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# HD74AC539

Dual 1-of-4 Decoder with 3-State Output

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## Description

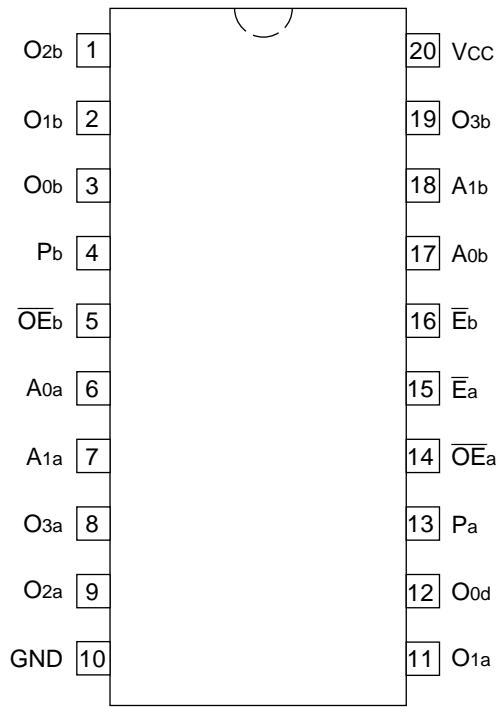
The HD74AC539 contains two independent decoders. Each accepts two Address ( $A_0$ ,  $A_1$ ) input signals and decodes them to select one of four mutually exclusive outputs. A polarity control input ( $P$ ) determines whether the outputs are active HIGH ( $P = L$ ) or active LOW ( $P = H$ ). An active LOW input Enable ( $\overline{E}$ ) is available for data demultiplexing; data is routed to the selected output in non-inverted form in the active LOW mode or in inverted form in the active HIGH mode. A HIGH signal on the active LOW Output Enable ( $\overline{OE}$ ) input forces the 3-state outputs to the high impedance state.

## Feature

- Outputs Source/Sink 24 mA

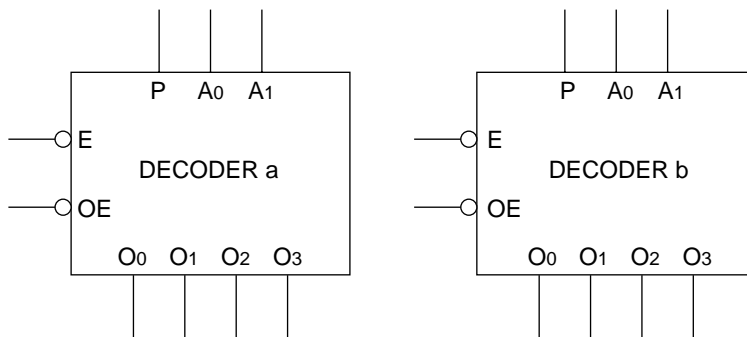
# HD74AC539

## Pin Arrangement



(Top view)

## Logic Symbol



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**Pin Names**

- $A_{0a}$  to  $A_{1a}$       Side A Address Inputs
- $A_{0b}$  to  $A_{1b}$       Side B Address Inputs
- $\overline{E}_a$  –  $\overline{E}_b$       Enable Inputs (Active LOW)
- $\overline{OE}_a$ ,  $\overline{OE}_b$       Output Enable Inputs (Active LOW)
- $P_a$ ,  $P_b$           Polarity Control Inputs
- $O_{0a}$  to  $O_{3a}$       Side A 3-State Outputs
- $O_{0b}$  to  $O_{3b}$       Side B 3-State Outputs

