2N3997

Silicon NPN Transistor

Data Sheet

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 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	$R_{\theta JC}$	3.33	°C/W
Operating Junction Temperature	T_J	-65 to +200	°C
Storage Temperature	T_{STG}	-65 to +200	°C

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ELECTRICAL CHARACTERISTICS

characteristics specified at T_A = 25°C

Off Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10 µA	100			Volts
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 50 mA	80			Volts
Collector-Emitter Cutoff Current	I_{CEO}	V_{CE} = 60 Volts			10	µA
Collector-Emitter Cutoff Current	I_{CES1} I_{CES1}	V_{CE} = 80 Volts V_{CE} = 80 Volts, T_A = 150°C			200 50	nA µA
Emitter-Base Cutoff Current	I_{EBO1} I_{EBO2}	V_{EB} = 5 Volts V_{EB} = 8 Volts			200 10	nA µA

On Characteristics

Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤ 2.0%

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
DC Current Gain	h_{FE1} h_{FE2} h_{FE3} h_{FE4}	I_C = 50 mA, V_{CE} = 2 Volts I_C = 1 A, V_{CE} = 2 Volts I_C = 5 A, V_{CE} = 5 Volts I_C = 1 A, V_{CE} = 2 Volts T_A = -55°C	60 80 20 20		240	
Base-Emitter Saturation Voltage	V_{BEsat1} V_{BEsat2}	I_C = 1 A, I_B = 100 mA I_C = 5 A, I_B = 500 mA	0.6		1.2 1.6	Volts
Collector-Emitter Saturation Voltage	V_{CEsat1} V_{CEsat2}	I_C = 1 A, I_B = 100 mA I_C = 5 A, I_B = 500 mA			0.25 2	Volts

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$\|h_{FE}\|$	V_{CE} = 5 Volts, I_C = 1 A, f = 10 MHz	3		12	
Open Circuit Output Capacitance	C_{OBO}	V_{CB} = 10 Volts, I_E = 0 mA, 100 kHZ < f < 1 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				1.75	µs
Fall Time	t_f				300	ns
Saturated Turn-On Time	t_{ON}				300	ns
Saturated Turn-Off Time	t_{OFF}				2.0	µs

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