PI74ALVCH16863

18-Bit Transceiver with 3-State Outputs

Product Features

· PI74ALVCH16863 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:
– 56-pin 240 mil wide plastic TSSOP (A)
– 56-pin 300 mil wide plastic SSOP (V)

Product Description

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

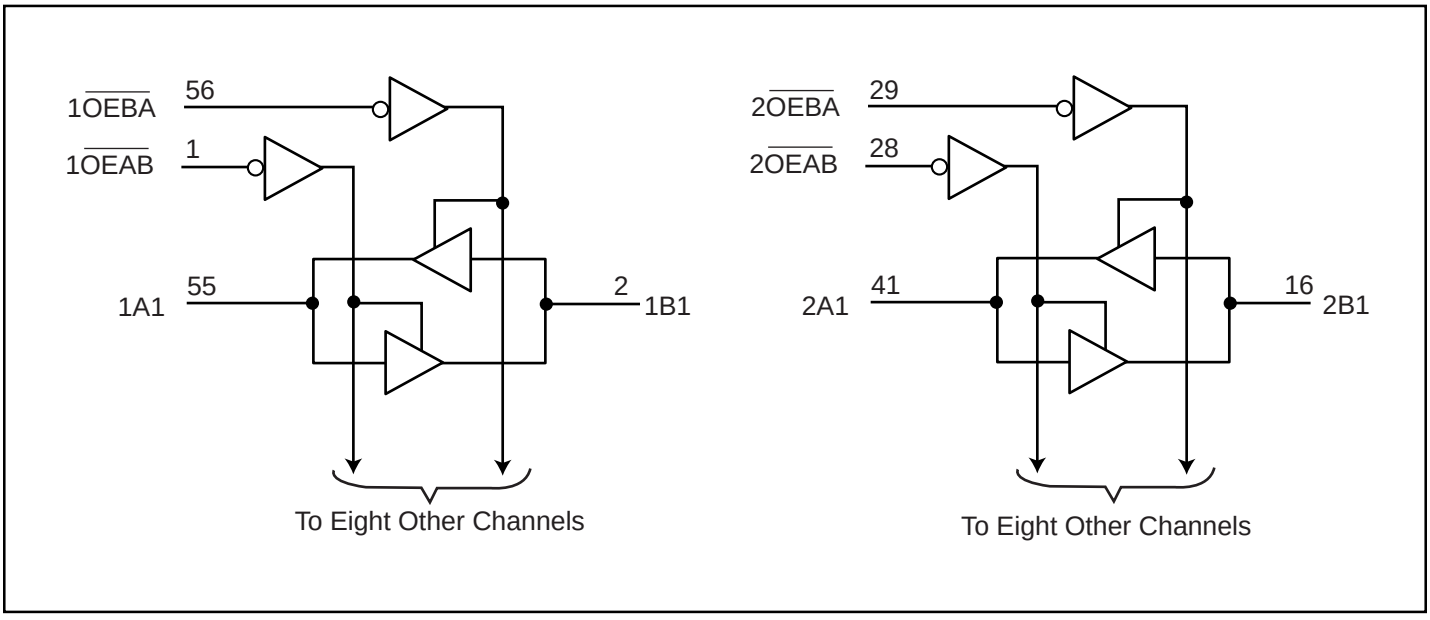
The PI74ALVCH16863 is an 18-bit noninverting transceiver designed for synchronous communication between data buses. The control-function implementation minimizes external timing requirements.

The PI74ALCH16863 can be used as two 9-bit transceivers or one 18-bit transceiver. They allow data transmission from the A bus to the B bus or from the B bus to the A bus, depending on the logic level at the output-enable ($\overline{OEAB}$ or $\overline{OEBA}$) inputs.

To ensure the high-impedance state during power up or power down, OE should be tied to Vcc through a pull-up resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

The PI74ALVCH16863 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

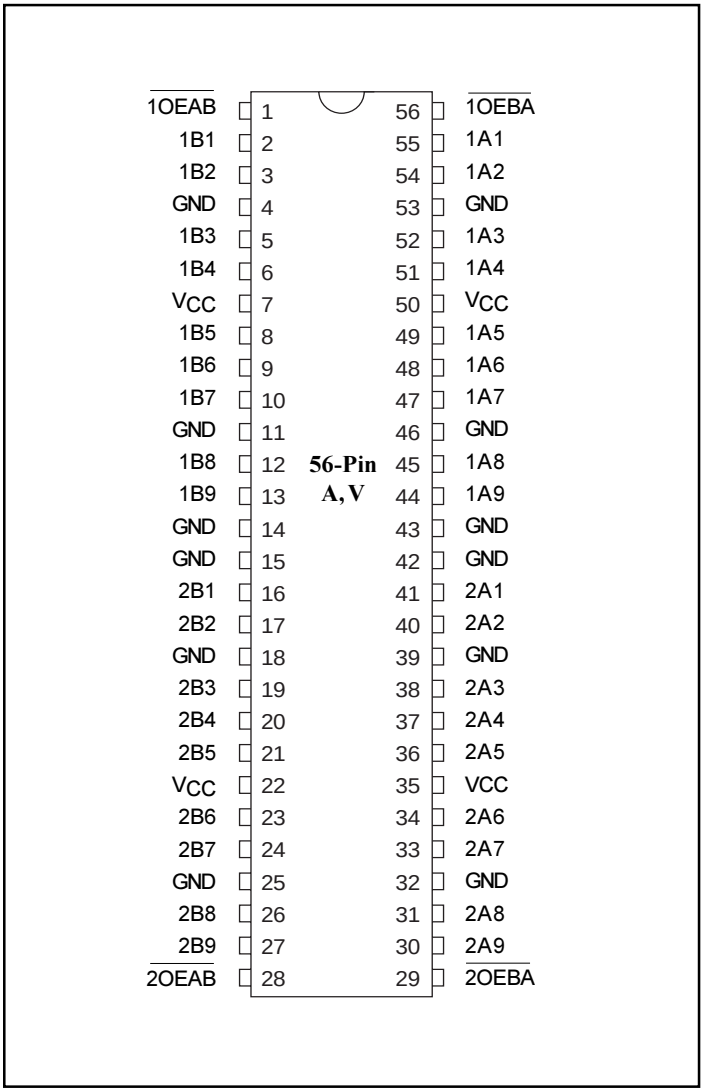
Pin Name	Description
$\overline{OE}$xx	Output Enable Input (Active LOW)
Ax	Data I/O
Bx	Data I/O
GND	Ground
VCC	Power

