

1. DESCRIPTION

The **XD74LS283** adders are electrically and functionally; only the arrangement of the terminals has been changed.

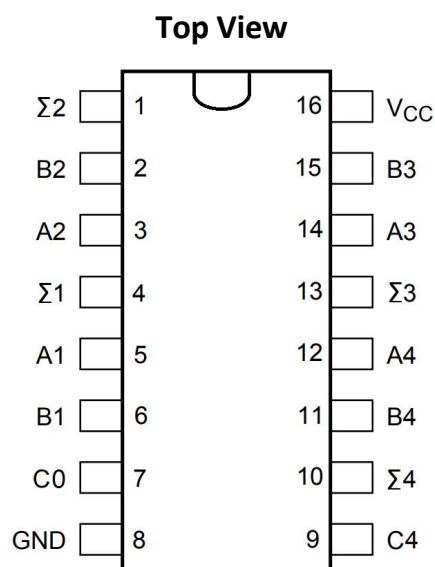
These improved full adders perform the addition of two 4-bit binary words. The sum outputs are provided for each bit and the resultant carry is obtained from the fourth bit. These adders feature full internal look-ahead across all four bits generating the carry term in ten nanoseconds, typically, for the **XD74LS283**. This capability provides the system designer with partial look-ahead performance at the economy and reduced package count of a ripple-carry implementation.

The adder logic, including the carry, is implemented in its true form. End around carry can be accomplished without the need for logic or level inversion.

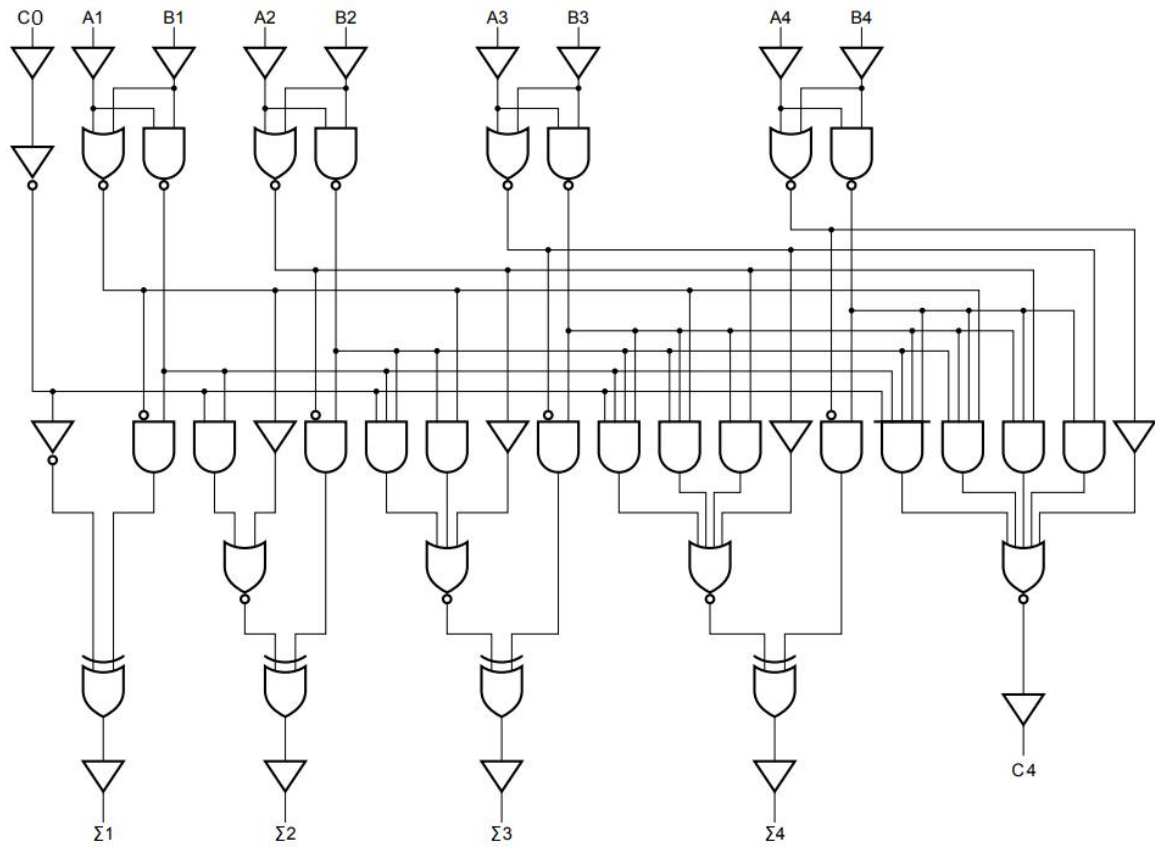
2. FEATURES

- Full-Carry Look-Ahead Across the Four Bits
- Systems Achieve Partial Look-Ahead Performance with the Economy of Ripple Carry
- Supply Voltage and Ground on Corner Pins to Simplify P-C Board Layout