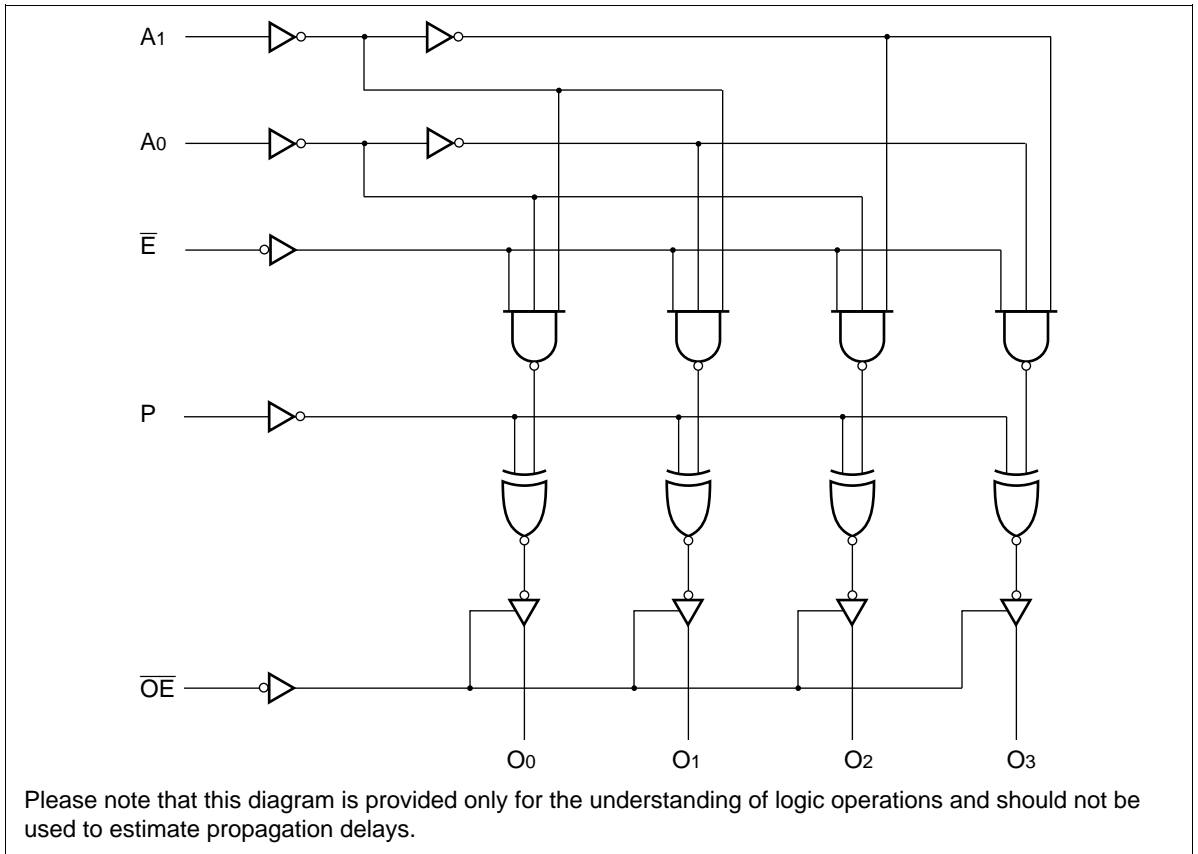
**Truth Table**

Function	Inputs				Outputs			
	$\overline{OE}$	$\overline{E}$	$A_1$	$A_0$	$O_0$	$O_1$	$O_2$	$O_3$
High impedance	H	X	X	X	Z	Z	Z	Z
Disable	L	H	X	X	$O_n = P$			
Active HIGH output ( $P = L$ )	L	L	L	L	H	L	L	L
	L	L	L	H	L	H	L	L
	L	L	H	L	L	L	H	L
	L	L	H	H	L	L	L	H
Active LOW output ( $P = H$ )	L	L	L	L	L	H	H	H
	L	L	L	H	H	L	H	H
	L	L	H	L	H	H	L	H
	L	L	H	H	H	H	H	L

- H : High Voltage Level
- L : Low Voltage Level
- X : Immaterial
- Z : High Impedance

# HD74AC539

## Logic Diagram (one half shown)



## DC Characteristics (unless otherwise specified)

Item	Symbol	Max	Unit	Condition
Maximum quiescent supply current	$I_{CC}$	80	$\mu A$	$V_{IN} = V_{CC}$ or ground, $V_{CC} = 5.5 V$ , $T_a = \text{Worst case}$
Maximum quiescent supply current	$I_{CC}$	8.0	$\mu A$	$V_{IN} = V_{CC}$ or ground, $V_{CC} = 5.5 V$ , $T_a = 25^\circ C$

