

## SN74LVC7266A 四路双输入异或非门

## 1 特性

- 工作范围为 1.1V 至 3.6V
- 5.5V 容限输入引脚
- 支持标准引脚排列
- 门锁性能超过 250mA，符合 JESD 17 规范
- ESD 保护性能超过 JESD 22 规范要求
  - 2000V 人体放电模型 (A114-A)
  - 1000V 充电器件模型 (C101)

## 2 应用

- 将电源正常信号进行结合
- 使能数字信号

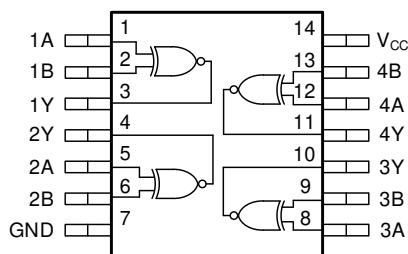
## 3 说明

SN74LVC7266A 包含四个独立双输入异或非门。每个逻辑门以正逻辑执行布尔函数  $Y = \overline{A \oplus B}$ 。

## 封装信息

| 器件型号         | 封装 <sup>(1)</sup> | 封装尺寸 <sup>(2)</sup> | 封装尺寸 (标称值) <sup>(3)</sup> |
|--------------|-------------------|---------------------|---------------------------|
| SN74LVC7266A | BQA ( WQFN , 14 ) | 3mm × 2.5mm         | 3mm × 2.5mm               |
|              | PW ( TSSOP , 14 ) | 5mm × 6.4mm         | 5mm × 4.4mm               |

- (1) 如需了解更多信息，请参阅 节 11。
- (2) 封装尺寸 (长 × 宽) 为标称值，并包括引脚 (如适用)。
- (3) 本体尺寸 (长 × 宽) 为标称值，不包括引脚。



逻辑图



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## 4 Pin Configuration and Functions

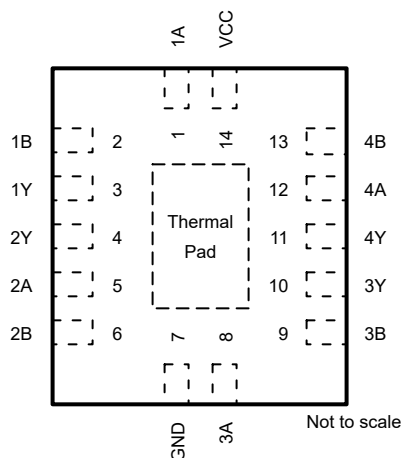


图 4-1. SN74LVC7266A BQA Package,  
14-Pin WQFN (Top View)

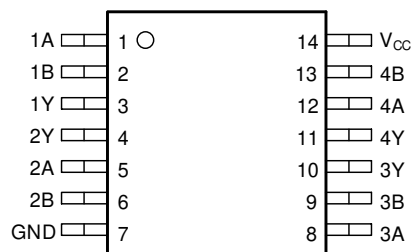


图 4-2. SN74LVC7266A PW Package,  
14-Pin TSSOP (Top View)

表 4-1. Pin Functions

| PIN                                |     | TYPE <sup>(1)</sup> | DESCRIPTION                                                                                             |
|------------------------------------|-----|---------------------|---------------------------------------------------------------------------------------------------------|
| NAME                               | NO. |                     |                                                                                                         |
| 1A                                 | 1   | I                   | Channel 1, Input A                                                                                      |
| 1B                                 | 2   | I                   | Channel 1, Input B                                                                                      |
| 1Y                                 | 3   | O                   | Channel 1, Output Y                                                                                     |
| 2Y                                 | 4   | O                   | Channel 2, Output Y                                                                                     |
| 2A                                 | 5   | I                   | Channel 2, Input A                                                                                      |
| 2B                                 | 6   | I                   | Channel 2, Input B                                                                                      |
| GND                                | 7   | —                   | Ground                                                                                                  |
| 3A                                 | 8   | I                   | Channel 3, Input A                                                                                      |
| 3B                                 | 9   | I                   | Channel 3, Input B                                                                                      |
| 3Y                                 | 10  | O                   | Channel 3, Output Y                                                                                     |
| 4Y                                 | 11  | O                   | Channel 4, Output Y                                                                                     |
| 4A                                 | 12  | I                   | Channel 4, Input A                                                                                      |
| 4B                                 | 13  | I                   | Channel 4, Input B                                                                                      |
| V <sub>CC</sub>                    | 14  | —                   | Positive Supply                                                                                         |
| Thermal Information <sup>(2)</sup> |     | —                   | The thermal pad can be connected to GND or left floating. Do not connect to any other signal or supply. |

(1) I = input, O = output

(2) For BQA package only.

## 5 Specifications

### 5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

|                  |                                                          |                     | MIN  | MAX                   | UNIT |    |
|------------------|----------------------------------------------------------|---------------------|------|-----------------------|------|----|
| V <sub>CC</sub>  | Supply voltage range                                     |                     | -0.5 | 6.5                   | V    |    |
| V <sub>I</sub>   | Input voltage range <sup>(2)</sup>                       |                     | -0.5 | 6.5                   | V    |    |
| V <sub>O</sub>   | Output voltage range <sup>(2)</sup>                      |                     | -0.5 | V <sub>CC</sub> + 0.5 | V    |    |
| I <sub>IK</sub>  | Input clamp current                                      | V <sub>I</sub> < 0V |      |                       | -50  | mA |
| I <sub>OK</sub>  | Output clamp current                                     | V <sub>O</sub> < 0V |      |                       | -50  | mA |
| I <sub>O</sub>   | Continuous output current                                |                     |      |                       | ±50  | mA |
| I <sub>O</sub>   | Continuous output current through V <sub>CC</sub> or GND |                     |      |                       | ±100 | mA |
| T <sub>J</sub>   | Junction temperature                                     |                     | -65  | 150                   | °C   |    |
| T <sub>stg</sub> | Storage temperature                                      |                     | -65  | 150                   | °C   |    |

- (1) Operation outside the *Absolute Maximum Ratings* may cause permanent device damage. Absolute maximum ratings do not imply functional operation of the device at these or any other conditions beyond those listed under *Recommended Operating Conditions*. If briefly operating outside the *Recommended Operating Conditions* but within the *Absolute Maximum Ratings*, the device may not sustain damage, but it may not be fully functional. Operating the device in this manner may affect device reliability, functionality, performance, and shorten the device lifetime.
- (2) The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

### 5.2 ESD Ratings

|             |                         |                                                                       | VALUE | UNIT |
|-------------|-------------------------|-----------------------------------------------------------------------|-------|------|
| $V_{(ESD)}$ | Electrostatic discharge | Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 <sup>(1)</sup>     | ±2000 | V    |
|             |                         | Charged-device model (CDM), per ANSI/ESDA/JEDEC JS-002 <sup>(2)</sup> | ±1000 |      |

