

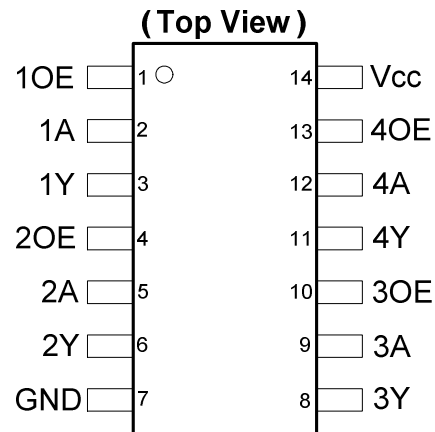
## Description

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**

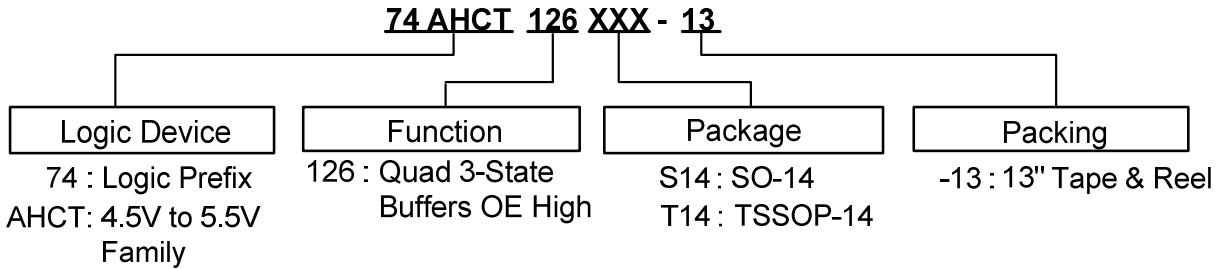
## Applications

- 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.

## 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                |

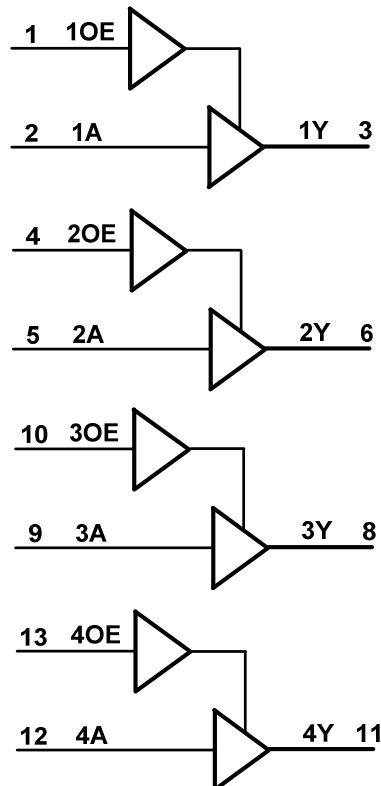
## Pin Descriptions

| 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 <sub>CC</sub> | Supply Voltage                  |

## Function Table

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

## Logic Diagram



**Absolute Maximum Ratings** (Note 4) ( $T_A = +25^\circ\text{C}$ , 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 $V_I < -0.5\text{V}$             | -20          | mA               |
| $I_{OK}$  | Output Clamp Current $V_O < 0\text{V}$               | -20          | mA               |
| $I_{OK}$  | Output Clamp Current $V_O > V_{CC}$                  | 20           | mA               |
| $I_O$     | Continuous Output Current $0\text{V} < V_O < V_{CC}$ | +/- 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  | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                                  | -65 to +150  | $^\circ\text{C}$ |
| $P_{TOT}$ | 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) ( $T_A = +25^\circ\text{C}$ , 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     | $^\circ\text{C}$ |

