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NTE909 & NTE909D
Integrated Circuits
Operational Amplifier

Description:

These devices are monolithic operational amplifiers intended for general–purpose applications. Operation is completely specified over the range of voltages commonly used for these devices. The design, in addition to providing high gain, minimizes both offset voltages and bias currents. Further, the class–B output stage gives a large output capability with minimum power drain.

External components are used to frequency compensate the amplifier. Although the unity–gain compensation network specified will make the amplifiers unconditionally stable in all feedback configurations, compensation can be tailored to optimize high–frequency performance for any gain setting.

The fact that the amplifiers are built on a single silicon chip provides low offset and temperature drift at minimum cost. It also ensures negligible drift due to temperature gradients in the vicinity of the amplifier.

Absolute Maximum Ratings:

Supply Voltage . . . . ±18V
Power Dissipation (Note 1) 250mW
Differential Input Voltage . . . . ±10V
Input Voltage . . . . ±10V
Output Short–Circuit Duration (T_A = +25°C) . . . . 5 seconds
Storage Temperature Range . . . . –65° to +150°C
Operating Temperature Range . . . . 0° to +70°C
Lead Temperature (Soldering, 10 seconds) . . . . +300°C

Note 1 For operating at elevated temperatures, the device must be derated based on a 100°C maximum junction temperature and a thermal resistance 150°C/W junction to ambient or 45°C/W, junction to case for the metal can package.

Electrical Characteristics: (0°C ≤ T_A = ≤ +70°C, ±9V ≤ V_S ≤ ±15V, C1 = 5000pF, R1 = 1.5k, C2 = 200pF and R2 = 51Ω unless otherwise specified)

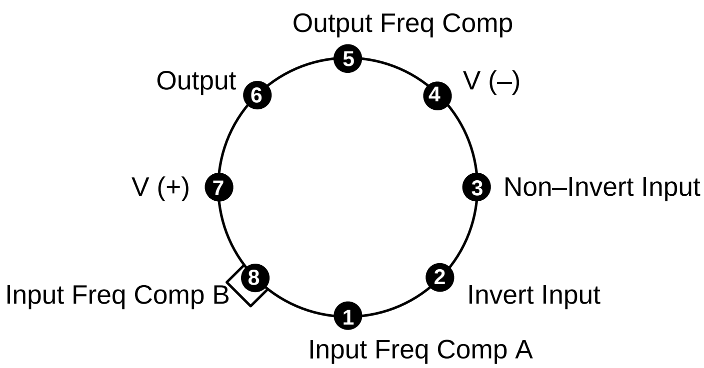
Parameter	Test Conditions	Min	Typ	Max	Unit
Input Offset Voltage	T_A = +25°C, R_S ≤ 10kΩ	–	2.0	7.5	mV
Input Bias Current	T_A = +25°C	–	300	1500	nA
	$T_A = T_{MIN}$	–	0.36	2.0	µA
Input Offset Current	T_A = +25°C	–	100	500	nA
	$T_A = T_{MIN}$	–	75	400	nA
	$T_A = T_{MAX}$	–	125	750	nA

Electrical Characteristics (Cont'd): (0°C ≤ T_A = ≤ +70°C, ±9V ≤ V_S ≤ ±15V, C1 = 5000pF, R1 = 1.5k, C2 = 200pF and R2 = 51Ω unless otherwise specified)

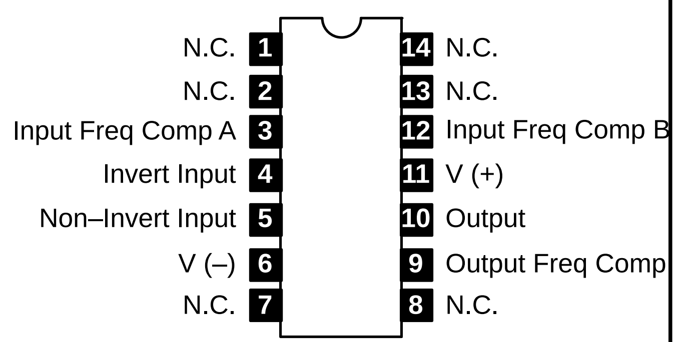
Parameter	Test Conditions	Min	Typ	Max	Unit
Input Resistance	T_A = +25°C	50	250	–	kΩ
	T_A = T_{MIN}	50	250	–	kΩ
Output Resistance	T_A = +25°C	–	150	–	Ω
Supply Current	T_A = +25°C, V_S = ±15V	–	2.6	6.6	mA
Transient Response Risetime	V_{IN} = 20mV, C_L ≤ 100pF, T_A = +25°C	–	0.3	1.0	µs
Transient Response Overshoot		–	10	30	%
Slew Rate	T_A = +25°C	–	0.25	–	V/µs
Average Temperature Coefficient of Input Offset Voltage	R_S = 50Ω, T_A = +25°C to T_{MAX}	–	6.0	–	µV/°C
	R_S = 50Ω, T_A = +25°C to T_{MIN}	–	12	–	µV/°C
Large Signal Voltage	V_S = ±15V, R_L ≥ 2kΩ, V_{OUT} = ±10V	15	45	–	V/mV
Output Voltage Swing	V_S = ±15V, R_L = 10kΩ	±12	±14	–	V
	V_S = ±15V, R_L = 2kΩ	±10	±13	–	V
Input Voltage Range	V_S = ±15V	±8	±10	–	V
Common Mode Rejection Ratio	R_S ≥ 10kΩ	65	90	–	dB
Supply Voltage Rejection Ratio	R_S ≥ 10kΩ	–	25	200	µV/V

