Hex Buffer(Open Drain)

Features

- HIGH SPEED:

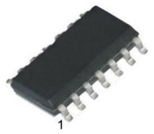
  t_{PD} = 6ns (TYP.) at V_{CC} = 6V
- LOW POWER DISSIPATION:

  I_{CC} = 1μA(MAX.) at T_A=25°C
- HIGH NOISE IMMUNITY:

  $V_{NIH} = V_{NIL}$ = 28 % V_{CC} (MIN.)
- WIDE OPERATING VOLTAGE RANGE:

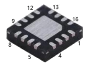
  V_{CC} (OPR) = 2V to 6V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 07

DIP-14



SOP-14

TSSOP-14



QFN- 16 3*3

Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
HG74HC07N	DIP-14	HG74HC07	TUBE	1000pcs/box
HG74HC07M/TR	SOP-14	HG74HC07	REEL	2500pcs/reel
HG74HC07MT/TR	TSSOP-14	H74HC07	REEL	2500pcs/reel
HG74HC07LQ/TR	QFN-16 3*3	H74HC07	REEL	5000pcs/reel

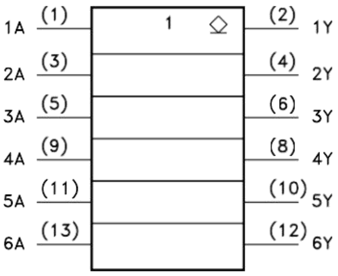
DeScription

The HG74HC07 is an high speed CMOS HEX OPEN DRAIN BUFFER fabricated with silicon gate C^2MOS technology.

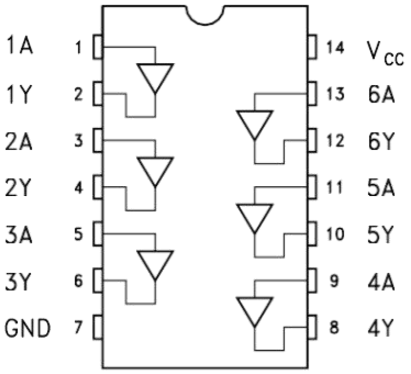
The internal circuit is composed of 2 stages including buffer output, which enables high noise immunity and stable output.

All inputs are equipped with protection circuits against static discharge and transient excess voltage.

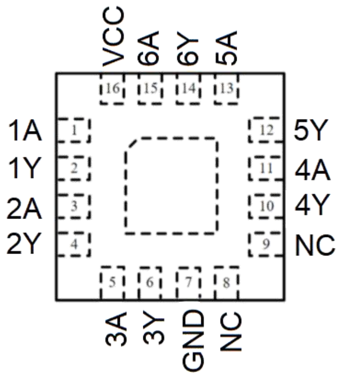
Pin Connection



Iec Logic Symbols



DIP-14/SOP-14/TSSP-14



QFN-16 3*3

Pin Description

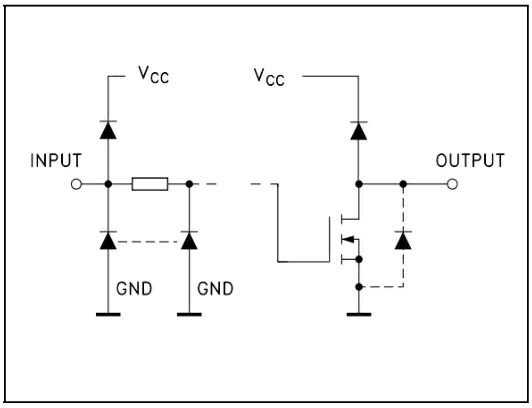
PIN No		SYMBOL	NAME AND FUNCTION
DIP/SOP/TSSOP	QFN		
1, 3, 5, 9,11,13	1,3,5,11,13,15	1A to 6A	Data Inputs
2, 4, 6, 8,10,12	2,4,6,10,12,14	1Y to 6Y	Data Outputs
7	7	GND	Ground (0V)
14	16	VCC	Positive Supply Voltage
-	8,9	NC	No internal connections

