SN74LS147N

Product Introduction

The SN74LS147N is a Encode 10-Line Decimal to 4-Line BCD.

Product Features

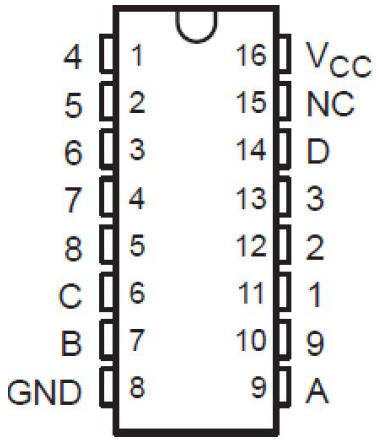
- Encode 10-Line Decimal to 4-Line BCD.
- Fully compatible with TTL input and output logic level
- Package : DIP16, SOP16

Product Applications

- Keyboard Encoding,Range Selection.
- Industrial control applications
- Other application areasBattery-powered equipment

Package and Pin Assignment

SOP16 or DIP16			
Pin NO	Pin Definition	Pin NO	Pin Definition
1	Input 4	16	Supply VCC
2	Input 5	15	NC
3	Input 6	14	Output D
4	Input 7	13	Input 3
5	Input 8	12	Input 2
6	Output C	11	Input 1
7	Output B	10	Input 9
8	Supply GND	9	Output A

