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NTE870
Integrated Circuit
Dual Operational Transconductance Amp

Description:

The NTE870 consists of two current controlled transconductance amplifiers each with differential inputs and a push–pull output. The two amplifiers share common supplies but otherwise operate independently. Linearizing diodes are provided at the inputs to reduce distortion and allow higher input levels resulting in a 10dB signal–to–noise improvement referenced to 0.5 percent THD. Controlled impedance buffers are provided which are especially designed to complement the dynamic range of the amplifiers.

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Supply Voltage, V+/V– . . . . . 36V or ±18V
Differential Input Voltage, V_{ID} . . . . . ±5V
Diode Bias Current, I_D 2mA
Amp Bias Current, I_{ABC} 2mA
Buffer Output Current, I_o 20mA
Power Dissipation, P_D 570mW
DC Input Voltage, V_{IN} . . . . . V+ to V–
Operating Temperature Range, T_{opr} . . . . . –20° to +75°C
Storage Temperature Range, T_{stg} . . . . . –40° to +125°C

Electrical Characteristics: (T_A = +25°C, V+/V– = ±15V, I_{ABC} = 500µA unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Offset Voltage (V_{OS})	V_{IO}		–	0.4	5.0	mV
Input Offset Voltage		I_{ABC} = 5µA	–	0.3	5.0	mV
V_{OS} Including Diodes		Diode Base Current, I_D = 500µA	–	0.5	5.0	mV
Input Offset Change		5µA ≤ I_{ABC} ≤ 500µA	–	0.1	–	mV
Input Bias Current	I_B		–	0.4	5.0	µA
		T_A = –20° to +75°C	–	1.0	8.0	µA

Electrical Characteristics (Cont'd): (T_A = +25°C, V+/V– = ±15V, I_{ABC} = 500µA)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Transconductance (gm)	gm		6700	9600	13000	µmhos
		T_A = –20° to +75°C	5400	–	–	µmhos
gm Tracking		R_L = 0, I_{ABC} = 5µA	–	0.3	–	dB
Peak Output Current	I_{OP}	R_L = 0, I_{ABC} = 5µA	–	5.0	–	µA
		R_L = 0, I_{ABC} = 500µA	350	500	650	µA
		R_L = 0, T_A = –20° to +75°C	300	–	–	µA
Peak Output Voltage Positive	V_{OP}	R_L = ∞, 5µA ≤ I_{ABC} ≤ 500µA	+12	±14.2	–	V
Peak Output Voltage Negative		R_L = ∞, 5µA ≤ I_{ABC} ≤ 500µA	–12	–14.4	–	V
Supply Current	I_{CC}	I_{ABC} = 500µA, two circuit	–	2.6	–	mA
V_{OS} Sensitivity Positive	SVR	$\Delta V_{OS}/\Delta V+$	76.5	94.0	–	dB
V_{OS} Sensitivity Negative		$\Delta V_{OS}/\Delta V–$	76.5	94.0	–	dB
Input Offset Current	I_{IO}		–	0.1	0.6	µA
CMMR	CMR		80	110	–	dB
Common Mode Range	V_{ICM}		±12.0	±13.5	–	V
Cross Talk	CT	20Hz < f < 20kHz, Note 2	–	–100	100	dB
Differential Input Current	I_{ID}	I_{ABC} = 0, Input = ±4V	–	0.02	100	nA
Leakage Current	I_{LEAK}	I_{ABC} = 0	–	0.2	0	nA
Input Resistance	R_{IN}		10	26	–	kΩ
Open Loop Bandwidth			–	2	–	MHz
Slew Rate	SR		–	50	–	V/µs
Buffer Input Current		Note 2	–	0.4	5.0	µA
Peak Buffer Output Voltage		Note 2	10	–	–	V

Note 1. Open unless otherwise specified. The inputs to the buffers are grounded and the outputs are open.

Note 2. R_{OUT} = 5kΩ connected from the buffer output to V– and the input buffer is connected to the transconductance amplifier output. I_{ABC} = 500µA.

Pin Connection Diagram