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## CMOS Logic

## ■ GENERAL DESCRIPTION

The XC74UL14AA is a CMOS schmitt trigger inverter, manufactured using silicon gate CMOS fabrication.

CMOS low power circuit operation makes high speed LS-TTL operation achievable.

With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.

As the XC74UL14AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

## ■ APPLICATIONS

- Palmtops
- Digital equipment

## ■ FEATURES

**High Speed Operation** : tpd = 2.3ns (TYP.)

**Operating Voltage Range** : 2V ~ 5.5V

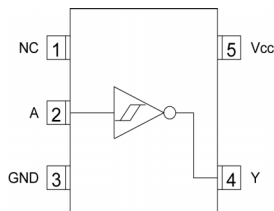
**Low Power Consumption** : 1  $\mu$  A (MAX.)

**CMOS Schmitt Trigger Inverter**

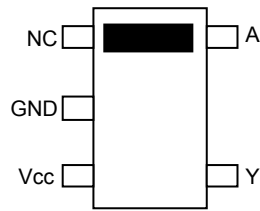
**Ultra Small Packages** : SSOT-25, SON-6\*

\* Under Development

## ■ PIN CONFIGURATION



SSOT-25  
(TOP VIEW)  
XC74UL14AAN



SON-6  
(TOP VIEW)  
XC74UL14AAR

## ■ FUNCTIONS

INPUT	OUTPUT
A	Y
H	L
L	H

H=High level

L=Low level

## ■ ABSOLUTE MAXIMUM RATINGS

Ta=-40°C~85°C

PARAMETER	SYMBOL	RATINGS	UNITS
Supply Voltage	VCC	-0.5~+6.0	V
Input Voltage	VIN	-0.5~+6.0	V
Output Voltage	VOUT	-0.5~VCC+0.5	V
Input Diode Current	I <sub>IK</sub>	-20	mA
Output Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
VCC,GND Current	I <sub>CC</sub> ,I <sub>GND</sub>	±50	mA
Power Dissipation	SSOT-25* <sup>1</sup>	150	mW
	SON-6* <sup>2</sup>	200	
Storage Temperature Range	T <sub>stg</sub>	-65~+150	°C

Voltage is all ground standardized.

\* 1) Ta=55°C

\* 2) Ta=25°C

## RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	V <sub>CC</sub> (V)	CONDITIONS	UNITS
Supply Voltage	V <sub>CC</sub>	—	2~5.5	V
Input Voltage	V <sub>IN</sub>	—	0~5.5	V
Output Voltage	V <sub>OUT</sub>	—	0~V <sub>CC</sub>	V
Operating Temperature Range	T <sub>opr</sub>	—	-40~+85	°C
Output Current	I <sub>OH</sub>	3.0	-4	mA
		4.5	-8	
	I <sub>OL</sub>	3.0	4	
		4.5	8	

