Ver 1.00

SN74LS75N

■ Product Introduction

The SN74LS75N is ideally suited for use as temporary storage for binary information between processing units and input / output or indicator units. Information present at a data (D) input is transferred to the Q output when the enable (G) is high and the Q output will follow the data input as long as the enable remains high. When the enable goes low,the information (that was present at the data input at the time the transition occurred) is retained at the Q output until the enable is permitted to go high. This device features complementary Q and Q outputs from a 4-bit latch.

■ Product Features

- Integrated four sets of D trigger with high level control trigger
- Fully compatible with TTL input and output logic level
- Input Clamp Diodes Limit High Speed Termination Effects
- Package : DIP16, SOP16

■ Product Applications

- Signal decoding processing
- Industrial control applications
- Other application areasBattery-powered equipment

■ Package and Pin Assignment

SOP16 or DIP16			
Pin NO	Pin Definition	Pin NO	Pin Definition
1	Output $1\overline{Q}$	16	Output $1Q$
2	Input 1D	15	Output $2Q$
3	Input 2D	14	Output $2\overline{Q}$
4	Input 3G/4G	13	Input 1G/2G
5	Supply VCC	12	Supply GND
6	Input 3D	11	Output $3\overline{Q}$
7	Input 4D	10	Output $3Q$
8	Output $4\overline{Q}$	9	Output $4Q$
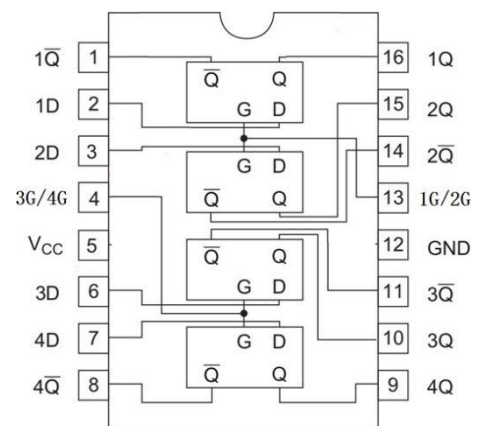
■ Absolute Maximum Ratings

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
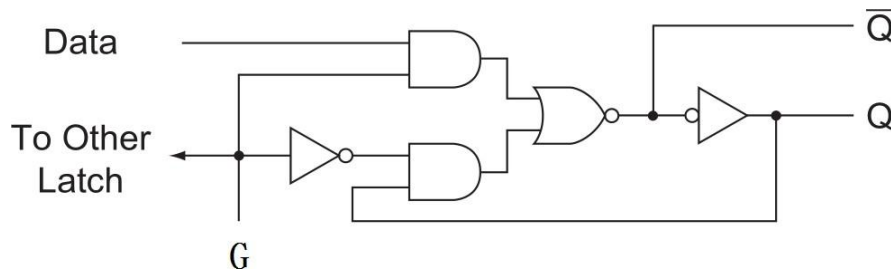
■ Function Table

Inputs		Outputs	
D	G	Q	$\overline{Q}$
L	H	L	H
H	H	H	L
✕	L	Q_0	$\overline{Q_0}$

H; high level, L; low level, X; irrelevant

Q_0; level of Q before the indicated steady-state input conditions were established.

$\overline{Q_0}$; complement of Q_0 or level of Q_0 before the indicated steady-state input conditions were established.

■ Recommended Operating Conditions

Item	Symbol	Min	Tpy	Max	Unit
Supply voltage	V_{CC}	4.75	5.00	5.25	V
Output current	I_{OH}	—	—	−400	uA
	I_{OL}	—	—	8	mA
Operating temperature	T_A	0	–	60	℃
Pulse width	t_W	20	—	—	ns
Setup time	t_{su}	15	—	—	ns
Hold time	t_h	5	—	—	ns

■ Electrical Characteristics $(T_A=25℃，Unless\ specified)$

| Item		Symbol	Min	Tpy	Max	Unit	Conditions	
Input voltage		V_{IH}	2	—	—	V		
		V_{IL}	—	—	0.7	V		
Output voltage		V_{OH}	2.7	3.3	—	V	$V_{CC} = 4.75V，V_{IH} = 2V，V_{IL} = 0.7V，$ $I_{OH} = -400\ uA$	
		V_{OL}	—	0.3	0.5	V	$I_{OL} = 8\ mA$	$V_{CC} = 4.75V，V_{IL} = 0.7V，$ $V_{IH} = 2V$
			—	0.2	0.4		$I_{OL} = 4\ mA$	
Input current	D	I_{IH}	—	—	20	uA	$V_{CC} = 5.25V，V_I = 2.7V$	
	G		—	—	80			
	D	I_{IL}	—	0.25	0.4	mA	$V_{CC} = 5.25V，V_I = 0.4V$	
	G		—	0.65	1.6			
	D	I_I	—	—	−0.1	mA	$V_{CC} = 5.25V，V_I = 7V$	
	G		—	—	−0.4			
Short-circuit output current*		I_{OS}	—	−40	−100	mA	$V_{CC} = 5.25V$	
Supply current		I_{CC}	—	5.8	12	mA	$V_{CC} = 5.25V，$ all inputs grounded.	
Input clamp voltage		V_{IR}	—	−0.9	−1.5	V	$V_{CC} =4.75\ V，I_{IN}= -18\ mA$	

