

SN74CB3Q3305 Dual FET Bus Switch

2.5-V or 3.3-V Low-Voltage High-Bandwidth Bus Switch

1 Features

- High-bandwidth data path (up to 500 MHz)¹
- 5-V tolerant I/Os with device powered up or powered down
- Low and flat ON-state resistance (r_{on}) characteristics over operating range ($r_{on} = 3\ \Omega$ typical)
- Supports input voltage beyond supply on data I/O ports
 - 0 to 5 V switching with 3.3 V V_{CC}
 - 0 to 3.3 V switching with 2.5 V V_{CC}
- Bidirectional data flow with near-zero propagation delay
- Low input or output capacitance minimizes loading and signal distortion ($C_{io(OFF)} = 3.5\text{ pF}$ typical)
- Fast switching frequency ($f_{OE} = 20\text{ MHz}$ maximum)
- Data and control inputs provide undershoot clamp diodes
- Low power consumption ($I_{CC} = 0.25\text{ mA}$ typical)
- V_{CC} operating range from 2.3 V to 3.6 V
- Data I/Os support 0 to 5 V signaling levels (0.8 V, 1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V, and 5 V)
- Control inputs can be driven by TTL or 5 V/3.3 V CMOS outputs
- I_{off} supports partial-power-down mode operation
- Latch-up performance exceeds 100 mA per JESD 78, Class II

2 Applications

- IP phones: wired and wireless
- Optical modules
- Optical networking: video over fiber and EPON
- Private branch exchange (PBX)
- WiMAX and wireless infrastructure equipment
- USB, differential signal interface
- Bus isolation

3 Description

The SN74CB3Q3305 device is a high-bandwidth FET bus switch using a charge pump to elevate the gate voltage of the pass transistor, providing a low and flat ON-state resistance (r_{on}). The low and flat ON-state resistance allows for minimal propagation delay and supports switching input voltage beyond the supply on the data input/output (I/O) ports. The device also features low data I/O capacitance to minimize capacitive loading and signal distortion on the data bus. Specifically designed to support high-bandwidth applications, the SN74CB3Q3305 device provides an optimized interface solution ideally suited for broadband communications, networking, and data-intensive computing systems.

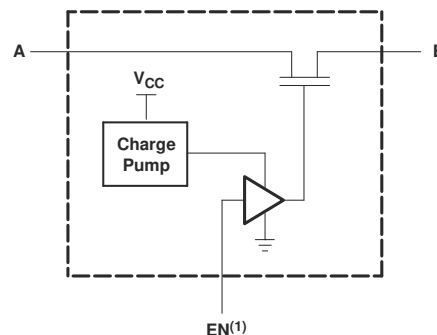
This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry prevents damaging current backflow through the device when it is powered down. The device has isolation during power off.

To ensure the high-impedance state during power up or power down, OE should be tied to GND through a pulldown resistor; the minimum value of the resistor is determined by the current-sourcing capability of the driver.

Device Information⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SN74CB3Q3305	VSSOP (8)	2.00 mm × 3.10 mm
	TSSOP (8)	3.00 mm × 6.10 mm

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



(1) EN is the internal enable signal applied to the switch.

Simplified Schematic, Each FET Switch (SW)

¹ For additional information regarding the performance characteristics of the CB3Q family, refer to the TI application report, *CBT-C, CB3T, and CB3Q Signal-Switch Families*, [SCDA008](#).



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4 Revision History

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

Changes from Revision C (October 2015) to Revision D (September 2021)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document.....	1
• Updated data sheet to include inclusive terminology.....	1
Changes from Revision B (October 2009) to Revision C (October 2015)	Page
• Added <i>Pin Configuration and Functions</i> section, <i>ESD Ratings</i> table, <i>Feature Description</i> section, <i>Device Functional Modes</i> , <i>Application and Implementation</i> section, <i>Power Supply Recommendations</i> section, <i>Layout</i> section, <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section	1

5 Pin Configuration and Functions

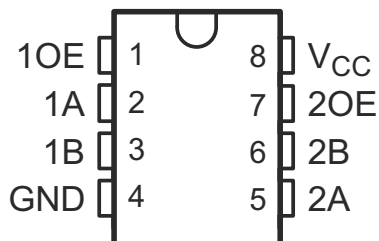


**Figure 5-1. PW Package
8-Pin TSSOP
Top View**

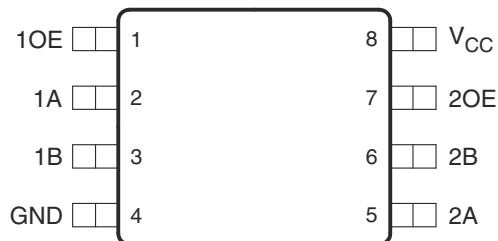


**Figure 5-2. DCU Package
8-Pin VSSOP
Top View**

Table 5-1. Pin Functions

PIN		TYPE ⁽¹⁾	DESCRIPTION
NAME	NO.		
1A	2	I/O	Channel 1 A port
1B	3	I/O	Channel 1 B port
1OE	1	I	Output Enable for switch 1
2A	5	I/O	Channel 2 A port
2B	6	I/O	Channel 2 B port
2OE	7	I	Output Enable for switch 2
GND	4	P	Ground
V _{cc}	8	P	Power supply

(1) I = input, O = output, I/O = input and output, P = power

6 Specifications

6.1 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 _{IN}	Control input voltage ^{(2) (3)}	−0.5	7	V
V _{I/O}	Switch I/O voltage ^{(2) (3) (4)}	−0.5	7	V
I _{IK}	Control input clamp current	V _{IN} < 0		−50 mA
I _{I/OK}	I/O port clamp current	V _{I/O} < 0		−50 mA
I _{I/O}	ON-state switch current ⁽⁵⁾		±64	mA
	Continuous current through V _{CC} or GND		±100	mA
θ _{JA}	Package thermal impedance ⁽⁶⁾		88	°C/W
T _J	Junction temperature		150	°C
T _{stg}	Storage temperature	−65	150	°C

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) All voltages are with respect to ground, unless otherwise specified.

