ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089

NTE871
Integrated Circuit
Wideband High Speed Operational Amp

Description:

The NTE871 is a large–signal wideband, high speed operational amplifier which has a unity gain crossover frequency (f_T) of approximately 38MHz and an open–loop, 3dB corner frequency of approximately 110kHz. It can operate at a total supply voltage of from 14 to 36 volts (±7 to ±18 votls when using split supplies) and can provide at least $18V_{P-P}$ and $30mA_{P-P}$ at the output when operating from ±15 volt supplies. The NTE871 can be compensated with a single external capacitor and has DC offset adjust terminals for those applications requiring offset null.

The NTE871 circuit contains both bipolar and PMOS transistors on a single monlithic chip and is supplied in a 8–Lead TO5 package.

Features:

- High Open–Loop Gain at Video Frequencies: 42dB Typ. at 1MHz
- High Unity–Gain Crossover Frequency: f_T = 38MHz Typ.
- Wide Power Bandwidth;
  - $V_O = 18V_{P-P}$: 1.2MHz Typ.
- High Slew Rate;
  - 20dB Amplifier: 70V/µs Typ.
  - Unity–Gain Amplifier: 25V/µs Typ.
- Fast Setting Time: 0.6µs Typ.
- High Output Current: ±15mA Min.
- Single Capacitor Compensation
- Offset Null Terminals

Absolute Maximum Ratings:

Supply Voltage (Between V+ and V– terminals) 36V
Differential Input Voltage . . . . ±12V
Input Voltage to GND (Note 1) . . . . ±15V
Offset Terminal to V– Terminal Voltage . . . . ±0.5V
Output Current (Note 2) 50mA
Device Dissipation (Up to T_A = +55°C), P_D 630mW
Derate Above T_A = +55°C . . . . 6.67mW/°C
Operating Temperature Range, T_{opr} . . . . –55° to +125°C
Storage Temperature range. T_{stg} . . . . –65° to +150°C
Lead Temperature (During Soldering), T_L
At distance 1/16” ±1/32” (1.59 ± 0.79mm) from case for 10s max . . . . +265°C

Note 1. If the supply voltage is less than ±15 volts, the maximum input voltage to GND is equal to the supply voltage.

Note 2. The NTE871 does not contain circuitry to protect against short circuits in the output.

Electrical Characteristics: (T_A = +25°C, V_{CC} = ±15V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Input Offset Voltage	V_{IO}	V_O = 0 ±0.1V	–	±1	±5	mV
Input Bias Current	I_{IB}	V_O = 0 ±0.1V	–	0.7	2.0	µA
Input Offset Current	I_{IO}	V_O = 0 ±0.1V	–	±0.05	±0.4	µA
Low–Frequency Open–Loop Voltage Gain	A_{OL}	V_O = ±1V Peak, F = 1kHz, Note 3	56	61	–	dB
Common–Mode Input Voltage Range	V_{ICR}	CMRR ≥ 76dB	±12	+14 –13	–	V
Common–Mode Rejection Ratio	CMRR	V_I Common Mode = ±12V	76	90	–	dB
Maximum Output Voltage: Positive	$V_{OM}+$	Differential Input Voltage = 0 ±0.1V R_L = 2kΩ	+9	+11	–	V
Negative	$V_{OM}–$		–9	–11	–	
Maximum Output Current: Positive	$V_{OM}+$	Differential Input Voltage = 0 ±0.1V R_L = 250kΩ	+15	+30	–	mA
Negative	$V_{OM}–$		–15	–30	–	
Supply Current	I+	V_O = 0 ±0.1V, R_L ≥ 10kΩ	–	8.5	10.5	mA
Power Supply Rejection Ratio	PSRR	ΔV+ = ±1V, ΔV– = ±1V	60	70	–	dB
Dynamic						
Unity–Gain Crossover Frequency	f_T	C_C = 0, V_O = 0.3$V_{P–P}$	–	38	–	MHz
1MHz Open–Loop Voltage Gain	A_{OL}	f = 1MHz, C_C = 0, V_O = 10$V_{P–P}$	36	42	–	dB
Slew Rate 20dB Amplifier	SR	A_V = 10, C_C = 0, V_I = 1V (Pulse)	50	70	–	V/µs
Follower Mode		A_V = 1, C_C = 10pF, V_I = 10V (Pulse)	–	25	–	
Power Bandwidth 20dB Amplifier	PBW (Note 4)	A_V = 10, C_C = 0, V_O = 10$V_{P–P}$	0.8	1.2	–	MHz
Follower Mode		A_V = 1, C_C = 10pF, V_O = 10$V_{P–P}$	–	0.4	–	
Open–Loop Differential Impedance	Z_I	F = 1MHz	–	30	–	kΩ
Open–Loop Output Impedance	Z_O	F = 1MHz	–	110	–	Ω
Wideband Noise Voltage Referred to Input	e_N(Total)	BW = 1MHz, R_S = 1kΩ	–	8	–	µV_{RMS}
Setting Time (To Within ±50mV of 9V Output Swing)	t_s	R_L = 2kΩ, C_L = 20pF	–	0.6	–	µs

Note 3. Low–frequency dynamic characteristics.

Note 4. Power Bandwidth = $\frac{\text{Slew Rate}}{\pi V_O \text{(P–P)}}$

Pin Connection Diagram
(Top View)