PERICOM

PI74ALVCH16244

16-Bit Buffer Driver with 3-State Outputs

Product Features

- PI74ALVCH16244 is designed for low-voltage operation
- V_{CC} = 2.3V to 3.6V
- Hysteresis on all inputs
- Typical V_{OLP} (Output Ground Bounce) < 0.8V at V_{CC} = 3.3V, T_A = 25°C
- Typical V_{OHV} (Output V_{OH} Undershoot) < 2.0V at V_{CC} = 3.3V, T_A = 25°C
- Bus Hold retains last active bus state during 3-State, eliminating the need for external pullup resistors
- Industrial operation at –40°C to +85°C
- Packages available:
  – 48-pin 240 mil wide plastic TSSOP (A)
  – 48-pin 300 mil wide plastic SSOP (V)

Product Description

Pericom Semiconductor's PI74ALVCH series of logic circuits are produced using the Company's advanced 0.5 micron CMOS technology, achieving industry leading speed.

The PI74ALVCH16244 is an non-inverting 16-bit buffer/driver designed for low-voltage 2.3V to 3.6V V_{CC} operation.

The buffer/driver is designed specifically to improve both the performance and density of 3-State memory address drivers, clock drivers, and bus-oriented receivers and transmitters.

The device can be used as four 4-bit buffers, two 8-bit buffers, or one 16-bit buffer. It provides inverting outputs and symmetrical active-low output-enable ($\overline{OE}$) inputs.

To ensure the high-impedance state during power up or power down, $\overline{OE}$ should be tied to V_{CC} through a pullup resistor in which the minimum value is determined by the current-sinking capability of the driver.

The PI74ALVCH16244 has "Bus Hold" which retains the data input's last state whenever the data input goes to high-impedance preventing "floating" inputs and eliminating the need for pullup/down resistors.

Logic Block Diagram
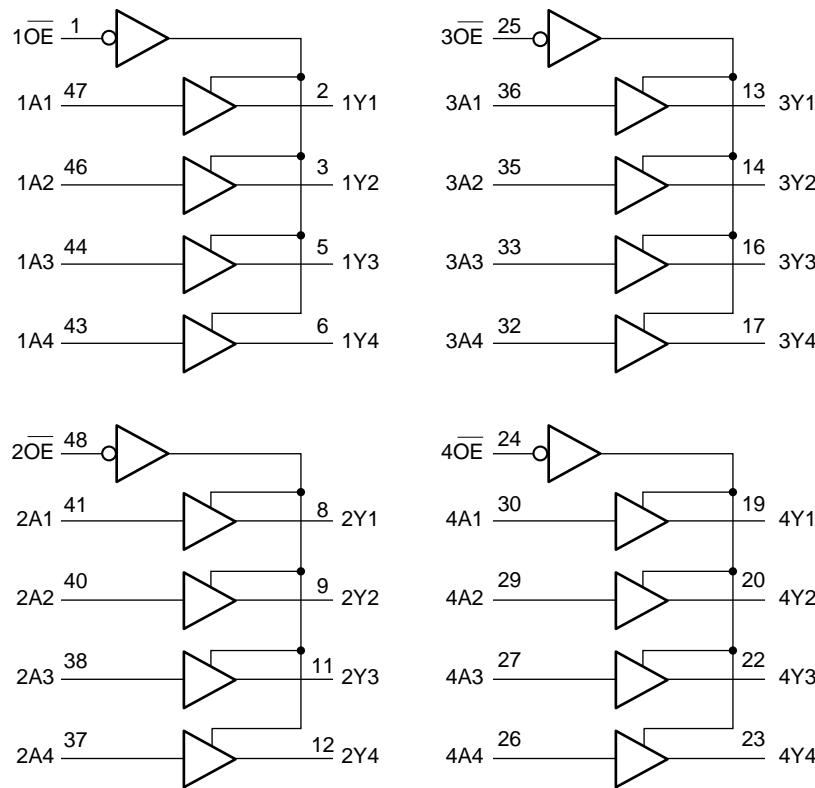
Product Pin Description

Pin Name	Description
nOE	3-State Output Enable Inputs (Active LOW)
nAx	Inputs
nYx	3-State Outputs
GND	Ground
V_{CC}	Power

Truth Table[1]