(3) The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

(4) V_I and V_O are used to denote specific conditions for V_{I/O}.

(5) I_I and I_O are used to denote specific conditions for I_{I/O}.

(6) The package thermal impedance is calculated in accordance with JESD 51-7.

6.2 ESD Ratings

		VALUE	UNIT
V _(ESD)	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001 ⁽¹⁾	2000
		Charged-device model (CDM), per JEDEC specification JESD22-C101 ⁽²⁾	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.

6.3 Recommended Operating Conditions⁽¹⁾

		MIN	MAX	UNIT
V _{CC}	Supply voltage	2.3	3.6	V
V _{IH}	High-level control input voltage	V _{CC} = 2.3 V to 2.7 V	1.7	V
		V _{CC} = 2.7 V to 3.6 V	2	
V _{IL}	Low-level control input voltage	V _{CC} = 2.3 V to 2.7 V	0.7	V
		V _{CC} = 2.7 V to 3.6 V	0.8	
V _{I/O}	Data input/output voltage	0	5.5	V
T _A	Operating free-air temperature	−40	85	°C

(1) All unused control inputs of the device must be held at V_{CC} 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 ⁽¹⁾		SN74CB3Q3305	SN74CB3Q3305	UNIT
		DCU (VSSOP)	PW (TSSOP)	
		8 PINS	8 PINS	
$R_{\theta JA}$	Junction-to-ambient thermal resistance	183	190.6	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	64.2	74.0	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	62.5	119.4	°C/W
Ψ_{JT}	Junction-to-top characterization parameter	4.3	120.0	°C/W
Ψ_{JB}	Junction-to-board characterization parameter	62.1	117.7	°C/W
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	—	—	°C/W

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

6.5 Electrical Characteristics

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

PARAMETER		TEST CONDITIONS		MIN	TYP ⁽²⁾	MAX	UNIT
V_{IK}		$V_{CC} = 3.6\text{ V}$, $I_I = -18\text{ mA}$				-1.8	V
I_{IN}	Control inputs	$V_{CC} = 3.6\text{ V}$, $V_{IN} = 0\text{ to }5.5\text{ V}$				±1	μA
I_{OZ} ⁽³⁾		$V_{CC} = 3.6\text{ V}$, $V_O = 0\text{ to }5.5\text{ V}$, $V_I = 0$, Switch OFF, $V_{IN} = V_{CC}\text{ or GND}$				±1	μA
I_{off}		$V_{CC} = 0$, $V_O = 0\text{ to }5.5\text{ V}$, $V_I = 0$				1	μA
I_{CC}		$V_{CC} = 3.6\text{ V}$, $I_{IO} = 0$, Switch ON or OFF, $V_{IN} = V_{CC}\text{ or GND}$			0.25	0.7	mA
ΔI_{CC} ⁽⁴⁾	Control inputs	$V_{CC} = 3.6\text{ V}$, One input at 3 V, Other inputs at $V_{CC}\text{ or GND}$				25	μA
I_{CCD} ⁽⁵⁾	Per control input	$V_{CC} = 3.6\text{ V}$, A and B ports open, Control input switching at 50% duty cycle			0.040	0.045	mA/MHz
C_{in}	Control inputs	$V_{CC} = 3.3\text{ V}$, $V_{IN} = 5.5\text{ V}, 3.3\text{ V}, \text{ or }0$			2.5	3.5	pF
$C_{io(OFF)}$		$V_{CC} = 3.3\text{ V}$, Switch OFF, $V_{IN} = V_{CC}\text{ or GND}$, $V_{IO} = 5.5\text{ V}, 3.3\text{ V}, \text{ or }0$			3.5	5	pF
$C_{io(ON)}$		$V_{CC} = 3.3\text{ V}$, Switch ON, $V_{IN} = V_{CC}\text{ or GND}$, $V_{IO} = 5.5\text{ V}, 3.3\text{ V}, \text{ or }0$			8	10.5	pF
r_{on} ⁽⁶⁾		$V_{CC} = 2.3\text{ V}$, TYP at $V_{CC} = 2.5\text{ V}$	$V_I = 0$, $I_O = 30\text{ mA}$		3	8	Ω
			$V_I = 1.7\text{ V}$, $I_O = -15\text{ mA}$		3.5	9	
		$V_{CC} = 3\text{ V}$	$V_I = 0$, $I_O = 30\text{ mA}$		3	6	
			$V_I = 2.4\text{ V}$, $I_O = -15\text{ mA}$		3.5	8	

- (1) V_{IN} and I_{IN} refer to control inputs. V_I , V_O , I_I , and I_O refer to data pins.
- (2) All typical values are at $V_{CC} = 3.3\text{ V}$ (unless otherwise noted), $T_A = 25^\circ\text{C}$.
- (3) For I/O ports, the parameter I_{OZ} includes the input leakage current.
- (4) This is the increase in supply current for each input that is at the specified TTL voltage level, rather than V_{CC} or GND.
- (5) This parameter specifies the dynamic power-supply current associated with the operating frequency of a single control input (see [Figure 9-2](#)).
- (6) Measured by the voltage drop between the A and 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.

