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

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HD74HCT238

3-to-8-line Decoder/Demultiplexer

ADE-205-549 (Z)
1st. Edition
Sep. 2000

Description

The HD74HCT238 has 3 binary select inputs (A, B, and C). If the device is enabled these inputs determined which one of the eight normally high outputs will go low. Two active low and one active high enables (G_1, $\overline{G_{2A}}$ and $\overline{G_{2B}}$) are provided to ease the cascading of decoders.

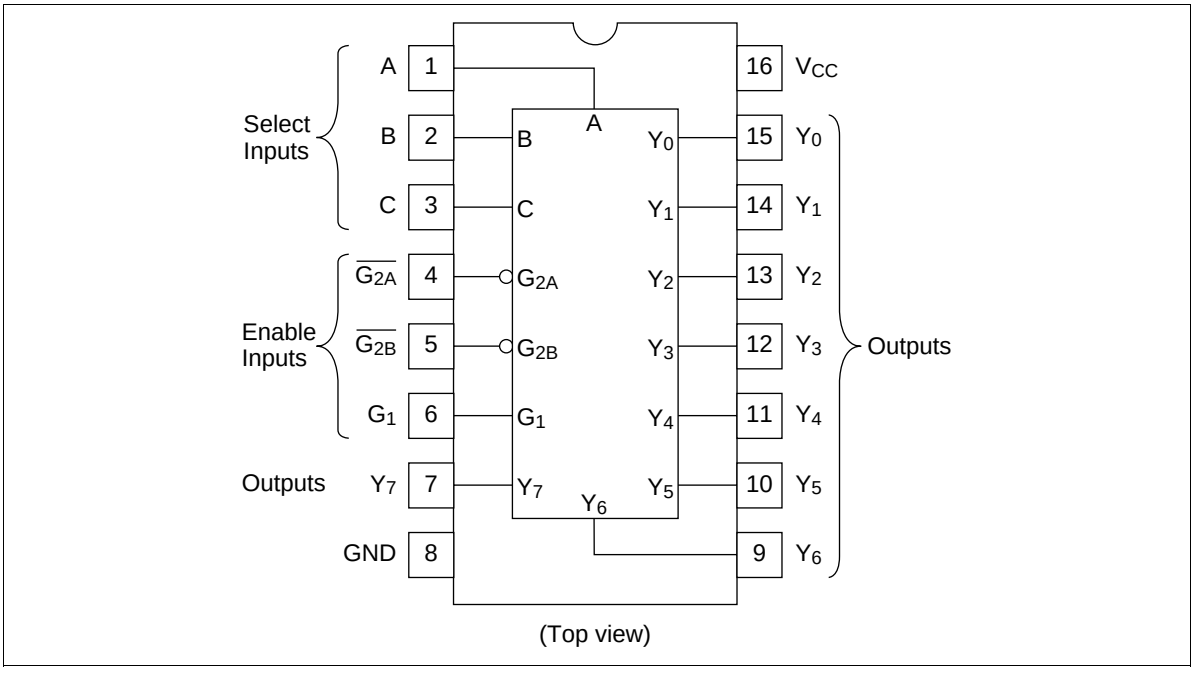
Features

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation: t_{pd} (A, B, C to Y) = 18.5 ns typ (C_L = 50 pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: V_{CC} = 4.5 to 5.5 V
- Low Input Current: 1 μA max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μA max (Ta = 25°C)

