

## SN74LV07A Hex Buffers/Drivers With Open-Drain Outputs

### 1 Features

- 2-V to 5.5-V  $V_{CC}$  Operation
- Typical  $V_{OLP}$  (Output Ground Bounce)  $< 0.8$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot)  $> 2.3$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Outputs are Disabled During Power Up and Power Down With Inputs Tied to  $V_{CC}$
- Support Mixed-Mode Voltage Operation on All Ports
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model
  - 200-V Machine Model
  - 1000-V Charged-Device Model

### 2 Applications

- Servers
- Telecom Infrastructures
- TV Set-Top Boxes

### 3 Description

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

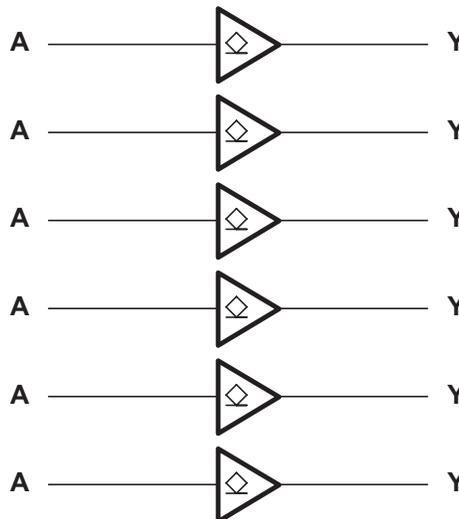
The SN74LV07A device performs the Boolean function  $Y = A$  in positive logic.

#### Device Information<sup>(1)</sup>

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SN74LV07A	TVSOP (14)	3.60 mm x 4.40 mm
	SOIC (14)	8.65 mm x 3.91 mm
	SOP (14)	10.30 mm x 5.30 mm
	SSOP (14)	6.20 mm x 5.30 mm
	TSSOP (14)	5.00 mm x 4.40 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

### 4 Simplified Schematic



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## 5 Revision History

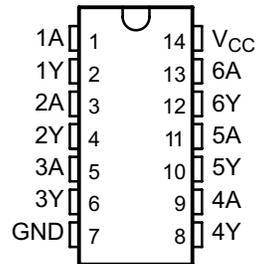
### Changes from Revision J (October 2010) to Revision K

Page

• Updated document to new TI data sheet format .....	1
• Deleted Ordering Information table. ....	1
• Added Handling Ratings table. ....	4
• Changed MAX operating temperature to 125°C in Recommended Operating Conditions table. ....	4
• Added Thermal Information table. ....	5
• Added Typical Characteristics. ....	6
• Added Detailed Description section.....	7
• Added Application and Implementation section.....	8
• Added Power Supply Recommendations and Layout sections.....	9

## 6 Pin Configuration and Functions

SN74LV07A . . . D, DB, DGV, NS, OR PW PACKAGE  
(TOP VIEW)



Pin Functions

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

## 7 Specifications

### 7.1 Absolute Maximum Ratings<sup>(1)</sup>

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

		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

- (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.

### 7.2 Handling Ratings

		MIN	MAX	UNIT	
T <sub>stg</sub>	Storage temperature range	-65	150	°C	
V <sub>(ESD)</sub>	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins <sup>(1)</sup>	0	2000	V
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins <sup>(2)</sup>	0	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.

### 7.3 Recommended Operating Conditions

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

		MIN	MAX	UNIT
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	50	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	
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)*.

## 7.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>		SN74LV07A					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).

## 7.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V <sub>CC</sub>	SN74LV07A			–40°C to 125°C SN74LV07A			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
V <sub>OL</sub>	I <sub>OL</sub> = 50 μA	2 V to 5.5 V			0.1			0.1	V
	I <sub>OL</sub> = 2 mA	2.3 V			0.4			0.4	
	I <sub>OL</sub> = 8 mA	3 V			0.44			0.44	
	I <sub>OL</sub> = 16 mA	4.5 V			0.55			0.55	
I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	0 to 5.5 V			±1			±1	μA
I <sub>OH</sub>	V <sub>I</sub> = V <sub>IH</sub> , V <sub>OH</sub> = V <sub>CC</sub>	5.5 V			±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	μA
I <sub>off</sub>	V <sub>I</sub> or V <sub>O</sub> = 0 to 5.5 V	0			5			5	μA
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	3.3 V		1.6			1.6		pF

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

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T <sub>A</sub> = 25°C			SN74LV07A		–40°C to 125°C SN74LV07A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 15 pF		6.6 <sup>(1)</sup>	10.4 <sup>(1)</sup>	1	13	1	14	ns
t <sub>PHL</sub>	A	Y			7.5 <sup>(1)</sup>	10.4 <sup>(1)</sup>	1	13	1	14	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 50 pF		11.1	15.2	1	18	1	19	ns
t <sub>PHL</sub>	A	Y			9.6	15.2	1	18	1	19	

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

## 7.7 Switching Characteristics, V<sub>CC</sub> = 3.3 V ± 0.3 V

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T <sub>A</sub> = 25°C			SN74LV07A		–40°C to 125°C SN74LV07A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 15 pF		5 <sup>(1)</sup>	7.1 <sup>(1)</sup>	1	8.5	1	9.5	ns
t <sub>PHL</sub>	A	Y			5 <sup>(1)</sup>	7.1 <sup>(1)</sup>	1	8.5	1	9.5	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 50 pF		8.2	10.6	1	12	1	13	ns
t <sub>PHL</sub>	A	Y			6.6	10.6	1	12	1	13	

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

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

 operating free-air temperature range (unless otherwise noted) (see [Figure 3](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN74LV07A		$-40^\circ\text{C to } 125^\circ\text{C}$ SN74LV07A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{PLH}$	A	Y	$C_L = 15\text{ pF}$		3.8	5.5 <sup>(1)</sup>	1	6.5	1	7.2	ns
$t_{PHL}$	A	Y			3.4 <sup>(1)</sup>	5.5 <sup>(1)</sup>	1	6.5	1	7.2	
$t_{PLH}$	A	Y	$C_L = 50\text{ pF}$		5.7	7.5	1	8.5	1	9.2	ns
$t_{PHL}$	A	Y			4.5	7.5	1	8.5	1	9.2	