6.6 Switching Characteristics

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 7-1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC}	MIN	MAX	UNIT
f _{OE} ⁽¹⁾	OE	A or B	V _{CC} = 2.5 V ± 0.2 V		10	MHz
			V _{CC} = 3.3 V ± 0.3 V		20	
t _{pd} ⁽²⁾	A or B	B or A	V _{CC} = 2.5 V ± 0.2 V		0.09	ns
			V _{CC} = 3.3 V ± 0.3 V		0.15	
t _{en}	OE	A or B	V _{CC} = 2.5 V ± 0.2 V	1	5	ns
			V _{CC} = 3.3 V ± 0.3 V	1	4.5	
t _{dis}	OE	A or B	V _{CC} = 2.5 V ± 0.2 V	1	4.5	ns
			V _{CC} = 3.3 V ± 0.3 V	1	5	

(1) Maximum switching frequency for control input (V_O > V_{CC}, V_I = 5 V, R_L ≥ 1 MΩ, C_L = 0).

(2) 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 ideal voltage source (zero output impedance).

6.7 Typical Characteristics

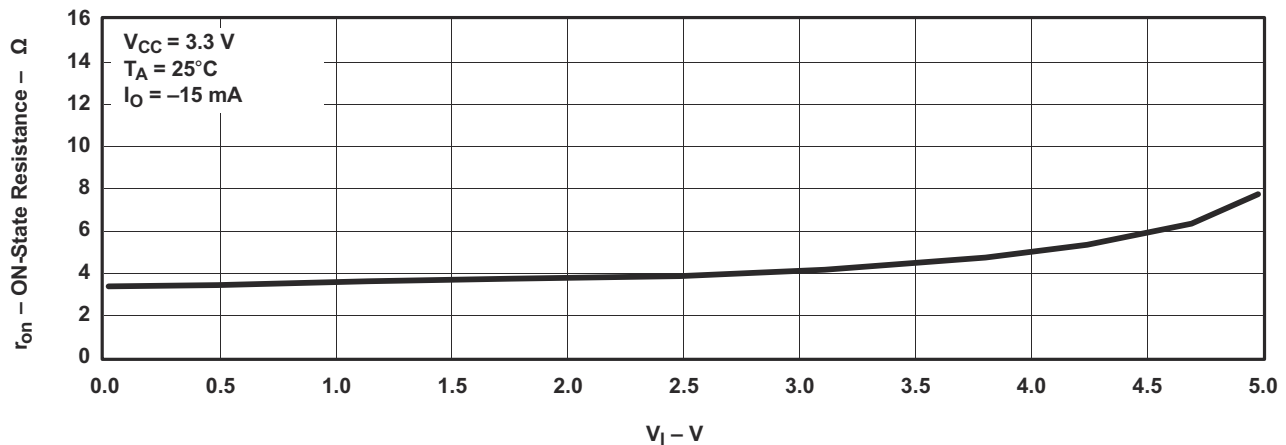
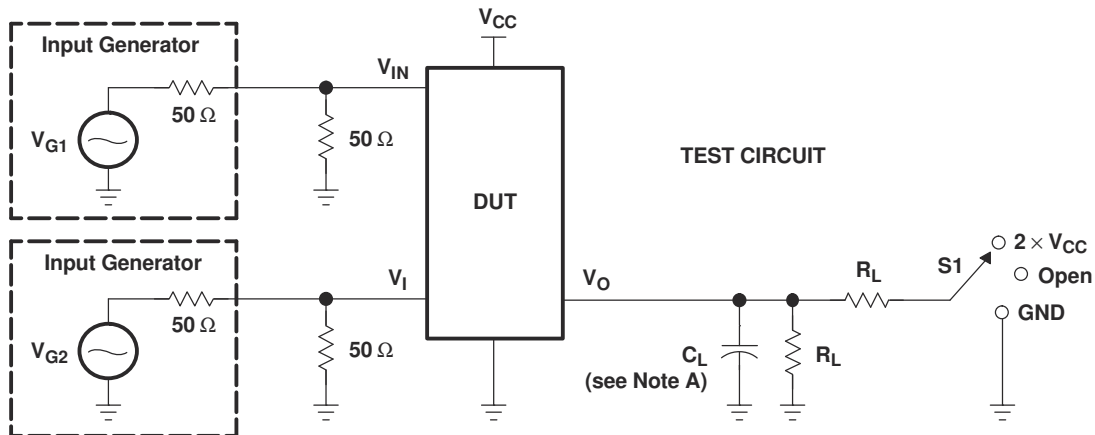
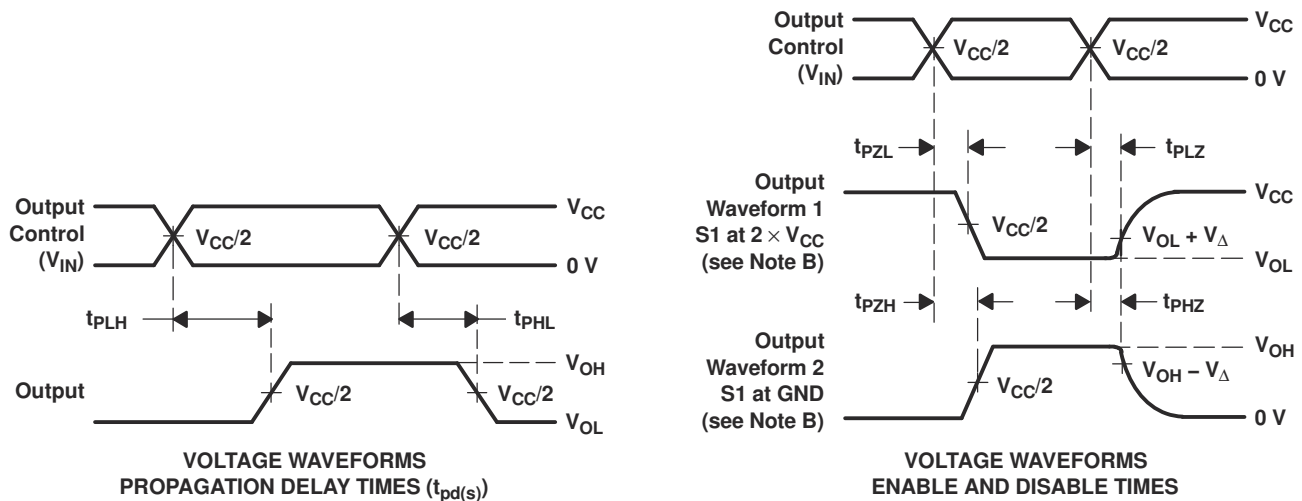