Truth Table[1]†

Inputs		Output B
$\overline{OEAB}$	$\overline{OEBA}$	
H	L	B data to A bus
L	H	A data to B bus
H	H	High Impedance

Note:
1. H = High Signal Level
   L = Low Signal Level
   Z = High Impedance
   ↑ = LOW-to-HIGH Transition

Product Pin Configuration



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.

Recommended Operating Conditions(1)

Parameters	Description	Test Conditions	Min.	Typ.	Max.	Units
V_{CC}	Supply Voltage		2.3		3.6	V
V_{IH}	Input HIGH Voltage	V_{CC} = 2.3V to 2.7V	1.7			
		V_{CC} = 2.7V to 3.6V	2.0			
V_{IL}	Input LOW Voltage	V_{CC} = 2.3V to 2.7V			0.7	
		V_{CC} = 2.7V to 3.6V			0.8	
V_{IN}	Input Voltage		0		V_{CC}	
V_{OUT}	Output Voltage		0		V_{CC}	
I_{OH}	High-level Output Current	V_{CC} = 2.3V			-12	mA
		V_{CC} = 2.7V			-12	
		V_{CC} = 3.0V			-24	
I_{OL}	Low-level Output Current	V_{CC} = 2.3V			12	
		V_{CC} = 2.7V			12	
		V_{CC} = 3.0V			24	
T_A	Operating Free-Air Temperature		-40		85	°C
$\Delta t/\Delta v$	Input Transition Rise or Fall		0		10	ns/V

Note:
1. Unused control inputs must be held HIGH or LOW to prevent them from floating.

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

Parameters		Test Conditions		V_{CC}[1]	Min.	Typ.[2]	Max.	Units
V_{OH}		I_{OH} = -100 µA		Min. to Max.	V_{CC} -0.2			V
		I_{OH} = -6 MA	V_{IH} = 1.7V	2.3V	2.0			
		I_{OH} = -12 mA	V_{IH} = 1.7V	2.3V	1.7			
			V_{IH} = 2.0V	2.7V	2.2			
			V_{IH} = 2.0V	3.0V	2.4			
		I_{OH} = -24 MA	V_{IH} = 2.0V	3.0V	2.0			
V_{OL}		I_{OL} = 100 µA		Min. to Max.			0.2	V
		I_{OL} = 6 mA	V_{IL} = 0.7V	2.3V			0.4	
		I_{OL} = 12 MA	V_{IL} = 0.7V	2.3V			0.7	
			V_{IL} = 0.8V	2.7V			0.4	
		I_{OL} = 24 mA	V_{IL} = 0.8V	3.0V			0.55	
I_I		V_I = V_{CC} or GND		3.6V			±5	µA
I_I (Hold)[3]		V_I = 0.7V		2.3V	45			
		V_I = 1.7V			-45			
		V_I = 0.8V		3.0V	75			
		V_I = 2.0V			-75			
		V_I = 0 to 3.6V		3.6V			±500	
I_{OZ}[4]		V_O = V_{CC} or GND		3.6V			±10	
I_{CC}		V_I = V_{CC} or GND	I_O = 0	3.6V			40	
ΔI_{CC}		One input at V_{CC} - 0.6V, Other inputs at V_{CC} or GND		3V to 3.6V			750	
C_I	Control Inputs	V_I = V_{CC} or GND		3.3V		3.5		pF
	Data Inputs					6		
C_{IO}	A or B ports	V_O = V_{CC} or GND		3.3V		7.5		pF

Notes:

1. For Max. or Min. conditions, 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. Bus Hold maximum dynamic current required to switch the input from one state to another.
4. For I/O ports, the I_{OZ} includes the input leakage current.

Switching Characteristics Over Operating Range[1]

Parameters	From (Input)	To (Output)	V_{CC} = 2.5V ± 0.2V		V_{CC} = 2.7V		V_{CC} = 3.3V ± 0.V		Units
			Min.[2]	Max.	Min.[2]	Max.	Min.[2]	Max.	
t_{PD}	A or B	B or A	1.0	4.1		4	1	3.4	ns
t_{EN}	$\overline{OEAB}$ or $\overline{OEBA}$	A or B	1.0	5.7		5.8	1.0	4.7	
t_{DIS}	$\overline{OEAB}$ or $\overline{OEBA}$	A or B	1.3	5.5		4.7	1.4	4.2	

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

Operating Characteristics, T_A = 25°C

Parameter		Test Conditions	V_{CC} = 2.5V ± 0.2V	V_{CC} = 3.3V ± 0.3V	Units
			Typical		
C_{PD} Power Dissipation Capacitance	Outputs Enabled	C_L = 50pF, f = 10 MHz	21	30	pF
	Outputs Disabled		2	3	