

- ◆ **CMOS 2-Input NAND Gate**
- ◆ **High Speed Operation $t_{pd}=7\text{ns}$ TYP**
- ◆ **Operating Voltage Range 2V~6V**
- ◆ **Low Power Consumption $1\mu\text{A}$ MAX**

Applications

- Palmtops
- Digital Equipment

General Description

The XC74UH00AAM 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 XC74UH00AAM is integrated into a mini molded, SOT-25 package, high density mounting is possible.

Features

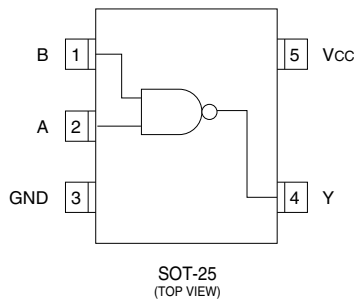
High Speed Operation: $t_{pd}=7\text{ns}$ TYP

Operating Voltage Range: 2V~6V

Low Power Consumption: $1\mu\text{A}$ MAX

Space Saving Package: SOT-25

Pin Configuration



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

$T_a=25^\circ\text{C}$

PARAMETER	SYMBOL	RATINGS	UNITS
Power Supply Voltage	VCC	-0.5 ~ +7.0	V
Input Voltage	VIN	-0.5 ~ VCC +0.5	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	± 25	mA
Continuous Total Power Dissipation	Pd	200	mW
Storage Temperature	Tstg	-65 ~ +150	$^\circ\text{C}$

Note: Voltage is all Ground standardized.

DC Electrical Characteristics

PARAMETER	SYMBOL	V _{CC} (V)	CONDITIONS	Ta=25°C			Ta=-40-85°C		UNITS	
				MIN	TYP	MAX	MIN	MAX		
Input Voltage	V _{IH}	2.0		1.5	-	-	1.5	-	V	
		4.5		3.15	-	-	3.15	-		
		6.0		4.2	-	-	4.2	-		
	V _{IL}	2.0		-	-	0.5	-	0.5	V	
		4.5		-	-	1.35	-	1.35		
		6.0		-	-	1.8	-	1.8		
Output Voltage	V _{OH}	2.0	V _{IN} =V _{IH} or V _{IL}	I _{OH} =-20μA	1.9	2.0	-	1.9	-	V
		4.5			4.4	4.5	-	4.4	-	
		6.0			5.9	6.0	-	5.9	-	
		4.5		I _{OH} =-2mA	4.18	4.36	-	4.13	-	
		6.0		I _{OH} =-2.6mA	5.68	5.84	-	5.63	-	
		V _{OL}		V _{IN} =V _{IH}	2.0	I _{OL} =20μA	-	0.0	0.1	
	4.5		-		0.0		0.1	-	0.1	
	6.0		-		0.0		0.1	-	0.1	
	4.5		I _{OL} =2mA		-		0.11	0.26	-	0.33
	6.0	I _{OL} =2.6mA	-	0.13	0.26	-	0.33			
Input Current	I _{IN}	6.0	V _{IN} =V _{CC} or GND	-	-	±0.1	-	±1.0	μA	
Quiescent Supply Current	I _{CC}	6.0	V _{IN} =V _{CC} or GND, I _{OUT} =0μA	-	-	1.0	-	10.0		

