Hex Schmidt-trigger Inverters

Features

- Wide Operating Voltage Range of 2V to 6V
- Outputs Can Drive Up To 10 LSTTL Loads
- Low Power Consumption I_{CC} = 20μA Max
- Typical t_{PD} = 8ns @4.5V
- ±4mA Output Drive @ 4.5V
- Low Input Current of 1μA Max

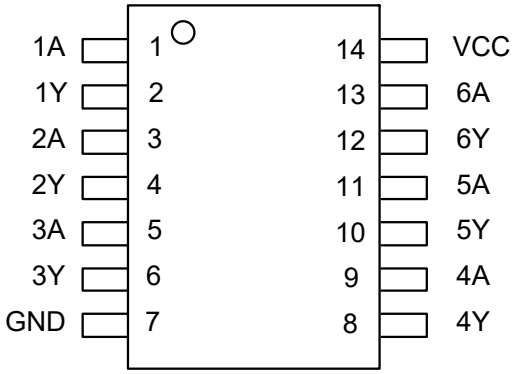
Applications

- Memory chip select decoding
- Data transmission system

Device Information

Product Name	Package
74HC14M	SOP14
74HC14V	TSSOP14
74HC14P	DIP14

Pin Configuration

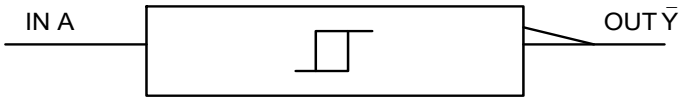


TOP VIEW

Pin Function

No.	Name	Function
1	1A	Channel 1 input.
2	1Y	Channel 1 output.
3	2A	Channel 2 input.
4	2Y	Channel 2 output.
5	3A	Channel 3 input.
6	3Y	Channel 3 output.
7	GND	Ground.
8	4Y	Channel 4 output.
9	4A	Channel 4 input.
10	5Y	Channel 5 output.
11	5A	Channel 5 input.
12	6Y	Channel 6 output.
13	6A	Channel 6 input.
14	VCC	Positive voltage supply.

Logic Diagram



Functional Description

Input A	Output Y
H	L
L	H

Absolute Maximum Ratings

Parameter	Symbol	Range		Unit
Supply voltage	V_{CC}	-0.5～7		V
Input clamp current	I_{IK}	±20		mA
Output clamp current	I_{OK}	±20		mA
Continuous output current	I_O	±25		mA
Continuous current through VCC or GND	I_{CC}	±50		mA
Package thermal impedance	θ_{JA}	SOP14	80	°C/W
		TSSOP14	80	
		DIP14	86	
Storage temperature	T_{STG}	-65～150		°C

***Note**:* The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{CC}	2	5	6	V
Input voltage	V_I	0		V_{CC}	V
Output voltage	V_O	0		V_{CC}	V
Operating free-air temperature	T_A	-40		85	°C

Electrical Characteristics

Symbol	Test Conditions		V_{CC}	T_A=25°C			−40°C≤T_A≤85°C		Unit
				Min.	Typ	Max.	Min.	Max.	
V_{T+}			2V	0.7	1.2	1.5	0.7	1.5	V
			4.5V	1.55	2.5	3.15	1.55	3.15	
			6V	2.1	3.3	4.2	2.1	4.2	
V_{T-}			2V	0.3	0.6	1	0.3	1	V
			4.5V	0.9	1.6	2.45	0.9	2.45	
			6V	1.2	2	3.2	1.2	3.2	
V_{T+} - V_{T-}			2V	0.2	0.6	1.2	0.2	1.2	V
			4.5V	0.4	0.9	2.1	0.4	2.1	
			6V	0.5	1.3	2.5	0.5	2.5	
V_{OH}	V_I = V_{IH} or V_{IL}	I_{OH} =-20μA	2V	1.9	1.998		1.9		V
			4.5V	4.4	4.499		4.4		
			6V	5.9	5.999		5.9		
		I_{OH} =-4mA	4.5V	3.98	4.3		3.84		
		I_{OH} =-5.2mA	6V	5.48	5.8		5.34		
V_{OL}	V_I = V_{IH} or V_{IL}	I_{OL} =20μA	2V		0.002	0.1		0.1	V
			4.5V		0.001	0.1		0.1	
			6V		0.001	0.1		0.1	
		I_{OL} =4mA	4.5V		0.17	0.26		0.33	
		I_{OL} =5.2mA	6V		0.15	0.26		0.33	
I_I	V_I = V_{CC} or 0		6V		±0.1	±100		±1000	nA
I_{CC}	V_I = V_{CC} or 0, I_O =0		6V			2		20	μA
C_I			2V to 6V		3	10		10	pF