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

## 7.9 Noise Characteristics<sup>(1)</sup>

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

PARAMETER		MIN	TYP	MAX	UNIT
$V_{OL(P)}$	Quiet output, maximum dynamic $V_{OL}$		0.4	0.8	V
$V_{OL(V)}$	Quiet output, minimum dynamic $V_{OL}$		-0.1	-0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic $V_{OH}$		3.2		V
$V_{IH(D)}$	High-level dynamic input voltage	2.31			V
$V_{IL(D)}$	Low-level dynamic input voltage			0.99	V

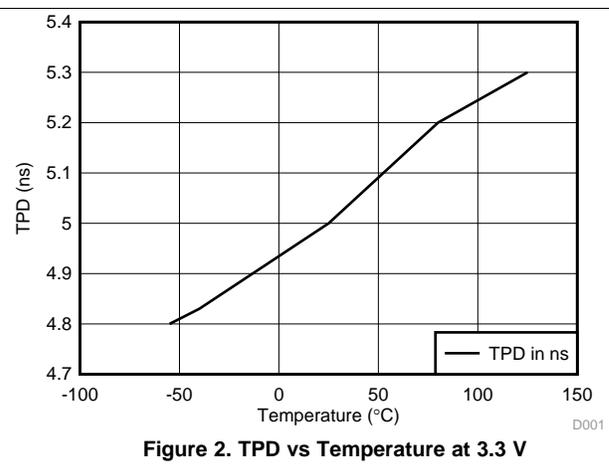
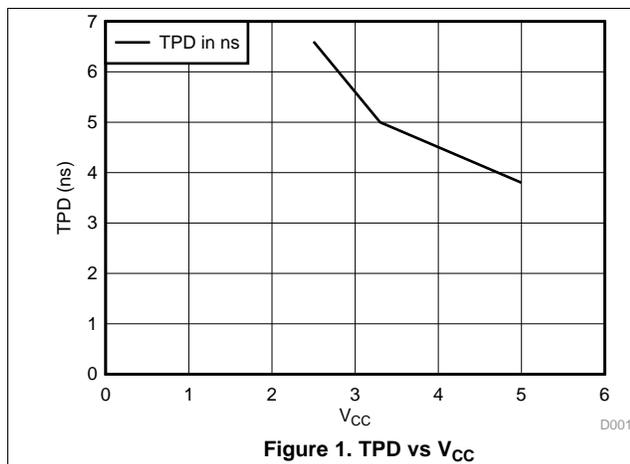
(1) Characteristics are for surface-mount packages only.

## 7.10 Operating Characteristics

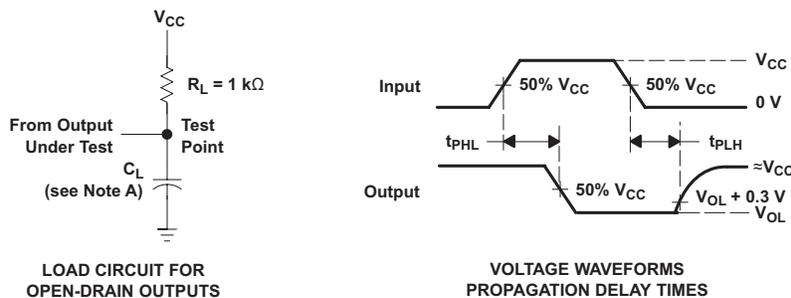
 $T_A = 25^\circ\text{C}$ 

PARAMETER		TEST CONDITIONS		$V_{CC}$	TYP	UNIT
$C_{pd}$	Power dissipation capacitance	$C_L = 50\text{ pF}$ ,	$f = 10\text{ MHz}$	3.3 V	2.9	pF
				5 V	5.3	

## 7.11 Typical Characteristics



## 8 Parameter Measurement Information



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

Figure 3. Load Circuit and Voltage Waveforms

## 9 Detailed Description

### 9.1 Overview

The outputs of the SN74LV07A device are open drain and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions. The maximum sink current is 16 mA at 5-V  $V_{CC}$ . Inputs can be driven from 2.5-V, 3.3-V, or 5-V (CMOS) devices. This feature allows the use of the SN74LV07A device as a translator in a mixed-system environment. This device is fully specified for partial power-down applications using  $I_{off}$ . The  $I_{off}$  circuitry disables the outputs, thus preventing a damaging current backflow through the device when it is powered down.

### 9.2 Functional Block Diagram

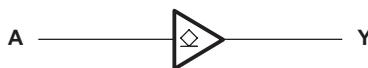


Figure 4. Logic Diagram, Each Buffer/Driver (Positive Logic)

### 9.3 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

### 9.4 Device Functional Modes

Table 1. Function Table  
(Each Buffer/Driver)

INPUT A	OUTPUT Y
H	H
L	L

## 10 Application and Implementation

### NOTE

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. Customers should validate and test their design implementation to confirm system functionality.

### 10.1 Application Information

The SN74LV07A device 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. The outputs are open drain and 5.5-V tolerant; thus, allowing the device to translate up to 5.5 V or down to any other voltage between GND and 5.5 V.