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

### 5.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)

| Specifications        | Description                        | Condition           | MIN    | MAX      | UNIT |
|-----------------------|------------------------------------|---------------------|--------|----------|------|
| $V_{CC}$              | Supply voltage                     |                     | 1.1    | 3.6      | V    |
| $V_I$                 | Input voltage                      |                     |        | 5.5      | V    |
| $V_O$                 | Output voltage                     | (High or low state) |        | $V_{CC}$ | V    |
| $I_{OH}$              | High-level output current          | $V_{CC} = 1.8V$     |        | -4       | mA   |
|                       |                                    | $V_{CC} = 2.3V$     |        | -8       |      |
|                       |                                    | $V_{CC} = 2.7V$     |        | -12      |      |
|                       |                                    | $V_{CC} = 3V$       |        | -24      |      |
| $I_{OL}$              | Low-level output current           | $V_{CC} = 1.8V$     |        | 4        | mA   |
|                       |                                    | $V_{CC} = 2.3V$     |        | 8        |      |
|                       |                                    | $V_{CC} = 2.7V$     |        | 12       |      |
|                       |                                    | $V_{CC} = 3V$       |        | 24       |      |
| $\Delta t / \Delta v$ | Input transition rise or fall rate |                     |        | 10       | ns/V |
| $T_A$                 | Operating free-air temperature     |                     | -40    | 125      | °C   |
| $V_{IH}$              | High-level input voltage           | $V_{CC} = 1.1V$     | 0.75   |          | V    |
| $V_{IH}$              | High-level input voltage           | $V_{CC} = 1.5V$     | 0.975  |          | V    |
| $V_{IH}$              | High-level input voltage           | $V_{CC} = 1.65V$    | 1.075  |          | V    |
| $V_{IH}$              | High-level input voltage           | $V_{CC} = 1.95V$    | 1.2675 |          | V    |

### 5.3 Recommended Operating Conditions (续)

over operating free-air temperature range (unless otherwise noted)

| Specifications  | Description              | Condition               | MIN | MAX    | UNIT |
|-----------------|--------------------------|-------------------------|-----|--------|------|
| V <sub>IH</sub> | High-level input voltage | V <sub>CC</sub> = 2.3V  | 1.7 |        | V    |
| V <sub>IH</sub> | High-level input voltage | V <sub>CC</sub> = 2.7V  | 1.7 |        | V    |
| V <sub>IH</sub> | High-level input voltage | V <sub>CC</sub> = 3.6V  | 2   |        | V    |
| V <sub>IL</sub> | Low-Level input voltage  | V <sub>CC</sub> = 1.1V  |     | 0.40   | V    |
| V <sub>IL</sub> | Low-Level input voltage  | V <sub>CC</sub> = 1.5V  |     | 0.525  | V    |
| V <sub>IL</sub> | Low-Level input voltage  | V <sub>CC</sub> = 1.65V |     | 0.5775 | V    |
| V <sub>IL</sub> | Low-Level input voltage  | V <sub>CC</sub> = 1.95V |     | 0.6825 | V    |
| V <sub>IL</sub> | Low-Level input voltage  | V <sub>CC</sub> = 2.3V  |     | 0.7    | V    |
| V <sub>IL</sub> | Low-Level input voltage  | V <sub>CC</sub> = 2.7V  |     | 0.7    | V    |
| V <sub>IL</sub> | Low-Level input voltage  | V <sub>CC</sub> = 3.6V  |     | 0.8    | V    |

### 5.4 Thermal Information

| THERMAL METRIC <sup>(1)</sup> |                                              | Package Options |            | UNIT |
|-------------------------------|----------------------------------------------|-----------------|------------|------|
|                               |                                              | PW (TSSOP)      | BQA (WQFN) |      |
|                               |                                              | 14 PINS         | 14 PINS    |      |
| R <sub>θJA</sub>              | Junction-to-ambient thermal resistance       | 150.8           | 102.3      | °C/W |
| R <sub>θJC(top)</sub>         | Junction-to-case (top) thermal resistance    | 78.3            | 96.8       | °C/W |
| R <sub>θJB</sub>              | Junction-to-board thermal resistance         | 93.8            | 70.9       | °C/W |
| Ψ <sub>JT</sub>               | Junction-to-top characterization parameter   | 24.7            | 16.6       | °C/W |
| Y <sub>JB</sub>               | Junction-to-board characterization parameter | 93.2            | 70.9       | °C/W |
| R <sub>θJC(bot)</sub>         | Junction-to-case (bottom) thermal resistance | -               | 50.1       | °C/W |

(1) For more information about traditional and new thermal metrics, see the [Semiconductor and IC Package Thermal Metrics](#) application report.

### 5.5 Electrical Characteristics

over operating free-air temperature range (unless otherwise noted)

| PARAMETER        | TEST CONDITIONS                                             | V <sub>CC</sub> | -40°C to 125°C        |     |     | UNIT |
|------------------|-------------------------------------------------------------|-----------------|-----------------------|-----|-----|------|
|                  |                                                             |                 | MIN                   | TYP | MAX |      |
| V <sub>OH</sub>  | I <sub>OH</sub> = -100 μA                                   | 1.1V to 3.6V    | V <sub>CC</sub> - 0.2 |     |     | V    |
| V <sub>OH</sub>  | I <sub>OH</sub> = -4mA                                      | 1.65V           | 1.2                   |     |     | V    |
| V <sub>OH</sub>  | I <sub>OH</sub> = -8mA                                      | 2.3V            | 1.75                  |     |     | V    |
| V <sub>OH</sub>  | I <sub>OH</sub> = -12mA                                     | 2.7V            | 2.2                   |     |     | V    |
| V <sub>OH</sub>  |                                                             | 3V              | 2.4                   |     |     | V    |
| V <sub>OH</sub>  | I <sub>OH</sub> = -24mA                                     | 3V              | 2.2                   |     |     | V    |
| V <sub>OL</sub>  | I <sub>OH</sub> = 100 μA                                    | 1.1V to 3.6V    | 0.15                  |     |     | V    |
| V <sub>OL</sub>  | I <sub>OH</sub> = 4mA                                       | 1.65V           | 0.45                  |     |     | V    |
| V <sub>OL</sub>  | I <sub>OH</sub> = 8mA                                       | 2.3V            | 0.7                   |     |     | V    |
| V <sub>OL</sub>  | I <sub>OH</sub> = 12mA                                      | 2.7V            | 0.4                   |     |     | V    |
| V <sub>OL</sub>  | I <sub>OH</sub> = 24mA                                      | 3V              | 0.55                  |     |     | V    |
| I <sub>I</sub>   | V <sub>I</sub> = V <sub>CC</sub> or GND                     | 3.6V            | ±5                    |     |     | μA   |
| I <sub>off</sub> | V <sub>I</sub> or V <sub>O</sub> = V <sub>CC</sub>          | 0V              | ±10                   |     |     | μA   |
| I <sub>CC</sub>  | V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0 | 3.6V            | 40                    |     |     | μA   |

## 5.5 Electrical Characteristics (续)

over operating free-air temperature range (unless otherwise noted)

| PARAMETER       | TEST CONDITIONS                                                             | V <sub>CC</sub> | -40°C to 125°C |     |     | UNIT |
|-----------------|-----------------------------------------------------------------------------|-----------------|----------------|-----|-----|------|
|                 |                                                                             |                 | MIN            | TYP | MAX |      |
| $\Delta I_{CC}$ | One input at V <sub>CC</sub> - 0.6V, other inputs at V <sub>CC</sub> or GND | 2.7V to 3.6V    |                |     | 500 | μA   |
| C <sub>I</sub>  | V <sub>I</sub> = V <sub>CC</sub> or GND                                     | 3.3V            |                |     |     | pF   |
| C <sub>O</sub>  | V <sub>O</sub> = V <sub>CC</sub> or GND                                     | 3.3V            |                |     |     | pF   |
| C <sub>PD</sub> | f = 10MHz                                                                   | 1.8V            |                | 31  |     | pF   |
| C <sub>PD</sub> | f = 10MHz                                                                   | 2.5V            |                | 31  |     | pF   |
| C <sub>PD</sub> | f = 10MHz                                                                   | 3.3V            |                | 32  |     | pF   |

