C = 5\text{ A}$ , $I_B = 500\text{ mA}$        |     |     | 1.50 |       |

### Dynamic Characteristics

| Parameter                                                                | Symbol     | Test Conditions                                                            | Min | Typ | Max | Units |
|--------------------------------------------------------------------------|------------|----------------------------------------------------------------------------|-----|-----|-----|-------|
| Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio | $ h_{FE} $ | $V_{CE} = 5\text{ Volts}$ , $I_C = 500\text{ mA}$ ,<br>$f = 10\text{ MHz}$ | 6   |     |     |       |
| Small Signal Short Circuit Forward Current Transfer Ratio                | $h_{FE}$   | $V_{CE} = 5\text{ Volts}$ , $I_C = 100\text{ mA}$ ,<br>$f = 1\text{ kHz}$  | 20  |     |     |       |
| Open Circuit Output Capacitance                                          | $C_{OBO}$  | $V_{CB} = 10\text{ Volts}$ , $I_E = 0\text{ mA}$ ,<br>$f = 1\text{ MHz}$   |     |     | 250 | pF    |

### Switching Characteristics

|                         |           |                                                                                                                                  |  |  |     |               |
|-------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------|--|--|-----|---------------|
| Saturated Turn-On Time  | $t_{ON}$  | $I_C = 5\text{ A}$ , $I_{B1} = 500\text{ mA}$ ,<br>$I_{B2} = -500\text{ mA}$ , $V_{BEoff} = 3.7\text{ V}$ ,<br>$R_L = 6\ \Omega$ |  |  | 0.5 | $\mu\text{s}$ |
| Storage Time            | $t_s$     |                                                                                                                                  |  |  | 1.4 | $\mu\text{s}$ |
| Fall Time               | $t_f$     |                                                                                                                                  |  |  | 0.5 | $\mu\text{s}$ |
| Saturated Turn-Off Time | $t_{OFF}$ |                                                                                                                                  |  |  | 1.5 | $\mu\text{s}$ |