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NTE9601
Integrated Circuit
TTL – Retriggerable Monostable Multivibrator

Description:

The NTE9601 is a retriggerable one–shot in a 14–Lead DIP type package that provides the designer with four inputs; two active high and two active low. This permits a choice of either leading–edge or trailing–edge triggering, independent of input transition times. When input conditions for triggering are met, a new cycle starts and the external capacitor is rapidly discharged and then allowed to charge again. The retriggerable feature allows for output pulse widths to be expanded. In fact a continuous true output can be maintained by having an input cycle time which is shorter than the output cycle time. Retriggering may be inhibited by tying the $\overline{Q}$ output to an active low input.

Features:

- High Speed Operation – Input Repetition Rate > 10MHz
- Flexibility of Operation – Optional Retriggering/Lock–Out Capacity
- Output Pulse Width Range – 50ns to ∞
- Leading or Trailing Edge Triggering
- Complementary Outputs/Inputs
- Input Clamping Diodes
- DTL/TTL Compatible Logic Levels

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC} 7V
Input Voltage, V_{IN} 5.5V
Operating Ambient Temperature Range, T_{opr} . . . . . 0° to +70°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C

Note 1. The “Absolute Maximum Ratings” are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the “Electrical Characteristics” table are not guaranteed at the absolute maximum ratings. The “Recommended Operating Conditions” table will define the conditions for actual device operation.

Recommended Operating Conditions:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		4.75	5.00	5.25	V
High Level Input Voltage	V_{IH}	T_A = 0°C	1.9	–	–	V
		T_A = +25°C	1.8	–	–	V
		T_A = +75°C	1.6	–	–	V
Low Level Input Voltage	V_{IL}	T_A = 0°C	–	–	0.85	V
		T_A = +25°C	–	–	0.85	V
		T_A = +75°C	–	–	0.85	V
High Level Output Current	I_{OH}		–	–	−0.96	mA
Low Level Output Current	I_{OL}		–	–	12.8	mA
Free Air Ambient Temperature	T_A		0	–	+75	°C

Electrical Characteristics: (T_A = 0° to +70°C, Note 2, Note 4 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Clamp Voltage	V_I	V_{CC} = Min, I_I = −12mA	–	–	−1.5	V
High Level Output Voltage	V_{OH}	V_{CC} = Min, I_{OH} = Max, V_{IL} = Max, V_{IH} = Min, Note 5	2.4	–	–	V
Low Level Output Voltage	V_{OL}		–	–	0.45	V
High Level Input Current	I_{IH}	V_{CC} = Max, V_I = 4.5V	–	–	60	μA
Low Level Input Current	I_{IL}	V_{CC} = Max, V_{IN} = 0.45V	–	–	−1.6	mA
Short Circuit Output Current	I_{OS}	V_{CC} = Max, Note 3, Note 5	−10	–	−40	mA
Supply Current	I_{CC}	V_{CC} = Max	–	–	25	mA

Note 2. All typical ratings are at V_{CC} = 5V, T_A = +25°C.

Note 3. Not more than one output should be shorted at a time.

Note 4. Unless otherwise noted, 10kΩ resistor placed between Pin13 and V_{CC}, for all tests.

Note 5. GND Pin11 for V_{OL} test on Pin6, V_{OH} and I_{OS} test on Pin8. Open Pin11 for V_{OL} test on Pin8, V_{OH} and I_{OS} test on Pin6.

Switching Characteristics: (V_{CC} = 5V, T_A = +25°C unless otherwise specified)

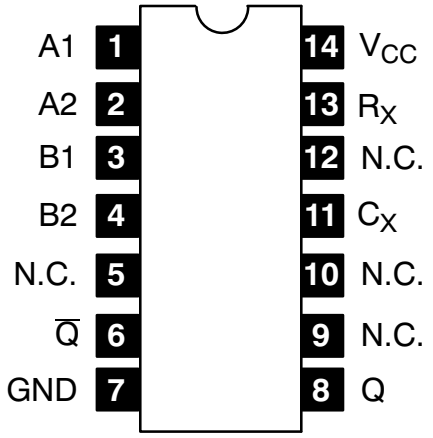
Parameter	Symbol	From (Input) To (Output)	Test Conditions	Min	Max	Unit
Propagation Delay Time Low to High Level Output	t_{PLH}	Negative Trigger Input to True Output	C_L = 15pF, C_X = 0, R_X = 5kΩ	–	40	ns
Propagation Delay Time High to Low Level Output	t_{PHL}	Negative Trigger Input to Complement Output		–	40	ns
Minimum True Output Pulse Width	$t_{PW(MIN)}$			–	65	ns
Pulse Width	t_{PW}		R_X = 10kΩ, C_X = 1000pF	3.08	3.76	μs
Maximum Allowable Wiring Capacitance	C_{STRAY}		Pin13 to GND	–	50	pF
External Timing Reststor	R_X			–	25	kΩ

