
HD74HCT138

3-to-8-line Decoder/Demultiplexer

HITACHI

Description

The HD74HCT138 has 3 binary select inputs (A, B, and C). If the device is enabled these inputs determine which one of the eight normally high outputs will go low. Two active low and one active high enables (G_1 , G_{2A} and 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 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)

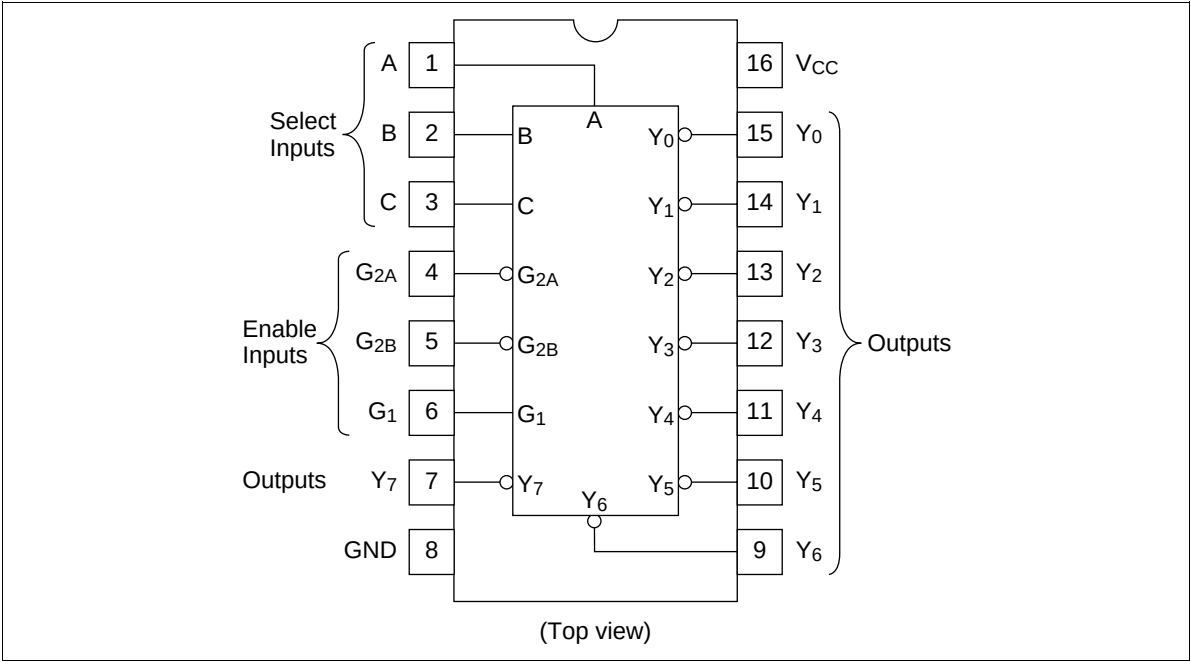
HD74HCT138

Function Table

Inputs

Enable			Select			Outputs							
G ₁	G _{2A}	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	H	H	H	H	H	H	H	H
X	H	X	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	L	H	H	H	H	H	L	H	H	H	H
H	L	L	H	L	L	H	H	H	H	L	H	H	H
H	L	L	H	L	H	H	H	H	H	H	L	H	H
H	L	L	H	H	L	H	H	H	H	H	H	L	H
H	L	L	H	H	H	H	H	H	H	H	H	H	L

Pin Arrangement



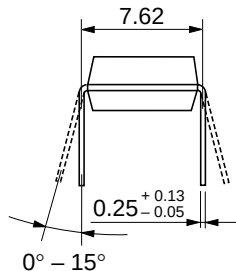
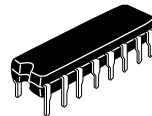
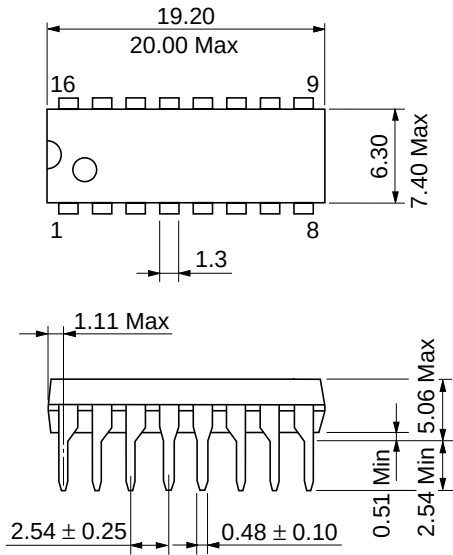
DC Characteristics