Figure 6-1. Typical r_{on} vs V_I

7 Parameter Measurement Information



TEST	V _{CC}	S1	R _L	V _I	C _L	V _Δ
t _{pd(s)}	2.5 V ± 0.2 V	Open	500 Ω	V _{CC} or GND	30 pF	
	3.3 V ± 0.3 V	Open	500 Ω	V _{CC} or GND	50 pF	
t _{PLZ} /t _{PZL}	2.5 V ± 0.2 V	2 × V _{CC}	500 Ω	GND	30 pF	0.15 V
	3.3 V ± 0.3 V	2 × V _{CC}	500 Ω	GND	50 pF	0.3 V
t _{PHZ} /t _{PZH}	2.5 V ± 0.2 V	GND	500 Ω	V _{CC}	30 pF	0.15 V
	3.3 V ± 0.3 V	GND	500 Ω	V _{CC}	50 pF	0.3 V



- NOTES:
- C_L includes probe and jig capacitance.
 - 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.
 - All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r ≤ 2.5 ns, t_f ≤ 2.5 ns.
 - The outputs are measured one at a time, with one transition per measurement.
 - t_{PLZ} and t_{PHZ} are the same as t_{dis}.
 - t_{PZL} and t_{PZH} are the same as t_{en}.
 - t_{PLH} and t_{PHL} are the same as t_{pd(s)}. The t_{pd} 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 ideal voltage source (zero output impedance).
 - All parameters and waveforms are not applicable to all devices.

Figure 7-1. Test Circuit and Voltage Waveforms

8 Detailed Description

8.1 Overview

The SN74CB3Q3305 device is organized as two 1-bit switches with separate output-enable (1OE and 2OE) inputs. It can be used as two 1-bit bus switches or as one 2-bit bus switch. When OE is high, the associated 1-bit bus switch is ON and the A port is connected to the B port, allowing bidirectional data flow between ports. When OE is low, the associated 1-bit bus switch is OFF and a high-impedance state exists between the A and B ports.

8.2 Functional Block Diagram

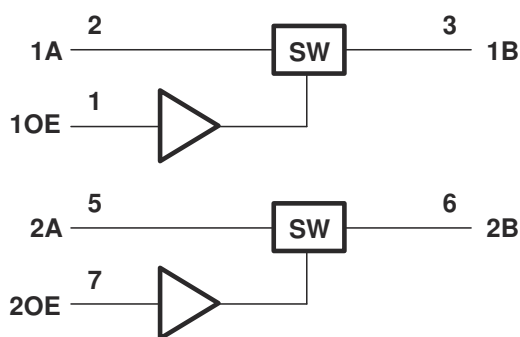


Figure 8-1. Logic Diagram (Positive Logic)

8.3 Feature Description

The device supports High-Bandwidth data path up to 500 MHz. The I/O ports are 5 V tolerant when powered up or powered down due to I_{OFF} . The charge pump creates low and flat ON-state resistance characteristics over the whole operating temperature range.

Switching input voltage beyond the supply is supported on data I/O ports: 0 V to 5 V with 3.3 V V_{CC} or 0 V to 3.3 V with 2.5 V V_{CC} .

The data flow is bidirectional with near-zero propagation delay. Reduced input/output capacitance for higher speed applications. OE can be toggled at the high speeds of 20 MHz for fast switching applications.

8.4 Device Functional Modes

Table 8-1 lists the functional modes of the SN74CB3Q3305.

Table 8-1. Function Table (Each Bus Switch)

INPUT OE	INPUT/OUTPUT A	FUNCTION
H	B	A port = B port
L	Z	Disconnect

9 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.

9.1 Application Information

Figure 9-1 shows that the SN74CB3Q3305 can be used as bidirectional switch. The controller operates at 5 V and the peripheral can accept 5 V. Even with a V_{CC} of 3 V on the SN74CB3Q3305, the two ports can be connected to pass the 5 V signal. The controller uses the OE pin control the switch. This is a very generic example and could apply to many situations. For applications that require only 1 bit (for example, one channel), tie the unused OE low and tie the unused ports A and B to either high or low (not shown).