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

■ Switching Characteristics $(T_A=25℃，Unless\ specified)$

| Item	Symbol	Inputs	Outputs	Min	Tpy	Max	Unit	Conditions
Propagation delay time	t_{PHL}	D	Q	—	8	—	ns	R_L=2k C_L=15pF
	t_{PLH}			—	14	—	ns	
	t_{PHL}	D	$\overline{Q}$	—	21	—	ns	
	t_{PLH}			—	16	—	ns	
	t_{PHL}	G	Q	—	22	—	ns	
	t_{PLH}			—	33	—	ns	
	t_{PHL}	G	$\overline{Q}$	—	38	—	ns	
	t_{PLH}			—	31	—	ns	

■ Testing Method

1、t_{PLH}、t_{PHL} $(D、G \rightarrow Q, \overline{Q})$
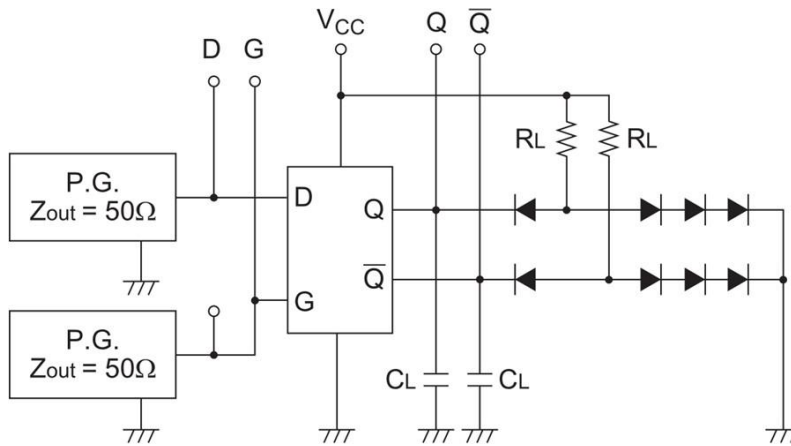
Notes:

1. Only one trigger is tested at a time.

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.

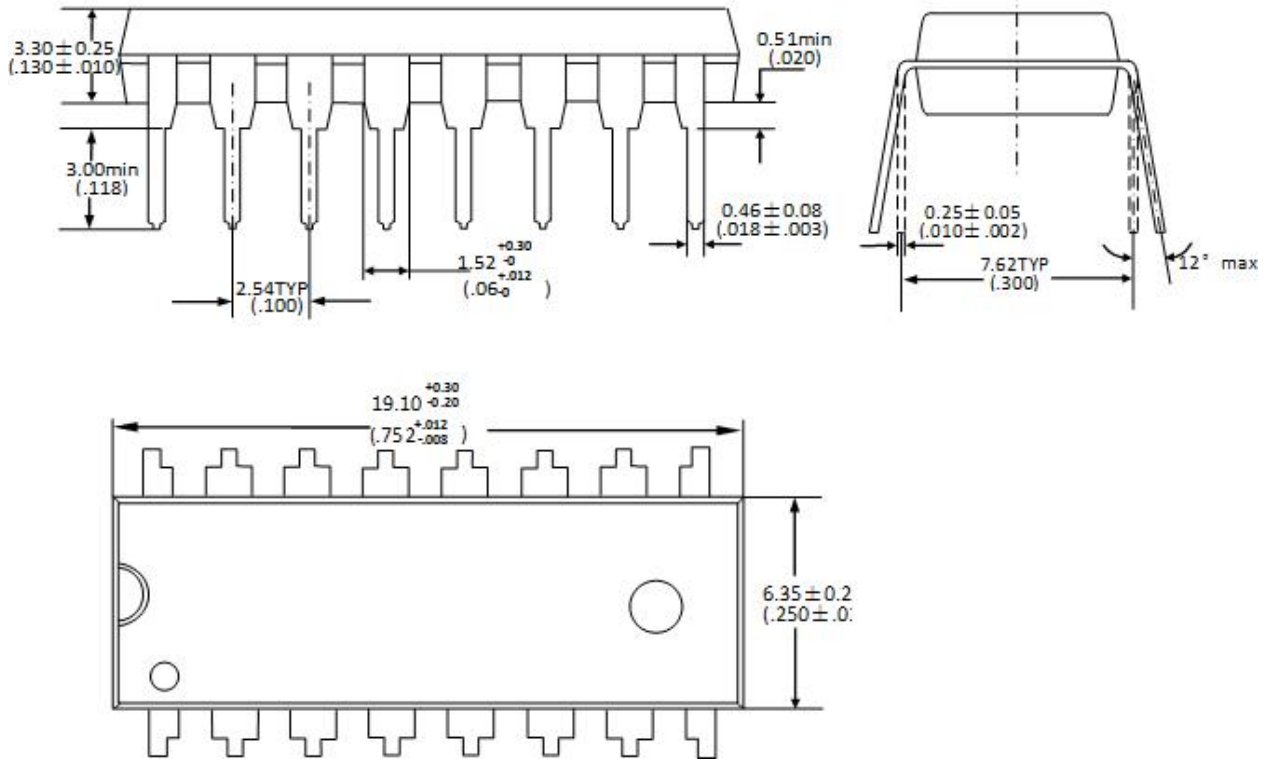3. All diode models are 1S2074 (H).