3. PIN CONFIGURATIONS

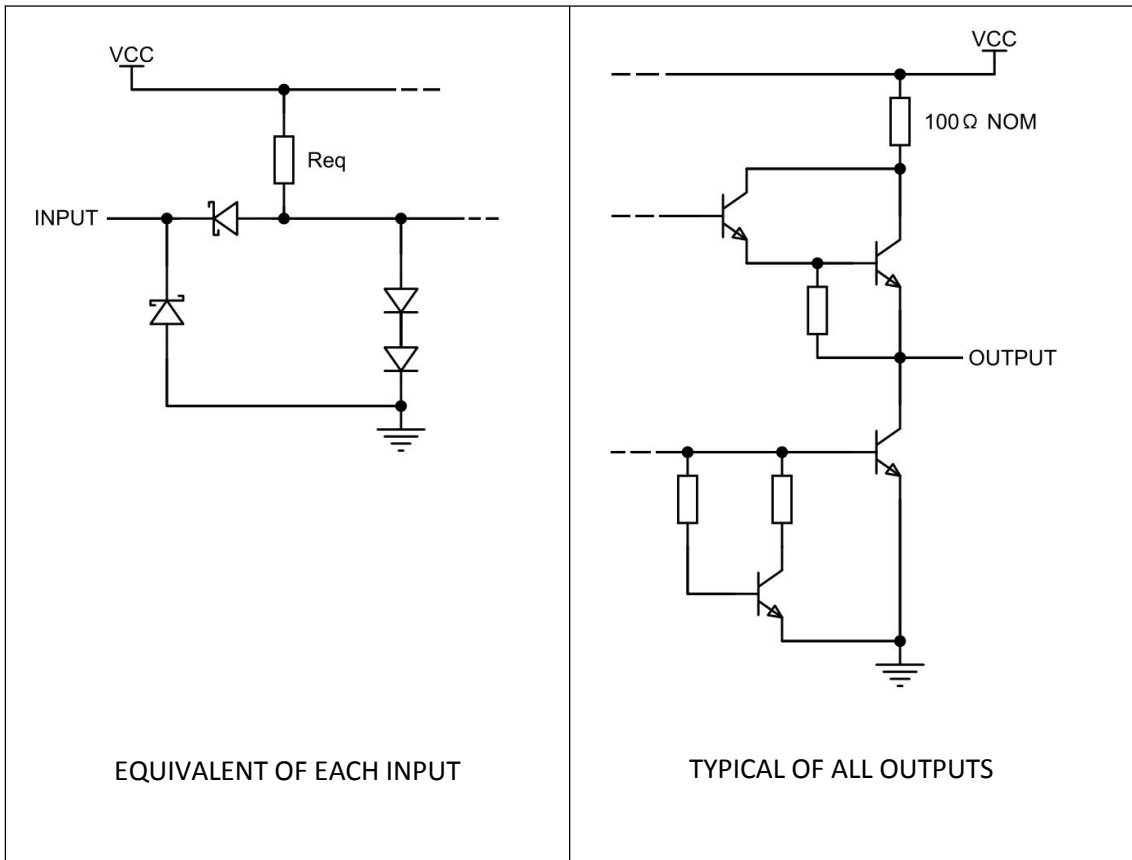


4. LOGIC DIAGRAM



INPUT				OUTPUT					
				WHEN C0=L			WHEN C0=H		
A1	B1	A2	B2	$\Sigma 1$	$\Sigma 2$	C2	$\Sigma 1$	$\Sigma 2$	C2
A2	B3	A4	B4	$\Sigma 3$	$\Sigma 4$	C4	$\Sigma 3$	$\Sigma 4$	C4
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

5. SCHEMATICS OF INPUTS AND OUTPUTS



6. ABSOLUTE MAXIMUM RATINGS OVER OPERATING FREE-AIR TEMPERATURE RANGE (UNLESS OTHERWISE NOTES)

Supply voltage, V_{CC} (see Note 1).....	7V
Input voltage, V_I : 74LS283.....	7V
Operating free-air temperature range: SOP package.....	0°C to 70°C
DIP package.....	0°C to 70°C
Storage temperature range, T_{stg}	-65°C to 150°C

- NOTES: 1. Voltage values, except inter-emitter voltage, are with respect to the network ground terminal.
2. This is the voltage between two emitters of a multiple-emitter transistor.

