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NTE4597B & NTE4598B Integrated Circuit CMOS, 8-Bit Bus-Compatible Latches

Description:

The NTE4597B (16-Lead DIP) and NTE4598B (18-Lead DIP) are 8-bit latches, one addressed with an internal counter (NTE4597B) and the other addressed with an external binary address (NTE4598B). The 8 latch-outputs are high drive, three-state and bus line compatible. The drive capability allows direct applications with MPU systems such as the NTE6800 family.

With the NTE4597B, a 3-bit address counter (clocked on the falling edge of Increment) selects the appropriate latch. The latches of the NTE4598B are accessed via the Address pins, A0, A1, and A2. A Full Flag is provided on the NTE4597B to indicate the position of the Address counter.

All 8 outputs from the latches are available in parallel when $\overline{\text{Enable}}$ is in the low state. Data is entered into a selected latch from the data pin when the Strobe is high. Master reset is available on both devices.

Features:

- Serial Data Input
- Three-State Bus Compatible Parallel Outputs
- Three-State Control Pin ($\overline{\text{Enable}}$) TTL Compatible Input
- Open Drain Full Flag (Multiple Latch Wire-O Ring)
- Master Reset
- Level Shifting Inputs on All Except $\overline{\text{Enable}}$
- Diode Protection on All Inputs
- Supply Voltage Range = 3.0Vdc to 18Vdc
- Capable of Driving TTL Over the Rated Temperature Range With Fanout as Follows:
 - 1 TTL Load
 - 4 LSTTL Loads

Absolute Maximum Ratings: (Voltages Referenced to V_{SS} , Note 1)

DC Supply Voltage, V_{DD}	-0.5 to +18.0V
Input Voltage, Enable (DC or Transient), V_{in}	-0.5 to $V_{DD} + 0.5V$
Input Voltage, All Other Inputs (DC or Transient), V_{in}	-0.5 to $V_{DD} + 12V$
Output Voltage (DC or Transient), V_{out}	-0.5 to $V_{DD} + 0.5V$
Input or Output Current (DC or Transient), Per Pin, I_{in}, I_{out}	$\pm 10mA$
Power Dissipation, P_D	500mW
Derate Above +65°C	7mW/°C
Operating Temperature Range, T_A	-55° to +125°C
Storage Temperature Range, T_{stg}	-65° to +150°C

Note 1. This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields; however, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high impedance circuit. For proper operation, V_{in} and V_{out} should be constrained to the range $V_{SS} \leq (V_{in} \text{ or } V_{out}) \leq V_{DD}$.

Unused inputs must always be tied to an appropriate logic voltage level (e.g., either V_{SS} or V_{DD}). Unused outputs must be left open.

Electrical Characteristics: (Voltages Referenced to V_{SS} , Note 2)