## 5.6 Switching Characteristics

over operating free-air temperature range; typical values measured at T<sub>A</sub> = 25°C (unless otherwise noted). See *Parameter Measurement Information*

| PARAMETER          | FROM (INPUT) | TO (OUTPUT) | LOAD CAPACITANCE       | V <sub>CC</sub> | -40°C to 125°C |     |      | UNIT |
|--------------------|--------------|-------------|------------------------|-----------------|----------------|-----|------|------|
|                    |              |             |                        |                 | MIN            | TYP | MAX  |      |
| t <sub>pd</sub>    | A or B       | Y           | C <sub>L</sub> = 15 pF | 1.2V ± 0.1V     |                | 12  | 44   | ns   |
| t <sub>pd</sub>    | A or B       | Y           | C <sub>L</sub> = 15 pF | 1.5V ± 0.12V    |                | 9   | 15   | ns   |
| t <sub>pd</sub>    | A or B       | Y           | C <sub>L</sub> = 30 pF | 1.8V ± 0.15V    |                |     | 10.2 | ns   |
| t <sub>pd</sub>    | A or B       | Y           | C <sub>L</sub> = 30 pF | 2.5V ± 0.2V     |                |     | 6.9  | ns   |
| t <sub>pd</sub>    | A or B       | Y           | C <sub>L</sub> = 50 pF | 2.7V            |                |     | 6.4  | ns   |
| t <sub>pd</sub>    | A or B       | Y           | C <sub>L</sub> = 50 pF | 3.3V ± 0.3V     |                |     | 5.6  | ns   |
| t <sub>sk(o)</sub> |              |             |                        | 3.3V ± 0.3V     |                |     | 1.5  | ns   |

## 5.7 Noise Characteristics

V<sub>CC</sub> = 3.3V, C<sub>L</sub> = 50 pF, T<sub>A</sub> = 25°C

| PARAMETER          | DESCRIPTION                                   | MIN  | TYP  | MAX | UNIT |
|--------------------|-----------------------------------------------|------|------|-----|------|
| V <sub>OL(P)</sub> | Quiet output, maximum dynamic V <sub>OL</sub> |      | 0.9  | 0.8 | V    |
| V <sub>OL(V)</sub> | Quiet output, minimum dynamic V <sub>OL</sub> | -0.8 | -0.3 |     | V    |
| V <sub>OH(V)</sub> | Quiet output, minimum dynamic V <sub>OH</sub> | 2.2  | 3.3  |     | V    |
| V <sub>IH(D)</sub> | High-level dynamic input voltage              | 2.0  |      |     | V    |
| V <sub>IL(D)</sub> | Low-level dynamic input voltage               |      |      | 0.8 | V    |

## 5.8 Typical Characteristics

$T_A = 25^\circ\text{C}$  (unless otherwise noted)

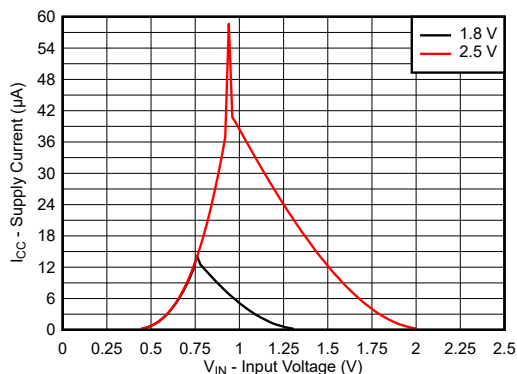


图 5-1. Supply Current Across Input Voltage 1.8V and 2.5V Supply

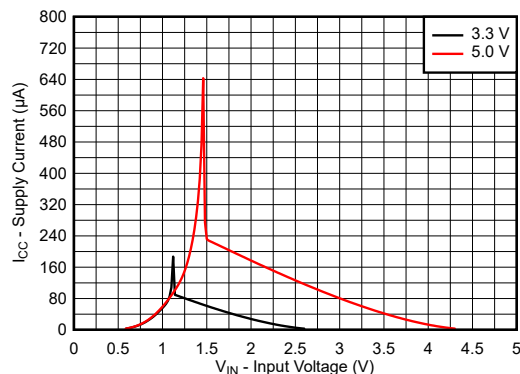


图 5-2. Supply Current Across Input Voltage 3.3V and 5.0V Supply

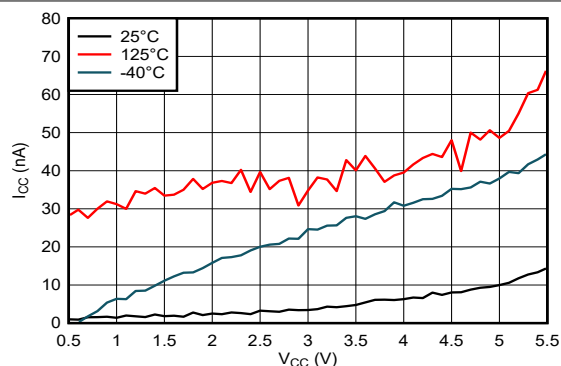


图 5-3. Supply Current Across Supply Voltage

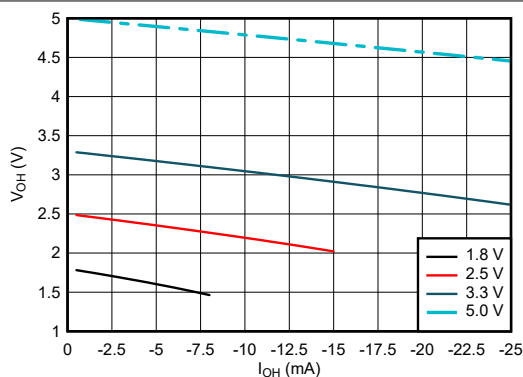


图 5-4. Output Voltage vs Current in HIGH State

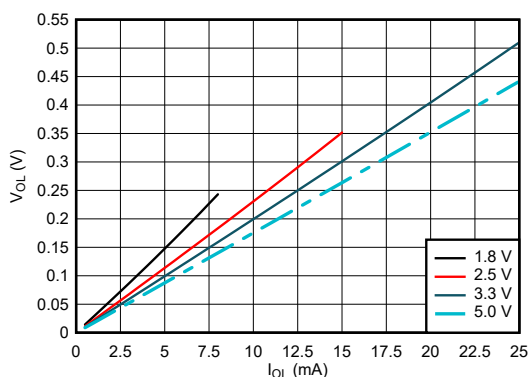


图 5-5. Output Voltage vs Current in LOW State

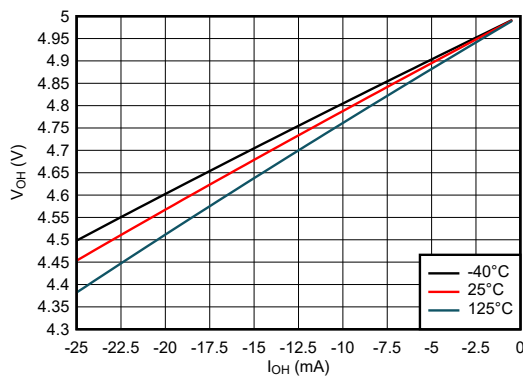


图 5-6. Output Voltage vs Current in HIGH State; 5V Supply

## 5.8 Typical Characteristics (continued)

$T_A = 25^\circ\text{C}$  (unless otherwise noted)

