

QUADRUPLE 3-STATE BUFFERS OE LOW

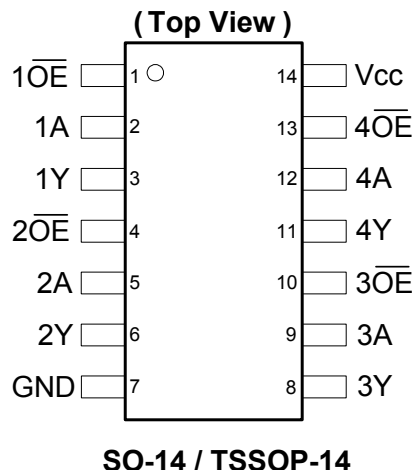
Description

The 74HCT125 provides provides four independent buffer gates with 3-state outputs. Each buffer has a separate enable pin that if driven with a high logic level places the corresponding output in the high impedance state. The device is designed for operation with a power supply range of 4.5V to 5.5V.

Features

- Wide Supply Voltage Range from 4.5V to 5.5V
- Pin Compatible with Low Power Schottky (LSTTL)
- Inputs Are TTL Voltage Level Compatible
- Sinks or Sources 4mA at $V_{CC} = 4.5V$
- CMOS Low Power Consumption
- Schmitt Trigger Action at All Inputs
- ESD Protection Exceeds JESD 22
 - 200-V Machine Model (A115-A)
 - 2000-V Human Body Model (A114-A)
 - Exceeds 1000-V Charged Device Model (C101C)
- Range of Package Options SO-14 and TSSOP-14
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Pin Assignments



Applications

- General Purpose Logic
- Wide array of products such as:
 - PCs, networking, notebooks, netbooks
 - Computer peripherals, hard drives, CD/DVD ROM
 - TV, DVD, DVR, set top box

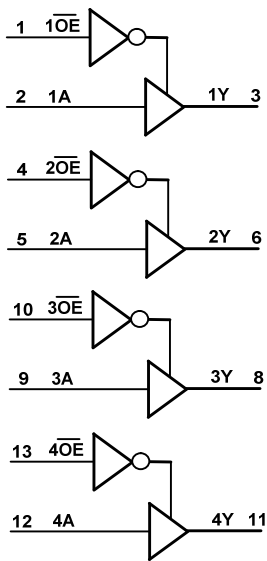
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Pin Descriptions

Pin Number	Pin Name	Description
1	1OE	Data Enable Input (active low)
2	1A	Data Input
3	1Y	Data Output
4	2OE	Data Enable Input (active low)
5	2A	Data Input
6	2Y	Data Output
7	GND	Ground
8	3Y	Data Output
9	3A	Data Input
10	3OE	Data Enable Input (active low)
11	4Y	Data Outp
12	4A	Data Input
13	4OE	Data Enable Input (active low)
14	VCC	Supply Voltage

Logic Diagram



Function Table

Inputs		Output
OE	A	Y
L	H	H
L	L	L
H	X	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 V _I > 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		4.5	5.5	V
V _I	Input Voltage		0	V _{CC}	V
V _O	Output Voltage		0	V _{CC}	V
Δt/ΔV	Input Transition Rise or Fall Rate	V _{CC} = 4.5V to 5.5V		500	ns/V
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		4.5V to 5.5V	2.0		2.0		V
V _{IL}	Low-Level Input Voltage		4.5V to 5.5V		0.8		0.8	V
V _{OH}	High-Level Output Voltage	I _{OH} = -20μA	4.5V	4.4		4.4		V
		I _{OH} = -4mA	4.5V	3.84		3.70		
V _{OL}	Low-Level Output Voltage	I _{OL} = 20μA	4.5V		0.1		0.1	V
		I _{OL} = 4.0mA	4.5V		0.33		0.4	
I _{OZ}	Z State Leakage Current	V _O = 0 to 5.5V	5.5V		± 5.0		± 10	μA
I _I	Input Current	V _I = GND to 6.0V	6.0V		± 1		± 1	μA
I _{CC}	Supply Current	V _I = GND or V _{CC} , I _O = 0	6.0V		20		40	μA
ΔI _{CC}	Additional Supply Current	One Input at V _{CC} -2.1V Other Pins at V _{CC} or GND	4.5V to 5.5V		675		735	μA