## DC ELECTRICAL CHARACTERISTICS

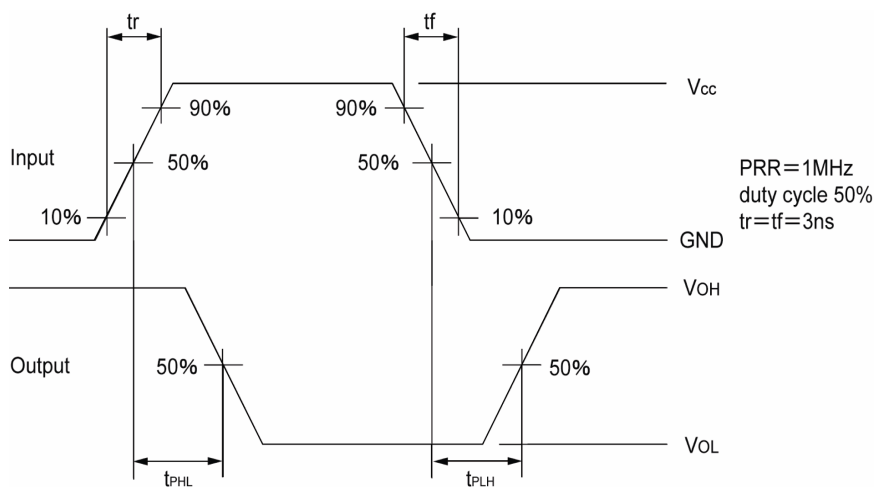
PARAMETER	SYMBOL	V <sub>CC</sub> (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS		
				MIN.	TYP.	MAX.	MIN.	MAX.			
Threshold Voltage	V <sub>T+</sub>	2.0		—	—	2.2	—	2.2	V		
		3.0		—	—	3.15	—	3.15			
		5.5		—	—	3.85	—	3.85			
	V <sub>T-</sub>	2.0		0.9	—	—	0.9	—	V		
		3.0		1.35	—	—	1.35	—			
		5.5		1.65	—	—	1.65	—			
Hysteresis Voltage	V <sub>H</sub>	3.0		0.25	—	1.2	0.25	1.2			
		4.5		0.30	—	1.4	0.30	1.4			
		5.5		0.35	—	1.6	0.35	1.6			
Output Voltage	V <sub>OH</sub>	2.0	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-50 μA	1.9	2.0	—	1.9	—	V	
		3.0			2.9	3.0	—	2.9	—		
		4.5			4.4	4.5	—	4.4	—		
		3.0			I <sub>OH</sub> =-4mA	2.58	—	—	2.48		—
		4.5				I <sub>OH</sub> =-8mA	3.94	—	—		3.80
	V <sub>OL</sub>	2.0	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =50 μA	—		—	0.1	—	0.1	V
		3.0			—	—	0.1	—	0.1		
		4.5			—	—	0.1	—	0.1		
		3.0			I <sub>OL</sub> =4mA	—	—	0.36	—	0.44	
		4.5				I <sub>OL</sub> =8mA	—	—	0.36	—	
Input Current	I <sub>IN</sub>	5.5	V <sub>IN</sub> =V <sub>CC</sub> or GND	-0.1	—		0.1	-1.0	1.0	μA	
Static Supply Current	I <sub>CC</sub>	5.5	V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0 μA	—	—	1.0	—	10.0			

## SWITCHING ELECTRICAL CHARACTERISTICS

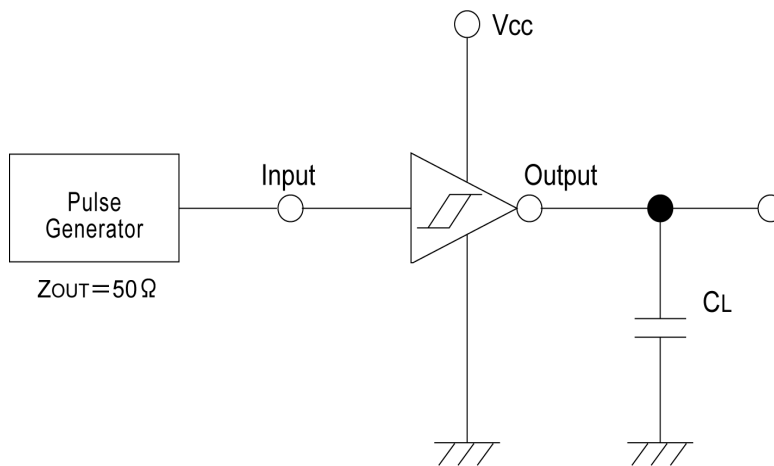
tr=tf=3ns

PARAMETER	SYMBOL	C <sub>L</sub>	V <sub>CC</sub> (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS
					MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time	t <sub>PLH</sub>	15pF	3.3		—	2.8	12.8	1.0	15.0	ns
			5.0		—	2.1	8.6	1.0	10.0	
		50pF	3.3		—	4.3	16.3	1.0	18.5	ns
			5.0		—	3.1	10.6	1.0	12.0	
	t <sub>PHL</sub>	15pF	3.3		—	3.1	12.8	1.0	15.0	ns
			5.0		—	2.5	8.6	1.0	10.0	
		50pF	3.3		—	4.4	16.3	1.0	18.5	ns
			5.0		—	3.4	10.6	1.0	12.0	
Input Capacitance	C <sub>IN</sub>	—	5.0	V <sub>IN</sub> =V <sub>CC</sub> or GND	—	2	10	—	10	pF
Power Dissipation Capacitance	C <sub>pd</sub>	No Load, f=1MHz			—	10	—	—	—	pF

■ WAVEFORM



■ TEST CIRCUIT



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