SEMICOA SEMICONDUCTORS

Data Sheet No. 2N3499L

Type 2N3499L
Geometry 5620
Polarity NPN
Qual Level: JAN - JANTXV

Generic Part Number: 2N3499

REF: MIL-PRF-19500/366

Features:

Request Quotation

- General-purpose silicon transistor for switching and amplifier applications.
- Housed in TO-5 case.
- Also available in chip form using the 5620 chip geometry.
- The Min and Max limits shown are per MIL-PRF-19500/366 which Semicoa meets in all cases.

TO-5

Maximum Ratings

T_C = 25°C unless otherwise specified

Rating	Symbol	Rating	Unit
Collector-Emitter voltage	V_{CEO}	100	V
Collector-Base Voltage	V_{CBO}	100	V
Emitter-Base voltage	V_{EBO}	6.0	V
Collector Current, Continuous	I_C	500	mA
Power Dissipation, T_A = 25°C	P_D	5.0	mW
Derate above 25°C		28.8	mW/°C
Operating Junction Temperature	T_J	-65 to +200	°C
Storage Temperature	T_{STG}	-65 to +200	°C

Electrical Characteristics

$T_C = 25^oC$ unless otherwise specified

OFF Characteristics	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage I_C = 10 µA	$V_{(BR)CBO}$	100	---	V
Collector-Emitter Breakdown Voltage I_C = 10 mA	$V_{(BR)CEO}$	100	---	V
Emitter-Base Breakdown Voltage I_E = 10 µA	$V_{(BR)EBO}$	6.0	---	V
Collector-Base Cutoff Current V_{CB} = 50 V	I_{CBO}	---	50	nA
Emitter-Base Cutoff Current V_{EB} = 4 V	I_{EBO}	---	25	nA

ON Characteristics	Symbol	Min	Max	Unit
Forward Current Transfer Ratio				
I_C = 100 µA, V_{CE} = 10 V (pulsed)	h_{FE1}	35	---	---
I_C = 1.0 mA, V_{CE} = 10 V (pulsed)	h_{FE2}	50	---	---
I_C = 10 mA, V_{CE} = 10 V (pulsed)	h_{FE3}	75	---	---
I_C = 150 mA, V_{CE} = 10 V (pulsed)	h_{FE4}	100	300	---
I_C = 300 mA, V_{CE} = 10 V (pulsed)	h_{FE6}	20	---	---
Base-Emitter Saturation Voltage				
I_C = 10 mA, I_B = 1.0 mA	$V_{BE(sat)1}$	---	0.8	V dc
I_C = 300 mA, I_B = 300 mA	$V_{BE(sat)3}$	---	1.4	V dc
Collector-Emitter Saturation Voltage				
I_C = 10 mA, I_B = 1.0 mA	$V_{CE(sat)1}$	---	0.2	V dc
I_C = 300 mA, I_B = 30 mA	$V_{CE(sat)3}$	---	0.6	V dc

Small Signal Characteristics	Symbol	Min	Max	Unit
Short Circuit Forward Current Transfer Ratio I_C = 10 mA, V_{CE} = 10 V, f = 1 kHz	AC h_{FE}	75	375	---
Magnitude of Common Emitter, Small Signal, Short Circuit Forward Current Transfer Ratio V_{CE} = 20 V, I_C = 20 mA, f = 100 MHz	$\|h_{FE}\|$	1.5	8.0	---
Open Circuit Output Capacitance V_{CB} = 10 V, I_E = 0, 100 kHz < f < 1 MHz	C_{OBO}	---	10	pF
Input Capacitance, Output Open Circuited V_{EB} = 0.5 V, I_C = 0, 100 kHz < f < 1 MHz	C_{IBO}	---	80	pF
Noise Figure V_{CE} = 10 V, I_C = 0.5 mA, Rg = 1 kOhm, 1 kHz	NF	---	16	dB
Noise Figure V_{CE} = 10 V, I_C = 0.5 mA, Rg = 1 kOhm, 1 kHz	NF	---	6.0	dB

Switching Characteristics	Symbol	Min	Max	Unit
Saturated Turn On Switching time to 90% I_C = 150 mA, I_{B1} = 15 mA, V_{EB} = 2 V	t_{ON}	---	115	ns
Saturated Turn Off Switching time to 10% I_C = 150 mA, I_{B2} = -I_{B1} = 15 mA	t_{OFF}	---	1150	ns