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NTE948 & NTE948SM
Integrated Circuit
Quad Operational Amplifier

Description:

The NTE948 (14–Lead DIP) and NTE948SM (SOIC–14) consists of four independent, high gain, internally compensated, low power operational amplifiers which have been designed to provide functional characteristics identical to those of the familiar 741 operational amplifier.

Features:

- Low Supply Current Drain
- Class AB Output Stage – No Crossover Distortion
- Low Input Offset Voltage
- Low Input Offset Current
- Low Input Bias Current
- High Degree of Isolation Between Amplifiers
- Overload Protection for Inputs and Outputs
- Available in 14–Lead DIP (NTE948) and Surface Mount (NTE948SM)

Absolute Maximum Ratings:

Supply Voltage, V_S . . . . ±18V
Differential Input Voltage . . . . ±36V
Output Short Circuit Duration (Note 1) . . . . Continuous
Power Dissipation (T_A = +25°C, Note 2), P_D 750mW
Maximum Junction Temperature, T_J . . . . +100°C
Operating Ambient Temperature Range, T_A . . . . 0° to +70°C
Storage Temperature Range, T_{stg} . . . . –65° to +150°C
Thermal Resistance, Junction–to–Ambient (Note 2), R_{thJA} . . . . 100°C/W

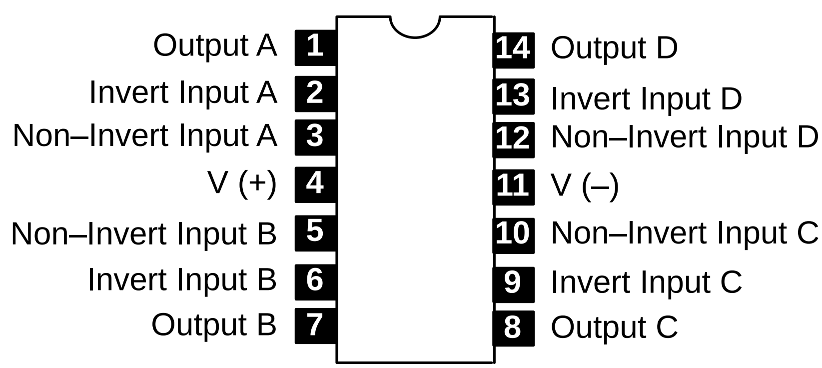
Note 1. Any of the amplifier outputs can be shorted to ground indefinitely; however, more than one should not be simultaneously shorted as the maximum junction temperature will be exceeded.

Note 2. The maximum power dissipation for these devices must be derated at elevated temperatures and is dicated by $T_{J(MAX)}$, R_{thJA}, and the ambient temperature, T_A. The maximum available power dissipation at any temperature is $P_D = (T_{J(MAX)} – T_A)/R_{thJA}$ or the 25°C $P_{D(MAX)}$, which ever is less.

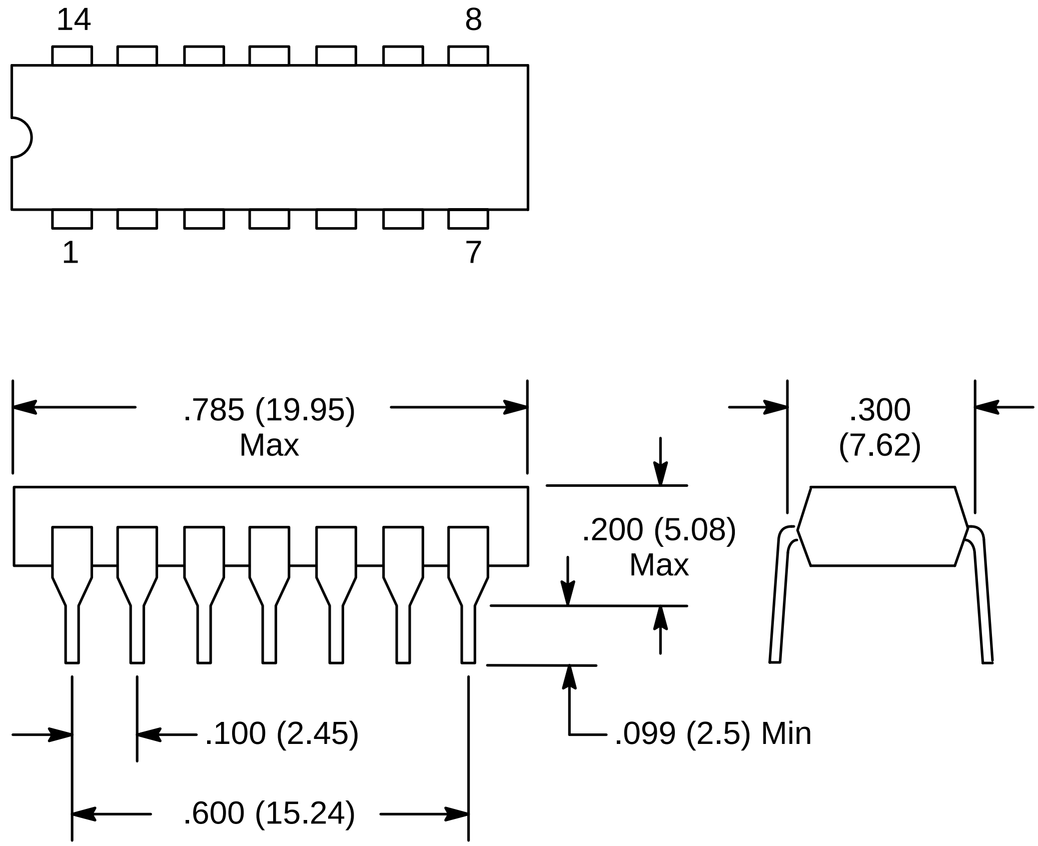
Electrical Characteristics: (V_S = ±15V, 0° ≤ T_A ≤ +70°C unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
Input Offset Voltage	T_A = +25°C, R_S ≤ 10kΩ	–	1.0	6.0	mV
	R_S ≤ 10kΩ	–	–	7.5	mV
Input Offset Current	T_A = +25°C	–	4	50	nA
		–	–	100	nA
Input Bias Current	T_A = +25°C	–	30	200	nA
		–	–	400	nA
Input Resistance	T_A = +25°C	0.8	2.5	–	MΩ
Supply Current, All Amplifiers	T_A = +25°C, V_S = ±15V	–	2.4	4.5	mA
Large Signal Voltage Gain	T_A = +25°C, V_S = ±15V, V_{OUT} = ±10V, R_L ≥ 2kΩ	25	160	–	V/mV
	V_S = ±15V, V_{OUT} = ±10V, R_L > 2kΩ	–	–	15	V/mV
Amplifier–to–Amplifier Coupling	T_A = +25°C, f = 1Hz to 20kHz	–	–120	–	dB
Small–Signal Bandwidth	T_A = +25°C	–	1.0	–	MHz
Phase Margin	T_A = +25°C, A_V = 1	–	60	–	degrees
Slew Rate	T_A = +25°C, A_V = 1	–	0.5	–	V/µs
Output Short–Circuit Current	T_A = +25°C	–	25	–	mA
Output Voltage Swing	V_S = ±15V, R_L = 10kΩ	±12	±13	–	V
	V_S = ±15V, R_L = 2kΩ	±10	±12	–	V
Input Voltage Range	V_S = ±15V	±12	–	–	V
Common–Mode Rejection Ratio	R_S ≤ 10kΩ	70	90	–	dB
Supply Voltage Rejection Ratio	R_S ≤ 10kΩ, ±5V ≤ V_S ≤ ±15V	77	96	–	dB

