

SN74CBTLV3251 Low-Voltage 1-OF-8 FET Multiplexer/Demultiplexer

1 Features

- 5Ω Switch Connection Between Two Ports
- Rail-to-Rail Switching on Data I/O Ports
- I_{off} Supports Partial-Power-Down Mode Operation
- Latch-Up Performance Exceeds 100mA Per JESD 78, Class II

2 Applications

- [Datacenter and enterprise computing](#)
- [Broadband fixed line access](#)
- [Building automation](#)
- [Wired networking](#)
- [Motor drives](#)

3 Description

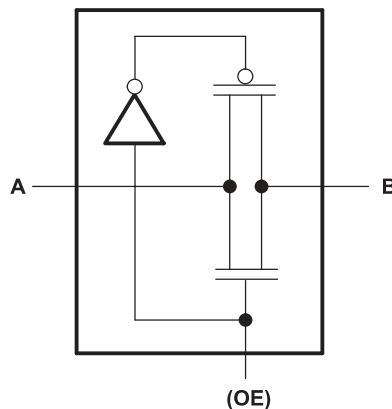
The SN74CBTLV3251 device is a 1-of-8 high-speed FET multiplexer/demultiplexer. The low on-state resistance of the switch allows connections to be made with minimal propagation delay. The select inputs (S0, S1, S2) control the data flow. The FET multiplexers/demultiplexers are disabled when the output-enable ($\overline{OE}$) input is high. This device is fully specified for partial-power-down applications using I_{off} . The I_{off} feature is designed so that damaging current cannot backflow through the device when it is powered down. The device has isolation during power off. To ensure the high-impedance state during power up or power down, OE must be tied to VCC through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

Package Information

PART NUMBER	PACKAGE ⁽¹⁾	PACKAGE SIZE ⁽²⁾
SN74CBTLV3251DBQR	DBQ (SSOP, 16)	4.90mm × 3.90mm
SN74CBTLV3251PWR	PW (TSSOP, 16)	5.00mm × 4.40mm
SN74CBTLV3251DGVR	DGV(TVSOP, 16)	3.60mm × 4.40mm
SN74CBTLV3251DR	D (SOIC, 16)	9.90mm × 3.91mm
SN74CBTLV3251RGYR	RGY (VQFN, 16)	4.00mm × 3.50mm

(1) For more information, see [Section 11](#).

(2) The package size (length × width) is a nominal value and includes pins, where applicable.



Simplified Schematic (Each FET Switch)

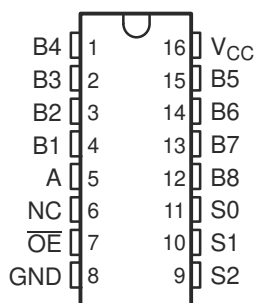


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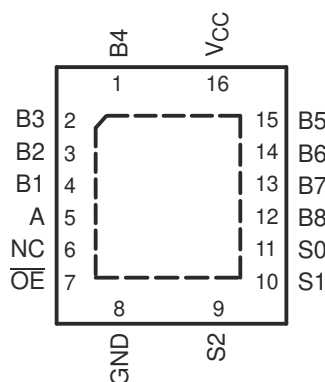
4 Pin Configuration and Functions

**DBQ, DGV, OR PW PACKAGE
(TOP VIEW)**



NC - No internal connection

**RGY PACKAGE
(TOP VIEW)**



NC - No internal connection

Figure 4-1. D, DBQ, DGV, PW and RGY

Table 4-1. Pin Functions

PIN		TYPE ⁽¹⁾	DESCRIPTION
NAME	NO.		
B4	1	I/O	Input/Output of mux
B3	2	I/O	Input/Output of mux
B2	3	I/O	Input/Output of mux
B1	4	I/O	Input/Output of mux
A	5	O/I	Output/Input of mux
NC	6	—	No internal connection
$\overline{OE}$	7	I	Output Enable, active low
GND	8	—	Ground
S2	9	I	Select pin 2
S1	10	I	Select pin 1
S0	11	I	Select pin 0
B8	12	I/O	Input/Output of mux
B7	13	I/O	Input/Output of mux
B6	14	I/O	Input/Output of mux
B5	15	I/O	Input/Output of mux
V _{CC}	16	—	Power

(1) I = Input, O = Output, I/O = Input or Output, G = Ground, P = Power.

5 Specifications

5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)⁽¹⁾

			MIN	MAX	UNIT
V _{CC}	Supply voltage		−0.5	4.6	V
V _I	Input voltage ⁽²⁾		−0.5	4.6	V
	Continuous channel current			128	mA
I _{IK}	Input clamp current	V _{I/O} < 0		−50	mA
T _J	Junction temperature			150	°C
T _{stg}	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 used outside the Recommended Operating Conditions but within the Absolute Maximum Ratings, the device may not be fully functional, and this may affect device reliability, functionality, performance, and shorten the device lifetime.
- (2) The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

5.2 ESD Ratings

			VALUE	UNIT
V _(ESD)	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 ⁽¹⁾	2000	V

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

5.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)⁽¹⁾

			MIN	MAX	UNIT
V _{CC}	Supply voltage		2.3	3.6	V
V _{IH}	High-level control input voltage	V _{CC} = 2.3V to 2.7V	1.7		V
		V _{CC} = 2.7V to 3.6V	2		
V _{IL}	Low-level control input voltage	V _{CC} = 2.3V to 2.7V		0.7	V
		V _{CC} = 2.7V to 3.6V		0.8	
T _A	Operating free-air temperature	PKG = RGY, DBQ, D, PW, DGV	−40	85	°C

- (1) All unused control inputs of the device must be held at V_{CC} or GND to ensure proper device operation. See [Implications of Slow or Floating CMOS Inputs](#).

5.4 Thermal Information

THERMAL METRIC ⁽¹⁾		SN74CBTLV3251					UNIT
		D	DBQ	DGV	PW	RGY	
		16 PINS	16 PINS	16 PINS	16 PINS	16 PINS	
R _{θJA}	Junction-to-ambient thermal resistance	102.7	116.6	120	129.1	77.73	°C/W
R _{θJC(bottom)}	Junction-to-case (bottom) thermal resistance	-	-	-	-	35.4	°C/W

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

5.5 Electrical Characteristics

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

PARAMETER		TEST CONDITIONS		MIN	TYP ⁽¹⁾	MAX	UNIT
V_{IK}		$V_{CC} = 3V$,	$I_I = -18mA$			-1.2	V
I_I		$V_{CC} = 3.6V$,	$V_I = V_{CC}$ or GND			± 1	μA
I_{off}		$V_{CC} = 0$,	V_I or $V_O = 0$ to 3.6V			20	μA
I_{CC}		$V_{CC} = 3.6V$,	$I_O = 0$, $V_I = V_{CC}$ or GND			10	μA
ΔI_{CC} ⁽²⁾	Control inputs	$V_{CC} = 3.6V$,	One input at 3V, Other inputs at V_{CC} or GND			300	μA
C_i		$V_I = 3V$ or 0			3		pF
$C_{io(OFF)}$	A port	$V_O = 3V$ or 0,	$\overline{OE} = V_{CC}$		40.5		pF
	B port				6		
r_{on} ⁽³⁾		$V_{CC} = 2.3V$, TYP at $V_{CC} = 2.5V$	$V_I = 0$	$I_I = 64mA$	5	8	Ω
				$I_I = 24mA$	5	8	
			$V_I = 1.7V$	$I_I = 15mA$	27	40	
		$V_{CC} = 3V$	$V_I = 0$	$I_I = 64mA$	5	7	
				$I_I = 24mA$	5	7	
			$V_I = 2.4V$	$I_I = 15mA$	10	15	

(1) All typical values are at $V_{CC} = 3.3V$ (unless otherwise noted), $T_A = 25^\circ C$.