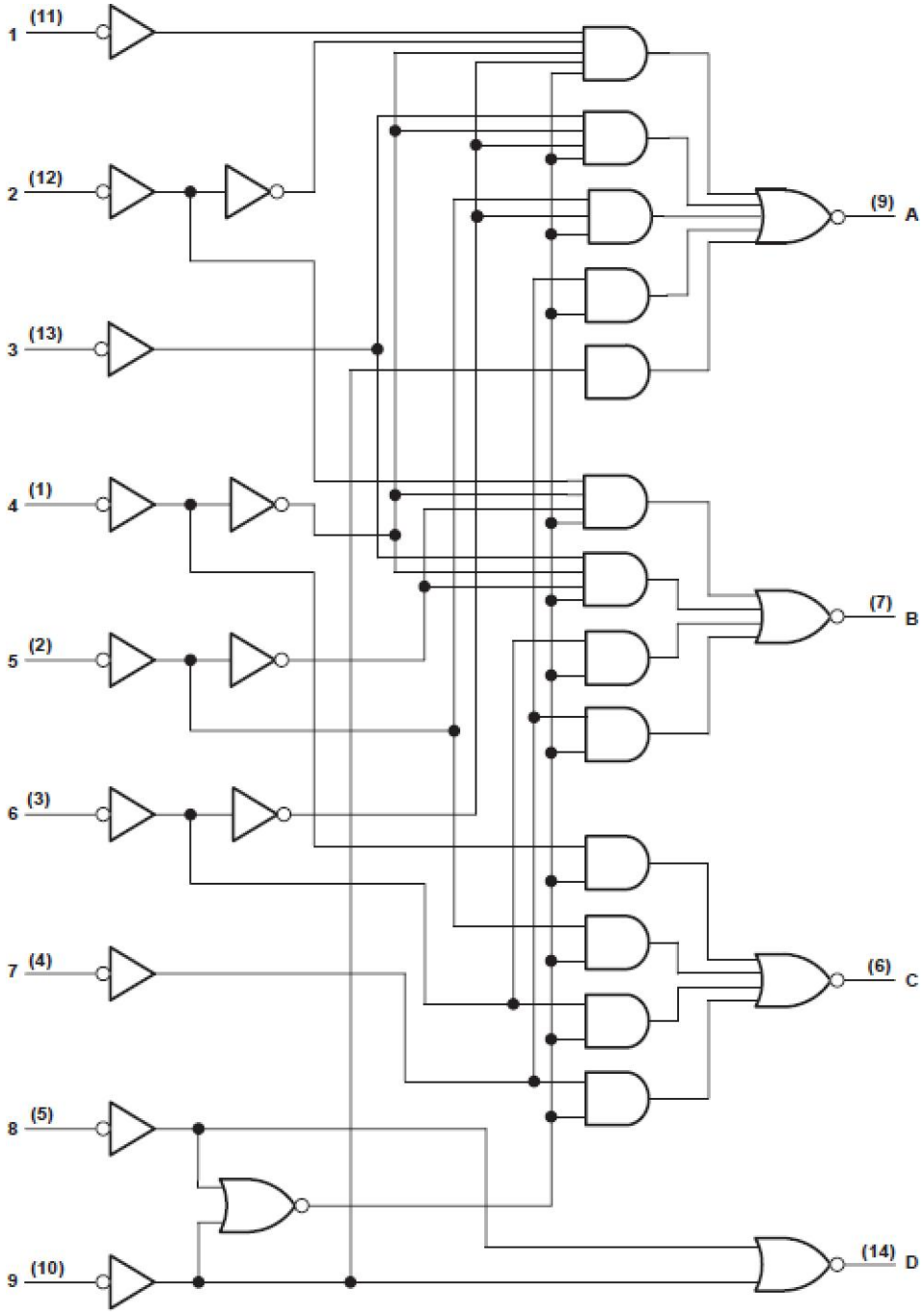


Absolute Maximum Ratings

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



■ Function Table

INPUTS									OUTPUTS			
1	2	3	4	5	6	7	8	9	D	C	B	A
H	H	H	H	H	H	H	H	H	H	H	H	H
X	X	X	X	X	X	X	X	L	L	H	H	L
X	X	X	X	X	X	X	L	H	L	H	H	H
X	X	X	X	X	X	L	H	H	H	L	L	L
X	X	X	X	X	L	H	H	H	H	L	L	H
X	X	X	X	L	H	H	H	H	H	L	H	L
X	X	X	L	H	H	H	H	H	H	L	H	H
X	X	L	H	H	H	H	H	H	H	H	L	L
X	L	H	H	H	H	H	H	H	H	H	L	H
L	H	H	H	H	H	H	H	H	H	H	H	L

H = high logic level, L = low logic level, X = irrelevant

■ 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_{IL}=0.7V
	V_{OL}	—	0.15	0.4	V	I_{OL}=4mA	
			0.23	0.5		I_{OL}=8mA	
Input current	I_I	—	0.1	100	uA	VCC=5.25V, V_I=7V	
	I_{IH}	—	0.1	20	uA	VCC=5.25V, V_I=2.7V	
	I_{IL}	—	0.18	0.4	mA	VCC=5.25V, V_I=0.4V	
Short-circuit output current *	I_{OS}	—	-35	-100	mA	VCC=5.25V	
Supply current	I_{CCH}	—	12	20	mA	VCC=5.25V, input 7=GND, other open	
	I_{CCL}	—	11	17	mA	VCC=5.25V, all input=GND or open	
Input clamp voltage	V_{IK}	—	0.9	-1.5	V	VCC=4.75V, I_I=-18mA	

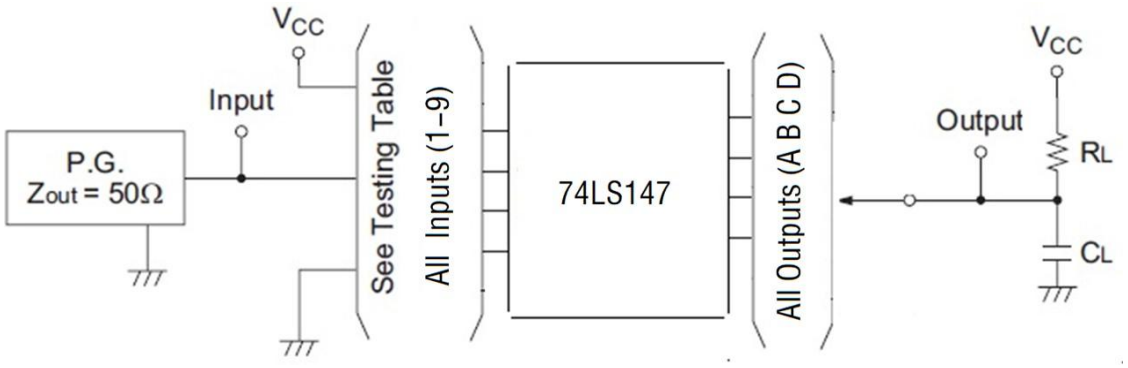
Notes: * only one output port is short circuited each time, and the short circuit time is not more than one second.

Switching Characteristics (T_A=25℃, Unless specified)

