June 2005
Revised August 2024

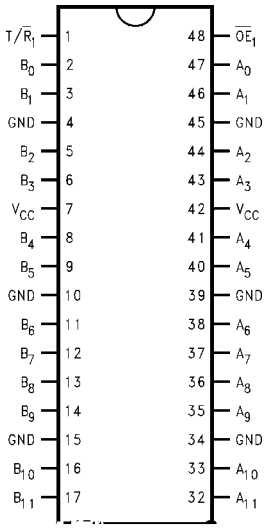
74LCXZ16245
Low Voltage 16-Bit Bidirectional Transceiver with 5V Tolerant Inputs and Outputs

General Description

The LCXZ16245 contains sixteen non-inverting bidirectional buffers with 3-STATE outputs and is intended for bus oriented applications. The device is designed for low voltage (2.7V or 3.3V) V_{CC} applications with capability of interfacing to a 5V signal environment. The device is byte controlled. Each byte has separate control inputs which could be shorted together for full 16-bit operation. Tf/ (.)-1.R(om)]TJ 283178.6 i

Connection Diagram

Pin Assignment for SSOP and TSSOP



Pin Descriptions

Pin Names	Description
$\overline{OE}_n$	Output Enable Input
$T/\overline{R}_n$	Transmit/Receive Input
A_0–A_{15}	Side A Inputs or 3-STATE Outputs
B_0–B_{15}	Side B Inputs or 3-STATE Outputs
NC	No Connect

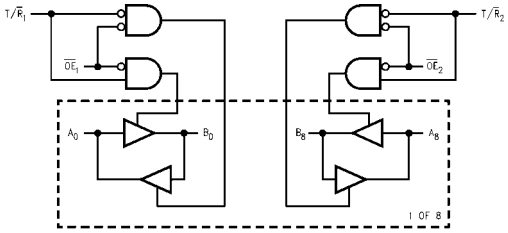
Truth Tables

Inputs		Outputs
$\overline{OE}_1$	$T/\overline{R}_1$	
L	L	Bus B_0–B_7 Data to Bus A_0–A_7
L	H	Bus A_0–A_7 Data to Bus B_0–B_7
H	X	HIGH Z State on A_0–A_7, B_0–B_7

Inputs		Outputs
$\overline{OE}_2$	$T/\overline{R}_2$	
L	L	Bus B_8–B_{15} Data to Bus A_8–A_{15}
L	H	Bus A_8–A_{15} Data to Bus B_8–B_{15}
H	X	HIGH Z State on A_8–A_{15}, B_8–B_{15}

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
Z = High Impedance

Logic Diagram



Absolute Maximum Ratings(Note 2)

Recommended Operating Conditions (Note 4)

Note 2: The Absolute Maximum Ratings are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the Absolute Maximum Ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Note 3: I_O Absolute Maximum Rating must be observed.

Note 4:

AC Electrical Characteristics

Symbol	Parameter	$T_A = -40°C$ to $+85°C$, $R_L = 500\Omega$ $V_{CC} = 3.3V \pm 0.3V$ $C_L = 50$ pF		$V_{CC} = 2.7V$ $C_L = 50$ pF		Units
		Min	Max	Min	Max	
t_{PHL}	Propagation Delay	1.0	4.5	1.0	5.2	ns
t_{PLH}	A_n to B_n or B_n to A_n	1.0	4.5	1.0	5.2	
t_{PZL}	Output Enable Time	1.0	6.5	1.0	7.2	ns
t_{PZH}		1.0	6.5	1.0	7.2	
t_{PLZ}	Output Disable Time	1.0	6.4	1.0	6.9	ns
t_{PHZ}		1.0	6.4	1.0	6.9	
t_{OSHL}	Output to Output Skew (Note 6)		1.0			ns
t_{OSLH}			1.0			

Note 6: Skew is defined as the absolute value of the difference between the actual propagation delay for any two separate outputs of the same device. The specification applies to any outputs switching in the same direction, either HIGH-to-LOW (t_{OSHL}) or LOW-to-HIGH (t_{OSLH}). Parameter guaranteed by design.

Dynamic Switching Characteristics

Symbol	Parameter	Conditions	V_{CC} (V)	$T_A = 25°C$ Typical	Units
V_{OLP}	Quiet Output Dynamic Peak V_{OL}	$C_L = 50$ pF, $V_{IH} = 3.3V$, $V_{IL} = 0V$	3.3	0.8	V
V_{OLV}	Quiet Output Dynamic Valley V				

Capacitance

AC LOADING and WAVEFORMS Generic for LCX Family

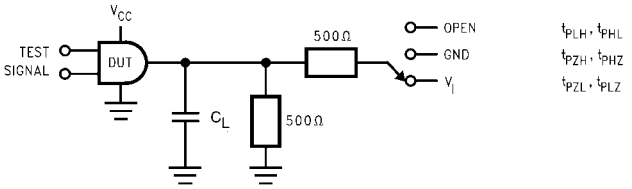
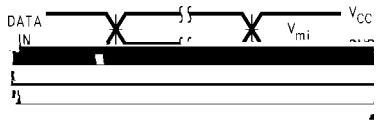
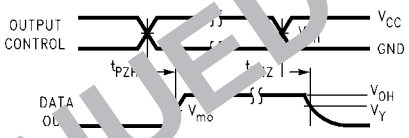


FIGURE 1. AC Test Circuit (C_L includes probe and jig capacitance)

