MC74LVX32

Quad 2-Input OR Gate

With 5 V-Tolerant Inputs

The MC74LVX32 is an advanced high speed CMOS 2-input OR gate. The inputs tolerate voltages up to 7.0 V, allowing the interface of 5.0 V systems to 3.0 V systems.

Features

- High Speed: $t_{PD} = 4.4 \text{ ns}$ (Typ) at $V_{CC} = 3.3 \text{ V}$
- Low Power Dissipation: $I_{CC} = 2 \mu A$ (Max) at $T_A = 25^{\circ}C$
- Power Down Protection Provided on Inputs
- Balanced Propagation Delays
- Low Noise: $V_{OLP} = 0.5 \text{ V (Max)}$
- Pin and Function Compatible with Other Standard Logic Families
- Latchup Performance Exceeds 300 mA
- ESD Performance:

Human Body Model > 2000 V; Machine Model > 200 V

• These Devices are Pb-Free and are RoHS Compliant

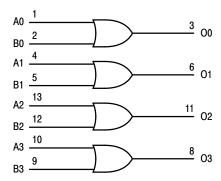


Figure 1. Logic Diagram

PIN NAMES

Pins	Function
An, Bn	Data Inputs
On	Outputs

FUNCTION TABLE

INPU	JTS	OUTPUTS
An	Bn	On
L	L	L
L	Н	Н
Н	L	Н
H	Н	Н



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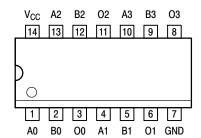
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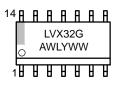
SOIC-14 NB D SUFFIX CASE 751A TSSOP-14 DT SUFFIX CASE 948G

PIN ASSIGNMENT



14-Lead (Top View)

MARKING DIAGRAMS



SOIC-14 NB



TSSOP-14

LVX32 = Specific Device Code A = Assembly Location

WL, L = Wafer Lot Y = Year WW, W = Work Week G or = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

MC74LVX32

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	DC Supply Voltage	-0.5 to +7.0	V
V _{in}	DC Input Voltage	-0.5 to +7.0	V
V _{out}	DC Output Voltage	-0.5 to V _{CC} + 0.5	V
I _{IK}	Input Diode Current	-20	mA
I _{OK}	Output Diode Current	±20	mA
l _{out}	DC Output Current, per Pin	±25	mA
I _{CC}	DC Supply Current, V _{CC} and GND Pins	±50	mA
P _D	Power Dissipation	180	mW
T _{stg}	Storage Temperature	-65 to +150	°C

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.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage	2.0	3.6	V
V _{in}	DC Input Voltage	0	5.5	V
V _{out}	DC Output Voltage	0	V _{CC}	V
T _A	Operating Temperature, All Package Types	-40	+85	°C
Δt/ΔV	Input Rise and Fall Time	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.

DC ELECTRICAL CHARACTERISTICS

			v _{cc}		T _A = 25°C		$T_A = -40$	to 85°C	
Symbol	Parameter	Test Conditions	v	Min	Тур	Max	Min	Max	Unit
V _{IH}	High-Level Input Voltage		2.0 3.0 3.6	1.5 2.0 2.4			1.5 2.0 2.4		V
V _{IL}	Low-Level Input Voltage		2.0 3.0 3.6			0.5 0.8 0.8		0.5 0.8 0.8	V
V _{OH}	High-Level Output Voltage (V _{in} = V _{IH} or V _{IL})	$I_{OH} = -50\mu A$ $I_{OH} = -50\mu A$ $I_{OH} = -4mA$	2.0 3.0 3.0	1.9 2.9 2.58	2.0 3.0		1.9 2.9 2.48		V
V _{OL}	Low-Level Output Voltage (V _{in} = V _{IH} or V _{IL})	I _{OL} = 50μA I _{OL} = 50μA I _{OL} = 4mA	2.0 3.0 3.0		0.0 0.0	0.1 0.1 0.36		0.1 0.1 0.44	V
I _{in}	Input Leakage Current	V _{in} = 5.5V or GND	3.6			±0.1		±1.0	μΑ
Icc	Quiescent Supply Current	$V_{in} = V_{CC}$ or GND	3.6			2.0		20.0	μΑ

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 (Input $t_r = t_f = 3.0 \text{ns}$)

		T _A = 25°C		$T_A = -40$	to 85°C				
Symbol	Parameter	Test Condi	tions	Min	Тур	Max	Min	Max	Unit
t _{PLH} , t _{PHL}	Propagation Delay, Input to Output	V _{CC} = 2.7V	$C_L = 15pF$ $C_L = 50pF$		5.8 8.3	10.7 14.2	1.0 1.0	13.5 17.0	ns
		$V_{CC} = 3.3 \pm 0.3 V$	$C_L = 15pF$ $C_L = 50pF$		4.4 6.9	6.6 10.1	1.0 1.0	8.0 11.5	
t _{OSHL} t _{OSLH}	Output-to-Output Skew (Note 1)	$V_{CC} = 2.7V$ $V_{CC} = 3.3 \pm 0.3V$	$C_L = 50pF$ $C_L = 50pF$			1.5 1.5		1.5 1.5	ns

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.