(2) This is the increase in supply current for each input that is at the specified voltage level, rather than V_{CC} or GND.

(3) Measured by the voltage drop between the A and the B terminals at the indicated current through the switch. On-state resistance is determined by the lower of the voltages of the two (A or B) terminals.

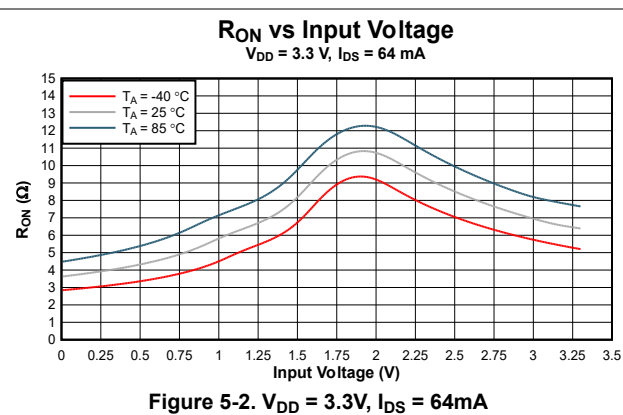
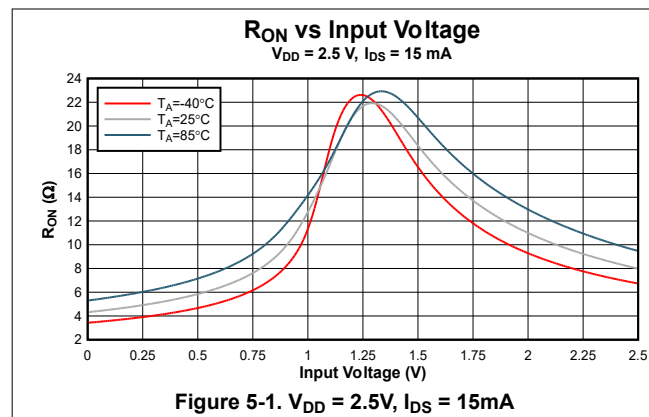
5.6 Switching Characteristics

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

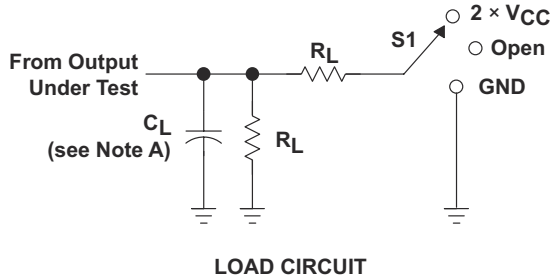
PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 2.5 \pm 0.2V$		$V_{CC} = 3.3V \pm 0.3V$		UNIT
			MIN	MAX	MIN	MAX	
t_{pd}	A or B ⁽¹⁾	B or A		0.15		0.25	ns
	S	A	1	6.1	1	5.3	
t_{en}	S	B	1	4.1	1	3.6	ns
t_{dis}	S	B	1	3.5	1	3.3	ns
t_{en}	$\overline{OE}$	A or B	1	5.2	1	4.5	ns
t_{dis}	$\overline{OE}$	A or B	1	6.7	1	7.2	ns

(1) The propagation delay is the calculated RC time constant of the typical on-state resistance of the switch and the specified load capacitance, when driven by an appropriate voltage source (zero output impedance).

5.7 Typical Characteristics

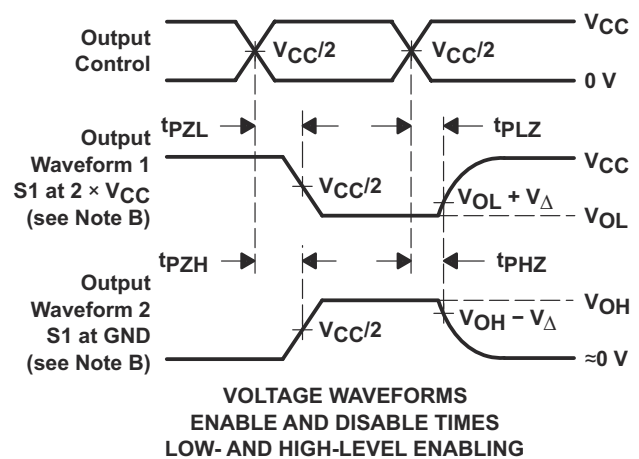
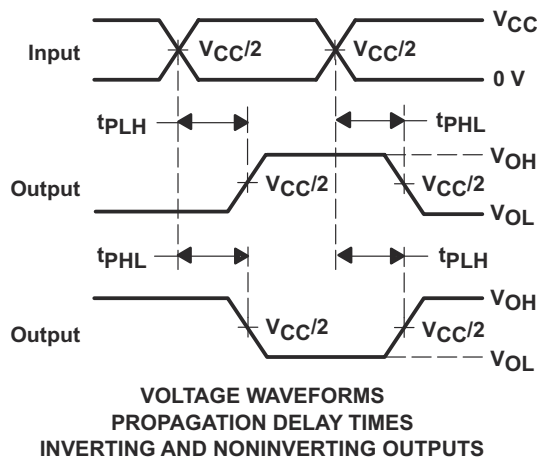
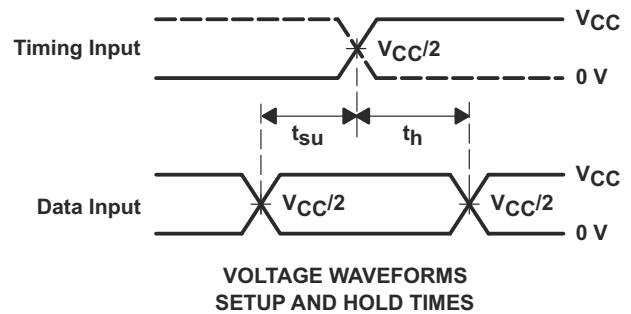
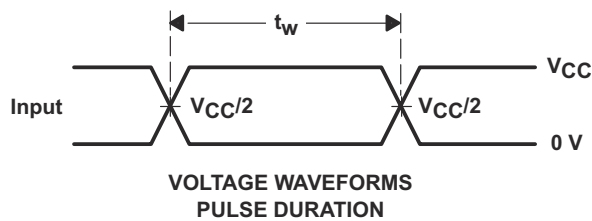


6 Parameter Measurement Information



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	$2 \times V_{CC}$
t_{PHZ}/t_{PZH}	GND

V_{CC}	C_L	R_L	V_{Δ}
$2.5\text{ V} \pm 0.2\text{ V}$	30 pF	500 Ω	0.15 V
$3.3\text{ V} \pm 0.3\text{ V}$	50 pF	500 Ω	0.3 V



- NOTES: A. C_L includes probe and jig capacitance.
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r \leq 2\text{ ns}$, $t_f \leq 2\text{ ns}$.
 D. The outputs are measured one at a time with one transition per measurement.
 E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 F. t_{PZL} and t_{PZH} are the same as t_{en} .
 G. t_{PLH} and t_{PHL} are the same as t_{pd} .
 H. All parameters and waveforms are not applicable to all devices.