Truth Table

A	Y
L	L
H	Z

Z:High Impedance

Input And Output Equivalent Circuit



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	-0.5 to +7	V
V_I	DC Input Voltage	-0.5 to V_{CC} + 0.5	V
V_O	DC Output Voltage	-0.5 to V_{CC} + 0.5	V
I_{IK}	DC Input Diode Current	20	mA
I_{OK}	DC Output Diode Current	20	mA
I_O	DC Output Current	25	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	50	mA
P_D	Power Dissipation	500(*)	mW
T_{stg}	Storage Temperature	-65 to +150	°C
T_L	Lead Temperature (10s)	260	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

(*) 500mW at 65°C; derate to 300mW by 10mW/°C from 65°Cto 85°C

Recommended Opera Ting Conditions

Symbol	Parameter		Value	Unit
V_{CC}	Supply Voltage		2 to 6	V
V_I	Input Voltage		0 to V_{CC}	V
V_O	Output Voltage		0 to V_{CC}	V
T_{op}	Operating Temperature		-40 to 85	°C
t_r, t_f	Input Rise and Fall Time	V_{CC} = 2.0V	0 to 1000	ns
		V_{CC} = 4.5V	0 to 500	ns
		V_{CC} = 6.0V	0 to 400	ns

Dc Specifications

Symbol	Parameter	Test Condition		Value					Unit
		V_{CC}(V)		T_A = 25°C			-40 to 85°C		
				Min	Typ	Max	Min	Max	
V_{IH}	High Level Input Voltage	2.0		1.5			1.5		V
		4.5		3.15			3.15		
		6.0		4.2			4.2		
V_{IL}	Low Level Input Voltage	2.0				0.5		0.5	V
		4.5				1.35		1.35	
		6.0				1.8		1.8	
V_{OL}	Low Level Output Voltage	2.0	I_O=20μA		0.0	0.1		0.1	V
		4.5	I_O=20μA		0.0	0.1		0.1	
		6.0	I_O=20μA		0.0	0.1		0.1	
		4.5	I_O=4.0 mA		0.17	0.26		0.33	
		6.0	I_O=5.2 mA		0.18	0.26		0.33	
I_I	Input Leakage Current	6.0	V_I=V_{CC} or GND			0.1		1	μA
I_{OZ}	Output Leakage Current	6.0	V_I = V_{IH} or $V_{IL}$$V_O$=$V_{CC}$ or GND			0.5		5	μA
I_{CC}	Quiescent Supply Current	6.0	V_I = V_{CC} or GND			1		10	μA

AC Electrical Characteristics(CL=5pF,Input tr=tf=6ns)

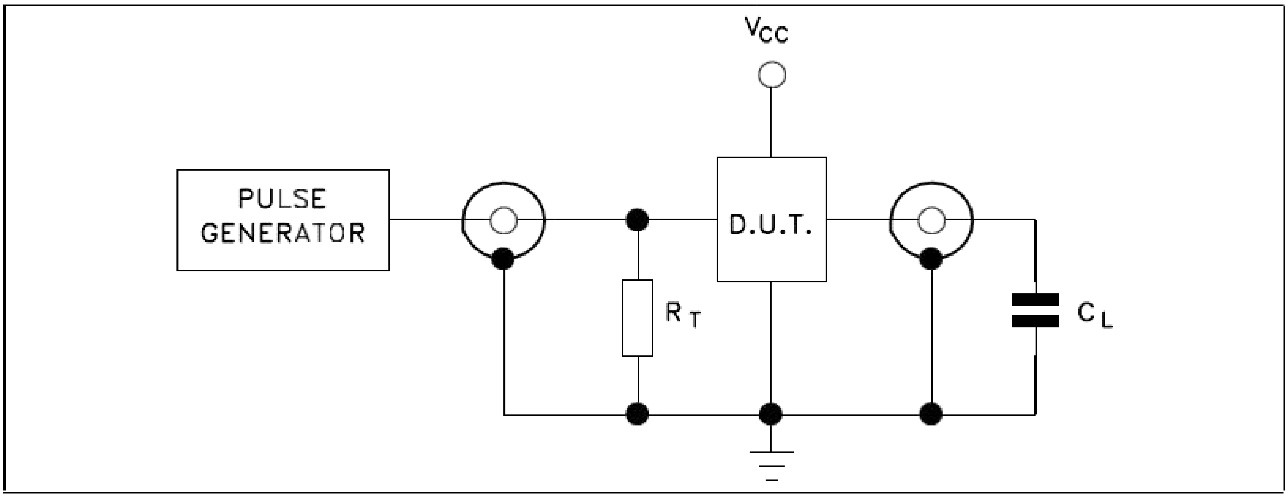
Symbol	Parameter	Test Condition		Value					Unit
		V_{CC}(V)		T_A = 25°C			-40 to 85°C		
				Min.	Typ.	Max.	Min.	Max.	
t_{THL}	Output Transition Time	2.0			30	75		95	ns
		4.5			8	15		19	
		6.0			7	13		16	
t_{PLZ}	Propagation Delay Time	2.0	R_L = 1 KΩ		10	90		115	ns
		4.5			7	18		23	
		6.0			6	15		20	
t_{PZL}	Propagation Delay Time	2.0	R_L = 1 KΩ		17	90		115	ns
		4.5			7	18		23	
		6.0			5	15		20	

