

# HD74AC368

## Hex Inverter Buffer with 3-State Output

REJ03D0272-0200Z  
 (Previous ADE-205-393 (Z))  
 Rev.2.00  
 Jul.16.2004

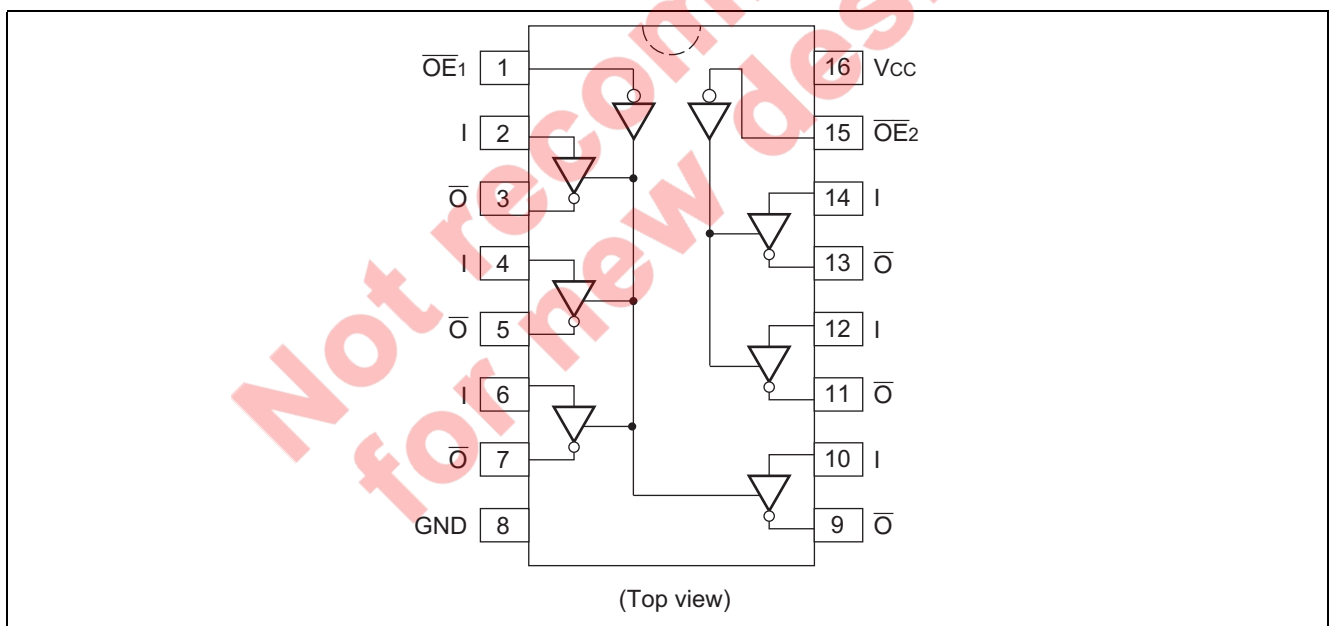
### Features

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Outputs Source/Sink 24 mA
- Ordering Information

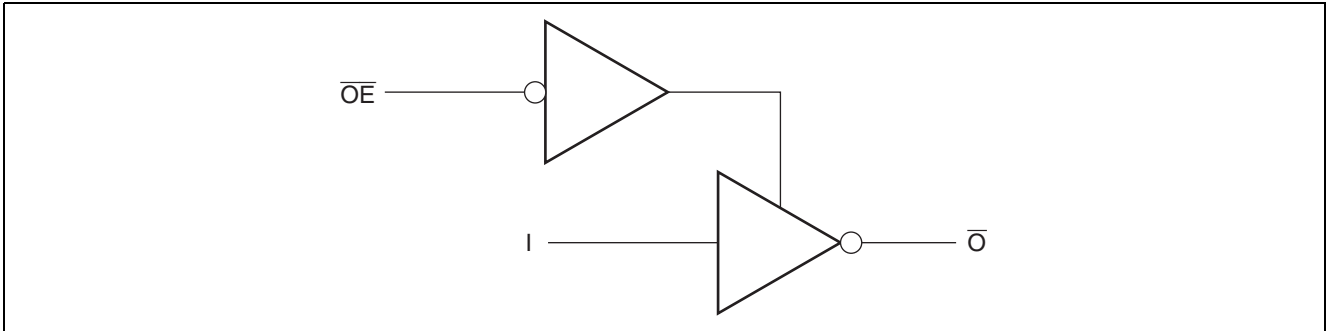
Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74AC368FPEL	SOP-16 pin (JEITA)	FP-16DAV	FP	EL (2,000 pcs/reel)
HD74AC368RPEL	SOP-16 pin (JEDEC)	FP-16DNV	RP	EL (2,500 pcs/reel)

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**

- $\overline{OE}_1, \overline{OE}_2$  3-State Output: Enable Input (Active Low)
- I Inputs
- O Outputs