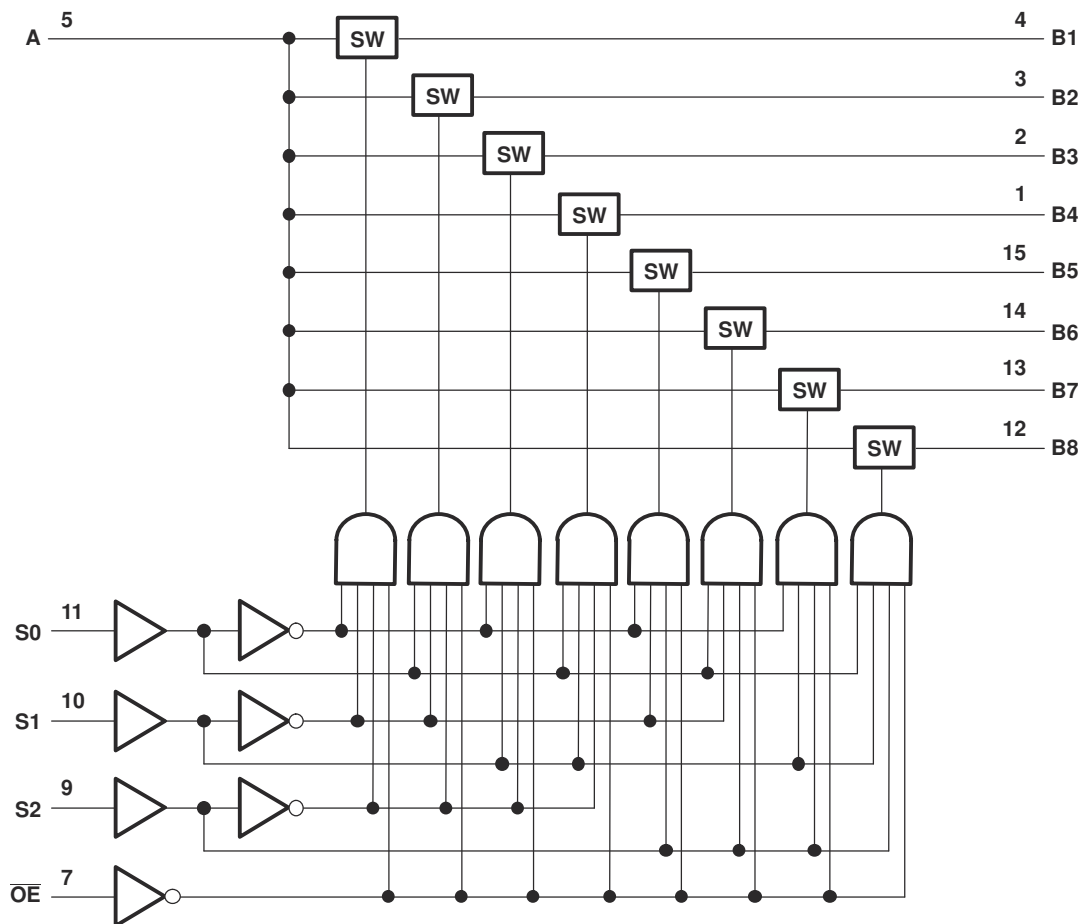
Figure 6-1. Load Circuit and Voltage Waveforms

7 Detailed Description

7.1 Overview

The SN74CBTLV3251 device is a 1-of-8 high-speed FET multiplexer/demultiplexer. The low on-state resistance of the switch allows connections to be made with minimal propagation delay. The select inputs (S0, S1, S2) control the data flow. The FET multiplexers/demultiplexers are disabled when the output-enable ($\overline{\text{OE}}$) input is high. This device is fully specified for partial-power-down applications using Ioff. The Ioff feature ensures that damaging current will not backflow through the device when it is powered down. The device has isolation during power off. To ensure the high-impedance state during power up or power down, OE must be tied to VCC through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

7.2 Functional Block Diagram



Logic Diagram (Positive Logic)

7.3 Feature Description

The SN74CBTLV3251 features 5Ω switch connection between ports, allowing for low signal loss across the switch. Rail-to-rail switching on data I/O allows for full voltage swing outputs. Ioff supports partial-power-down mode operation, protecting the chip from voltages at output ports when it is not powered on. Latch-up performance exceeds 100mA per JESD 78, Class II.

7.4 Device Functional Modes

Table 7-1. Function Table

INPUTS				INPUT/OUTPUT A	FUNCTION
OE	S2	S1	S0		
L	L	L	L	B1	A port = B1 port
L	L	L	H	B2	A port = B2 port
L	L	H	L	B3	A port = B3 port
L	L	H	H	B4	A port = B4 port
L	H	L	L	B5	A port = B5 port
L	H	L	H	B6	A port = B6 port
L	H	H	L	B7	A port = B7 port
L	H	H	H	B8	A port = B8 port
H	X	X	X	Z	Disconnect

8 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, as well as validating and testing their design implementation to confirm system functionality.

8.1 Typical Application

The SN74CBTLV3251 device can be used in conjunction with a microcontroller to poll a keypad. [Figure 8-1](#) shows the basic schematic for such a polling system. The microcontroller uses the channel-select pins to cycle through the different channels while reading the input to see if a user is pressing any of the keys. This is a very robust setup that allows for simultaneous key presses with very little power consumption. The device also uses very few pins on the microcontroller. The down side of polling is that the microcontroller must frequently scan the keys for a press.

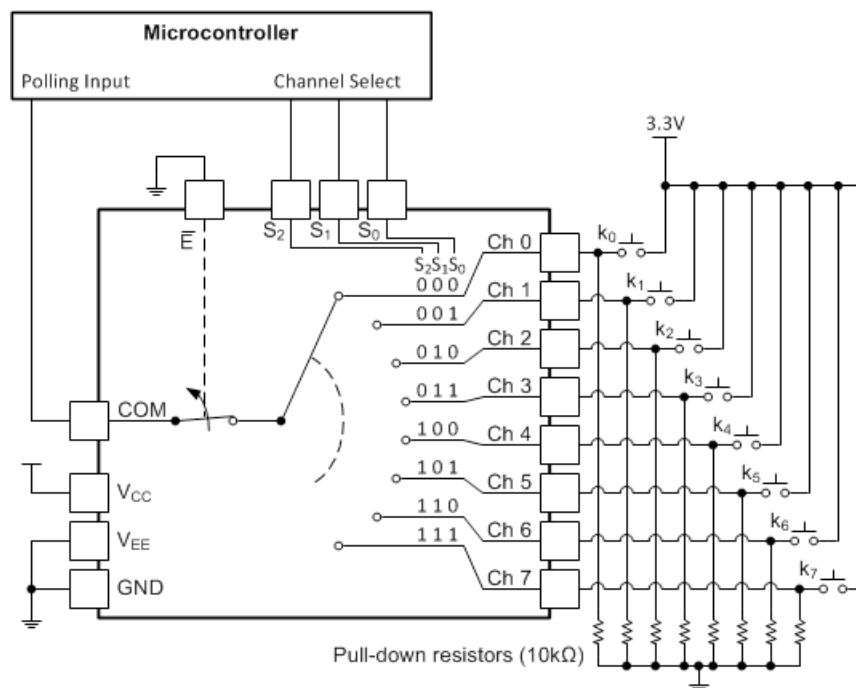


Figure 8-1. Keypad Polling Application

8.1.1 Design Requirements

These devices use CMOS technology and have balanced output drive. Take care to avoid bus contention because it can drive currents that would exceed maximum limits.

