

## SN74LV06A 具有漏极开路输出的六路反相缓冲器/驱动器

### 1 特性

- $V_{CC}$  工作电压范围为 2V 至 5.5V
- 5V 时  $t_{pd}$  最大值为 6.5ns
- $V_{CC} = 3.3V$ 、 $T_A = 25^\circ C$  时， $V_{OLP}$  (输出接地反弹) 典型值小于 0.8V
- $V_{CC} = 3.3V$ 、 $T_A = 25^\circ C$  时， $V_{OHV}$  (输出  $V_{OH}$  下冲) 典型值大于 2.3V
- 在上电和断电期间，输出被禁用，输入连接至  $V_{CC}$
- 所有端口上均支持混合模式电压运行
- $I_{off}$  支持带电插入、局部关断模式和后驱动保护
- 闩锁性能超过 100mA，符合 JESD 78 II 类规范

### 2 应用

- 服务器
- 电信基础设施
- 电视机顶盒
- UPS
- 打印机
- 升降机和自动扶梯
- EPOS、ECR 和收银柜
- 销售、支付和找零机

### 3 说明

这些六路反相缓冲器/驱动器旨在 2V 至 5.5V  $V_{CC}$  下运行。

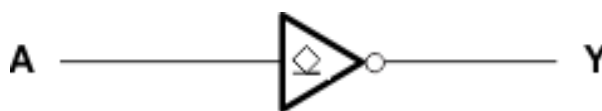
SN74LV06A 器件以正逻辑执行布尔函数  $Y = \bar{A}$ 。

漏极开路输出需要上拉电阻才能正常工作，可连接到其他漏极开路输出，从而实现低电平有效的“线或”或高电平有效的“线与”功能。

#### 封装信息

器件型号 <sup>(1)</sup>	封装	封装尺寸 (标称值)
SN74LV06A	DGV (TVSOP, 14)	3.60mm x 4.40mm
	D (SOIC, 14)	8.65mm x 3.90mm
	NS (SO, 14)	10.20mm x 5.30mm
	DB (SSOP, 14)	6.20mm x 5.30mm
	PW (TSSOP, 14)	5.00mm x 4.40mm

(1) 如需了解所有可用封装，请参阅数据表末尾的可订购产品附录。



简化版原理图



## Table of Contents

<b>1 特性</b> .....	1	8.1 Overview.....	8
<b>2 应用</b> .....	1	8.2 Functional Block Diagram.....	8
<b>3 说明</b> .....	1	8.3 Feature Description.....	9
<b>4 Revision History</b> .....	2	8.4 Device Functional Modes.....	9
<b>5 Pin Configurations and Functions</b> .....	3	<b>9 Application and Implementation</b> .....	10
<b>6 Specifications</b> .....	4	9.1 Application Information.....	10
6.1 Absolute Maximum Ratings.....	4	9.2 Typical Application.....	10
6.2 ESD Ratings.....	4	9.3 Power Supply Recommendations.....	11
6.3 Recommended Operating Conditions.....	4	9.4 Layout.....	11
6.4 Thermal Information.....	5	<b>10 Device and Documentation Support</b> .....	12
6.5 Electrical Characteristics.....	5	10.1 Documentation Support.....	12
6.6 Switching Characteristics, $V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$ .....	5	10.2 接收文档更新通知.....	12
6.7 Switching Characteristics, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$ .....	6	10.3 支持资源.....	12
6.8 Switching Characteristics, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$ .....	6	10.4 Trademarks.....	12
6.9 Noise Characteristics.....	6	10.5 静电放电警告.....	12
6.10 Operating Characteristics.....	6	10.6 术语表.....	12
6.11 Typical Characteristics.....	7	<b>11 Mechanical, Packaging, and Orderable Information</b> .....	12
<b>7 Parameter Measurement Information</b> .....	8		
<b>8 Detailed Description</b> .....	8		

## 4 Revision History

### Changes from Revision J (January 2016) to Revision K (March 2023) Page

- 更新了文档的结构布局和表格的格式..... 1

### Changes from Revision I (February 2015) to Revision J (January 2016) Page

- Added  $T_J$  Junction temperature to the [表 6.1](#) table ..... 4
- Changed [图 9-2](#) ..... 11