Switching Electrical Characteristics

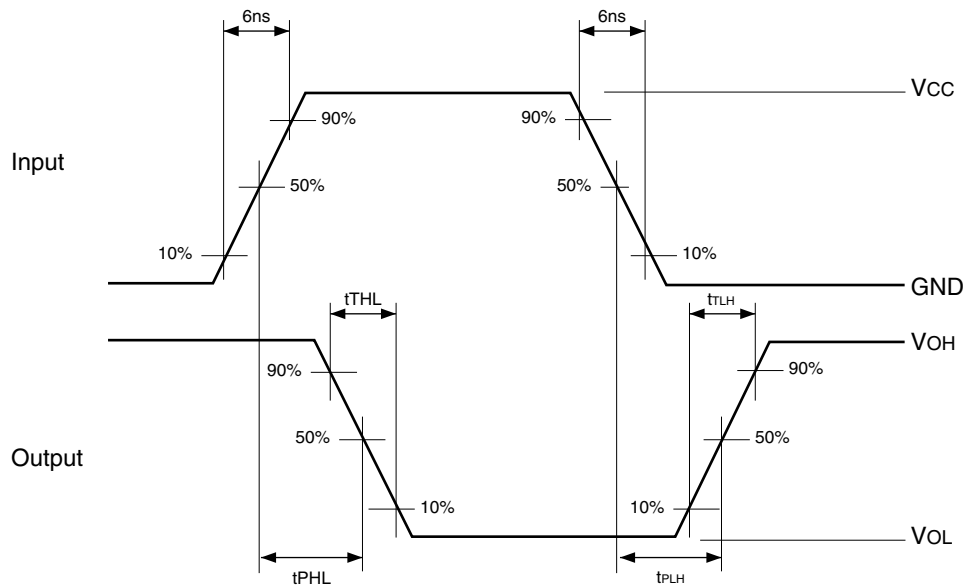
CL=15pF, tr=6ns, VCC=5V

PARAMETER	SYMBOL	CONDITIONS	Ta=25°C			UNITS
			MIN	TYP	MAX	
Output Transition Time	t _{TLH}		-	4	10	ns
	t _{THL}		-	3	10	ns
Propagation Delay Time	t _{PLH}		-	5	15	ns
	t _{PHL}		-	5	15	ns

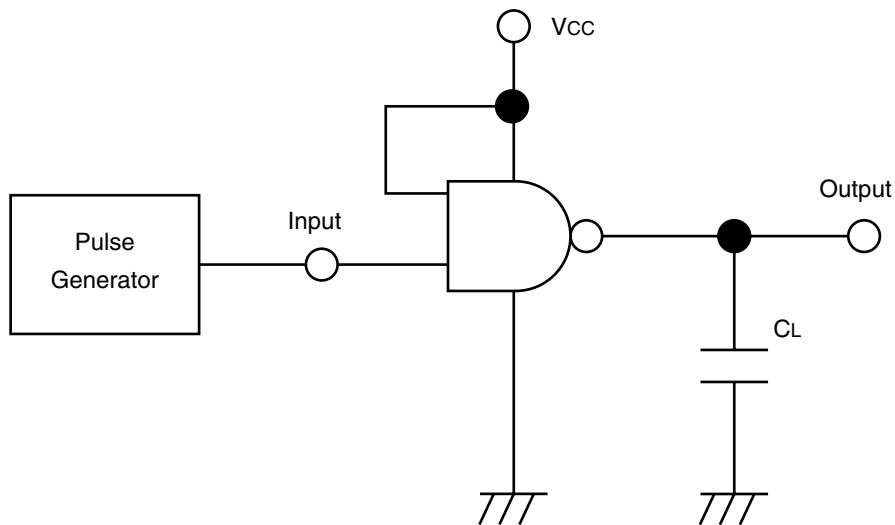
CL=50pF, tr=tf=6ns

PARAMETER	SYMBOL	V _{CC} (V)	CONDITIONS	Ta=25°C			Ta=-40-85°C		UNITS
				MIN	TYP	MAX	MIN	MAX	
Output Transition Time	t _{TLH}	2.0		-	18	125	-	155	ns
		4.5		-	7	25	-	31	
		6.0		-	6	21	-	26	
	t _{THL}	2.0		-	14	125	-	155	ns
		4.5		-	6	25	-	31	
		6.0		-	6	21	-	26	
Propagation Delay Time	t _{PLH}	2.0		-	16	100	-	125	ns
		4.5		-	8	20	-	25	
		6.0		-	7	17	-	21	
	t _{PHL}	2.0		-	16	100	-	125	ns
		4.5		-	6	20	-	25	
		6.0		-	5	17	-	21	
Input Capacitance	C _{IN}	-		-	5	10	-	10	pF

Waveforms



Typical Application Circuit



Note: open output when measuring supply current

Recommended Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	UNITS
Supply Voltage	V_{CC}	2 ~ 6	V
Input Voltage	V_{IN}	0 ~ V_{CC}	V
Output Voltage	V_{OUT}	0 ~ V_{CC}	V
Operating Temperature	T_{opr}	-40 ~ +85	°C
Input Rise and Fall Time	t_r, t_f	0 ~ 1000 ($V_{CC}=2.0V$)	ns
		0 ~ 500 ($V_{CC}=4.5V$)	
		0 ~ 400 ($V_{CC}=6.0V$)	