

## SN74LS139N

### Product Introduction

The SN74LS139N is a Dual 2-line-to-4-line Decoders / Demultiplexers. It comprises two individual two-line-to-four-line decoder in a single package. The active-low enable input can be used as a data line in demultiplexing applications.

### Product Features

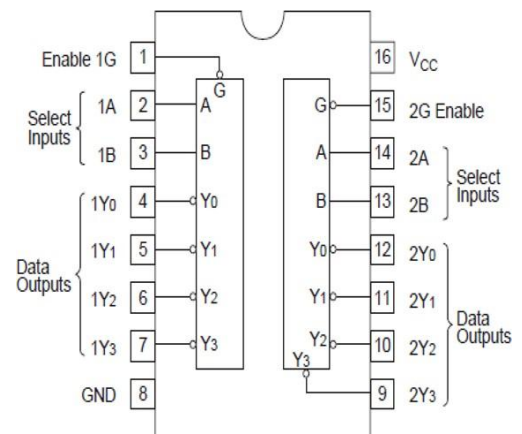
- 2-Line-to-4-Line Decoders / Demultiplexers.
- Fully compatible with TTL input and output logic level
- Package : DIP16, SOP16

### Product Applications

- 4 bit decoder.
- Industrial control applications
- Other application areas Battery-powered equipment

### Package and Pin Assignment

SOP16 or DIP16			
Pin NO	Pin Definition	Pin NO	Pin Definition
1	Enable 1G	16	Supply VCC
2	Input 1A	15	Enable 2G
3	Input 1B	14	Input 2A
4	Output 1Y0	13	Input 2B
5	Output 1Y1	12	Output 2Y0
6	Output 1Y2	11	Output 2Y1
7	Output 1Y3	10	Output 2Y2
8	Supply GND	9	Output 2Y3

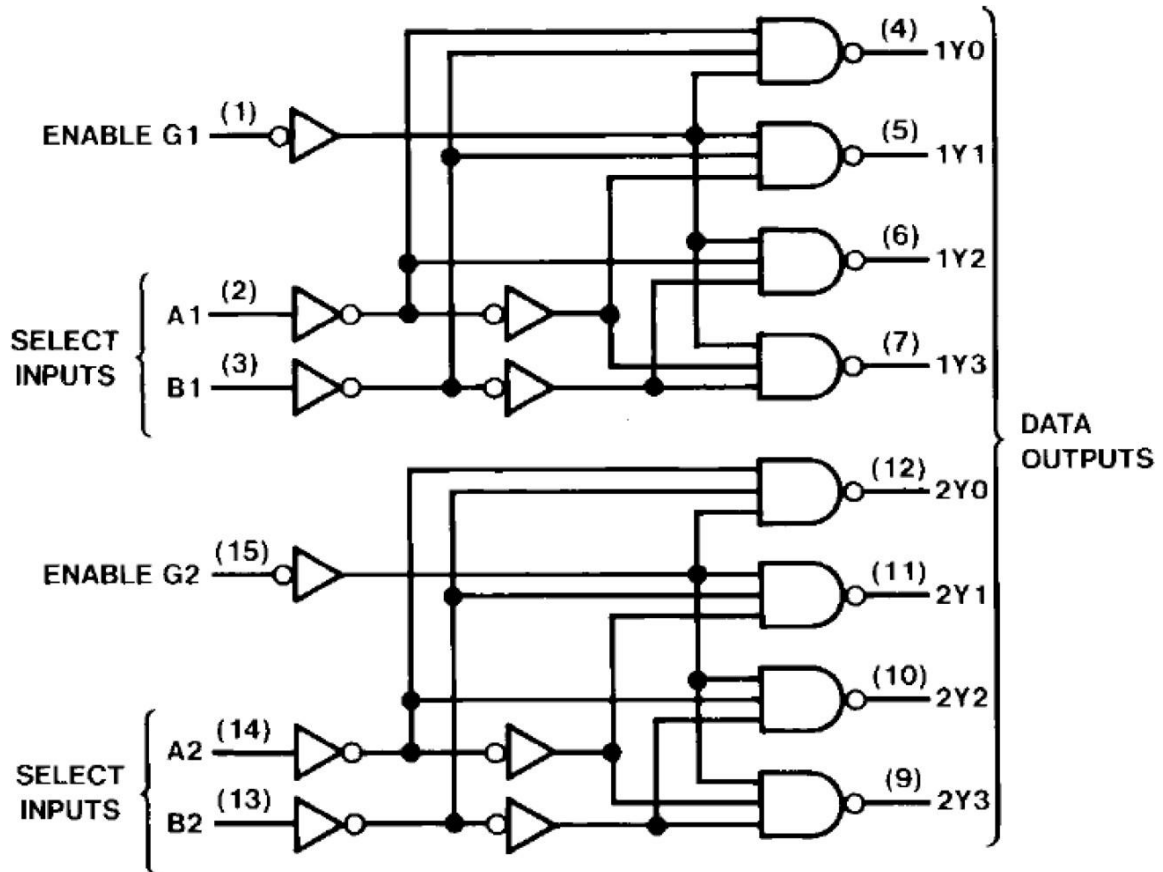


### Absolute Maximum Ratings

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



## ■ Function Table

Inputs			Outputs			
Enable	Select		Y0	Y1	Y2	Y3
G	B	A				
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