8.1.2 Detailed Design Procedure

1. Recommended input conditions:
 - For switch time specifications, see propagation delay times in [Section 5.3](#).
 - Inputs must not be pulled below ground.
 - For input voltage level specifications for control inputs, see V_{IH} and V_{IL} in [Section 5.3](#).
2. Input and output current consideration:
 - Load currents must not exceed per output and must not exceed (Continuous current through V_{CC} or GND) total current for the part. These limits are located in [Section 5.1](#).

8.2 Power Supply Recommendations

The power supply can be any voltage between the minimum and maximum supply voltage rating located in .

Each V_{CC} pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, a 0.1- μ F capacitor is recommended and if there are multiple V_{CC} pins then a 0.01- μ F or 0.022- μ F capacitor is recommended for each power pin. It is ok to parallel multiple bypass caps to reject different frequencies of noise. 0.1- μ F and 1- μ F capacitors are commonly used in parallel. The bypass capacitor must be installed as close to the power pin as possible for best results.

8.3 Layout

8.3.1 Layout Guidelines

When using multiple bit logic devices inputs must not ever 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 must 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 must 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 make more sense or is more convenient.

8.3.2 Layout Example

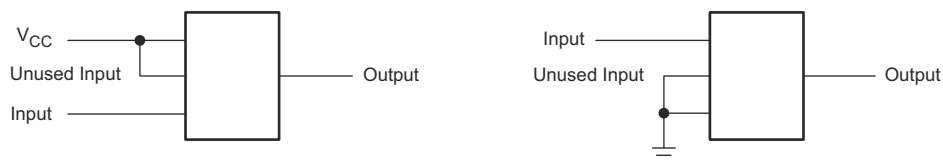


Figure 8-2. Layout Diagram

9 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

9.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

9.2 Support Resources

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

9.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.

All trademarks are the property of their respective owners.

9.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

9.5 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

10 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision I (October 2003) to Revision J (July 2026)	Page
• Added Applications section, Device Information table, Pin Configuration and Functions section, ESD Ratings table, Feature Description section, Device Functional Modes, Application and Implementation section, Power Supply Recommendations section, Layout section, Device and Documentation Support section, and Mechanical, Packaging, and Orderable Information section	1
• Updated Thermal ratings.....	4
• Added Electrical Specification section for new package.....	5
• Added Switching Specification section for new package.....	5
• Added Typical Curves	6

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 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)
74CBTLV3251RGYRG4	Active	Production	VQFN (RGY) 16	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
74CBTLV3251RGYRG4.A	Active	Production	VQFN (RGY) 16	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
74CBTLV3251RGYRG4.B	Active	Production	VQFN (RGY) 16	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
SN74CBTLV3251D	Obsolete	Production	SOIC (D) 16	-	-	Call TI	Call TI	-40 to 85	CBTLV3251
SN74CBTLV3251DBQR	Active	Production	SSOP (DBQ) 16	2500 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
SN74CBTLV3251DBQR.A	Active	Production	SSOP (DBQ) 16	2500 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
SN74CBTLV3251DBQR.B	Active	Production	SSOP (DBQ) 16	2500 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
SN74CBTLV3251DGVR	Active	Production	TVSOP (DGV) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251DGVR.B	Active	Production	TVSOP (DGV) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251DR	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CBTLV3251
SN74CBTLV3251DR.A	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CBTLV3251
SN74CBTLV3251DR.B	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CBTLV3251
SN74CBTLV3251PWR	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251PWR.A	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251PWR.B	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251PWRG4	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251PWRG4.A	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251PWRG4.B	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	CL251
SN74CBTLV3251RGYR	Active	Production	VQFN (RGY) 16	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
SN74CBTLV3251RGYR.A	Active	Production	VQFN (RGY) 16	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251
SN74CBTLV3251RGYR.B	Active	Production	VQFN (RGY) 16	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	CL251

⁽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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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
74CBTLV3251RGYRG4	VQFN	RGY	16	3000	330.0	12.4	3.8	4.3	1.5	8.0	12.0	Q1
SN74CBTLV3251DBQR	SSOP	DBQ	16	2500	330.0	12.5	6.4	5.2	2.1	8.0	12.0	Q1
SN74CBTLV3251DGVR	TVSOP	DGV	16	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74CBTLV3251DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74CBTLV3251PWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74CBTLV3251PWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74CBTLV3251PWRG4	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74CBTLV3251RGYR	VQFN	RGY	16	3000	330.0	12.4	3.8	4.3	1.5	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)
74CBTLV3251RGYRG4	VQFN	RGY	16	3000	353.0	353.0	32.0
SN74CBTLV3251DBQR	SSOP	DBQ	16	2500	353.0	353.0	32.0
SN74CBTLV3251DGVR	TVSOP	DGV	16	2000	353.0	353.0	32.0
SN74CBTLV3251DR	SOIC	D	16	2500	353.0	353.0	32.0
SN74CBTLV3251PWR	TSSOP	PW	16	2000	356.0	356.0	35.0
SN74CBTLV3251PWR	TSSOP	PW	16	2000	353.0	353.0	32.0
SN74CBTLV3251PWRG4	TSSOP	PW	16	2000	353.0	353.0	32.0
SN74CBTLV3251RGYR	VQFN	RGY	16	3000	353.0	353.0	32.0

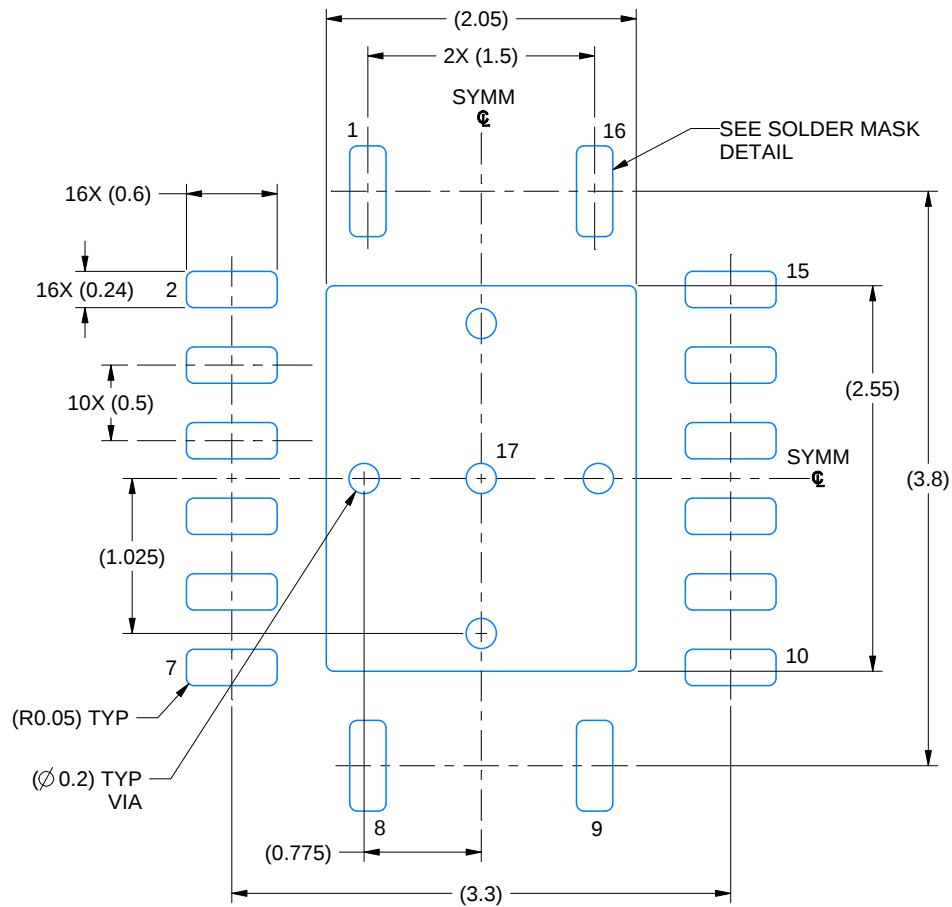
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