## 5 Pin Configurations and Functions

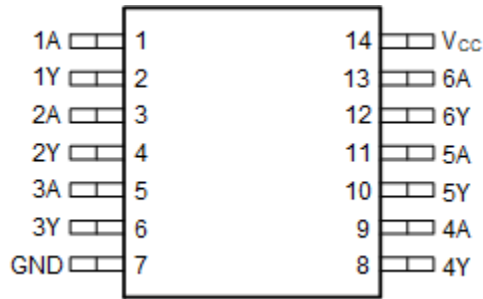


图 5-1. SN74LV06A D, DB, DGV, NS, or PW Package (Top View)

表 5-1. Pin Functions

PIN		TYPE <sup>(1)</sup>	DESCRIPTION
NO.	NAME		
1	1A	I	Input 1
2	1Y	O	Output 1
3	2A	I	Input 2
4	2Y	O	Output 2
5	3A	I	Input 3
6	3Y	O	Output 3
8	4Y	O	Output 4
9	4A	I	Input 4
10	5Y	O	Output 5
11	5A	I	Input 5
12	6Y	O	Output 6
13	6A	I	Input 6
7	GND	GND	Ground Pin
14	V <sub>CC</sub>	—	Power Pin

(1) Signal Types: I = Input, O = Output, I/O = Input or Output, GND = Ground.

## 6 Specifications

### 6.1 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	7	V
V <sub>I</sub>	Input voltage range <sup>(2)</sup>		- 0.5	7	V
V <sub>O</sub>	Voltage range applied to any output in the high-impedance or power-off state <sup>(2)</sup>		- 0.5	7	V
I <sub>IK</sub>	Input clamp current	V <sub>I</sub> < 0		- 20	mA
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> < 0		- 50	mA
I <sub>O</sub>	Continuous output current	V <sub>O</sub> = 0 to V <sub>CC</sub>		- 35	mA
	Continuous current through V <sub>CC</sub> or GND			±50	mA
T <sub>stg</sub>	Storage temperature range		- 65	150	°C
T <sub>J</sub>	Junction Temperature			150	°C

- (1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

### 6.2 ESD Ratings

		VALUE	UNIT
V <sub>(ESD)</sub>	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 <sup>(1)</sup>	V
		Machine Model (MM), per JEDEC specification	
		Charged-device model (CDM), per JEDEC specification JESD22-C101 <sup>(2)</sup>	

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 500-V HBM is possible with the necessary precautions.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 250-V CDM is possible with the necessary precautions.

### 6.3 Recommended Operating Conditions

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

		SN74LV06A		UNIT
		MIN	MAX	
V <sub>CC</sub>	Supply voltage	2	5.5	V
V <sub>IH</sub>	High level input voltage	V <sub>CC</sub> = 2 V	1.5	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	V <sub>CC</sub> × 0.7	
		V <sub>CC</sub> = 3 V to 3.6 V	V <sub>CC</sub> × 0.7	
		V <sub>CC</sub> = 4.5 V to 5.5 V	V <sub>CC</sub> × 0.7	
V <sub>IL</sub>	Low level input voltage	V <sub>CC</sub> = 2 V	0.5	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	V <sub>CC</sub> × 0.3	
		V <sub>CC</sub> = 3 V to 3.6 V	V <sub>CC</sub> × 0.3	
		V <sub>CC</sub> = 4.5 V to 5.5 V	V <sub>CC</sub> × 0.3	
V <sub>I</sub>	Input voltage	0	5.5	V
V <sub>O</sub>	Output voltage	0	5.5	V
I <sub>OL</sub>	Low level output current	V <sub>CC</sub> = 2 V	20	mA
		V <sub>CC</sub> = 2.3 V to 2.7 V	2	
		V <sub>CC</sub> = 3 V to 3.6 V	8	
		V <sub>CC</sub> = 4.5 V to 5.5 V	16	
Δt/Δv	Input transition rise and fall rate	V <sub>CC</sub> = 2.3 V to 2.7 V	200	ns/V
		V <sub>CC</sub> = 3 V to 3.6 V	100	
		V <sub>CC</sub> = 4.5 V to 5.5 V	20	

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

		SN74LV06A		UNIT
		MIN	MAX	
T <sub>A</sub>	Operating free-air temperature	- 40	125	°C

(1) All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs (SCBA004)*.