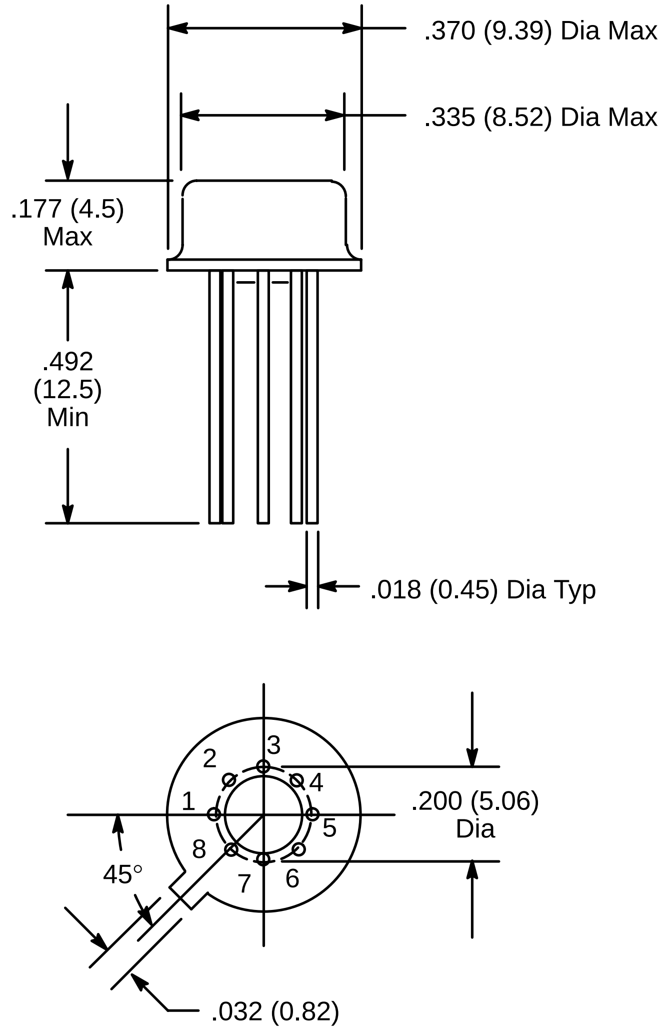
Pin Connection Diagram

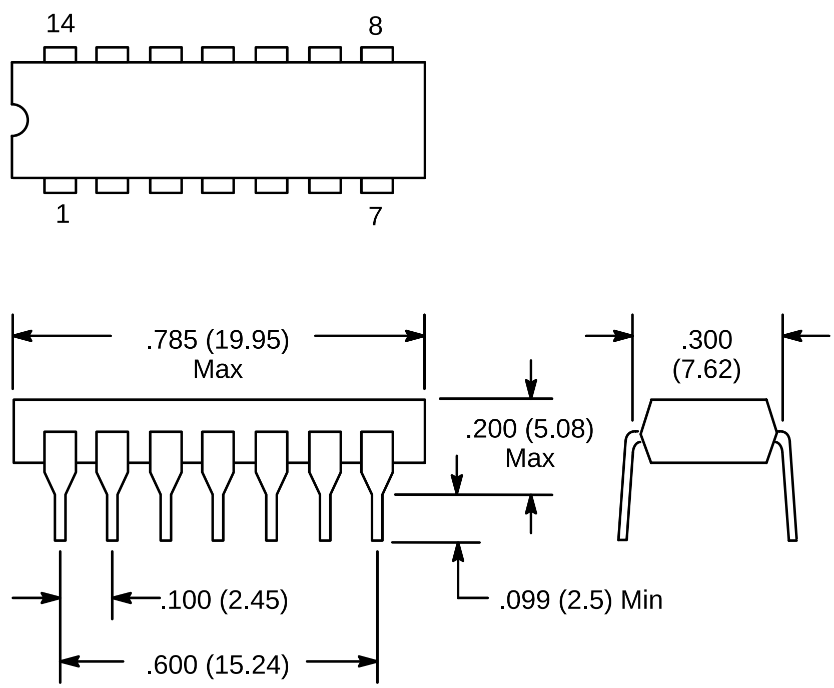
NTE909
(Top View)



NTE909D




.370 (9.39) Dia Max
.335 (8.52) Dia Max
.177 (4.5)
Max
.492
(12.5)
Min
.018 (0.45) Dia Typ
3
2
4
1
5
8
7
6
.200 (5.06)
Dia
45°
.032 (0.82)


14
8
1
7
.785 (19.95)
Max
.300
(7.62)
.200 (5.08)
Max
.100 (2.45)
.099 (2.5) Min
.600 (15.24)