SN74LS21N

Product Introduction

The SN74LS21N is a digital integrated circuit that integrates two sets of four input and AND gates.

Product Features

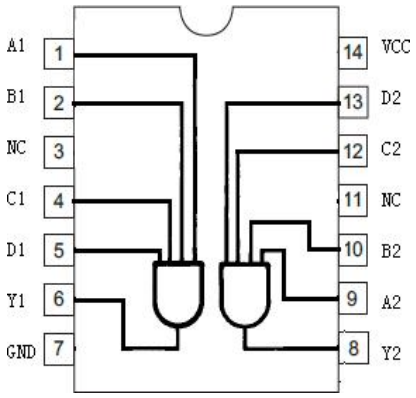
- Ntegrating two sets of four INPUT AND gates
- Fully compatible with TTL/DTL input and output logic level
- Package : DIP14, SOP14

Product Applications

- Digital logic driver
- Industrial control applications
- Other application areasBattery-powered equipment

Package and Pin Assignment

SOP14 or DIP14.			
Pin NO	Pin Definition	Pin NO	Pin Definition
1	Input A1	14	Supply VCC
2	Input B1	13	Input D2
3	NC	12	Input C2
4	Input C1	11	NC
5	Input D1	10	Input B2
6	Output Y1	9	Input A2
7	Supply GND	8	Output Y2

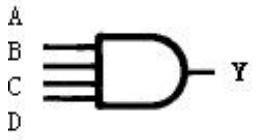


Absolute Maximum Ratings

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	℃
Storage temperature	T_S	-65-150	℃
welding temperature	T_W	260	℃,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 = ABCD

Function Table

Inputs				Output
A	B	C	D	Y
X	X	X	L	L
X	X	L	X	L
X	L	X	X	L
L	X	X	X	L
H	H	H	H	H

H = High Logic Level
L = Low Logic Level
X = Either Low or High 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	uA
	I_{OL}	—	—	8	mA
Operating temperature	T_A	0	—	60	℃

Electrical Characteristics

(T_A=25℃, Unless specified)

Item	Symbol	Min	Tpy	Max	Unit	Conditions	
Output voltage	V_{OH}	2.7	3.3	—	V	I_{OH}=-400uA	VCC=4.75V, V_{IH}=2V
	V_{OL}	—	0.20	0.4	V	I_{OL}=4mA	VCC=4.75V, V_{IL}=0.7V
		—	0.36	0.7		I_{OL}=8mA	
Input current	I_I	—	0.01	20	uA	VCC=5.25V, V_I=7V	
	I_{IH}	—	0.0	20	uA	VCC=5.25V, V_I=2.7V	
	I_{IL}	—	0.25	0.4	mA	VCC=5.25V, V_I=0.4V	
Short-circuit output current	$I_{OS(Note1)}$	—	-15	-100	mA	VCC=5.25V	
Supply current	I_{CCH}	—	1.6	2.4	mA	VCC=5.25V, all V_I=VCC	
	I_{CCL}	—	2.8	4.4	mA	VCC=5.25V, all V_I=GND	
Input clamp voltage	V_{IK}	—	0.90	-1.5	V	VCC=4.75V, I_I = - 18mA	

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

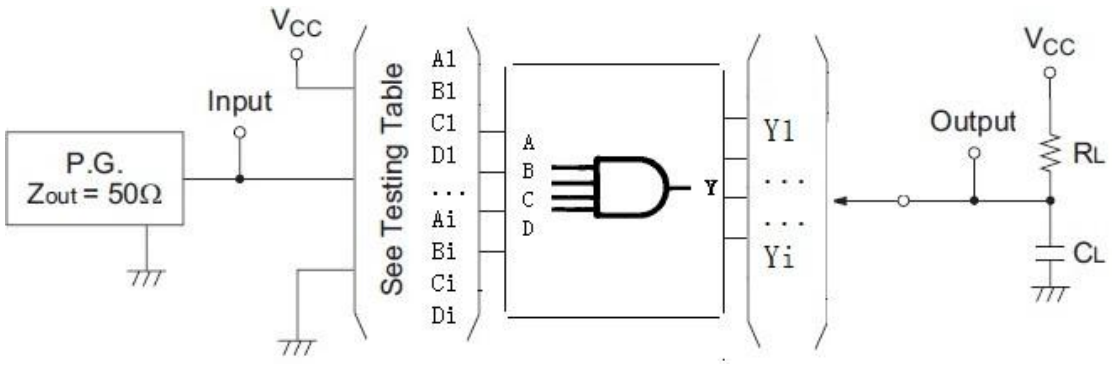
Switching Characteristics

(T_A=25℃, Unless specified)