## 6.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>		SN74LV06A					UNIT
		D	DB	DGV	NS	PW	
		14 PINS	14 PINS	14 PINS	14 PINS	14 PINS	
R <sub>θJA</sub>	Junction-to-ambient thermal resistance	100.6	112.5	135.2	95.4	128.7	°C/W
R <sub>θJC(top)</sub>	Junction-to-case (top) thermal resistance	51.8	65.0	57.9	52.9	57.2	
R <sub>θJB</sub>	Junction-to-board thermal resistance	54.9	59.9	68.3	51.2	70.7	
ψ <sub>JT</sub>	Junction-to-top characterization parameter	25.0	25.0	9.2	17.9	9.3	
ψ <sub>JB</sub>	Junction-to-board characterization parameter	54.7	59.3	67.6	53.8	70.0	

(1) For more information about traditional and new thermal metrics, see the *IC Package Thermal Metrics* application report (SPRA953).

## 6.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V <sub>CC</sub>	SN74LV06A			- 40°C to 85°C SN74LV06A			- 40°C to 125°C SN74LV06A		UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	MAX	
V <sub>OL</sub>	I <sub>OL</sub> = 50 μA	2 V to 5.5 V			0.1			0.1		0.1	V
	I <sub>OL</sub> = 2 mA	2.3 V			0.4			0.4		0.4	
	I <sub>OL</sub> = 8 mA	3 V			0.44			0.44		0.44	
	I <sub>OL</sub> = 16 mA	4.5 V			0.55			0.55		0.55	
I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	0 to 5.5 V			±1			±1		±1	μA
I <sub>OH</sub>	V <sub>I</sub> = V <sub>IL</sub> , V <sub>OH</sub> = V <sub>CC</sub>	5.5 V			±2.5			±2.5		±2.5	μA
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V			20			20		20	μA
I <sub>off</sub>	V <sub>I</sub> or V <sub>O</sub> = 0 to 5.5 V	0			5			5		5	μA
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	3.3 V		1.6			1.6			1.6	pF

## 6.6 Switching Characteristics, V<sub>CC</sub> = 2.5 V ± 0.2 V

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T <sub>A</sub> = 25°C			- 40°C to 85°C SN74LV06A		- 40°C to 125°C SN74LV06A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 15 pF		5.4 <sup>(1)</sup>	10.4 <sup>(1)</sup>	1 <sup>(1)</sup>	13 <sup>(1)</sup>	1	14	ns
t <sub>PHL</sub>					7.2 <sup>(1)</sup>	10.4 <sup>(1)</sup>	1 <sup>(1)</sup>	13 <sup>(1)</sup>	1	14	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 50 pF		9.7	15.2	1	18	1	19	ns
t <sub>PHL</sub>					9.3	15.2	1	18	1	19	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

## 6.7 Switching Characteristics, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C to } 85^\circ\text{C}$ SN74LV06A		$-40^\circ\text{C to } 125^\circ\text{C}$ SN74LV06A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{PLH}$	A	Y	$C_L = 15\text{ pF}$	4.1 <sup>(1)</sup>	7.1 <sup>(1)</sup>		1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	9.5	ns
$t_{PHL}$	A	Y		4.9 <sup>(1)</sup>	7.1 <sup>(1)</sup>		1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	9.5	
$t_{PLH}$	A	Y	$C_L = 50\text{ pF}$	7.1	10.6		1	12	1	13	ns
$t_{PHL}$	A	Y		6.4	10.6		1	12	1	13	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

## 6.8 Switching Characteristics, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$

operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C to } 85^\circ\text{C}$ SN74LV06A		$-40^\circ\text{C to } 125^\circ\text{C}$ SN74LV06A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{PLH}$	A	Y	$C_L = 15\text{ pF}$	3 <sup>(1)</sup>	5.5 <sup>(1)</sup>		1 <sup>(1)</sup>	6.5 <sup>(1)</sup>	1	7	ns
$t_{PHL}$	A	Y		3.3 <sup>(1)</sup>	5.5 <sup>(1)</sup>		1 <sup>(1)</sup>	6.5 <sup>(1)</sup>	1	7	
$t_{PLH}$	A	Y	$C_L = 50\text{ pF}$	4.8	7.5		1	8.5	1	9	ns
$t_{PHL}$	A	Y		4.4	7.5		1	8.5	1	9	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