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

## Electrical Characteristics

| Symbol           | Parameter                 | Test Conditions  | V <sub>CC</sub> | T <sub>A</sub> = -40°C to +85°C |      | T <sub>A</sub> = -40°C to +125°C |      | Unit |
|------------------|---------------------------|--|-----------------|---------------------------------|------|----------------------------------|------|------|
|                  |                           |  |                 | Min                             | Max  | Min                              | Max  |      |
| V <sub>IH</sub>  | High-Level Input Voltage  | -  | 4.5V to 5.5V    | 2.0                             | -    | 2.0                              | -    | V    |
| V <sub>IL</sub>  | Low-Level Input Voltage   | -  | 4.5V to 5.5V    | -                               | 0.8  | -                                | 0.8  | V    |
| V <sub>OH</sub>  | High-Level Output Voltage | I <sub>OH</sub> = -50μA  | 4.5V            | 4.4                             | -    | 4.4                              | -    | V    |
|                  |                           | I <sub>OH</sub> = -8mA   | 4.5V            | 3.80                            | -    | 3.70                             | -    |      |
| V <sub>OL</sub>  | Low-Level Output Voltage  | I <sub>OL</sub> = 50μA   | 4.5V            | -                               | 0.1  | -                                | 0.1  | V    |
|                  |                           | I <sub>OL</sub> = 8mA  | 4.5V            | -                               | 0.44 | -                                | 0.55 |      |
| I <sub>OZ</sub>  | Z State Leakage Current   | V <sub>O</sub> = 0 to 5.5V   | 5.5V            | -                               | ±2.5 | -                                | ±10  | μA   |
| I <sub>I</sub>   | Input Current             | V <sub>I</sub> = GND to 5.5V   | 3.6V            | -                               | ±1   | -                                | ±2   | μA   |
| I <sub>CC</sub>  | Supply Current            | V <sub>I</sub> = GND or V <sub>CC</sub> , I <sub>O</sub> = 0               | 3.6V            | -                               | 20   | -                                | 40   | μA   |
| ΔI <sub>CC</sub> | Additional Supply Current | One input at V <sub>CC</sub> -2.1V<br>Other pins at V <sub>CC</sub> or GND | 5.5V            | -                               | 1.35 | -                                | 5    | mA   |

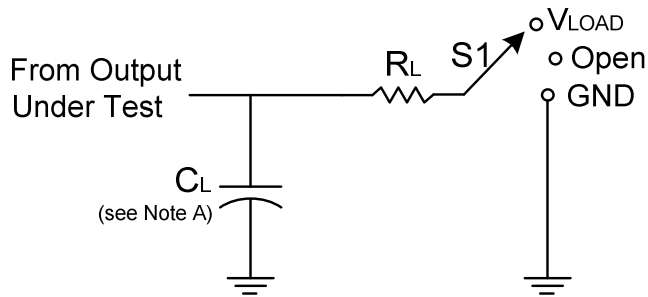
## Operating Characteristics

| Parameter       |  | Test Conditions                           | V <sub>CC</sub> = 5.5V | Unit |
|-----------------|--|---|------------------------|------|
|                 |  |   | Typ                    |      |
| C <sub>pd</sub> | Power Dissipation Capacitance per Gate | f = 1MHz                                  | 14.8                   | pF   |
| C <sub>i</sub>  | Input Capacitance                      | V <sub>i</sub> = V <sub>CC</sub> - or GND | 4.0                    | pF   |

