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# HD74AC259

8-bit Addressable Latch

# HITACHI

ADE-205-385 (Z)  
1st. Edition  
Sep. 2000

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## Description

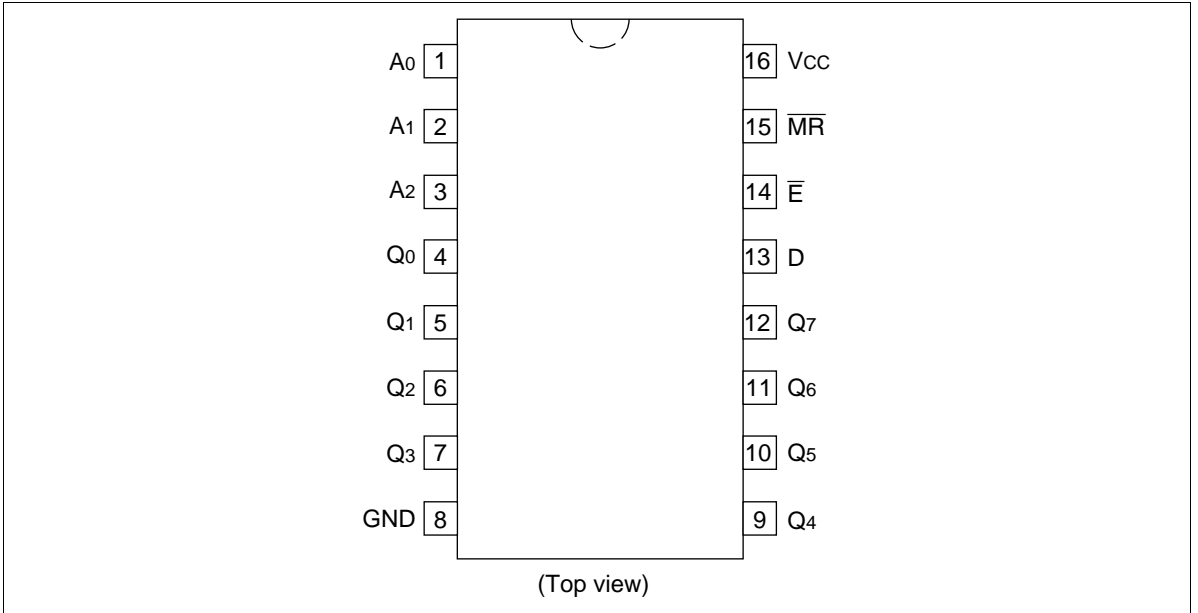
The HD74AC259 is a high-speed 8-bit addressable latch designed for general purpose storage applications in digital systems. It is a multifunctional device capable of storing single line data in eight addressable latches, and also a 1-of-8 decoder and demultiplexer with active HIGH outputs. The device also incorporates an active LOW Common Clear for resetting all latches, as well as an active LOW Enable.

## Features

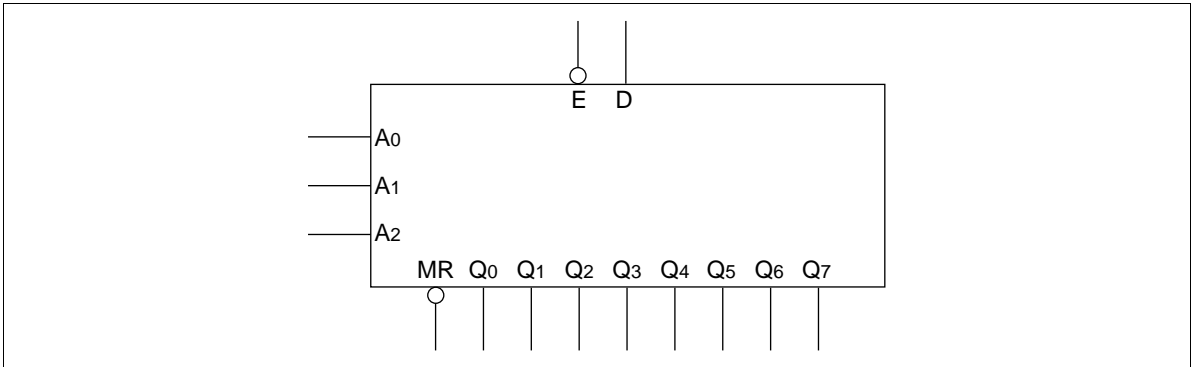
- Serial-to-Parallel Conversion
- Eight Bits of Storage with Output of Each Bit Available
- Random (Addressable) Data Entry
- Active High Demultiplexing or Decoding Capability
- Easily Expandable
- Common Clear
- Outputs Source/Sink 24 mA

