

Description

Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N3998J)
- JANTX level (2N3998JX)
- JANTXV level (2N3998JV)
- 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 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 _C = 25°C unless otherwise specified | |
|--|------------------|--|------------|
| Parameter | Symbol | Rating | Unit |
| Collector-Emitter Voltage | V _{CEO} | 80 | Volts |
| Collector-Base Voltage | V _{CBO} | 100 | Volts |
| Emitter-Base Voltage | V _{EBO} | 8 | Volts |
| Collector Current, Continuous | I _C | 5 | A |
| Power Dissipation, T _A = 25°C Derate linearly above 25°C | P _T | 2 11.4 | W mW/°C |
| Power Dissipation, T _C = 25°C Derate linearly above 25°C | P _T | 30 300 | W mW/°C |
| Thermal Resistance | R _{θJC} | 3.33 | °C/W |
| Operating Junction Temperature | T _J | -65 to +200 | °C |
| Storage Temperature | T _{STG} | -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 | $V_{(BR)CBO}$ | $I_C = 10 \mu\text{A}$ | 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 | μA |
| 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 | μA |
| Emitter-Base Cutoff Current | I_{EBO1} | $V_{EB} = 5 \text{ Volts}$ | | | 200 | nA |
| | I_{EBO2} | $V_{EB} = 8 \text{ Volts}$ | | | 10 | μA |

| On Characteristics | | | Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$ | | | |
|--------------------------------------|--------------|--|---|-----|------|-------|
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
| DC Current Gain | h_{FE1} | $I_C = 50 \text{ mA}, V_{CE} = 2 \text{ Volts}$ | 30 | | 120 | |
| | h_{FE2} | $I_C = 1 \text{ A}, V_{CE} = 2 \text{ Volts}$ | 40 | | | |
| | h_{FE3} | $I_C = 5 \text{ A}, V_{CE} = 5 \text{ Volts}$ | 15 | | | |
| | h_{FE4} | $I_C = 1 \text{ A}, V_{CE} = 2 \text{ Volts}$ $T_A = -55^\circ\text{C}$ | 10 | | | |
| 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 | |

| Dynamic Characteristics | | | | | | |
|--|------------|---|-----|-----|-----|-------|
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
| Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio | $ h_{FE} $ | $V_{CE} = 5 \text{ Volts}, I_C = 1 \text{ A},$ $f = 10 \text{ MHz}$ | 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 |

| Switching Characteristics | | | | | | |
|---------------------------|-----------|-----------------|-----|-----|-----|---------------|
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
| Delay Time | t_d | | | | 100 | ns |
| Rise Time | t_r | | | | 240 | ns |
| Storage Time | t_s | | | | 1.4 | μs |
| Fall Time | t_f | | | | 300 | ns |
| Saturated Turn-On Time | t_{ON} | | | | 300 | ns |
| Saturated Turn-Off Time | t_{OFF} | | | | 1.5 | μs |