

## NTE996

### Linear Integrated Circuit

### Operational Transconductance Amplifier

**Description:**

The NTE996 is a programmable transconductance block intended to fulfill a wide variety of variable gain applications. This device has differential inputs and high impedance push-pull outputs. The NTE996 has high input impedance and its transconductance ( $g_m$ ) is directly proportional to the amplifier bias current ( $I_{ABC}$ ).

High slew rate together with programmable gain make the NTE996 an ideal choice for variable gain applications such as sample and hold, multiplexing, filtering, and multiplying,

**Features:**

- Slew Rate (Unity Gain Compensated): 50V/ $\mu$ s
- Fully Adjustable Gain: 0 to  $g_m \cdot R_L$  Limit
- Extended  $g_m$  Linearity: 3 Decades
- Flexible Supply Voltage Range:  $\pm 2V$  to  $\pm 18V$
- Adjustable Power Consumption

**Absolute Maximum Ratings:**

DC Supply Voltage, $V_S$ .....	$\pm 18V$
Power Dissipation, $P_D$ .....	250mW
Differential Input Voltage .....	$\pm 5V$
Amplifier Bias Current, $I_{ABC}$ .....	2mA
DC Input Voltage .....	$+V_S$ to $-V_S$
Output Short Circuit Duration .....	Indefinite
Operating Temperature Range, $T_{opr}$ .....	$0^\circ$ to $+70^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ C$
Lead Temperature (During Soldering, 10sec), $T_L$ .....	$+260^\circ C$

**Electrical Characteristics:** ( $V_S = \pm 15V$ ,  $I_{ABC} = 500\mu A$ ,  $T_A = +25^\circ C$  unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit	
Input Offset Voltage		–	0.4	5.0	mV	
	$T_A = 0^\circ$ to $+70^\circ C$ , $I_{ABC} = 5\mu A$	–	0.3	–		
Input Offset Voltage Charge	$5\mu A \leq I_{ABC} \leq 500\mu A$	–	0.1	–	mV	
Input Offset Current		–	0.1	–	$\mu A$	
Input Bias Current		–	0.4	5.0	$\mu A$	
	$T_A = 0^\circ$ to $+70^\circ C$	–	1.0	7.0		
Forward Transconductance ( $g_m$ )		6700	9600	13000	$\mu mho$	
	$T_A = 0^\circ$ to $+70^\circ C$	5400	–	–		
Peak Output Current	$R_L = 0$ , $I_{ABC} = 5\mu A$	–	5	–	$\mu A$	
	$R_L = 0$	350	500	650		
	$R_L = 0$ , $T_A = 0^\circ$ to $+70^\circ C$	300	–	–		
Peak Output Voltage	$R_L = \infty$ , $5\mu A \leq I_{ABC} \leq 500\mu A$	Positive	+12.0	+14.2	–	V
		Negative	–12.0	–14.4		
Amplifier Supply Current		–	1.1	–	mA	
Input Offset Voltage Sensitivity	$\Delta V_{OFFSET}/\Delta V$	Positive	–	20	150	$\mu V/V$
		Negative	–	20	150	
Common Mode Rejection Ratio		80	110	–	dB	
Common Mode Range		$\pm 12$	$\pm 14$	–	V	
Input Resistance		10	26	–	k $\Omega$	
Magnitude of Leakage Current	$I_{ABC} = 0$	–	0.2	100	nA	
Differential Input Current	$I_{ABC} = 0$ , Input = $\pm 4V$	–	0.02	100	nA	
Open Loop Bandwidth		–	2.0	–	MHz	
Slew Rate	Unity Gain Compensated	–	50	–	V/ $\mu s$	

### Pin Connection Diagram