# HD74AC259

## Pin Arrangement



## Logic Symbol

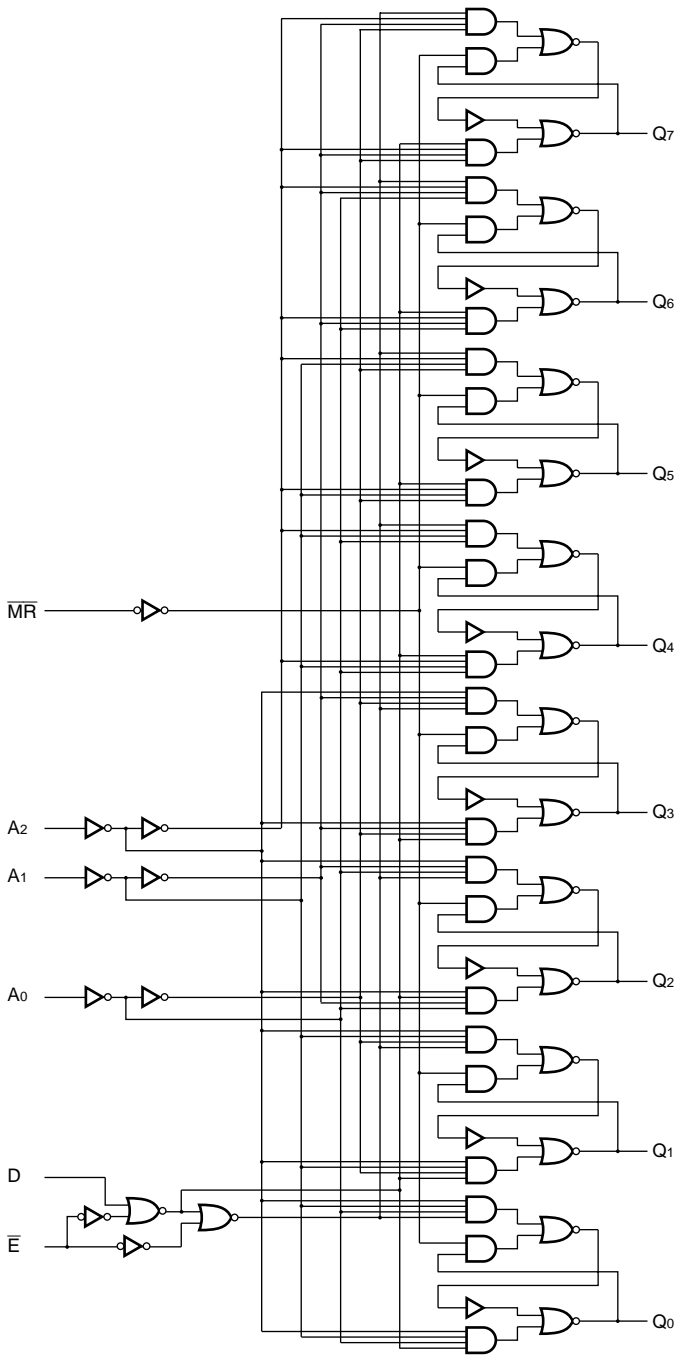


## Pin Names

- A<sub>0</sub> – A<sub>2</sub> Address Inputs
- D Data Inputs
- $\bar{E}$  Enable Input (Active LOW)
- $\overline{MR}$  Master Reset (Active LOW)
- Q<sub>0</sub> – Q<sub>7</sub> Latch Outputs

