

- ◆ 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

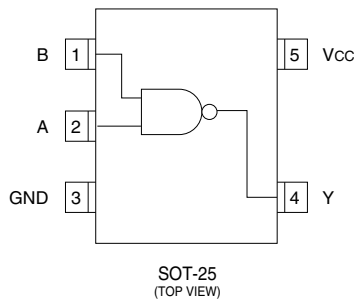
**High Speed Operation:**  $t_{pd}=7\text{ns TYP}$

**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	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>	±25	mA
Continuous Total Power Dissipation	P <sub>d</sub>	200	mW
Storage Temperature	T <sub>stg</sub>	-65 ~ +150	°C

Note: Voltage is all Ground standardized.

### DC Electrical Characteristics

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

### Switching Electrical Characteristics

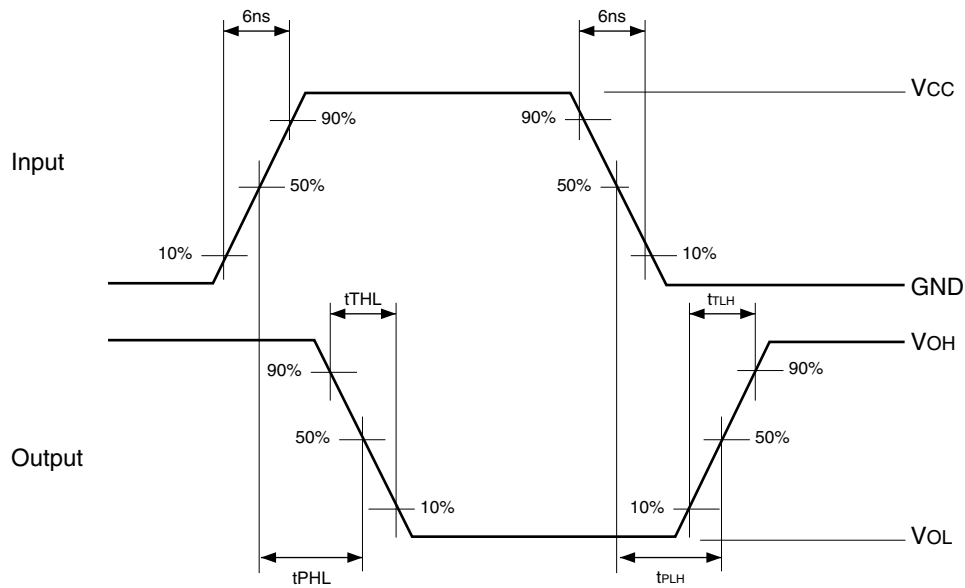
CL=15pF, tr=6ns, VCC=5V

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

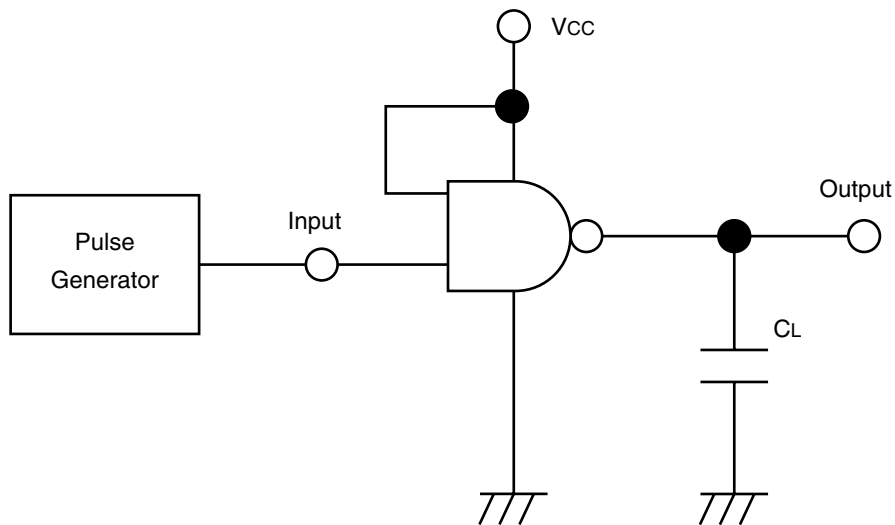
CL=50pF, tr=tf=6ns

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