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NTE74HC32 Integrated Circuit TTL – High Speed CMOS, Quad 2-Input OR Gate

Description:

The NTE74HC32 contains four 2-input OR gates in a 14-Lead DIP type package. Logic gates utilize silicon gate CMOS technology to achieve operating speeds similar to LS-TTL gates with the low power consumption of standard CMOS integrated circuits. All devices have the ability to drive 10 LS-TTL loads.

Features:

- Wide Power Supply Range: 2V to 6V
- High Noise Immunity: $N_{IL} = 30\%$, $N_{IH} = 30\%$ of V_{CC} at $V_{CC} = 5V$
- Typical Propagation Delay: 7ns at $V_{CC} = 5V$, $C_L = 15pF$, $T_A = +25^\circ C$
- Fanout (Over Temperature Range):
 - Standard Outputs . . . 10 LS-TTL Loads
 - Bus Driver Outputs . . 15 LS-TTL Loads
- Balanced Propagation Delay and Transition Times
- Significant Power Reduction Compared to LS-TTL Logic ICs

Absolute Maximum Ratings: (Note 1, Note 2)

Supply Voltage, V_{CC}	-0.5 to +7.0V
Clamp Diode Current, I_{IK}, I_{OK}	$\pm 20mA$
DC Drain Current (Per Output), I_{OUT}	$\pm 25mA$
DC Output Source or Sink Current (Per Output), I_{OUT}	$\pm 25mA$
DC V_{CC} or GND Current (Per Pin), I_{CC}	$\pm 50mA$
Maximum Junction, T_J	$+150^\circ C$
Storage Temperature Range, T_{stg}	$-65^\circ C$ to $+150^\circ C$
Typical Thermal Resistance, Junction-to-Ambient, R_{thJA}	$80^\circ C/W$
Lead Temperature (During Soldering, 10sec), T_L	$+300^\circ C$

Note 1. Absolute Maximum Ratings are those values beyond which damage to the device may occur.
 Note 2. Unless otherwise specified, all voltages are referenced to GND.

Recommended Operating Conditions:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	2.0	-	6.0	V
DC Input or Output Voltage	V_{IN}, V_{OUT}	0	-	V_{CC}	V
Operating Temperature Range	T_A	-40	-	+85	$^\circ C$
Input Rise or Fall Times	t_r, t_f				
$V_{CC} = 2.0V$		-	-	1000	ns
$V_{CC} = 4.5V$		-	-	500	ns
$V_{CC} = 6.0V$		-	-	400	ns

DC Electrical Characteristics:

Parameter	Symbol	Test Conditions	V _{CC}	T _A = +25°C		T _A = -40° to +85°C		Unit
				Typ	Guaranteed Limits			
Minimum HIGH Level Input Voltage	V _{IH}		2.0	-	1.5	1.5	V	
			4.5	-	3.15	3.15	V	
			6.0	-	4.2	4.2	V	
Maximum LOW Level Input Voltage	V _{IL}		2.0	-	0.5	0.5	V	
			4.5	-	1.35	1.35	V	
			6.0	-	1.8	1.8	V	
Minimum HIGH Level Output Voltage	V _{OH}	V _{IN} = V _{IH} or V _{IL}	I _{OUT} = -20μA	-	V _{CC}	V _{CC} ^{-0.1}	V _{CC} ^{-0.1}	V
			I _{OUT} = -4mA	4.5	-	3.98	3.84	V
			I _{OUT} = -5.2mA	6.0	-	5.48	5.34	V
Minimum LOW Level Output Voltage	V _{OL}	V _{IN} = V _{IH} or V _{IL}	I _{OUT} = 20μA	-	-	0.1	0.1	V
			I _{OUT} = 4mA	4.5	0.2	0.26	0.33	V
			I _{OUT} = 5.2mA	6.0	0.2	0.26	0.33	V
Maximum Input Leakage Current	I _{IN}	V _{IN} = V _{CC} or GND	6.0	-	±0.1	±1.0	μA	
Maximum Quiescent Device Current	I _{CC}	V _{IN} = V _{CC} or GND, I _{OUT} = 0μA	6.0	-	2.0	20	μA	

Switching Specifications: (t_r = t_f = 6ns unless otherwise specified)

Parameter	Symbol	Test Conditions	V _{CC}	T _A = +25°C		T _A = -40° to +85°C		Unit
				Typ	Guaranteed Limits			
Propagation Delay Time (Input to Output)	t _{PLH} , t _{PHL}	C _L = 50pF	2.0	-	90	115	ns	
			4.5	-	18	23	ns	
			6.0	-	15	20	ns	
Propagation Delay Time (Data Input to Output Y)	t _{PLH} , t _{PHL}	C _L = 15pF	5.0	7	-	-	ns	
Transition Time	t _{TLH} , t _{THL}	C _L = 50pF	2.0	-	75	95	ns	
			4.5	-	15	19	ns	
			6.0	-	13	16	ns	
Maximum Input Capacitance	C _{IN}		-	-	10	10	pF	
Power Dissipation Capacitance	C _{PD}	Note 3	5.0	22	-	-	pF	

Note 3. C_{PD} is used to determine the dynamic power consumption, per gate.

$$P_D = C_{PD} V_{CC}^2 f_i (C_{PD} + C_L) \text{ where } f_i = \text{Input Frequency, } C_L = \text{Output Load Capacitance, } V_{CC} = \text{Supply Voltage.}$$

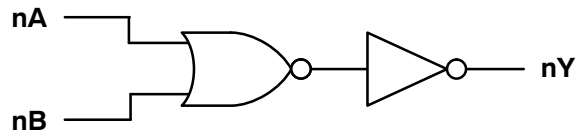
Truth Table:

Inputs		Output
nA	nB	nY
L	L	L
L	H	H
H	L	H
H	H	H

H = HIGH Level

L = LOW Level

Logic Diagram



Pin Connection Diagram

