

Low Voltage Octal Buffer/Line Driver with 5 V Tolerant Inputs and Outputs

74LVX245

The LVX245 contains eight non-inverting bidirectional buffers and is intended for bus-oriented applications. The Transmit/Receive (T/R) input determines the direction of data flow through the bidirectional transceiver. Transmit (active-HIGH) enables data from A ports to B ports; Receive (active-LOW) enables data from B ports to A ports. The Output Enable input, when HIGH, disables both A and B ports by placing them in a high impedance condition.

Features

- Ideal for Low Power/low Noise 3.3 V Applications
- Guaranteed Simultaneous Switching Noise Level and Dynamic Threshold Performance
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

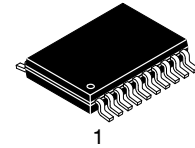
PIN DESCRIPTION

Pin Names	Description
$\overline{OE}$	Output Enable Input
$T/\overline{R}$	Transmit/Receive Input
A_0 – A_7	Side A Inputs or 3-STATE Outputs
B_0 – B_7	Side B Inputs or 3-STATE Outputs

TRUTH TABLE

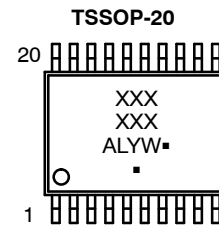
Inputs		Outputs
$\overline{OE}$	$T/\overline{R}$	
L	L	Bus B Data to Bus A
L	H	Bus A Data to Bus B
H	X	HIGH-Z State

H = High Voltage Level
L = Low Voltage Level
X = Immaterial



TSSOP-20
CASE 948AQ

MARKING DIAGRAM



XXXXXX = Specific Device Code
A = Assembly Location
WL, L = Wafer Lot
YY, Y = Year
WW, W = Work Week
■ = Pb-Free Package

(Note: Microdot may be in either location)

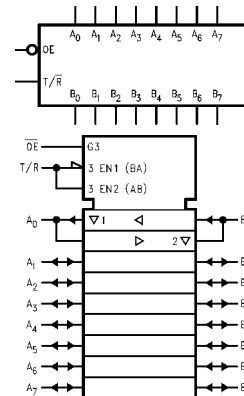


Figure 1. Logic Symbols

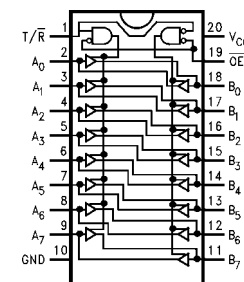


Figure 2. Connection Diagram

ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		–0.5 to +6.5	V
V _{IN}	DC Input Voltage		–0.5 to +6.5	V
V _{OUT}	DC Output Voltage		–0.5 to V _{CC} + 0.5	V
I _{IN}	DC Input Current, per Pin		±20	mA
I _{OUT}	DC Output Current, per Pin		±25	mA
I _{CC}	DC Supply Current, V _{CC} and GND Pins		±75	mA
I _{IK}	Input Clamp Current		–20	mA
I _{OK}	Output Clamp Current		±20	mA
T _{STG}	Storage Temperature Range		–65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds		260	°C
T _J	Junction Temperature Under Bias		+150	°C
θ _{JA}	Thermal Resistance (Note 2)	TSSOP-20	150	°C/W
P _D	Power Dissipation in Still Air at 25 °C	TSSOP-20	833	mW
MSL	Moisture Sensitivity	All Other Packages	Level 1	–
F _R	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.573 in	–
V _{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model	2000	V
		Charged Device Model	N/A	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Applicable to devices with outputs that may be tri-stated.
2. Measured with minimum pad spacing on an FR4 board, using 76 mm-by-114 mm, 2-ounce copper trace no air flow per JESD51-7.
3. HBM tested to EIA / JESD22-A114-A. CDM tested to JESD22-C101-A. JEDEC recommends that ESD qualification to EIA/JESD22-A115A (Machine Model) be discontinued.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage	2.0	3.6	V
V _{IN}	DC Input Voltage (Note 4)	0	5.5	V
V _{OUT}	DC Output Voltage (Note 4)	0	V _{CC}	V
T _A	Operating Temperature	–40	+85	°C
t _r , t _f	Input Rise or Fall Rate	0	100	ns/V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

4. Unused inputs must always be tied to an appropriate logic voltage level (e.g., either GND or V_{CC}). Unused outputs must be left open.



DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	T _A = +25 °C			T _A = -40 °C to +85 °C		Unit
				Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		2.0	1.5			1.5		V
			3.0	2.0			2.0		
			3.6	2.4			2.4		
V _{IL}	Low-Level Input Voltage		2.0		0.5			0.5	V
			3.0		0.8			0.8	
			3.6		0.8			0.8	
V _{OH}	High-Level Output Voltage	V _{IN} = V _{IH} or V _{IL}							V
		I _{OH} = -50 μA	2.0	1.9	2.0		1.9		
		I _{OH} = -50 μA	3.0	2.9	3.0		2.9		
		I _{OH} = -4 mA	3.6	2.58			2.48		
V _{OL}	Low-Level Output Voltage	V _{IN} = V _{IH} or V _{IL}							V
		I _{OH} = -50 μA	2.0		0	0.1		0.1	
		I _{OH} = -50 μA	3.0		0	0.1		0.1	
		I _{OL} = -4 mA	3.6			0.36		0.44	
I _{OZ}	3-State Output Leakage Current	V _{IN} = V _{IH} or V _{IL} , V _{OUT} = V _{CC} or GND	3.6			±0.25		±2.5	μA
I _{IN}	Input Leakage Current	V _{IN} = 5.5 V or GND	3.6			±0.1		±1.0	
I _{CC}	Quiescent Supply Current	V _{IN} = 5.5 V or GND	3.6			±4.0		40.0	μA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	T _A = +25 °C			T _A = -40 °C to +85 °C		Unit
				Min	Typ	Max	Min	Max	
t _{PLH} , t _{PHL}	Propagation Delay CP to Q _n	C _L = 15 pF	2.7		6.1	10.7	1.0	13.5	ns
		C _L = 50 pF			8.6	14.2	1.0	17.0	
		C _L = 15 pF	3.3 ± 0.3		4.7	6.8	1.0	8.0	
		C _L = 50 pF			7.2	10.1	1.0	11.5	
t _{PLH} , t _{PHL}	3-State Output Enable Current	C _L = 15 pF, R _L = 1 kΩ	2.7		9.0	16.9	1.0	20.5	ns
		C _L = 50 pF R _L = 1 kΩ			11.5	20.4	1.0	24.0	
		C _L = 15 pF R _L = 1 kΩ	3.3 ± 0.3		7.1	11.0	1.0	13.0	
		C _L = 50 pF R _L = 1 kΩ			9.6	14.5	1.0	16.5	
t _{PZL} , t _{PZH}	3-State Output Disable Current	C _L = 50 pF R _L = 1 kΩ	2.7	8.0	11.5	18.0	1.0	21.0	ns
		C _L = 50 pF R _L = 1 kΩ	3.3 ± 0.3	5.5	9.6	12.8	1.0	14.5	
t _{OSLH} , t _{OSHL}	Output to Output Skew (Note 5)	C _L = 50 pF	2.7	8.0		1.5		1.5	ns
			3.3 ± 0.3	5.5		1.5		1.5	

5. Parameter guaranteed by design. t_{OSLH} = |t_{PLHm} - t_{PLHn}|, t_{OSHL} = |t_{PHLm} - t_{PHLn}|.



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NOISE CHARACTERISTICS (Note 6)

Symbol	Characteristic	C _L (pF)	V _{CC} (V)	T _A = +25 °C		Unit
				Typ	Limit	
V _{OLP}	Quiet Output Dynamic Peak V _{OL}	50	3.3	0.5	0.8	V
V _{OLV}	Quiet Output Dynamic Valley V _{OL}	50	3.3	0.5	0.8	V
V _{IHD}	Minimum HIGH Level Dynamic Input Voltage	50	3.3		2.0	V
V _{ILD}	Maximum LOW Level Dynamic Input Voltage	50	3.3		0.8	V