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Logic Diagram



## Function Table

Operating Mode	Inputs						Outputs							
	MR	$\bar{E}$	D	A <sub>0</sub>	A <sub>1</sub>	A <sub>2</sub>	Q <sub>0</sub>	Q <sub>1</sub>	Q <sub>2</sub>	Q <sub>3</sub>	Q <sub>4</sub>	Q <sub>5</sub>	Q <sub>6</sub>	Q <sub>7</sub>
Master reset	L	H	X	X	X	X	L	L	L	L	L	L	L	L
Demultiplex	L	L	d	L	L	L	Q = d	L	L	L	L	L	L	L
(Active HIGH)	L	L	d	H	L	L	L	Q = d	L	L	L	L	L	L
Decoder when	L	L	d	L	H	L	L	L	Q = d	L	L	L	L	L
D = H)	L	L	d	H	H	L	L	L	L	Q = d	L	L	L	L
	L	L	d	L	L	H	L	L	L	L	Q = d	L	L	L
	L	L	d	H	L	H	L	L	L	L	L	Q = d	L	L
	L	L	d	L	H	H	L	L	L	L	L	L	Q = d	L
	L	L	d	H	H	H	L	L	L	L	L	L	L	Q = d
Store (Do nothing)	H	H	X	X	X	X	q <sub>0</sub>	q <sub>1</sub>	q <sub>2</sub>	q <sub>3</sub>	q <sub>4</sub>	q <sub>5</sub>	q <sub>6</sub>	q <sub>7</sub>
Addressable latch	H	L	d	L	L	L	Q = d	q <sub>1</sub>	q <sub>2</sub>	q <sub>3</sub>	q <sub>4</sub>	q <sub>5</sub>	q <sub>6</sub>	q <sub>7</sub>
	H	L	d	H	L	L	q <sub>0</sub>	Q = d	q <sub>2</sub>	q <sub>3</sub>	q <sub>4</sub>	q <sub>5</sub>	q <sub>6</sub>	q <sub>7</sub>
	H	L	d	L	H	L	q <sub>0</sub>	q <sub>1</sub>	Q = d	q <sub>3</sub>	q <sub>4</sub>	q <sub>5</sub>	q <sub>6</sub>	q <sub>7</sub>
	H	L	d	H	H	L	q <sub>0</sub>	q <sub>1</sub>	q <sub>2</sub>	Q = d	q <sub>4</sub>	q <sub>5</sub>	q <sub>6</sub>	q <sub>7</sub>
	H	L	d	L	L	H	q <sub>0</sub>	q <sub>1</sub>	q <sub>2</sub>	q <sub>3</sub>	Q = d	q <sub>5</sub>	q <sub>6</sub>	q <sub>7</sub>
	H	L	d	H	L	H	q <sub>0</sub>	q <sub>1</sub>	q <sub>2</sub>	q <sub>3</sub>	q <sub>4</sub>	Q = d	q <sub>6</sub>	q <sub>7</sub>
	H	L	d	L	H	H	q <sub>0</sub>	q <sub>1</sub>	q <sub>2</sub>	q <sub>3</sub>	q <sub>4</sub>	q <sub>5</sub>	Q = d	q <sub>7</sub>
	H	L	d	H	H	H	q <sub>0</sub>	q <sub>1</sub>	q <sub>2</sub>	q <sub>3</sub>	q <sub>4</sub>	q <sub>5</sub>	q <sub>6</sub>	Q = d

H : High Voltage Level

L : Low Voltage Level

X : Immaterial

d : High or Low data one setup time prior to the Low-to-High Enable transition.

q : Lower case letters indicate the state of the referenced output established during the last cycle in which it was addressed or cleared.

## DC Characteristics (unless otherwise specified)

Item	Symbol	Max	Unit	Condition
Maximum quiescent supply current	I <sub>cc</sub>	80	μA	V <sub>IN</sub> = V <sub>CC</sub> or ground, V <sub>CC</sub> = 5.5 V, Ta = Worst case
Maximum quiescent supply current	I <sub>cc</sub>	8.0	μA	V <sub>IN</sub> = V <sub>CC</sub> or ground, V <sub>CC</sub> = 5.5 V, Ta = 25°C

## AC Characteristics: HD74AC259

Item	Symbol	V <sub>CC</sub> (V)*1	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	
Maximum clock frequency	f <sub>max</sub>	3.3	65	—	—	60	—	MHz
		5.0	110	—	—	95	—	
Propagation delay M $\bar{R}$ to Q <sub>n</sub>	t <sub>PHL</sub>	3.3	1.0	8.5	14.5	1.0	16.5	ns
		5.0	1.0	6.5	9.0	1.0	10.5	
Propagation delay D <sub>n</sub> to Q <sub>n</sub>	t <sub>PLH</sub>	3.3	1.0	7.0	10.5	1.0	12.0	ns
		5.0	1.0	5.5	7.5	1.0	8.5	
Propagation delay D <sub>n</sub> to Q <sub>n</sub>	t <sub>PHL</sub>	3.3	1.0	7.0	10.5	1.0	12.0	ns
		5.0	1.0	5.5	7.5	1.0	8.5	
Propagaion delay A <sub>n</sub> to Q <sub>n</sub>	t <sub>PLH</sub>	3.3	1.0	11.5	18.5	1.0	21.5	ns
		5.0	1.0	8.0	11.5	1.0	14.0	
Propagation delay A <sub>n</sub> to Q <sub>n</sub>	t <sub>PHL</sub>	3.3	1.0	11.5	18.5	1.0	21.0	ns
		5.0	1.0	8.0	11.5	1.0	13.5	
Propagation delay E $\bar{}$ to Q	t <sub>PLH</sub>	3.3	1.0	9.0	15.0	1.0	17.0	ns
		5.0	1.0	6.5	9.0	1.0	10.5	
Propagation delay E $\bar{}$ to Q <sub>n</sub>	t <sub>PHL</sub>	3.3	1.0	9.0	14.0	1.0	16.0	ns
		5.0	1.0	6.5	8.5	1.0	10.0	