## 6.9 Noise Characteristics

$V_{CC} = 3.3\text{ V}$ ,  $C_L = 50\text{ pF}$ ,  $T_A = 25^\circ\text{C}$

PARAMETER <sup>(1)</sup>		MIN	TYP	MAX	UNIT
$V_{OL(P)}$	Quiet output, maximum dynamic $V_{OL}$		0.5	0.8	V
$V_{OL(V)}$	Quiet output, minimum dynamic $V_{OL}$		-0.1	-0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic $V_{OH}$		3.3		V
$V_{IH(D)}$	High-level dynamic input voltage	2.31			V
$V_{IL(D)}$	Low-level dynamic input voltage			0.99	V

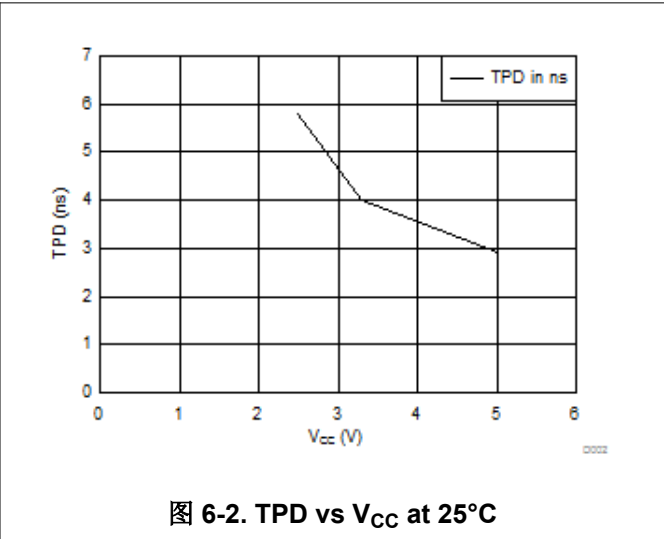
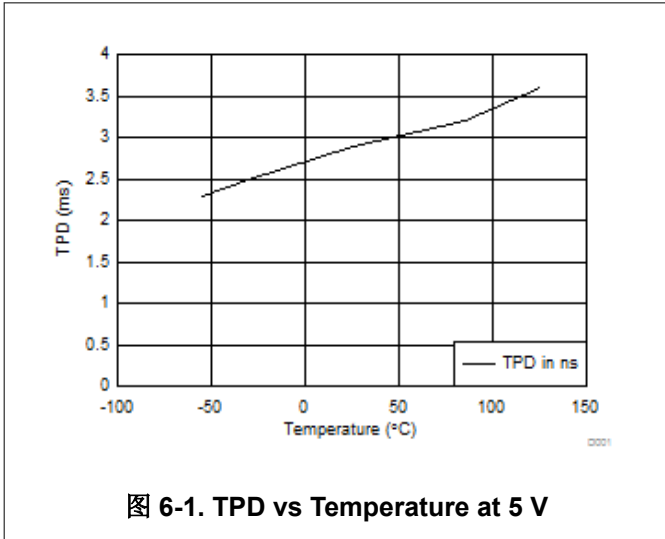
(1) Characteristics are for surface-mount packages only.

## 6.10 Operating Characteristics

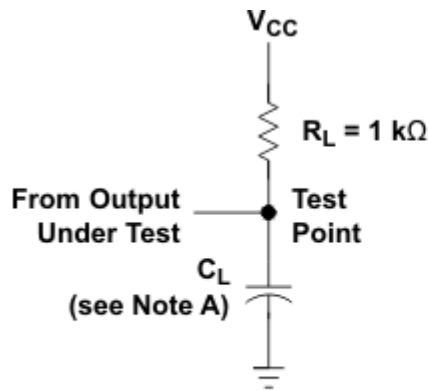
$T_A = 25^\circ\text{C}$

PARAMETER		TEST CONDITIONS		$V_{CC}$	TYP	UNIT
$C_{pd}$	Power dissipation capacitance	$C_L = 50\text{ pF}$	$f = 10\text{ MHz}$	3.3 V	2.6	pF
				5 V	4.7	