CAPACITIVE CHARACTERISTICS

		T _A = 25°C		T _A = -40 to 85°C			
Symbol	Parameter	Min	Тур	Max	Min	Max	Unit
Cin	Input Capacitance		4	10		10	pF
C _{PD}	Power Dissipation Capacitance (Note 2)		14				pF

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 equation: I_{CC(OPR)} = C_{PD} • V_{CC} • f_{in} + I_{CC}/4 (per gate). C_{PD} is used to determine the no–load dynamic power consumption; P_D = C_{PD} • V_{CC}² • f_{in} + I_{CC} • V_{CC}.

NOISE CHARACTERISTICS (Input $t_f = t_f = 3.0$ ns, $C_L = 50$ pF, $V_{CC} = 3.3$ V, Measured in SOIC Package)

		T _A = 25°C		
Symbol	Characteristic	Тур	Max	Unit
V _{OLP}	Quiet Output Maximum Dynamic V _{OL}	0.3	0.5	V
V _{OLV}	Quiet Output Minimum Dynamic V _{OL}	-0.3	-0.5	V
V_{IHD}	Minimum High Level Dynamic Input Voltage		2.0	V
V _{ILD}	Maximum Low Level Dynamic Input Voltage		0.8	V

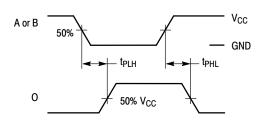
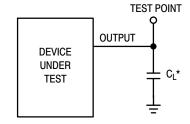


Figure 2. Switching Waveforms



*Includes all probe and jig capacitance

Figure 3. Test Circuit

ORDERING INFORMATION

Device	Package	Shipping [†]
MC74LVX32DR2G	SOIC-14 NB (Pb-Free)	2500 Tape & Reel
MC74LVX32DTR2G	TSSOP-14 (Pb-Free)	2500 Tape & Reel

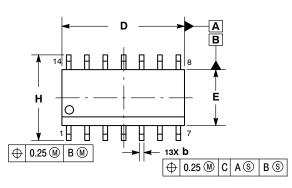
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

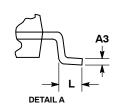


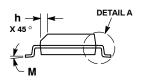


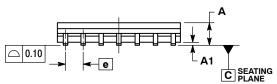
SOIC-14 NB CASE 751A-03 ISSUE L

DATE 03 FEB 2016









GENERIC MARKING DIAGRAM*

MIN MAX

0.050 BSC

0.068

0.019

0.054

0.25 0.004 0.010

0.25 0.008 0.010

0.50 0.010 0.019

1.25 0.016 0.049

0.49 0.014

8.55 8.75 0.337 0.344 3.80 4.00 0.150 0.157

NOTES:
1. DIMENSIONING AND TOLERANCING PER

5. MAXIMUM MOLD PROTRUSION 0.15 PER

MILLIMETERS MIN MAX

1.27 BSC

0.19

0.25

0.40

SIDE

Α

A1 0.10

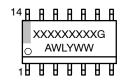
АЗ

b 0.35

D 8.55 E 3.80

e H h

ASME Y14.5M, 1994.
CONTROLLING DIMENSION: MILLIMETERS.
DIMENSION b DOES NOT INCLUDE DAMBAR
PROTRUSION. ALLOWABLE PROTRUSION
SHALL BE 0.13 TOTAL IN EXCESS OF AT
MAXIMUM MATERIAL CONDITION.
DIMENSIONS D AND E DO NOT INCLUDE
MOLD PROTRUSIONS.



XXXXX = Specific Device Code A = Assembly Location

WL = Wafer Lot
 Y = Year
 WW = Work Week
 G = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

DIMENSIONS: MILLIMETERS

STYLES ON PAGE 2

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DATE 03 FEB 2016

STYLE 1: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. NO CONNECTION 7. ANODE/CATHODE 8. ANODE/CATHODE 9. ANODE/CATHODE 10. NO CONNECTION 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 2: CANCELLED	STYLE 3: PIN 1. NO CONNECTION 2. ANODE 3. ANODE 4. NO CONNECTION 5. ANODE 6. NO CONNECTION 7. ANODE 8. ANODE 9. ANODE 10. NO CONNECTION 11. ANODE 12. ANODE 13. NO CONNECTION 14. COMMON CATHODE	STYLE 4: PIN 1. NO CONNECTION 2. CATHODE 3. CATHODE 4. NO CONNECTION 5. CATHODE 6. NO CONNECTION 7. CATHODE 8. CATHODE 9. CATHODE 10. NO CONNECTION 11. CATHODE 12. CATHODE 13. NO CONNECTION 14. COMMON ANODE
STYLE 5: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. NO CONNECTION 7. COMMON ANODE 8. COMMON CATHODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 6: PIN 1. CATHODE 2. CATHODE 3. CATHODE 4. CATHODE 5. CATHODE 6. CATHODE 7. CATHODE 8. ANODE 9. ANODE 10. ANODE 11. ANODE 12. ANODE 13. ANODE 14. ANODE	STYLE 7: PIN 1. ANODE/CATHODE 2. COMMON ANODE 3. COMMON CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. ANODE/CATHODE 7. ANODE/CATHODE 8. ANODE/CATHODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. COMMON CATHODE 12. COMMON ANODE 13. ANODE/CATHODE 14. ANODE/CATHODE	STYLE 8: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. ANODE/CATHODE 7. COMMON ANODE 8. COMMON ANODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. NO CONNECTION 12. ANODE/CATHODE 13. ANODE/CATHODE 14. COMMON CATHODE

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