## Switching Characteristics (V<sub>CC</sub> = 4.5V to 5.5V)

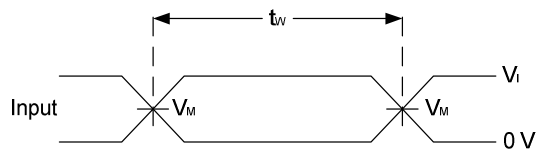
| Symbol           | Parameter  | Test Conditions                 | T <sub>A</sub> = +25°C |     |     | -40°C to +85°C |      | -40°C to +125°C |      | Unit |
|------------------|--|---------------------------------|------------------------|-----|-----|----------------|------|-----------------|------|------|
|                  |  |                                 | Min                    | Typ | Max | Min            | Max  | Min             | Max  |      |
| t <sub>PD</sub>  | Propagation Delay A <sub>N</sub> to Y <sub>N</sub> | Figure 1 C <sub>L</sub> = 15pF  | 0.5                    | 3.0 | 5.5 | 0.5            | 6.5  | 0.5             | 7.0  | ns   |
|                  |  | Figure 1 C <sub>L</sub> = 50pF  | 0.5                    | 4.3 | 7.5 | 0.5            | 8.5  | 0.5             | 9.5  |      |
| t <sub>EN</sub>  | Enable Time $\overline{OE}_N$ to Y <sub>N</sub>    | Figure 1 C <sub>L</sub> = 15 pF | 0.5                    | 3.3 | 5.1 | 0.5            | 6.0  | 0.5             | 6.5  | ns   |
|                  |  | Figure 1 C <sub>L</sub> = 50pF  | 0.5                    | 4.7 | 7.1 | 0.5            | 8.0  | 0.5             | 9.0  |      |
| t <sub>DIS</sub> | Disable Time $\overline{OE}_N$ to Y <sub>N</sub>   | Figure 1 C <sub>L</sub> = 15pF  | 0.5                    | 4.8 | 6.8 | 0.5            | 8.0  | 0.5             | 8.5  | ns   |
|                  |  | Figure 1 C <sub>L</sub> = 50pF  | 0.5                    | 6.5 | 8.9 | 0.5            | 10.0 | 0.5             | 11.5 |      |

**Parameter Measurement Information**

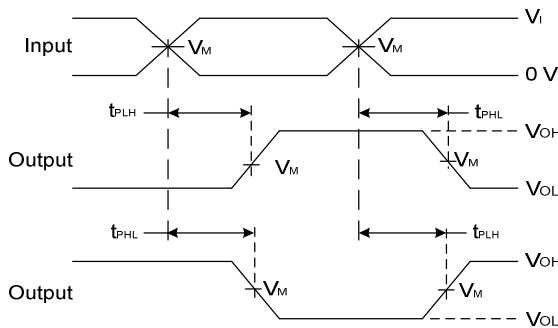


| TEST              | S1    |
|-------------------|-------|
| $t_{PLH}/t_{PHL}$ | Open  |
| $t_{PLZ}/t_{PZL}$ | Vload |
| $t_{PHZ}/t_{PZH}$ | GND   |

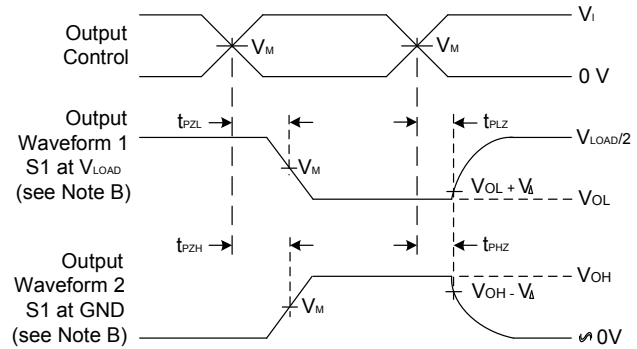
| Vcc          | Inputs |       | VM Inputs | VM Outputs | VLOAD | CL         | RL | VΔ   |
|--------------|--------|-------|-----------|------------|-------|------------|----|------|
|              | VI     | tr/tf |           |            |       |            |    |      |
| 4.5V to 5.5V | 3 V    | ≤3ns  | 1.5 V     | VCC/2      | VCC   | 15pF, 50pF | 1K | 0.3V |



