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## **NTE74HC273 Integrated Circuit TTL – High Speed CMOS, Octal Transparent D–Type Latch with 3–State Output**

### **Description:**

The NTE74HC273 is an octal transparent d–type latch in a 20–Lead DIP type package. When the latch–enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is low, the Q outputs are latched at the logic levels of the D inputs..

A buffered output–enable ( $\overline{OE}$ ) input can be used to place the eight outputs in either a normal logic state (high or low) or the high–impedance state. In the high–impedance state, the outputs neither load nor drive the bus lines significantly. The high–impedance state and increased drive provide the capability to drive bus lines without interface or pullup components.

$\overline{OE}$  does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are in the high–impedance state.

To ensure the high–impedance state during power up or power down,  $\overline{OE}$  should be tied to  $V_{CC}$  through a pullup resistor; the minimum value of the resistor is determined by the current–sinking capability of the driver.

### **Features:**

- Wide Power Supply Range: 2V to 6V
- Balanced Propagation Delay and Transition Times
- Standard Output Drives up to 15 LS–TTL Loads
- 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, $I_{IK}, I_{OK}$	$\pm 20$ mA
DC Drain Current (Per Output), $I_{OUT}$	$\pm 35$ mA
DC Output Source or Sink Current (Per Output), $I_{OUT}$	$\pm 25$ mA
DC $V_{CC}$ or GND Current (Per Pin), $I_{CC}$	$\pm 50$ mA
Storage Temperature Range, $T_{stg}$	-65°C to +150°C
Typical Thermal Resistance, Junction-to-Ambient, $R_{thJA}$	69°C/W
Lead Temperature (During Soldering, 10sec), $T_L$	+300°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:** (Note 3)

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{CC}$	2.0	-	6.0	V
High-Level Input Voltage $V_{CC} = 2.0V$ $V_{CC} = 4.5V$ $V_{CC} = 6.0V$	$V_{IH}$	1.5	-	-	V
		3.15	-	-	V
		4.2	-	-	V
Low-Level Input Voltage $V_{CC} = 2.0V$ $V_{CC} = 4.5V$ $V_{CC} = 6.0V$	$V_{IL}$	-	-	0.5	V
		-	-	1.35	V
		-	-	1.8	V
DC Input or Output Voltage	$V_{IN}, V_{OUT}$	0	-	$V_{CC}$	V
Operating Temperature Range	$T_A$	-40	-	+85	°C
Input Rise or Fall Times $V_{CC} = 2.0V$ $V_{CC} = 4.5V$ $V_{CC} = 6.0V$	$t_r, t_f$	-	-	1000	ns
		-	-	500	ns
		-	-	400	ns

Note 3. All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation.

**Electrical Characteristics:**

Parameter	Symbol	Test Conditions	$V_{CC}$	$T_A = +25^\circ C$		$T_A = -40^\circ \text{ to } +85^\circ C$		Unit
				Typ	Guaranteed Limits	Typ	Guaranteed Limits	
Minimum HIGH Level Output Voltage	$V_{OH}$	$V_{IN} = V_{IH}$ or $V_{IL}$	$I_{OUT} = -20\mu A$	-	$V_{CC}$	$V_{CC}^{-0.1}$	$V_{CC}^{-0.1}$	V
			$I_{OUT} = -6mA$	4.5	-	3.98	3.84	V
			$I_{OUT} = -7.8mA$	6.0	-	5.48	5.34	V
Minimum LOW Level Output Voltage	$V_{OL}$	$V_{IN} = V_{IH}$ or $V_{IL}$	$I_{OUT} = 20\mu A$	-	-	0.1	0.1	V
			$I_{OUT} = 6mA$	4.5	0.2	0.26	0.33	V
			$I_{OUT} = 7.8mA$	6.0	0.2	0.26	0.33	V
Maximum Input Current	$I_{IN}$	$V_{IN} = V_{CC}$ or GND	6.0	-	$\pm 0.1$	$\pm 1.0$	$\mu A$	
Three-State Leakage Current	$I_{OZ}$	$V_{IN} = V_{IH}$ or $V_{IL}$	6.0	-	$\pm 0.5$	$\pm 5.0$	$\mu A$	
Maximum Quiescent Supply Current	$I_{CC}$	$V_{IN} = V_{CC}$ or GND, $I_{OUT} = 0\mu A$	6.0	-	8.0	80	$\mu A$	
Maximum Input Capacitance	$C_{IN}$		-	-	10	10	pF	
Maximum 3-State Output Capacitance	$C_{OUT}$		-	-	20	20	pF	
Power Dissipation Capacitance	$C_{PD}$		5	51	-	-	pF	

### Timing Requirements:

Parameter	Symbol	Test Conditions	V <sub>CC</sub>	T <sub>A</sub> = +25°C		T <sub>A</sub> = -40° to +85°C		Unit
				Typ	Guaranteed Limits			
Minimum Pulse Duration, LE High	t <sub>w</sub>		2.0	-	80	100	ns	
			4.5	-	16	20	ns	
			6.0	-	14	17	ns	
Minimum Setup Time, Data Before LE↓	t <sub>su</sub>		2.0	-	50	65	ns	
			4.5	-	10	13	ns	
			6.0	-	9	11	ns	
Minimum Hold Time, Data After LE↓	t <sub>h</sub>		2.0	-	5	5	ns	
			4.5	-	5	5	ns	
			6.0	-	5	5	ns	

### Switching Characteristics: (C<sub>L</sub> = 50pF unless otherwise specified)

Parameter	Symbol	Test Conditions	V <sub>CC</sub>	T <sub>A</sub> = +25°C		T <sub>A</sub> = -40° to +85°C		Unit
				Typ	Guaranteed Limits			
Propagation Delay Time (From Input D to Output Q)	t <sub>pd</sub>		2.0	-	150	190	ns	
			4.5	-	30	38	ns	
			6.0	-	26	33	ns	
Propagation Delay Time (From Input LE to Output Q)	t <sub>pd</sub>		2.0	-	175	220	ns	
			4.5	-	35	44	ns	
			6.0	-	30	37	ns	
Output Enable and Disable Time (From Input $\overline{OE}$ to Output Q)	t <sub>en</sub> , t <sub>dis</sub>		2.0	-	150	190	ns	
			4.5	-	30	38	ns	
			6.0	-	26	33	ns	
Output Transition Time (To Output Q)	t <sub>t</sub>		2.0	-	60	75	ns	
			4.5	-	12	15	ns	
			6.0	-	10	13	ns	

### Function Table (Each Latch:

Inputs			Output
$\overline{OE}$	LE	D	Q
L	H	H	H
L	H	L	L
L	L	X	Q <sub>0</sub>
H	X	X	Z

H = Input Voltage HIGH Level  
 L = Input Voltage LOW Level  
 X = Don't Care  
 Z = Output in high impedance state

### Pin Connection Diagram