H ; high level, L ; low 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	$\mu$ 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	3.3	—	V	$I_{OH}=-400\mu$ A $V_{CC}=4.75$ V, $V_{IH}=2$ V $V_{IL}=0.7$ V
	$V_{OL}$	—	0.13	0.4	V	
		—	0.20	0.5		
Input current	$I_I$	—	0.01	20	$\mu$ 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
	$I_{IL}$	—	0.25	0.4	mA	$V_{CC}=5.25$ V, $V_I=0.4$ V
Short-circuit output current*	$I_{OS}$	—	-47	-100	mA	$V_{CC}=5.25$ V
Supply current	$I_{CCH}$	—	7.6	11	mA	$V_{CC}=5.25$ V, all $V_I=V_{CC}$
	$I_{CCL}$	—	7.7	11	mA	$V_{CC}=5.25$ V, all $V_I=GND$
Input clamp voltage	$V_{IK}$	—	0.85	-1.5	V	$V_{CC}=4.75$ V, $I_I = -18$ mA

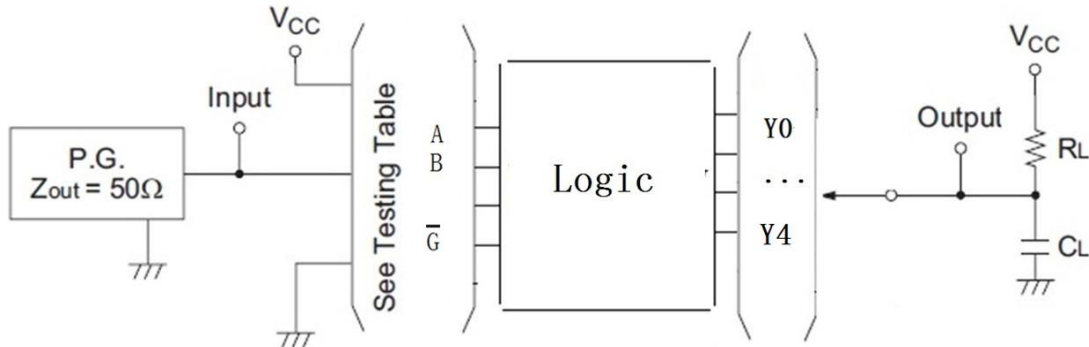
Note: \* only one output port is short circuited each time, and the short circuit time is not more than one second.

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

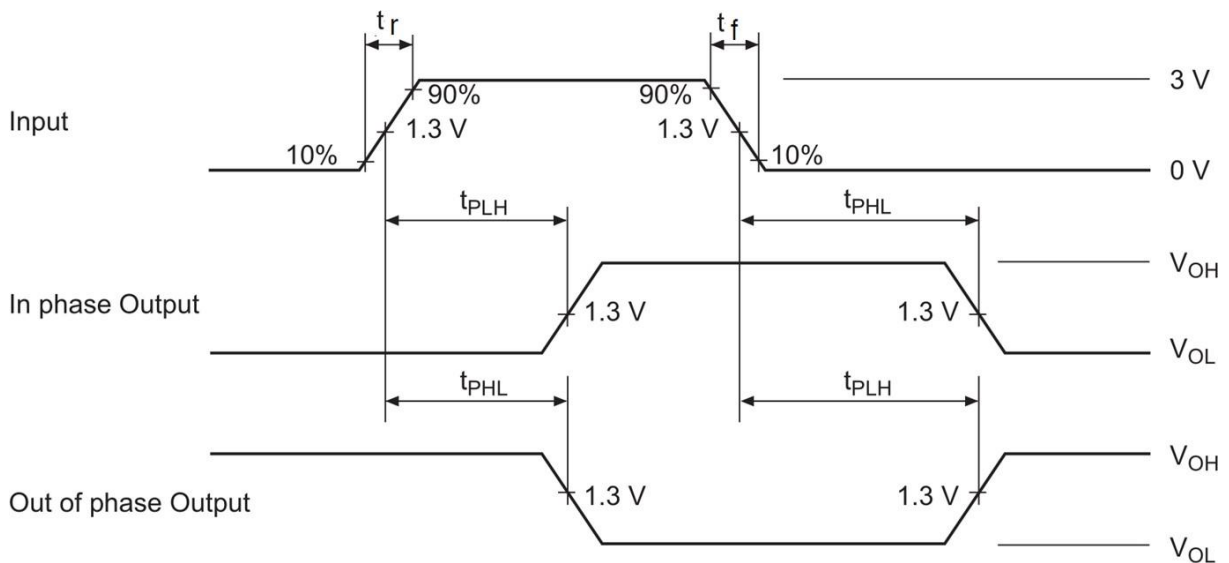
Item	Symbol	Min	Tpy	Max	Unit	Conditions
Propagation delay time A, B to Output	$t_{PHL}$	—	12	30	ns	$V_{CC}=5$ V, $C_L=16$ pF, $R_L=2$ K $\Omega$
	$t_{PLH}$	—	5	15	ns	
Propagation delay time G to Output	$t_{PHL}$	—	9	20	ns	
	$t_{PLH}$	—	3	15	ns	
	$t_{PLH}$	—	8	—	ns	