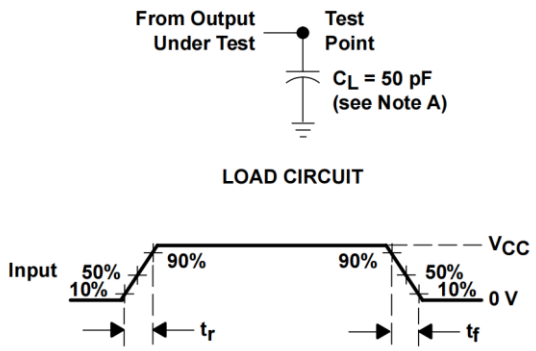
Switching Characteristics (C_L = 50pF)

Symbol	From (Input)	To (Output)	V_{CC}	T_A=25°C		−40°C≤T_A≤85°C		Unit
				Typ.	Max.	Min.	Max.	
t_{PD}	A	Y	2V	45	95		120	ns
			4.5V	8	18		24	
			6V	7	15		20	
t_T		Y	2V	38	75		95	ns
			4.5V	8	15		19	
			6V	6	13		16	

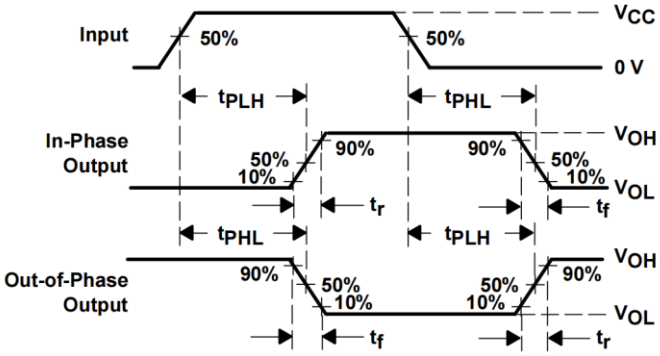
Operating Characteristics (T_A = 25°C)

Symbol	Parameter	Test Conditions	Typ.	Unit
C_{PD}	Power dissipation capacitance per inverter	No load	20	pF

Parameter Measurement Information



VOLTAGE WAVEFORM
INPUT RISE AND FALL TIMES



VOLTAGE WAVEFORMS
PROPAGATION DELAY AND OUTPUT TRANSITION TIMES

Notes:

A. C_L includes probe and test-fixture capacitance.

B. Phase relationships between waveforms were chosen arbitrarily.

All input pulses are supplied by generators having the following characteristics:

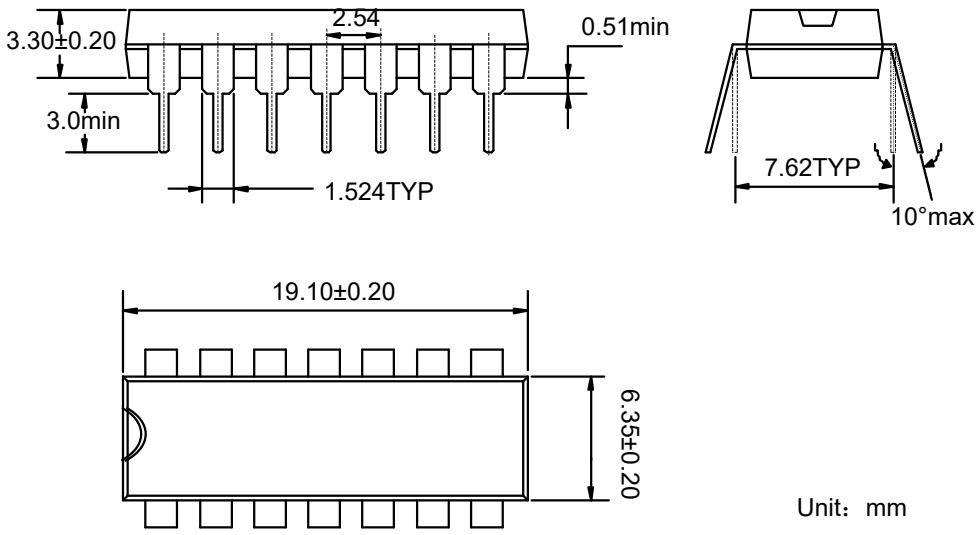
P_{RR}≤1MHz, Z_O = 50Ω, t_r = 6ns, t_f = 6ns.