### 10.2 Typical Application

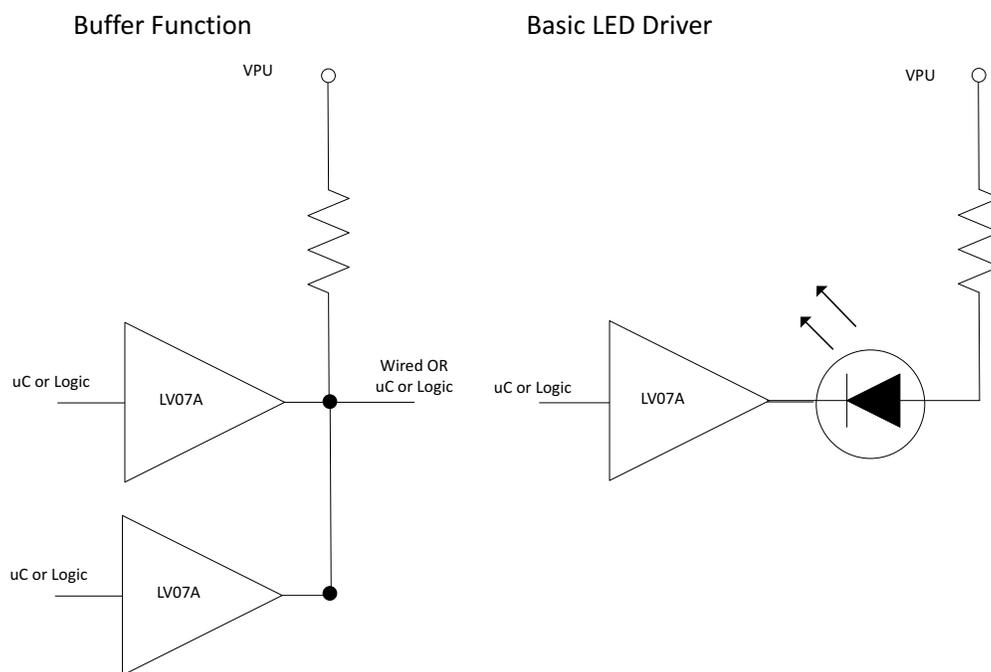


Figure 5. Typical Application Schematic

#### 10.2.1 Design Requirements

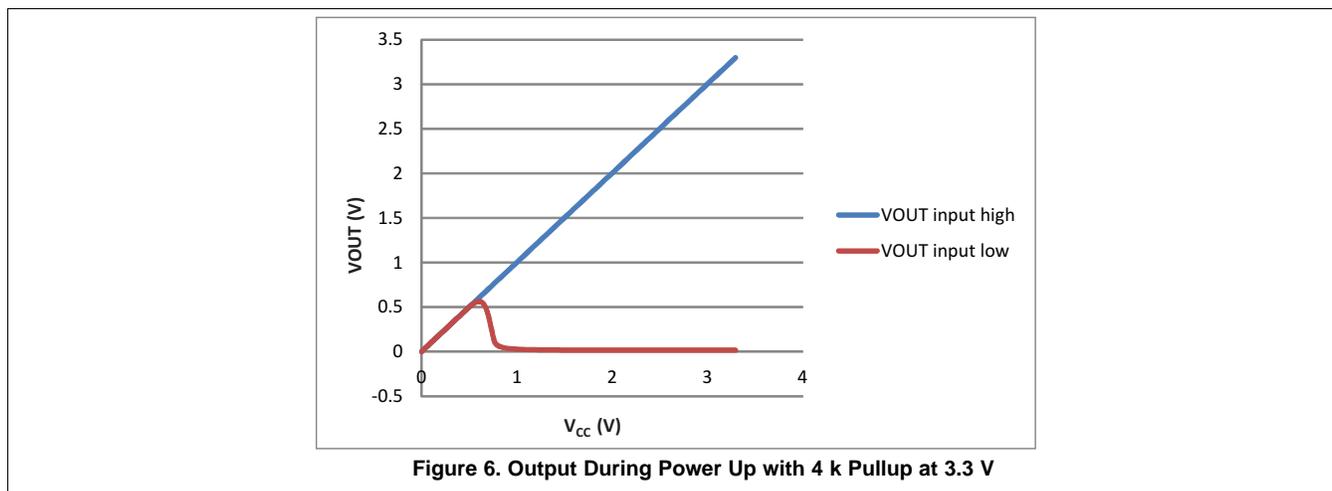
This device uses CMOS technology and is open drain, so it has low output drive only. Care should be taken to avoid bus contention, because it can drive currents that would exceed maximum limits. Parallel output drive can create fast edges into light loads, so routing and load conditions should be considered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

#### 10.2.2 Detailed Design Procedure

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

## Typical Application (continued)

### 10.2.3 Application Curves



## 11 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the [Recommended Operating Conditions](#). Each  $V_{CC}$  terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, 0.1  $\mu\text{F}$  is recommended. If there are multiple  $V_{CC}$  terminals then 0.01  $\mu\text{F}$  or 0.022  $\mu\text{F}$  is recommended for each power terminal. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. A 0.1  $\mu\text{F}$  and 1  $\mu\text{F}$  are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results.

## 12 Layout

### 12.1 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. Some examples are when only two inputs of a triple-input AND gate are used, or when 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 in [Figure 7](#) are 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  $V_{CC}$ , whichever makes more sense or is more convenient. It is acceptable to float outputs unless the part is a transceiver.

### 12.2 Layout Example

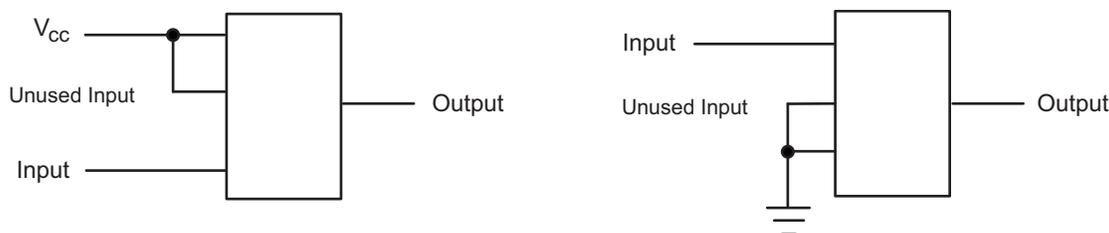


Figure 7. Layout Diagram

## 13 Device and Documentation Support

### 13.1 Related Links

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.

**Table 2. Related Links**

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN74LV07A	<a href="#">Click here</a>				

### 13.2 Trademarks

All trademarks are the property of their respective owners.

### 13.3 Electrostatic Discharge Caution



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

### 13.4 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

## 14 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 part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">SN74LV07AD</a>	Obsolete	Production	SOIC (D)   14	-	-	Call TI	Call TI	-40 to 125	LV07A
<a href="#">SN74LV07ADBR</a>	Active	Production	SSOP (DB)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
SN74LV07ADBR.A	Active	Production	SSOP (DB)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
<a href="#">SN74LV07ADGVR</a>	Active	Production	TVSOP (DGV)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
SN74LV07ADGVR.A	Active	Production	TVSOP (DGV)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
<a href="#">SN74LV07ADR</a>	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	LV07A
SN74LV07ADR.A	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
<a href="#">SN74LV07ADRG4</a>	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
SN74LV07ADRG4.A	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
<a href="#">SN74LV07ANS</a>	Obsolete	Production	SOP (NS)   14	-	-	Call TI	Call TI	-	74LV07A
<a href="#">SN74LV07ANSR</a>	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV07A
SN74LV07ANSR.A	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV07A
<a href="#">SN74LV07APW</a>	Obsolete	Production	TSSOP (PW)   14	-	-	Call TI	Call TI	-40 to 125	LV07A
<a href="#">SN74LV07APWR</a>	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	LV07A
SN74LV07APWR.A	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
<a href="#">SN74LV07APWRG3</a>	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	LV07A
SN74LV07APWRG3.A	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	LV07A
<a href="#">SN74LV07APWRG4</a>	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
SN74LV07APWRG4.A	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV07A
<a href="#">SN74LV07APWT</a>	Obsolete	Production	TSSOP (PW)   14	-	-	Call TI	Call TI	-40 to 125	LV07A

(1) **Status:** For more details on status, see our [product life cycle](#).