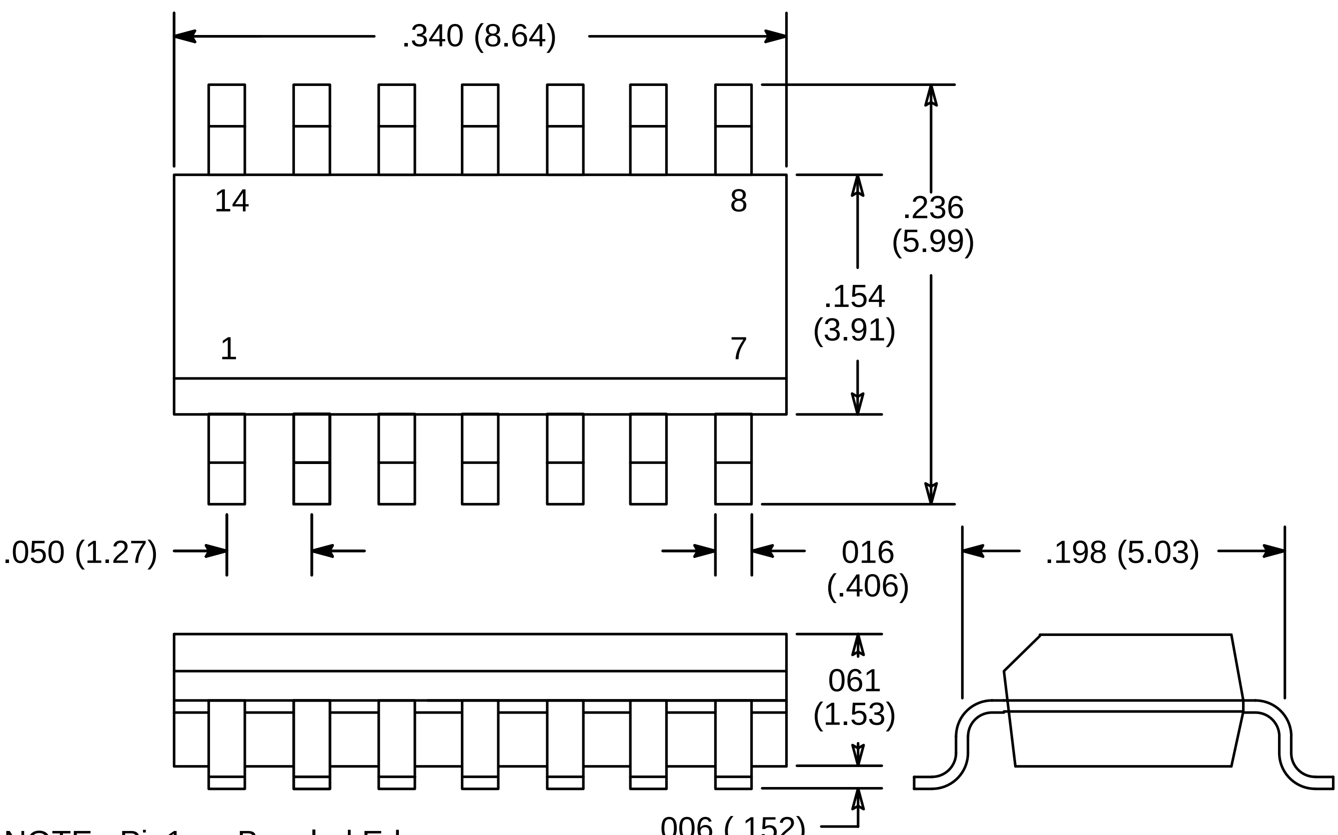
Pin Connection Diagram



NTE948



NTE948SM



NOTE: Pin1 on Beveled Edge