### ■ Testing Method

#### 1、Test Circuit



#### 2、Waveform



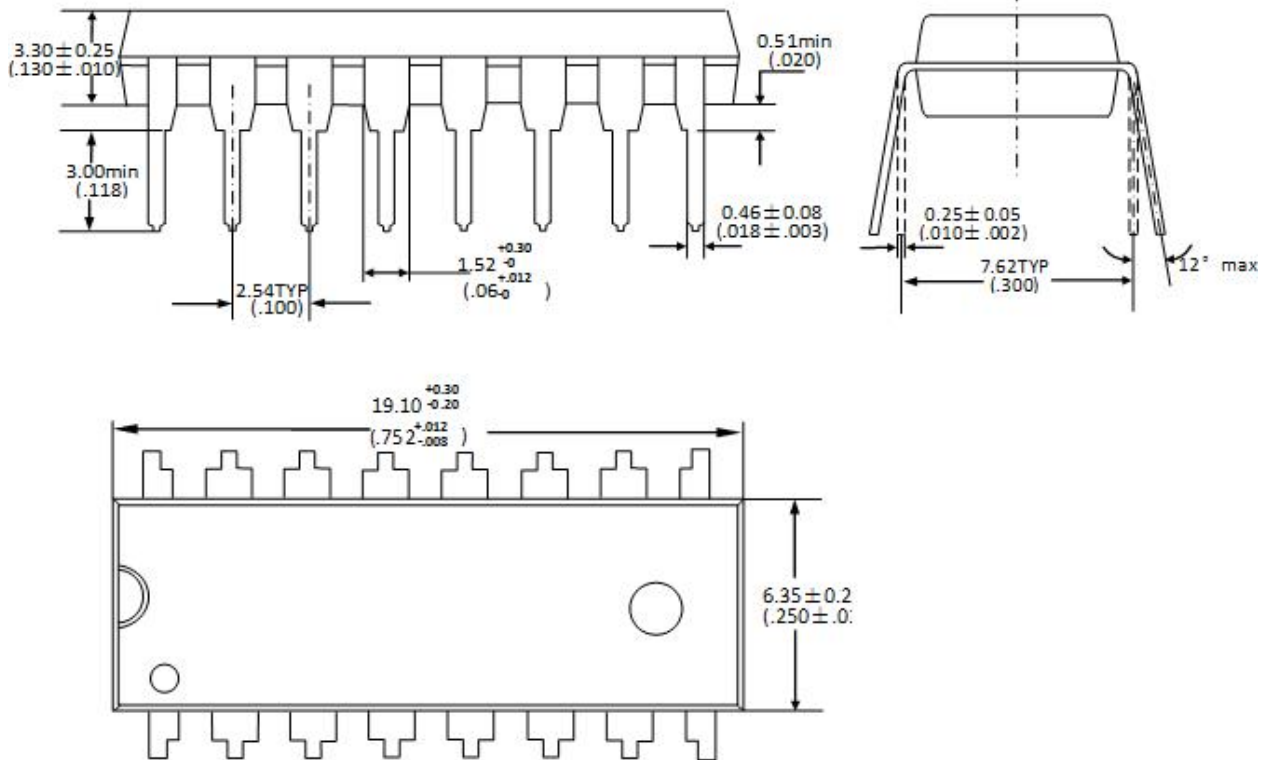
Note:

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,  $f=500\text{kHz}$ ,  $D=50\%$ ,  $t_r=t_f$  or less 20ns;
4. Output: Y output test port (Out of Phase Output, In Phase Output)

### Package Dimensions

Unit : mm / inch

#### DIP16



#### SOP16

