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 or 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

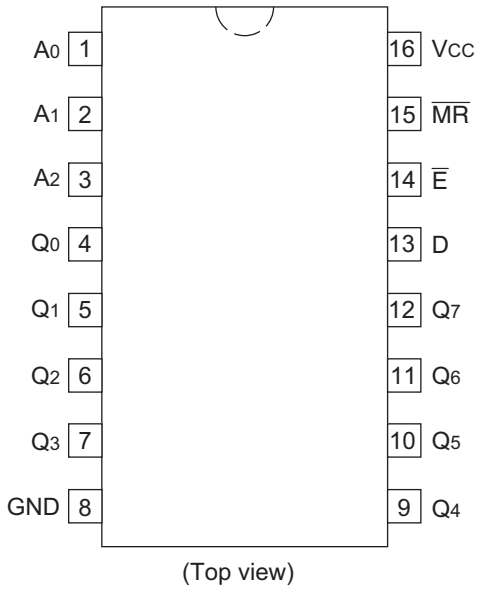
- Serial-to-Parallel Conversion
- Eight Bits of Storage with Output of Each Bit Available
- Random (Addressable) Data Entry
- Active High Demultiplexing or Decoding Capability
- Easily Expandable
- Common Clear
- Outputs Source/Sink 24 mA

- 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)

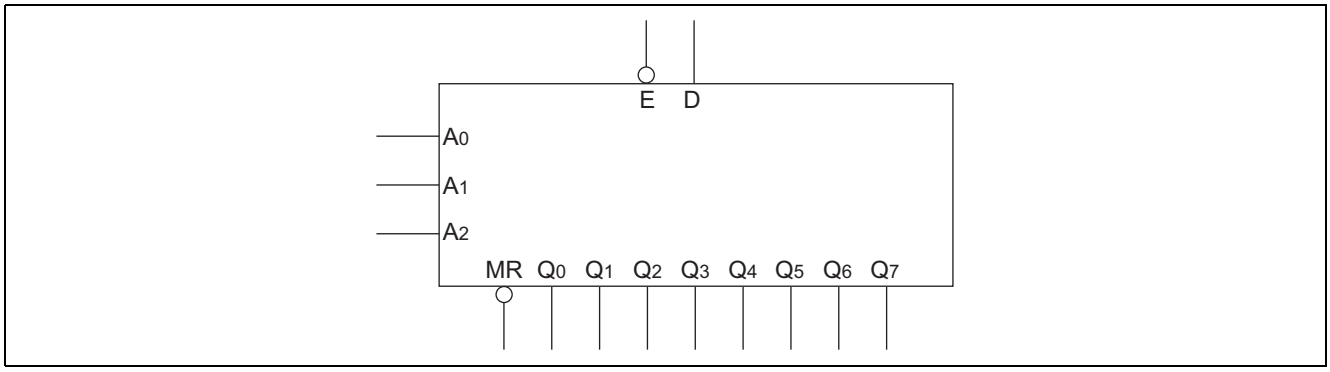
Notes: 1. Please consult the sales office for the above package availability.
2. The packages with lead-free pins are distinguished from the conventional products by adding V at the end of the package code.

Pin Arrangement



(Top view)