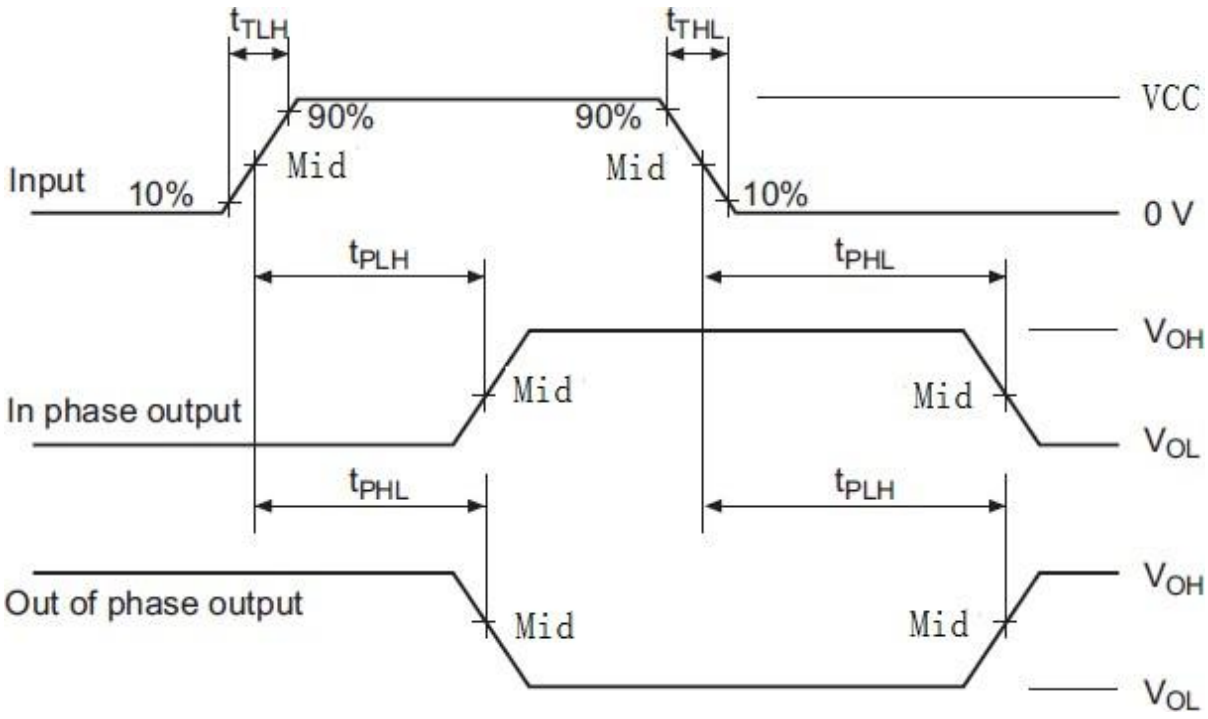
Item	Symbol	Min	Tpy	Max	Unit	Conditions
Propagation delay time	t_{PLH}	—	20	—	ns	VCC=5V, CL=16pF, RL=2KΩ
	t_{PHL}	—	12	—	ns	