Function Table

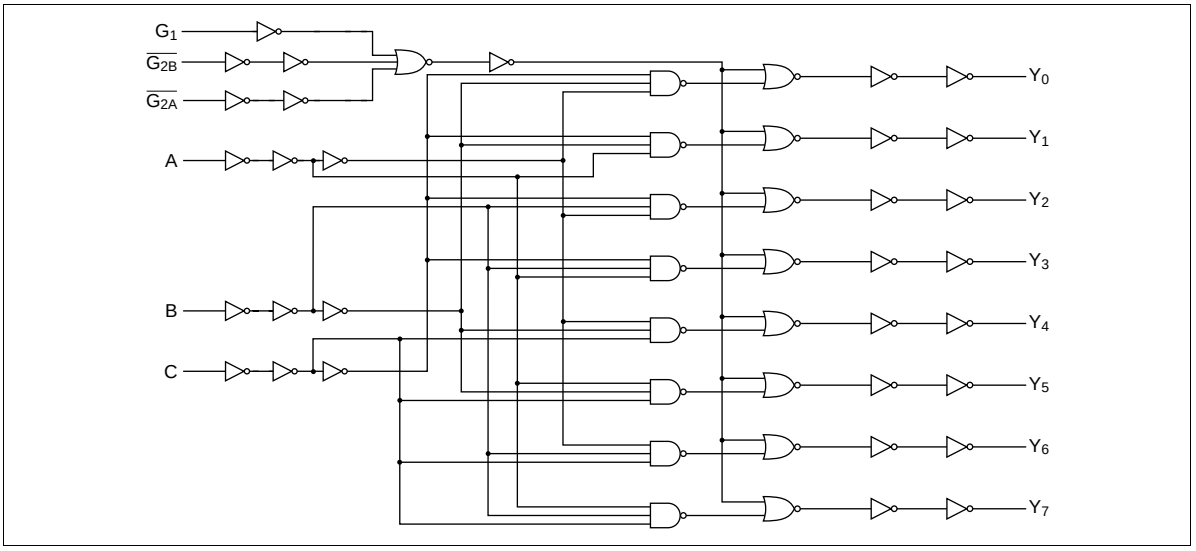
Inputs													
Enable			Select			Outputs							
G_1	$\overline{G_{2A}}$	$\overline{G_{2B}}$	C	B	A	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7
X	X	H	X	X	X	L	L	L	L	L	L	L	L
X	H	X	X	X	X	L	L	L	L	L	L	L	L
L	X	X	X	X	X	L	L	L	L	L	L	L	L
H	L	L	L	L	L	H	L	L	L	L	L	L	L
H	L	L	L	L	H	L	H	L	L	L	L	L	L
H	L	L	L	H	L	L	L	H	L	L	L	L	L
H	L	L	L	H	H	L	L	L	H	L	L	L	L
H	L	L	H	L	L	L	L	L	L	H	L	L	L
H	L	L	H	L	H	L	L	L	L	L	H	L	L
H	L	L	H	H	L	L	L	L	L	L	L	H	L
H	L	L	H	H	H	L	L	L	L	L	L	L	H

Pin Arrangement



(Top view)

Logic Diagram



DC Characteristics

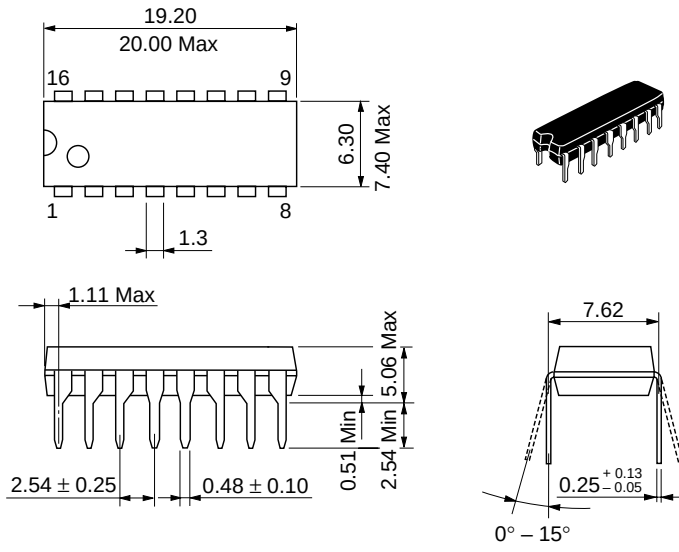
Item	Symbol	Ta = 25°C Min	Typ	Max	Ta = –40 to +85°C Min	Max	Unit	Test Conditions V_{CC} (V)	
Input voltage	V_{IH}	2.0	—	—	2.0	—	V	4.5 to 5.5	
	V_{IL}	—	—	0.8	—	0.8	V	4.5 to 5.5	
Output voltage	V_{OH}	4.4	—	—	4.4	—	V	4.5	Vin = V_{IH} or V_{IL} I_{OH} = –20 µA
		4.18	—	—	4.13	—		4.5	I_{OH} = –4 mA
	V_{OL}	—	—	0.1	—	0.1	V	4.5	Vin = V_{IH} or V_{IL} I_{OL} = 20 µA
		—	—	0.26	—	0.33		4.5	I_{OL} = 4 mA
Input current	Iin	—	—	±0.1	—	±1.0	µA	5.5	Vin = V_{CC} or GND
Quiescent supply current	I_{CC}	—	—	4.0	—	40	µA	5.5	Vin = V_{CC} or GND, Iout = 0 µA