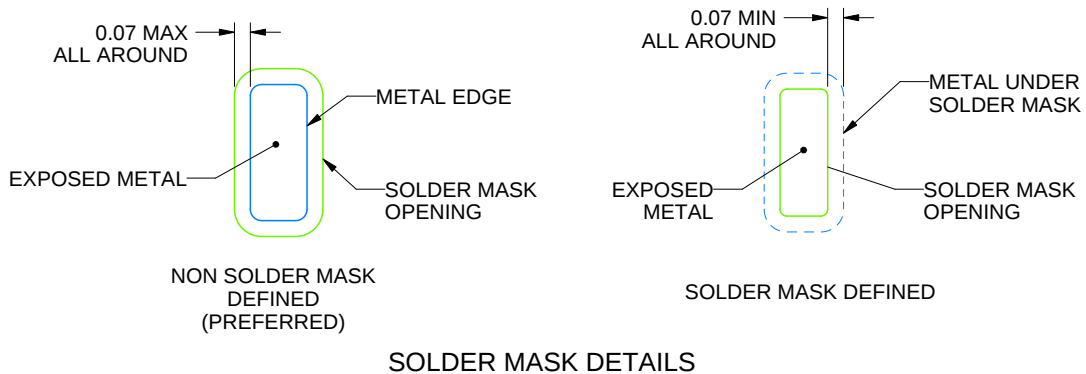
RGY0016A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 20X



4225140/A 07/2019

NOTES: (continued)

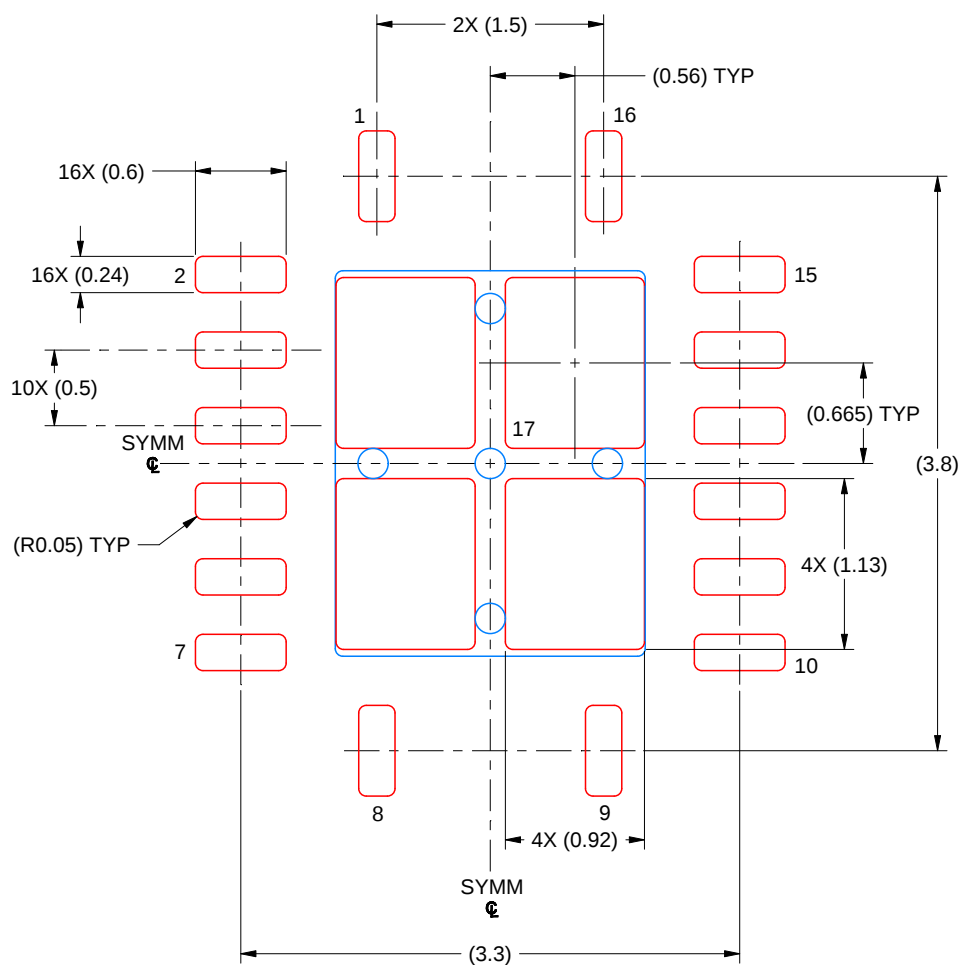
- This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/sluea271).
- Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown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

EXAMPLE STENCIL DESIGN

RGY0016A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.125 MM THICK STENCIL
SCALE: 20X