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

(4) **Lead finish/Ball material:** Parts 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.

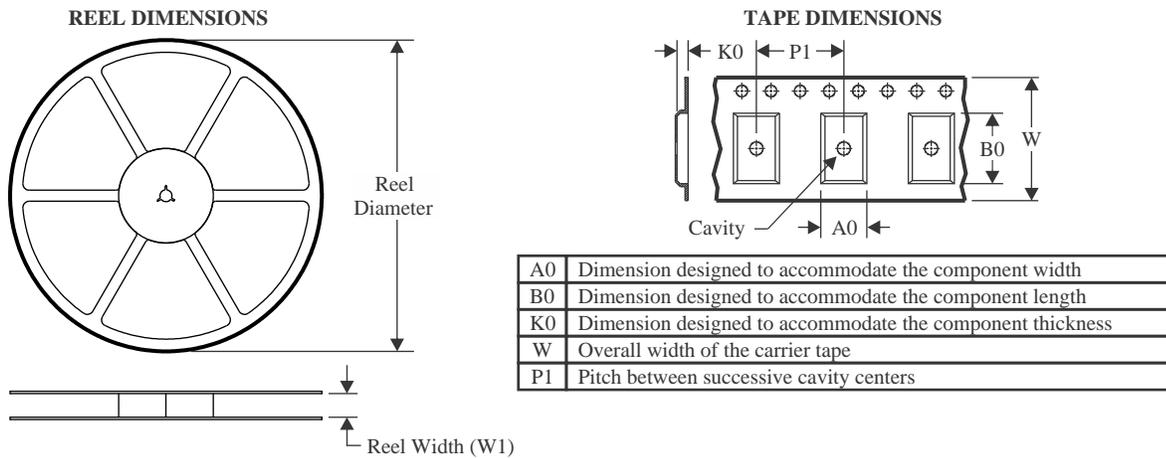
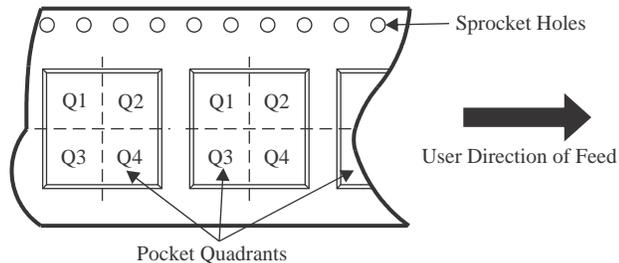
(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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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
SN74LV07ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV07ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV07ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV07ADRG4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV07ANSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74LV07APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV07APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV07APWRG3	TSSOP	PW	14	2000	330.0	12.4	6.85	5.45	1.6	8.0	12.0	Q1
SN74LV07APWRG4	TSSOP	PW	14	2000	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)
SN74LV07ADBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74LV07ADGVR	TVSOP	DGV	14	2000	353.0	353.0	32.0
SN74LV07ADR	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV07ADRG4	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV07ANSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74LV07APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV07APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV07APWRG3	TSSOP	PW	14	2000	366.0	364.0	50.0
SN74LV07APWRG4	TSSOP	PW	14	2000	353.0	353.0	32.0

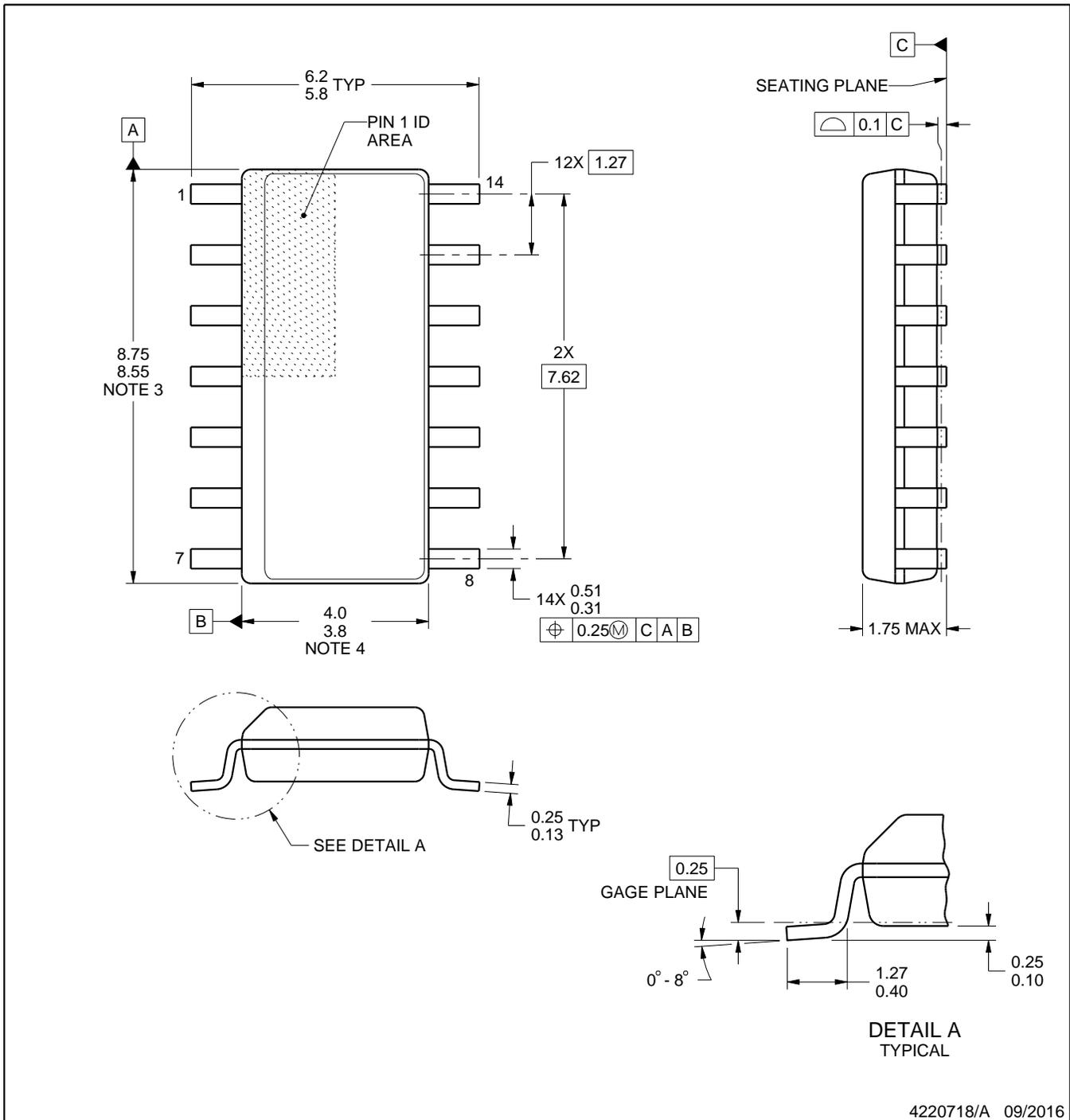
D0014A



# PACKAGE OUTLINE

## SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4220718/A 09/2016

NOTES:

