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## **NTE947 & NTE947D Integrated Circuit Dual Operational Amplifier**

**Description:**

The NTE947 and NTE947D are general purpose dual operational amplifiers in a 10-Lead Metal Can and 14-Lead DIP type packages respectively. These two amplifiers share a common bias network and power supply leads. Otherwise, their operation is completely independent.

**Features:**

- No Frequency Compensation Required
- Short-Circuit Protection
- Wide Common-Mode and Differential Voltage Ranges
- Low-Power Consumption
- No Latch-Up
- Balanced Offset Null
- Choice of Package Types:  
     NTE947: 10-Lead Metal Can  
     NTE947D: 14-Lead DIP

**Absolute Maximum Ratings:**

Supply Voltage, $V_{CC}$ .....	$\pm 18V$
Power Dissipation (Note 1), $P_D$ .....	800mW
Differential Input Voltage, $V_{ID}$ .....	$\pm 30V$
Common-Mode Input Swing Voltage (Note 2), $V_{ICR}$ .....	$\pm 15V$
Output Short-Circuit Duration, $t_{OS}$ .....	Indefinite
Operating Ambient Temperature Range, $T_A$ .....	$0^\circ$ to $+70^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ C$
Lead Temperature (During Soldering, 10sec), $T_L$ .....	$+300^\circ C$

Note 1. The maximum junction temperature of the NTE947 and NTE947D is  $100^\circ C$ . For operating at elevated temperatures, the NTE947 must be derated based on a thermal resistance of  $+150^\circ C/W$ , junction-to-ambient, or  $+45^\circ C/W$ , junction-to-case. The thermal resistance of the NTE947D is  $+100^\circ C$ , junction-to-ambient.

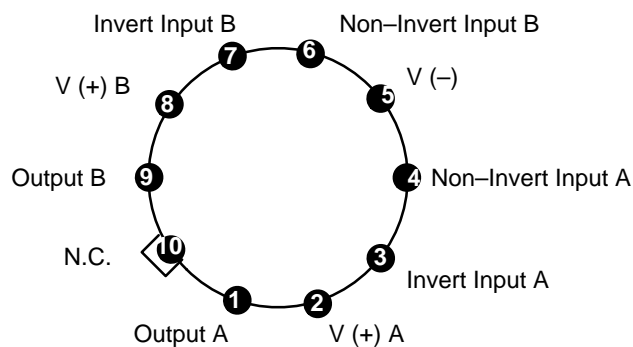
Note 2. For supply voltages less than  $\pm 15V$ , the absolute maximum input voltage is equal to the supply voltage.