Inputs		Outputs
nOE	nAx	nYx
L	H	H
L	L	L
H	X	Z

Notes:
1. H = High Signal Level
   L = Low Signal Level
   X = Don't Care or Irrelevant
   Z = High Impedance

Product Pin Configuration

Left	Pin		Pin	Right
1OE	1		48	2OE
1Y1	2		47	1A1
1Y2	3		46	1A2
GND	4		45	GND
1Y3	5		44	1A3
1Y4	6		43	1A4
V_{CC}	7		42	V_{CC}
2Y1	8		41	2A1
2Y2	9		40	2A2
GND	10		39	GND
2Y3	11		38	2A3
2Y4	12		37	2A4
3Y1	13		36	3A1
3Y2	14		35	3A2
GND	15		34	GND
3Y3	16		33	3A3
3Y4	17		32	3A4
V_{CC}	18		31	V_{CC}
4Y1	19		30	4A1
4Y2	20		29	4A2
GND	21		28	GND
4Y3	22		27	4A3
4Y4	23		26	4A4
4OE	24		25	3OE

48-Pin A,V

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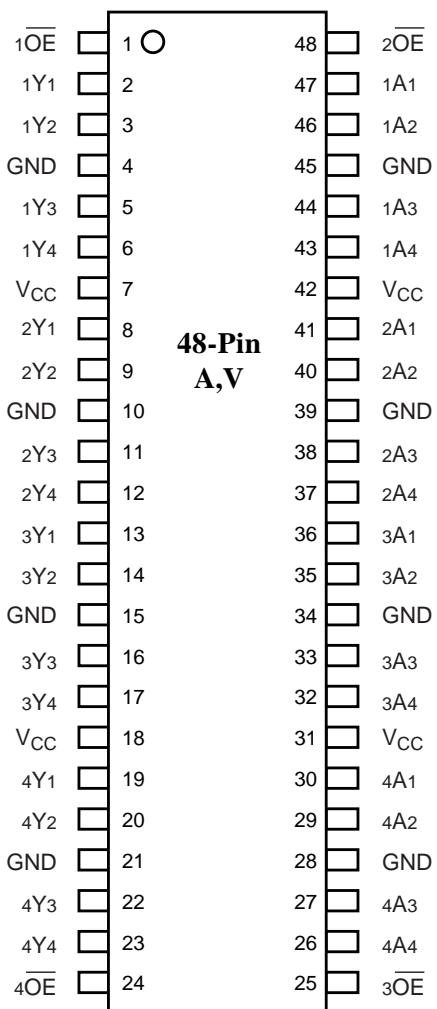
Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature .... –65°C to +150°C
Ambient Temperature with Power Applied .... –40°C to +85°C
Input Voltage Range, V_{IN} .... –0.5V to V_{CC} +0.5V
Output Voltage Range, V_{OUT} .... –0.5V to V_{CC} +0.5V
DC Input Voltage .... –0.5V to +5.0V
DC Output Current 100mA
Power Dissipation 1.0W

Note:
Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

DC Electrical Characteristics (Over the Operating Range, $T_A = -40°C$ to $+85°C$, $V_{CC} = 3.3V \pm 10\%$)