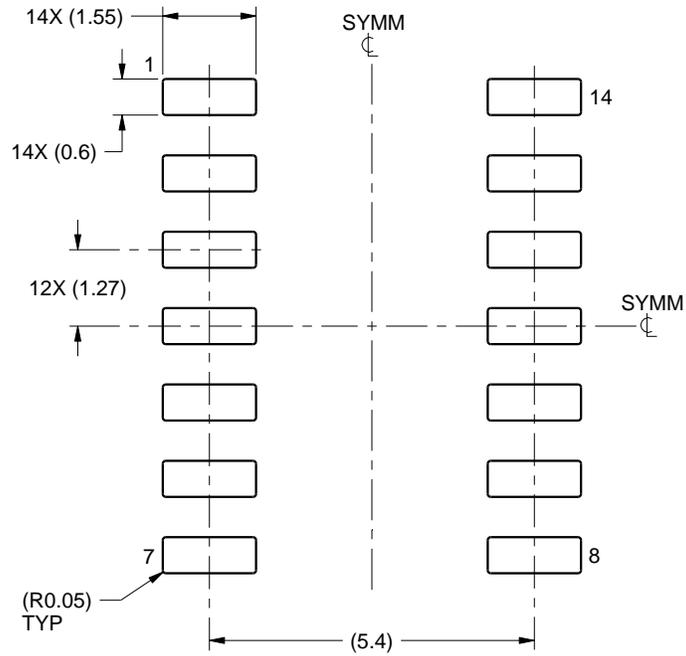
- All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
- This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs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

# EXAMPLE BOARD LAYOUT

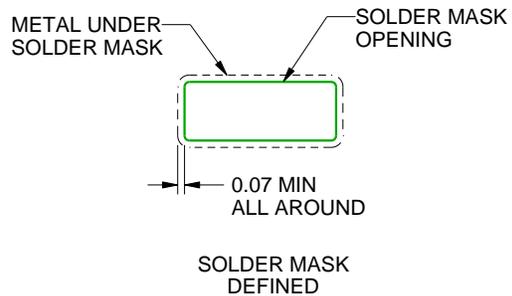
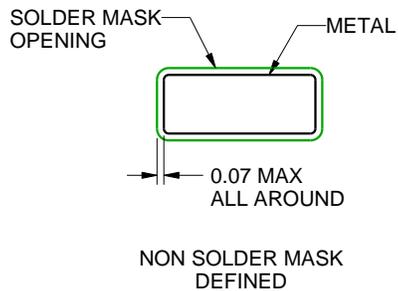
D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE  
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

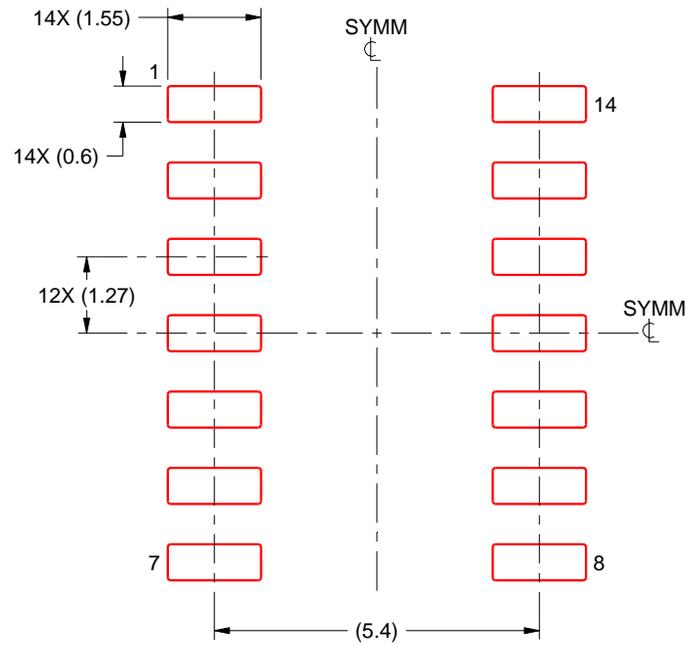
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# 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)