EXPOSED PAD 17
80% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE

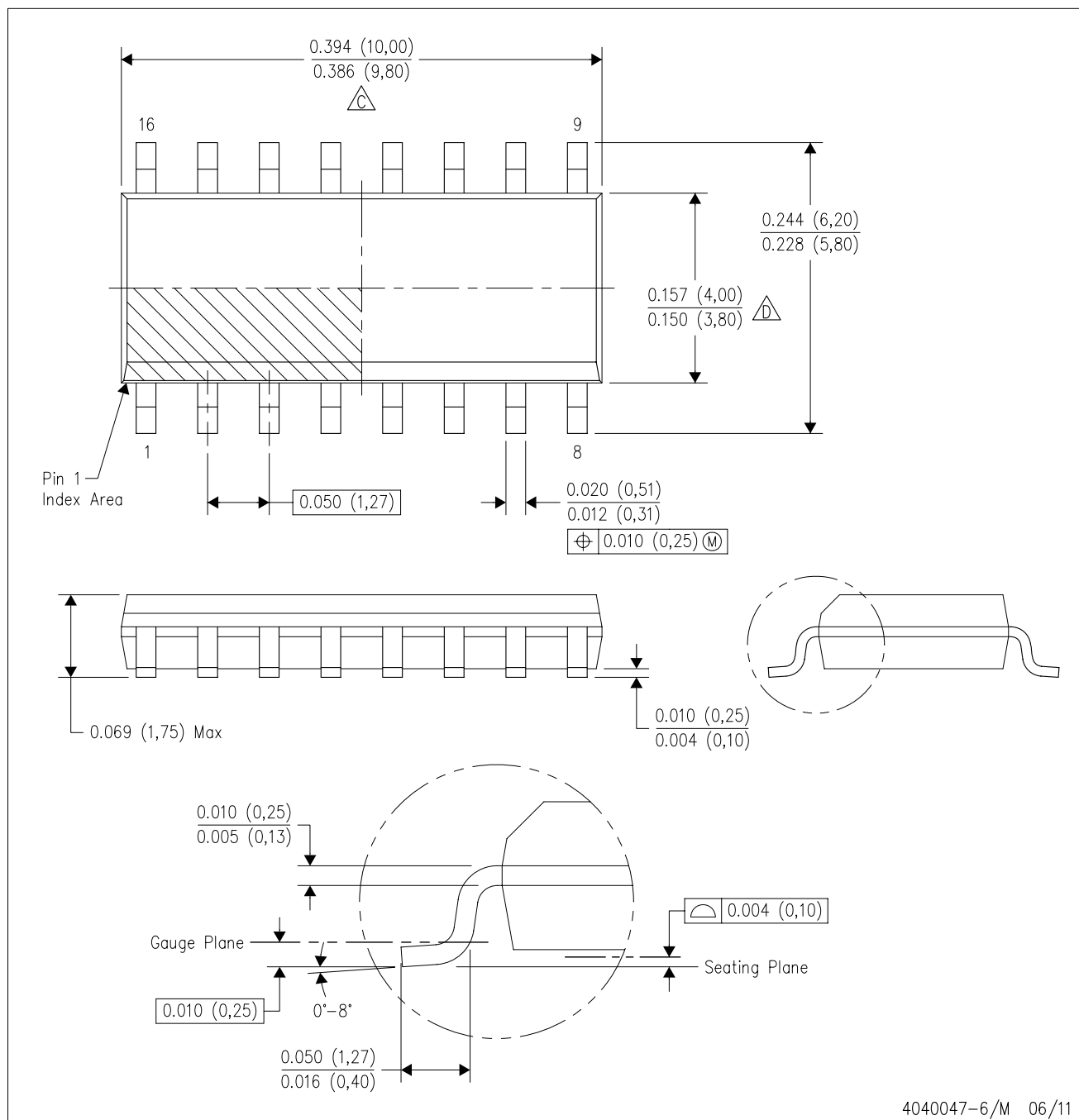
4225140/A 07/2019

NOTES: (continued)

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

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



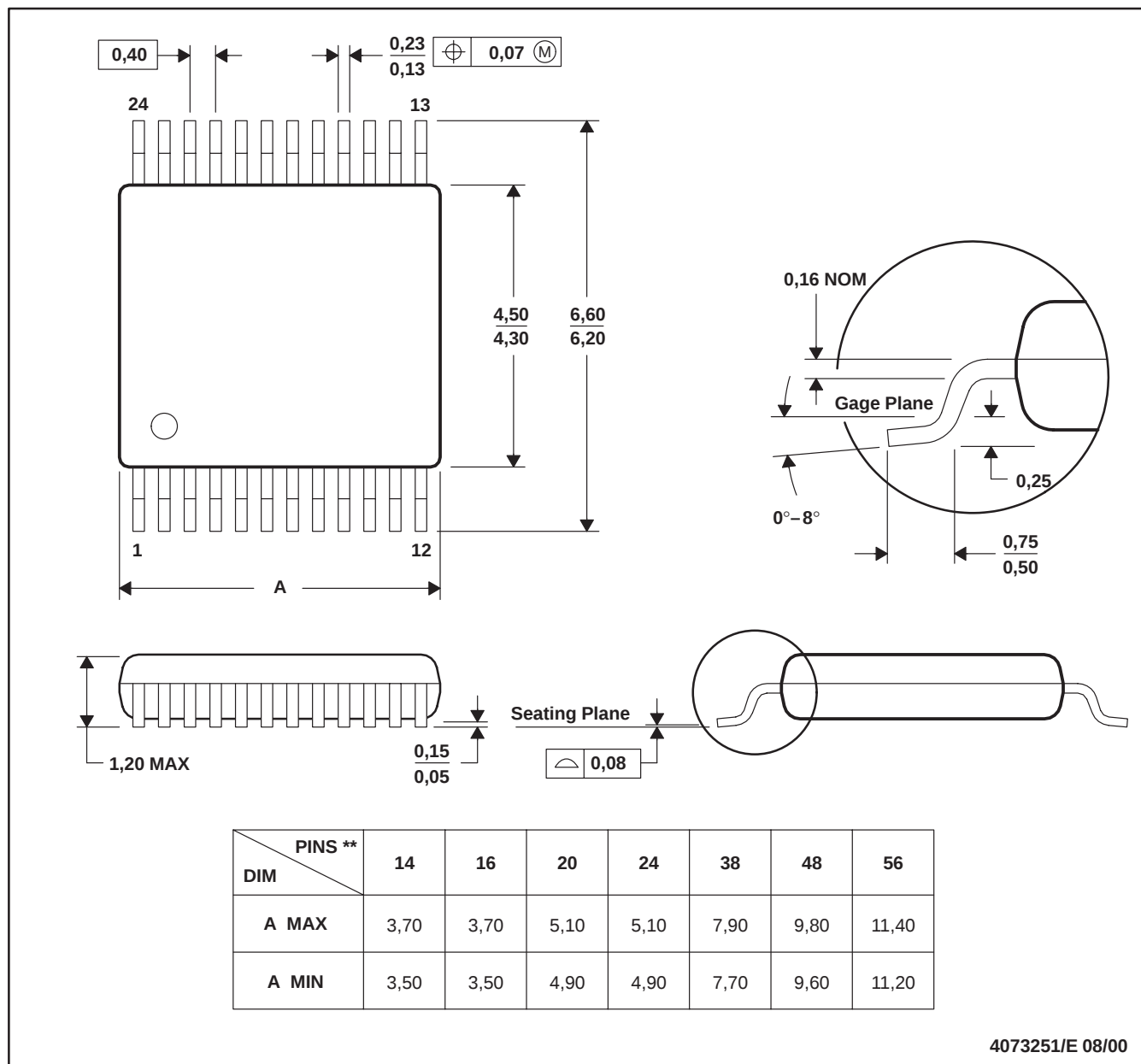
4040047-6/M 06/11

- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - 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 0.006 (0,15) each side.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 - E. Reference JEDEC MS-012 variation AC.

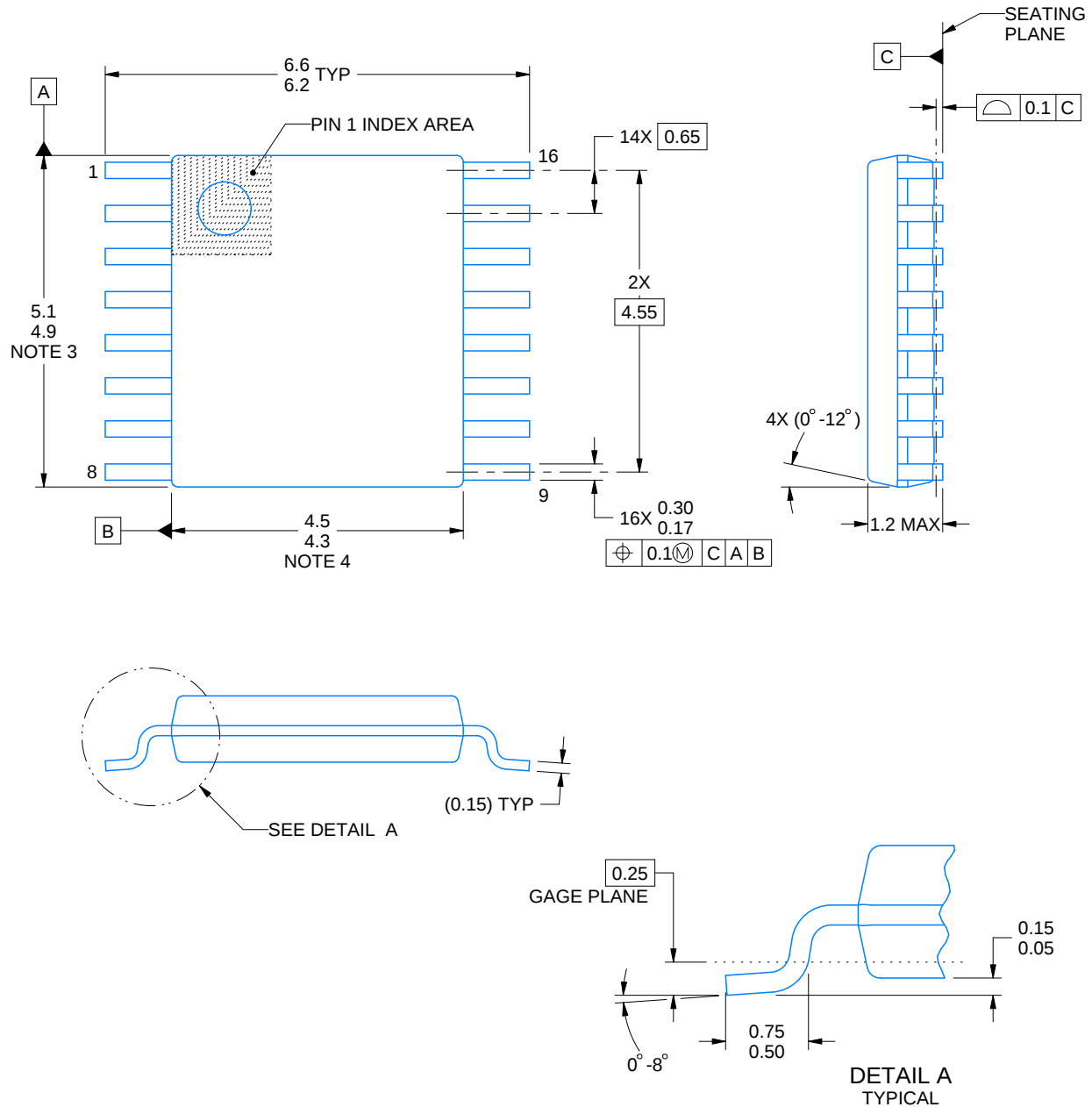
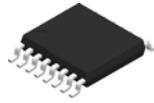
DGV (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