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

**AC Operating Requirements: HD74AC259**

Item	Symbol	$V_{CC}$ (V)*1	$T_a = +25^\circ\text{C}$	$T_a = -40^\circ\text{C}$		Unit
			Typ	to $+85^\circ\text{C}$		
			$C_L = 50\text{ pF}$	$C_L = 50\text{ pF}$		
Setup time, HIGH or LOW	$t_{su}$	3.3	1.0	3.5	3.5	ns
D to $\bar{E}$		5.0	0.0	3.0	3.0	
Hold time, HIGH or LOW	$t_h$	3.3	0.5	2.0	2.0	ns
D to $\bar{E}$		5.0	0.5	2.0	2.0	
Setup time, HIGH or LOW	$t_{su}$	3.3	1.0	6.0	7.0	ns
$A_n$ to $\bar{E}$		5.0	0.0	4.5	5.0	
Hold time, HIGH or LOW	$t_h$	3.3	-3.0	0.0	0.0	ns
$A_n$ to $\bar{E}$		5.0	-1.0	0.0	0.0	
Pulse width	$t_w$	3.3	3.0	5.5	7.0	ns
		5.0	3.0	4.5	5.0	

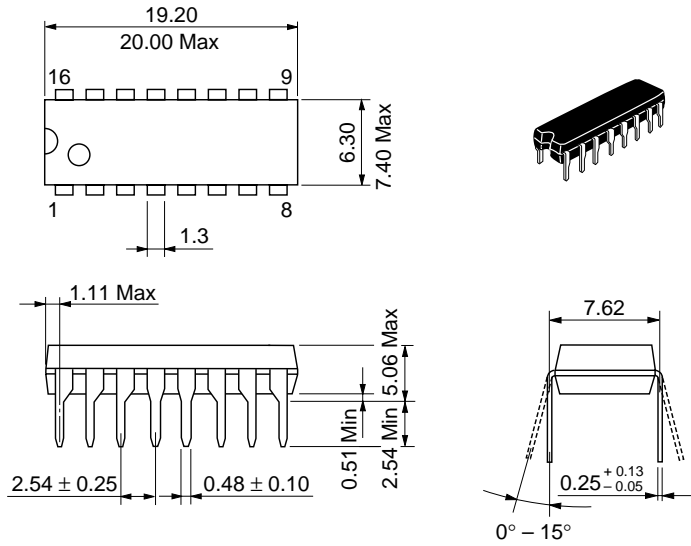
Note: 1. Voltage Range 3.3 is  $3.3\text{ V} \pm 0.3\text{ V}$   
Voltage Range 5.0 is  $5.0\text{ V} \pm 0.5\text{ V}$

**Capacitance**

Item	Symbol	Typ	Unit	Condition
Input capacitance	$C_{IN}$	4.5	pF	$V_{CC} = 5.5\text{ V}$
Power dissipation capacitance	$C_{PD}$	35	pF	$V_{CC} = 5.0\text{ V}$

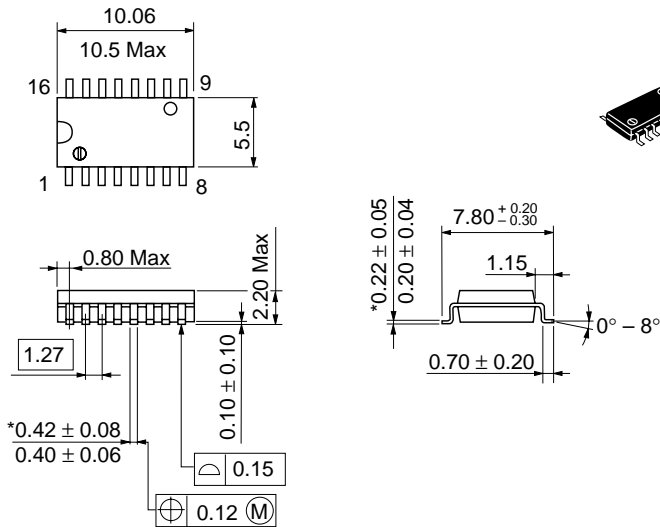
Package Dimensions

Unit: mm



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

Unit: mm



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

\*Dimension including the plating thickness  
Base material dimension



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