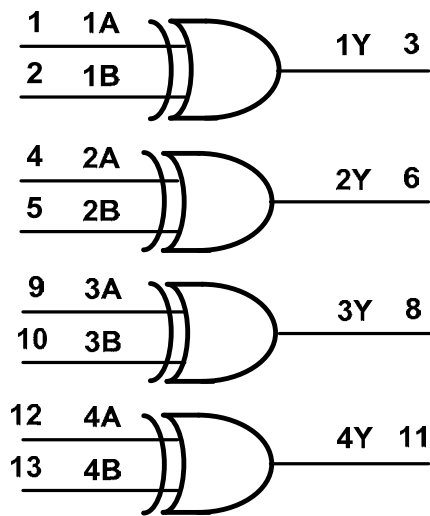


Pin Descriptions

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	V _{CC}	Supply Voltage

Logic Diagram



Function Table

Inputs		Output
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

Absolute Maximum Ratings (Note 4) (@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
V _{CC}	Supply Voltage Range	-0.5 to 6.5	V
V _I	Input Voltage Range	-0.5 to 6.5	V
V _O	Voltage applied to output in high impedance or I _{OFF} state	-0.5 to 6.5	V
V _O	Voltage applied to output in high or low state	-0.3 to V _{CC} +0.5	V
I _{IK}	Input Clamp Current V _I < 0	-50	mA
I _{OK}	Output Clamp Current V _O < 0	-50	mA
I _O	Continuous output current	50	mA
I _{CC} , I _{GND}	Continuous current through V _{CC} or GND	±100	mA
T _J	Operating Junction Temperature	-40 to +150	°C
T _{STG}	Storage Temperature	-65 to +150	°C
P _{TOT}	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) (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
V _{CC}	Supply Voltage		1.65	5.50	V
V _I	Input Voltage		0	5.5	V
V _O	Output Voltage	Active Mode	0	V _{CC}	V
		V _{CC} = 0V; Power Down Mode	0	5.5	V
Δt/ΔV	Input transition rise or fall rate	V _{CC} = 1.65V to 2.7V		20	ns/V
		V _{CC} = 2.7V to 5.5V		10	
T _A	Operating free-air temperature		-40	+125	°C

Note: 5. Unused inputs should be held at V_{CC} or Ground.

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

Symbol	Parameter	Test Conditions	V _{CC}	T _A = -40°C to +85°C		T _A = -40°C to +125°C		Unit
				Min	Max	Min	Max	
V _{IH}	High-level Input Voltage		1.65V to 1.95V	0.65 X V _{CC}		0.65 X V _{CC}		V
			2.3V to 2.7V	1.7		1.6		
			2.7V to 3.6V	2.0		2.0		
			4.5V to 5.5V	0.7 X V _{CC}		2.0		
V _{IL}	Low-level input voltage		1.65V to 1.95V		0.35 X V _{CC}		0.35 X V _{CC}	V
			2.3V to 2.7V		0.7		0.7	
			2.7V to 3.6V		0.8		0.8	
			4.5V to 5.5 V		0.3 X V _{CC}		0.3 X V _{CC}	
V _{OH}	High Level Output Voltage	I _{OH} = -100μA	1.65V to 3.6V	V _{CC} - 0.2		V _{CC} - 0.3		V
		I _{OH} = -4mA	1.65V	1.2				
		I _{OH} = -8mA	2.3V	1.9				
		I _{OH} = -12mA	2.7V	2.2		2.05		
			3.0V	2.3		2.1		
		I _{OH} = -24mA	3.0V	2.2		2.0		
V _{OL}	High-level Output Voltage	I _{OH} = 100μA	1.65V to 5.5V		0.2		0.3	V
		I _{OH} = 4mA	1.65V		0.45		0.6	
		I _{OH} = 8mA	2.3V		0.70		0.85	
		I _{OH} = 12mA	2.7V		0.40		0.6	
			3.0V		0.55		0.6	
		I _{OH} = -24mA	3.0V		0.55		0.6	
I _I	Input Current	V _I = GND to 5.5V	3.6V		±5		±20	μA
I _{OFF}	Power Down Leakage Current	V _I or V _O = 0V to 3.6V	0		10		20	μA
I _{CC}	Supply Current	V _I = GND or V _{CC} I _O =0	3.6V		10		40	μA
ΔI _{CC}	Additional Supply Current	One input at V _{CC} -0.6V Other	2.7V to 3.6V		500		5000	μA

