



74LV08A

QUADRUPLE 2-INPUT AND GATES

Description

The 74LV08A provides provides four independent 2-input AND gates with standard push-pull outputs. The device is designed for operation with a power supply range of 2.0V to 5.5V.

The inputs are tolerant to 5.5V allowing this device to be used in a mixed voltage environment. The device is fully specified for partial power down applications using I_{OFF} . The I_{OFF} circuitry disables the output preventing damaging current backflow when the device is powered down.

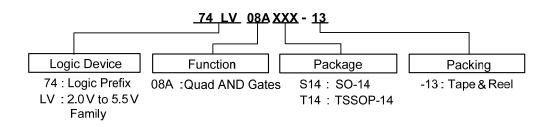
The gates perform the Boolean function:

 $Y = A \bullet B \text{ or } Y = \overline{\overline{A} + \overline{B}}$

Features

- Wide Supply Voltage Range from 2.0V to 5.5V
- Sinks or Sources 12mA at V_{CC} = 4.5V
- CMOS Low Power Consumption
- IOFF Supports Partial-Power Down Operation
- Inputs or Outputs accept up to 5.5V
- Inputs Can Be Driven by 3.3V or 5V Allowing for Voltage Translation Applications
- Schmitt Trigger Action at All Inputs
- ESD Protection Tested per JESD 22
 - Exceeds 200-V Machine Model (A115)
 - Exceeds 2000-V Human Body Model (A114)
 - Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 - 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 - 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Ordering Information

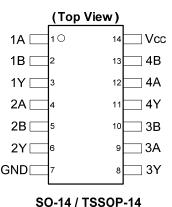


Device	Baakaga Cada	Packaging	13" Tape	and Reel
Device	Package Code	(Note 4)	Quantity	Part Number Suffix
74LV08AS14-13	S14	SO-14	2500/Tape & Reel	-13
74LV08AT14-13	T14	TSSOP-14	2500/Tape & Reel	-13

Note: 4. The taping orientation and tape details can be found at http://www.diodes.com/datasheets/ap02007.pdf

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Pin Assignments



Applications

- General Purpose Logic
- Power Down Signal Isolation
- Wide Array of Products Such As:
 - PCs, networking, Notebooks, Ultrabooks, Netbooks
 - Computer Peripherals, Hard Drives, CD/DVD ROM
 - TV, DVD, DVR, set top box



Pin Descriptions

Pin Number	Pin Name	Description
1	1A	Data Input
2	1B	Data Input
3	1Y	Data Output
4	2A	Data Input
5	2B	Data Input
6	2Y	Data Output
7	GND	Ground
8	3Y	Data Output
9	3A	Data Input
10	3B	Data Input
11	4Y	Data Output
12	4A	Data Input
13	4B	Data Input
14	Vcc	Supply Voltage

Function Table

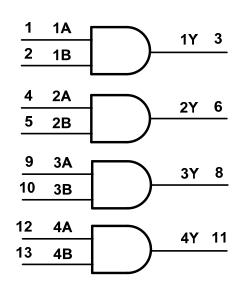
Inp	Inputs		
A	В	Y	
L	Х	L	
Х	L	L	
Н	Н	Н	

Absolute Maximum Ratings (Note 5) (@T_A = +25°C, unless otherwise specified.)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	kV
ESD CDM	Charged Device Model ESD Protection	1	kV
ESD MM	Machine Model ESD Protection	200	V
Vcc	Supply Voltage Range	-0.5 to +7.0	V
VI	Input Voltage Range	-0.5 to +7.0	V
I _{IK}	Input Clamp Current VI< 0V	-20	mA
I _{OK}	Output Clamp Current V _O <-0V	-50	mA
lo	Continuous Output Current $-0.5V < V_0 V_{CC} + 0.5V$	±25	mA
I _{CC}	Continuous Current Through V _{CC}	50	mA
I _{GND}	Continuous Current Through GND	-50	mA
TJ	Operating Junction Temperature	-40 to +150	°C
T _{STG}	Storage Temperature	-65 to +150	°C
P _{TOT}	Total Power Dissipation	500	mW

Note: 5. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

Logic Diagram





Recommended Operating Conditions (Note 6) (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
V _{CC}	Supply Voltage		2.0	5.5	V
VI	Input Voltage		0	5.5	V
Vo	Output Voltage		0	V _{CC}	V
	I _{OH} High-Level Output Current	2.0V	—	-50	mA
		2.3V to 2.7V	—	-2	μA
ЮН		3.0V to 3.6V	—	-6	mA
		4.5V to 5.5V	—	-12	mA
		2.0V	—	50	μA
	Low-Level Output Current	2.3V to 2.7V	—	2	mA
IOL	Low-Level Output Current	3.0V to 3.6V	—	6	mA
		4.5V to 5.5V	—	12	mA
		2.3V to 2.7V	—	200	
Δt/ΔV	Input Transition Rise or Fall Rate	3.0V to 3.6V	—	100	ns/V
		4.5V to 5.5V	—	20	
TA	Operating Free-Air Temperature	_	-40	+125	°C

Note: 6. Unused inputs should be held at V_{CC} or Ground.

