

## SN74LS02N

### Product Introduction

The SN74LS02N is an integrated or non gate integrated circuit with four sets of two inputs.

### Product Features

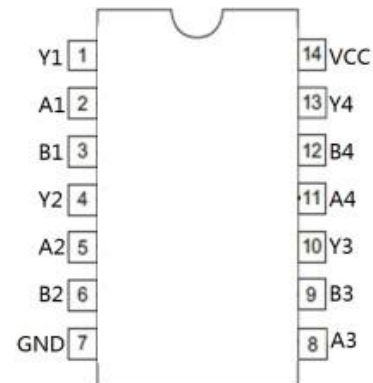
- Integrating four sets of two input or non gate circuits
- Fully compatible with TTL/DTL input and output logic level
- Package : DIP14, SOP14

### Product Applications

- Digital logic driver
- Industrial control applications (eg: responder, program control equipment, etc.)
- Other application areas Battery-powered equipment

### Package and Pin Assignment

SOP14 or DIP14.			
Pin NO	Pin Definition	Pin NO	Pin Definition
1	Output Y1	14	Supply VCC
2	Input A1	13	Output Y4
3	Input B1	12	InputB4
4	Output Y2	11	InputA4
5	Input A2	10	Output Y3
6	Input B2	9	InputB3
7	Supply GND	8	InputA3

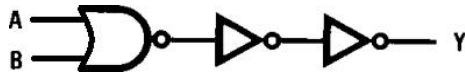


### Absolute Maximum Ratings

Item	Symbol	Maximum Ratings	Unit
Supply voltage	$V_{CC}$	7	V
Input voltage	$V_I$	7	V
Power dissipation	$P_D$	500	mW
Operating temperature	$T_A$	0-70	°C
Storage temperature	$T_S$	-65-150	°C
welding temperature	$T_W$	260	°C, 10s

Note: the limit parameter is the limit value that cannot be exceeded under any condition. Once this limit is exceeded, it may cause physical damage such as deterioration of the product. At the same time, the chip can not be guaranteed to work properly when it is close to the limit parameters.

### ■ Block Diagram



$$Y = \overline{A + B}$$

### ■ Function Table

Inputs		Output
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

H=High logic level

L=low logic level

### ■ Recommended Operating Conditions

Item	Symbol	Min	Tpy	Max	Unit
Supply voltage	$V_{CC}$	4.75	5	5.25	V
Input voltage	$V_{IH}$	2	—	—	V
	$V_{IL}$	—	—	0.7	V
Output current	$I_{OH}$	—	—	-400	$\mu$ A
	$I_{OL}$	—	—	8	mA
Operating temperature	$T_A$	0	—	60	$^{\circ}$ C

### ■ Electrical Characteristics

( $T_A=25^{\circ}$ C, Unless specified)

Item	Symbol	Min	Tpy	Max	Unit	Conditions	
Output voltage	$V_{OH}$	2.7	3.5	—	V	$I_{OH}=-400\mu$ A	$V_{CC}=4.75$ V, $V_{IL}=0.7$ V
	$V_{OL}$	—	0.12	0.4	V	$I_{OL}=4$ mA	$V_{CC}=4.75$ V, $V_{IH}=2$ V
		—	0.20	0.5			
Input current	$I_I$	—	0.01	100	$\mu$ A	$V_{CC}=5.25$ V, $V_I=7$ V	
	$I_{IH}$	—	0.01	20	$\mu$ A	$V_{CC}=5.25$ V, $V_I=2.7$ V	
	$I_{IL}$	—	0.20	0.4	mA	$V_{CC}=5.25$ V, $V_I=0.4$ V	
Short-circuit output current	$I_{OS}(\text{Note1})$	-	-35	-100	mA	$V_{CC}=5.25$ V	
Supply current	$I_{CCH}$	—	1.6	3.2	mA	$V_{CC}=5.25$ V, all $V_I=V_{CC}$	
	$I_{CCL}$	—	3.5	5.4	mA	$V_{CC}=5.25$ V, all $V_I=GND$	
Input clamp voltage	$V_{IK}$	—	0.9	-1.5	V	$V_{CC}=4.75$ V, $I_I = -18$ mA	

Note1: only one output port is short circuited each time, and the short circuit time is not more than one second.