9.2 Typical Application

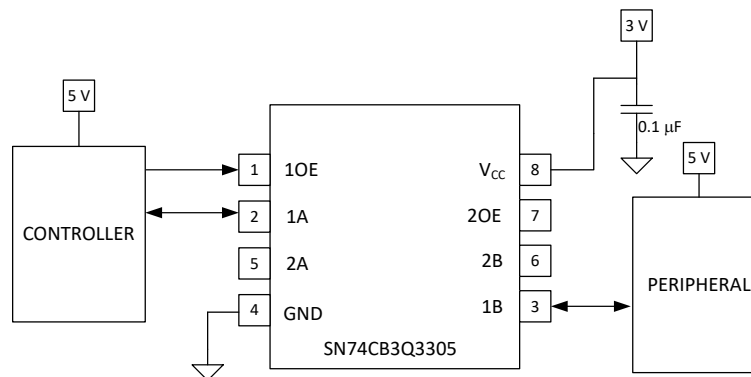


Figure 9-1. Typical Application of the SN74CB3Q3305

9.2.1 Design Requirements

- Recommended Input Conditions:
 - For specified high and low levels, see V_{IH} and V_{IL} in [Section 6.3](#).
 - Inputs and outputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid V_{CC} .
- Absolute Maximum Conditions:
 - I/O currents should not exceed ± 64 mA per channel.
 - Continuous current through GND or V_{CC} should not exceed ± 100 mA.
- Frequency Selection Criterion:
 - Maximum frequency tested is 500 MHz.
 - Added trace resistance/capacitance can reduce maximum frequency capability; use layout practices as directed in [Section 11](#).

9.2.2 Detailed Design Procedure

The 0.1 μ F capacitor should be placed as close as possible to the device.

9.2.3 Application Curve

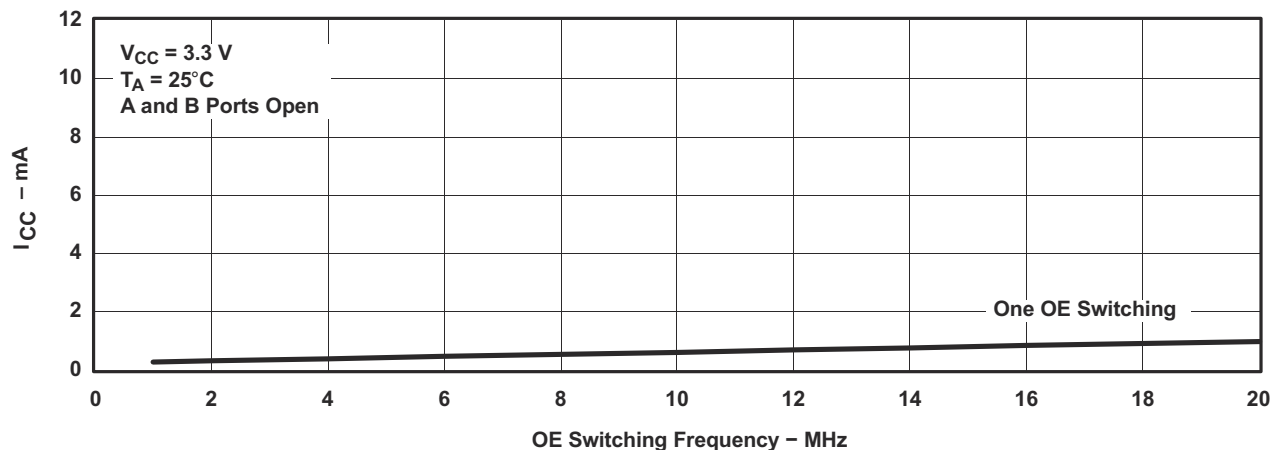


Figure 9-2. Typical I_{CC} vs OE Switching Frequency

10 Power Supply Recommendations

The power supply can be any voltage between the minimum and maximum supply voltage rating listed in [Section 6.1](#) table.

Each V_{CC} terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, a 0.1 μF bypass capacitor is recommended. If multiple pins are labeled V_{CC} , then a 0.01 μF or 0.022 μF capacitor is recommended for each V_{CC} because the V_{CC} pins are tied together internally. For devices with dual-supply pins operating at different voltages, for example V_{CC} and V_{DD} , a 0.1 μF bypass capacitor is recommended for each supply pin. To reject different frequencies of noise, use multiple bypass capacitors in parallel. Capacitors with values of 0.1 μF and 1 μF are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results.

11 Layout

11.1 Layout Guidelines

Reflections and matching are closely related to the loop antenna theory but are different enough to be discussed separately from the theory. When a PCB trace turns a corner at a 90° angle, a reflection can occur. A reflection occurs primarily because of the change of width of the trace. At the apex of the turn, the trace width increases to 1.414 times the width. This increase upsets the transmission-line characteristics, especially the distributed capacitance and self-inductance of the trace which results in the reflection. Not all PCB traces can be straight and therefore some traces must turn corners. [Figure 11-1](#) shows progressively better techniques of rounding corners. Only the last example (BEST) maintains constant trace width and minimizes reflections.

11.2 Layout Example

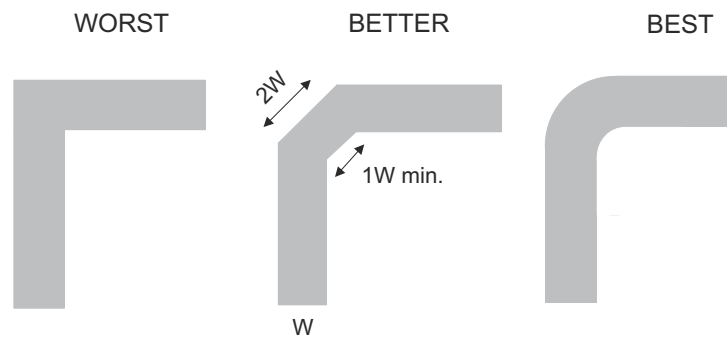


Figure 11-1. Trace Example

12 Device and Documentation Support

12.1 Documentation Support

12.1.1 Related Documentation

For related documentation see the following:

- Texas Instruments, [CBT-C, CB3T, and CB3Q Signal-Switch Families application report](#)
- Texas Instruments, [Implications of Slow or Floating CMOS Inputs application report](#)
- Texas Instruments, [Selecting the Right Texas Instruments Signal Switch application report](#)

12.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](#). Click on *Subscribe to updates* 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.