AC Characteristics: HD74AC539

Item	Symbol	V <sub>CC</sub> (V) <sup>*1</sup>	Ta = +25°C C <sub>L</sub> = 50 pF			Ta = -40°C to +85°C C <sub>L</sub> = 50 pF		Unit
			Min	Typ	Max	Min	Max	
Propagation delay A <sub>n</sub> to O <sub>n</sub>	t <sub>PLH</sub>	3.3	1.0	—	15.0	1.0	18.0	ns
		5.0	1.0	—	10.0	1.0	12.0	
Propagation delay A <sub>n</sub> to O <sub>n</sub>	t <sub>PHL</sub>	3.3	1.0	—	15.0	1.0	18.0	ns
		5.0	1.0	—	10.0	1.0	12.0	
Propagation delay E̅ to O <sub>n</sub>	t <sub>PLH</sub>	3.3	1.0	—	14.5	1.0	16.5	ns
		5.0	1.0	—	9.5	1.0	11.0	
Propagation delay E̅ to O <sub>n</sub>	t <sub>PHL</sub>	3.3	1.0	—	13.5	1.0	15.5	ns
		5.0	1.0	—	9.0	1.0	11.5	
Propagation delay P to O <sub>n</sub>	t <sub>PLH</sub>	3.3	1.0	—	16.0	1.0	19.0	ns
		5.0	1.0	—	11.5	1.0	12.5	
Propagation delay P to O <sub>n</sub>	t <sub>PHL</sub>	3.3	1.0	—	16.0	1.0	19.0	ns
		5.0	1.0	—	11.5	1.0	12.5	
Propagation delay OE̅ to O <sub>n</sub>	t <sub>ZH</sub>	3.3	1.0	—	10.0	1.0	11.5	ns
		5.0	1.0	—	8.0	1.0	9.0	
Propagation delay OE̅ to O <sub>n</sub>	t <sub>ZL</sub>	3.3	1.0	—	9.5	1.0	11.0	ns
		5.0	1.0	—	7.5	1.0	8.5	
Propagation delay OE̅ to O <sub>n</sub>	t <sub>HZ</sub>	3.3	1.0	—	11.5	1.0	13.0	ns
		5.0	1.0	—	9.5	1.0	10.5	
Propagation delay OE̅ to O <sub>n</sub>	t <sub>LZ</sub>	3.3	1.0	—	10.5	1.0	12.0	ns
		5.0	1.0	—	8.5	1.0	9.5	

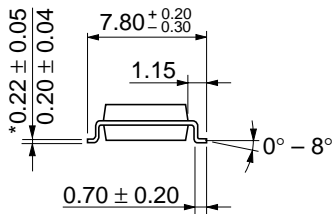
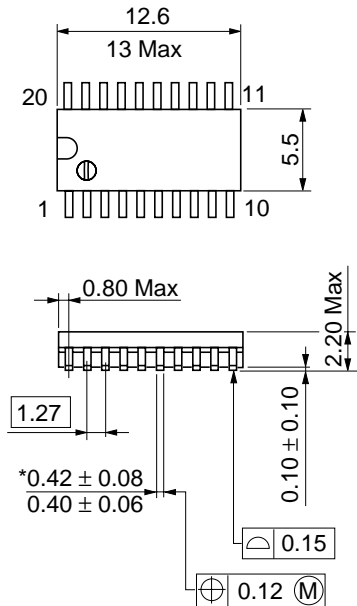
Note: 1. Voltage Range 3.3 is 3.3 V ± 0.3 V  
Voltage Range 5.0 is 5.0 V ± 0.5 V

Capacitance

Item	Symbol	Typ	Unit	Condition
Input capacitance	C <sub>IN</sub>	4.5	pF	V <sub>CC</sub> = 5.5 V
Power dissipation capacitance	C <sub>PD</sub>	60	pF	V <sub>CC</sub> = 5.0 V

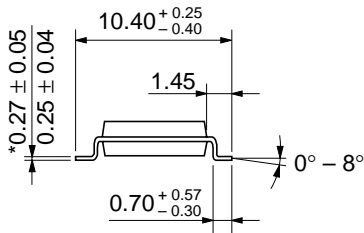
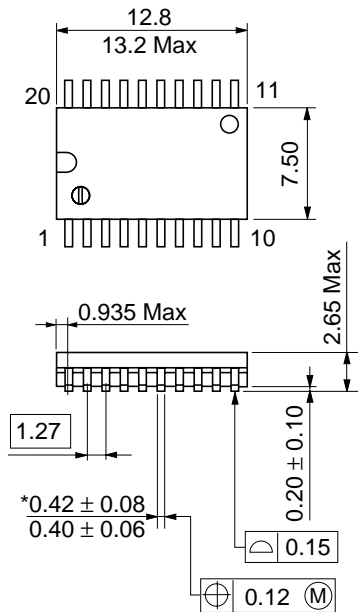


Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g



Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.31 g

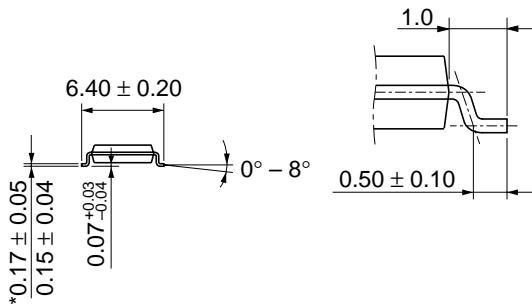
\*Dimension including the plating thickness  
Base material dimension



Hitachi Code	FP-20DB
JEDEC	Conforms
EIAJ	—
Weight (reference value)	0.52 g

\*Dimension including the plating thickness  
Base material dimension





\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	TTP-20DA
JEDEC	—
EIAJ	—
Weight (reference value)	0.07 g

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