7. RECOMMENDED OPERATING CONDITIONS

		74LS283			UNIT
		MIN	NOM	MAX	
V _{CC}	Supply voltage	4.75	5	5.25	V
I _{OH}	High-level output current			-400	μA
I _{OL}	Low-level output current			8	mA
T _A	Operating free-air temperature	0		70	°C

8. ELECTRICAL CHARACTERISTICS OVER RECOMMENDED OPERATING FREE-AIR RANGE (UNLESS OTHERWISE NOTED)

PARAMETER		TEST CONDITIONS [†]	74LS283		UNIT	
			MIN	TYP [‡]		MAX
V _{IH}	High-level input voltage		2		V	
V _{IL}	Low-level input voltage			0.8	V	
V _{IK}	Input clamp voltage	V _{CC} = MIN, I _I = -18 mA		-1.5	V	
V _{OH}	High-level output voltage	V _{CC} = MIN, V _{IL} = 0.8 V, V _{IH} = 2 V, I _{OH} = -400 μA	2.7	3.4	V	
V _{OL}	Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = V _{IL} MAX	I _{OL} = 4 mA	0.25	0.4	V
			I _{OL} = 8 mA	0.35	0.5	
I _I	Input current at maximum input voltage	Any A or B	V _{CC} = MAX, V _I = 7 V	0.2		mA
		C0		0.1		
I _{IH}	High-level input current	Any A or B	V _{CC} = MAX, V _I = 2.7 V	40		μA
		C0		20		
I _{IL}	Low-level input current	Any A or B	V _{CC} = MAX, V _I = 0.4 V	-0.8		mA
		C0		-0.4		
I _{OS}	Short-circuit output current [§]	V _{CC} = MAX	-20	-100	mA	
I _{CC}	Supply current	V _{CC} = MAX Outputs open	All inputs grounded	22	39	mA
			All B low, other inputs at 4.5V	19	34	
			All inputs at 4.5V	19	34	

[†] For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

[‡] All typical values are at V_{CC} = 5 V, T_A = 25°C.

[§] Not more than one output should be shorted at a time.

9. SWITCHING CHARACTERISTICS, VCC = 5 V, TA = 25°C

PARAMETER†	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t _{PLH}	C0	Any Σ	C _L = 15 pF, R _L = 2 kΩ See Note 3		16	24	ns
t _{PHL}					15	24	
t _{PLH}	Ai or Bi	Σi			15	24	ns
t _{PHL}					15	24	
t _{PLH}	C0	C4			11	17	ns
t _{PHL}					11	22	
t _{PLH}	Ai or Bi	C4			11	17	ns
t _{PHL}					12	17	

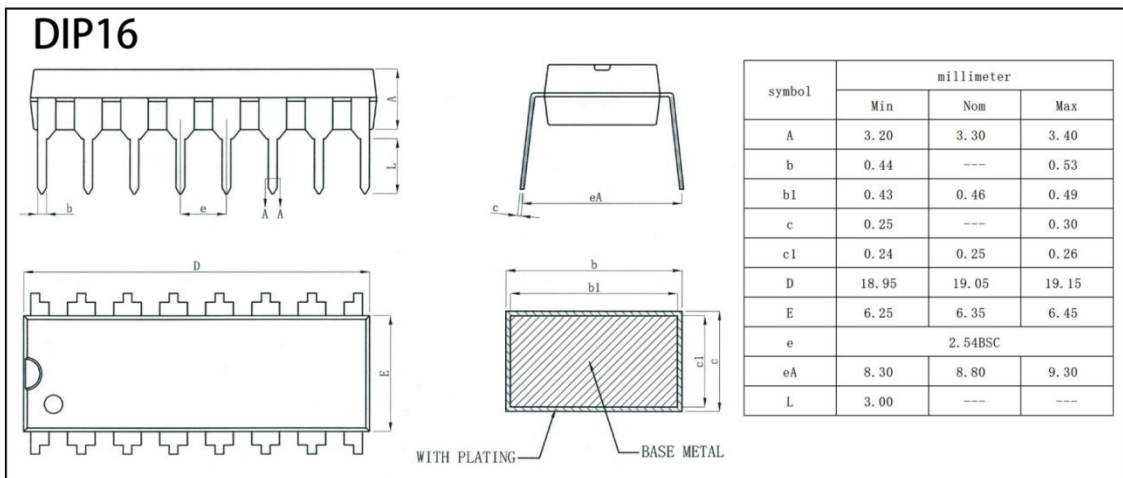
† t_{PLH} = propagation delay time, low-to-high-level output
t_{PHL} = propagation delay time, high-to-low-level output

10. ORDERING INFORMATION

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XD74LS283	XD74LS283	DIP16	19.05 * 6.35	-0 to 70	MSL3	Tube 25	1000

11. DIMENSIONAL DRAWINGS



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