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## NTE74LS05 Integrated Circuit TTL – Hex Inverter with Open Collector Outputs

**Description:**

The NTE74LS05 contains six independent inverters in a 14-Lead plastic DIP type package. The open collector outputs require pull-up resistors to perform correctly. They may be connected to other open collector outputs to implement active-low wired-OR or active-high wired-AND functions. Open collector devices are often used to generate higher  $V_{OH}$  levels.

**Absolute Maximum Ratings:** (Note 1)

Supply Voltage, $V_{CC}$ .....	7V
DC Input Voltage, $V_{IN}$ .....	7V
Off-State Voltage .....	7V
Operating Temperature Range, $T_A$ .....	0°C to +70°C
Storage Temperature Range, $T_{stg}$ .....	-65°C to +150°C

Note 1. Unless otherwise specified, all voltages are referenced to GND.

**Recommended Operating Conditions:**

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{CC}$	4.75	5.0	5.25	V
High-Level Input Voltage	$V_{IH}$	2.0	-	-	V
Low-Level Input Voltage	$V_{IL}$	-	-	0.8	V
High-Level Output Voltage	$V_{OH}$	-	-	5.5	V
Low-Level Output Current	$I_{OL}$	-	-	8	mA
Operating Temperature Range	$T_A$	0	-	+70	°C

**Electrical Characteristics:** (Note 2, Note 3)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Clamp Voltage	$V_{IK}$	$V_{CC} = \text{MIN}, I_I = -18\text{mA}$	-	-	-1.5	V
High Level Output Current	$I_{OH}$	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}, V_{OH} = -5.5\text{V}$	-	-	0.1	mA
Low Level Output Voltage	$V_{OL}$	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, I_{OL} = 4\text{mA}$	-	0.25	0.4	V
		$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, I_{OL} = 8\text{mA}$	-	0.35	0.5	V
Input Current	$I_I$	$V_{CC} = \text{MAX}, V_I = 7\text{V}$	-	-	0.1	mA

Note 2. For conditions shown as MIN or MAX, use the appropriate value specified under “Recommended Operation Conditions”.

Note 3. All typical values are at  $V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$ .

**Electrical Characteristics (Cont'd):** (Note 2, Note 3)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
High Level Input Current	$I_{IH}$	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$	-	-	20	$\mu\text{A}$
Low Level Input Current	$I_{IL}$	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$	-	-	-0.4	mA
High Level Supply Current	$I_{CCH}$	$V_{CC} = \text{MAX}, V_I = 0$	-	1.2	2.4	mA
Low Level Supply Current	$I_{CCL}$	$V_{CC} = \text{MAX}, V_I = 4.5\text{V}$	-	3.6	6.6	mA

Note 2. For conditions shown as MIN or MAX, use the appropriate value specified under "Recommended Operation Conditions".

Note 3. All typical values are at  $V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$ .

Note 4. Not more than one output should be shorted at a time, and the duration of the short-circuit should not exceed one second.

**Switching Characteristics:** ( $V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time (From A Input to Y Output)	$t_{PLH}$	$R_L = 2\text{k}\Omega, C_L = 15\text{pF}$	-	17	32	ns
	$t_{PHL}$		-	15	28	ns

**Function Table (Each Inverter):**

Input	Output
A	Y
H	L
L	H

H = HIGH Voltage Level

L = LOW Voltage Level

**Pin Connection Diagram**