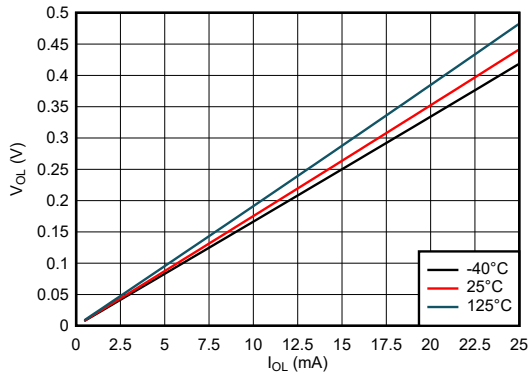


图 5-7. Output Voltage vs Current in LOW State; 5V Supply

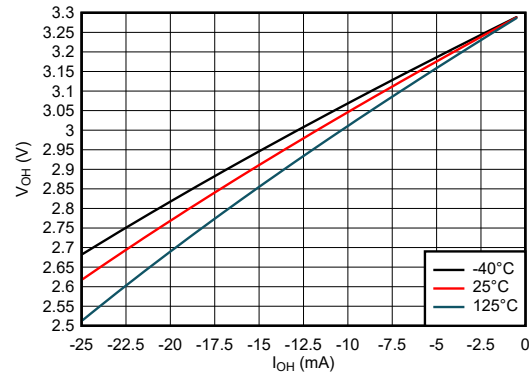


图 5-8. Output Voltage vs Current in HIGH State; 3.3V Supply

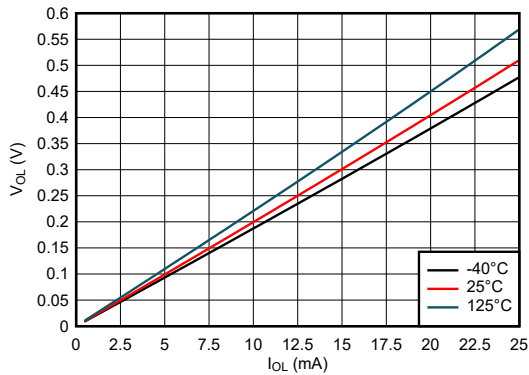


图 5-9. Output Voltage vs Current in LOW State; 3.3V Supply

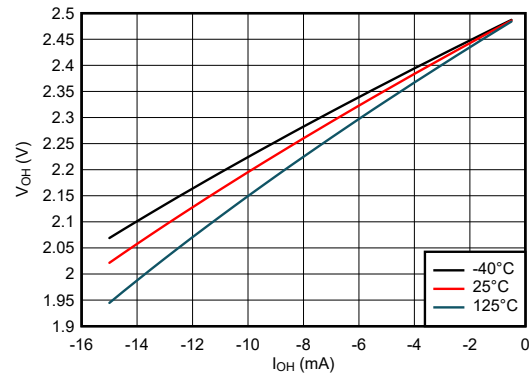


图 5-10. Output Voltage vs Current in HIGH State; 2.5V Supply

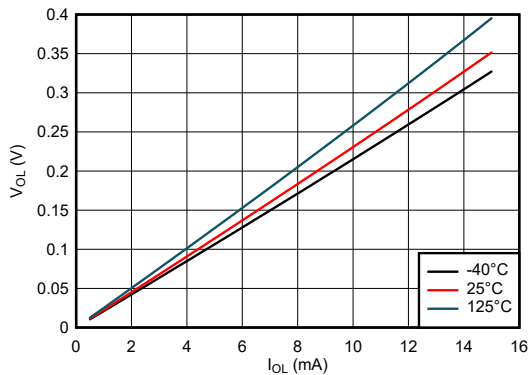


图 5-11. Output Voltage vs Current in LOW State; 2.5V Supply

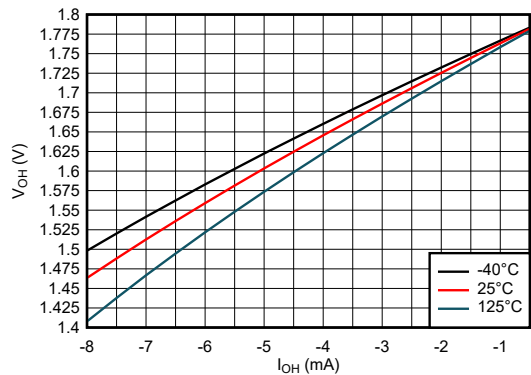


图 5-12. Output Voltage vs Current in HIGH State; 1.8V Supply

## 5.8 Typical Characteristics (continued)

$T_A = 25^\circ\text{C}$  (unless otherwise noted)

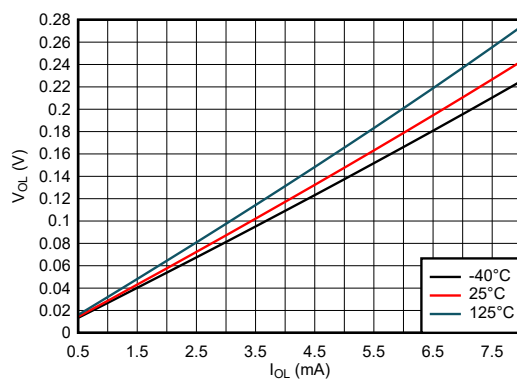


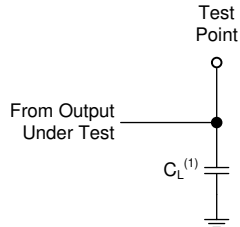
图 5-13. Output Voltage vs Current in LOW State; 1.8V Supply

## 6 Parameter Measurement Information

Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1\text{MHz}$ ,  $Z_O = 50\Omega$ .

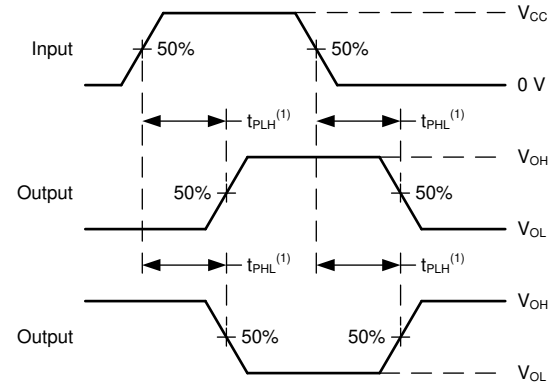
For clock inputs,  $f_{\text{max}}$  is measured when the input duty cycle is 50%.

The outputs are measured one at a time with one input transition per measurement.



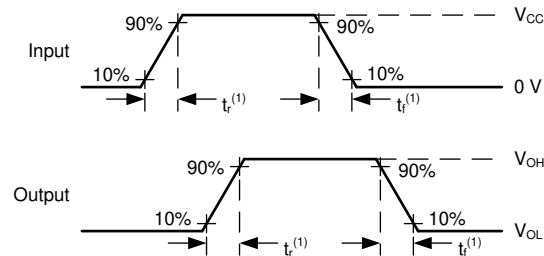
(1)  $C_L$  includes probe and test-fixture capacitance.

**图 6-1. Load Circuit for Push-Pull Outputs**



(1) The greater between  $t_{PLH}^{(1)}$  and  $t_{PHL}^{(1)}$  is the same as  $t_{pd}$ .

**图 6-2. Voltage Waveforms Propagation Delays**



(1) The greater between  $t_r$  and  $t_f$  is the same as  $t_t$ .

