

# HD74AC259

## 8-bit Addressable Latch

REJ03D0264-0200Z  
(Previous ADE-205-385 (Z))  
Rev.2.00  
Jul.16.2004

### 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

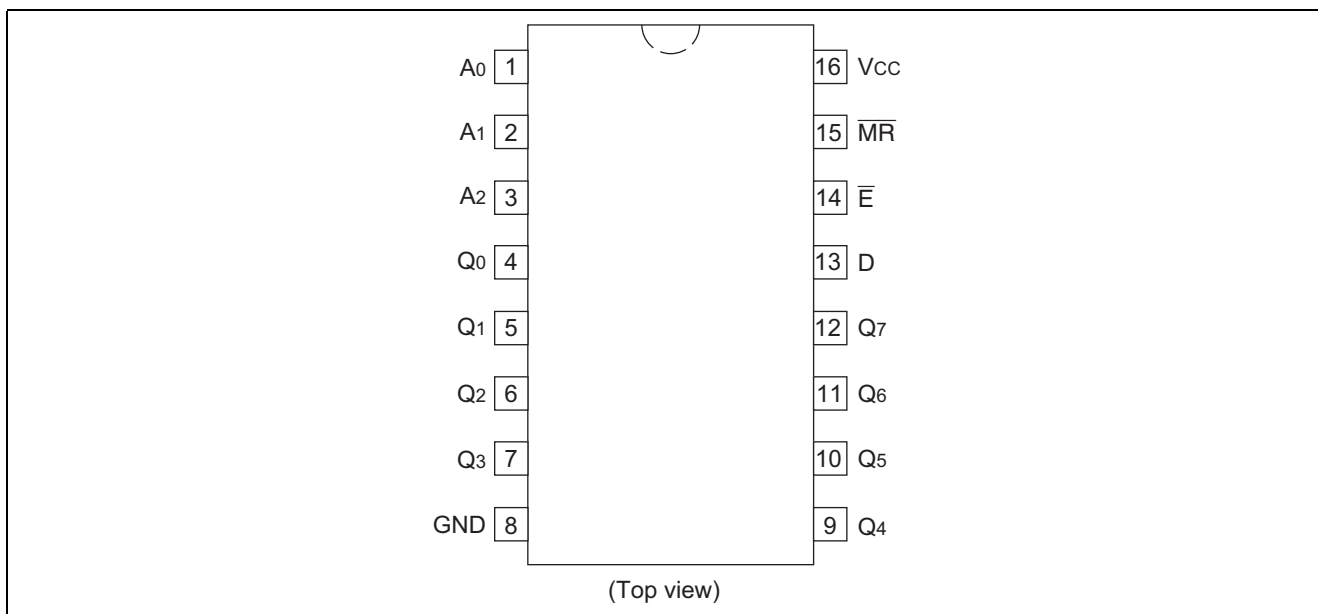
- Serial-to-Parallel Conversion
- Eight Bits of Storage with Output of Each Bit Available
- Random (Addressable) Data Entry
- Active High Demultiplexing or Decoding Capability
- Easily Expandable
- Common Clear
- Outputs Source/Sink 24 mA
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74AC259FPEL	SOP-16 pin (JEITA)	FP-16DAV	FP	EL (2,000 pcs/reel)
HD74AC259RPEL	SOP-16 pin (JEDEC)	FP-16DNV	RP	EL (2,500 pcs/reel)

