

CMOS Logic

■ GENERAL DESCRIPTION

The XC74ULU04A 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 a single stage inverter, so can be used in the crystal oscillator.

As the XC74ULU04A is integrated into mini molded, SSOT-25 and SON-6 packages, high density mounting is possible.

■ APPLICATIONS

- Crystal oscillators
- Palmtops
- Digital equipment

■ FEATURES

High Speed Operation : tpd = 2.3ns (TYP.)

Operating Voltage Range : 2V ~ 5.5V

Low Power Consumption : 1 μ A (MAX.)

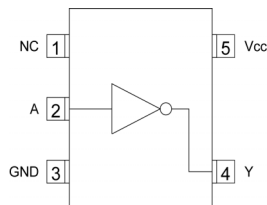
CMOS Inverter

Unbuffered Type

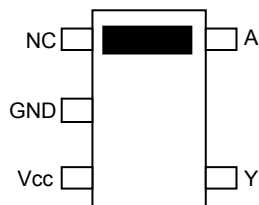
Ultra Small Packages : SSOT-25, SON-6*

* Under Development

■ PIN CONFIGURATION



SSOT-25
(TOP VIEW)
XC74ULU04AN



SON-6
(TOP VIEW)
XC74ULU04AR

■ 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	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
Power Dissipation	SSOT-25* ¹	150	mW
	SON-6* ²	200	
Storage Temperature Range	T _{stg}	-65~+150	°C

Voltage is all ground standardized.

* 1) Ta=55°C

* 2) Ta=25°C

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 Range	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,tf}	3.3	0~100	ns
		5.0	0~20	

DC ELECTRICAL CHARACTERISTICS

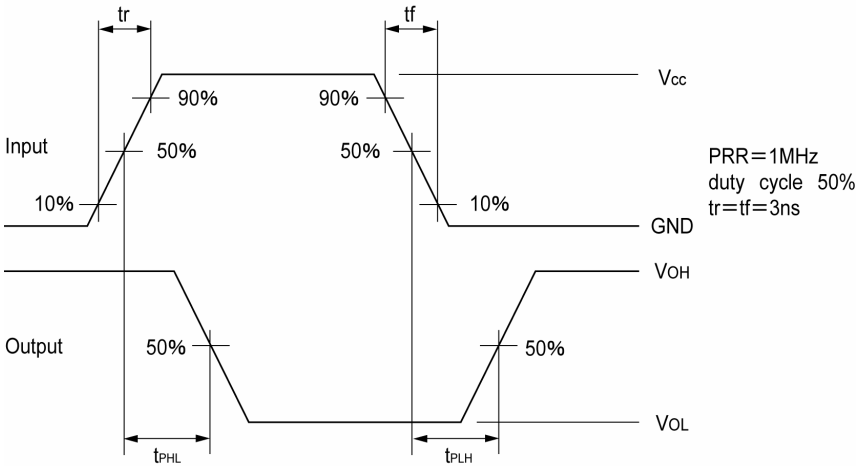
PARAMETER	SYMBOL	V _{CC} (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS		
				MIN.	TYP.	MAX.	MIN.	MAX.			
Input Voltage	V _{IH}	2.0		1.7	—	—	1.7	—	V		
		3.0		2.4	—	—	2.4	—			
		5.5		4.4	—	—	4.4	—			
	V _{IL}	2.0		—	—	0.3	—	0.3	V		
		3.0		—	—	0.6	—	0.6			
		5.5		—	—	1.1	—	1.1			
Output Voltage	V _{OH}	2.0	V _{IN} =V _{IL}	I _{OH} =-50 μA	1.8	2.0	—	1.8	—	V	
		3.0			2.7	3.0	—	2.7	—		
		4.5			4.0	4.5	—	4.0	—		
		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} =50 μA	—		—	0.2	—	0.2	V
		3.0			—	—	0.3	—	0.3		
		4.5			—	—	0.5	—	0.5		
		3.0			I _{OL} =4mA	—	—	0.36	—	0.44	
		4.5				I _{OL} =8mA	—	—	0.36	—	
Input Current	I _{IN}	5.5	V _{IN} =V _{CC} or GND	-0.1	—		0.1	-1.0	1.0	μA	
Static Supply Current	I _{CC}	5.5	V _{IN} =V _{CC} or GND, I _{OUT} =0 μA	—	—	1.0	—	10.0			

SWITCHING ELECTRICAL CHARACTERISTICS

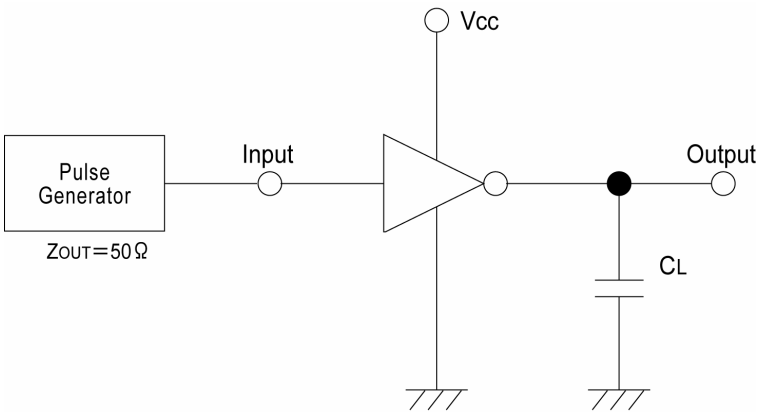
t_r=t_f=3ns

PARAMETER	SYMBOL	C _L	V _{CC} (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS
					MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time	t _{PLH}	15pF	3.3		—	2.8	8.9	1.0	10.5	ns
			5.0		—	2.4	5.5	1.0	6.5	
		50pF	3.3		—	4.5	11.4	1.0	13.0	ns
			5.0		—	3.6	7.0	1.0	8.0	
	t _{PHL}	15pF	3.3		—	2.7	8.9	1.0	10.5	ns
			5.0		—	2.2	5.5	1.0	6.5	
		50pF	3.3		—	4.2	11.4	1.0	13.0	ns
			5.0		—	3.5	7.0	1.0	8.0	
Input Capacitance	C _{IN}	—	5.0	V _{IN} =V _{CC} or GND	—	2	10	—	10	pF
Power Dissipation Capacitance	C _{pd}	No Load, f=1MHz			—	16	—	—	—	pF

■ WAVEFORM



■ TEST CIRCUIT



Note: Open output when measuring supply current

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