QUADRUPLE 3-STATE BUFFERS OE HIGH

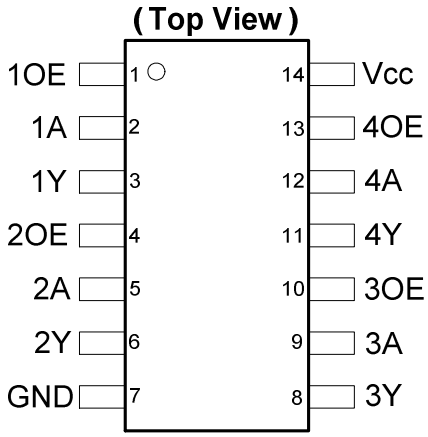
Description

The 74AHCT126 provides four independent buffer gates with 3-state outputs. Each buffer has a separate enable pin that if driven with a low 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
- Inputs Are TTL Voltage Level Compatible
- Outputs Sink or Source 8mA 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)
  - 2000-V Human Body Model (A114)
  - Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 250mA per JESD 78, Class II
- 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



SO-14 / TSSOP-14

Applications

- General Purpose Logic
- Wide Array of Products Such as:
  - PCs, Networking, Notebooks, Netbooks
  - Computer Peripherals, Hard Drives, CD/DVD ROMs
  - TVs, DVDs, DVRs, Set Top Boxes

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.

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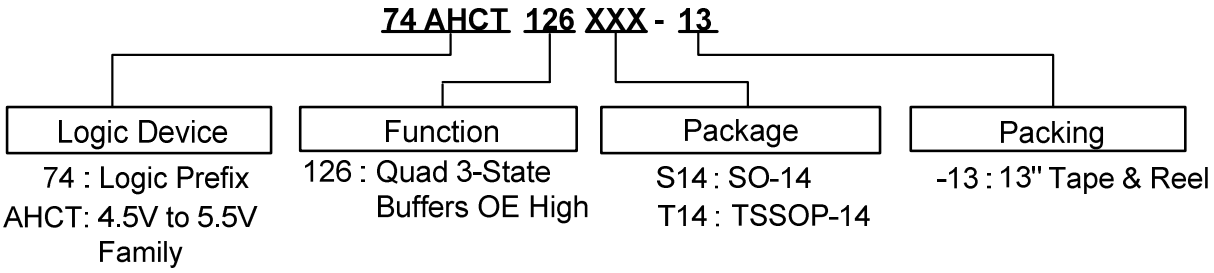
Ordering Information



Part Number	Package Code	Packaging	7" Tape and Reel	
			Quantity	Part Number Suffix
74AHCT126S14-13	S14	SO-14	2,500/Tape & Reel	-13
74AHCT126T14-13	T14	TSSOP-14	2,500/Tape & Reel	-13

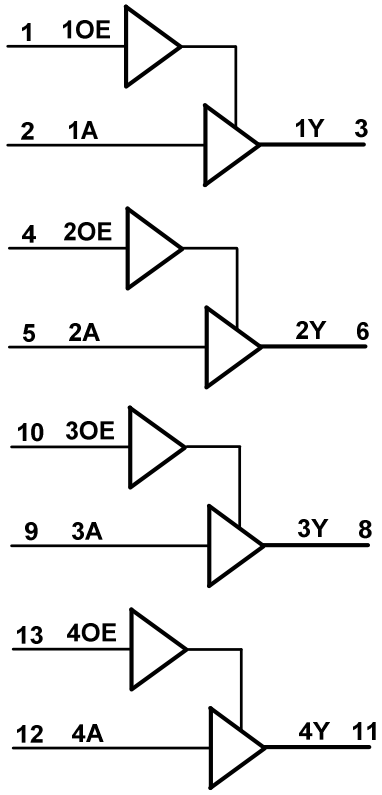
Pin Descriptions

Pin Number	Pin Name	Function
1	1OE	Data Enable Input (active high)
2	1A	Data Input
3	1Y	Data Output
4	2OE	Data Enable Input (active high)
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 high)
11	4Y	Data Output
12	4A	Data Input
13	4OE	Data Enable Input (active high)
14	V_{CC}	Supply Voltage

Function Table

Inputs		Output
OE	A	Y
H	H	H
H	L	L
L	X	Z

Logic Diagram



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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	-0.5 to +7.0	V
I_{IK}	Input Clamp Current $V_I < -0.5V$	-20	mA
I_{OK}	Output Clamp Current $V_O < 0$ V	-20	mA
I_{OK}	Output Clamp Current $V_O > V_{CC}$	20	mA
I_O	Continuous Output Current $0V < V_O < V_{CC}$	+/- 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

Note: 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.

Recommended Operating Conditions (Note 5) (T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply Voltage	4.5	5.5	V
V_I	Input Voltage	0	5.5	V
V_O	Output Voltage	0	V_{CC}	V
$\Delta t/\Delta V$	Input transition Rise or Fall Rate	-	20	ns/V
T_A	Operating Free-Air Temperature	-40	+125	°C

Note: 5. Unused inputs should be held at V_{CC} or Ground.

