

HD74HC148

8-to-3-line Octal Priority Encoder

HITACHI

Description

The HD74HC148 encodes eight data lines to three-line (4-2-1) binary (octal). Cascading circuitry (enable input EI and enable output EO) is provided to allow octal expansion without the need for external circuitry. The data inputs and outputs are active at the low logic level.

Features

- High Speed Operation: t_{pd} (0 - 7 to A_0 - A_2) = 15 ns typ (C_L = 50 pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: V_{CC} = 2 to 6 V
- Low Input Current: 1 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max (T_a = 25°C)

Function Table

Inputs									Outputs				
EI	0	1	2	3	4	5	6	7	A_2	A_1	A_0	GS	EO
H	X	X	X	X	X	X	X	X	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	L
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	X	X	X	X	X	X	L	H	L	L	H	L	H
L	X	X	X	X	L	H	H	H	L	H	H	L	H
L	X	X	X	L	H	H	H	H	H	L	H	L	H
L	X	L	H	H	H	H	H	H	H	H	L	L	H
L	L	H	H	H	H	H	H	H	H	H	H	L	H

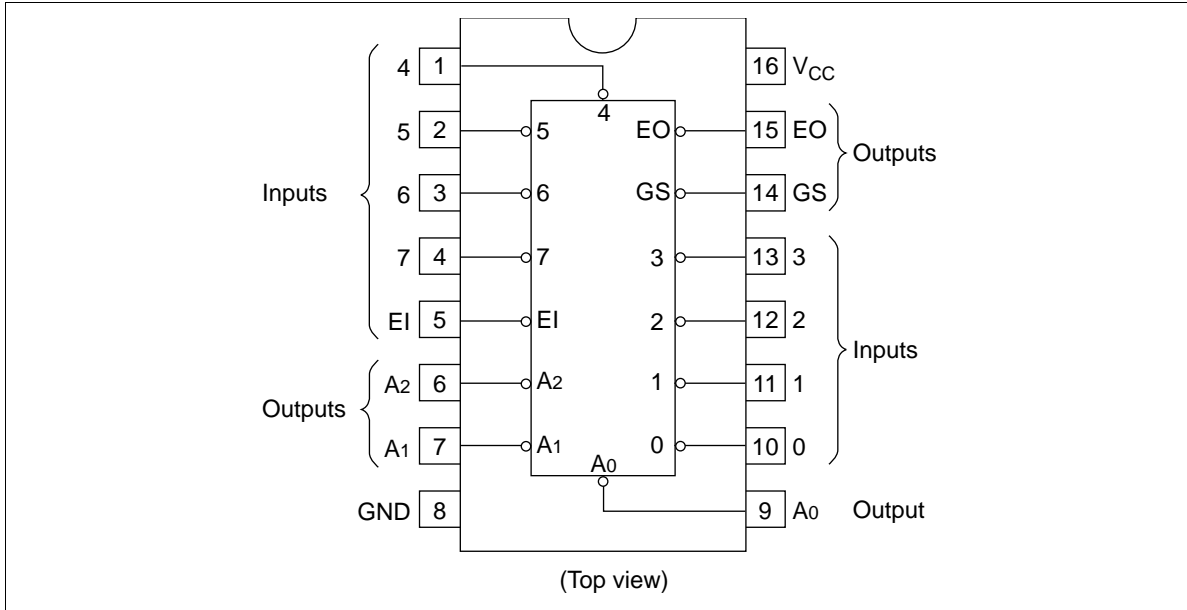
H : High level

L : Low level

X : Irrelevant

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Pin Arrangement



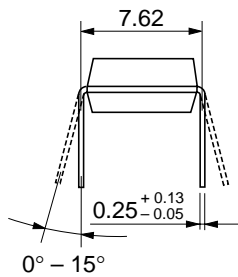
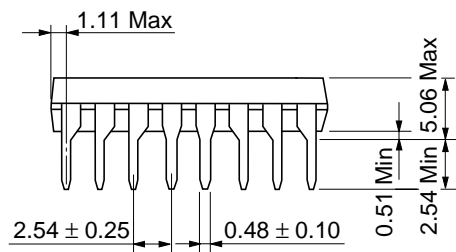
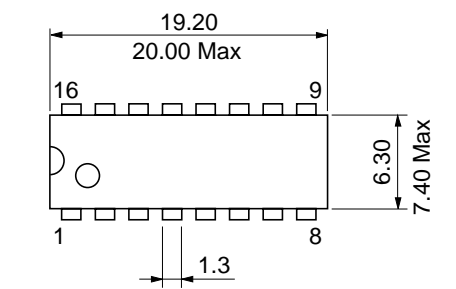
DC Characteristics

Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V _{IL}	2.0	—	—	0.5	—	0.5			V
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V _{OH}	2.0	1.9	2.0	—	1.9	—	V	Vin = V _{IH} or V _{IL} I _{OH} = -20 μA	
		4.5	4.4	4.5	—	4.4	—			
		6.0	5.9	6.0	—	5.9	—			
		4.5	4.18	—	—	4.13	—			I _{OH} = -4 mA
		6.0	5.68	—	—	5.63	—			I _{OH} = -5.2 mA
		V _{OL}	2.0	—	0.0	0.1	—			0.1
	4.5		—	0.0	0.1	—	0.1			
	6.0		—	0.0	0.1	—	0.1			
	4.5		—	—	0.26	—	0.33	I _{OL} = 4 mA		
	6.0		—	—	0.26	—	0.33	I _{OL} = 5.2 mA		
	6.0		—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND	
	Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, I _{out} = 0 μA

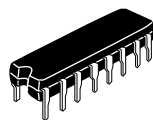
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AC Characteristics ($C_L = 50$ pF, Input $t_r = t_f = 6$ ns)

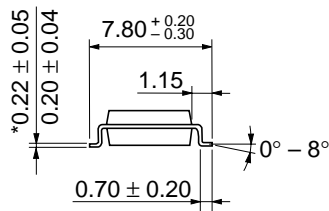
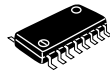
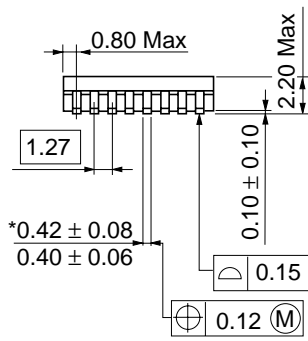
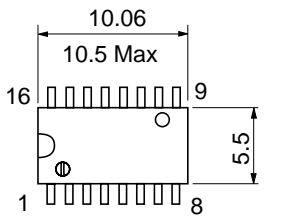
Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40$ to $+85^\circ\text{C}$		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t_{PLH}	2.0	—	—	230	—	290	ns	0 - 7 to $A_0 - A_2$
	t_{PHL}	4.5	—	15	46	—	58		
		6.0	—	—	39	—	49		
	t_{PLH}	2.0	—	—	250	—	315	ns	0 - 7 to EO
	t_{PHL}	4.5	—	16	50	—	63		
		6.0	—	—	43	—	54		
	t_{PLH}	2.0	—	—	270	—	340	ns	0 - 7 to GS
	t_{PHL}	4.5	—	18	54	—	68		
		6.0	—	—	46	—	58		
	t_{PLH}	2.0	—	—	230	—	290	ns	EI to $A_0 - A_2$
	t_{PHL}	4.5	—	12	46	—	58		
		6.0	—	—	39	—	49		
	t_{PLH}	2.0	—	—	250	—	315	ns	EI to GS
	t_{PHL}	4.5	—	12	50	—	63		
		6.0	—	—	43	—	54		
	t_{PLH}	2.0	—	—	270	—	340	ns	EI to EO
	t_{PHL}	4.5	—	12	54	—	68		
		6.0	—	—	46	—	58		
Output rise/fall time	t_{TLH}	2.0	—	—	75	—	90	ns	
	t_{THL}	4.5	—	5	15	—	19		
		6.0	—	—	13	—	16		
Input capacitance	C_{in}	—	—	5	10	—	10	pF	



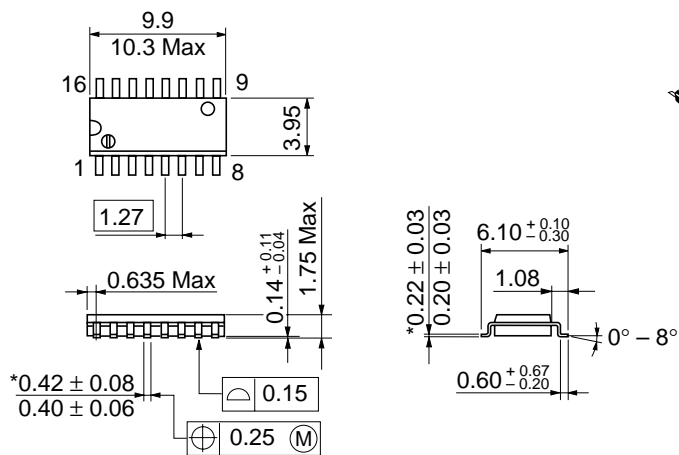
Unit: mm



Unit: mm



Unit: mm



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