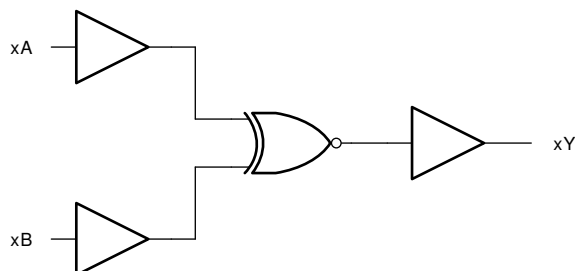
**图 6-3. Voltage Waveforms, Input and Output Transition Times**

## 7 Detailed Description

### 7.1 Overview

This device contains four independent 2-input XNOR gates. Each gate performs the Boolean function  $Y = \overline{A \oplus B}$  in positive logic.

### 7.2 Functional Block Diagram



### 7.3 Feature Description

#### 7.3.1 Balanced CMOS Push-Pull Outputs

A balanced output allows the device to sink and source similar currents. The drive capability of this device may create fast edges into light loads so routing and load conditions should be considered to prevent ringing. Additionally, the outputs of this device are capable of driving larger currents than the device can sustain without being damaged. It is important for the output power of the device to be limited to avoid damage due to over-current. The electrical and thermal limits defined in the [Absolute Maximum Ratings](#) must be followed at all times.

The SN74LVC7266A can drive a load with a total capacitance less than or equal to the maximum load listed in the [Switching Characteristics](#) connected to a high-impedance CMOS input while still meeting all of the datasheet specifications. Larger capacitive loads can be applied, however it is not recommended to exceed the provided load value. If larger capacitive loads are required, it is recommended to add a series resistor between the output and the capacitor to limit output current to the values given in the [Absolute Maximum Ratings](#).

### 7.3.2 Standard CMOS Inputs

This device includes standard CMOS inputs. Standard CMOS inputs are high impedance and are typically modeled as a resistor in parallel with the input capacitance given in the *Electrical Characteristics*. The worst case resistance is calculated with the maximum input voltage, given in the *Absolute Maximum Ratings*, and the maximum input leakage current, given in the *Electrical Characteristics*, using Ohm's law ( $R = V \div I$ ).

Standard CMOS inputs require that input signals transition between valid logic states quickly, as defined by the input transition time or rate in the *Recommended Operating Conditions* table. Failing to meet this specification will result in excessive power consumption and could cause oscillations. More details can be found in [Implications of Slow or Floating CMOS Inputs](#).

Do not leave standard CMOS inputs floating at any time during operation. Unused inputs must be terminated at  $V_{CC}$  or GND. If a system will not be actively driving an input at all times, then a pull-up or pull-down resistor can be added to provide a valid input voltage during these times. The resistor value will depend on multiple factors; a 10k $\Omega$  resistor, however, is recommended and will typically meet all requirements.

### 7.3.3 Clamp Diode Structure

图 7-1 shows the inputs and outputs to this device have negative clamping diodes only.

小心

Voltages beyond the values specified in the *Absolute Maximum Ratings* table can cause damage to the device. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

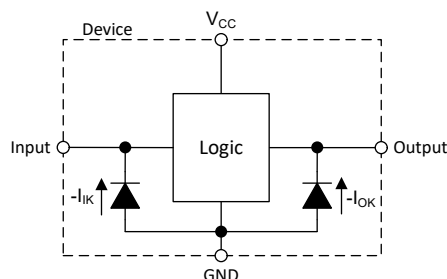


图 7-1. Electrical Placement of Clamping Diodes for Each Input and Output

## 7.4 Device Functional Modes

表 7-1. Function Table

| INPUTS |   | OUTPUT |
|--------|---|--------|
| A      | B | Y      |
| L      | L | H      |
| L      | H | L      |
| H      | L | L      |
| H      | H | H      |

## 8 Application and Implementation

### 备注

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

### 8.1 Application Information

In this application, a 2-input XNOR gate is used as a phase difference detector as shown in [图 8-1](#). The remaining three gates can be used for other applications in the system, or the inputs can be grounded and the channels left unused.

The device is used to identify phase difference between a reference clock and another input clock. Whenever the clock states are different, the XNOR output will pulse HIGH until the clocks return to the same state. The output is fed into a low-pass filter to obtain a DC representation of the phase difference.

### 8.2 Typical Application

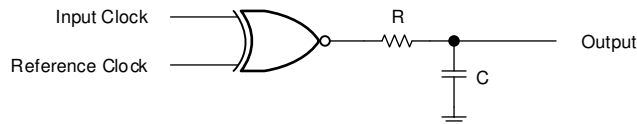


图 8-1. Typical application schematic

#### 8.2.1 Design Requirements

##### 8.2.1.1 Power Considerations

Ensure the desired supply voltage is within the range specified in the [Recommended Operating Conditions](#). The supply voltage sets the device's electrical characteristics as described in the [Electrical Characteristics](#).

The supply must be capable of sourcing current equal to the total current to be sourced by all outputs of the SN74LVC7266A plus the maximum supply current,  $I_{CC}$ , listed in the [Electrical Characteristics](#). The logic device can only source or sink as much current as it is provided at the supply and ground pins, respectively. Be sure not to exceed the maximum total current through GND or  $V_{CC}$  listed in the [Absolute Maximum Ratings](#).

Total power consumption can be calculated using the information provided in [CMOS Power Consumption and  \$C\_{pd}\$  Calculation](#).

Thermal increase can be calculated using the information provided in [Thermal Characteristics of Standard Linear and Logic \(SLL\) Packages and Devices](#).

### 小心

The maximum junction temperature,  $T_J(\text{max})$  listed in the [Absolute Maximum Ratings](#), is an *additional limitation* to prevent damage to the device. Do not violate any values listed in the [Absolute Maximum Ratings](#). These limits are provided to prevent damage to the device.

##### 8.2.1.2 Input Considerations

Input signals must cross  $V_{t-}(\text{min})$  to be considered a logic LOW, and  $V_{t+}(\text{max})$  to be considered a logic HIGH. Do not exceed the maximum input voltage range found in the [Absolute Maximum Ratings](#).

Unused inputs must be terminated to either  $V_{CC}$  or ground. These can be directly terminated if the input is completely unused, or they can be connected with a pull-up or pull-down resistor if the input is to be used sometimes, but not always. A pull-up resistor is used for a default state of HIGH, and a pull-down resistor is used

for a default state of LOW. The resistor size is limited by drive current of the controller, leakage current into the SN74LVC7266A, as specified in the [Electrical Characteristics](#), and the desired input transition rate. A  $10\text{k}\Omega$  resistor value is often used due to these factors.

The SN74LVC7266A has no input signal transition rate requirements because it has Schmitt-trigger inputs.

Another benefit to having Schmitt-trigger inputs is the ability to reject noise. Noise with a large enough amplitude can still cause issues. To know how much noise is too much, please refer to the  $\Delta V_T(\text{min})$  in the [Electrical Characteristics](#). This hysteresis value will provide the peak-to-peak limit.

Unlike what happens with standard CMOS inputs, Schmitt-trigger inputs can be held at any valid value without causing huge increases in power consumption. The typical additional current caused by holding an input at a value other than  $V_{CC}$  or ground is plotted in the [Typical Characteristics](#).

Refer to [§ 7.3](#) for additional information regarding the inputs for this device.

### 8.2.1.3 Output Considerations

The positive supply voltage is used to produce the output HIGH voltage. Drawing current from the output will decrease the output voltage as specified by the  $V_{OH}$  specification in the [Electrical Characteristics](#). Similarly, the ground voltage is used to produce the output LOW voltage. Sinking current into the output will increase the output voltage as specified by the  $V_{OL}$  specification in the [Electrical Characteristics](#).

