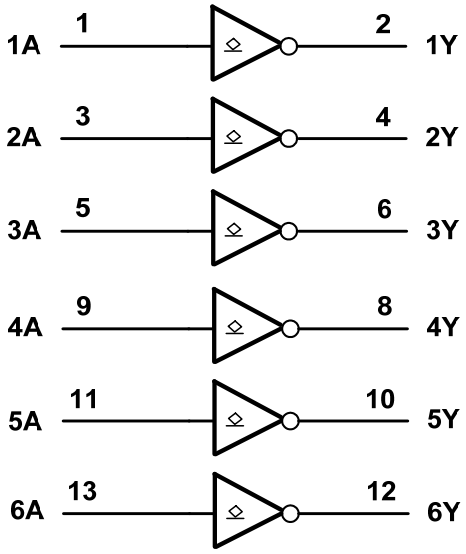
Pin Descriptions

Pin Number	Pin Name	Function
1	1A	Data Input
2	1Y	Data Output
3	2A	Data Input
4	2Y	Data Output
5	3A	Data Input
6	3Y	Data Output
7	GND	Ground
8	4Y	Data Output
9	4A	Data Input
10	5Y	Data Output
11	5A	Data Input
12	6Y	Data Output
13	6A	Data Input
14	V_{CC}	Supply Voltage

Logic Diagram



Function Table

Input	Output
A	**Y**
H	L
L	Z

Absolute Maximum Ratings (Note 4) (@T_A = +25°C, unless otherwise specified.)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	KV
ESD CDM	Charged Device Model ESD Protection	1	KV
ESD MM	Machine Model ESD Protection	200	V
V_{CC}	Supply Voltage Range	-0.5 to +7.0	V
V_I	Input Voltage Range (Note 5)	-0.5 to +7.0	V
I_{IK}	Input Clamp Current V_I < -0.5V or Vi > V_{CC} + 0.5V	±20	mA
I_{OK}	Output Clamp Current V_O < -0.5V or V_O > V_{CC} + 0.5V	±20	mA
I_O	Continuous Output Current - 0.5V < V_O V_{CC} + 0.5V	+/- 25	mA
I_{CC}	Continuous Current Through V_{CC}	50	mA
I_{GND}	Continuous Current Through GND	-50	mA
T_J	Operating Junction Temperature	-40 to +150	°C
T_{STG}	Storage Temperature	-65 to +150	°C
P_{TOT}	Total Power Dissipation	500	mW

Notes: 4. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.
5. Input Voltage cannot exceed V_{CC} to the extent the Maximum clamp current is exceeded

Recommended Operating Conditions (Note 6) (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	Supply Voltage		2.0	6.0	V
V_I	Input Voltage		0	Vcc	V
V_O	Output Voltage		0	V_{CC}	V
Δt/ΔV	Input transition rise or fall rate	V_{CC} = 2.0V		625	ns/V
		V_{CC} = 4.5V		140	
		V_{CC} = 6.0V		85	
T_A	Operating free-air temperature		-40	+125	°C

Note: 6. Unused inputs should be held at V_{CC} or Ground.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Test Conditions	V_{CC}	T_A = -40°C to +85°C		T_A = -40°C to +125°C		Unit
				Min	Max	Min	Max	
V_{IH}	High-level Input Voltage		2.0V	1.5		1.5		V
			4.5V	3.15		3.15		
			6.0V	4.2		4.2		
V_{IL}	Low-level input voltage		2.0V		0.5		0.5	V
			4.5V		1.35		1.35	
			6.0V		1.8		1.8	
V_{OL}	Low-level Output Voltage	I_{OL} = 20μA	2.0V		0.1		0.1	V
		I_{OL} = 20μA	4.5V		0.1		0.1	
		I_{OL} = 20μA	6.0V		0.1		0.1	
		I_{OL} = 4mA	4.5V		0.33		0.44	
		I_{OL} = 5.2mA	6.0V		0.33		0.44	
I_{OZ}	Z State Leakage Current	V_O =0 to 6.0V V_I =GND or 6.0V	6.0V		± 5.0		± 10	μA
I_I	Input Current	V_I =GND to 5.5V	6.0V		± 1		± 1	μA
I_{CC}	Supply Current	V_I = GND or V_{CC}, I_O=0	6.0V		20		40	μA

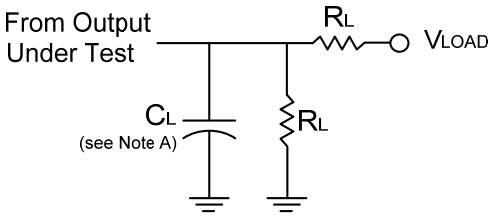
Switching Characteristics

Symbol	Parameter	Test Conditions	V_{CC}	T_A = +25°C			-40°C to +85°C	-40°C to +125°C	Unit
				Min	Typ	Max	Max	Max	
t_{PD}	Propagation Delay A_N to Y_N	Figure 1 C_L = 50 pF	2.0V	—	25	90	115	125	ns
			4.5V	—	9	18	23	27	
			6.0V	—	7	15	20	23	
t_t	Transition time	Figure 1 C_L = 50 pF	2.0V	—	19	75	95	110	ns
			4.5V	—	7	15	19	22	
			6.0V	—	6	13	16	19	

Operating Characteristics (@T_A = +25°C, unless otherwise specified.)