Switching Characteristics

Symbol	Parameter	Test Conditions	V _{CC}	T _A = +25°C			-40°C to +85°C		-40°C to +125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
t _{PD}	Propagation Delay A _N or B _N to Y _N	Figure 1	1.65V to 1.95V	1.0	4.1	9.4	1.0	9.9	1.0	11.4	ns
			2.3V to 2.7V	1.0	2.9	7.1	1.0	7.6	1.0	9.7	
			2.7V	1.0	2.8	5.4	1.0	5.6	1.0	7.1	
			3.0V to 3.6V	1.0	2.5	4.4	1.0	4.6	1.0	5.8	
t _{SK(0)}	Output Skew Time		3.0V to 3.6V					1.0		1.5	ns

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

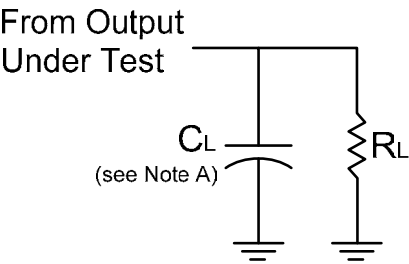
Parameter		Test Conditions	V _{CC} = 1.8V	V _{CC} = 2.5V	V _{CC} = 3.3V	Unit
			Typ	Typ	Typ	
C _{pd}	Power dissipation capacitance per gate	f = 10 MHz	6.4	7.4	8.4	pF
C _I	Input Capacitance	V _i = V _{CC} – or GND	4	4	4	pF

Package Characteristics

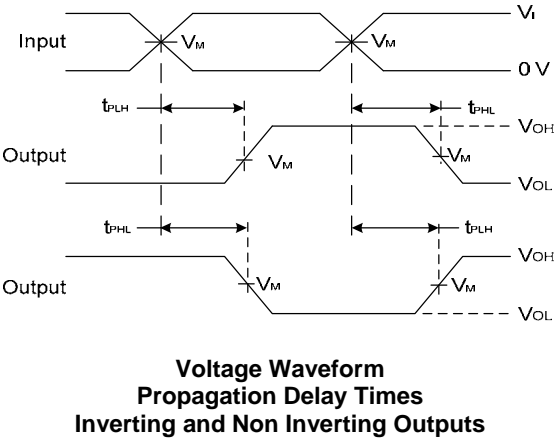
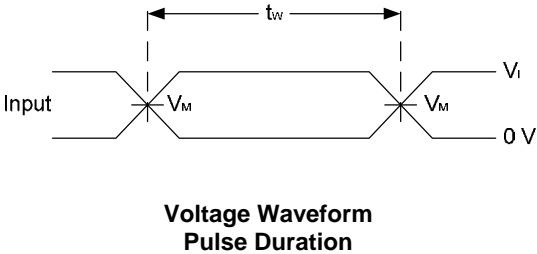
Symbol	Parameter	Test Conditions	V _{CC}	Min	Typ	Max	Unit
θ _{JA}	Thermal Resistance Junction-to-Ambient	SO-14	(Note 6)		TBD		°C/W
		TSSOP-14			159		
θ _{JC}	Thermal Resistance Junction-to-Case	SO-14	(Note 6)		TBD		°C/W
		TSSOP-14			25		

Note: 6. Test condition for SO-14 and TSSOP-14: Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

Parameter Measurement Information



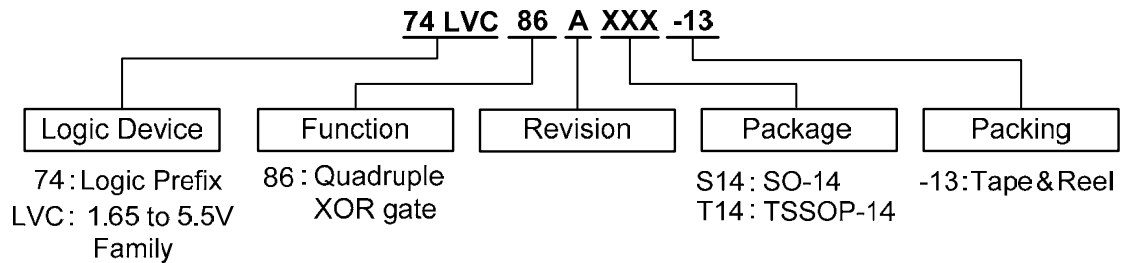
V_{CC}	Inputs		V_M	C_L	R_L
	V_I	t_r/t_f			
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	1K Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	500 Ω
2.7V	2.7V	$\leq 2.5ns$	1.5V	50pF	500 Ω
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V	50pF	500 Ω