Parameters	Description	Test Conditions[1]	Min.	Typ.[2]	Max.	Units
V_{CC}	Supply Voltage		2.3		3.6	
V_{IH}[3]	Input HIGH Voltage	V_{CC} = 2.3V to 2.7V	1.7			
		V_{CC} = 2.7V to 3.6V	2.0			
V_{IL}[3]	Input LOW Voltage	V_{CC} = 2.3V to 2.7V			0.7	
		V_{CC} = 2.7V to 3.6V			0.8	
V_{IN}[3]	Input Voltage		0		V_{CC}	
V_{OUT}[3]	Output Voltage		0		V_{CC}	
V_{OH}	Output HIGH Voltage	$I_{OH} = -100\mu A$, V_{CC} = Min. to Max.	V_{CC} -0.2			V
		V_{IH} = 1.7V, $I_{OH} = -6mA$, V_{CC} = 2.3V	2.0			
		V_{IH} = 1.7V, $I_{OH} = -12mA$, V_{CC} = 2.3V	1.7			
		V_{IH} = 2.0V, $I_{OH} = -12mA$, V_{CC} = 2.7V	2.2			
		V_{IH} = 2.0V, $I_{OH} = -12mA$, V_{CC} = 3.0V	2.4			
		V_{IH} = 2.0V, $I_{OH} = -24mA$, V_{CC} = 3.0V	2.0			
V_{OL}	Output LOW Voltage	$I_{OL} = 100\mu A$, V_{IL} = Min. to Max.			0.2	
		V_{IL} = 0.7V, $I_{OL} = 6mA$, V_{CC} = 2.3V			0.4	
		V_{IL} = 0.7V, $I_{OL} = 12mA$, V_{CC} = 2.3V			0.7	
		V_{IL} = 0.8V, $I_{OL} = 12mA$, V_{CC} = 2.7V			0.4	
		V_{IL} = 0.8V, $I_{OL} = 24mA$, V_{CC} = 3.0V			0.55	
I_{OH}[3]	Output HIGH Current	V_{CC} = 2.3V			–12	mA
		V_{CC} = 2.7V			–12	
		V_{CC} = 3.0V			–24	
I_{OL}[3]	Output LOW Current	V_{CC} = 2.3V			12	
		V_{CC} = 2.7V			12	
		V_{CC} = 3.0V			24	

DC Electrical Characteristics-Continued (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 3.3V ±10%)

Parameters	Description	Test Conditions[1]	Min.	Typ.[2]	Max.	Units
I_{IN}	Input Current	$V_{IN} = V_{CC}$ or GND, $V_{CC} = 3.6V$			±5	
I_{IN} (HOLD)	Input Hold Current	$V_{IN} = 0.7V$, $V_{CC} = 2.3V$	45			
		$V_{IN} = 1.7V$, $V_{CC} = 2.3V$	–45			
		$V_{IN} = 0.8V$, $V_{CC} = 3.0V$	75			
		$V_{IN} = 2.0V$, $V_{CC} = 3.0V$	–75			
		V_{IN} = 0 to 3.6V, $V_{CC} = 3.6V$			±500	μA
I_{OZ}	Output Current (3-State Outputs)	$V_{OUT} = V_{CC}$ or GND, $V_{CC} = 3.6V$			±10	
I_{CC}	Supply Current	$V_{CC} = 3.6V$, $I_{OUT} = 0μA$, V_{IN} = GND or V_{CC}			40	
ΔI_{CC}	Supply Current per Input @ TTL HIGH	$V_{CC} = 3.0V$ to 3.6V One Input at V_{CC} - 0.6V Other Inputs at V_{CC} or GND			750	
C_I	Control Inputs	$V_{IN} = V_{CC}$ or GND, $V_{CC} = 3.3V$		3		pF
	Data Inputs			6		
C_O	Outputs	$V_O = V_{CC}$ or GND, $V_{CC} = 3.3V$		7		

Notes:
1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V_{CC} = 3.3V, +25°C ambient and maximum loading.
3. Unused Control Inputs must be held HIGH or LOW to prevent them from floating.

Switching Characteristics over Operating Range[1]

Parameters	From (INPUT)	To (OUTPUT)	$V_{CC} = 2.5V \pm 0.2V$		$V_{CC} = 2.7V$		$V_{CC} = 3.3V \pm 0.3V$		Units
			Min.[2]	Max.	Min.[2]	Max.	Min.[2]	Max.	
t_{PD}	A	Y	1.0	3.7		3.6	1.0	3.0	ns
t_{EN}	$\overline{OE}$	Y	1.0	5.7		5.4	1.0	4.4	
t_{DIS}	$\overline{OE}$	Y	1.0	5.2		4.6	1.0	4.1	
	Description								
$\Delta t/\Delta v$[3]	Input Transition Rise or Fall		0	10	0	10	0	10	ns/V

Notes:
1. See test circuit and waveforms.
2. Minimum limits are guaranteed but not tested on Propagation Delays.
3. Recommended operating condition.

Operating Characteristics, T_A = 25°C

Parameter		Test Conditions	$V_{CC} = 2.5V \pm 0.2V$	$V_{CC} = 3.3V \pm 0.3V$	Units
			Typical		
C_{PD} Power Dissipation Capacitance	Outputs Enabled	CL = 50pF f = 10 MHz	16	19	pF
	Outputs Disabled		4	5	

PS8087B   07/28/00