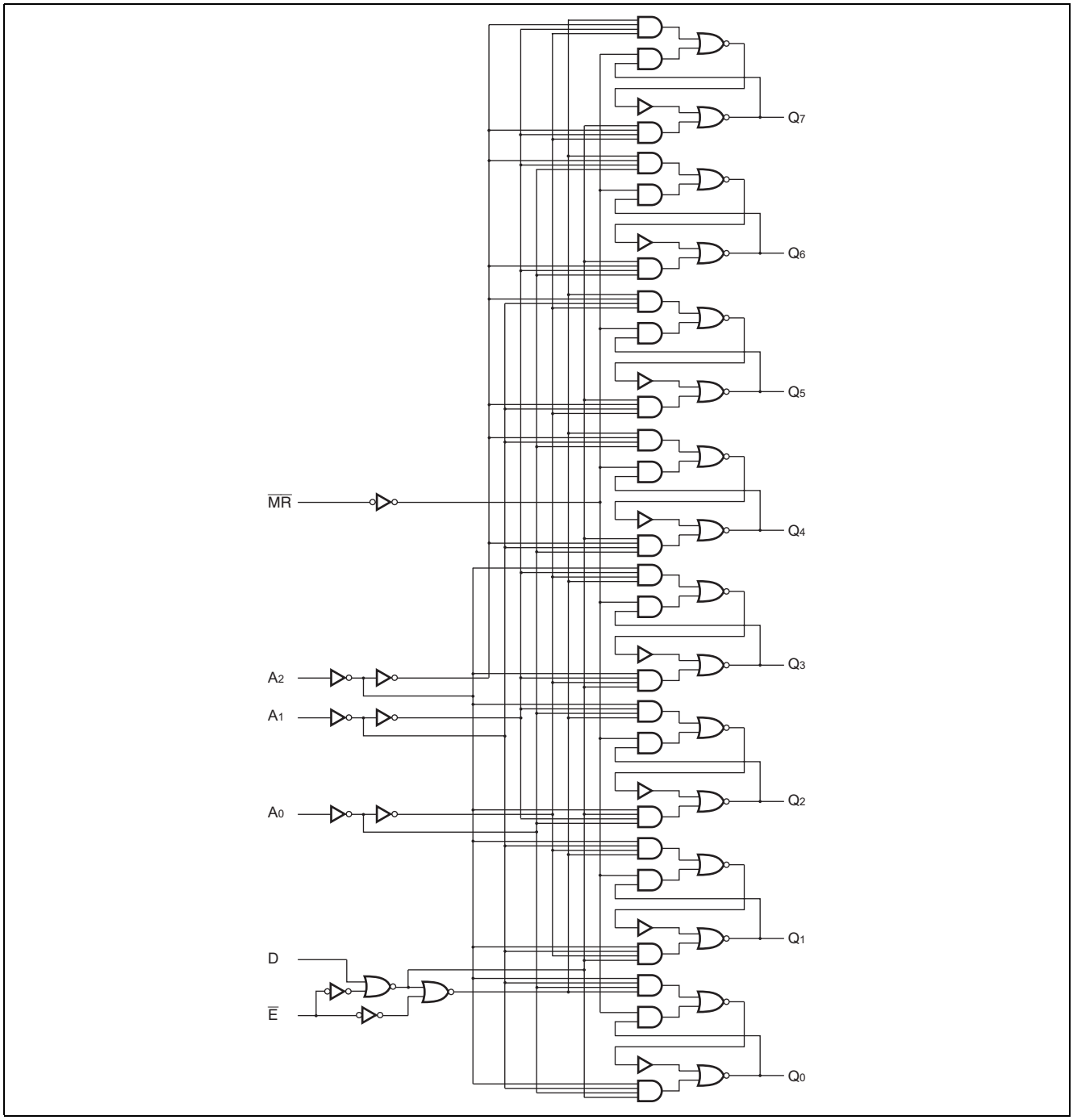
Logic Symbol



Pin Names

$A_0 – A_2$	Address Inputs
D	Data Inputs
$\overline{E}$	Enable Input (Active LOW)
$\overline{MR}$	Master Reset (Active LOW)
$Q_0 – Q_7$	Latch Outputs

Logic Diagram



Function Table

Operating Mode	Inputs						Outputs							
	$\overline{MR}$	$\overline{E}$	D	A_0	A_1	A_2	Q_0	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7
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_0	q_1	q_2	q_3	q_4	q_5	q_6	q_7
Addressable latch	H	L	d	L	L	L	Q = d	q_1	q_2	q_3	q_4	q_5	q_6	q_7
	H	L	d	H	L	L	q_0	Q = d	q_2	q_3	q_4	q_5	q_6	q_7
	H	L	d	L	H	L	q_0	q_1	Q = d	q_3	q_4	q_5	q_6	q_7
	H	L	d	H	H	L	q_0	q_1	q_2	Q = d	q_4	q_5	q_6	q_7
	H	L	d	L	L	H	q_0	q_1	q_2	q_3	Q = d	q_5	q_6	q_7
	H	L	d	H	L	H	q_0	q_1	q_2	q_3	q_4	Q = d	q_6	q_7
	H	L	d	L	H	H	q_0	q_1	q_2	q_3	q_4	q_5	Q = d	q_7
	H	L	d	H	H	H	q_0	q_1	q_2	q_3	q_4	q_5	q_6	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_{CC}	–0.5 to 7	V	
DC input diode current	I_{IK}	–20	mA	V_I = –0.5V
		20	mA	V_I = Vcc+0.5V
DC input voltage	V_I	–0.5 to Vcc+0.5	V	
DC output diode current	I_{OK}	–50	mA	V_O = –0.5V
		50	mA	V_O = Vcc+0.5V
DC output voltage	V_O	–0.5 to Vcc+0.5	V	
DC output source or sink current	I_O	±50	mA	
DC V_{CC} or ground current per output pin	I_{CC}, I_{GND}	±50	mA	
Storage temperature	Tstg	–65 to +150	°C	

Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Condition
Supply voltage	V_{CC}	2 to 6	V	
Input and output voltage	V_I, V_O	0 to V_{CC}	V	
Operating temperature	Ta	–40 to +85	°C	
Input rise and fall time (except Schmitt inputs) V_{IN} 30% to 70% V_{CC}	tr, tf	8	ns/V	V_{CC} = 3.0V
				V_{CC} = 4.5 V
				V_{CC} = 5.5 V

DC Characteristics

Item	Sym-bol	Vcc (V)	Ta = 25°C			Ta = –40 to +85°C		Unit	Condition	
			min.	typ.	max.	min.	max.			
Input Voltage	V_{IH}	3.0	2.1	1.5	—	2.1	—	V	V_{OUT} = 0.1 V or V_{CC} –0.1 V	
		4.5	3.15	2.25	—	3.15	—			
		5.5	3.85	2.75	—	3.85	—			
	V_{IL}	3.0	—	1.50	0.9	—	0.9		V_{OUT} = 0.1 V or V_{CC} –0.1 V	
		4.5	—	2.25	1.35	—	1.35			
		5.5	—	2.75	1.65	—	1.65			
Output voltage	V_{OH}	3.0	2.9	2.99	—	2.9	—	V	V_{IN} = V_{IL} or V_{IH} I_{OUT} = –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_{IN} = V_{IL} or V_{IH}	I_{OH} = –12 mA
		4.5	3.94	—	—	3.80	—			I_{OH} = –24 mA
		5.5	4.94	—	—	4.80	—			I_{OH} = –24 mA
	V_{OL}	3.0	—	0.002	0.1	—	0.1		V_{IN} = V_{IL} or V_{IH} I_{OUT} = 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_{IN} = V_{IL} or V_{IH}	I_{OL} = 12 mA
		4.5	—	—	0.32	—	0.37			I_{OL} = 24 mA
		5.5	—	—	0.32	—	0.37			I_{OL} = 24 mA
Input leakage current	I_{IN}	5.5	—	—	±0.1	—	±1.0	µA	V_{IN} = V_{CC} or GND	
Dynamic output current*	I_{OLD}	5.5	—	—	—	86	—	mA	V_{OLD} = 1.1 V	
	I_{OHD}	5.5	—	—	—	–75	—	mA	V_{OHD} = 3.85 V	
Quiescent supply current	I_{CC}	5.5	—	—	8.0	—	80	µA	V_{IN} = V_{CC} or ground	

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

AC Characteristics

Item	Symbol	V_{CC} (V)*[1]	Ta = +25°C C_L = 50 pF			Ta = –40°C to +85°C C_L = 50 pF		Unit
			Min	Typ	Max	Min	Max	
Maximum clock frequency	f_{max}	3.3	65	—	—	60	—	MHz
		5.0	110	—	—	95	—	
Propagation delay $\overline{MR}$ to Q_n	t_{PHL}	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_n to Q_n	t_{PLH}	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_n to Q_n	t_{PHL}	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_n to Q_n	t_{PLH}	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_n to Q_n	t_{PHL}	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 $\overline{E}$ to Q	t_{PLH}	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 $\overline{E}$ to Q_n	t_{PHL}	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_{CC} (V)*[1]	Ta = +25°C C_L = 50 pF		Ta = –40°C to +85°C C_L = 50 pF	Unit
			Typ	Guaranteed Minimum		
Setup time, HIGH or LOW D to $\overline{E}$	t_{su}	3.3	1.0	3.5	3.5	ns
		5.0	0.0	3.0	3.0	
Hold time, HIGH or LOW D to $\overline{E}$	t_h	3.3	0.5	2.0	2.0	ns
		5.0	0.5	2.0	2.0	
Setup time, HIGH or LOW A_n to $\overline{E}$	t_{su}	3.3	1.0	6.0	7.0	ns
		5.0	0.0	4.5	5.0	
Hold time, HIGH or LOW A_n to $\overline{E}$	t_h	3.3	–3.0	0.0	0.0	ns
		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 V ± 0.3 V
Voltage Range 5.0 is 5.0 V ± 0.5 V