12.3 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](#).

12.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

All trademarks are the property of their respective owners.

12.5 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.

12.6 Glossary

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

13 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)
74CB3Q3305DCURG4	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	GARR
74CB3Q3305DCURG4.B	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	GARR
SN74CB3Q3305DCUR	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	(GARQ, GARR)
SN74CB3Q3305DCUR.A	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 85	(GARQ, GARR)
SN74CB3Q3305DCUR.B	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 85	(GARQ, GARR)
SN74CB3Q3305PW	Obsolete	Production	TSSOP (PW) 8	-	-	Call TI	Call TI	-40 to 85	BU305
SN74CB3Q3305PWR	Active	Production	TSSOP (PW) 8	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	BU305
SN74CB3Q3305PWR.A	Active	Production	TSSOP (PW) 8	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BU305
SN74CB3Q3305PWR.B	Active	Production	TSSOP (PW) 8	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BU305
SN74CB3Q3305PWRE4	Active	Production	TSSOP (PW) 8	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BU305
SN74CB3Q3305PWRG4	Active	Production	TSSOP (PW) 8	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BU305
SN74CB3Q3305PWRG4.B	Active	Production	TSSOP (PW) 8	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BU305

⁽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.

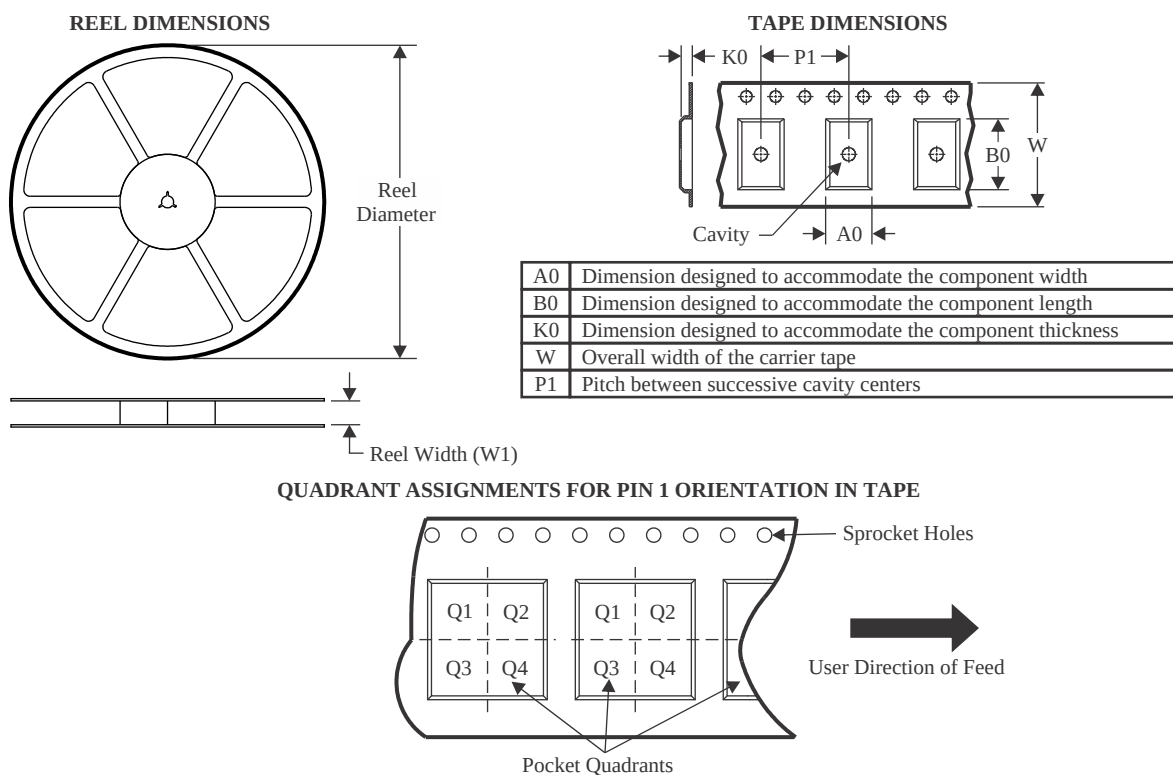
⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

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.

