

- ◆ CMOS Inverter
- ◆ Unbuffered Type
- ◆ High Speed Operation $t_{pd}=12\text{ns}$ TYP
- ◆ Operating Voltage Range 2V~6V
- ◆ Low Power Consumption $1\mu\text{A}$ MAX

■ Applications

- Crystal Oscillators
- Palmtops
- Digital Equipment

■ General Description

The XC74UHU04AM is a CMOS Inverter, manufactured using silicon gate CMOS fabrication.

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

The internal unbuffered, single-step composition makes the UHU04AM suitable for use with crystal oscillators.

As the XC74UHU04AM is integrated into a mini molded, SOT-25 package, high density mounting is possible.

■ Features

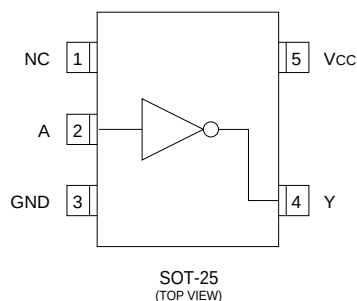
High Speed Operation: $t_{pd}=12\text{ns}$ TYP

Operating Voltage Range: 2V~6V

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

Space Saving Package: SOT-25

■ Pin Configuration



■ Function

INPUT	OUTPUT
A	Y
H	L
L	H

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 _{IK}	±20	mA
Output Diode Current	I _{OK}	±20	mA
Output Current	I _{OUT}	±25	mA
VCC, GND Current	I _{CC} , I _{GND}	±25	mA
Continuous Total Power Dissipation	P _d	200	mW
Storage Temperature	T _{stg}	-65 ~ +150	°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		1.7	-	-	1.7	-	V
		4.5		3.6	-	-	3.6	-	
		6.0		4.8	-	-	4.8	-	
	V _{IL}	2.0		-	-	0.3	-	0.3	V
		4.5		-	-	0.9	-	0.9	
		6.0		-	-	1.2	-	1.2	
Output Voltage	V _{OH}	2.0	V _{IN} =V _{IH} or V _{IL}	I _{OH} =-20μA	1.8	2.0	-	1.8	V
		4.5			4.0	4.5	-	4.0	
		6.0			5.5	6.0	-	5.5	
		4.5		I _{OH} =-2mA	4.18	4.31	-	4.13	
		6.0		I _{OH} =-2.6mA	5.68	5.8	-	5.63	
		6.0							
	V _{OL}	2.0	V _{IN} =V _{IH}	I _{OL} =20μA	-	0.0	0.2	-	V
		4.5			-	0.0	0.5	-	
		6.0			-	0.0	0.5	-	
		4.5		I _{OL} =2mA	-	0.17	0.26	-	
		6.0		I _{OL} =2.6mA	-	0.18	0.26	-	
		6.0							
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

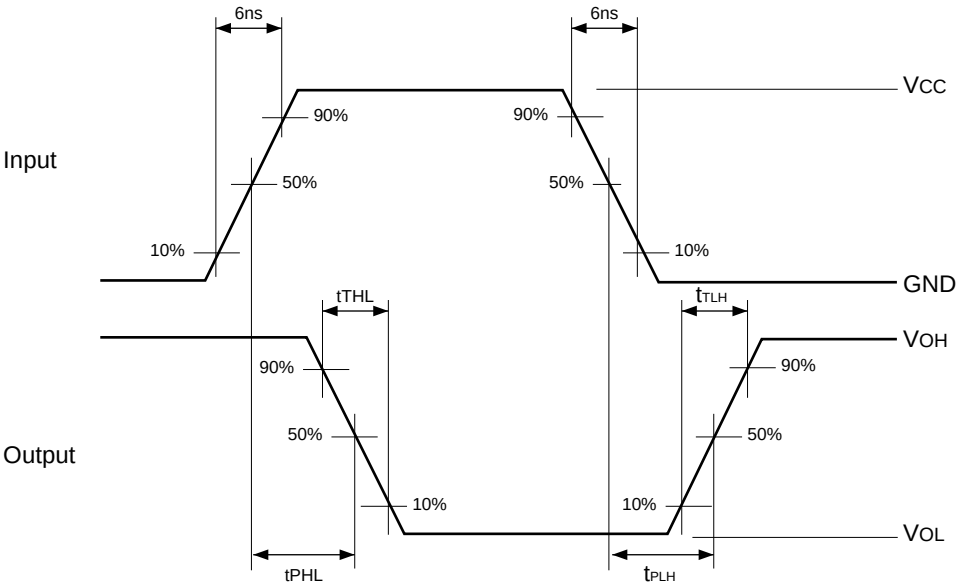
CL=15pF, tr=6ns, V_{CC}=5V

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

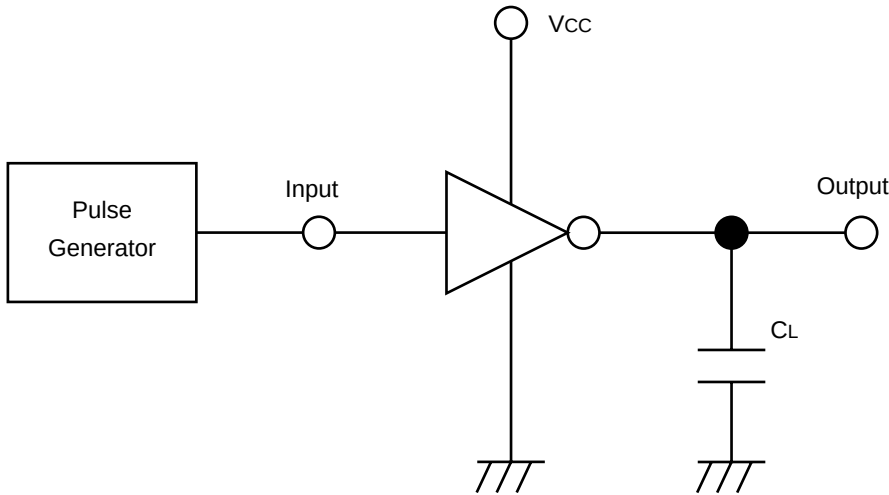
CL=50pF, tr=tf=6ns

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		-	50	125	-	155	ns
		4.5		-	14	25	-	31	
		6.0		-	12	21	-	26	
	t _{THL}	2.0		-	50	125	-	155	ns
		4.5		-	14	25	-	31	
		6.0		-	12	21	-	26	
Propagation Delay Time	t _{PLH}	2.0		-	48	100	-	125	ns
		4.5		-	12	20	-	25	
		6.0		-	9	17	-	21	
	t _{PHL}	2.0		-	48	100	-	125	ns
		4.5		-	12	20	-	25	
		6.0		-	9	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	VCC	2 ~ 6	V
Input Voltage	VIN	0 ~ VCC	V
Output Voltage	VOUT	0 ~ VCC	V
Operating Temperature	Topr	-40 ~ +85	°C
Input Rise and Fall Time	tr, tf	0 ~ 1000 (VCC=2.0V)	ns
		0 ~ 500 (VCC=4.5V)	
		0 ~ 400 (VCC=6.0V)	