Unused outputs can be left floating. Do not connect outputs directly to  $V_{CC}$  or ground.

Refer to [§ 7.3](#) for additional information regarding the outputs for this device.

### 8.2.2 Detailed Design Procedure

1. Add a decoupling capacitor from  $V_{CC}$  to GND. The capacitor needs to be placed physically close to the device and electrically close to both the  $V_{CC}$  and GND pins. An example layout is shown in the [§ 8.4](#).
2. Ensure the capacitive load at the output is  $\leq 70\text{pF}$ . This is not a hard limit; however, it will optimize performance. This can be accomplished by providing short, appropriately sized traces from the SN74LVC7266A to the receiving device.
3. Ensure the resistive load at the output is larger than  $(V_{CC} / I_O(\text{max})) \Omega$ . This will not violate the maximum output current from the [Absolute Maximum Ratings](#). Most CMOS inputs have a resistive load measured in megaohms; much larger than the minimum calculated above.
4. Thermal issues are rarely a concern for logic gates, however the power consumption and thermal increase can be calculated using the steps provided in the application report, [CMOS Power Consumption and Cpd Calculation](#)

### 8.2.3 Application Curves

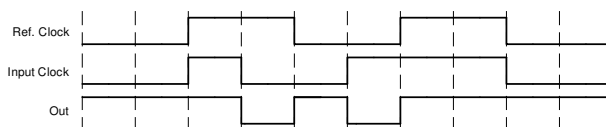


图 8-2. Typical Application Timing Diagram

### 8.3 Power Supply Recommendations

The power supply can be any voltage between the minimum and maximum supply voltage rating located in the [Recommended Operating Conditions](#). Each  $V_{CC}$  terminal should have a bypass capacitor to prevent power disturbance. A  $0.1\mu\text{F}$  capacitor is recommended for this device. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. The  $0.1\mu\text{F}$  and  $1\mu\text{F}$  capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results, as shown in [图 8-3](#).

## 8.4 Layout

### 8.4.1 Layout Guidelines

When using multiple-input and multiple-channel logic devices inputs must never be left floating. In many cases, functions or parts of functions of digital logic devices are unused; for example, when only two inputs of a triple-input AND gate are used. Such unused input pins must not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. All unused inputs of digital logic devices must be connected to a logic high or logic low voltage, as defined by the input voltage specifications, to prevent them from floating. The logic level that must be applied to any particular unused input depends on the function of the device. Generally, the inputs are tied to GND or  $V_{CC}$ , whichever makes more sense for the logic function or is more convenient.

### 8.4.2 Layout Example

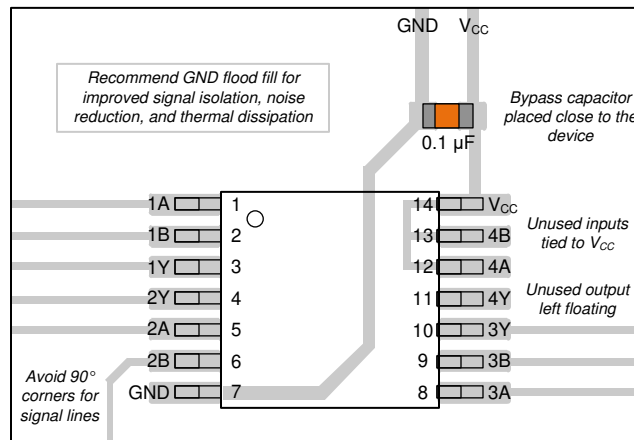


图 8-3. Example Layout for the SN74LVC7266A

## 9 Device and Documentation Support

### 9.1 Documentation Support

#### 9.1.1 Related Documentation

For related documentation, see the following:

- Texas Instruments, [Introduction to Logic application report](#)
- Texas Instruments, [Implications of Slow or Floating CMOS Inputs application note](#)

### 9.2 接收文档更新通知

要接收文档更新通知，请导航至 [ti.com](https://www.ti.com) 上的器件产品文件夹。点击 [通知](#) 进行注册，即可每周接收产品信息更改摘要。有关更改的详细信息，请查看任何已修订文档中包含的修订历史记录。

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链接的内容由各个贡献者“按原样”提供。这些内容并不构成 TI 技术规范，并且不一定反映 TI 的观点；请参阅 TI 的[使用条款](#)。

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ESD 的损坏小至导致微小的性能降级，大至整个器件故障。精密的集成电路可能更容易受到损坏，这是因为非常细微的参数更改都可能会导致器件与其发布的规格不相符。

### 9.6 术语表

[TI 术语表](#) 本术语表列出并解释了术语、首字母缩略词和定义。

## 10 Revision History

| DATE       | REVISION | NOTES           |
|------------|----------|-----------------|
| March 2024 | *        | Initial Release |

## 11 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser based versions of this data sheet, refer to the left hand navigation.

## PACKAGING INFORMATION

| Orderable Device | Status<br>(1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan<br>(2) | Lead finish/<br>Ball material<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|--------------------------------------|----------------------|--------------|-------------------------|-------------------------|
| SN74LVC7266ABQAR | ACTIVE        | WQFN         | BQA             | 14   | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | LC726A                  | <a href="#">Samples</a> |
| SN74LVC7266APWR  | ACTIVE        | TSSOP        | PW              | 14   | 3000        | RoHS & Green    | NIPDAU   SN                          | Level-1-260C-UNLIM   | -40 to 125   | LVC7266                 | <a href="#">Samples</a> |

(1) The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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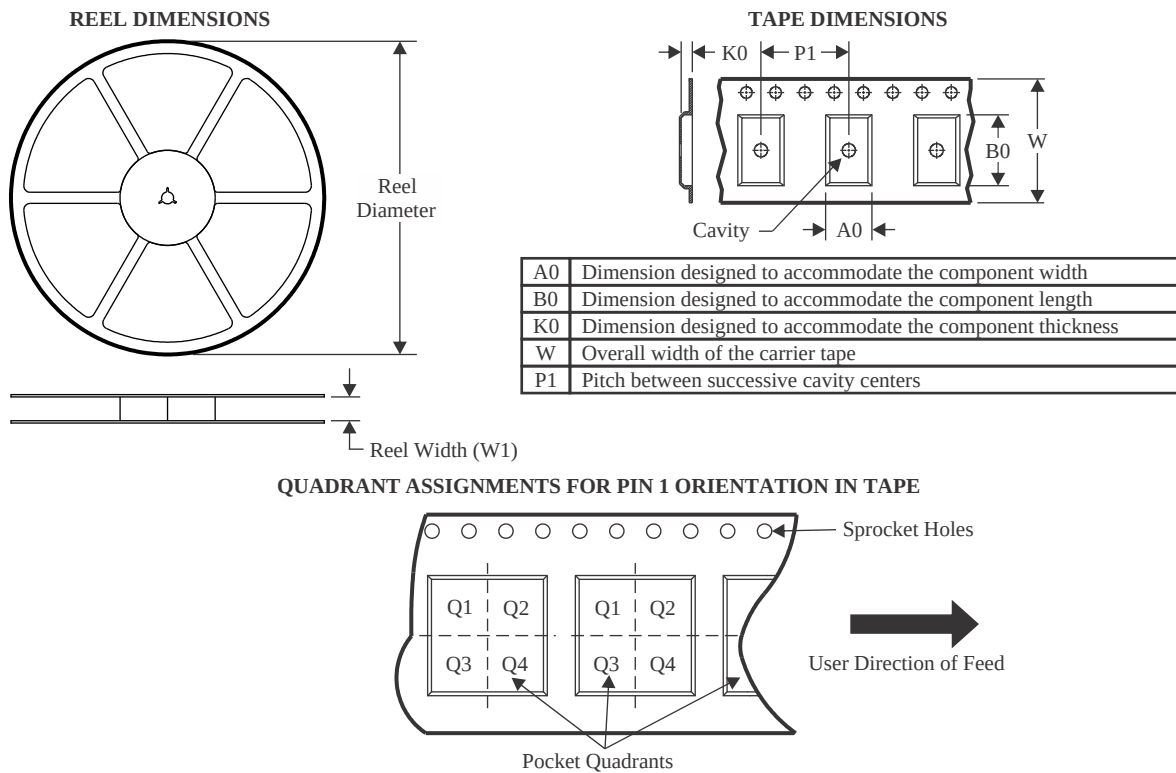
**OTHER QUALIFIED VERSIONS OF SN74LVC7266A :**

