



ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748-5089
<http://www.nteinc.com>

NTE930

Linear Integrated Circuit

BiMOS Operational Amp

Description:

The NTE930 is an integrated circuit operational amplifier in an 8-Lead Metal Can type package that combines the advantages of both COS/MOS and bipolar transistors on a monolithic chip.

Gate-protected P-channel MOS/FET (PMOS) transistors are used in the input circuit to provide very-high-input impedance, very-low-input current and exceptional speed performance. The use of PMOS field-effect transistors in the input stage results in common-mode input-voltage capability down to 0.5V below the negative-supply terminal, an important attribute in single-supply applications.

A complementary-symmetry MOS (COS/MOS) transistor pair, capable of swinging the output voltage to within 10mV of either supply-voltage terminal (at very high values of load impedance), is employed as the output circuit.

The NTE930 operates at supply voltages ranging from 5 to 16 volts, or ± 2.5 to ± 8 volts when using split supplies. They can be phase compensated with a single external capacitor, and have terminals for adjustment of offset voltage for applications requiring offset-null capability. Terminal provision are also made to permit strobing of the output stage.

Features:

- Wide BW: 15MHz typ (unity-gain crossover)
- High SR: 10V/ μ s typ (unity-gain follower)
- High Output Current (I_O): 20mA typ
- Compensations with single external capacitor

Applications:

- Ground-Referenced Single-Supply Amplifiers
- Fast Sample-and-Hold Amplifiers
- Long-Duration Timers/Monostables
- High-Input-Impedance Comparators (ideal interface with digital COS/MOS)
- High-Input-Impedance Wideband Amplifiers
- Voltage Followers (for single-supply D/A converter)
- Voltage Regulators (permits control of output voltage down to zero volts)
- Peak Detectors
- Single-Supply Full-Wave Precision Rectifiers
- Photo-Diode Sensor Amplifiers

Absolute Maximum Ratings:

DC Supply Voltage (Between V ⁺ & V ⁻ Terminals)	16V
Differential Mode Input Voltage	±8V
Common Mode DC Input Voltage	(V ⁺ +8V) to (V ⁻ -0.5V)
Input Terminal Current	1mA
Device Dissipation (without Heat Sink, up to +55°C)	630mW
Derate Linearly Above +55°C	6.67mW/°C
Device Dissipation (with Heat Sink, up to +90°C)	1W
Derate Linearly Above +90°C	1.67mW/°C
Operating Temperature Range, T _{opr}	-55° to +125°C
Storage Temperature Range, T _{stg}	-65° to +150°C
Output Short Circuit Duration (Note 1)	Indefinite
Lead Temperature (During Soldering, 1/16" ±1/32" from Case for 10sec Max), T _L	+265°C

Note 1. Short circuit may be applied to ground or to either supply

Electrical Characteristics: (T_A = +25°C, V⁺ = 15V, V⁻ = 0V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Offset Voltage	V _{IO}	V [±] = ±7.5V	–	8	15	mV
		V ⁺ = 5V	–	8	–	mV
Input Offset Current	I _{IO}	V [±] = ±7.5V	–	0.5	30	pA
		V ⁺ = 5V	–	0.1	–	pA
Input Current	I _I	V [±] = ±7.5V	–	5	50	pA
		V ⁺ = 5V	–	2	–	pA
Large-Signal Voltage Gain	A _{OL}	V _O = 10V _{P-P} R _L = 2kΩ	50k	320k	–	V/V
			94	110	–	dB
		V ⁺ = 5V, V _O = 4V _{P-P} R _L = 5kΩ	–	100k	–	V/V
			–	100	–	dB
Common-Mode Rejection Ratio	CMRR		70	90	–	dB
		V ⁺ = 5V	–	80	–	dB
Common-Mode Input Voltage Range	V _{ICR}		0	–0.5 to 12	10	V
		V ⁺ = 5V	–	0 to 2.8	–	V
Power-Supply Rejection Ratio	ΔV _{IO} /ΔV [±]	V [±] = ±7.5V	–	32	320	μV/V
		V ⁺ = 5V	–	200	–	μV/V
Maximum Output Voltage	V _{OM+}	R _L = 2kΩ	12.0	13.3	–	V
		R _L = ∞	14.99	15.0	–	V
	V _{OM–}	R _L = 2kΩ	–	0.002	0.01	V
		R _L = ∞	–	0	0.01	V
Maximum Output Current, Source	I _{OM+}	V _O = 0V	12	22	45	mA
Maximum Output Current, Sink	I _{OM–}	V _O = 15V	12	20	45	mA
Supply Current	I ⁺	V _O = 0V, R _L = ∞	–	2	3	mA
		V _O = 2.5V, R _L = ∞	–	500	–	μA
		V _O = 5V, R _L = ∞	–	300	–	μA
		V _O = 7.5V, R _L = ∞	–	10	–	mA
Input Offset Voltage Temp. Drift	ΔV _{IO} /ΔT		–	10	–	μV/°C

Pin Connection Diagram
(Top View)

