

NTE949 Integrated Circuit Dual Audio Operational Amplifier/Preamplifier

Description:

The NTE949 consists of two identical high gain OP Amps constructed on a single 8-Lead Metal Can type package. These three-stage amplifiers use Class A PNP transistor output stages with uncommitted collectors. This enables a variety of loads to be employed for general purpose applications from DC to 10MHz, where two high performance operational amplifiers are required. In addition, the outputs may be wired-OR for use as a dual comparator or they may function as diodes in low threshold rectifying circuits such as absolute value amplifiers and peak detectors.

Features:

- Single or Dual Supply Operation
- Low Power Consumption
- High Gain: 25,000 V/V
- Large Common Mode Range: +11V, -13V
- Excellent Gain Stability vs. Supply Voltage
- No Latch-Up
- Output Short Circuit Protected

Absolute Maximum Ratings:

Supply Voltage, V+, V-	±18V
Internal Power Dissipation (T _A = +70°C), P _D	500mW
Derate Above 70°C	6.8mW/°C
Input Differential Voltage, V _{ID}	±5V
Input Common-Mode Range (Note 1), V _{ICR}	±15V
Storage Temperature Range, T _{stg}	-65° to +150°C
Operating Temperature Range, T _{opr}	0° to +70°C
Lead Temperature (During Soldering, 60s), T _L	+300°C
Output Short-Circuit Duration (T _A = +25°C, Note 2), t _{OS}	30sec

Note 1. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

Note 2. Short circuit may be to GND or either supply.

Electrical Characteristics: ($V_+ = \pm 15V$, $R_L = 5k\Omega$ to Pin7, $T_A = +25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Input Offset Voltage	V_{IO}	$R_S = 200\Omega$	–	1.0	6.0	mV	
		$T_A = 0^\circ$ to $+70^\circ C$	–	1.0	9.0	mV	
		$V_+ = \pm 4V$, $R_L = 10k\Omega$ to Pin7	–	–	6.0	mV	
Input Offset Current	I_{IO}		–	50	750	nA	
		$T_A = +70^\circ C$	–	0.5	1.5	μA	
		$T_A = 0^\circ C$	–	0.5	1.5	μA	
		$V_+ = 4V$, $R_L = 10k\Omega$ to Pin7	–	50	600	μA	
Input Bias Current	I_{IB}		–	0.3	1.5	μA	
		$T_A = +70^\circ C$	–	0.3	3.0	μA	
		$T_A = 0^\circ C$	–	0.3	3.0	μA	
		$V_+ = 4V$, $R_L = 10k\Omega$ to Pin7	–	0.3	1.5	μA	
Input Resistance	r_i		50	150	–	$k\Omega$	
Large Signal Voltage Gain	A_V	$V_{OUT} = \pm 10V$	15000	50000	–	V/V	
		$V_+ = \pm 4V$, $R_L = 10k\Omega$ to Pin7, $V_{OUT} = \pm 2V$	15000	60000	–	V/V	
Positive Output Voltage Swing	V_O		+12	+13	–	V	
		$T_A = 0^\circ$ to $+70^\circ C$	+12	+13	–	V	
		$V_+ = \pm 4V$, $R_L = 10k\Omega$ to Pin7	+2.5	+2.8	–	V	
Negative Output Voltage Swing	V_O		–14	–15	–	V	
		$T_A = 0^\circ$ to $+70^\circ C$	–14	–15	–	V	
		$V_+ = \pm 4V$, $R_L = 10k\Omega$ to Pin7	–3.6	–4.0	–	V	
Output Resistance	r_o	$f = 1kHz$	–	5.0	–	$k\Omega$	
Common Mode Rejection Ratio	CMRR	$R_S = 200\Omega$, $V_{IN} = +11.5V$ to $-13.5V$	70	90	–	dB	
Supply Voltage Rejection Ratio	PSRR	$R_S = 200\Omega$	–	50	350	$\mu V/V$	
Input Voltage Range	V_I		–13	–	+11	V	
Internal Power Dissipation		$V_{OUT} = 0$	–	180	330	mW	
		$V_+ = \pm 4V$, $R_L = 10k\Omega$ to Pin7	–	20	–	mW	
Supply Current	I_{CC} , I_{EE}	$V_{OUT} = 0$	–	9.0	14.0	mA	
		$V_+ = \pm 4V$, $R_L = 10k\Omega$ to Pin7	–	2.5	–	mA	
Broadband Noise Figure		$R_S = 10k\Omega$, $BW = 10Hz$ to $10kHz$	–	2.5	–	dB	
Turn On Delay	t_{on}	Open Loop, $V_{IN} = \pm 20mV$	–	0.2	–	μs	
Turn Off Delay	t_{off}	Open Loop, $V_{IN} = \pm 20mV$	–	0.3	–	μs	
Slew Rate (Unity Gain)	SR	$C_1 = 0.02\mu F$, $R_1 = 33\Omega$, $C_2 = 10pF$	–	1.0	–	$V/\mu s$	
Channel Separation		$R_S = 1k\Omega$, $f = 10kHz$	–	140	–	dB	
Input Offset Voltage Drift		$R_S = 200\Omega$	$+25^\circ C \leq T_A \leq +70^\circ C$	–	3.0	–	$\mu V/^\circ C$
			$0^\circ C \leq T_A \leq +25^\circ C$	–	3.0	–	$\mu V/^\circ C$

Pin Connection Diagram
(Top View)