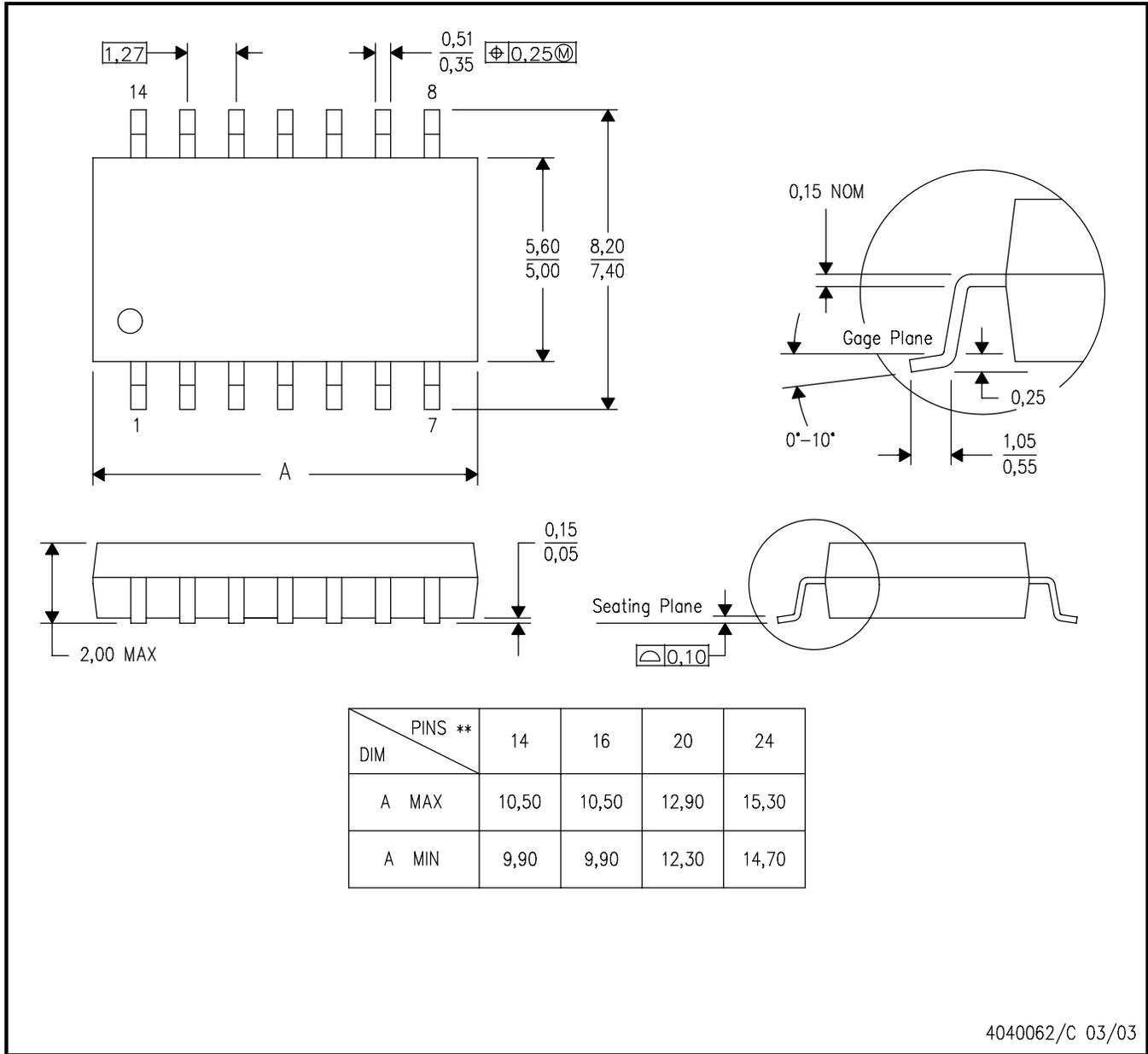
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

# MECHANICAL DATA

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

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN

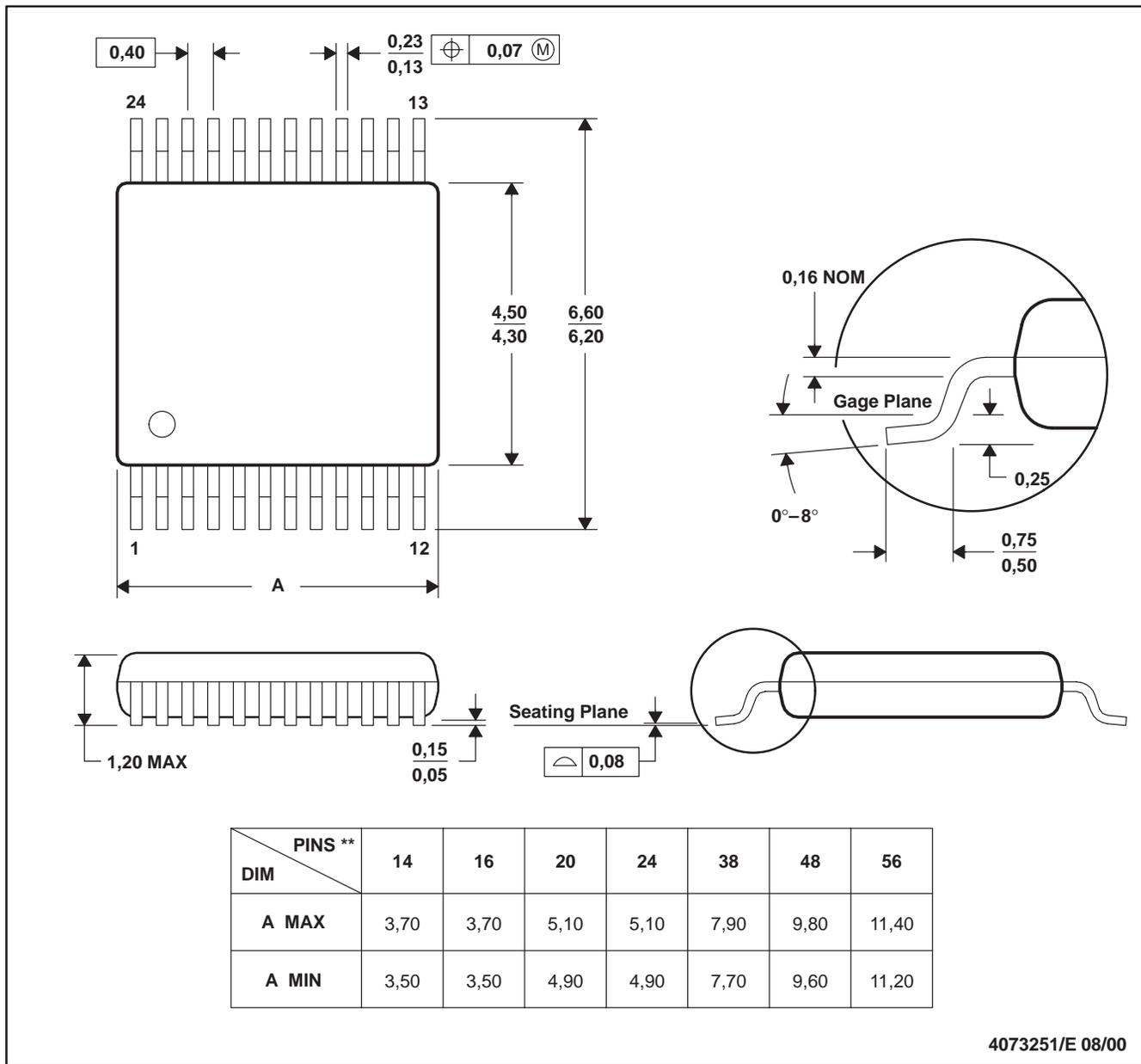


- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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