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

Figure 1. Load Circuit and Voltage Waveforms

Ordering Information

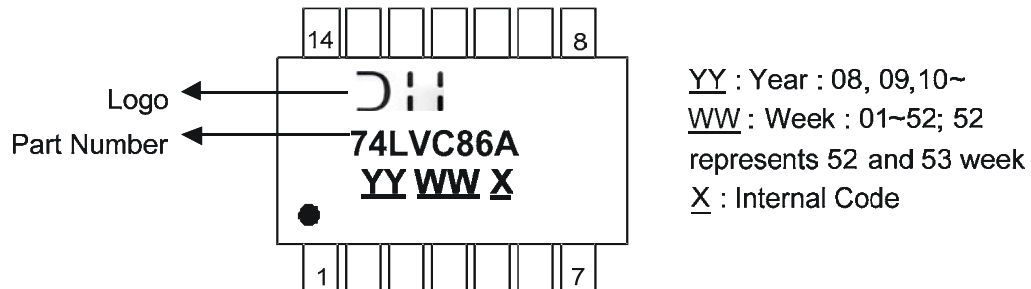


Device	Package Code	Packaging (Note 7)	13" Tape and Reel	
			Quantity	Part Number Suffix
74LVC86AS14-13	S14	SO-14	2500/Tape & Reel	-13
74LVC86AT14-13	T14	TSSOP-14	2500/Tape & Reel	-13

Notes: 7. The taping orientation and tape details can be found at <http://www.diodes.com/datasheets/ap02007.pdf>

Marking Information

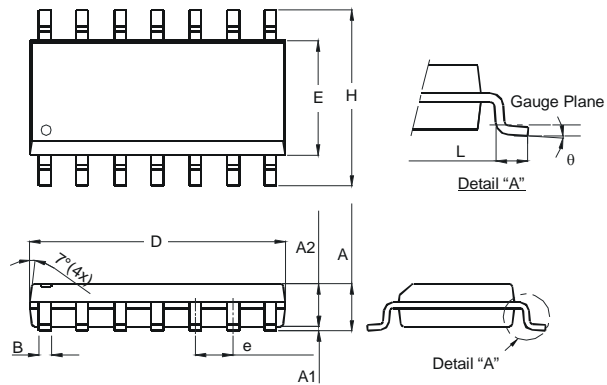
(1) SO-14, TSSOP-14



Part Number	Package
74LVC86AS14	SO-14
74LVC86AT14	TSSOP-14

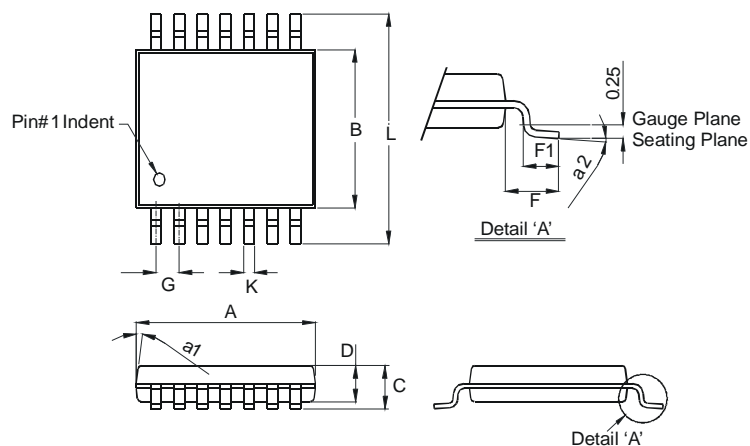
Package Outline Dimensions (All dimensions in mm.)

Package Type: SO-14



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

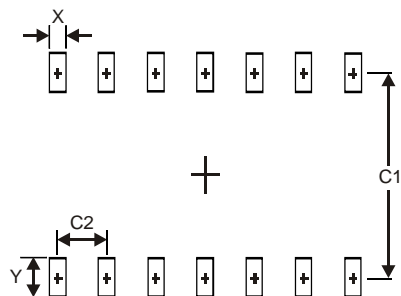
Package Type: TSSOP-14



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

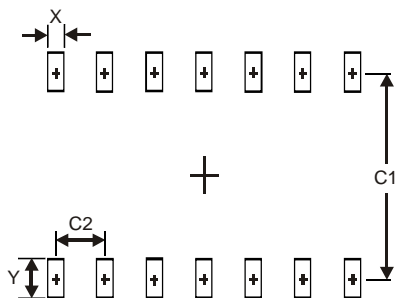
Suggested Pad Layout

Package Type: SO-14



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

Package Type: TSSOP-14



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

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