■ Testing Method

1、Test Circuit



2、Waveform



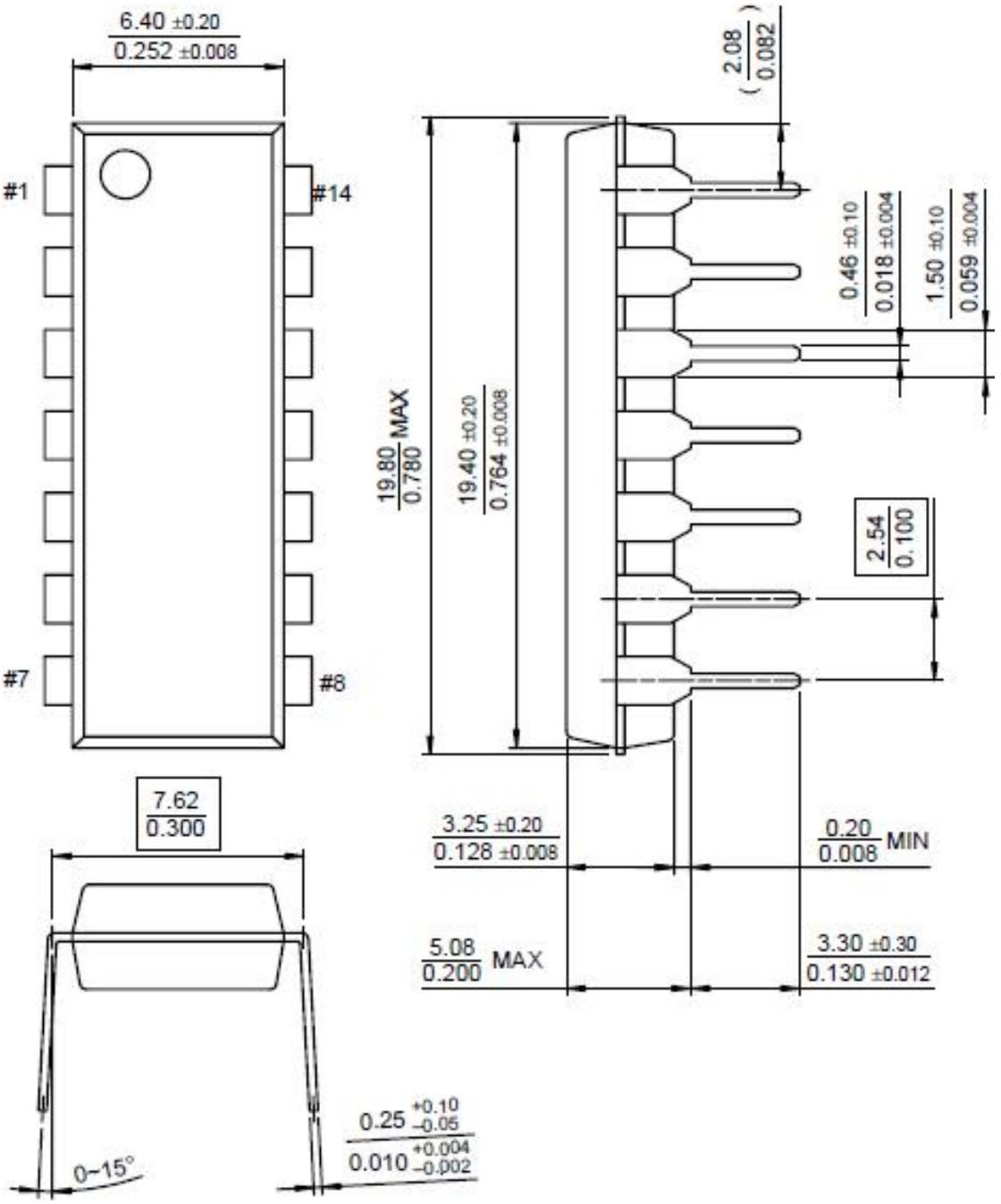
Note:

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=500kHz, D=50%, tTLH=tTHL or less 20ns;
4. Output: Y output test port (Out of Phase Output, In Phase Output)