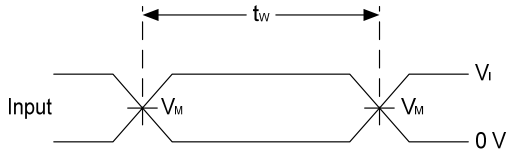
Parameter		Test Conditions	V_{CC} = 6V	Unit
			Typ	
C_{pd}	Power dissipation capacitance per gate	f = 1 MHz	22	pF
C_I	Input Capacitance	V_I = V_{CC} – or GND	4	pF

Parameter Measurement Information

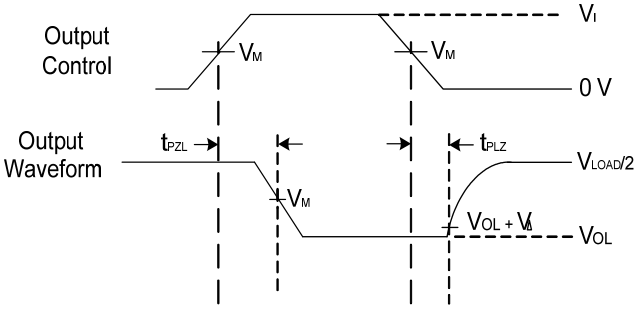


TEST	Condition
t_{PLZ} (see Notes D and E)	Vload
t_{PZL}(see Notes D and F)	Vload

V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	t_r/t_f					
2.0V to 6.0V	V_{CC}	≤6ns	$V_{CC}/2$	2 X V_{CC}	50 pF	2 KΩ	10% of Vcc



Voltage Waveform
Pulse Duration

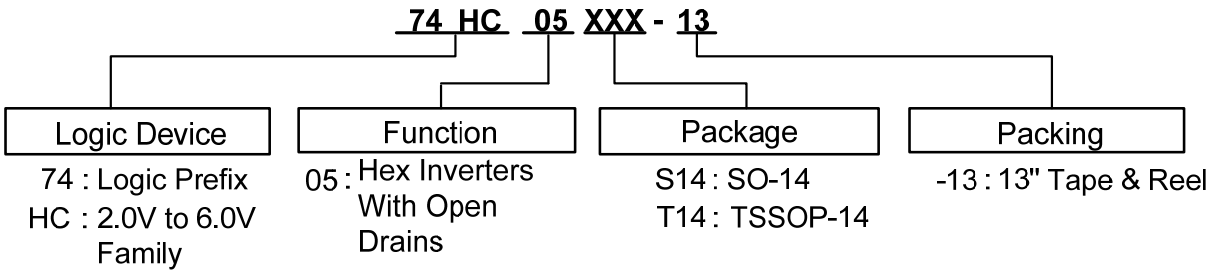


Voltage Waveform
Propagation Delay Times

Notes:
A. Includes test lead and test apparatus capacitance.
B. All pulses are supplied at pulse repetition rate ≤ 1 MHz.
C.The inputs are measured one at a time with one transition per measurement.
D. For the open drain device t_{PLZ} and t_{PZL} are the same as t_{PD}.
E. t_{PZL} is measured at V_M.
F. t_{PLZ} is measured at V_{OL} +V_Δ.
D. A Thevenin equivalent load may be used in place of V_{CC} X 2 and resistor divider.