**Electrical Characteristics:** ( $V_S = \pm 15V$ ,  $0^\circ \leq T_A \leq +70^\circ C$  unless otherwise specified)

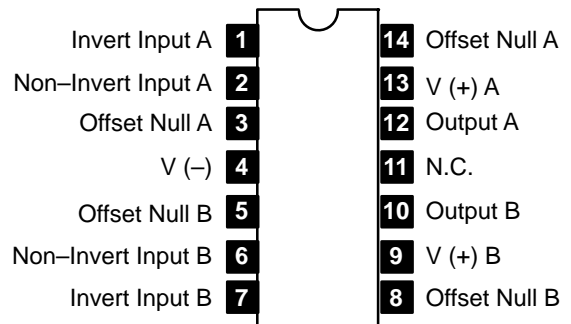
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Input Offset Voltage	$V_{IO}$	$R_S \leq 10k\Omega$	$T_A = +25^\circ C$	–	2.0	6.0	mV
			$0^\circ \leq T_A \leq +70^\circ C$	–	–	7.5	mV
Input Offset Voltage Adjustment Range		$T_A = +25^\circ C$ , $V_S = \pm 20V$	–	$\pm 15$	–	mV	
Input Offset Current	$I_{IO}$	$T_A = +25^\circ C$	–	20	200	nA	
		$0^\circ \leq T_A \leq +70^\circ C$	–	–	300	nA	
Input Bias Current	$I_{IB}$	$T_A = +25^\circ C$	–	80	500	nA	
		$0^\circ \leq T_A \leq +70^\circ C$	–	–	0.8	$\mu A$	
Input Resistance	$r_i$	$T_A = +25^\circ C$ , $V_S = \pm 20V$	0.3	2.0	–	$M\Omega$	
Common-Mode Input Voltage Swing	$V_{ICR}$	$T_A = +25^\circ C$	$\pm 12$	$\pm 13$	–	V	
Large Signal Voltage Gain		$V_S = \pm 15V$ , $V_O = \pm 10V$ , $R_L \geq 2k\Omega$	$T_A = +25^\circ C$	20	200	–	V/mV
			$0^\circ \leq T_A \leq +70^\circ C$	15	–	–	V/mV
Output Voltage Swing	$V_{OR}$	$V_S = \pm 15V$	$R_L \geq 10k\Omega$	$\pm 12$	$\pm 14$	–	V
			$R_L \geq 2k\Omega$	$\pm 10$	$\pm 13$	–	V
Output Short-Circuit Current	$I_{OS}$	$T_A = +25^\circ C$	–	25	–	mA	
Common-Mode Rejection Ratio	CMRR	$0^\circ \leq T_A \leq +70^\circ C$ , $R_S \leq 10k\Omega$ , $V_{CM} = \pm 12V$	70	90	–	dB	
Supply Voltage Rejection Ratio	SVRR	$0^\circ \leq T_A \leq +70^\circ C$ , $R_S \leq 10k\Omega$ , $V_S = \pm 20V$ to $\pm 5V$	77	96	–	dB	
Transient Response Rise Time	$t_{PLH}$	$T_A = +25^\circ C$ , Unity Gain	–	0.3	–	$\mu s$	
			–	5	–	%	
Overshoot							
Slew Rate	SR	$T_A = +25^\circ C$ , Unity Gain	–	0.5	–	V/ $\mu s$	
Supply Current (Per Amplifier)	$I_{CC}$ , $I_{EE}$	$T_A = +25^\circ C$	–	1.7	2.8	mA	
Power Consumption (Per Amplifier)	$P_C$	$T_A = +25^\circ C$ , $V_S = \pm 15V$	–	50	85	mW	

**Pin Connection Diagram**

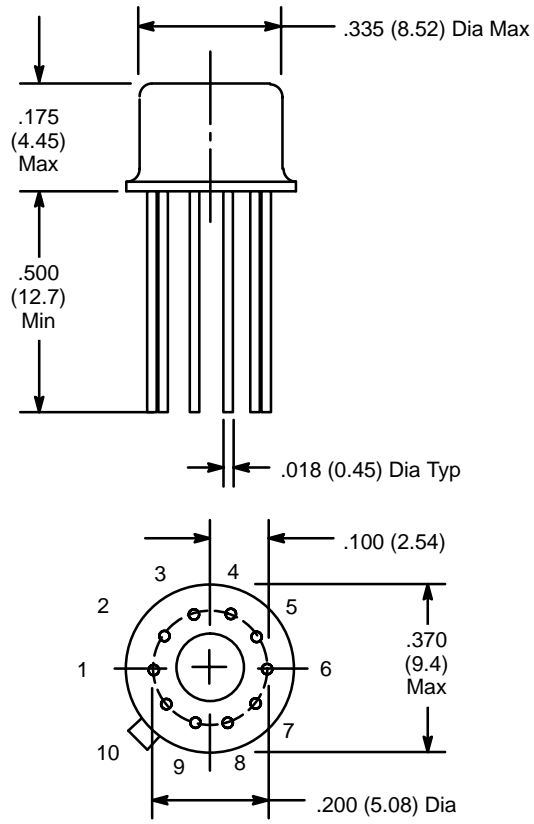
**NTE947**  
(Top View)



**NTE947D**



### NTE947



### NTE947D

