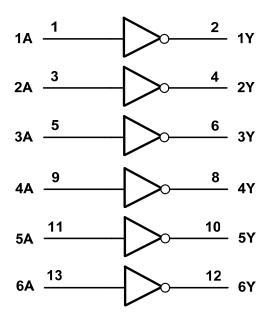


## **Pin Descriptions**

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

# Logic Diagram



## **Function Table**

Input	Output
Α	Υ
Н	L
L	Н

## Absolute Maximum Ratings (Note 4) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Parameter	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
V <sub>CC</sub>	Supply Voltage Range	-0.5 to +7.0	V
VI	Input Voltage Range (Note 4)	-0.5 to +7.0	V
l <sub>IK</sub>	Input Clamp Current V <sub>I</sub> < 0V	-20	mA
lok	Output Clamp Current V <sub>O</sub> <-0V	-50	mA
lo	Continuous Output Current - 0.5V < V <sub>O</sub> Vcc + 0.5V	±25	mA
Icc	Continuous Current Through Vcc	50	mA
I <sub>GND</sub>	Continuous Current Through GND	-50	mA
TJ	Operating Junction Temperature	-40 to +150	°C
T <sub>STG</sub>	Storage Temperature	-65 to +150	°C
P <sub>TOT</sub>	Total Power Dissipation	500	mW

Note:

4. 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.



# Recommended Operating Conditions (Note 5) (@TA = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>CC</sub>	Supply Voltage		2.0	5.5	V
VI	Input Voltage		0	5.5	V
Vo	Output Voltage		0	Vcc	V
		2.0V		-50	mA
	Lligh Lovel Output Current	2.3V to 2.7V		-2	μA
I <sub>OH</sub>	High-Level Output Current	3.0V to 3.6V		-6	mA
		4.5V to 5.5V		-12	mA
		2.0V		50	μA
	Low Lovel Output Current	2.3V to 2.7V		2	mA
I <sub>OL</sub>	Low-Level Output Current	3.0V to 3.6V		6	mA
		4.5V to 5.5V		12	mA
	Leavet Topografica Discour Fall	2.3V to 2.7V		200	
$\Delta t/\Delta V$	Input Transition Rise or Fall Rate	3.0V to 3.6V		100	ns/V
	Tato	4.5V to 5.5V		20	
T <sub>A</sub>	Operating Free-Air Temperature		-40	125	°C

Note:

5. Unused inputs should be held at  $V_{\text{CC}}$  or Ground.

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

Symbol	Parameter	Test Conditions	Vcc	T <sub>A</sub> = -40°0	C to +85°C	T <sub>A</sub> = -40°C	to +125°C	Unit
Зуппоот	Parameter	rest Conditions	VCC	Min	Max	Min	Max	Unit
		2.0V	1.5		1.5			
.,	High-Level Input		2.3V to 2.7V	V <sub>CC</sub> X 0.7		V <sub>CC</sub> X 0.7		V
$V_{IH}$	Voltage		3.0V to 3.6V	V <sub>CC</sub> X 0.7		V <sub>CC</sub> X 0.7		
			4.5V to 5.5V	V <sub>CC</sub> X 0.7		V <sub>CC</sub> X 0.7		
			2.0V		0.5		0.5	
\	Low-Level Input		2.3V to 2.7V		V <sub>CC</sub> X 0.3		V <sub>CC</sub> X 0.3	V
$V_{IL}$	Voltage		3.0V to 3.6V		V <sub>CC</sub> X 0.3		V <sub>CC</sub> X 0.3	
		4.5V to 5.5V		V <sub>CC</sub> X 0.3		V <sub>CC</sub> X 0.3		
	, High-Level	I <sub>OH</sub> = -50μA	2.0V to 5.5V	V <sub>CC</sub> -0.1		V <sub>CC</sub> -0.1		
		I <sub>OH</sub> = -2mA	2.3V	2.0		2.0		V
$V_{OH}$	Output Voltage	I <sub>OH</sub> = -6mA	3.0V	2.48		2.48		V
		I <sub>OH</sub> = -12mA	4.5V	3.8		3.8		
		I <sub>OL</sub> = 50μA	2.0V to 5.5V		0.1		0.1	
.,	Low-Level	I <sub>OL</sub> = 2mA	2.3V		0.4		0.4	.,
$V_{OL}$	Output Voltage	I <sub>OL</sub> = 6mA	3.0V		0.44		0.44	V
		I <sub>OL</sub> = 12mA	4.5V		0.55		0.55	
I <sub>OFF</sub>	Power Down Leakage Current	$V_1 \text{ or } V_0 = 0 \text{ to } 5.5V$	0V		5		5	μA
II	Input Current	V <sub>I</sub> =GND or 5.5V	0 to 5.5V		±1		±1	μΑ
I <sub>CC</sub>	Supply Current	$V_I = GND \text{ or } V_{CC}$ $I_O = 0$	5.5V		20		20	μΑ



## **Switching Characteristics**

Symbol	mbol Parameter Test Conditions	Test	V	-	Γ <sub>A</sub> = +25°C	;	-40°C to	+85 °C	-40°C to	+125°C	Unit
Symbol		Conditions	V <sub>CC</sub>	Min	Тур	Max	Min	Max	Min	Max	Oilit
		Figure 4	2.5V ± 0.2V	_	7.1	11.7	1	14	1	14	
	$t_{PD} \begin{tabular}{ll} Figure 1 \\ C_L = 15pF \\ \hline Propagation \\ Delay A_N to Y_N \\ \hline Figure 1 \\ C_L = 50 pF \\ \hline \end{tabular}$	$3.3V \pm 0.3V$	_	5.1	7.1	1	8.5	1	8.5	ns	
		CL = 15pF	5.0V ± 0.5V	_	3.6	5.5	1	6.5	1	6.5	
t <sub>PD</sub>		-: .	2.5V ± 0.2V	_	10	15.5	1	18	1	18	
		"	3.3V ± 0.3V	_	7.3	10.6	1	12	1	12	ns
		OL - 30 pi	5.0V ± 0.5V	_	5.1	7.5	1	8.5	1	8.5	