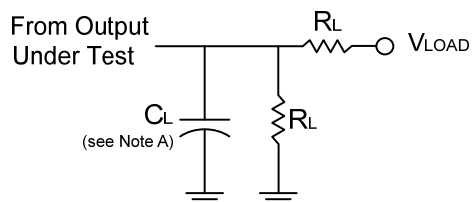
Switching Characteristics

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 = 50pF	4.5V	—	15	25	31	38	ns
t _{EN}	Enable Time O _E N to Y _N			—	15	28	35	42	ns
t _{DIS}	Disable Time O _E N to Y _N			—	15	25	31	38	ns
t _t	Transition Time			—	5	12	15	18	ns

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

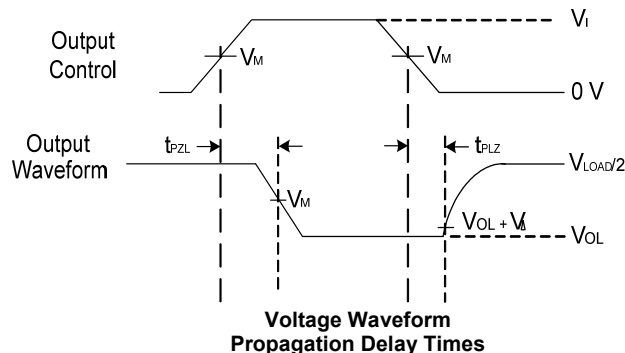
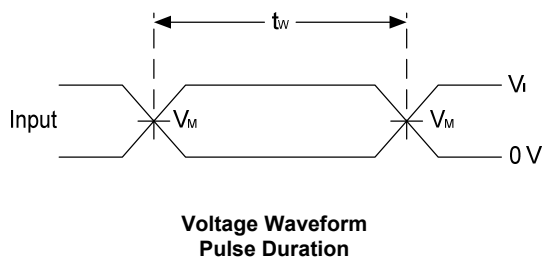
Parameter		Test Conditions	V _{CC} = 5.5V	Unit
			Typ	
C _{pd}	Power Dissipation Capacitance per Gate	f = 1 MHz	24	pF
C _I	Input Capacitance	V _I = V _{CC} – or GND	3.5	pF

Parameter Measurement Information



TEST	Condition
t _{PLZ} (see Notes D and E)	V _{load}
t _{PZL} (see Notes D and F)	V _{load}

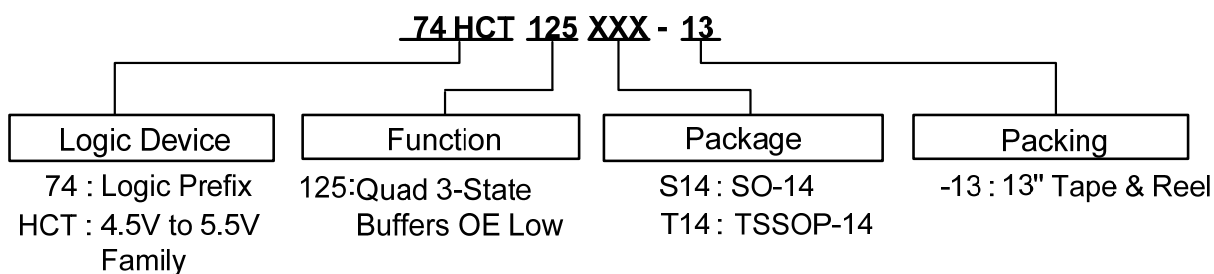
V _{CC}	Inputs		V _M	V _{LOAD}	C _L	R _L	V _Δ
	V _I	t _r /t _f					
4.5V	1.5V	≤6ns	3.0V	2 X V _{CC}	50pF	2KΩ	10% of V _{CC}



- 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.
 - D. t_{PLZ} is measured at V_{OL} + V_Δ
 - F. A Thevenin equivalent load may be used in place of V_{CC} X 2 and resistor divider

