ECG Semiconductors

ECG996

Operational Transconductance Amplifier

Features

- **Slew rate (unity gain compensated):** 50V/μs
- **Fully adjustable gain:** 0 to gm R_L limit
- **Extended gm linearity:** 3 decades
- **Flexible supply voltage range:** ±2V to ±18V
- **Adjustable power consumption**

.256" (6.50) MAX.
.300" (7.62)
.393" (9.98) MAX.
.150" (3.81) MAX.
.070" (1.78) MIN.
.300" (7.62)

The ECG996 is a programmable transconductance block intended to fulfill a wide variety of variable gain applications. It has differential inputs and high impedance push-pull outputs. The device has high input impedance and its transconductance (gm) is directly proportional to the amplifier bias current (I_{ABC}).

High slew rate together with programmable gain make the ECG996 an ideal choice for variable gain applications such as sample and hold, multiplexing, filtering, and multiplying.

NC — 1
(-) INPUT — 2
(+) INPUT — 3
V- — 4
8 — NC
7 — V+
6 — OUTPUT
5 — AMPLIFIER BIAS INPUT

TOP VIEW

Schematic Diagram

Absolute Maximum Ratings
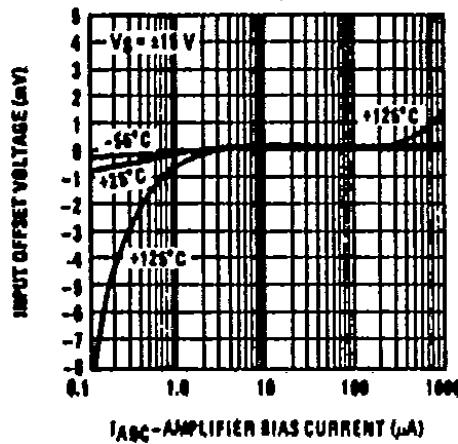
Supply Voltage .... ± 18V
Power Dissipation 250mW
Differential Input Voltage .... ± 5V
Amplifier Bias Current (I_{ABC}) 2mA
DC Input Voltage .... $+V_S$ to $-V_S$
Output Short Circuit Duration .... Indefinite
Operating Temperature Range .... 0°C to +70°C
Storage Temperature Range .... −65°C to +150°C
Lead Temperature (Soldering, 10 seconds) .... 300°C

Electrical Characteristics

($V_S = \pm 15V$ and $T_A = 25°C$, amplifier bias current (I_{ABC}) = 500µA unless otherwise specified.)
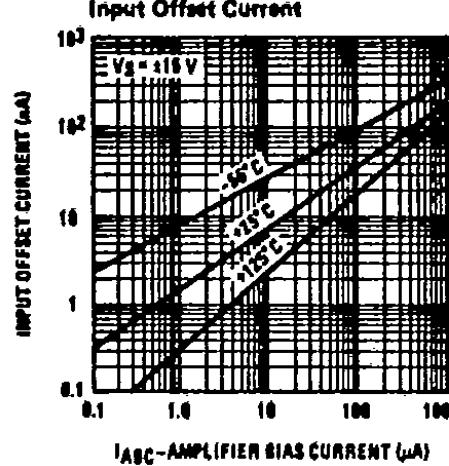
| Characteristic	Conditions	Min	Typ	Max	Units
Input Offset Voltage Range	Over Specified Temperature	--	0.4	5	mV
		--	--	6	mV
	$I_{ABC} = 5µA$	--	0.3	--	mV
Input Offset Voltage Change	$5µA \leqslant I_{ABC} \leqslant 500µA$	--	0.1	--	mV
Input Offset Current		--	0.1	0.6	µA
Input Bias Current		--	0.4	5	µA
	Over Specified Temperature Range	--	1	7	µA
Forward Transconductance (gm)		6700	9600	13000	µmho
	Over Specified Temperature	5400	--	--	µmho
Peak Output Current	$R_L = 0$, $I_{ABC} = 5µA$	--	5	--	µA
	$R_L = 0$	350	500	650	µA
	$R_L = 0$ Over Specified Temperature Range	300	--	--	µA
Peak Output Voltage Positive	$R_L = \infty$, $5µA \leqslant I_{ABC} \leqslant 500µA$	+ 12	+ 14.2	--	V
Negative	$R_L = \infty$, $5µA \leqslant I_{ABC} \leqslant 500µA$	− 12	− 14.4	--	V
Amplifier Supply Current		--	1.1	--	mA
Input Offset Voltage Sensitivity Positive	$\Delta_{OFFSET}/\Delta V +$	--	20	150	µV/V
Negative	$\Delta V_{OFFSET}/\Delta V -$	--	20	150	µV/V
Common Mode Rejection Ratio		80	110	--	dB
Common Mode Range		± 12	± 14	--	V
Input Resistance		10	26	--	kΩ
Magnitude of Leakage Current	$I_{ABC} = 0$	--	0.2	100	nA
Differential Input Current	$I_{ABC} = 0$, Input = ± 4V	--	0.02	100	nA
Open Loop Bandwidth		--	2	--	MHz
Slew Rate	Unity Gain Compensated	--	50	--	V/µs

