

## NTE1577 Integrated Circuit Dual, Low Noise Preamp w/Auto Reverse

**Description:**

The NTE1577 is a dual preamplifier with tape autoreverse facility in a 16-Lead DIP type package designed for the amplification of low level signals in applications requiring very low noise performance, as stereo cassette players. Each channel consists of two independent amplifiers. The first has a fixed gain of 30dB while the second one is an operational amplifier optimized for high quality audio application.

**Features:**

- Very Low Noise
- High Gain
- Large Output Voltage Swing
- Low Distortion
- Tape Autoreverse Facility
- Single Supply Operation
- Short Circuit Protection
- Wide Supply Range

**Absolute Maximum Ratings:**

Supply Voltage,  $V_S$  ..... 36V  
 Total Power Dissipation ( $T_A = +60^\circ\text{C}$ ),  $P_D$  ..... 600mW  
 Operating Junction Temperature Range,  $T_J$  .....  $-40^\circ$  to  $+150^\circ\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-40^\circ$  to  $+150^\circ\text{C}$   
 Thermal Resistance, Junction-to-Ambient,  $R_{thJA}$  .....  $150^\circ\text{C/W}$

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_S = 14.4\text{V}$ ,  $G_V = 60\text{dB}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Current	$I_S$	$V_S = 8\text{V to } 30\text{V}$	–	10	–	mA
Output Current (Pin1 to Pin15) Source	$I_O$	$V_S = 8\text{V to } 30\text{V}$	–	10	–	mA
Sink			–	1	–	mA
Closed Loop Gain	$G_V$	$f = 20\text{Hz to } 20\text{kHz}$	–	60	–	dB

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$ ,  $V_S = 14.4\text{V}$ ,  $G_V = 60\text{dB}$  unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Input Resistance	$R_i$	$f = 1\text{kHz}$		50	80	–	$\text{k}\Omega$
Output Resistance (pins 1–15)	$R_o$	$f = 1\text{kHz}$		–	50	–	$\Omega$
Total Harmonic Distortion	THD	$V_O = 300\text{mV}$	$f = 1\text{kHz}$	–	0.05	–	%
			$f = 10\text{kHz}$	–	0.05	–	%
Output Voltage Swing (Pin1 to Pin15)	$V_O$	Peak-to-Peak	$V_S = 14.4\text{V}$	–	12	–	V
			$V_S = 30\text{V}$	–	28	–	V
Total Input Noise	$e_n$	Note 1	$R_g = 50\Omega$	–	0.25	–	$\mu\text{V}$
			$R_g = 600\Omega$	–	0.4	0.6	$\mu\text{V}$
			$R_g = 5\text{k}\Omega$	–	1.3	–	$\mu\text{V}$
Signal-to-Noise Ratio	S/N	$V_{in} = 0.3\text{mV}$ , $R_g = 600\Omega$ , Note 1		–	57	–	dB
		$V_{in} = 1\text{mV}$ , $R_g = 0$ , Note 1		–	73	–	dB
Channel Separation	CS	$f = 1\text{kHz}$		–	60	–	dB
Crosstalk (Differential Input)	CT	$f = 1\text{kHz}$ , Note 3		–	80	–	dB
Supply Voltage Rejection	SVR	$f = 1\text{kHz}$ , $R_g = 600\Omega$ , Note 2		–	120	–	dB
Supply Voltage Rejection of Reference Voltage (Pin4)	SVR	$f = 1\text{kHz}$ , $R_g = 600\Omega$ , Note 2		–	100	–	dB
Reference Voltage (Pin 4)	$V_{ref}$			–	55	–	mV
Reference Voltage Output Resistance (Pin4)	$R_{ref}$			–	100	–	$\Omega$
Voltage Temperature Coefficient	$\frac{\Delta V_{ref}}{\Delta T}$			–	10	–	$\mu\text{V}/^\circ\text{C}$

Note 1. The weighting filter used for the noise measurement has a curve A frequency response.

Note 2. Referred to the input

Note 3. Between a disabled input and an input ON.

**Electrical Characteristics:** ( $V_S = 30\text{V}$  unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
<b>Amplifier No. 1</b>							
Gain (Pin6 to Pin5)	$G_V$			29	30	30.5	dB
Distortion	d	$V_O = 300\text{mV}$	$f = 1\text{kHz}$	–	0.05	–	%
			$f = 10\text{kHz}$	–	0.05	–	%
Total Input Noise	$e_n$	$R_g = 600\Omega$ , Note 1		–	0.4	–	$\mu\text{V}$
Output Impedance (Pin5)	$Z_O$	$f = 1\text{kHz}$		–	100	–	$\Omega$
Output Current (Pin5)	$I_O$			–	1	–	mA
DC Output Voltage (Pin5)	$V_5$	$V_S = 10\text{V}$		1.3	2	2.7	V

Note 1. The weighting filter used for the noise measurement has a curve A frequency response.

**Electrical Characteristics (Cont'd):** ( $V_S = 30V$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Amplifier No. 2</b>						
Open Loop Voltage Gain (Pin2 to Pin1)	$G_V$		–	100	–	dB
Input Bias Current	$I_B$		–	0.2	–	$\mu A$
Input Offset Voltage	$V_{OS}$		–	2	–	mV
Input Offset Current	$I_{OS}$		–	0.05	–	$\mu A$
Small Signal Bandwidth	BW	$G_V = 30dB$	–	150	–	kHz
Total Input Noise	$e_n$	$R_g = 600\Omega$ , Note 1	–	2	–	$\mu V$
Input Impedance	$R_I$	$f = 1kHz$ (Open Loop)	150	500	–	$k\Omega$

Note 1. The weighting filter used for the noise measurement has a curve A frequency response.

**Autoreverse:**

$P_{in}$	$V_{12} < 2V$	$V_{12} > 4.5V$
6 – 10	OFF	ON
7 – 9	ON	OFF

**Pin Connection Diagram**