6. Input $t_r = t_f = 3$ ns.

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	T _A = +25 °C			T _A = -40 °C to +85 °C		Unit
		Min	Typ	Max	Min	Max	
C _{IN}	Input Capacitance T/ $\overline{R}$, $\overline{OE}$		4	10		10	pF
C _{OUT}	Output Capacitance A _n , B _n		6				pF
C _{PD}	Power Dissipation Capacitance (Note 7)		21				pF

7. C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the following equation:

$$ICC(opr.) = \frac{C_{PD} \times V_{CC} \times f_{IN} + I_{CC}}{8 \text{ (per bit)}} \quad (\text{eq. 1})$$

ORDERING INFORMATION

Device	Marking	Package	Shipping [†]
74LVX245MTCX	LCX 275	TSSOP-20 (Pb-Free)	2500 / Tape & Reel

[†] For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

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REVISION HISTORY

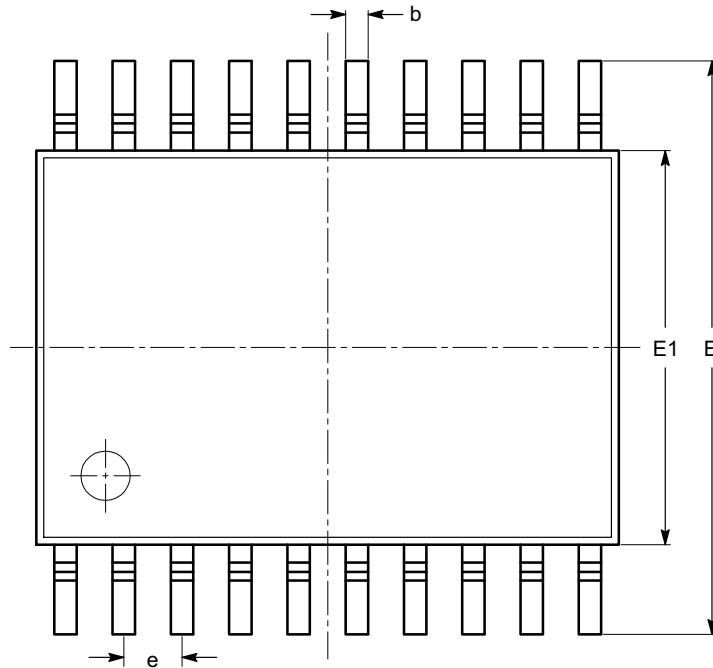
Revision	Description of Changes	Date
2	Modified voltage ratings from 7.0 V to 6.5 V. Removed discontinued devices from ordering table. Converted the Data Sheet to onsemi format.	07/10/2025

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



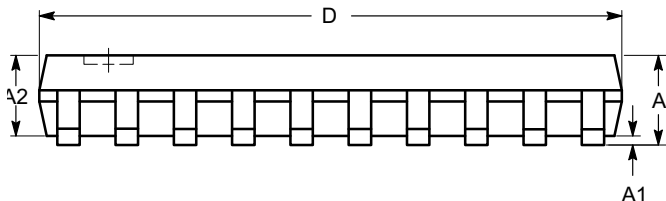
TSSOP20, 4.4x6.5
CASE 948AQ
ISSUE A

DATE 19 MAR 2009

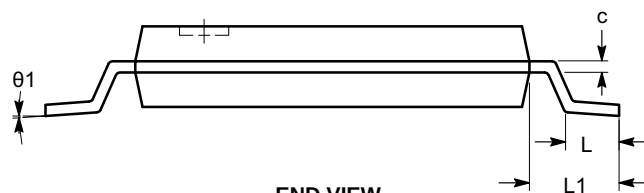


TOP VIEW

SYMBOL	MIN	NOM	MAX
A			1.20
A1	0.05		0.15
A2	0.80		1.05
b	0.19		0.30
c	0.09		0.20
D	6.40	6.50	6.60
E	6.30	6.40	6.50
E1	4.30	4.40	4.50
e	0.65 BSC		
L	0.45	0.60	0.75
L1	1.00 REF		
θ	0°		8°



SIDE VIEW



END VIEW

Notes:

- (1) All dimensions are in millimeters. Angles in degrees.
- (2) Complies with JEDEC MO-153.

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