Item	Symbol	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions	
		Min	Typ	Max	Min	Max	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	I _{in}	—	—	±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, I _{out} = 0 µA

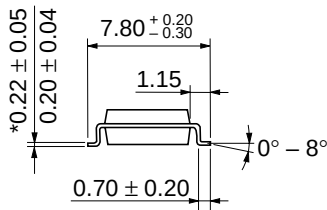
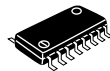
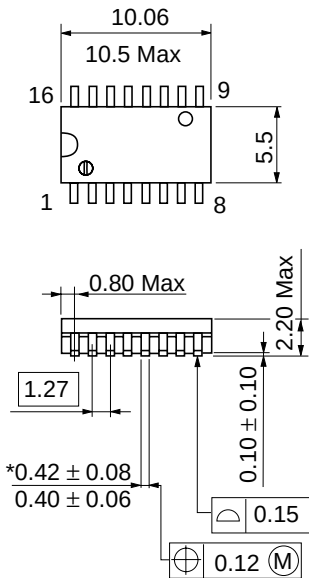
AC Characteristics (C_L = 50 pF, Input t_r = t_f = 6 ns)

Item	Symbol	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions	
		Min	Typ	Max	Min	Max	V _{CC} (V)	
Propagation delay time	t _{PHL}	—	18	35	—	44	ns	4.5 A, B or C to output
	t _{PLH}	—	19	30	—	38	ns	4.5
	t _{PHL}	—	17	30	—	38	ns	4.5 G ₁ to output
	t _{PLH}	—	17	30	—	38	ns	4.5
	t _{PHL}	—	17	35	—	44	ns	4.5 G _{2A} or G _{2B} to output
	t _{PLH}	—	17	30	—	38	ns	4.5
Output rise/fall time	t _{TLH}	—	5	15	—	19	ns	4.5
	t _{THL}	—	5	15	—	19	ns	4.5
Input capacitance	C _{in}	—	5	10	—	10	pF	—

Unit: mm

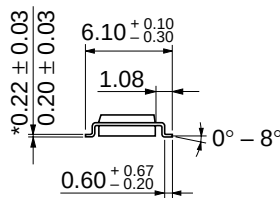
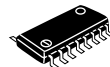
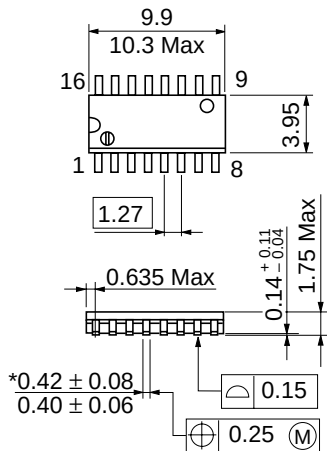


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



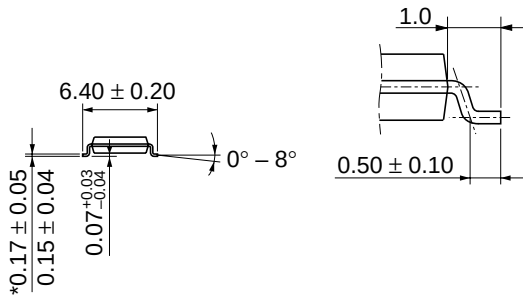
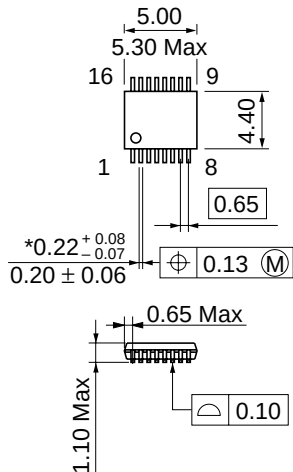
*Dimension including the plating thickness
Base material dimension

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



*Dimension including the plating thickness
Base material dimension

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



*Dimension including the plating thickness
Base material dimension

Hitachi Code	TTP-16DA
JEDEC	—
EIAJ	—
Weight (reference value)	0.05 g

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