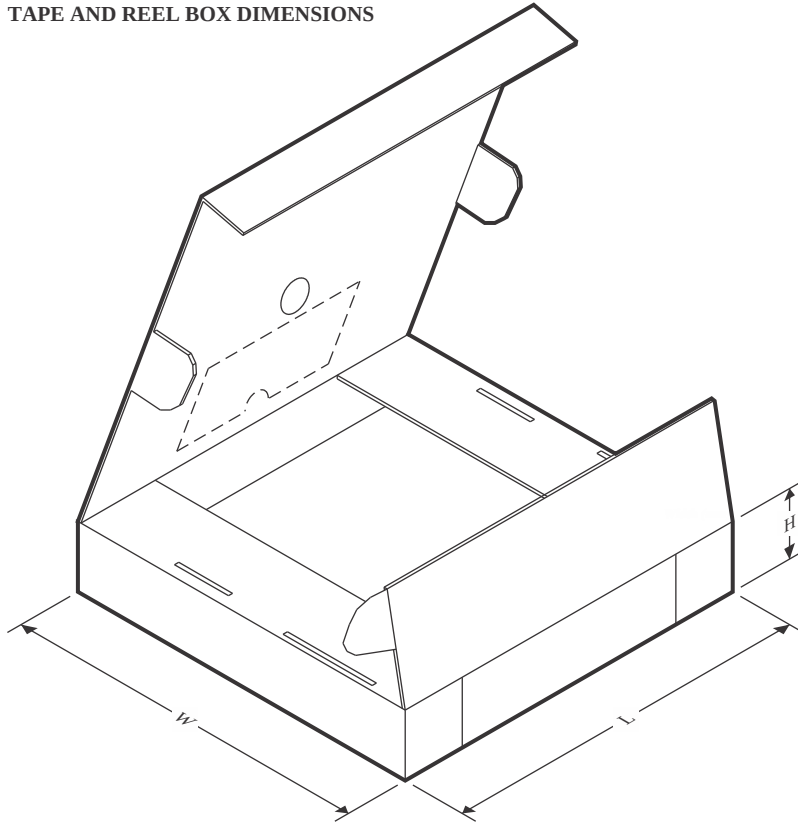
TAPE AND REEL INFORMATION



*All dimensions are nominal

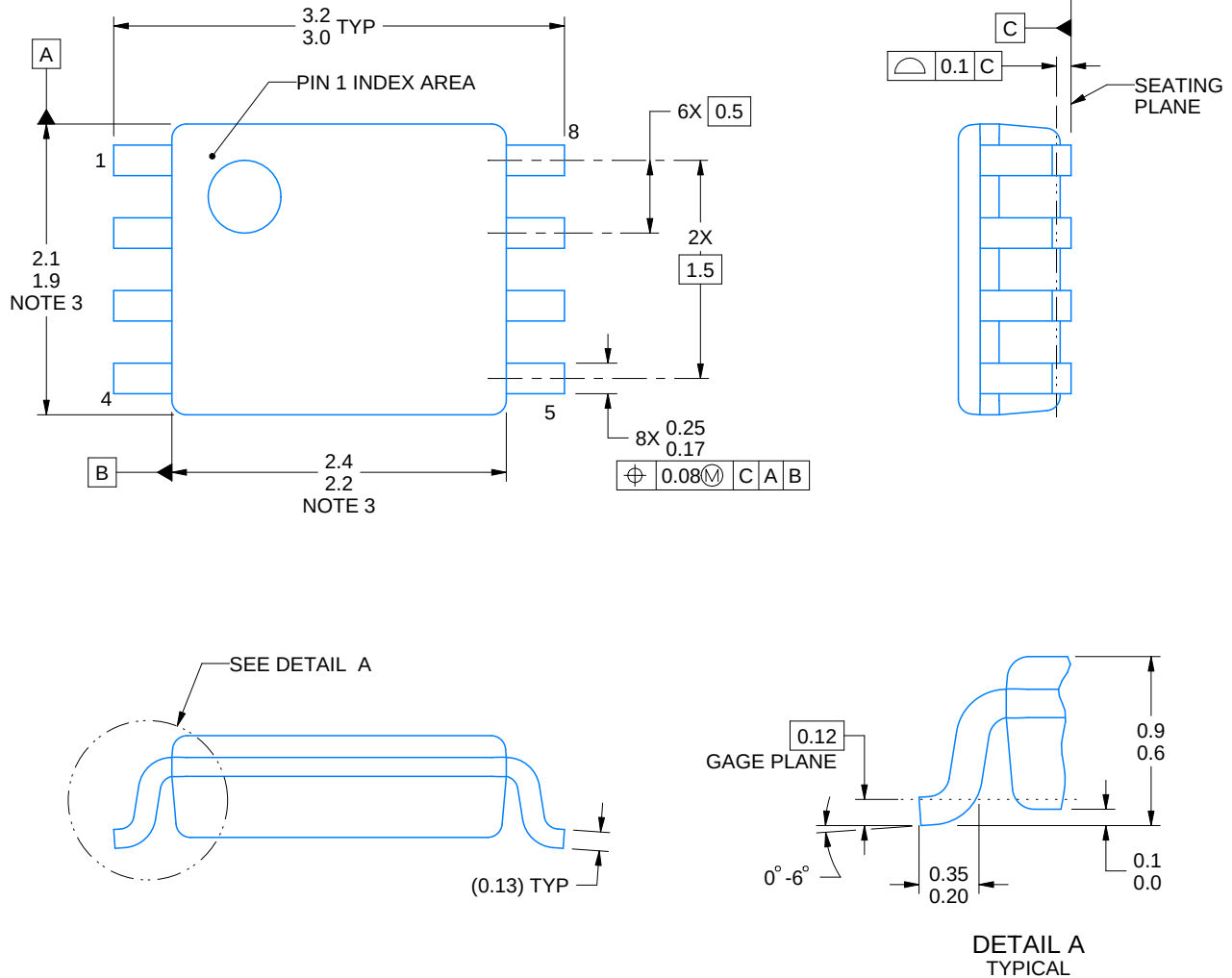
Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
74CB3Q3305DCURG4	VSSOP	DCU	8	3000	180.0	8.4	2.25	3.35	1.05	4.0	8.0	Q3
SN74CB3Q3305DCUR	VSSOP	DCU	8	3000	178.0	9.0	2.25	3.35	1.05	4.0	8.0	Q3
SN74CB3Q3305PWR	TSSOP	PW	8	2000	330.0	12.4	7.0	3.6	1.6	8.0	12.0	Q1
SN74CB3Q3305PWRG4	TSSOP	PW	8	2000	330.0	12.4	7.0	3.6	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)
74CB3Q3305DCURG4	VSSOP	DCU	8	3000	202.0	201.0	28.0
SN74CB3Q3305DCUR	VSSOP	DCU	8	3000	180.0	180.0	18.0
SN74CB3Q3305PWR	TSSOP	PW	8	2000	353.0	353.0	32.0
SN74CB3Q3305PWRG4	TSSOP	PW	8	2000	353.0	353.0	32.0