Typical Performance Characteristics
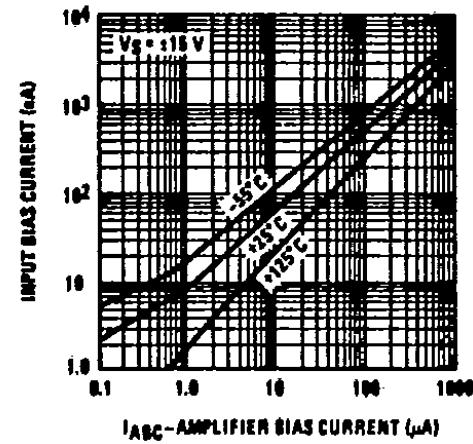
Input Offset Voltage
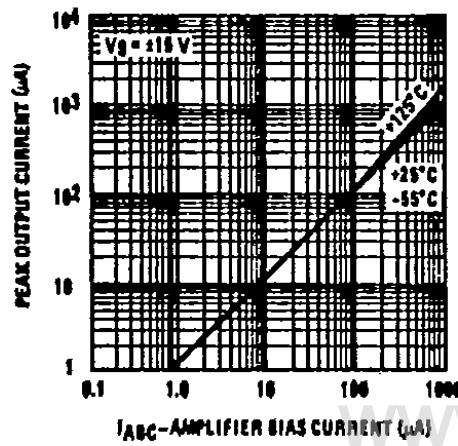
Input Offset Current
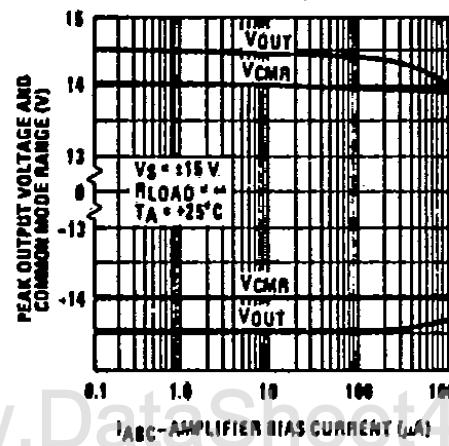
Input Bias Current
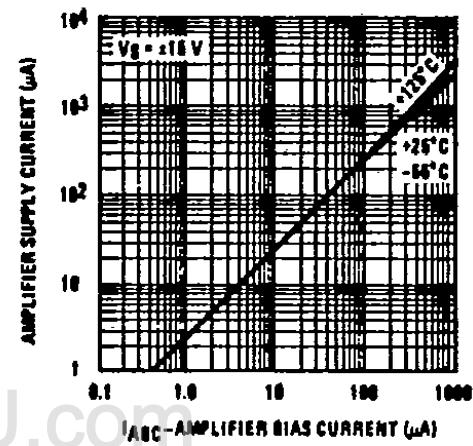
Peak Output Current
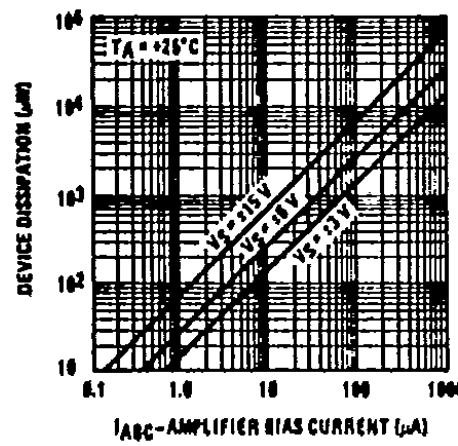
Peak Output Voltage and Common Mode Range
