

XC74UL00AA



CMOS Logic

◆CMOS 2-Input NAND Gate

◆High Speed Operation : $t_{pd}=2.6\text{ns}$ TYP

◆Operating Voltage Range : $2\text{V}\sim 5.5\text{V}$

◆Low Power Consumption : $1\mu\text{A}$ (max)

■General Description

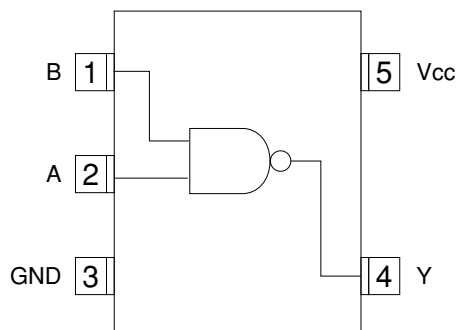
The XC74UL00AA is a 2-input CMOS NAND gate, manufactured using silicon gate CMOS fabrication.

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

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

As the XC74UL00AA is integrated into mini molded, SSOT-25 and SOT-25 packages, high density mounting is possible.

■Pin Configuration



SSOT-25/SOT-25
(TOP VIEW)

■Applications

- Palmtops
- Digital Equipment

■Features

High Speed Operation : $t_{pd}=2.6\text{ns}$ TYP

Operating Voltage Range : $2\text{V}\sim 5.5\text{V}$

Low Power Consumption : $1\mu\text{A}$ (max)

Ultra Small Package : SSOT-25 and SOT-25

■Function

INPUT		OUTPUT
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

H=High level, L=Low level

■Absolute Maximum Ratings

$T_a=-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$

PARAMETER	SYMBOL	RATINGS	UNITS
Power 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 _{IK}	-20	mA
Output Diode Current	I _{OK}	±20	mA
Output Current	I _{OUT}	±25	mA
VCC ,GND Current	I _{CC} , I _{GND}	±50	mA
Continuous Total Power Dissipation (T _a =55°C)	P _d	150	mW
Storage Temperature	T _{stg}	-65 ~ +150	°C

Note: Voltage is all Ground standardized.

Recommended Operating Conditions

PARAMETER	SYMBOL	V _{CC} (V)	CONDITIONS	UNITS
Supply Voltage	V _{CC}	-	2 ~ 5.5	V
Input Voltage	V _{IN}	-	0 ~ 5.5	V
Output Voltage	V _{OUT}	-	0 ~ V _{CC}	V
Operating Temperature	T _{opr}	-	-40 ~ +85	°C
Output Current	I _{OH}	3.0	-4	mA
		4.5	-8	
	I _{OL}	3.0	4	
		4.5	8	
Input Rise and Fall Time	t _r , t _f	3.3	0 ~ 100	ns/V
		5.0	0 ~ 20	