**Voltage Waveform Pulse Duration**



**Voltage Waveform Propagation Delay Times Inverting and Non Inverting Outputs**



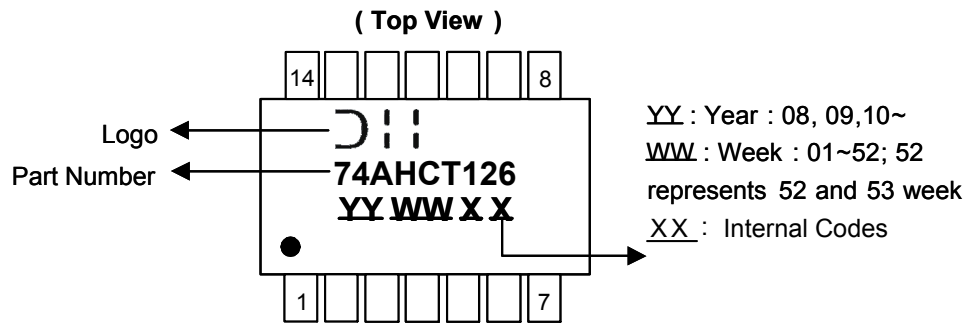
**Voltage Waveform Enable and Disable Times Low and High Level Enabling**

**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  $t_{PD}$ .

**Marking Information**

(1) SO-14, TSSOP-14

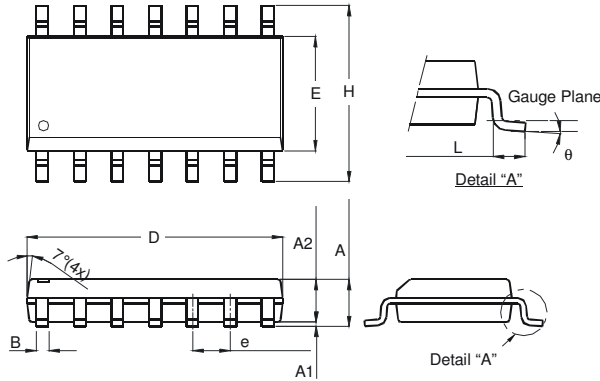


| Part Number  | Package  |
|--------------|----------|
| 74AHCT126S14 | SO-14    |
| 74AHCT126T14 | TSSOP-14 |

**Package Outline Dimensions** (All dimensions in mm.)

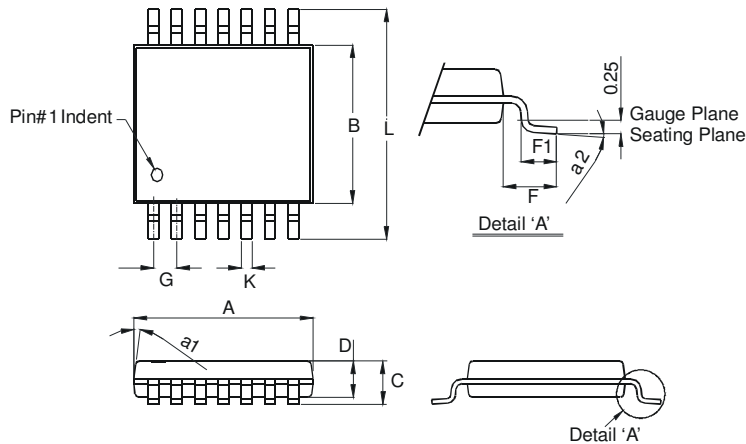
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

**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 |
| $\theta$             | 0°       | 8°   |
| All Dimensions in mm |          |      |

**Package Type: TSSOP-14**

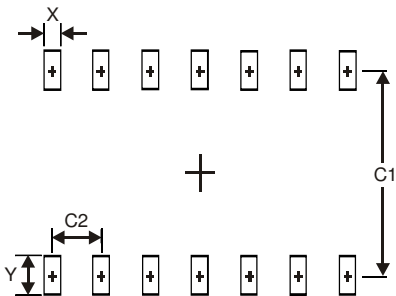


| TSSOP-14             |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| a1                   | 7° (4X)  |      |
| a2                   | 0°       | 8°   |
| A                    | 4.9      | 5.10 |
| B                    | 4.30     | 4.50 |
| 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**

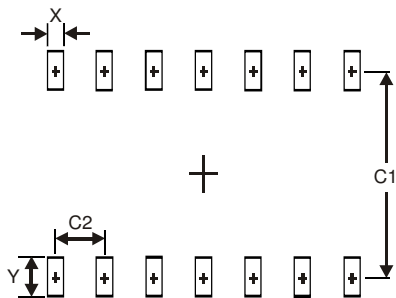
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

**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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