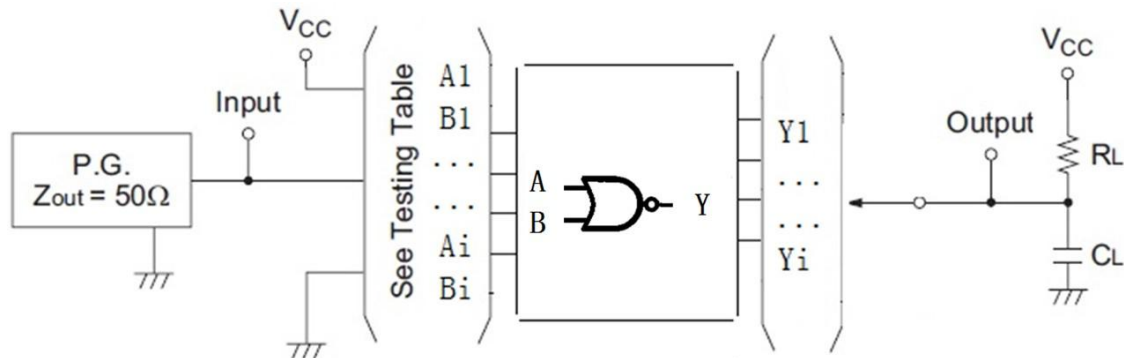
### ■ Switching Characteristics

( $T_A=25^{\circ}$ C, Unless specified)

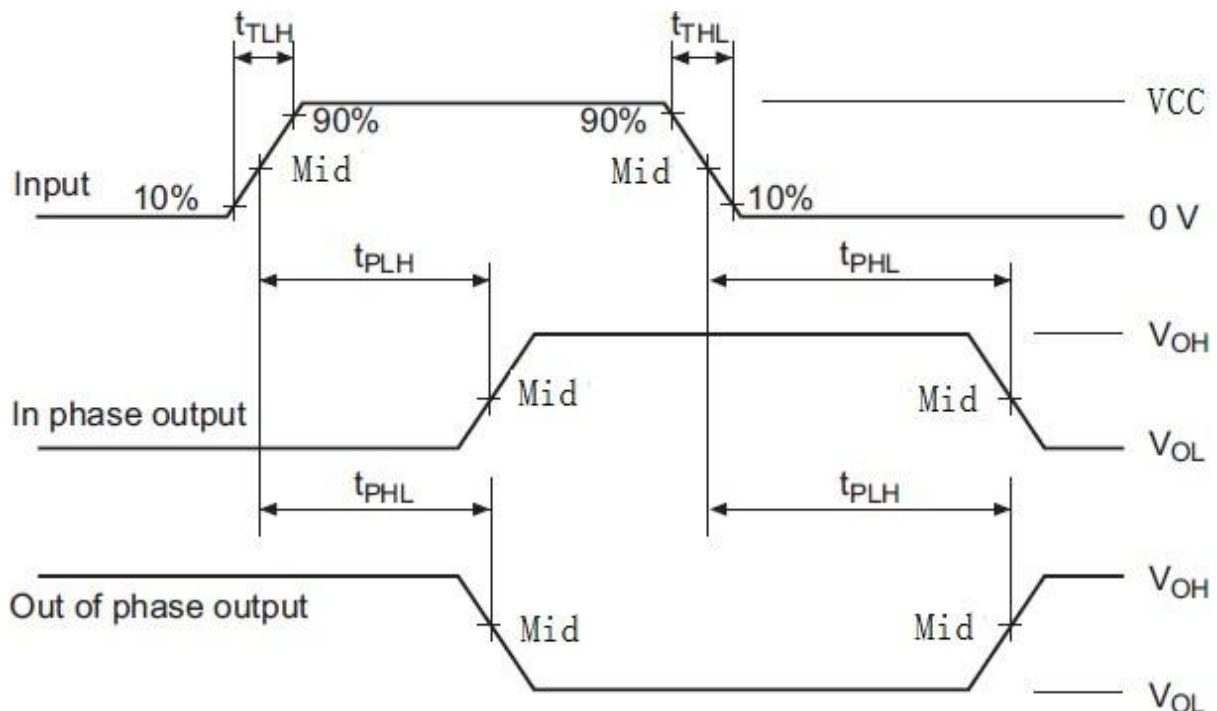
Item	Symbol	Min	Tpy	Max	Unit	Conditions
Propagation delay time	$t_{PLH}$	—	24	—	ns	$V_{CC}=5$ V, $CL=16$ pF, $RL=2$ K $\Omega$
	$t_{PHL}$	—	3	—	ns	