Figure 1 Load Circuit and Voltage Waveforms

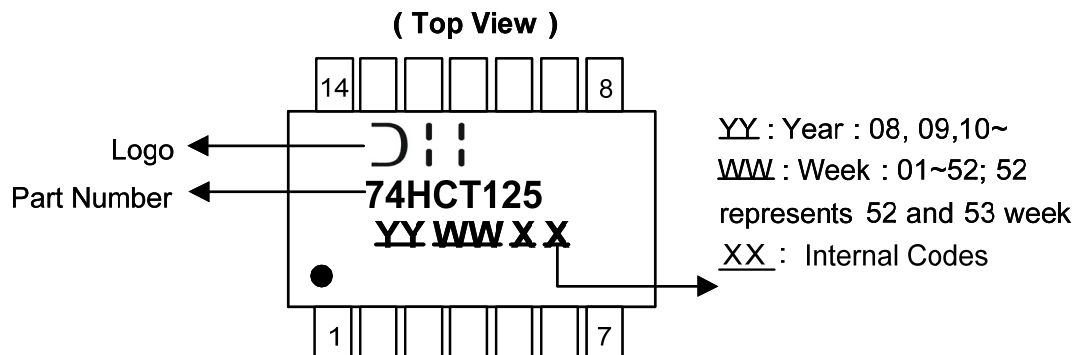
Ordering Information



Device	Package Code	Packaging	7" Tape and Reel	
			Quantity	Part Number Suffix
74HCT125S14-13	S14	SO-14	2500/Tape & Reel	-13
74HCT125T14-13	T14	TSSOP-14	2500/Tape & Reel	-13

Marking Information

(1) SO-14, TSSOP-14

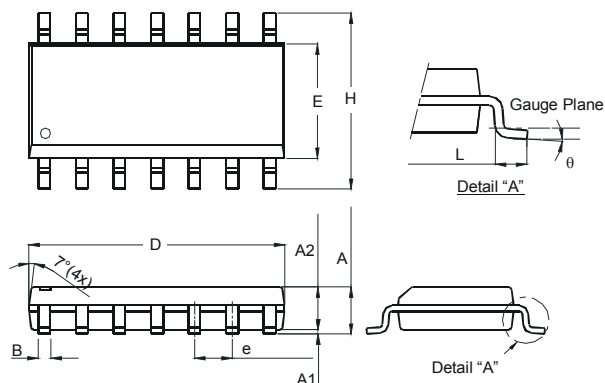


Part Number	Package
74HCT125S14	SO-14
74HCT125T14	TSSOP-14

Package Outline Dimensions (All dimensions in mm.)

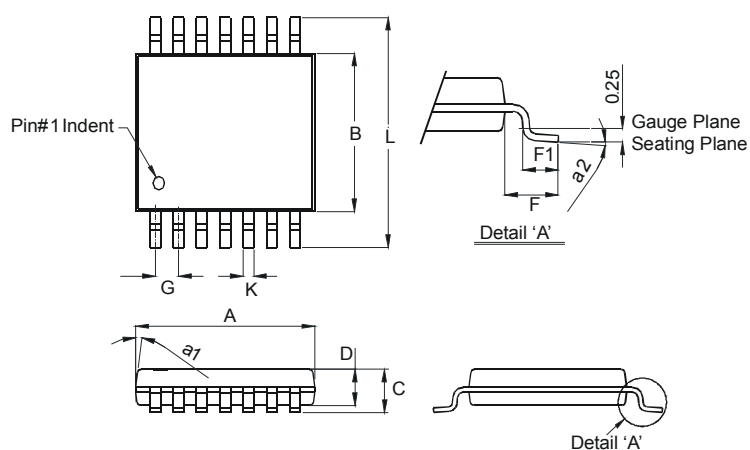
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

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

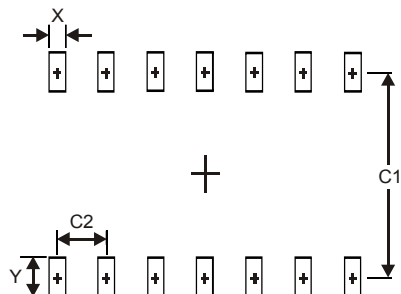


TSSOP-14		
Dim	Min	Max
a1	7° (4X)	
a2	0°	8°
A	4.9	5.10
B	4.30	4.50
C	—	1.2
D	0.8	1.05
F	1.00 Typ	
F1	0.45	0.75
G	0.65 Typ	
K	0.19	0.30
L	6.40 Typ	
All Dimensions in mm		

Suggested Pad Layout

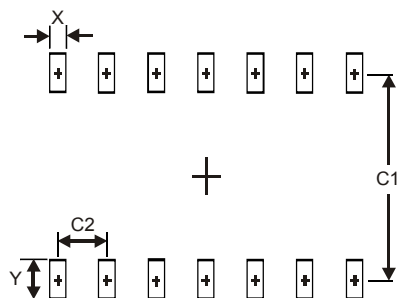
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.

Package Type: SO-14



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

Package Type: TSSOP-14



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

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