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

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

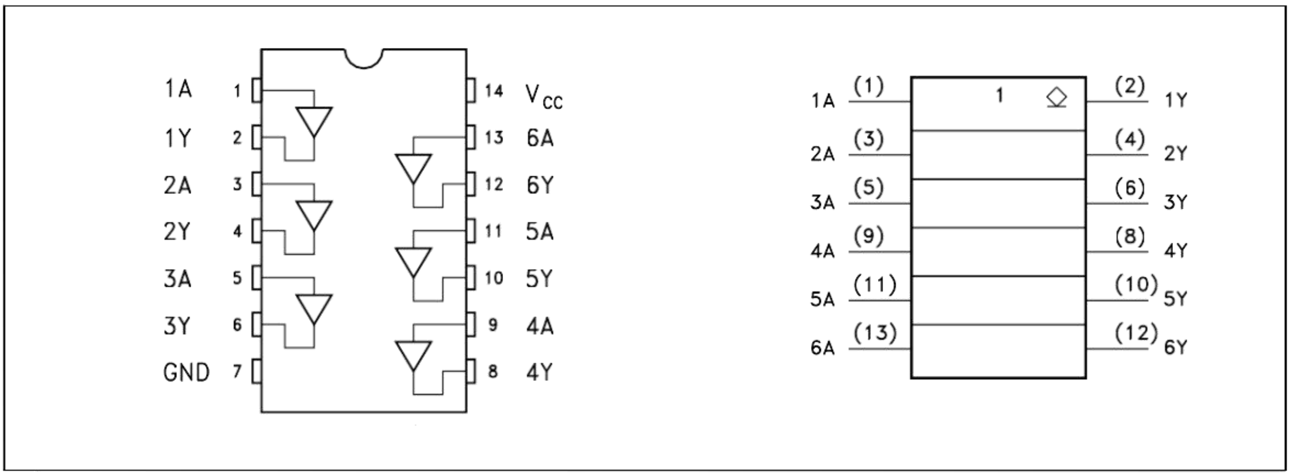
DeScription

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 And Iec Logic Symbols



Pin Description

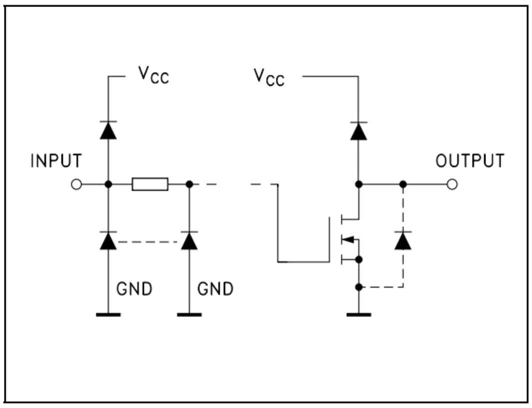
PIN No	SYMBOL	NAME AND FUNCTION
1, 3, 5, 9,11,13	1A to 6A	Data Inputs
2, 4, 6, 8,10,12	1Y to 6Y	Data Outputs
7	GND	Ground (0V)
14	V_{CC}	Positive Supply Voltage

Truth Table

A	Y
L	L
H	Z

ZZ: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)