### 6.11 Typical Characteristics

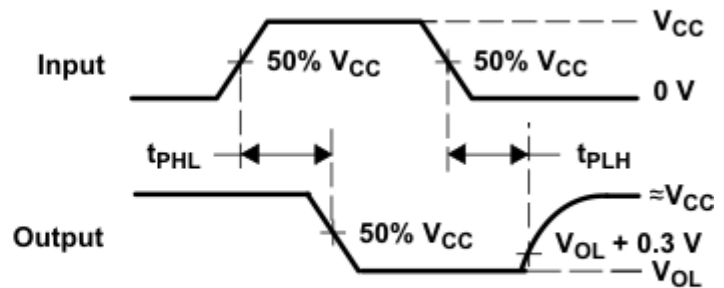


## 7 Parameter Measurement Information



**LOAD CIRCUIT FOR  
OPEN-DRAIN OUTPUTS**

- $C_L$  includes probe and jig capacitance.
- All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1 \text{ MHz}$ ,  $Z_O = 50 \ \Omega$ ,  $t_r \leq 3 \text{ ns}$ ,  $t_f \leq 3 \text{ ns}$ .
- The outputs are measured one at a time, with one input transition per measurement.



**VOLTAGE WAVEFORMS  
PROPAGATION DELAY TIMES**

**图 7-1. Load Circuit and Voltage Waveforms**

## 8 Detailed Description

### 8.1 Overview

These hex inverter buffers/drivers are designed for 2-V to 5.5-V  $V_{CC}$  operation.

The SN74LV06A device performs the Boolean function  $Y = \bar{A}$  in positive logic.

The open-drain output require pull-up resistors to perform correctly and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions.

These devices are fully specified for partial-power-down applications using  $I_{off}$ . The  $I_{off}$  circuitry disables the outputs, preventing damaging current back-flow through the devices when they are powered down.

### 8.2 Functional Block Diagram



**图 8-1. Logic Diagram (Positive Logic)**



### 8.3 Feature Description

- Wide operating voltage range
  - Operates from 2 V to 5.5 V
- Allows up or down voltage translation
  - Inputs and outputs accept voltages to 5.5 V
- $I_{off}$  feature
  - Allows voltages on the inputs and outputs when  $V_{CC}$  is 0 V

### 8.4 Device Functional Modes

**表 8-1. Function Table  
(Each Inverter)**

<b>INPUT<sup>(1)</sup> A</b>	<b>OUTPUT<sup>(2)</sup> Y</b>
H	L
L	H

(1) H = High Voltage Level, L = Low Voltage Level

(2) H = Driving High, L = Driving Low

## 9 Application and Implementation

### 备注

以下应用部分中的信息不属于 TI 器件规格的范围，TI 不担保其准确性和完整性。TI 的客户应负责确定器件是否适用于其应用。客户应验证并测试其设计，以确保系统功能。

### 9.1 Application Information

The SN74LV06A is a low drive Open drain CMOS device that can be used for a multitude of buffer type functions. The inputs are 5.5 V tolerant and the outputs open drain and 5.5 V tolerant allowing it to translate up to 5.5 V or down to any other voltage between GND and 5.5 V.