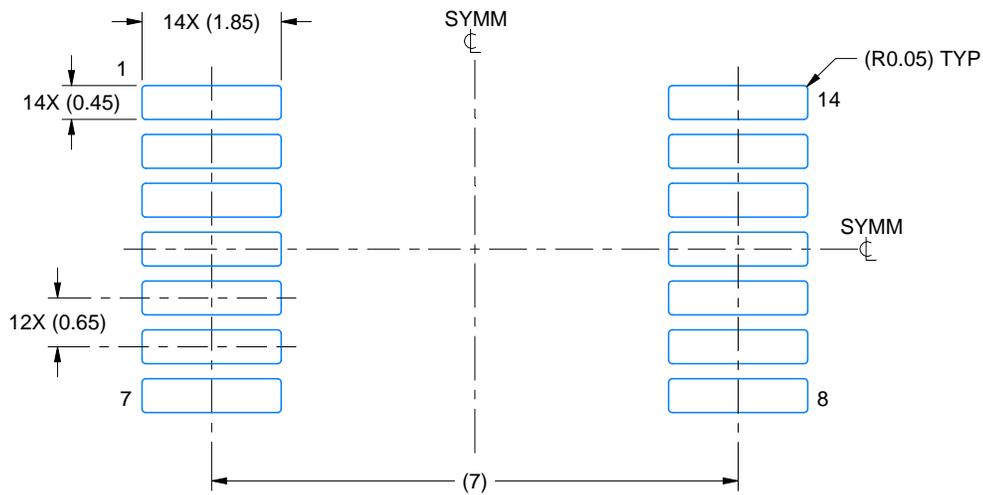


# EXAMPLE BOARD LAYOUT

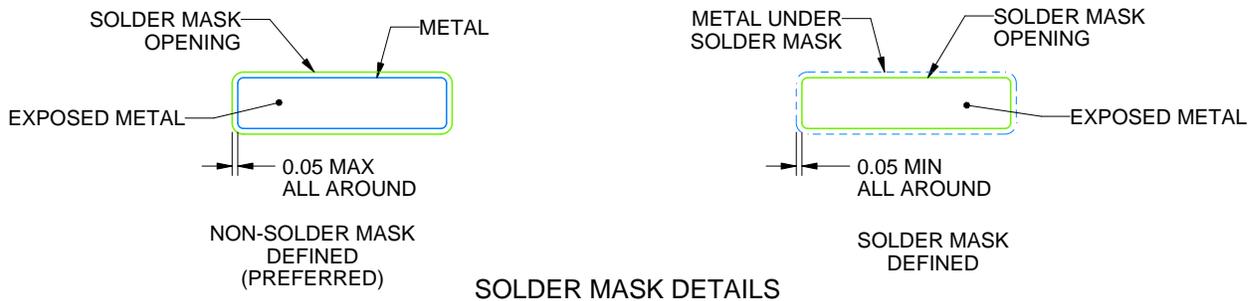
DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220762/A 05/2024

NOTES: (continued)

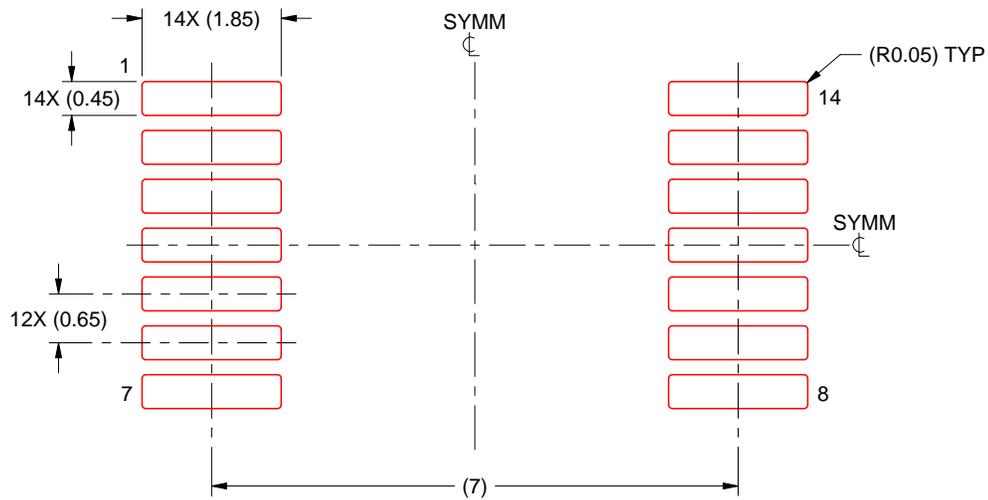
- 5. Publication IPC-7351 may have alternate designs.
- 6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



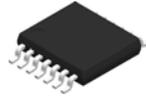
SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

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.