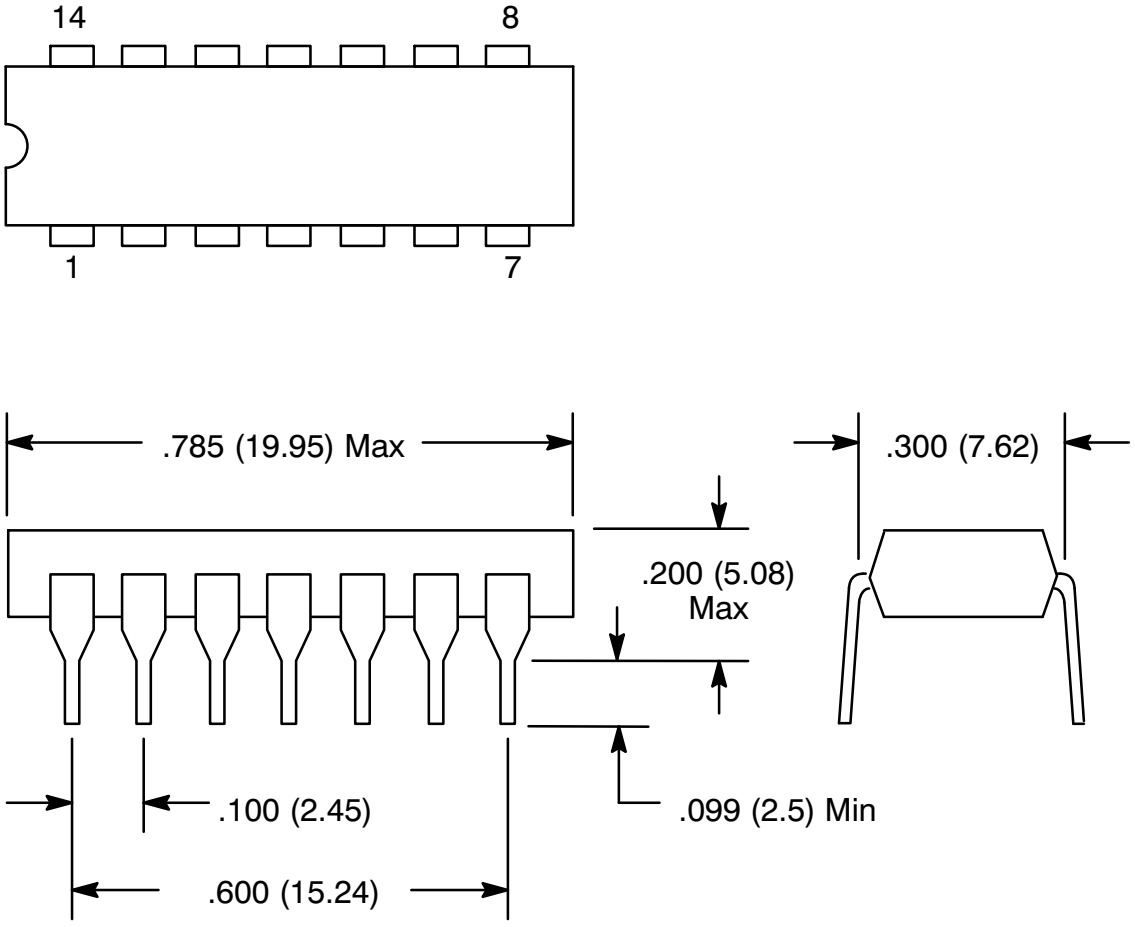
Function Table:

Inputs				Outputs	
A1	**A2**	**B1**	**B2**	**Q**	**$\overline{Q}$**
H	H	X	X	L	H
X	X	L	X	L	H
X	X	X	L	L	H
L	X	H	H	L	H
L	X	↑	H	⎍	⎍
L	X	H	↑	⎍	⎍
X	L	H	H	L	H
X	L	↑	H	⎍	⎍
X	L	H	↑	⎍	⎍
H	↓	H	H	⎍	⎍
↓	↓	H	H	⎍	⎍
↓	H	H	H	⎍	⎍

H = HIGH Logic Level
L = LOW Logic Level
X = Either LOW or HIGH Logic Level
↑ = LOW to HIGH Level Transition
↓ = HIGH to LOW Level Transition
⎍ = Positive Pulse
⎍ = Negative Pulse

Pin Connection Diagram




14
8
1
7
.785 (19.95) Max
.300 (7.62)
.200 (5.08)
Max
.100 (2.45)
.099 (2.5) Min
.600 (15.24)