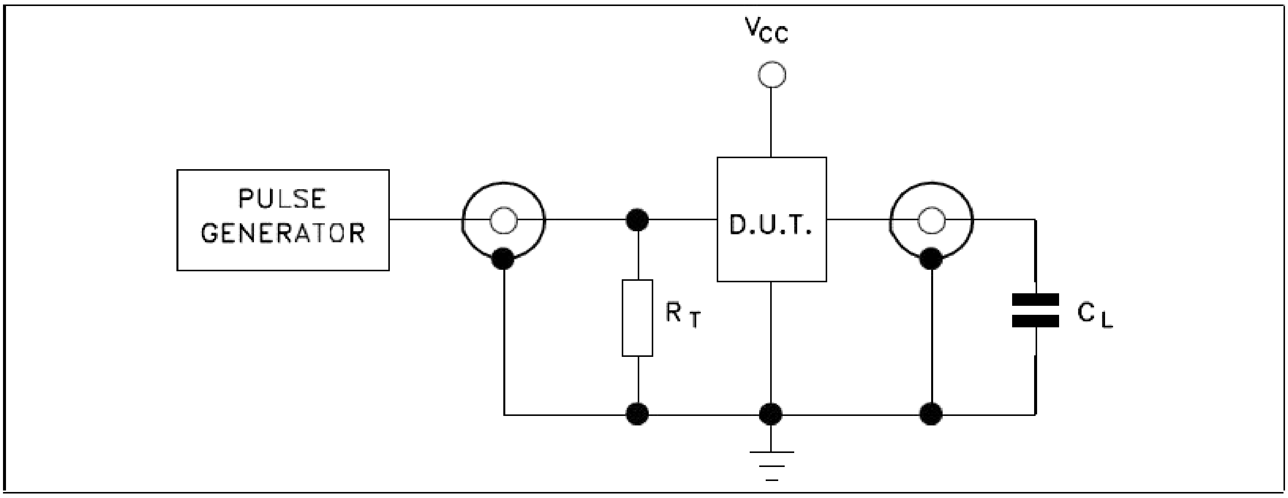
Symbol	Parameter	Test Condition		Value					Unit
		V_{CC}(V)		T_A = 25°C			-40 to 85°C		
				Min.	Typ.	Max.	Min.	Max.	
t_{THL}	Output Transition Time	2.0			30	75		95	ns
		4.5			8	15		19	
		6.0			7	13		16	
t_{PLZ}	Propagation Delay Time	2.0	R_L = 1 KΩ		10	90		115	ns
		4.5			7	18		23	
		6.0			6	15		20	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

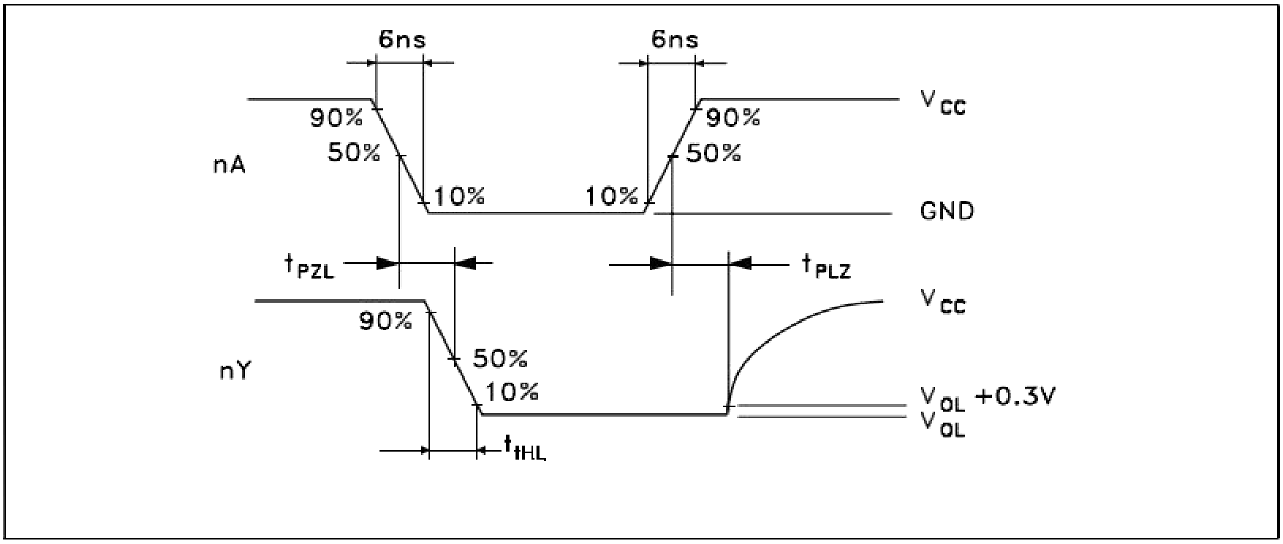
Symbol	Parameter	Test Condition			Value					Unit
		V_{CC} (V)			T_A = 25°C			-40 to 85°C		
					Min.	Typ.	Max.	Min.	Max.	
C_{IN}	Input Capacitance	5.0				5	10		10	pF
C_{OUT}	Output Capacitance	5.0				3				pF
C_{PD}	Power Dissipation Capacitance (note1)	5.0				4				pF