DC Electrical Characteristics

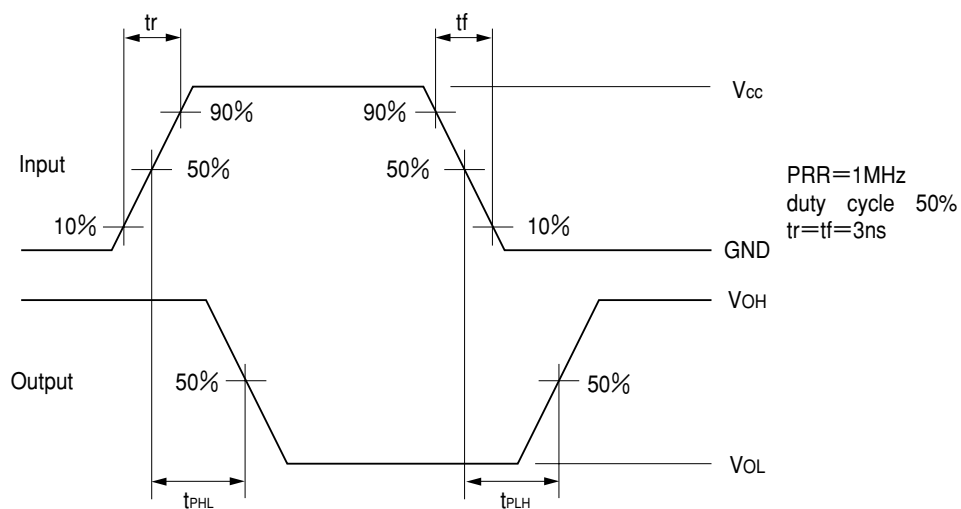
PARAMETER	SYMBOL	V _{CC} (V)		CONDITIONS	T _a =25°C			T _a =-40~85°C		UNITS
					MIN	TYP	MAX	MIN	MAX	
Input Voltage	V _{IH}	2.0			1.5	-	-	1.5	-	V
		3.0			2.1	-	-	2.1	-	
		5.5			3.85	-	-	3.85	-	
	V _{IL}	2.0			-	-	0.5	-	0.5	V
		3.0			-	-	0.9	-	0.9	
		5.5			-	-	1.65	-	1.65	
Output Voltage	V _{OH}	2.0	V _{IN} =V _{IH} or V _{IL}	I _{OH} =-50μA	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 _{OH} =-4mA	2.58	-	-	2.48	-	
		4.5		I _{OH} =-8mA	3.94	-	-	3.80	-	
	V _{OL}	2.0	V _{IN} =V _{IH}	I _{OL} =50μA	-	-	0.1	-	0.1	V
		3.0			-	-	0.1	-	0.1	
		4.5			-	-	0.1	-	0.1	
		3.0		I _{OL} =4mA	-	-	0.36	-	0.44	
		4.5		I _{OL} =8mA	-	-	0.36	-	0.44	
Input Current	I _{IN}	5.5	V _{IN} =V _{CC} or GND		-0.1	-	0.1	-1.0	1.0	μA
Quiescent Supply Current	I _{CC}	5.5	V _{IN} =V _{CC} or GND, I _{OUT} =0μA		-	-	1.0	-	10.0	

Switching Electrical Characteristics

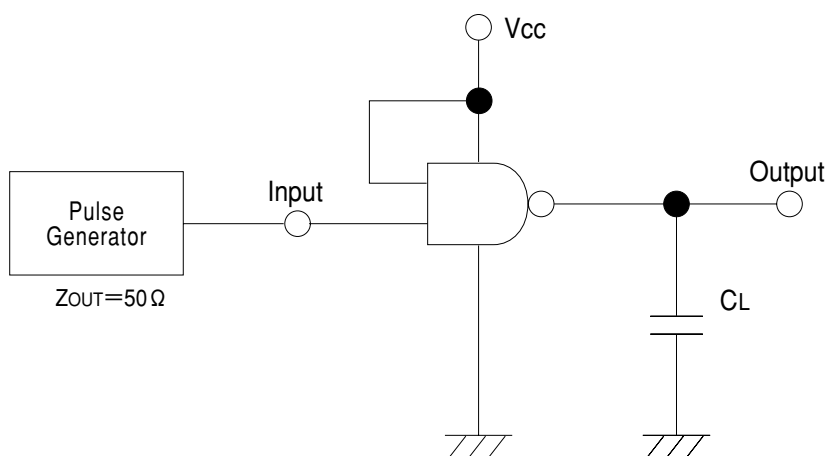
tr=tf=3ns											
PARAMETER	SYMBOL				CONDITIONS	Ta=25°C			Ta=-40~85°C		UNITS
						MIN	TYP	MAX	MIN	MAX	
Propagation Delay Time	tPLH	15pF	3.3		-	3.7	7.9	1	9.5	ns	
			5.0		-	2.7	5.5	1	6.5		
		50pF	3.3			-	5.4	11.4	1	13	ns
			5.0			-	3.6	7.5	1	8.5	
	tPHL	15pF	3.3		-	3.3	7.9	1	9.5	ns	
			5.0		-	2.5	5.5	1	6.5		
		50pF	3.3			-	4.6	11.4	1	13	ns
			5.0			-	3.5	7.5	1	8.5	
Input Capacitance	CIN	-	5.0	VIN=VCC or GND	-	2	10	-	10	pF	
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			-	9.3	-	-	-	pF	

t_r=t_f=3ns

Waveforms



Typical Application Circuit



Note: Open output when measuring supply current