Parameter	Symbol	V_{DD} Vdc	-55°C		+25°C			+125°C		Unit	
			Min	Max	Min	Typ	Max	Min	Max		
Output Voltage "0" Level $V_{in} = V_{DD}$ or 0	V_{OL}	5.0	-	0.05	-	0	0.05	-	0.05	Vdc	
		10	-	0.05	-	0	0.05	-	0.05	Vdc	
		15	-	0.05	-	0	0.05	-	0.05	Vdc	
	"1" Level $V_{in} = 0$ or V_{DD}	V_{OH}	5.0	4.95	-	4.95	5.0	-	4.95	-	Vdc
			10	9.95	-	9.95	10	-	9.95	-	Vdc
			15	14.95	-	14.95	15	-	14.95	-	Vdc
Input Voltage (Note 2) Enable ($V_O = 4.5$ or $0.5V_{dc}$) ($V_O = 9.0$ or $1.0V_{dc}$) ($V_O = 13.5$ or $1.5V_{dc}$)	"0" Level V_{IL}	5.0	-	0.8	-	1.1	0.8	-	0.8	Vdc	
		10	-	1.6	-	2.2	1.6	-	1.6	Vdc	
		15	-	2.4	-	3.4	2.4	-	2.4	Vdc	
	"1" Level	V_{IH}	5.0	2.0	-	2.0	1.9	-	2.0	-	Vdc
			10	6.0	-	6.0	3.1	-	6.0	-	Vdc
			15	10	-	10	4.3	-	10	-	Vdc
Input Voltage Other Inputs ($V_O = 4.5$ or $0.5V_{dc}$) ($V_O = 9.0$ or $1.0V_{dc}$) ($V_O = 13.5$ or $1.5V_{dc}$)	"0" Level V_{IL}	5.0	-	1.5	-	2.25	1.5	-	1.5	Vdc	
		10	-	3.0	-	4.50	3.0	-	3.0	Vdc	
		15	-	4.0	-	6.75	4.0	-	4.0	Vdc	
	"1" Level	V_{IH}	5.0	3.5	-	3.5	2.75	-	3.5	-	Vdc
			10	7.0	-	7.0	5.50	-	7.0	-	Vdc
			15	11	-	11	8.25	-	11	-	Vdc
Output Drive Current Full – Sink Only ($V_{OH} = 4.6V_{dc}$) ($V_{OH} = 9.5V_{dc}$) ($V_{OH} = 13.5V_{dc}$)	Source I_{OH}	5.0	-1.0	-	-1.0	-2.0	-	-1.0	-	mAdc	
		10	-	-	-	-6.0	-	-	-	mAdc	
		15	-	-	-	-12	-	-	-	mAdc	
	Sink I_{OL}	5.0	1.6	-	1.6	3.2	-	1.6	-	mAdc	
		10	-	-	-	6.0	-	-	-	mAdc	
		15	-	-	-	12	-	-	-	mAdc	
Input Current	I_{in}	15	-	±0.1	-	±0.00001	±0.1	-	±1.0	µAdc	
Three-State Leakage Current	I_{TL}	15	-	±0.1	-	±0.00001	±0.1	-	±3.0	µAdc	
Input Capacitance ($V_{IN} = 0$)	C_{in}	-	-	-	-	5.0	7.5	-	-	pF	
Quiescent Current (Per Package)	I_{DD}	5.0	-	5.0	-	0.005	5.0	-	150	µAdc	
		10	-	10	-	0.010	10	-	300	µAdc	
		15	-	20	-	0.015	20	-	600	µAdc	
Total Supply Current (External Load Capacitance of 130pF, Note 3)	I_T	5.0	$I_T = (2.0\mu A/kHz) f + I_{DD}$							µAdc	
		10	$I_T = (4.0\mu A/kHz) f + I_{DD}$							µAdc	
		15	$I_T = (6.0\mu A/kHz) f + I_{DD}$							µAdc	

Note 2. Data labeled "Typ" is not to be used for design purposes but is intended as an indication of the device's potential performance.

Note 3. The formulas given are for the typical characteristics only at +25°C.

Switching Characteristics: ($C_L = 130\text{pF} + 1 \text{ TTL Load}$, $T_A = +25^\circ\text{C}$, Note 2)