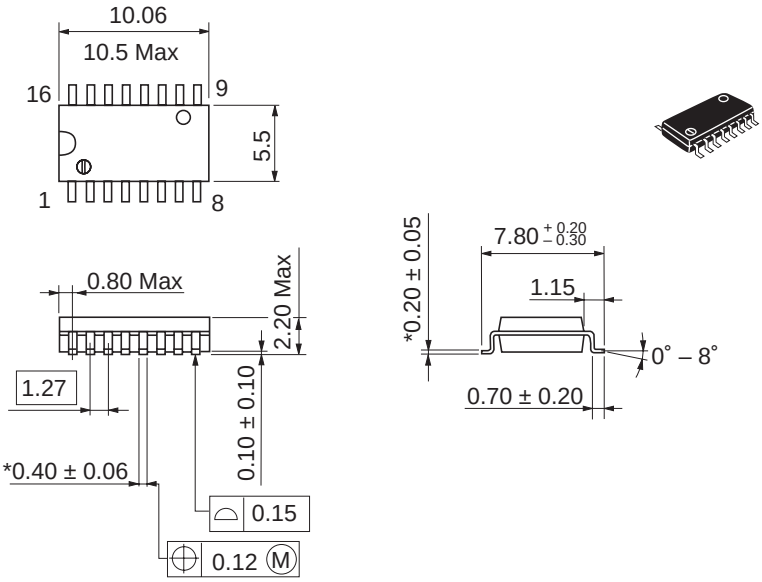
Capacitance

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

Package Dimensions

As of January, 2003

Unit: mm

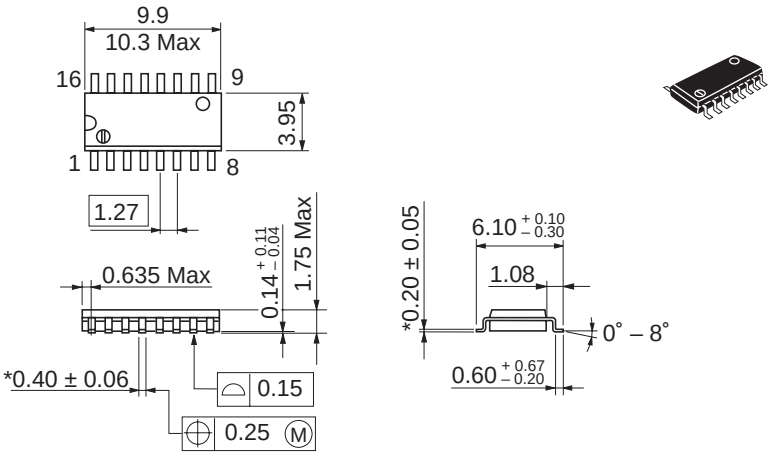


Package Code	FP-16DAV
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.24 g

*Ni/Pd/Au plating

As of January, 2003

Unit: mm



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

*Ni/Pd/Au plating

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

RENESAS SALES OFFICES

http://www.renesas.com

Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500 Fax: <1> (408) 382-7501

Renesas Technology Europe Limited.
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, United Kingdom
Tel: <44> (1628) 585 100, Fax: <44> (1628) 585 900

Renesas Technology Europe GmbH
Dornacher Str. 3, D-85622 Feldkirchen, Germany
Tel: <49> (89) 380 70 0, Fax: <49> (89) 929 30 11

Renesas Technology Hong Kong Ltd.
7/F., North Tower, World Finance Centre, Harbour City, Canton Road, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2375-6836

Renesas Technology Taiwan Co., Ltd.
FL 10, #99, Fu-Hsing N. Rd., Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.
26/F., Ruijin Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.
1, Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Colophon .1.0