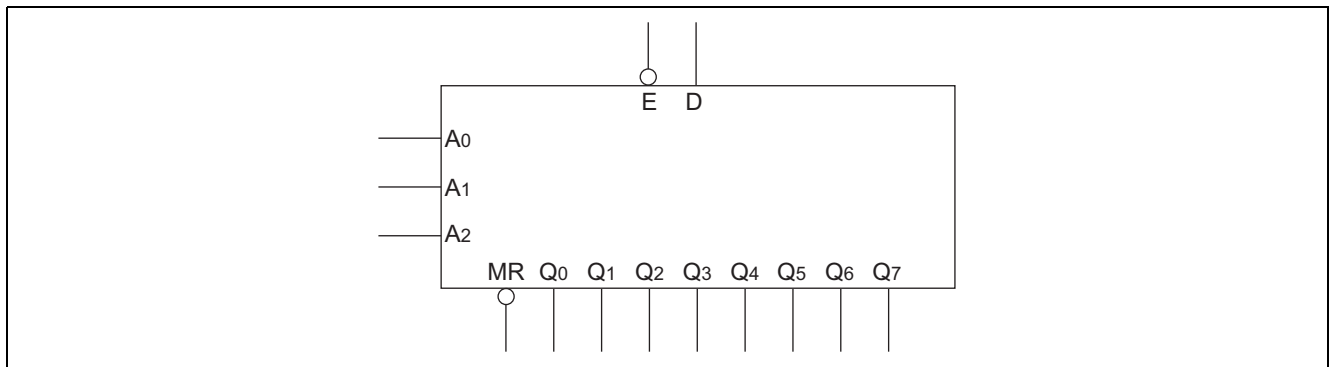
Notes: 1. Please consult the sales office for the above package availability.

2. The packages with lead-free pins are distinguished from the conventional products by adding V at the end of the package code.