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

		Ta = 25°C			Ta = –40 to +85°C			Test Conditions	
Item	**Symbol**	**Min**	**Typ**	**Max**	**Min**	**Max**	**Unit**	**V_{CC} (V)**	
Propagation delay time	t_{PLH}	—	18	30	—	38	ns	4.5	A, B or C to Y
	t_{PHL}	—	19	30	—	38		4.5	
	t_{PLH}	—	17	30	—	38	ns	4.5	$\overline{G_{2A}}$ to Y
	t_{PHL}	—	17	30	—	39		4.5	
	t_{PLH}	—	17	30	—	38	ns	4.5	$\overline{G_{2B}}$ to Y
	t_{PHL}	—	17	30	—	38		4.5	
	t_{PLH}	—	17	30	—	38	ns	4.5	G_1 to Y
	t_{PHL}	—	17	30	—	38		4.5	
Output rise/fall time	t_{TLH} t_{THL}	—	5	15	—	19	ns	4.5	
Input capacitance	Cin	—	5	10	—	10	pF	—	

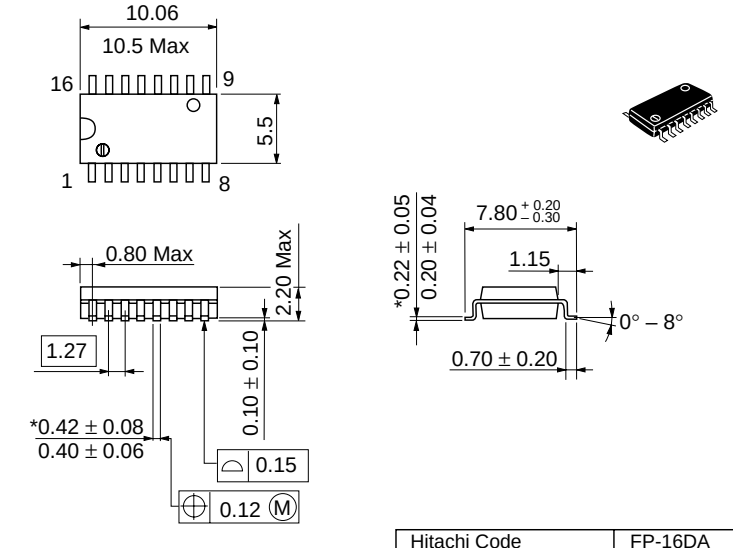
Package Dimensions

Unit: mm



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

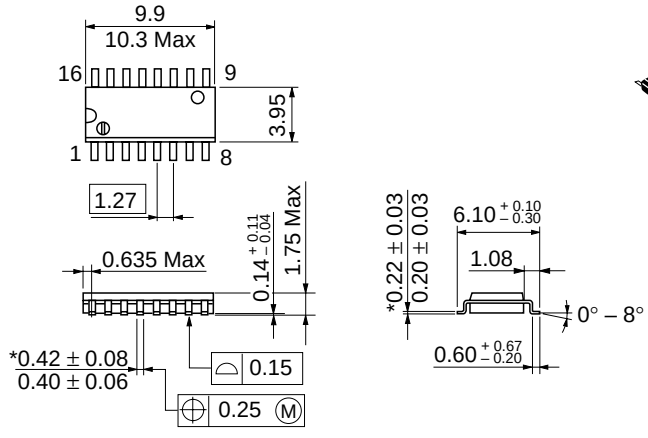
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.15 g

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