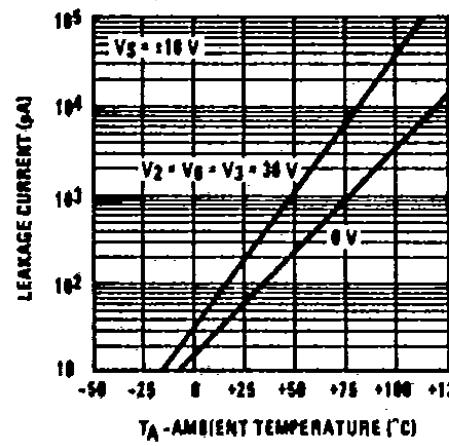
Amplifier Supply Current
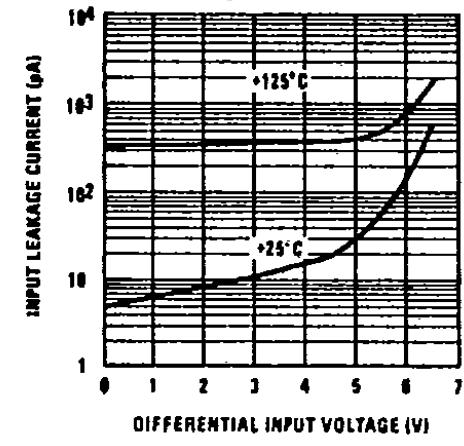
Total Power Dissipation
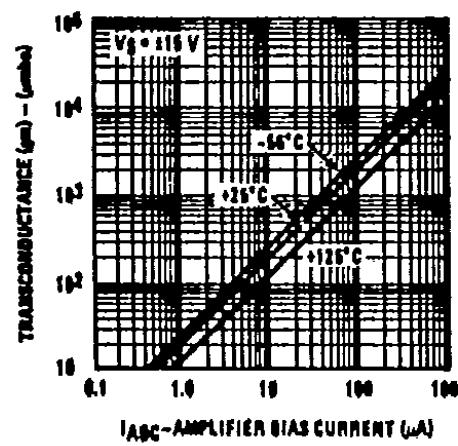
Leakage Current
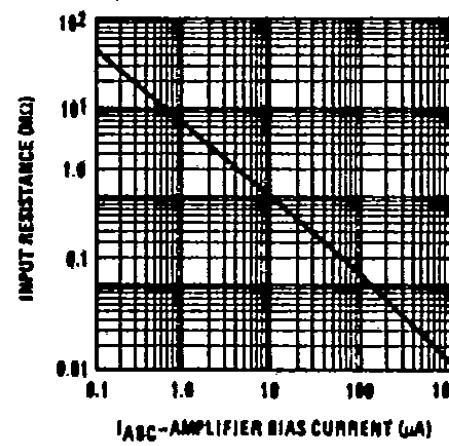
Input Leakage
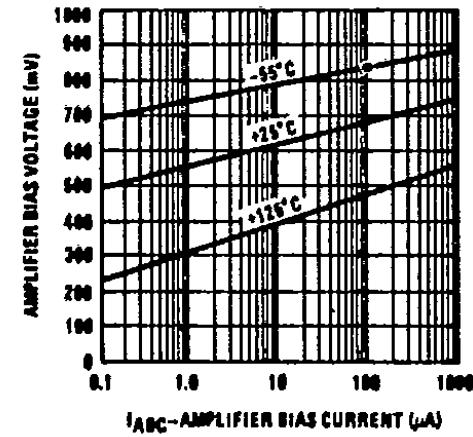
Transconductance
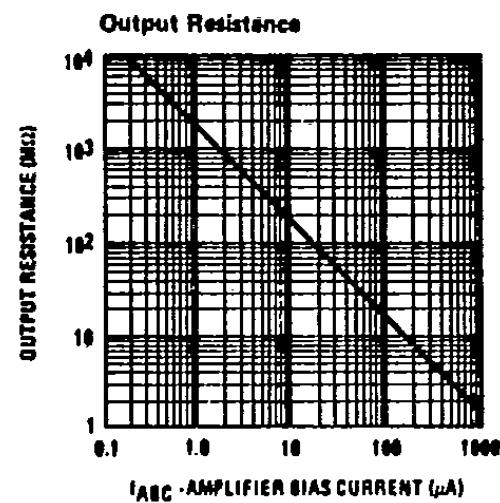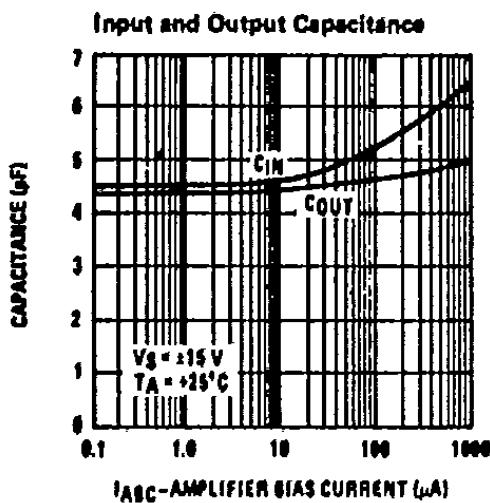
Input Resistance