### Pin Arrangement



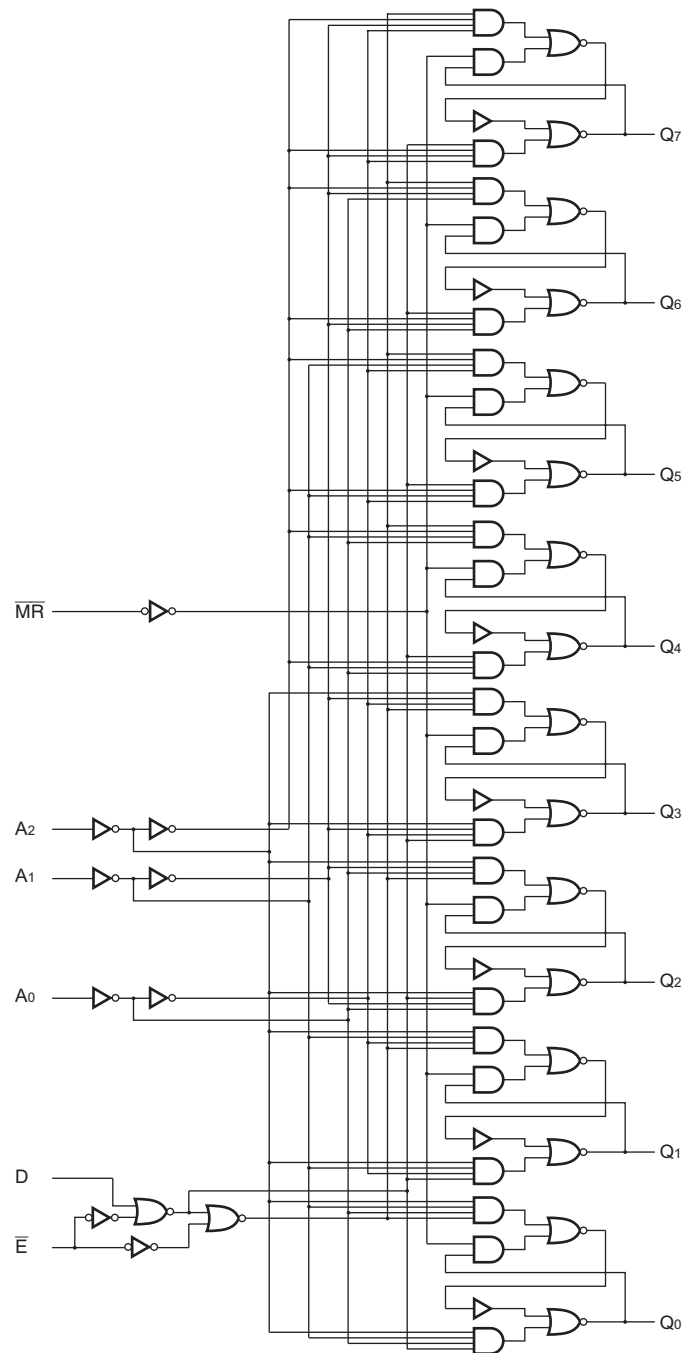
## Logic Symbol



## Pin Names

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

## 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 (Active HIGH Decoder when D = H)	L	L	d	L	L	L	Q = d	L	L	L	L	L	L	L
	L	L	d	H	L	L	L	Q = d	L	L	L	L	L	L
	L	L	d	L	H	L	L	L	Q = d	L	L	L	L	L
	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.

## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Condition
Supply voltage	V <sub>CC</sub>	−0.5 to 7	V	
DC input diode current	I <sub>IK</sub>	−20	mA	V <sub>I</sub> = −0.5V
		20	mA	V <sub>I</sub> = V <sub>CC</sub> +0.5V
DC input voltage	V <sub>I</sub>	−0.5 to V <sub>CC</sub> +0.5	V	
DC output diode current	I <sub>OK</sub>	−50	mA	V <sub>O</sub> = −0.5V
		50	mA	V <sub>O</sub> = V <sub>CC</sub> +0.5V
DC output voltage	V <sub>O</sub>	−0.5 to V <sub>CC</sub> +0.5	V	
DC output source or sink current	I <sub>O</sub>	±50	mA	
DC V <sub>CC</sub> or ground current per output pin	I <sub>CC</sub> , I <sub>GND</sub>	±50	mA	
Storage temperature	T <sub>stg</sub>	−65 to +150	°C	

## Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Condition
Supply voltage	V <sub>CC</sub>	2 to 6	V	
Input and output voltage	V <sub>I</sub> , V <sub>O</sub>	0 to V <sub>CC</sub>	V	
Operating temperature	T <sub>a</sub>	−40 to +85	°C	
Input rise and fall time (except Schmitt inputs) V <sub>IN</sub> 30% to 70% V <sub>CC</sub>	tr, tf	8	ns/V	V <sub>CC</sub> = 3.0V
				V <sub>CC</sub> = 4.5 V
				V <sub>CC</sub> = 5.5 V

## DC Characteristics

Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Condition
			min.	typ.	max.	min.	max.		
Input Voltage	V <sub>IH</sub>	3.0	2.1	1.5	—	2.1	—	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
		4.5	3.15	2.25	—	3.15	—		
		5.5	3.85	2.75	—	3.85	—		
	V <sub>IL</sub>	3.0	—	1.50	0.9	—	0.9		V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
		4.5	—	2.25	1.35	—	1.35		
		5.5	—	2.75	1.65	—	1.65		
Output voltage	V <sub>OH</sub>	3.0	2.9	2.99	—	2.9	—	V	V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OUT</sub> = -50 µA
		4.5	4.4	4.49	—	4.4	—		
		5.5	5.4	5.49	—	5.4	—		
		3.0	2.58	—	—	2.48	—		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OH</sub> = -12 mA
		4.5	3.94	—	—	3.80	—		
		5.5	4.94	—	—	4.80	—		
	V <sub>OL</sub>	3.0	—	0.002	0.1	—	0.1		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OUT</sub> = 50 µA
		4.5	—	0.001	0.1	—	0.1		
		5.5	—	0.001	0.1	—	0.1		
		3.0	—	—	0.32	—	0.37		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OL</sub> = 12 mA
		4.5	—	—	0.32	—	0.37		
		5.5	—	—	0.32	—	0.37		
		3.0	—	—	0.32	—	0.37		
		4.5	—	—	0.32	—	0.37		
		5.5	—	—	0.32	—	0.37		
Input leakage current	I <sub>IN</sub>	5.5	—	—	±0.1	—	±1.0	µA	V <sub>IN</sub> = V <sub>CC</sub> or GND
Dynamic output current*	I <sub>OLD</sub>	5.5	—	—	—	86	—	mA	V <sub>OLD</sub> = 1.1 V
	I <sub>OHD</sub>	5.5	—	—	—	-75	—	mA	V <sub>OHD</sub> = 3.85 V
Quiescent supply current	I <sub>CC</sub>	5.5	—	—	8.0	—	80	µA	V <sub>IN</sub> = V <sub>CC</sub> or ground