### 9.2 Typical Application

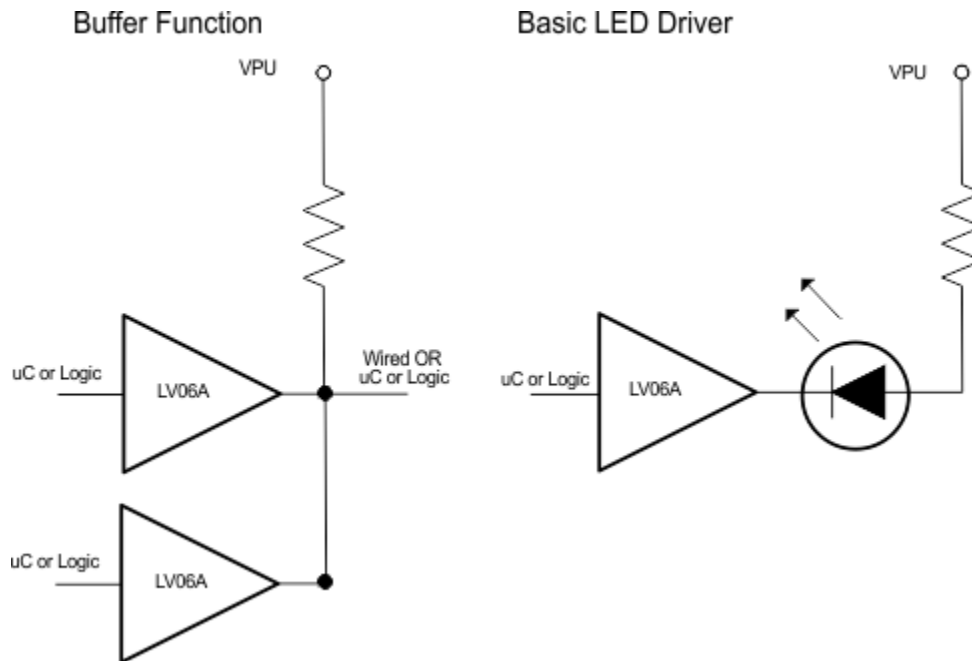


图 9-1. Typical Application Schematic

#### 9.2.1 Design Requirements

This device uses CMOS technology and is open drain so it has low output drive only. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. The parallel output drive can create fast edges into light loads so routing and load conditions should be considered to prevent ringing.

#### 9.2.2 Detailed Design Procedure

- Recommended Input Conditions:
  - For rise time and fall time specifications, see  $\Delta t / \Delta V$  in the 节 6.3 table.
  - For specified high and low levels, see  $V_{IH}$  and  $V_{IL}$  in the 节 6.3 table.
  - Inputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid  $V_{CC}$ .
- Recommended Output Conditions:
  - Load currents should not exceed 35 mA per output and 50 mA total for the part.

### 9.2.3 Application Curves

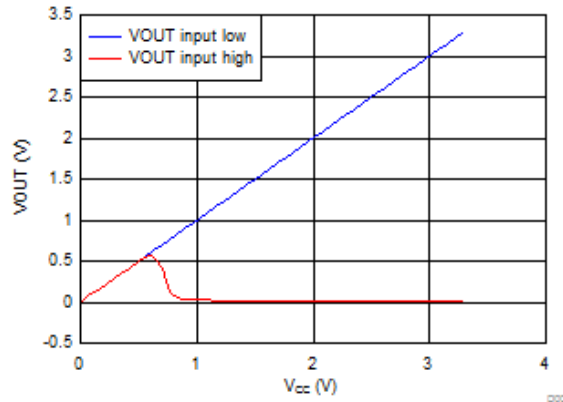


图 9-2. Output During Power Up with 4 k Pull-up at 3.3 V

### 9.3 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the # 6.3. Each V<sub>CC</sub> terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, a 0.1 μF capacitor is recommended. If there are multiple V<sub>CC</sub> terminals then 0.01 μF or 0.022 μF capacitor is recommended for each power terminal. It is acceptable to parallel multiple bypass capacitors to reject different frequencies of noise. 0.1 μF and 1 μF capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results.

### 9.4 Layout

#### 9.4.1 Layout Guidelines

When using multiple bit logic devices, inputs should not float.

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 or only 3 of the 4 buffer gates are used. Such input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. Specified below are the rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or V<sub>CC</sub> whichever make more sense or is more convenient. It is generally OK to float outputs unless the part is a transceiver.

#### 9.4.2 Layout Example

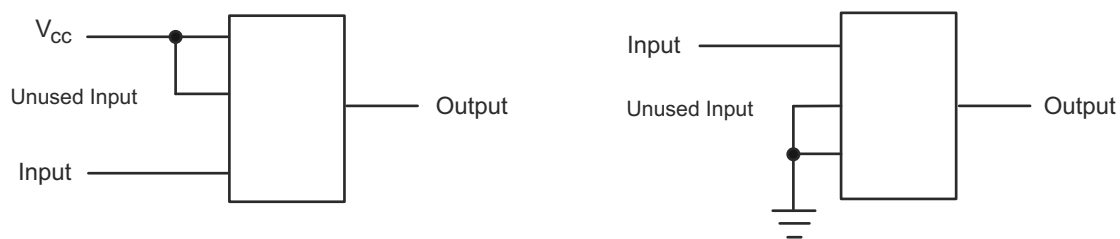


图 9-3. Layout Diagram

## 10 Device and Documentation Support

### 10.1 Documentation Support

#### 10.1.1 Related Documentation

The table below lists quick access links. Categories include technical documents, support and community resources, tools and software, and quick access to sample or buy.