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Electrical Characteristics

Symbol	Parameter	Test Conditions	Vcc	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} = -50μA	4.5V	4.4	-	4.4	-	V
		I_{OH} = -8mA	4.5V	3.80	-	3.70	-	
V_{OL}	Low-Level Output Voltage	I_{OL} = 50μA	4.5V	-	0.1	-	0.1	V
		I_{OL} = 8mA	4.5V	-	0.44	-	0.55	
I_{OZ}	Z State Leakage Current	V_O = 0 to 5.5V	5.5V	-	±2.5	-	±10	μA
I_I	Input Current	V_I = GND to 5.5V	3.6V	-	±1	-	±2	μA
I_{CC}	Supply Current	V_I = GND or V_{CC}, I_O = 0	3.6V	-	20	-	40	μA
ΔI_{CC}	Additional Supply Current	One input at V_{CC} –2.1V Other pins at V_{CC} or GND	5.5V	-	1.35	-	5	mA

Operating Characteristics

Parameter		Test Conditions	V_{CC} = 5.5V	Unit
			Typ	
C_{pd}	Power Dissipation Capacitance per Gate	f = 1MHz	14.8	pF
C_i	Input Capacitance	V_i = V_{CC} – or GND	4.0	pF

Switching Characteristics (V_{CC} = 4.5V to 5.5V)

Symbol	Parameter	Test Conditions	T_A = +25°C			-40°C to +85°C		-40°C to +125°C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
t_{PD}	Propagation Delay A_N to Y_N	Figure 1 C_L = 15pF	0.5	3.0	5.5	0.5	6.5	0.5	7.0	ns
		Figure 1 C_L = 50pF	0.5	4.3	7.5	0.5	8.5	0.5	9.5	
t_{EN}	Enable Time $\overline{OE}_N$ to Y_N	Figure 1 C_L = 15 pF	0.5	3.3	5.1	0.5	6.0	0.5	6.5	ns
		Figure 1 C_L = 50pF	0.5	4.7	7.1	0.5	8.0	0.5	9.0	
t_{DIS}	Disable Time $\overline{OE}_N$ to Y_N	Figure 1 C_L = 15pF	0.5	4.8	6.8	0.5	8.0	0.5	8.5	ns
		Figure 1 C_L = 50pF	0.5	6.5	8.9	0.5	10.0	0.5	11.5	

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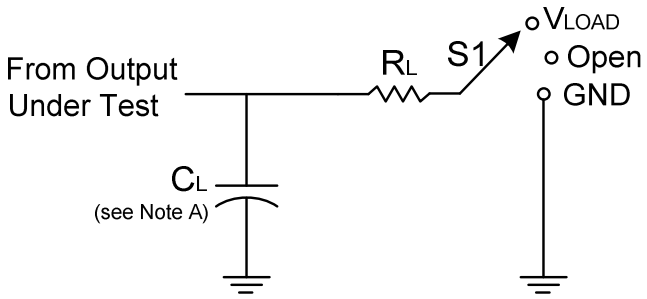
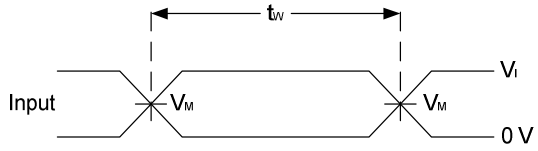
Parameter Measurement Information

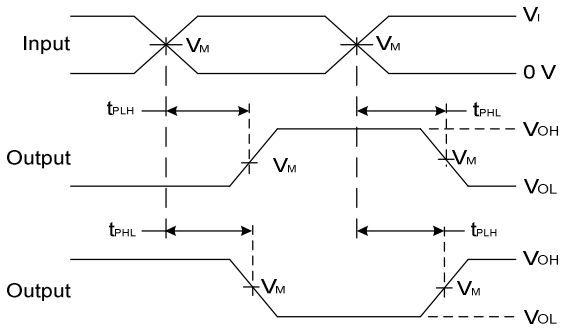


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	Vload
t_{PHZ}/t_{PZH}	GND

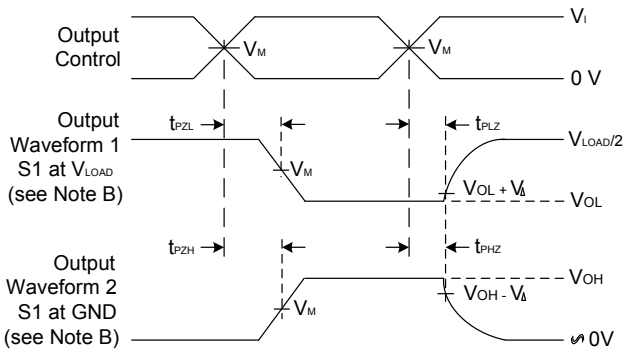
Vcc	Inputs		V_M Inputs	V_M Outputs	V_{LOAD}	C_L	R_L	$V\Delta$
	V_I	t_r/t_f						
4.5V to 5.5V	3 V	≤3ns	1.5 V	$V_{CC}/2$	V_{CC}	15pF, 50pF	1K	0.3V



