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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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HD74HC148

8-to-3-line Octal Priority Encoder



ADE-205-447 (Z)
1st. Edition
Sep. 2000

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

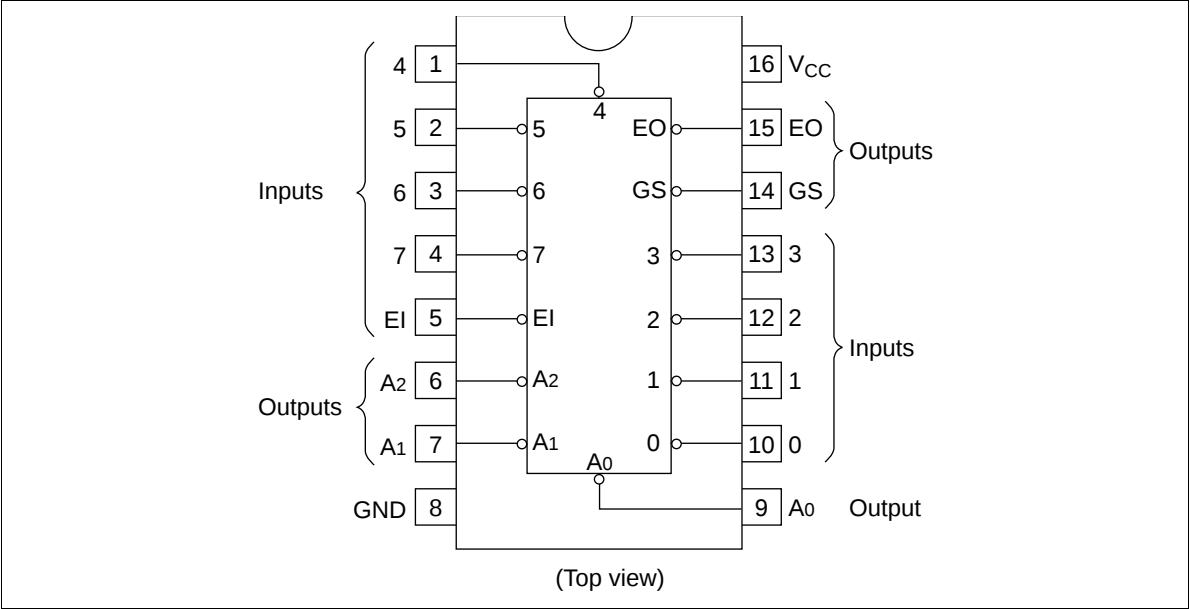
- High Speed Operation: t_{pd} (0 - 7 to A_0 - A_2) = 15 ns typ (C_L = 50 pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: V_{CC} = 2 to 6 V
- Low Input Current: 1 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max (T_a = 25°C)

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	X	L	H	H	L	H	L	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	L	L	H
L	X	X	L	H	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

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	—		
		6.0	5.68	—	—	5.63	—		
	V _{OL}	2.0	—	0.0	0.1	—	0.1	V	Vin = V _{IH} or V _{IL} I _{OL} = 20 μA
		4.5	—	0.0	0.1	—	0.1		
		6.0	—	0.0	0.1	—	0.1		
		4.5	—	—	0.26	—	0.33		
		6.0	—	—	0.26	—	0.33		
Input current	I _{in}	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

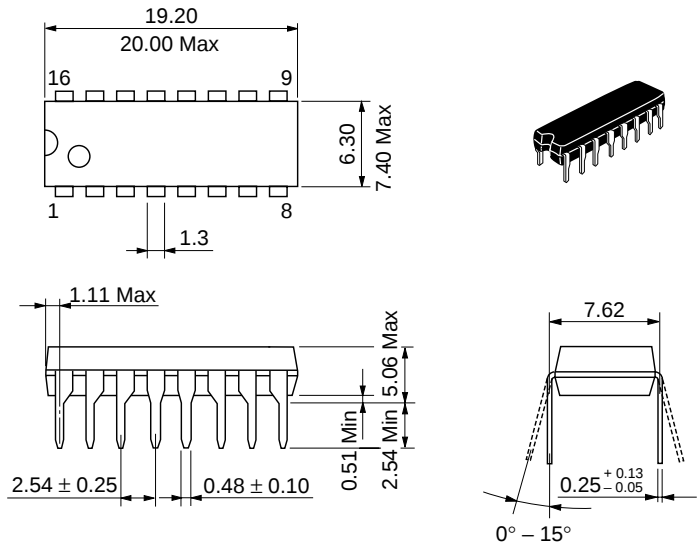
HD74HC148

AC Characteristics ($C_L = 50 \text{ pF}$, Input $t_r = t_f = 6 \text{ ns}$)

Item	Symbol	V _{CC} (V)	Ta = 25°C					Ta = -40 to +85°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			

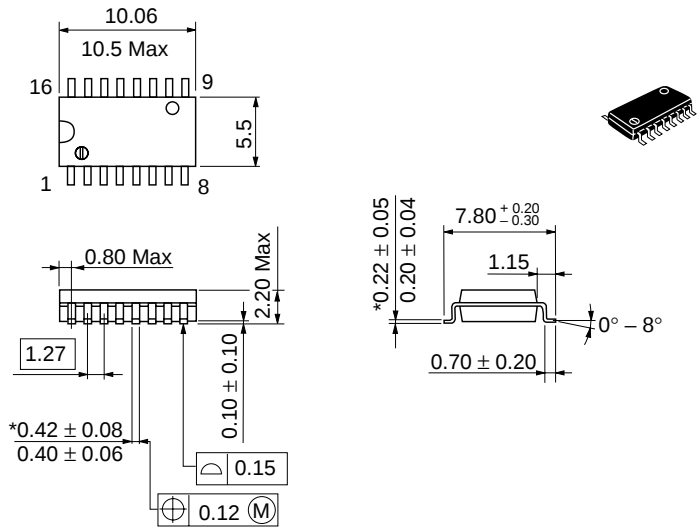
Package Dimensions

Unit: mm



Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	1.07 g

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.24 g

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