

CMOS Logic

■ GENERAL DESCRIPTION

XC74WL00AASR is a dual 2-input CMOS NAND gate, manufactured using silicon gate CMOS processes.

The small supply current, which is one of the features of the CMOS logic, gives way to high speed operations which enables LS-TTL.

With wave forming buffers connected internally, stabilized output can be achieved as the series offers high noise immunity.

As the series is integrated into a mini molded, MSOP-8B package, high density mounting is possible.

■ APPLICATIONS

- Palmtops
- Digital equipment

■ FEATURES

High Speed Operations : $t_{pd} = 2.6\text{ns}$ (TYP.) ($V_{CC}=5\text{V}$)

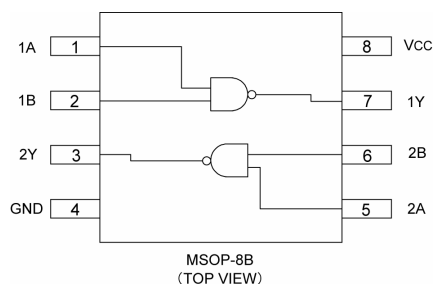
Operating Voltage Range : $2\text{V} \sim 5.5\text{V}$

Low Power Consumption : $1\mu\text{A}$ (MAX.)@ $T_a=25^\circ\text{C}$

CMOS Logic Dual-Input NAND Gate

Small Package : MSOP-8B

■ PIN CONFIGURATION



■ FUNCTIONS

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

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	V_{CC}	$-0.5 \sim +6.0$	V
Input Voltage	V_{IN}	$-0.5 \sim +6.0$	V
Output Voltage	V_{OUT}	$-0.5 \sim V_{CC} + 0.5$	V
Input Diode Current	I_{IK}	-20	mA
Output Diode Current	I_{OK}	± 20	mA
Switch Output Current	I_{OUT}	± 25	mA
V_{CC}, GND Current	I_{CC}, I_{GND}	± 50	mA
Power Dissipation ($T_a = 25^\circ\text{C}$)	P_d	300	mW
Storage Temperature Range	T_{stg}	$-65 \sim +150$	$^\circ\text{C}$

Note : Voltage is all ground standardized.

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	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
Input Rise/Fall Time	tr,tf	0~200 (V _{CC} =3.3V)	ns
		0~100 (V _{CC} =5V)	

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		1.5	—	—	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 _{IL} or V _{IH}	I _{OH} =-50 μA	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	
		5.5							
	V _{OL}	2.0	V _{IN} =V _{IH}	I _{OL} =50 μA	—	—	0.1	—	V
		3.0			—	—	0.1	—	
		4.5			—	—	0.1	—	
		3.0		I _{OL} =4mA	—	—	0.36	—	
		4.5		I _{OL} =8mA	—	—	0.36	—	
		5.5							
Input Voltage	I _{IN}	0~5.5	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	μA

SWITCHING ELECTRICAL CHARACTERISTICS

(tr=tf=3ns)

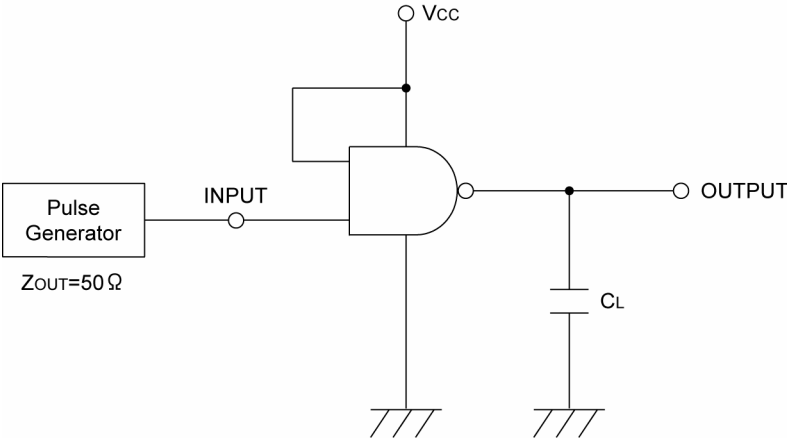
PARAMETER	SYMBOL	CL	V _{CC} (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS
					MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time	t _{PLH}	15pF	3.3		—	3.7	7.9	1.0	9.5	ns
			5.0		—	2.7	5.5	1.0	6.5	
		50pF	3.3		—	5.4	11.4	1.0	13	ns
			5.0		—	3.6	7.5	1.0	8.5	
	t _{PHL}	15pF	3.3		—	3.3	7.9	1.0	9.5	ns
			5.0		—	2.5	5.5	1.0	6.5	
		50pF	3.3		—	4.6	11.4	1.0	13	ns
			5.0		—	3.5	7.5	1.0	8.5	
Input Capacitance	C _{IN}	—	5.0	V _{IN} =V _{CC} or GND	—	2	10	1.0	10	pF
Power Dissipation Capacitance	C _{pd}	No Load, f=1MHz			—	9.3	—	—	—	pF

NOISE CHARACTERISTICS

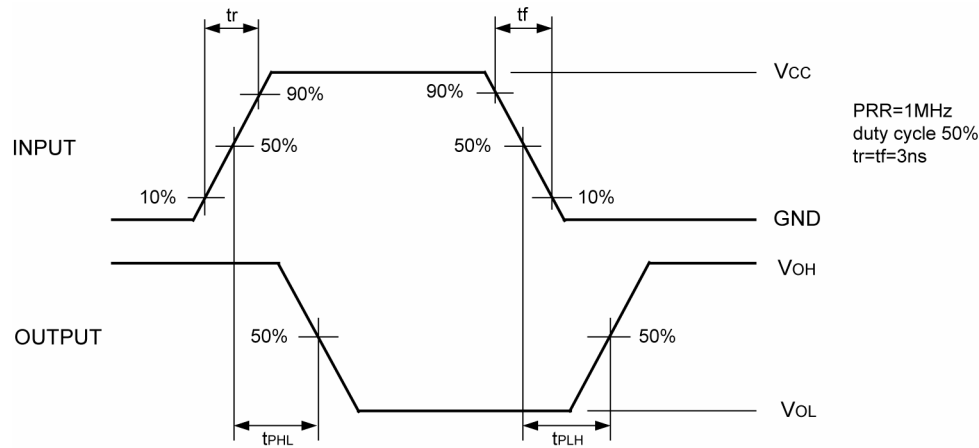
(tr=tf=3ns)

PARAMETER	SYMBOL			CONDITIONS	Ta=25°C			UNITS
		CL	Vcc(V)		MIN.	TYP.	MAX.	
Non Functional Output Maximum Dynamic VOL	VOLP	50pF	5.0		—	0.3	0.8	V
Non Functional Output Minimum Dynamic VOL	VOLV	50pF	5.0		-0.8	-0.3	—	V
Minimum Dynamic VIH	VIHD	50pF	5.0		—	—	3.5	V
Maximum Dynamic VIL	VILD	50pF	5.0		—	—	1.5	V

TEST CIRCUIT



WAVEFORM



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