

Type 2N3499
Geometry 5620
Polarity NPN
Qual Level: JAN - JANTXV

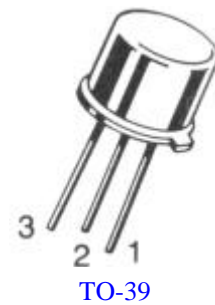
Generic Part Number:
2N3499

REF: MIL-PRF-19500/366

Features:

[Request Quotation](#)

- General-purpose silicon transistor for switching and amplifier applications.
- Housed in [TO-39](#) 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.



Maximum Ratings

$T_C = 25^\circ\text{C}$ 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, $T_A = 25^\circ\text{C}$	P_D	5.0	mW
Derate above 25°C		28.8	mW/ $^\circ\text{C}$
Operating Junction Temperature	T_J	-65 to +200	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 to +200	$^\circ\text{C}$

Electrical Characteristics

$T_C = 25^\circ\text{C}$ unless otherwise specified

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

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

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

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