C. mahal	Deveneter	Test Conditions	N/	T _A = -40	to +85°C	T _A = -40 1	to +125°C	l lmit	
Symbol	ool Parameter	lest Conditions	Vcc	Min	Max	Min	Max	Unit	
		_	2.0V	1.5		1.5			
	High-Level Input	_	2.3V to 2.7V	V _{CC} X 0.7		V _{CC} X 0.7			
VIH	Voltage	—	3.0V to 3.6V	V _{CC} X 0.7	—	V _{CC} X 0.7	—	V	
		—	4.5V to 5.5V	V _{CC} X 0.7	—	V _{CC} X 0.7	—		
		—	2.0V	—	0.5	-	0.5		
	Low-Level Input	_	2.3V to 2.7V	—	V _{CC} X 0.3	-	V _{CC} X 0.3	V	
VIL	Voltage	_	3.0V to 3.6V	—	V _{CC} X 0.3	-	V _{CC} X 0.3	V	
		—	4.5V to 5.5V	—	V _{CC} X 0.3	-	V _{CC} X 0.3		
		I _{OH} = -50μA	2.0V to 5.5V	V _{CC} -0.1	—	V _{CC} -0.1	—		
V	High-Level	I _{OH} = -2mA	2.3V	2.0	—	2.0	—	V	
V _{OH}	Output Voltage	Dutput Voltage I _{OH} = -6mA	3.0V	2.48	—	2.48	—	v	
		I _{OH} = -12mA	4.5V	3.8	—	3.8	—		
		I _{OL} = 50μA	2.0V to 5.5V	—	0.1	—	0.1		
N/	Low-Level	I _{OL} = 2mA	2.3V	—	0.4	—	0.4	V	
V _{OL}	Output Voltage	I _{OL} = 6mA	3.0V	—	0.44	_	0.44	v	
		I _{OL} = 12mA	4.5V	—	0.55	—	0.55	1	
I _{OFF}	Power Down Leakage Current	$V_1 \text{ or } V_0 = 0 \text{ to } 5.5 \text{V}$	0V	_	5		5	μA	
h	Input Current	V _I =GND or 5.5V	0 to 5.5V	—	±1	_	±1	μA	
I _{CC}	Supply Current	$V_{I} = GND \text{ or } V_{CC}$ $I_{O}=0$	5.5V	_	20	—	20	μA	

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Switching Characteristics

Symbol	Parameter	Test	V.	-	Γ _A = +25°0	C	-40°C to	o +85°C	-40°C to	o +125°C	Unit
Symbol	Farameter	Conditions	Vcc	Min	Тур	Max	Min	Max	Min	Max	Unit
	. Propagation	Figure 1	2.5V ± 0.2V	-	7.9	13.8	1	16	1	17	
			3.3V ± 0.3V	-	5.6	8.8	1	10.5	1	11.5	ns
		Propagation	C _L = 15pF	5.0V ± 0.5V	-	4.1	5.9	1	7	1	8
t _{PD}	Delay A_N to Y_N	F : 4	2.5V ± 0.2V	-	10.5	17.3	1	20	1	21	
		Figure 1 C _L = 50 pF	3.3V ± 0.3V	-	7.5	12.5	1	14	1	15	ns
		CL = 30 pr	5.0V ± 0.5V	-	5.5	7.9	1	9	1	10	1

Operating Characteristics (@T_A = +25°C, unless otherwise specified.)