## Operating Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

	Parameter	Test Conditions	V <sub>CC</sub>	Тур	Unit
0	Power Dissipation	F = 10 MHz	3.3V	9.6	- ۲
Cpd	Capacitance per Gate	$C_L = 50pF$	5.0V	11.4	pF

#### **Noise Characteristics**

 $V_{CC} = 3V$ ,  $C_L = 50pF T_A = +25^{\circ}C$ 

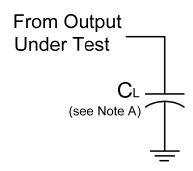
Symbol	Parameter	Min	Тур	Max	Unit
$V_{OL(p)}$	Quiet output, maximum dynamic V <sub>OL</sub>	_	0.2	0.8	V
V <sub>OL(V)</sub>	Quiet output, minimum dynamic V <sub>OL</sub>	_	-0.1	-0.8	V
V <sub>OH(V)</sub>	Quiet output, minimum dynamic V <sub>OH</sub>	_	3.1	_	V
$V_{IH(D)}$	V <sub>IH(D)</sub> High Level dynamic input voltage		_	_	V
$V_{IL(D)}$			_	0.99	V

# **Package Characterisitics**

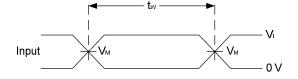
Symbol	Parameter	Test Conditions	Vcc	Min	Тур	Max	Unit
Ci	Input Capacitance	$V_i = V_{CC} - \text{ or GND}$	2.0 to 5.5V		3.3	10	pF



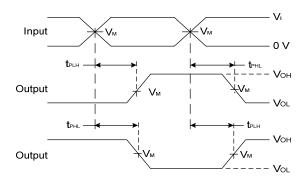
## **Parameter Measurement Information**



V	Inputs		V	C	
V <sub>CC</sub>	VI	t <sub>r</sub> /t <sub>f</sub>	V <sub>M</sub>	C <sub>L</sub>	
2.0V to 5.5V	V <sub>CC</sub>	<3ns	V <sub>CC</sub> /2	15pF or 50pF	



Voltage Waveform Pulse Duration



Voltage Waveform Propagation Delay Times Inverting and Non Inverting Outputs

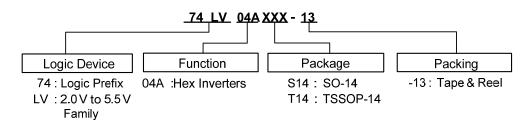
Notes: A. Includes test lead and test apparatus capacitance.

- B. All pulses are supplied at pulse repetition rate ≤ 10MHz.
  C. Inputs are measured separately one transition per measurement.
- D. t<sub>PLH</sub> and t<sub>PHL</sub> are the same as t<sub>PD</sub>

Figure 1 Load Circuit and Voltage Waveforms



## **Ordering Information**



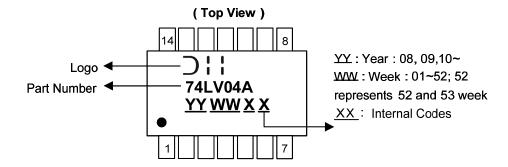
Device	Backage Code	Packaging	13" Tape	and Reel
Device	Package Code	(Note 6)	Quantity	Part Number Suffix
74LV04AS14-13	S14	SO-14	2500/Tape & Reel	-13
74LV04AT14-13	T14	TSSOP-14	2500/Tape & Reel	-13

Note:

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

## **Marking Information**

(1) SO14, TSSOP14



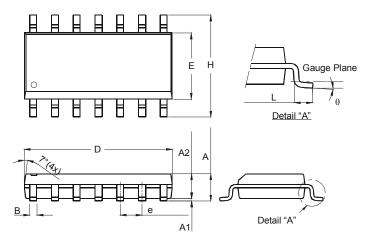
Part Number	Package	
74LV04AS14	SO-14	
74LV04AT14	TSSOP-14	



# Package Outline Dimensions (All dimensions in mm.)

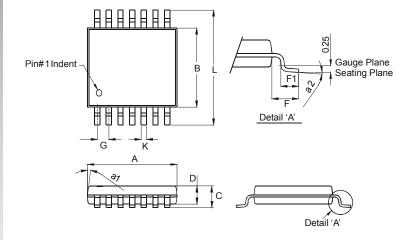
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.

#### Package Type: SO-14



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

#### Package Type: TSSOP-14



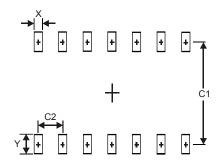
TSSOP-14		
Dim	Min	Max
a1	7° (4X)	
a2	0°	8°
Α	4.9	5.10
В	4.30	4.50
С	_	1.2
D	8.0	1.05
F	1.00 Typ	
F1	0.45	0.75
G	0.65 Typ	
K	0.19	0.30
Ĺ	6.40 Typ	
All Dimensions in mm		



## **Suggested Pad Layout**

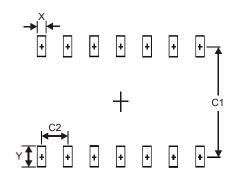
Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

#### Package Type: SO-14



Dimensions	Value (in mm)
Х	0.60
Υ	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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