Voltage Waveform Pulse Duration



Voltage Waveform Propagation Delay Times
Inverting and Non Inverting Outputs



Voltage Waveform Enable and Disable Times
Low and High Level Enabling

Figure 1. Load Circuit and Voltage Waveforms

Notes: A. Includes test lead and test apparatus capacitance.
B. All pulses are supplied at pulse repetition rate ≤ 1 MHz.
C. Inputs are measured separately one transition per measurement.
D. t_{PLZ} and t_{PHZ} are the same as t_{dis}.
E. t_{PZL} and t_{PZH} are the same as t_{EN0}
F. t_{PLH} and t_{PHL} are the same as t_{PD}.

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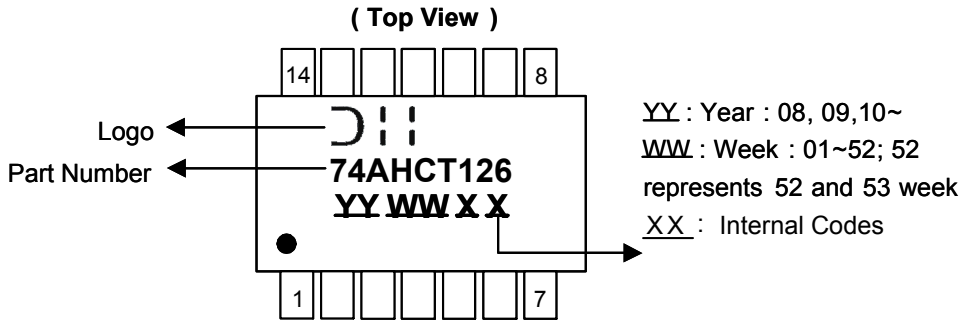
Marking Information

(1) SO-14, TSSOP-14



Part Number	Package
74AHCT126S14	SO-14
74AHCT126T14	TSSOP-14

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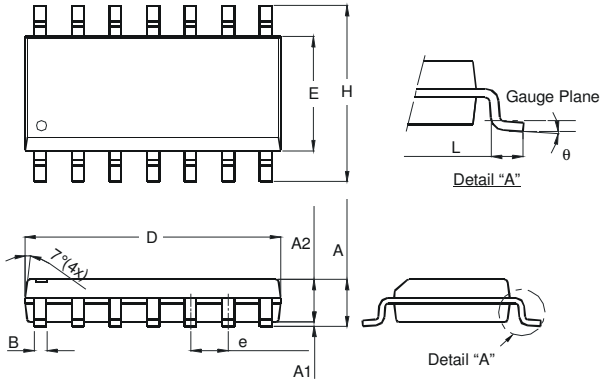
Package Outline Dimensions (All dimensions in mm.)

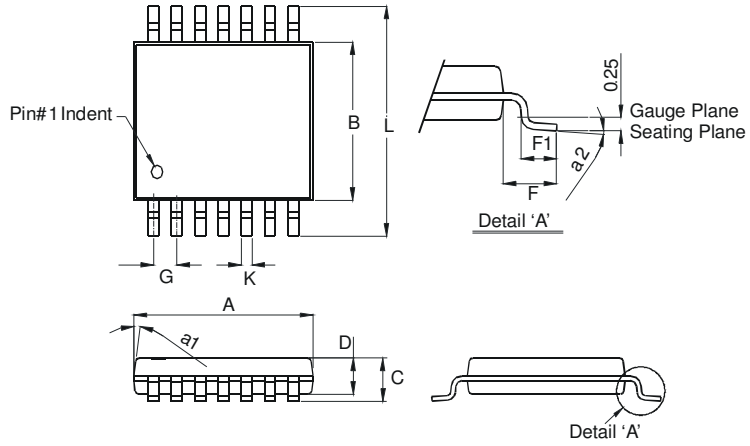
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

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		

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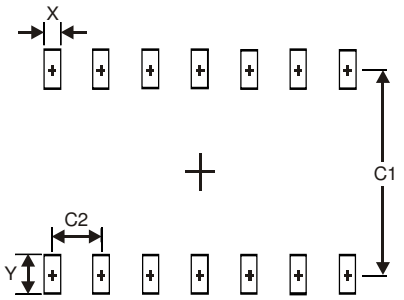
Suggested Pad Layout

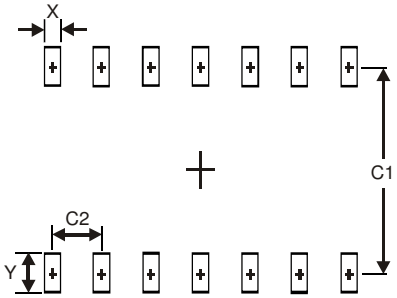
Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

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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