- Automotive : [SN74LVC7266A-Q1](#)

## NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

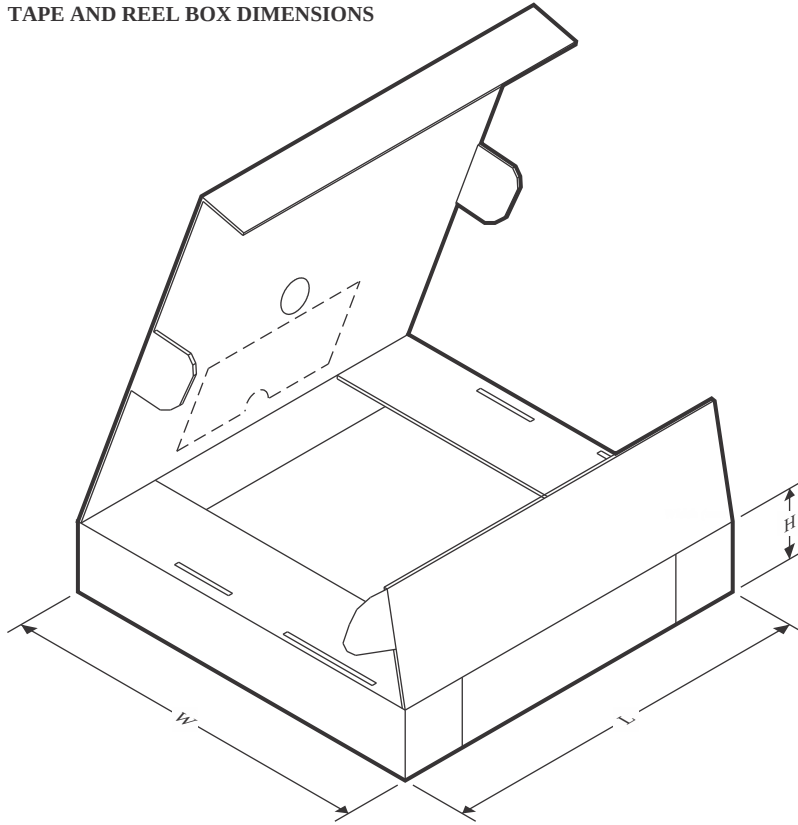
## TAPE AND REEL INFORMATION



\*All dimensions are nominal

| Device           | Package Type | Package Drawing | Pins | SPQ  | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LVC7266ABQAR | WQFN         | BQA             | 14   | 3000 | 180.0              | 12.4               | 2.8     | 3.3     | 1.1     | 4.0     | 12.0   | Q1            |
| SN74LVC7266APWR  | TSSOP        | PW              | 14   | 3000 | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS

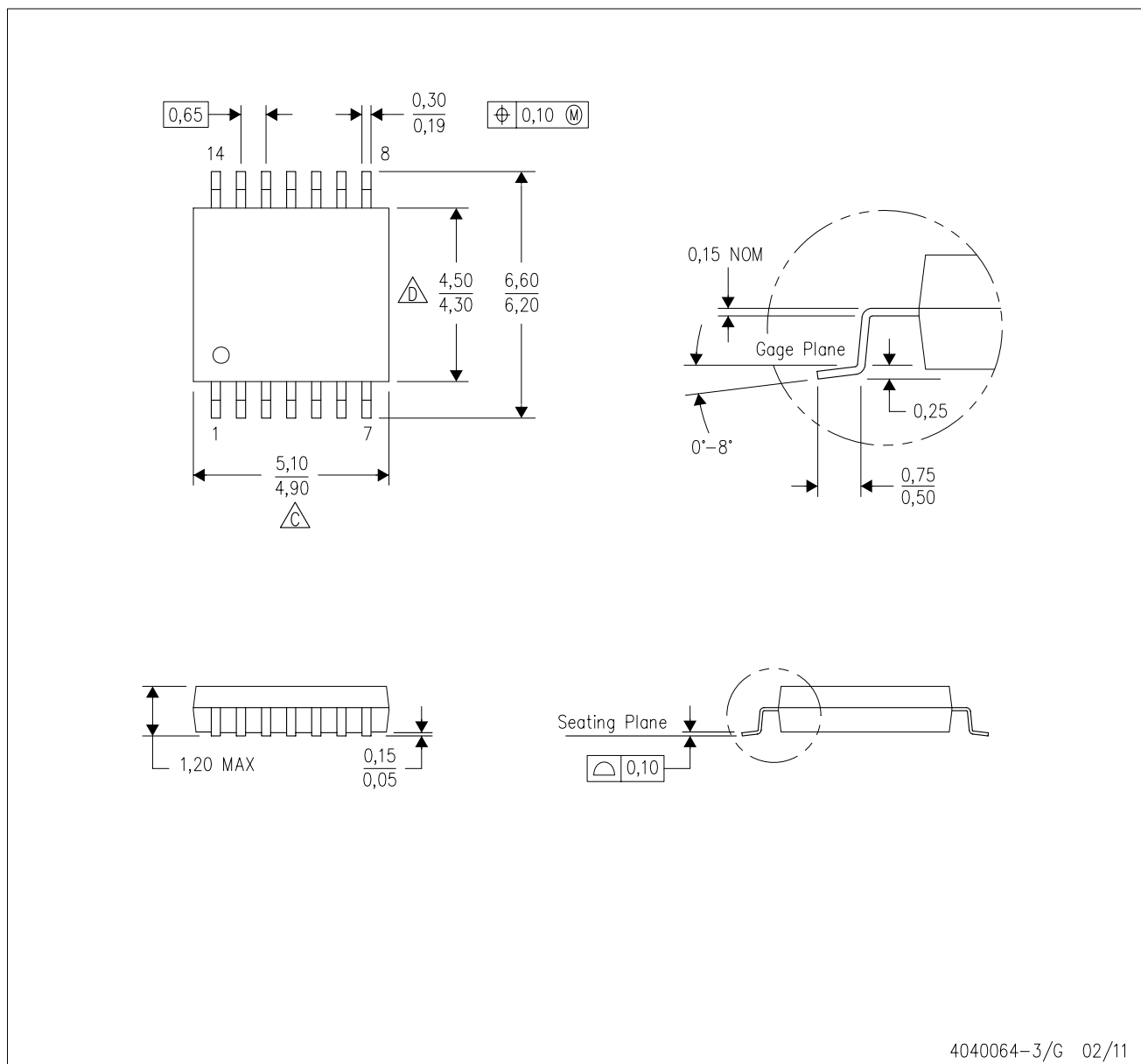


\*All dimensions are nominal

| Device           | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LVC7266ABQAR | WQFN         | BQA             | 14   | 3000 | 210.0       | 185.0      | 35.0        |
| SN74LVC7266APWR  | TSSOP        | PW              | 14   | 3000 | 356.0       | 356.0      | 35.0        |