\*Maximum test duration 2.0 ms, one output loaded at a time.

## AC Characteristics

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	
Maximum clock frequency	f <sub>max</sub>	3.3	65	—	—	60	—	MHz
		5.0	110	—	—	95	—	
Propagation delay MR 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 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 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

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
			Typ	Guaranteed Minimum		
Setup time, HIGH or LOW D to $\bar{E}$	t <sub>su</sub>	3.3	1.0	3.5	3.5	ns
		5.0	0.0	3.0	3.0	
Hold time, HIGH or LOW D to $\bar{E}$	t <sub>h</sub>	3.3	0.5	2.0	2.0	ns
		5.0	0.5	2.0	2.0	
Setup time, HIGH or LOW A <sub>n</sub> to $\bar{E}$	t <sub>su</sub>	3.3	1.0	6.0	7.0	ns
		5.0	0.0	4.5	5.0	
Hold time, HIGH or LOW A <sub>n</sub> to $\bar{E}$	t <sub>h</sub>	3.3	−3.0	0.0	0.0	ns
		5.0	−1.0	0.0	0.0	
Pulse width	t <sub>w</sub>	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 V ± 0.3 V  
Voltage Range 5.0 is 5.0 V ± 0.5 V

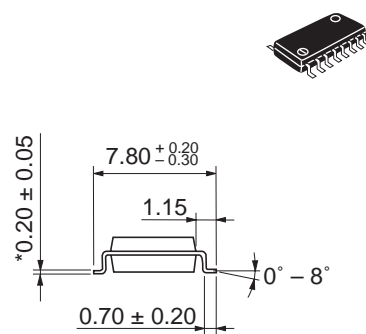
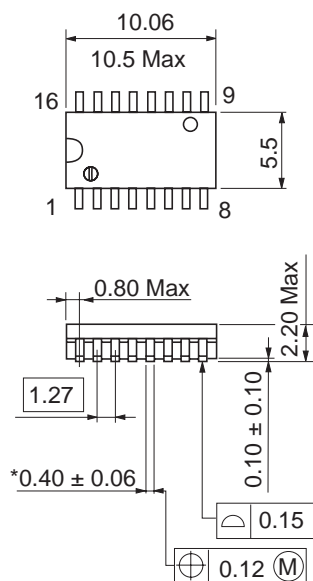
## Capacitance

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>	35	pF	V <sub>CC</sub> = 5.0 V

## Package Dimensions

As of January, 2003

Unit: mm

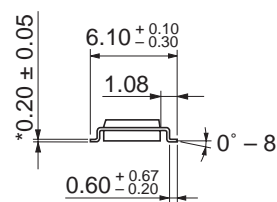
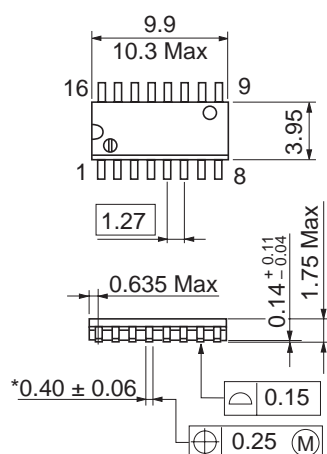


\*Ni/Pd/Au plating

Package Code	FP-16DAV
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.24 g

As of January, 2003

Unit: mm



\*Ni/Pd/Au plating

Package Code	FP-16DNV
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	0.15 g

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