Parameter	Symbol	V_{DD} Vdc	Min	Typ	Max	Unit
Output Rise and Fall Time $t_{TLH}, t_{THL} = (0.5\text{ns/pF}) C_L + 35\text{ns}$ $t_{TLH}, t_{THL} = (0.2\text{ns/pF}) C_L + 25\text{ns}$ $T_{TLH}, t_{THL} = (0.16\text{ns/pF}) C_L + 20\text{ns}$	$t_{TLH},$ t_{THL}	5.0	–	100	200	ns
		10	–	50	100	ns
		15	–	40	80	ns
Propagation Delay Time Enable to Output Strobe to Output Strobe to $\overline{\text{Full}}$ (NTE4597B Only) $\overline{\text{Reset}}$ to Output	$t_{PLH},$ t_{PHL}	5.0	–	160	320	ns
		10	–	125	250	ns
		15	–	100	200	ns
		5.0	–	200	400	ns
		10	–	100	200	ns
		15	–	80	160	ns
		5.0	–	200	400	ns
		10	–	100	200	ns
		15	–	80	160	ns
		5.0	–	175	350	ns
		10	–	90	180	ns
		15	–	70	140	ns
Pulse Width $\overline{\text{Enable}}$ Strobe Increment (NTE4597B Only) $\overline{\text{Reset}}$	$t_{WH},$ t_{WL}	5.0	320	160	–	ns
		10	240	120	–	ns
		15	160	80	–	ns
		5.0	200	100	–	ns
		10	100	50	–	ns
		15	80	40	–	ns
		5.0	200	100	–	ns
		10	100	50	–	ns
		15	80	40	–	ns
		5.0	300	150	–	ns
		10	160	80	–	ns
		15	100	50	–	ns
Setup Time Data Address (NTE4598B Only) Increment (NTE4597B Only)	t_{su}	5.0	100	50	–	ns
		10	50	25	–	ns
		15	35	20	–	ns
		5.0	200	100	–	ns
		10	100	50	–	ns
		15	70	35	–	ns
		5.0	400	200	–	ns
		10	200	100	–	ns
15	170	85	–	ns		

Note 2. Data labeled “Typ” is not to be used for design purposes but is intended as an indication of the device’s potential performance.

Note 3. The formulas given are for the typical characteristics only at $+25^\circ\text{C}$.

Switching Characteristics (Cont'd): ($C_L = 130\text{pF} + 1 \text{ TTL Load}$, $T_A = +25^\circ\text{C}$, Note 2)

Parameter	Symbol	V_{DD} Vdc	Min	Typ	Max	Unit
Hold Time Data Address (NTE4598B Only)	t_h	5.0	100	50	-	ns
		10	50	25	-	ns
		15	35	20	-	ns
		5.0	100	50	-	ns
		10	50	25	-	ns
		15	35	20	-	ns
Reset Removal Time	t_{rem}	5.0	20	-25	-	ns
		10	20	-15	-	ns
		15	20	-10	-	ns

Note 2. Data labeled "Typ" is not to be used for design purposes but is intended as an indication of the device's potential performance.

Note 3. The formulas given are for the typical characteristics only at $+25^\circ\text{C}$.

