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NTE7482
Integrated Circuit
TTL, 2–Bit Binary Full Adder

Description:

The NTE7482 is a 2–bit binary full adder in a 14–Lead DIP type package that performs the addition of two 2–bit binary numbers. The sum (Σ) outputs are provided for each bit and the resultant carry (C2) is obtained from the second bit. Designed for medium–to–high–speed, multiple–bit, parallel–add/serial–carry applications, this circuit utilizes high–speed, high–fan–out transistor–transistor logic (TTL) and is compatible with both DTL an TTL logic families. Th implementation of a single–inversion, high–speed, Darlington–connected serial–carry circuit within each bit minimizes the necessity for extensive “look–ahead” and carry–cascading circuits.

Applications:

- Digital Computer Systems
- Data–Handling Systems
- Control Sytems

Absolute Maximum Ratings: (T_A = 0° to +70°C unless otherwise specified)

Supply Voltage (Note 1), V_{CC} 7V
Input Voltage (Note 2), V_{IN} 5.5V
Operating Ambient Temperature Range, T_A . . . . . 0° to +70°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C

Note 1. Voltage values are with respect to network GND terminal.
Note 2. Input signals must be zero or positive with respect to network ground terminal.

Recommended Operating Conditions:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		4.75	5.0	5.25	V
High–Level Output Current Σ1 or Σ2	I_{OH}		–	–	–400	μA
C2			–	–	–200	μA
Low–Level Output Current Σ1 or Σ2	I_{OL}		–	–	16	mA
C2			–	–	8	mA
Operating Ambient Temperature	T_A		0	–	70	°C

Electrical Characteristics: (Note 3, Note 4)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
High−Level Input Voltage	V_{IH}			2	–	–	V
Low−Level Input Voltage	V_{IL}			–	–	0.8	V
High−Level Output Voltage Σ1 or Σ2	V_{OH}	V_{CC} = MIN, V_{IH} = 2V, V_{IL} = 0.4V	I_{OH} = −400μA	2.4	3.5	–	V
C2			I_{OH} = −200μA	2.4	3.5	–	V
Low−Level Output Voltage Σ1 or Σ2	V_{OL}	V_{CC} = MIN, V_{IH} = 2V, V_{IL} = 0.4V	I_{OL} = 16mA	–	0.2	0.4	V
C2			I_{OL} = 8mA	–	0.2	0.4	V
Input Current	I_I	V_{CC} = Max, V_I = 5.5V		–	–	1	mA
High−Level Input Current A1, B1, or C0	I_{IH}	V_{CC} = Max, V_I = 2.4V		–	–	160	μA
A2 or B2				–	–	40	μA
Low−Level Input Current A1, B1, or C0	I_{IL}	V_{CC} = Max, V_I = 0.4V		–	–	−6.4	mA
A2 or B2				–	–	−1.6	mA
Short Circuit Output Current Σ1 or Σ2	I_{OS}	V_{CC} = Max, Note 5		−18	–	−55	mA
C2				−18	–	−70	mA
Supply Current	I_{CC}	V_{CC} = Max, Note 6		–	35	58	mA

Note 3. For conditions shown as Min and Max, use the appropriate value specified under recommended operating conditions.

Note 4. All typical values are at V_{CC} = 5V, T_A = +25°C.

Note 5. Not more than one output should be shorted at a time.

Note 6. I_{CC} is measured with outputs open, B1 and B2 grounded, and 4.5V applied to A1, A2, and C0.

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

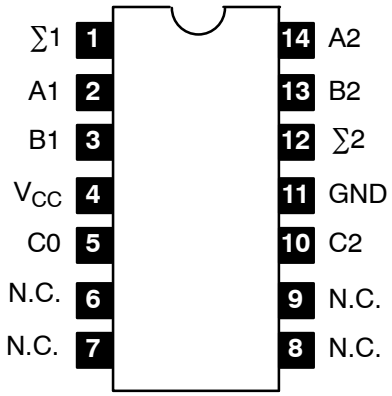
Parameter	Symbol	From(Input)	To(Output)	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time	t_{PLH}	C0	∑1	R_L = 400Ω, C_L = 15pF	–	–	34	ns
	t_{PHL}				–	–	40	ns
Propagation Delay Time	t_{PLH}	B2	∑2		–	–	40	ns
	t_{PHL}				–	–	35	ns
Propagation Delay Time	t_{PLH}	C0	∑2		–	–	38	ns
	t_{PHL}				–	–	42	ns
Propagation Delay Time	t_{PLH}	C0	C2	R_L = 780Ω, C_L = 15p	–	12	19	ns
	t_{PHL}				–	17	27	ns