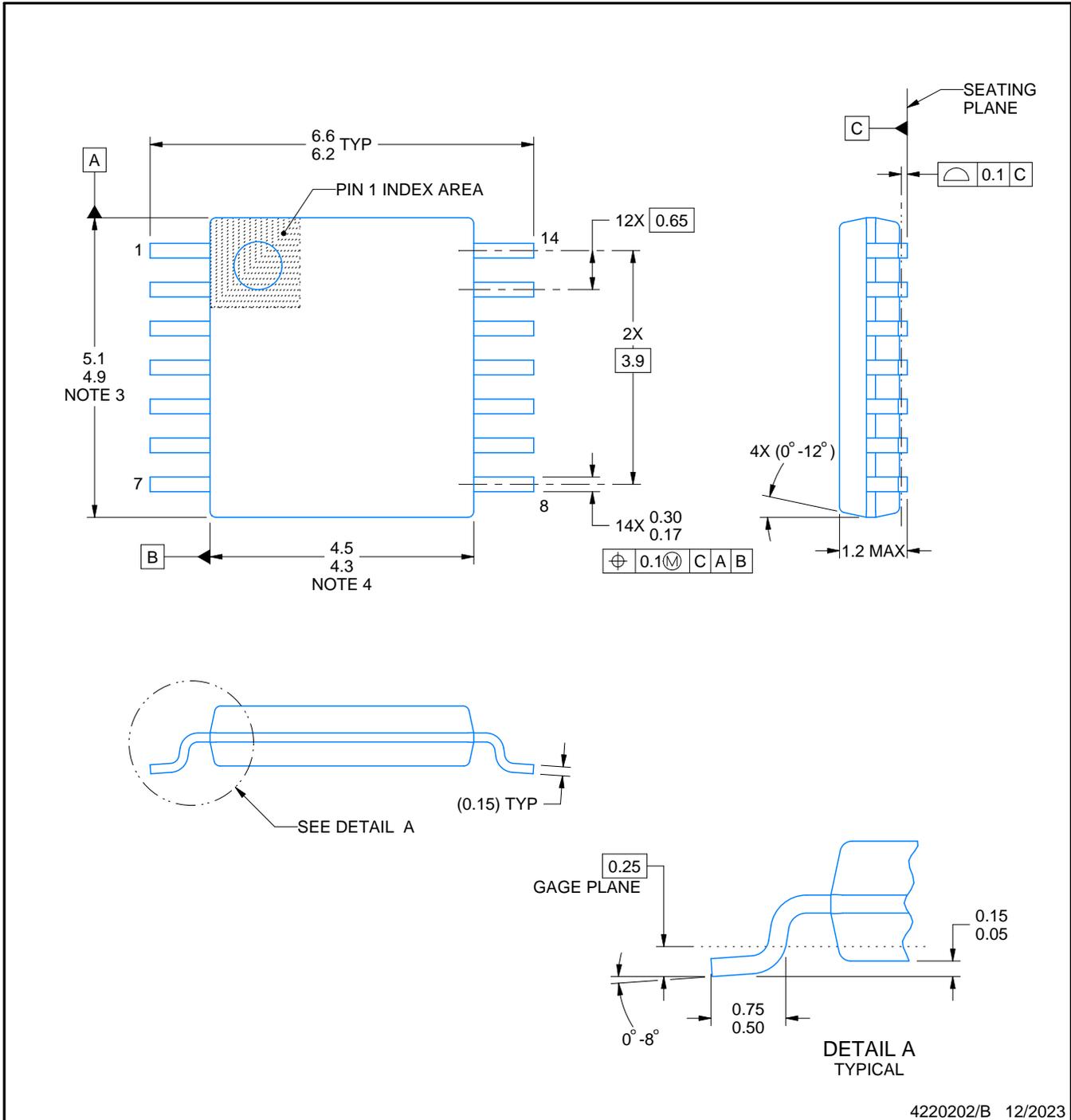
PW0014A



# PACKAGE OUTLINE

## TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



4220202/B 12/2023

NOTES:

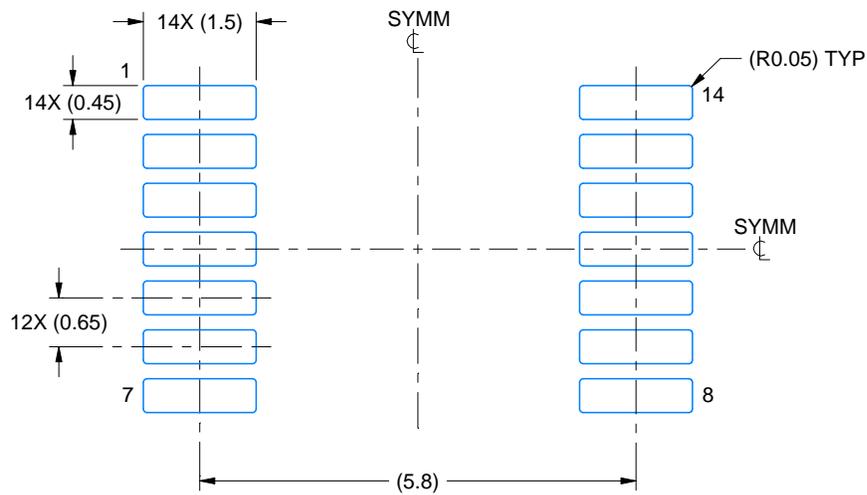
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or 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

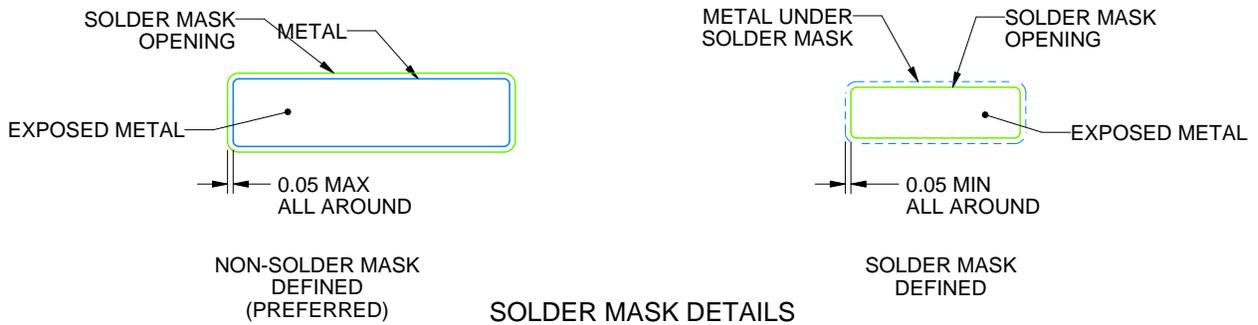
PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220202/B 12/2023

NOTES: (continued)

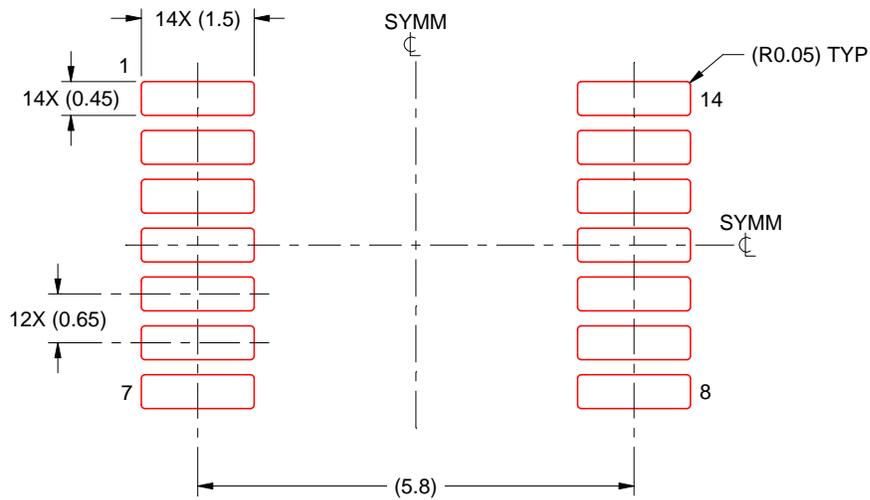
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# 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.

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