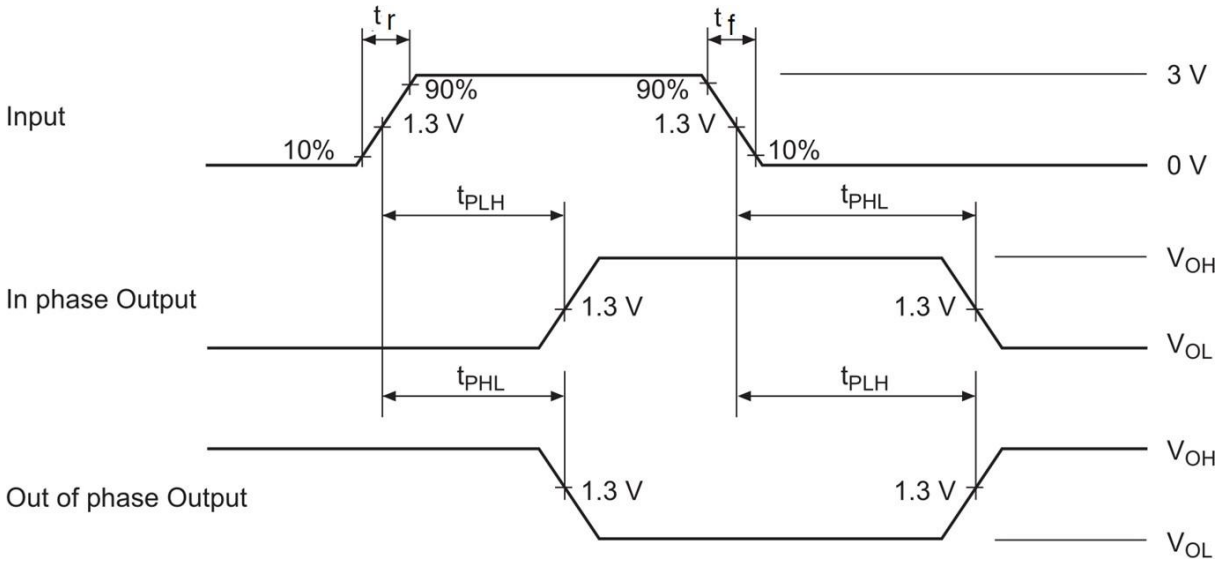
Item	Symbol	Min	Tpy	Max	Unit	Conditions
Propagation delay time (1 to 9) to Output(A、B、C、D)	t_{PHL}	—	8	—	ns	VCC=5V, CL=16pF, RL=2KΩ
	t_{PLH}	—	12	—	ns	

Testing Method

1、Test Circuit



2、Waveform



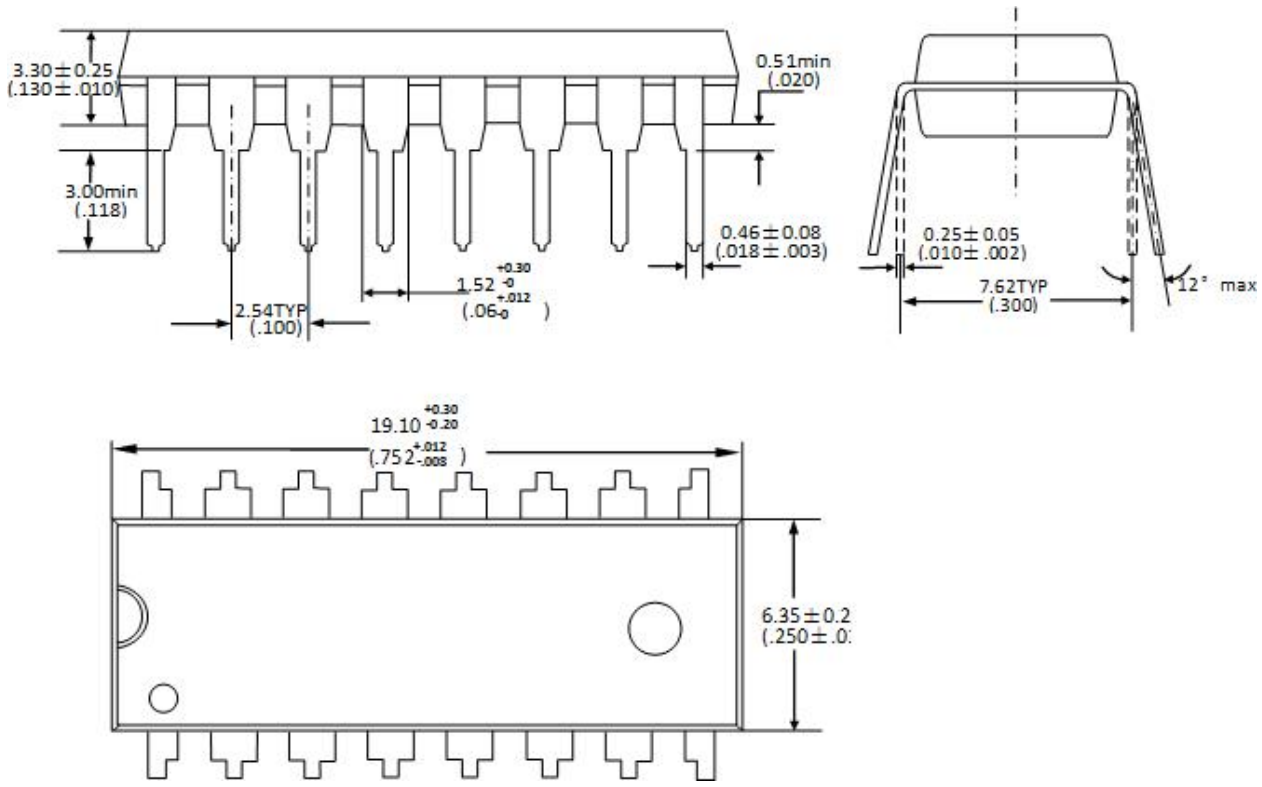
Note:

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=1MHz, D=50%, tr=tf or less 20ns;
4. Output: Y output test port (Out of Phase Output, In Phase Output)

■ Package Dimensions

Unit : mm /inch

DIP16



SOP16