Figure 1 Load Circuit and Voltage Waveforms

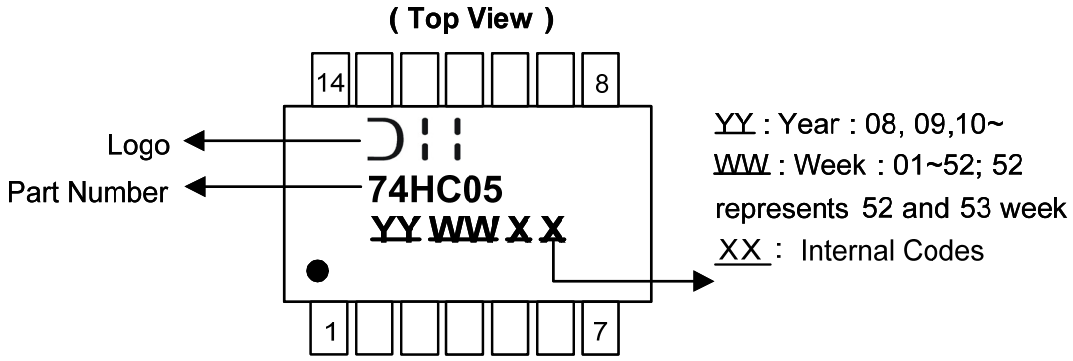
Ordering Information



Device	Package Code	Packaging	7" Tape and Reel	
			Quantity	Part Number Suffix
74HC05S14-13	S14	SO-14	2500/Tape & Reel	-13
74HC05T14-13	T14	TSSOP-14	2500/Tape & Reel	-13

Marking Information

(1) SO-14, TSSOP-14

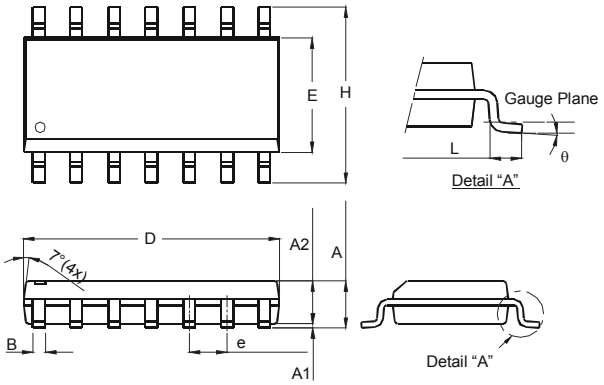


Part Number	Package
74HC05S14	SO-14
74HC05T14	TSSOP-14

Package Outline Dimensions (All dimensions in mm.)

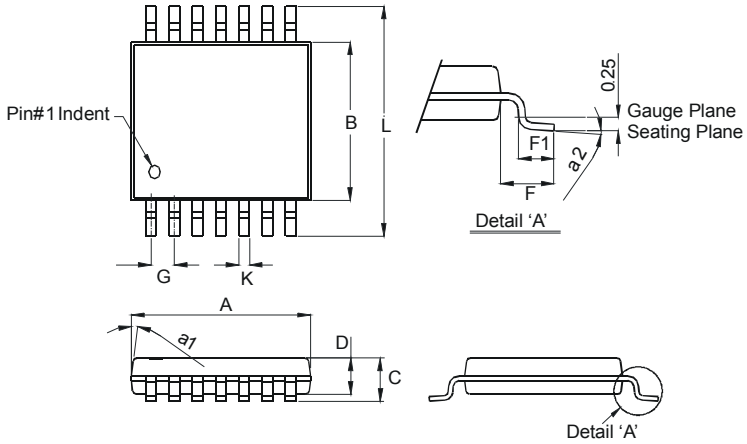
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.

Package Type: SO-14



SO-14		
Dim	**Min**	**Max**
A	1.47	1.73
A1	0.10	0.25
A2	1.45 Typ	
B	0.33	0.51
D	8.53	8.74
E	3.80	3.99
e	1.27 Typ	
H	5.80	6.20
L	0.38	1.27
θ	0°	8°
All Dimensions in mm		

Package Type: TSSOP-14

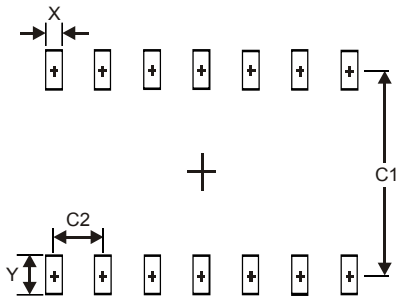


TSSOP-14		
Dim	**Min**	**Max**
a1	7° (4X)	
a2	0°	8°
A	4.9	5.10
B	4.30	4.50
C	—	1.2
D	0.8	1.05
F	1.00 Typ	
F1	0.45	0.75
G	0.65 Typ	
K	0.19	0.30
L	6.40 Typ	
All Dimensions in mm		

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for latest version.

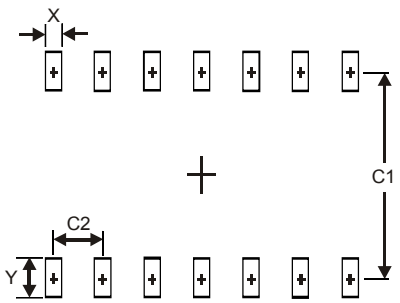
Package Type: SO-14



Dimensions	Value (in mm)
X	0.60
Y	1.50
C1	5.4
C2	1.27

Suggested Pad Layout (cont.)

Package Type: TSSOP-14



Dimensions	Value (in mm)
X	0.45
Y	1.45
C1	5.9
C2	0.65