Capacitive Charactristics

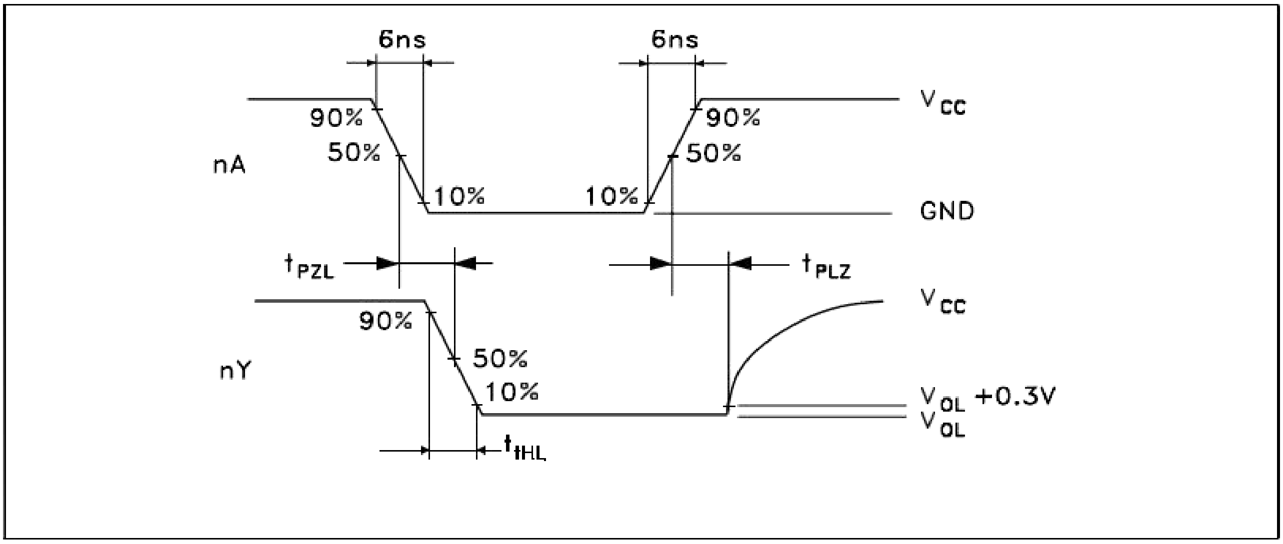
Symbol	**Parameter**	**Test Condition**			**Value**					**Unit**
		V_{CC} (V)			**T_A = 25°C**			**-40 to 85°C**		
					Min.	**Typ.**	**Max.**	**Min.**	**Max.**	
C_{IN}	Input Capacitance	5.0				5	10		10	pF
C_{OUT}	Output Capacitance	5.0				3				pF
C_{PD}	Power Dissipation Capacitance (note1)	5.0				4				pF

C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/6$ (per gate)

