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## CMOS Logic

## ■ GENERAL DESCRIPTION

XC74WL125ASR is dual bus buffer 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** :  $t_{pd} = 3.8\text{ns(TYP.)}$  ( $V_{CC}=5\text{V}$ )

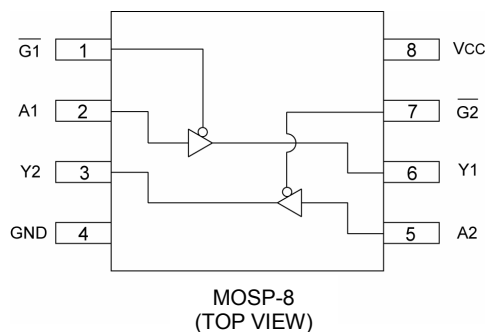
**Operating Voltage Range** :  $2\text{V} \sim 5.5\text{V}$

**Low Power Consumption**:  $2\mu\text{A (MAX.)}$

**CMOS Logic Dual Bus Buffer**

**Small Package** : MSOP-8B

## ■ PIN CONFIGURATION



## ■ FUNCTIONS

INPUT		OUTPUT
$\bar{G}$	A	Y
H	X	Z
L	H	H
L	L	L

H=High level

L=Low level

X=Don't care

Z=High impedance

## ■ ABSOLUTE MAXIMUM RATINGS

$T_a = -40^\circ\text{C} \sim 85^\circ\text{C}$

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

Note : Voltage is all ground standardized.

## RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	UNITS
Supply Voltage	V <sub>CC</sub>	2~5.5	V
Input Voltage	V <sub>IN</sub>	0~5.5	V
Output Voltage	V <sub>OUT</sub>	0~V <sub>CC</sub>	V
Operating Temperature Range	T <sub>opr</sub>	-40~+85	°C
Input Rise and Fall Time	tr,tf	0~200 (V <sub>CC</sub> =3.3V)	ns
		0~100 (V <sub>CC</sub> =5V)	

## DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	V <sub>CC</sub> (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS	
				MIN.	TYP.	MAX.	MIN.	MAX.		
Input Voltage	V <sub>IH</sub>	2.0		1.50	—	—	1.50	—	V	
		3.0		2.10	—	—	2.10	—		
		5.5		3.85	—	—	3.85	—		
	V <sub>IL</sub>	2.0		—	—	0.50	—	0.50	V	
		3.0		—	—	0.90	—	0.90		
		5.5		—	—	1.65	—	1.65		
Output Voltage	V <sub>OH</sub>	2.0	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OH</sub> =-50 μA	1.90	2.00	—	1.90	—	V
		3.0			2.90	3.00	—	2.90	—	
		4.5			4.40	4.50	—	4.40	—	
		3.0		I <sub>OH</sub> =-4mA	2.58	—	—	2.48	—	
		4.5		I <sub>OH</sub> =-8mA	3.94	—	—	3.80	—	
	V <sub>OL</sub>	2.0	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OL</sub> =50 μA	—	—	0.10	—	0.10	V
		3.0			—	—	0.10	—	0.10	
		4.5			—	—	0.10	—	0.10	
		3.0		I <sub>OL</sub> =4mA	—	—	0.36	—	0.44	
		4.5		I <sub>OL</sub> =8mA	—	—	0.36	—	0.44	
3 State Off-Leak Current	I <sub>oz</sub>	5.0	V <sub>IN</sub> =V <sub>IL</sub> or V <sub>IH</sub> , V <sub>OUT</sub> =V <sub>CC</sub> or GND	-0.25	—	0.25	-2.50	2.50	μA	
Input Current	I <sub>IN</sub>	0~5.5	V <sub>IN</sub> =V <sub>CC</sub> or GND	-0.10	—	0.1	-1.00	1.00	μA	
Static Supply Current	I <sub>CC</sub>	5.5	V <sub>IN</sub> =V <sub>CC</sub> or GND	—	—	2.0	—	20.0	μA	

## SWITCHING ELECTRICAL CHARACTERISTICS

(tr=tf=3ns)