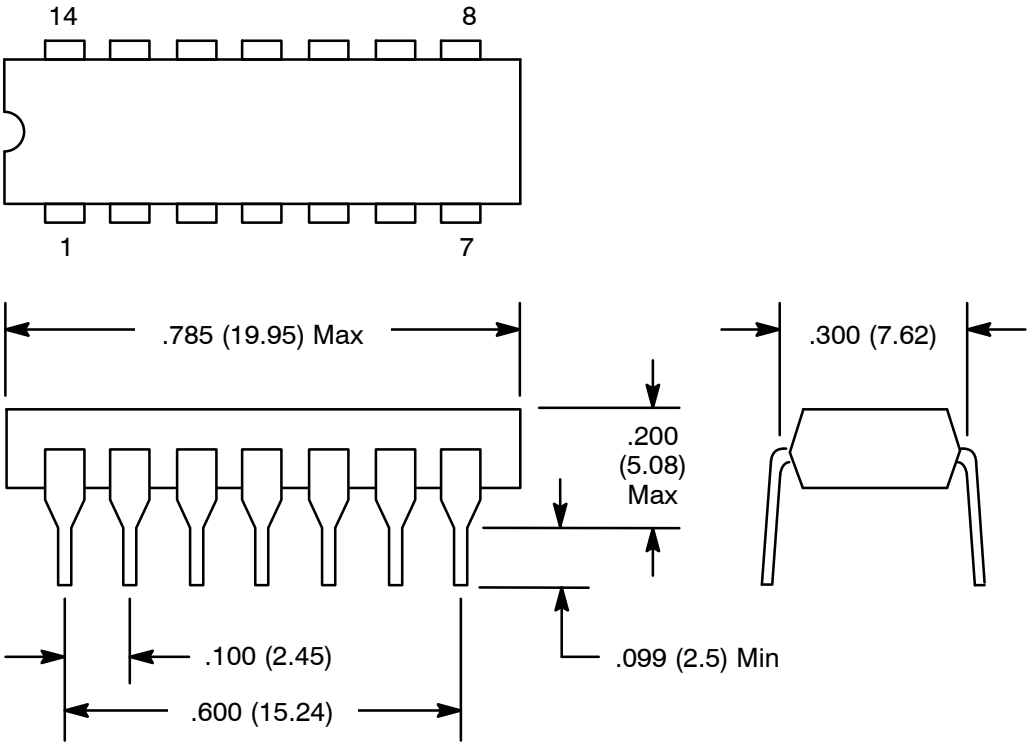
Function Table:

Inputs				Outputs					
				When C0 = L			When C0 = H		
A1	B1	A2	B2	Σ1	Σ2	C2	Σ1	Σ2	C2
L	L	L	L	L	L	L	H	L	L
H	L	L	L	H	L	L	L	H	L
L	H	L	L	H	L	L	L	H	L
H	H	L	L	L	H	L	H	H	L
L	L	H	L	L	H	L	H	H	L
H	L	H	L	H	H	L	L	L	H
L	H	H	L	H	H	L	L	L	H
H	H	H	L	L	L	H	H	L	H
L	L	L	H	L	H	L	H	H	L
H	L	L	H	H	H	L	L	L	H
L	H	L	H	H	H	L	L	L	H
H	H	L	H	L	L	H	H	L	H
L	L	H	H	L	L	H	H	L	H
H	L	H	H	H	L	H	L	H	H
L	H	H	H	H	L	H	L	H	H
H	H	H	H	L	H	H	H	H	H

H = High level, L = Low level

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)