Test Circuit



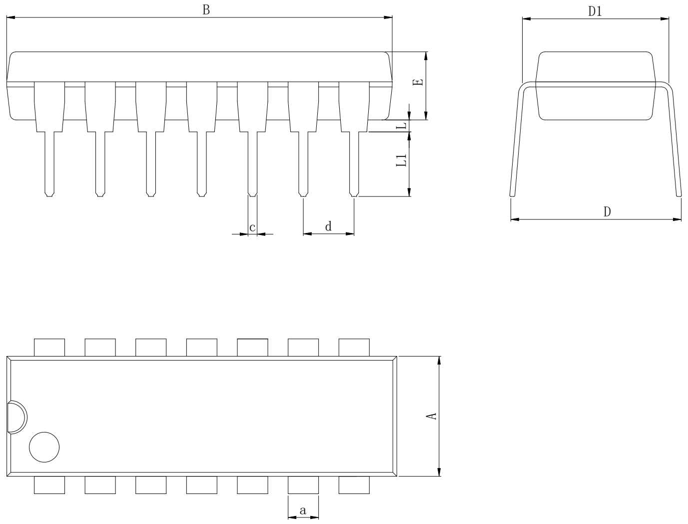
CL = 50pF or equivalent (includes jig and probe capacitance)
RT = ZOUT of pulse generator (typically 50Ω)



WAVEFORM:PROPAGA TION DELAY TIME(f=1MHz;50% duty cycle)

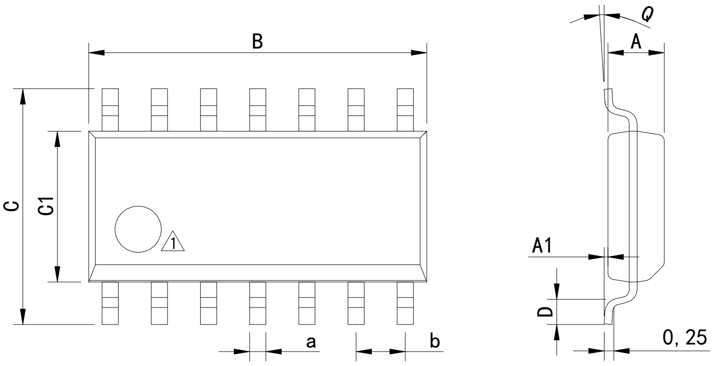
Physical Dimensions

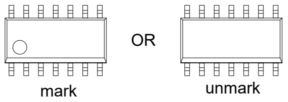
DIP-14



Dimensions In Millimeters(DIP-14)										
Symbol:	A	B	D	D1	E	L	L1	a	c	d
Min:	6.10	18.94	8.10	7.42	3.10	0.50	3.00	1.50	0.40	2.54 BSC
Max:	6.68	19.56	10.9	7.82	3.55	0.70	3.60	1.55	0.50	