Amplifier Bias Voltage vs Amplifier Bias Current

typical performance characteristics (con't)

**Input and Output Capacitance**



Output Resistance
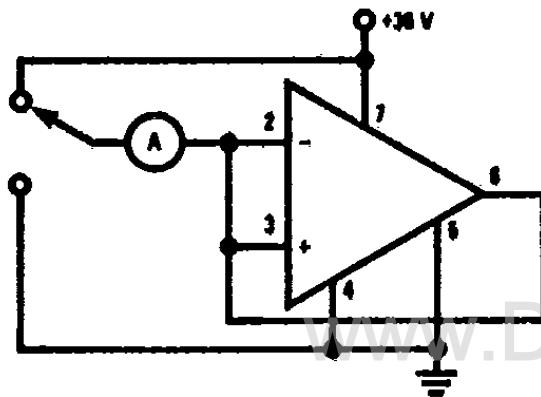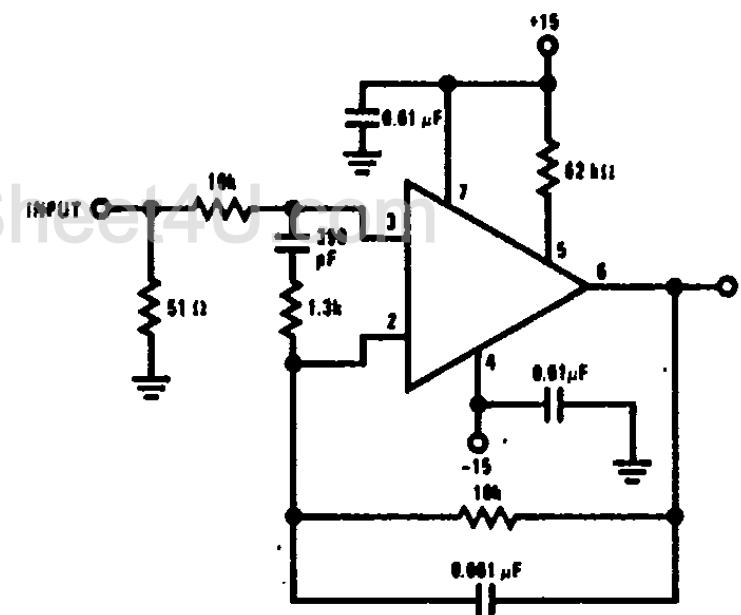
Applications

Leakage Current Test Circuit

Differential Input Current Test Circuit

Unity Gain Follower