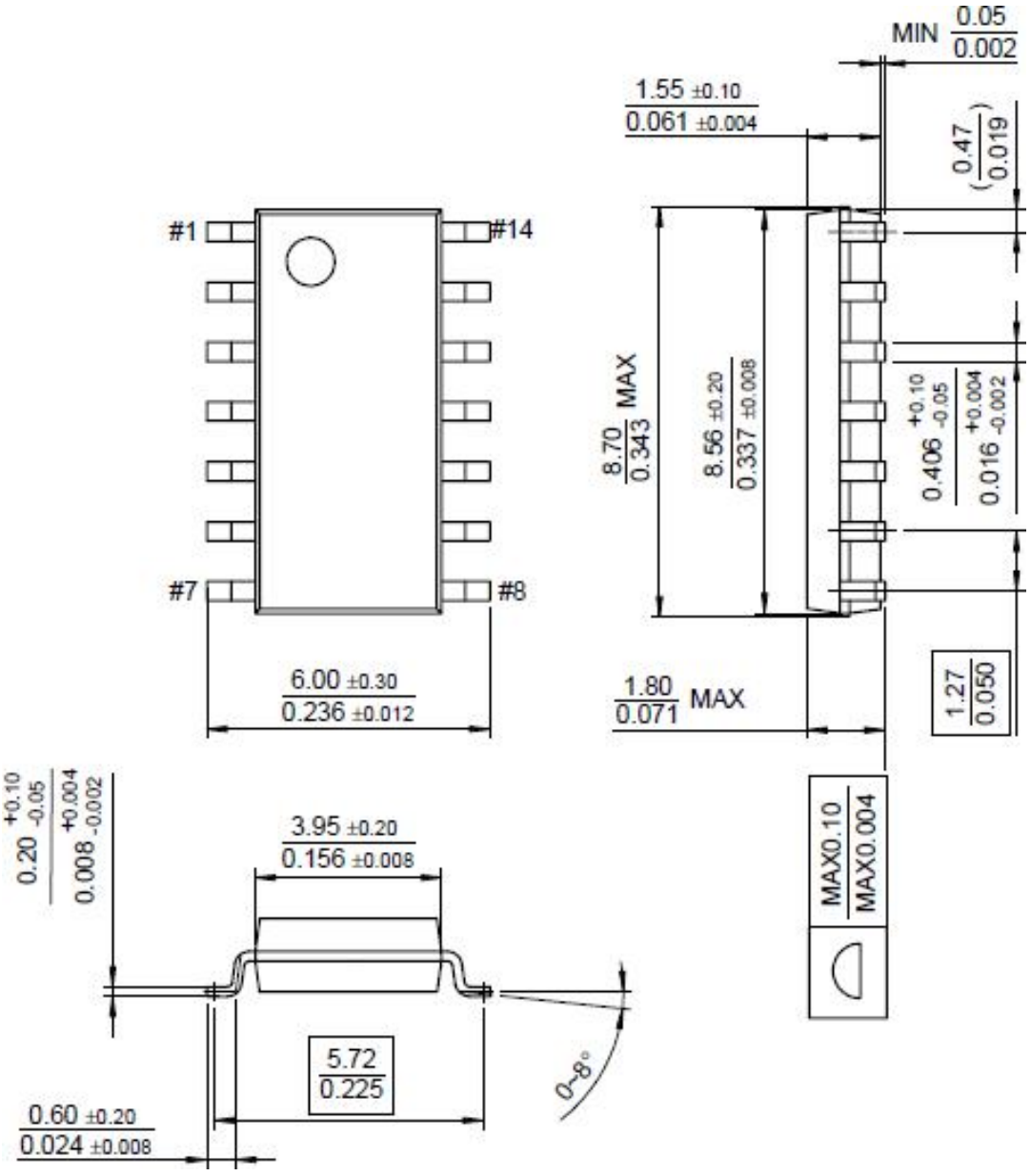
■ Package Dimensions

Unit : mm /inch

DIP14



SOP14


MIN 0.05 0.002
1.55 ±0.10
0.061 ±0.004
0.47 (0.019)
#1
#14
#7
#8
8.70 MAX 0.343
8.56 ±0.20 0.337 ±0.008
0.406 +0.10 -0.05
0.016 +0.004 -0.002
6.00 ±0.30
0.236 ±0.012
1.80 MAX 0.071
1.27 0.050
0.20 +0.10 -0.05
0.008 +0.004 -0.002
3.95 ±0.20
0.156 ±0.008
MAX0.10 MAX0.004
5.72 0.225
0~8°
0.60 ±0.20
0.024 ±0.008