24 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 per side.
 D. Falls within JEDEC: 24/48 Pins – MO-153
 14/16/20/56 Pins – MO-194



4220204/B 12/2023

NOTES:

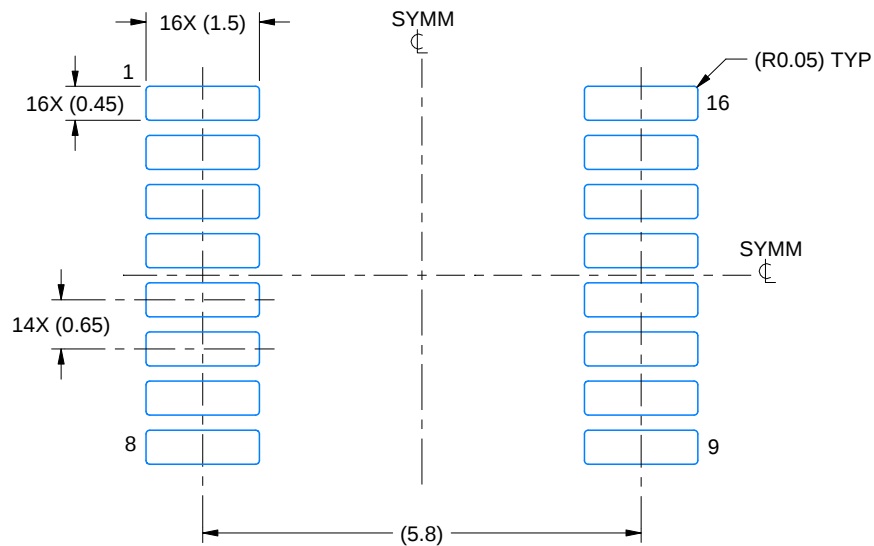
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or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

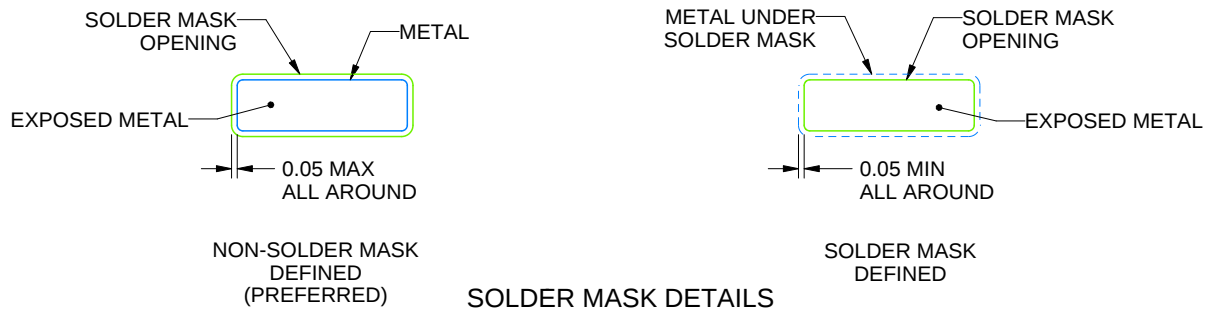
PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4220204/B 12/2023

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

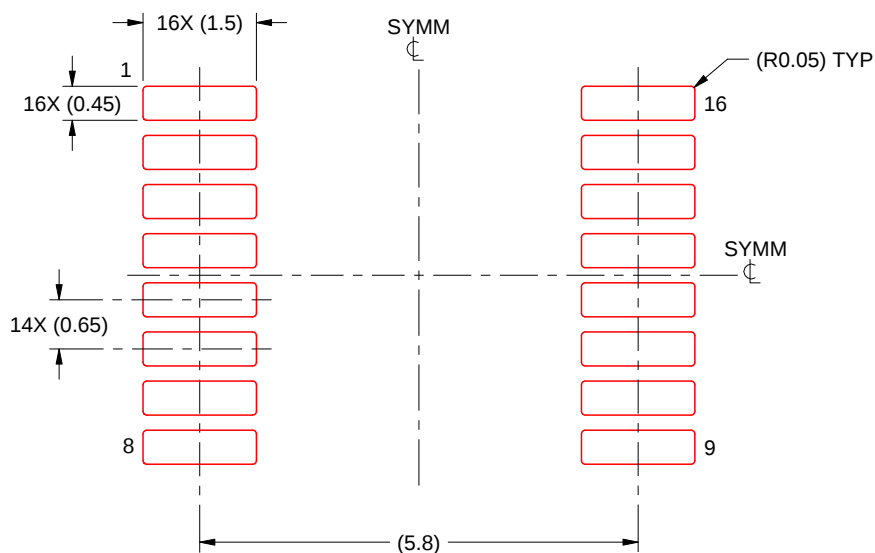
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

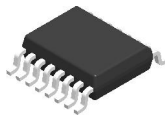


SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4220204/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.