PARAMETER	SYMBOL	V <sub>CC</sub> (V)	CONDITIONS	Ta=25°C			Ta=-40°C~85°C		UNITS
				MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time	t <sub>PLH</sub>	3.3	C <sub>L</sub> =15pF	—	5.6	8.0	1.0	9.5	ns
		5.0		—	3.8	5.5	1.0	6.5	
		3.3	C <sub>L</sub> =50pF	—	8.1	11.5	1.0	13.0	ns
		5.0		—	5.3	7.5	1.0	8.5	
	t <sub>PHL</sub>	3.3	C <sub>L</sub> =15pF	—	5.6	8.0	1.0	9.5	ns
		5.0		—	3.8	5.5	1.0	6.5	
		3.3	C <sub>L</sub> =50pF	—	8.1	11.5	1.0	13.0	ns
		5.0		—	5.3	7.5	1.0	8.5	
Output Enable Time	t <sub>ZL</sub>	3.3	R <sub>L</sub> =1kΩ	—	5.4	8.0	1.0	9.5	ns
		5.0	C <sub>L</sub> =15pF	—	3.6	5.1	1.0	6.0	
		3.3	R <sub>L</sub> =1kΩ	—	7.9	11.5	1.0	13	ns
		5.0	C <sub>L</sub> =50pF	—	5.1	7.1	1.0	8.0	
	t <sub>ZH</sub>	3.3	R <sub>L</sub> =1kΩ	—	5.4	8.0	1.0	9.5	ns
		5.0	C <sub>L</sub> =15pF	—	3.6	5.1	1.0	6.0	
		3.3	R <sub>L</sub> =1kΩ	—	7.9	11.5	1.0	13.0	ns
		5.0	C <sub>L</sub> =50pF	—	5.1	7.1	1.0	8.0	
Output Disable Time	t <sub>LZ</sub>	3.3	R <sub>L</sub> =1kΩ	—	9.5	13.2	1.0	15.0	ns
		5.0	C <sub>L</sub> =50pF	—	6.1	8.8	1.0	10.0	
	t <sub>HZ</sub>	3.3	R <sub>L</sub> =1kΩ	—	9.5	13.2	1.0	15.0	ns
		5.0	C <sub>L</sub> =50pF	—	6.1	8.8	1.0	10.0	
Output Pin Skew (Note)	t <sub>OSLH</sub>	3.3	C <sub>L</sub> =50pF	—	—	1.5	—	1.5	ns
		5.0		—	—	1.0	—	1.0	
	t <sub>OSHL</sub>	3.3	C <sub>L</sub> =50pF	—	—	1.5	—	1.5	ns
		5.0		—	—	1.0	—	1.0	
Input Capacitance	C <sub>IN</sub>	—		—	4	10	—	10	pF
Output Capacitance	C <sub>OUT</sub>	—		—	6	—	—	—	pF
Power Dissipation Capacitance	C <sub>pd</sub>	—		—	14	—	—	—	pF

Note: t<sub>OSLH</sub> and t<sub>OSHL</sub> are the guaranteed parameters.

$$t_{OSLH} = |t_{PLHm} - t_{PHLn}|, \quad t_{OSHL} = |t_{PHLm} - t_{PLLn}|$$

## NOISE CHARACTERISTICS

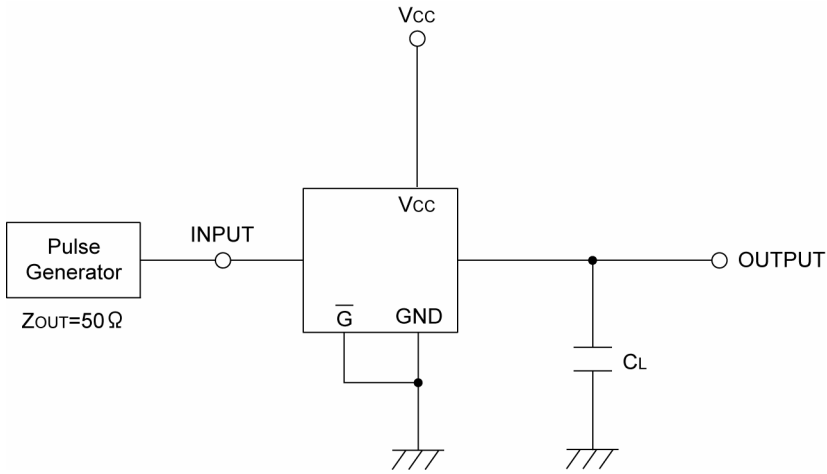
(tr=tf=3ns)

PARAMETER	SYMBOL	C <sub>L</sub>	V <sub>CC</sub> (V)	CONDITIONS	Ta=25°C			UNITS
					MIN.	TYP.	MAX.	
Non Functional Output Maximum Dynamic V <sub>OL</sub>	V <sub>OLP</sub>	50pF	5.0		—	0.3	0.8	V
Non Functional Output Minimum Dynamic V <sub>OL</sub>	V <sub>OLV</sub>	50pF	5.0		-0.8	-0.3	—	V
Minimum Dynamic V <sub>IH</sub>	V <sub>IHD</sub>	50pF	5.0		—	—	3.5	V
Maximum Dynamic V <sub>IL</sub>	V <sub>ILD</sub>	50pF	5.0		—	—	1.5	V