**Truth Table**

Inputs		Output
$\overline{OE}$	I	$\overline{O}$
L	L	H
L	H	L
H	X	Z

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

**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	$V_I = V_{CC}+0.5V$
DC input voltage	$V_I$	-0.5 to $V_{CC}+0.5$	V	
DC output diode current	$I_{OK}$	-50	mA	$V_O = -0.5V$
		50	mA	$V_O = V_{CC}+0.5V$
DC output voltage	$V_O$	-0.5 to $V_{CC}+0.5$	V	
DC output source or sink current	$I_O$	$\pm 50$	mA	
DC $V_{CC}$ or ground current per output pin	$I_{CC}, I_{GND}$	$\pm 50$	mA	
Storage temperature	$T_{stg}$	-65 to +150	$^{\circ}C$	

**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	$T_a$	-40 to +85	$^{\circ}C$	
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	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	—				I <sub>OH</sub> = -24 mA
		5.5	4.94	—	—	4.80	—				I <sub>OH</sub> = -24 mA
	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			I <sub>OL</sub> = 24 mA	
		5.5	—	—	0.32	—	0.37			I <sub>OL</sub> = 24 mA	
Input leakage current	I <sub>IN</sub>	5.5	—	—	±0.1	—	±1.0	μA	V <sub>IN</sub> = V <sub>CC</sub> or GND		
3 State current	I <sub>OZ</sub>	5.5	—	—	±0.5	—	±5.0	μA	V <sub>IN(OE)</sub> = V <sub>IL</sub> , V <sub>IH</sub> V <sub>IN</sub> = V <sub>CC</sub> or GND V <sub>OUT</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)*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	
Propagation delay	t <sub>PLH</sub>	3.3	1.0	7.0	9.0	1.0	10.0	ns
		5.0	1.0	5.0	7.0	1.0	7.5	
Propagation delay	t <sub>PHL</sub>	3.3	1.0	7.0	9.0	1.0	10.0	ns
		5.0	1.0	4.5	7.0	1.0	7.5	
Enable time	t <sub>ZH</sub>	3.3	1.0	9.0	13.0	1.0	13.5	ns
		5.0	1.0	7.0	9.5	1.0	10.0	
Enable time	t <sub>ZL</sub>	3.3	1.0	10.0	12.5	1.0	13.5	ns
		5.0	1.0	7.5	10.0	1.0	10.5	
Disable time	t <sub>HZ</sub>	3.3	1.0	9.5	12.0	1.0	12.5	ns
		5.0	1.0	7.5	10.0	1.0	10.5	
Disable time	t <sub>LZ</sub>	3.3	1.0	9.0	12.5	1.0	13.5	ns
		5.0	1.0	7.0	10.0	1.0	10.5	

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

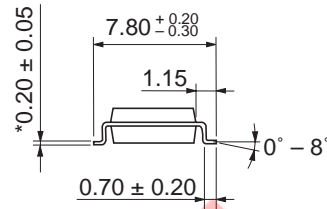
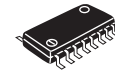
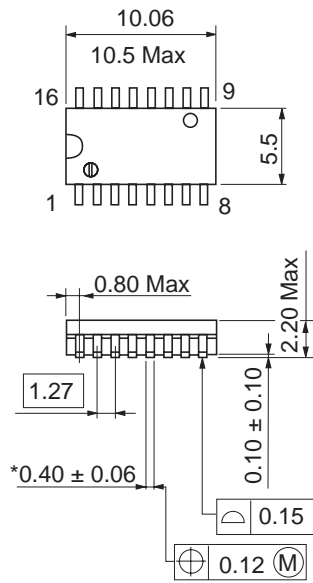
**Capacitance**

Item	Symbol	Typ	Unit	Condition
Input capacitance	$C_{IN}$	4.5	pF	$V_{CC} = 5.5 \text{ V}$
Power dissipation capacitance	$C_{PD}$	40.0	pF	$V_{CC} = 5.0 \text{ V}$

Not recommend  
for new design

Package Dimensions

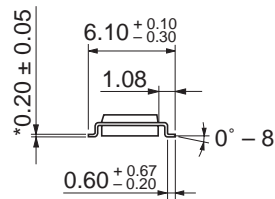
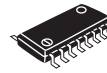
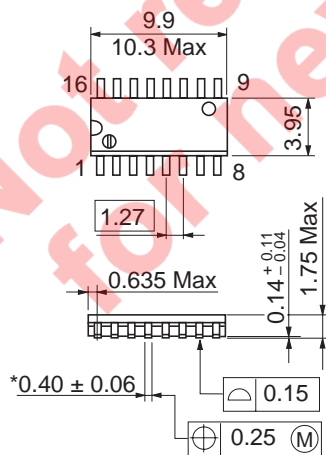
As of January, 2003  
Unit: mm



\*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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