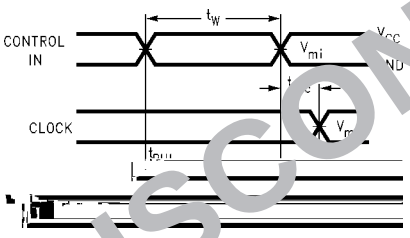
Test	Switch
t_{PLH}, t_{PHL}	Open
t_{PZL}, t_{PLZ}	6V at V_{CC} = 3.3 ± 0.3V, and 2.7V
t_{PZH}, t_{PHZ}	GND



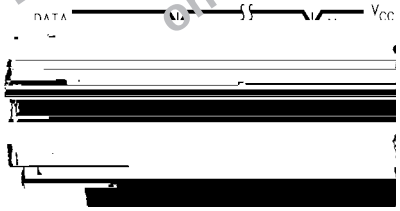
Waveform for Inverting and Non-Inverting Functions



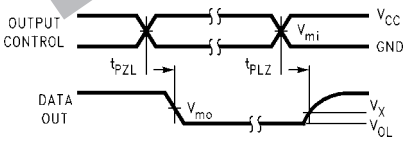
3-STATE Output High Enable and Disable Times for Logic



Propagation Delay, Pulse Width and t_{rec} Waveforms



Setup Time, Hold Time and Recovery Time for Logic



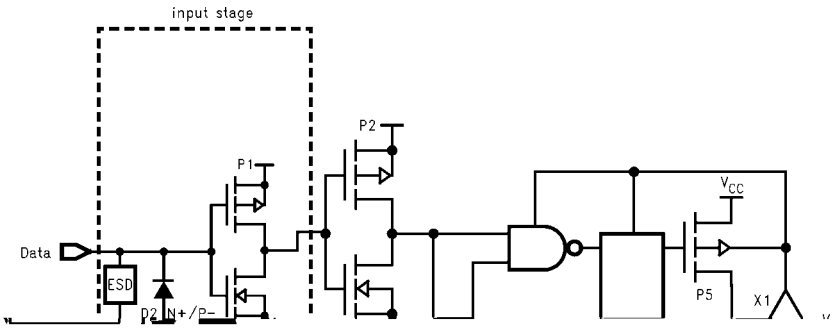
3-STATE Output Low Enable and Disable Times for Logic

t_{rise} and t_{fall}

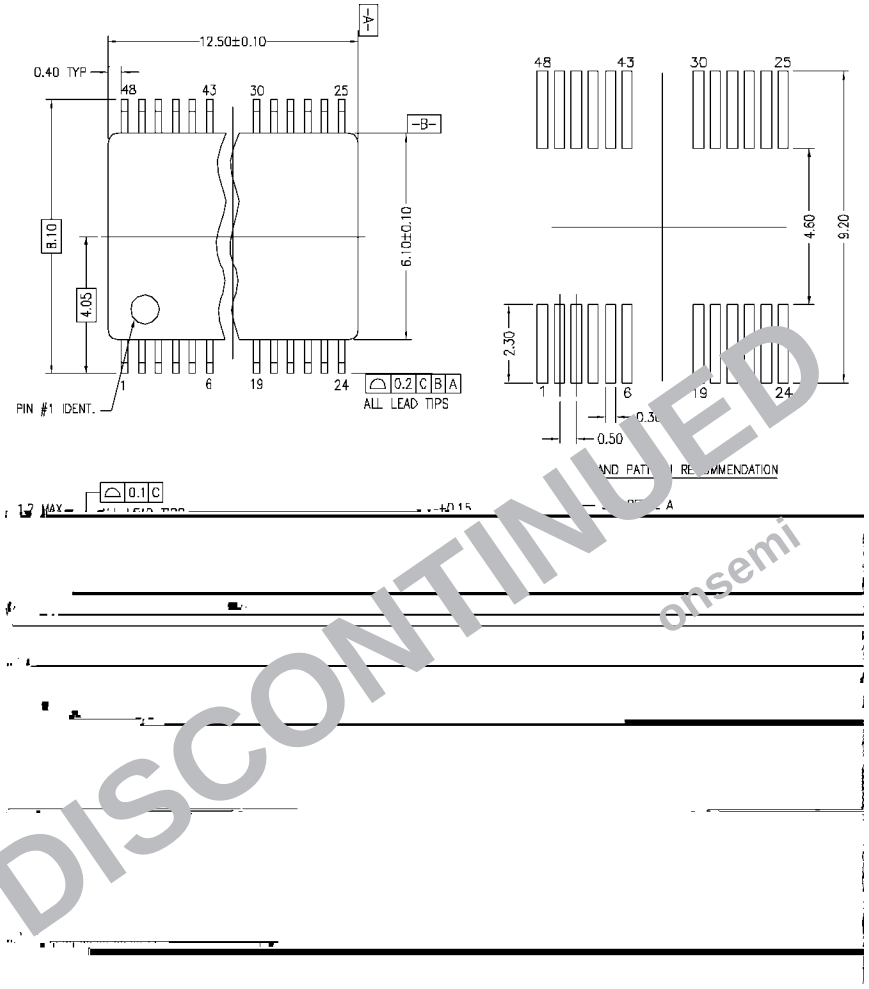
FIGURE 2. Waveforms
(Input Characteristics; f =1MHz, t_r = t_f = 3ns)

Symbol	V_{CC}	
	3.3V ± 0.3V	**2.7V**
V_{mi}	1.5V	1.5V
V_{mo}	1.5V	1.5V
V_x	V_{OL} + 0.3V	V_{OL} + 0.3V
V_y	V_{OH} − 0.3V	V_{OH} − 0.3V

Schematic Diagram Generic for LCX Family



Physical Dimensions inches (millimeters) unless otherwise noted



48-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 6.1mm Wide
Package Number MTD48

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