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



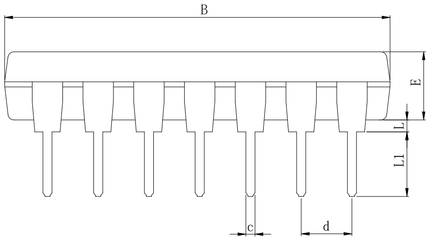
CL = 50pF or equivalent (includes jig and probe capacitance)
RT = ZOUT of pulse generator (typically 50Ω)

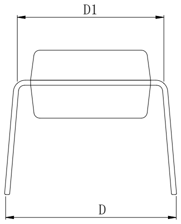


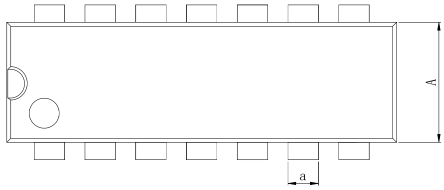
WAVEFORM:PROPAGA TION DELAY TIME(f=1MHz;50% duty cycle)

Physical Dimensions

DIP-14

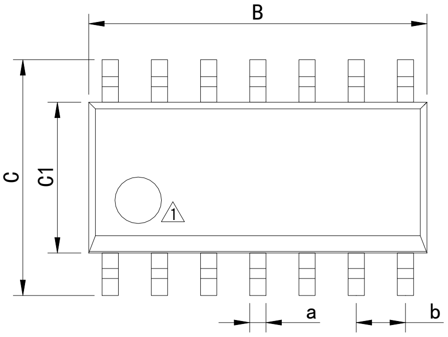


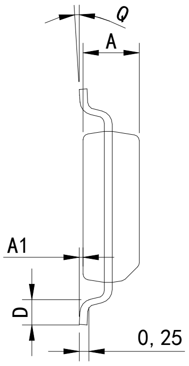


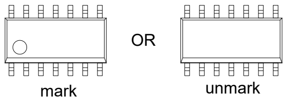


Dimensions In Millimeters(DIP-14)										
Symbol:	A	B	D	D1	E	L	L1	a	c	d
Min:	6.10	18.94	8.10	7.42	3.10	0.50	3.00	1.50	0.40	2.54 BSC
Max:	6.68	19.56	10.9	7.82	3.55	0.70	3.60	1.55	0.50	

SOP-14



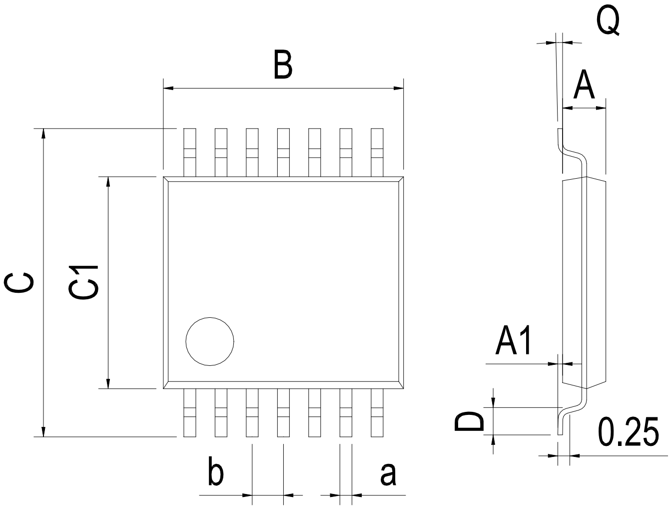




△1 Package top mark may be in lower left corner or unmark

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	

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

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