2、**Waveform**
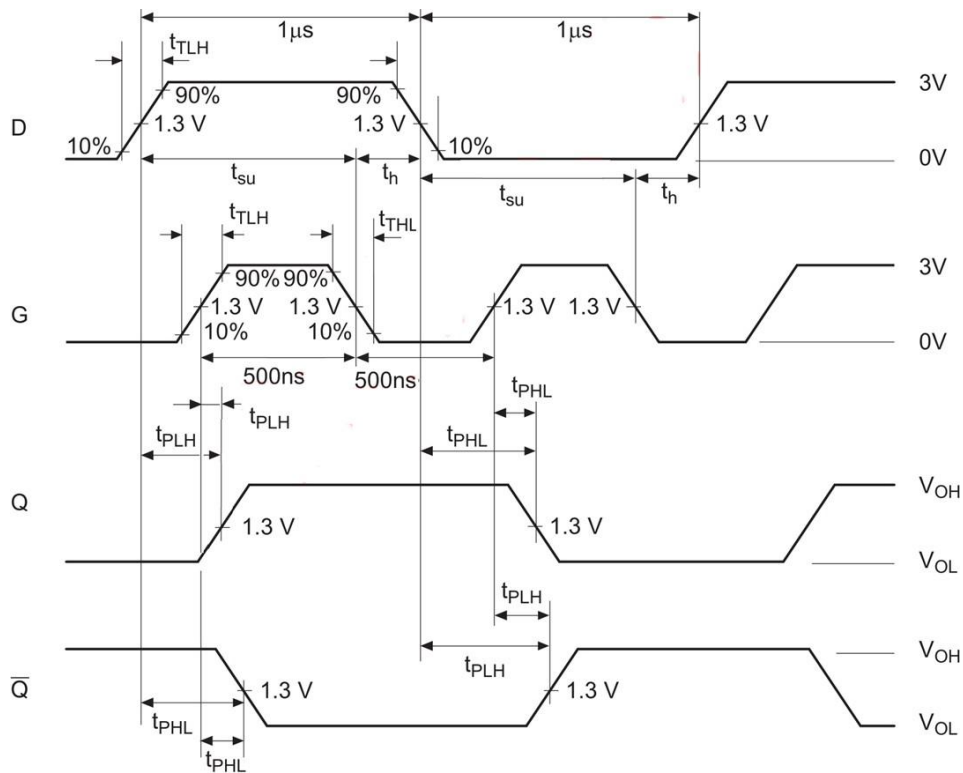
Notes: D input PRR=500KHz; G input PRR=1MHz; $t_{TLH}=t_{THL} \leqslant 20ns$

■ Package Dimensions

Unit：mm /inch

DIP16

3.30±0.25
(.130±.010)

0.51min
(.020)

3.00min
(.118)

0.46±0.08
(.018±.003)

1.52 +0.30 -0
(.06 +.012 -0)

2.54TYP
(.100)

0.25± 0.05
(.010± .002)

7.62TYP
(.300)

12° max

19.10 +0.30 -0.20
(.752 +.012 -.008)

6.35±0.2
(.250±.0:

SOP16

9.90±0.10
(.390±.004)

3.90±0.10
(.154±.004)

6.00±0.20
(.236±.008)

1.27 TYP
(.050)

0.406 TYP
(.016)

1.38±0.10
(.054±.004)

0.175±0.075
(.0069±.0030)

1.55±0.20
(.061±.008)

0.375±0.125 ×45°
(.0148±.0049)

0.203±0.008
(.008±.0003)

0.825±0.425
(.0325±.0167)

0~7°