SOP-14

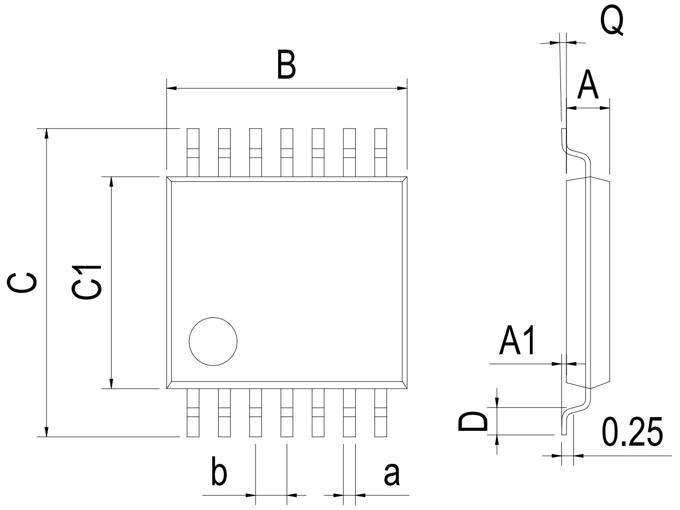




△1 Package top mark may be in lower left corner or unmark

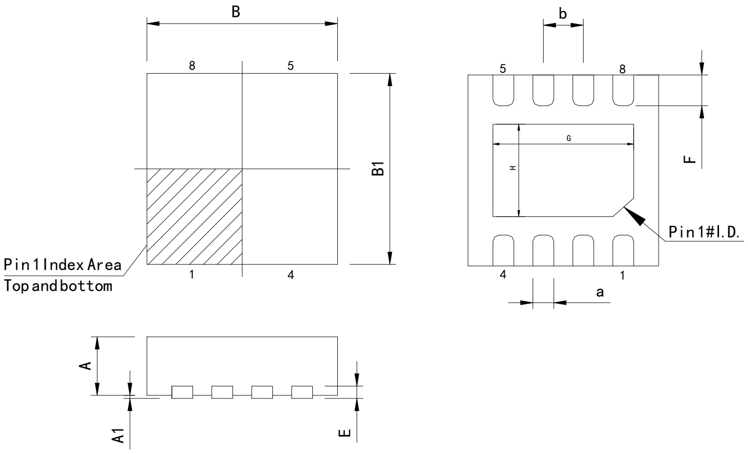
Dimensions In Millimeters(SOP-14)									
Symbol:	**A**	**A1**	**B**	**C**	**C1**	**D**	**Q**	**a**	**b**
Min:	1.35	0.05	8.55	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	8.95	6.20	4.00	0.80	8°	0.45	

TSSOP-14



Dimensions In Millimeters(TSSOP-14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	

DFN-8 3*3_0.65 Pin spacing



Dimensions In Millimeters(DFN-8 3*3)										
Symbol:	A	A1	B	B1	E	F	G	H	a	b
Min:	0.85	0.00	2.90	2.90	0.20	0.30	2.1	1.3	0.20	0.65 BSC
Max:	0.95	0.05	3.10	3.10	0.25	0.50	2.5	1.7	0.34	

Revision History

REVISION NUMBER	DATE	REVISION	PAGE
V1.0	2019-3	New	1-9
V1.1	2023-9	Modify features ang descriptions、Update encapsulation type、Updated DIP-14 Physical dimension、Update Title	1、4、6
V1.2	2024-10	Update Lead Temperature	3
V1.3	2025-9	Update important statements、Update sop-14 Dimension drawing	6、9
V1.4	2026-3	Add QFN-16 package model	1

IMPORTANT STATEMENT:

Huaguan Semiconductor reserves the right to change products and services offered without prior notice. Customers should obtain the latest relevant information before placing orders and verify that such information is current and complete. Huaguan Semiconductor assumes no responsibility or liability for altered documents.

Customers are responsible for complying with safety standards and implementing safety measures when using Huaguan Semiconductor products in system design and end-product manufacturing. You assume full responsibility for: selecting the appropriate Huaguan Semiconductor products for your application; designing, validating, and testing your application; and ensuring that your application complies with applicable standards and all other safety, security, or other requirements. This is to prevent potential risks that may lead to personal injury or property damage.

Huaguan Semiconductor products are not approved for use in life support, military, aerospace, or other high-risk applications. Huaguan products are neither intended nor warranted for use in such systems or equipment. Any failure or malfunction may lead to personal injury or severe property damage. Such applications are deemed "Unsafe Use." Unsafe Use includes, but is not limited to: surgical and medical equipment, nuclear energy control equipment, aircraft or spacecraft instruments, control or operation of vehicle power, braking, or safety systems, traffic signal instruments, all types of safety devices, and any other applications intended to support or sustain life. Huaguan Semiconductor shall not be liable for consequences resulting from Unsafe Use in these fields. Users must independently evaluate and assume all risks. Any issues, liabilities, or losses arising from the use of products beyond their approved applications shall be solely borne by the user. Users may not claim any compensation from Huaguan Semiconductor based on these terms. If any third party claims against Huaguan Semiconductor due to such Unsafe Use, the user shall compensate Huaguan Semiconductor for all resulting damages and liabilities.

Huaguan Semiconductor provides technical and reliability data (including datasheets), design resources (including reference designs), application or other design advice, web tools, safety information, and other resources for its semiconductor products. However, no guarantee is made that these resources are free from defects, and no express or implied warranties are provided. The use of testing and other quality control techniques is limited to Huaguan Semiconductor's quality assurance scope. Not all parameters of each device are tested.

Huaguan Semiconductor's documentation authorizes you to use these resources only for developing applications related to the products described herein. You are not granted rights to any other intellectual property of Huaguan Semiconductor or any third party. Any other reproduction or display of these resources is strictly prohibited. You shall fully indemnify Huaguan Semiconductor and its agents against any claims, damages, costs, losses, and liabilities arising from your use of these resources. Huaguan Semiconductor shall not be held responsible.