PW (R-PDSO-G14)

PLASTIC SMALL OUTLINE



4040064-3/G 02/11

- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
  - B. This drawing is subject to change without notice.
  - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
  - D. Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
  - E. Falls within JEDEC MO-153

## GENERIC PACKAGE VIEW

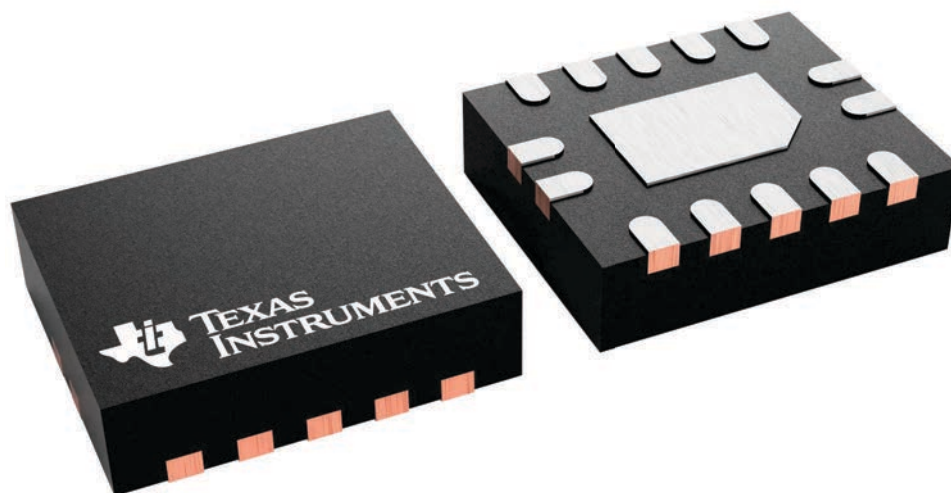
**BQA 14**

**WQFN - 0.8 mm max height**

2.5 x 3, 0.5 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD

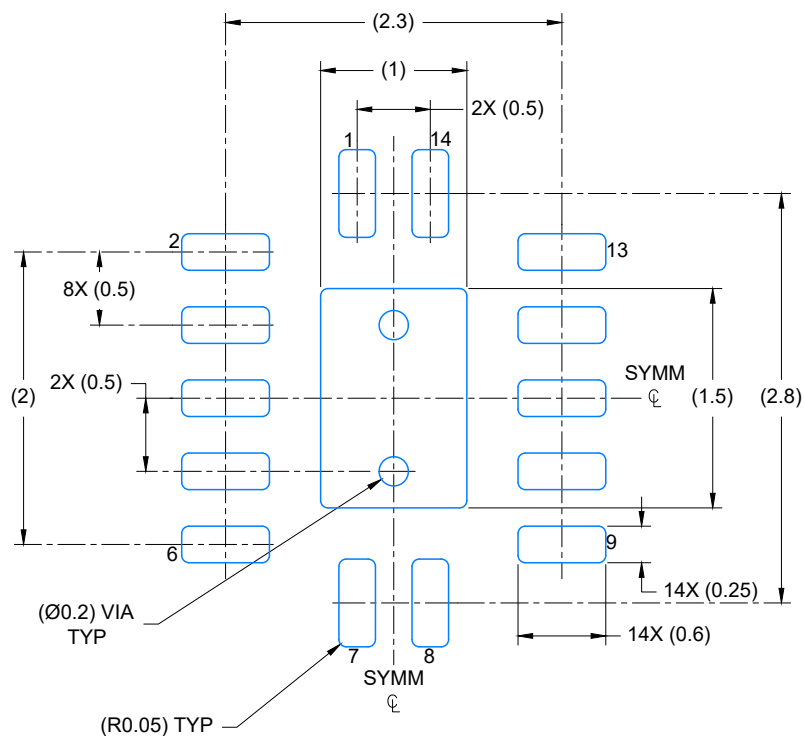
This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.



## PLASTIC QUAD FLAT PACK-NO LEAD



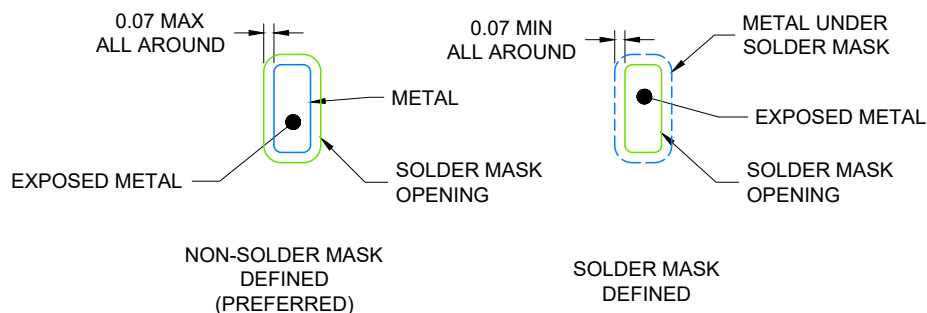
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for optimal thermal and mechanical performance.



## LAND PATTERN EXAMPLE

EXPOSED METAL SHOWN

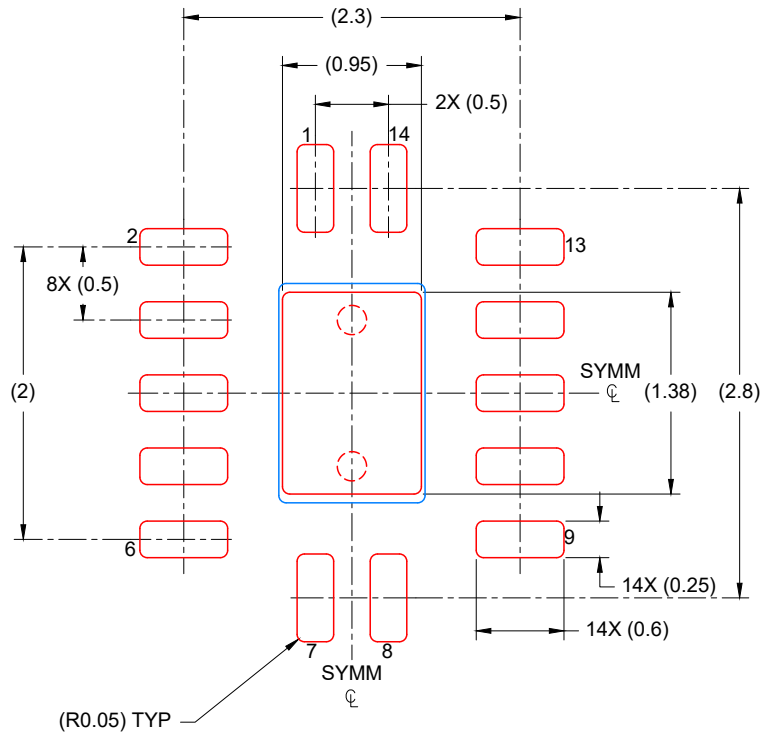
SCALE: 20X



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## NOTES: (continued)

4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 ([www.ti.com/lit/sluea271](http://www.ti.com/lit/sluea271)).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.



SOLDER PASTE EXAMPLE  
 BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD  
 88% PRINTED COVERAGE BY AREA  
 SCALE: 20X

4224636/A 11/2018

NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

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