

## CMOS Logic

### ■ GENERAL DESCRIPTION

The XC74UL04AA is a CMOS inverter, manufactured using silicon gate CMOS fabrication.

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

The internal circuit is composed of inverter and buffer, which provide high noise immunity and stable output.

As the XC74UL04AA 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 = 2.05ns(TYP.)

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

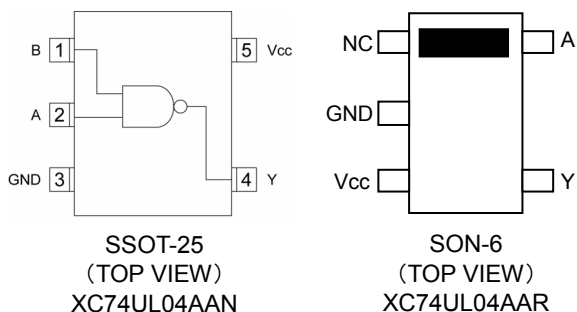
**Low Power Consumption**: 1  $\mu$  A (MAX.)

**CMOS Inverter**

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

\* Under Development

### ■ PIN CONFIGURATION



### ■ 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	IiK	-20	mA
Output Diode Current	IoK	±20	mA
Output Current	IOUT	±25	mA
Vcc,GND Current	ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	150	mW
	SON-6*2	200	
Storage Temperature Range	Tstg	-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	Topr	—	-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	
Input Rise and Fall Time	tr,tf	3.3	0~100	ns
		5.0	0~20	

## DC ELECTRICAL CHARACTERISTICS

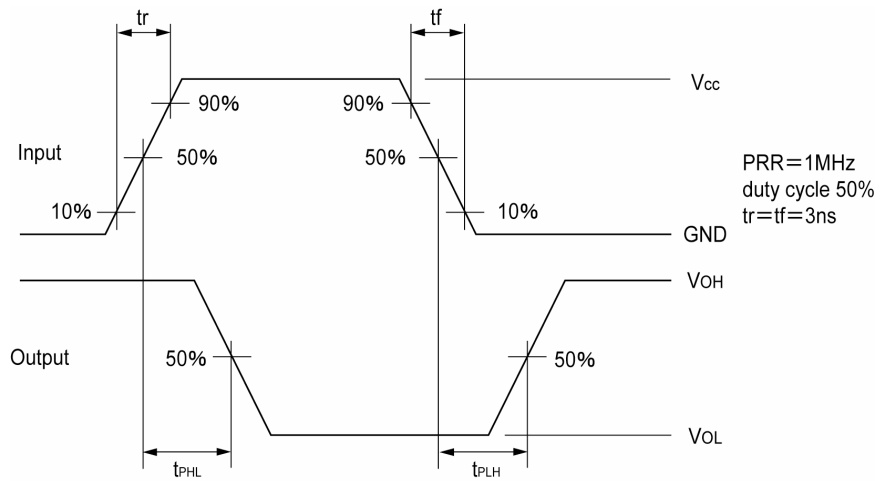
PARAMETER	SYMBOL	V <sub>CC</sub> (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS		
				MIN.	TYP.	MAX.	MIN.	MAX.			
Input Voltage	V <sub>IH</sub>	2.0		1.5	—	—	1.5	—	V		
		3.0		2.1	—	—	2.1	—			
		5.5		3.85	—	—	3.85	—			
	V <sub>IL</sub>	2.0		—	—	0.5	—	0.5	V		
		3.0		—	—	0.9	—	0.9			
		5.5		—	—	1.65	—	1.65			
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			2.58	—	—	2.48	—		
		4.5			3.94	—	—	3.80	—		
	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	2.0	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	—	—	0.36	—		0.44
					4.5	—	—	0.36	—		0.44
Input Current	I <sub>IN</sub>	0~5.5	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	μA		

## SWITCHING ELECTRICAL CHARACTERISTICS

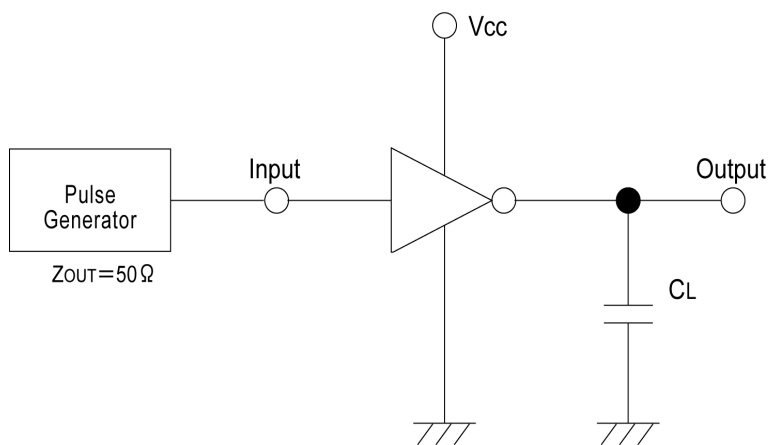
tr=tf=3ns

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		—	2.7	7.1	1.0	8.5	ns
			5.0		—	2.1	5.5	1.0	6.5	
		50pF	3.3		—	4.1	10.6	1.0	12.0	ns
			5.0		—	3.2	7.5	1.0	8.5	
	t <sub>PHL</sub>	15pF	3.3		—	2.5	7.1	1.0	8.5	ns
			5.0		—	2.0	5.5	1.0	6.5	
		50pF	3.3		—	3.9	10.6	1.0	12.0	ns
			5.0		—	3.0	7.5	1.0	8.5	
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			—	8.9	—	—	—	pF

## ■ WAVEFORM



## ■ TEST CIRCUIT



Note: Open output when measuring supply current

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