表 10-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN74LV06A	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>

#### 10.2 接收文档更新通知

要接收文档更新通知，请导航至 [ti.com](http://ti.com) 上的器件产品文件夹。点击 [订阅更新](#) 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。

#### 10.3 支持资源

TI E2E™ [支持论坛](#) 是工程师的重要参考资料，可直接从专家获得快速、经过验证的解答和设计帮助。搜索现有解答或提出自己的问题可获得所需的快速设计帮助。

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》](#)。

#### 10.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

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#### 10.5 静电放电警告



静电放电 (ESD) 会损坏这个集成电路。德州仪器 (TI) 建议通过适当的预防措施处理所有集成电路。如果不遵守正确的处理和安装程序，可能会损坏集成电路。

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。

#### 10.6 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。

## 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 (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LV06AD	OBSOLETE	SOIC	D	14		TBD	Call TI	Call TI	-40 to 125	LV06A	
SN74LV06ADBR	ACTIVE	SSOP	DB	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A	Samples
SN74LV06ADGVR	ACTIVE	TVSOP	DGV	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A	Samples
SN74LV06ADR	ACTIVE	SOIC	D	14	2500	RoHS & Green	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	LV06A	Samples
SN74LV06ADRE4	ACTIVE	SOIC	D	14	2500	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A	Samples
SN74LV06ANSR	ACTIVE	SO	NS	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV06A	Samples
SN74LV06APW	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 125	LV06A	
SN74LV06APWR	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	LV06A	Samples
SN74LV06APWT	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 125	LV06A	

(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.

<sup>(6)</sup> 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.

**Important Information and Disclaimer:** The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**TAPE AND REEL INFORMATION**

**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**


\*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
SN74LV06ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV06ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV06ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV06ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV06ADRE4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV06ADRE4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV06ANSR	SO	NS	14	2000	330.0	16.4	8.45	10.55	2.5	12.0	16.2	Q1
SN74LV06ANSR	SO	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN74LV06APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV06APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV06APWR	TSSOP	PW	14	2000	330.0	12.4	6.85	5.45	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)
SN74LV06ADBR	SSOP	DB	14	2000	356.0	356.0	35.0
SN74LV06ADGVR	TVSOP	DGV	14	2000	356.0	356.0	35.0
SN74LV06ADR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV06ADR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV06ADRE4	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV06ADRE4	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV06ANSR	SO	NS	14	2000	356.0	356.0	35.0
SN74LV06ANSR	SO	NS	14	2000	356.0	356.0	35.0
SN74LV06APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV06APWR	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74LV06APWR	TSSOP	PW	14	2000	366.0	364.0	50.0



DGV (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE

24 PINS SHOWN



4073251/E 08/00

- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.  
 D. Falls within JEDEC: 24/48 Pins – MO-153  
 14/16/20/56 Pins – MO-194

# DB0014A



# PACKAGE OUTLINE

## SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



4220762/A 05/2024

### NOTES:

- All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
- This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
- Reference JEDEC registration MO-150.

# EXAMPLE BOARD LAYOUT

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220762/A 05/2024

NOTES: (continued)

- 5. Publication IPC-7351 may have alternate designs.
- 6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4220762/A 05/2024

NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.



4220202/B 12/2023

NOTES:

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. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-153.

# EXAMPLE BOARD LAYOUT

PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220202/B 12/2023

NOTES: (continued)

- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

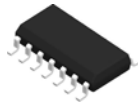


SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4220202/B 12/2023

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.



# D0014A

# PACKAGE OUTLINE

## SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4220718/A 09/2016

### NOTES:

1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
5. Reference JEDEC registration MS-012, variation AB.



# EXAMPLE BOARD LAYOUT

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE  
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:8X

4220718/A 09/2016

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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