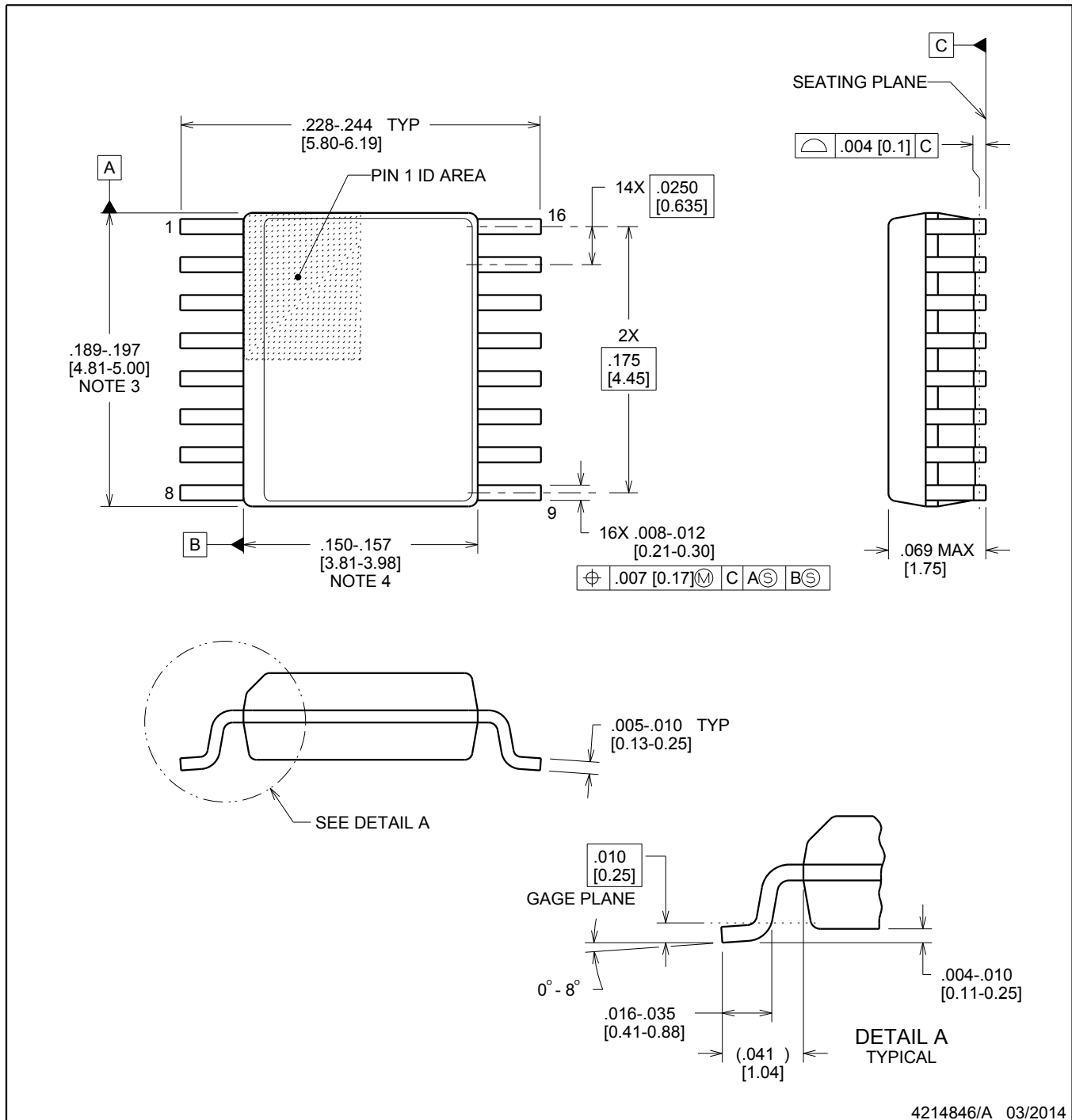


DBQ0016A

PACKAGE OUTLINE

SSOP - 1.75 mm max height

SHRINK SMALL-OUTLINE PACKAGE



4214846/A 03/2014

NOTES:

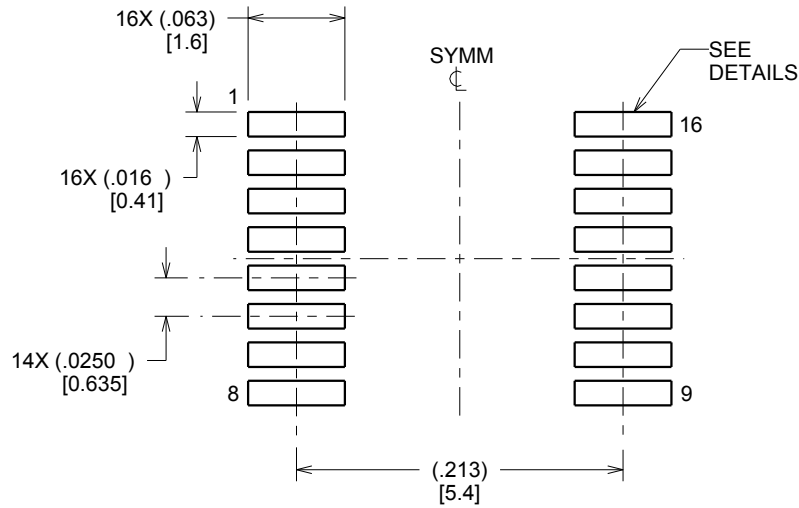
1. Linear dimensions are in inches [millimeters]. Dimensions in parenthesis are for reference only. Controlling dimensions are in inches. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 inch, per side.
4. This dimension does not include interlead flash.
5. Reference JEDEC registration MO-137, variation AB.

EXAMPLE BOARD LAYOUT

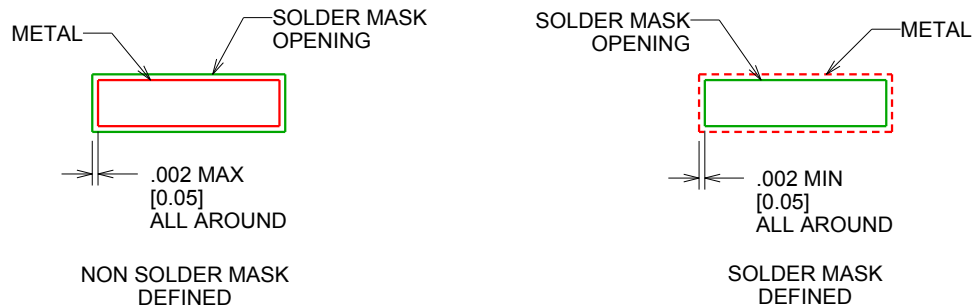
DBQ0016A

SSOP - 1.75 mm max height

SHRINK SMALL-OUTLINE PACKAGE



LAND PATTERN EXAMPLE
SCALE:8X



SOLDER MASK DETAILS

4214846/A 03/2014

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

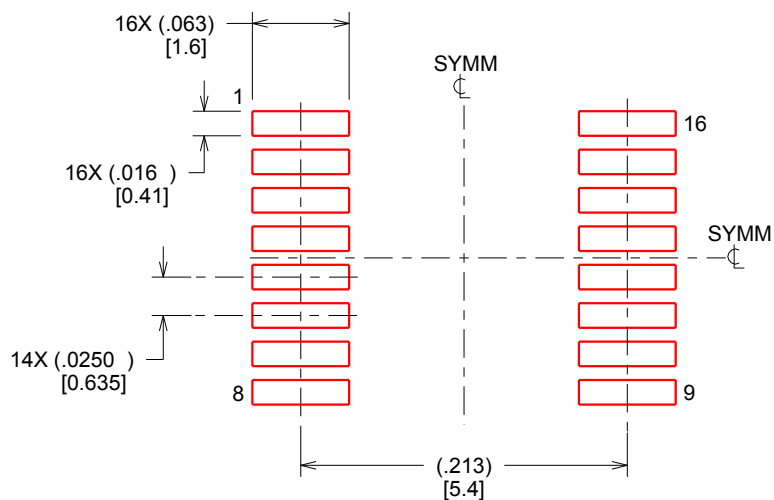
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DBQ0016A

SSOP - 1.75 mm max height

SHRINK SMALL-OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON .005 INCH [0.127 MM] THICK STENCIL
SCALE:8X

4214846/A 03/2014

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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