	Parameter	Test Conditions	V _{cc}	Тур	Unit
0	Power Dissipation	F= 10 MHz	3.3V	8	" Г
C _{pd}	Capacitance per Gate	C _L =50pF	5.0V	10	рF

Noise Characteristics

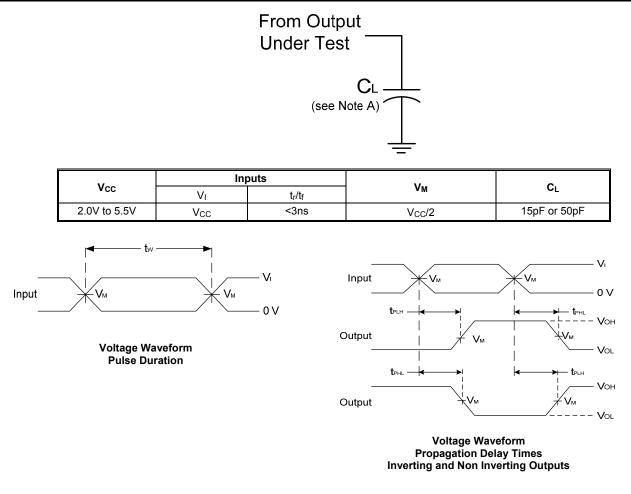
$V_{\rm CC}$ = 3V, C _L = 50	$pF T_A = +25^{\circ}C$				
Symbol	Parameter	Min	Тур	Max	Unit
V _{OL(p)}	Quiet Output, Maximum Dynamic V _{OL}		0.2	0.8	V
V _{OL(V)}	Quiet Output, Minimum Dynamic V _{OL}	_	-0.1	-0.8	V
V _{OH(V)}	Quiet Output, Minimum Dynamic V _{OH}	_	3.1	_	V
V _{IH(D)}	High Level Dynamic Input Voltage	2.31	_	_	V
V _{IL(D)}	Low Level Dynamic Input Voltage		—	0.99	V

Package Characterisitics

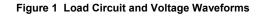
Symbol	Parameter	Test Conditions	Vcc	Min	Тур	Max	Unit
Ci	Input Capacitance	$V_i = V_{CC} - or GND$	2.0V to 5.5V	_	3.3	10	pF



Parameter Measurement Information

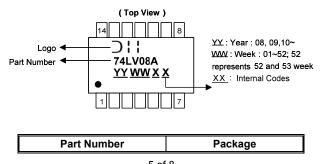


- Notes: A. Includes test lead and test apparatus capacitance. B. All pulses are supplied at pulse repetition rate ≤ 10MHz C. Inputs are measured separately one transition per measurement
 - D. t_{PLH} and t_{PHL} are the same as t_{PD}



Marking Information

(1) SO14, TSSOP14



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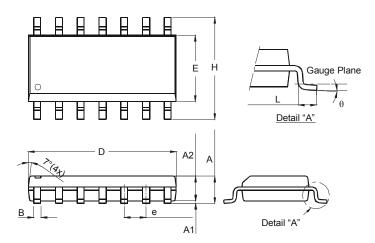


74LV08AS14	SO-14
74LV08AT14	TSSOP-14

Package Outline Dimensions (All dimensions in mm.)

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.

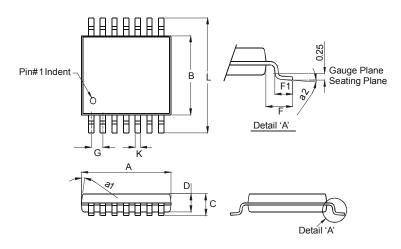
Package Type: SO-14



SO-14						
Dim	Min	Max				
Α	1.47	1.73				
A1	0.10	0.25				
A2	1.45	Тур				
В	0.33	0.51				
D	8.53	8.74				
Ш	3.80	3.99				
e	1.27	Тур				
Н	5.80	6.20				
L	0.38	1.27				
θ	0°	8°				
All Di	All Dimensions in mm					

74LV08A

Package Type: TSSOP-14



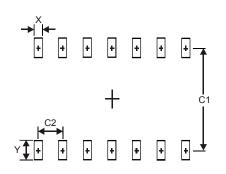
TSSOP-14		
Dim	Min	Max
a1	7° (4X)	
a2	0°	8°
Α	4.9	5.10
В	4.30	4.50
С	-	1.2
D	0.8	1.05
F	1.00 Typ	
F1	0.45	0.75
G	0.65 Typ	
К	0.19	0.30
L	6.40 Тур	
All Dimensions in mm		



Suggested Pad Layout

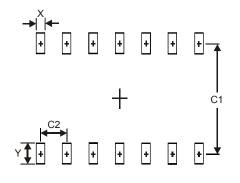
Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

Package Type: SO-14



Dimensions	Value (in mm)
Х	0.60
Y	1.50
C1	5.4
C2	1.27

Package Type: TSSOP-14



Dimensions	Value (in mm)
Х	0.45
Y	1.45
C1	5.9
C2	0.65



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