C. The outputs are measured one at a time, with one input transition per measurement.

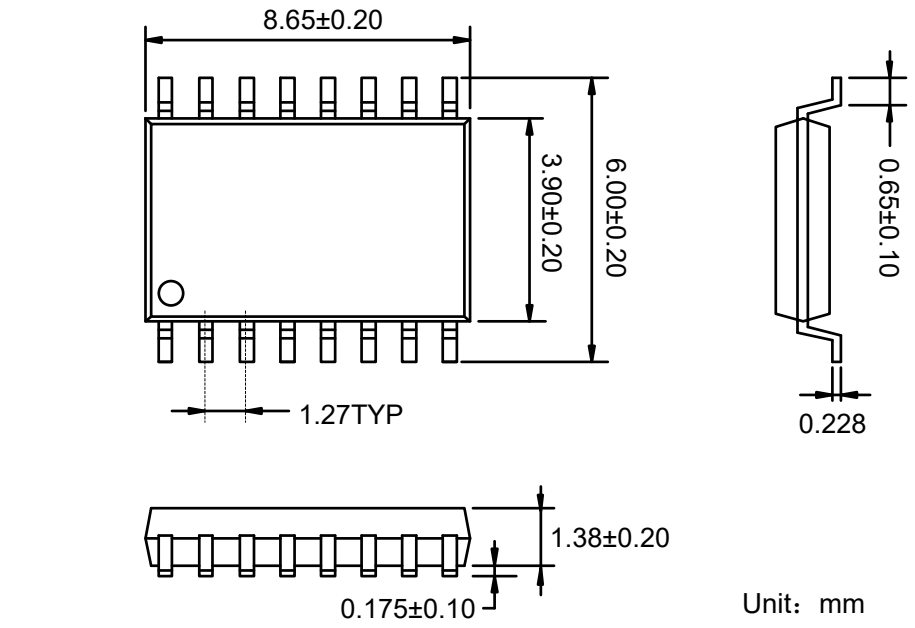
D. t_{PLH} and t_{PHL} are the same as t_{PD}.

Package Dimension

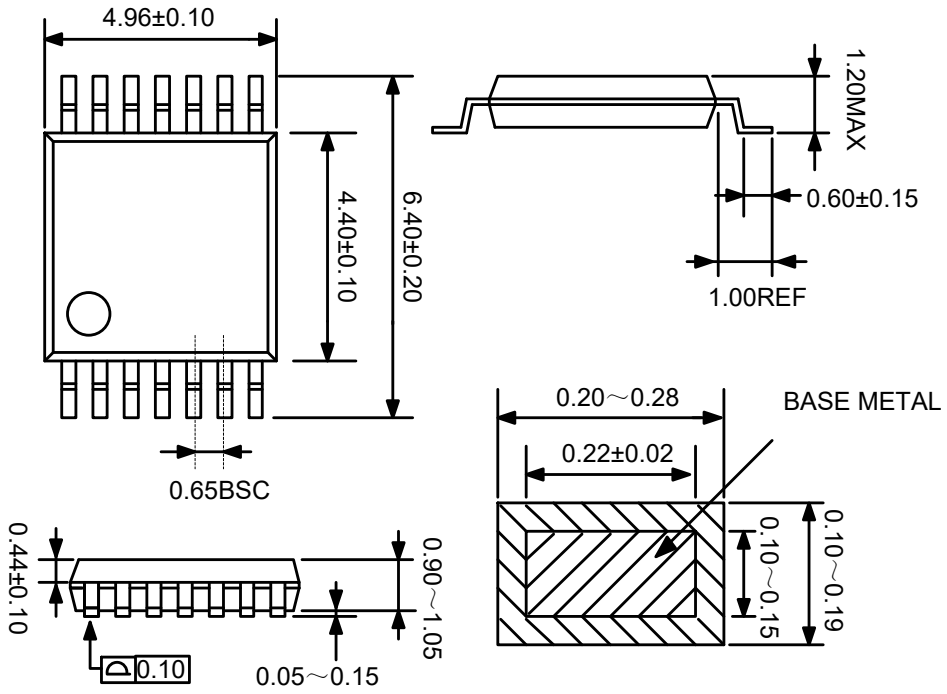
DIP14



SOP14



TSSOP14


4.96±0.10
4.40±0.10
6.40±0.20
0.65BSC
1.20MAX
0.60±0.15
1.00REF
0.20～0.28
BASE METAL
0.22±0.02
0.10～0.15
0.10～0.19
0.44±0.10
0.90～1.05
0.10
0.05～0.15
Unit：mm