### ■ Testing Method

#### 1、Test Circuit



#### 2、Waveform



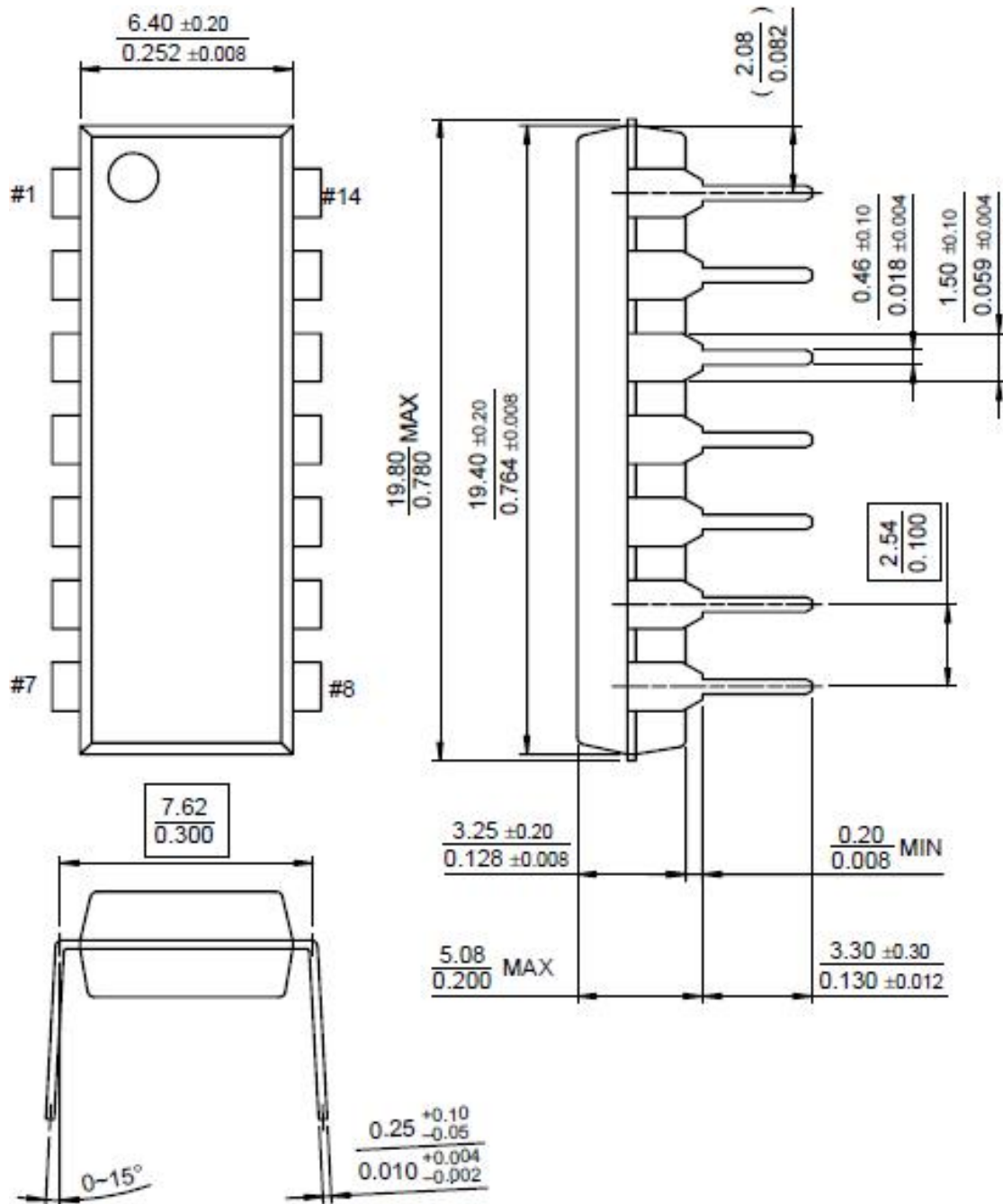
Note:

1. See Testing Table refers to the corresponding test items in the switch characteristic table.
2. the CL capacitor is an external patch capacitor (0603), which is connected to the output pin and the capacitor is near the chip GND.
3. Input: port input level,  $f=500\text{kHz}$ ,  $D=50\%$ ,  $t_{TLH}=t_{THL}$  or less 20ns;
4. Output: Y output test port (Out of Phase Output, In Phase Output)

■ Package Dimensions

Unit : mm / inch

DIP14



SOP14