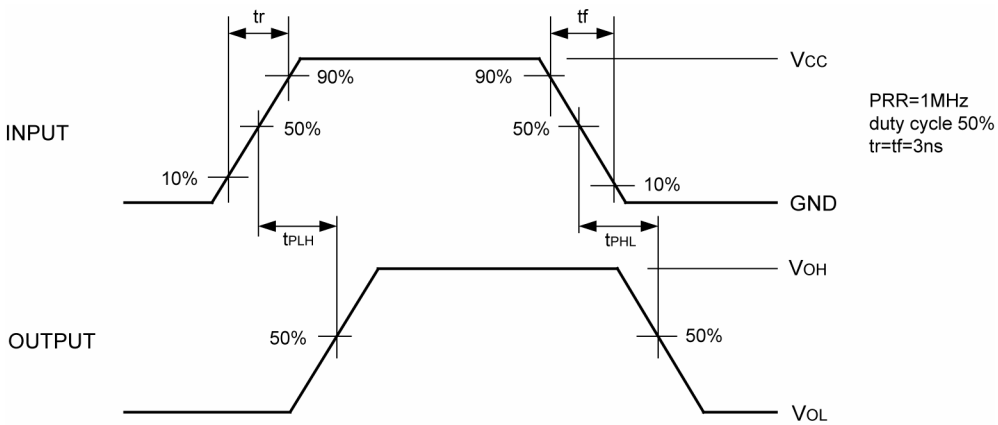
# XC74WL125ASR

## ■ DELAY TIME

### ● Test Circuit

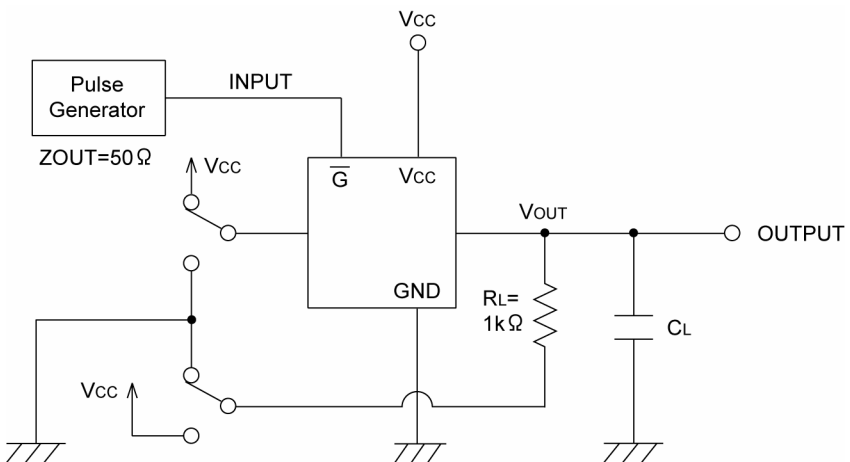


### ● Waveform

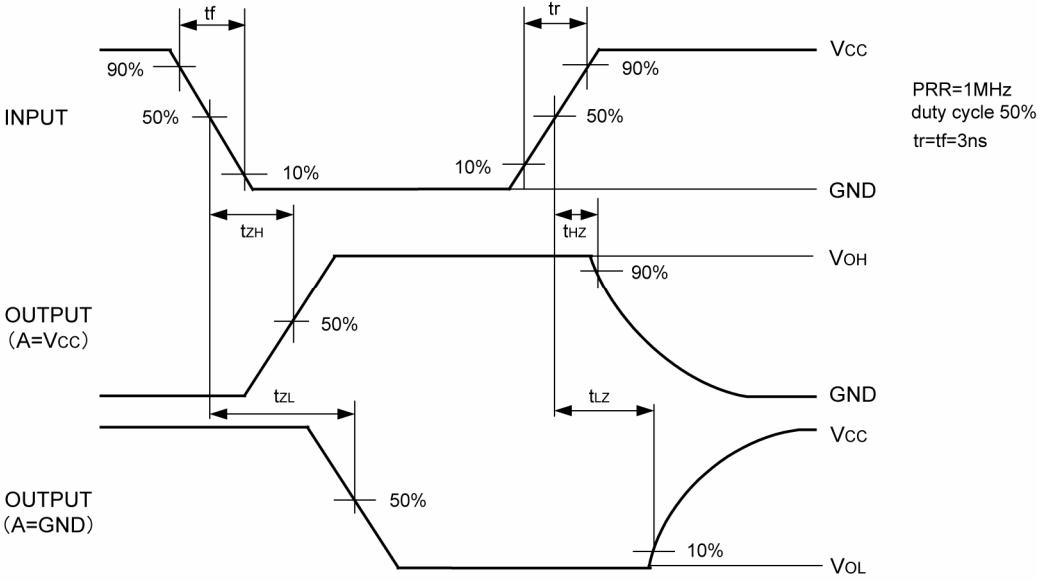


# OUTPUT ENABLE TIME, OUTPUT DISABLE TIME

## Test Circuit



## Waveform



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