Latch Truth Table

Strobe	Reset	Address Latch	Other Latches
0	1	*	*
1	1	Data	*
X	0	0	0

* = No change in state of latch

X = Don't Care

Latch Truth Table

Enable	Outputs
1	High Impedance
0	D_n

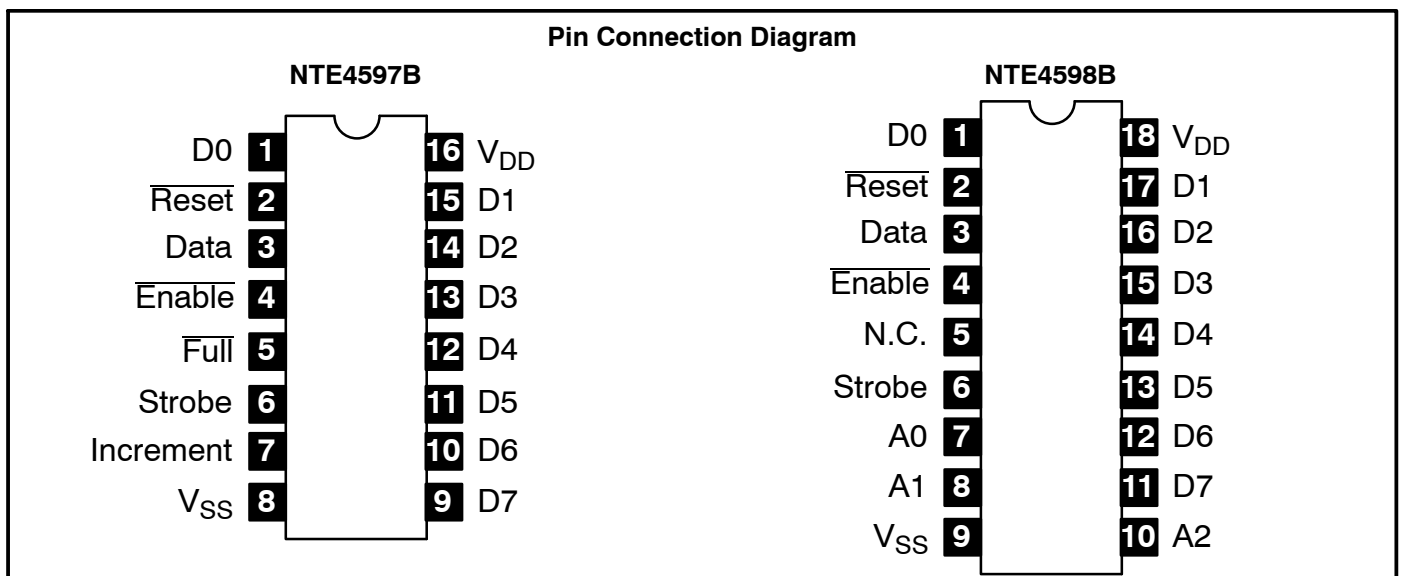
D_n = State of nth latch

Truth Table for NTE4597B

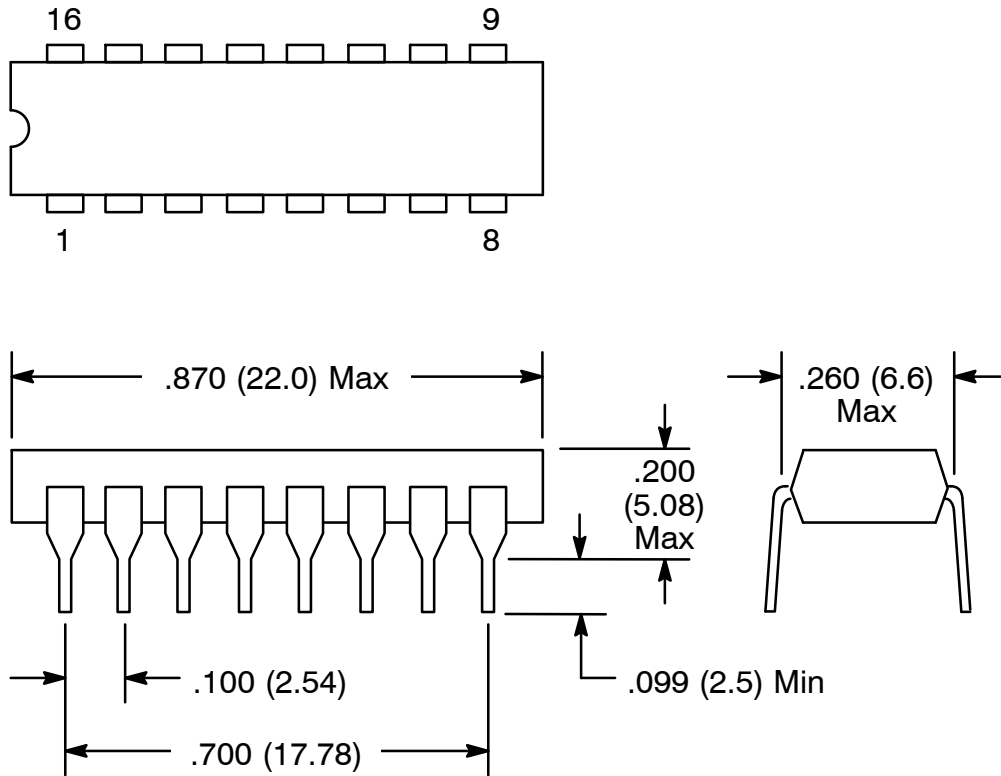
Increment	Enable	Reset	Address Counter	Full
	X	1	Count Up	-
	X	1	No Change	-
X	1	0	Reset to Zero	Set to One
X	0	1	No Change	Set to One
X	1	1	If at ADDRESS 7	To Zero on Falling Edge of STROBE

X = Don't Care

Pin Connection Diagram



NTE4597B



NTE4598B