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NOTES:

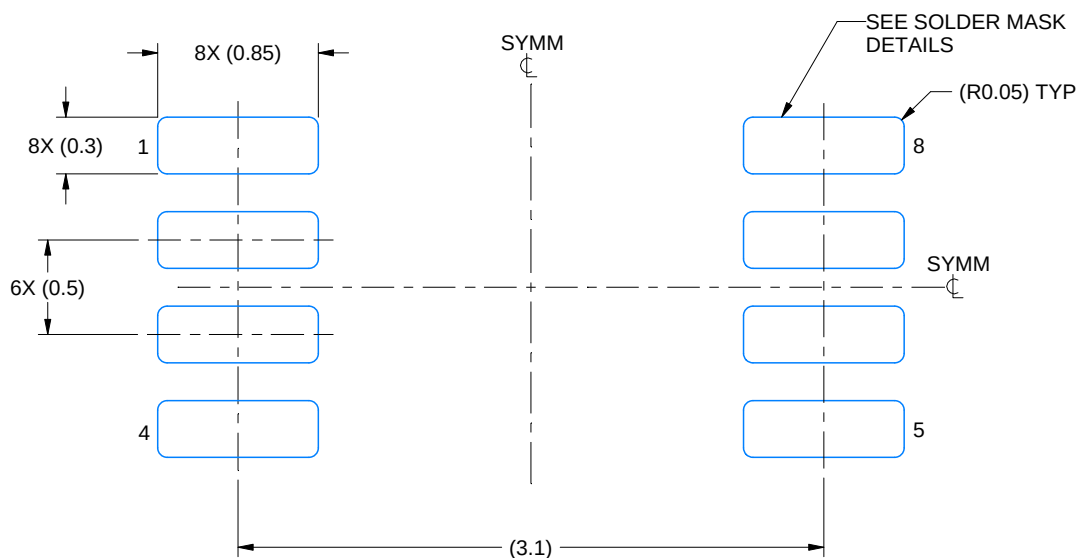
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. Reference JEDEC registration MO-187 variation CA.

EXAMPLE BOARD LAYOUT

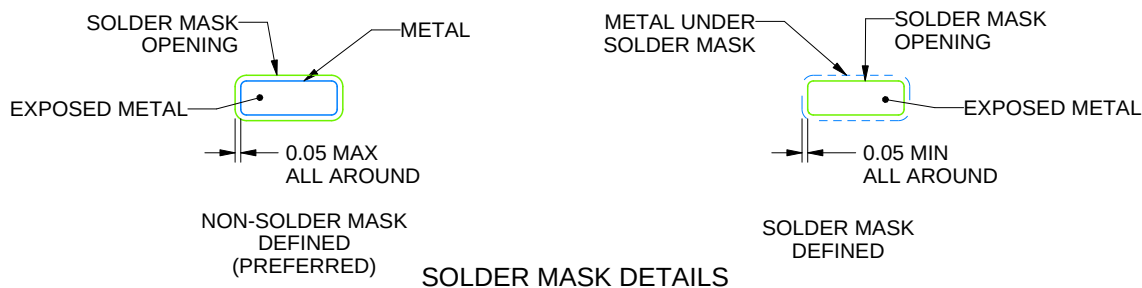
DCU0008A

VSSOP - 0.9 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 25X



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NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.

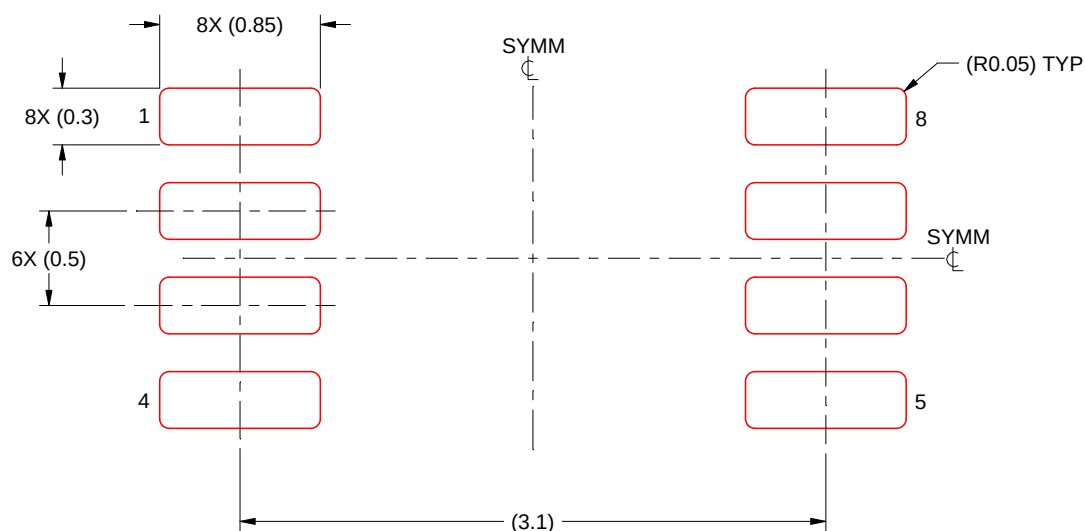
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DCU0008A

VSSOP - 0.9 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 25X

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NOTES: (continued)

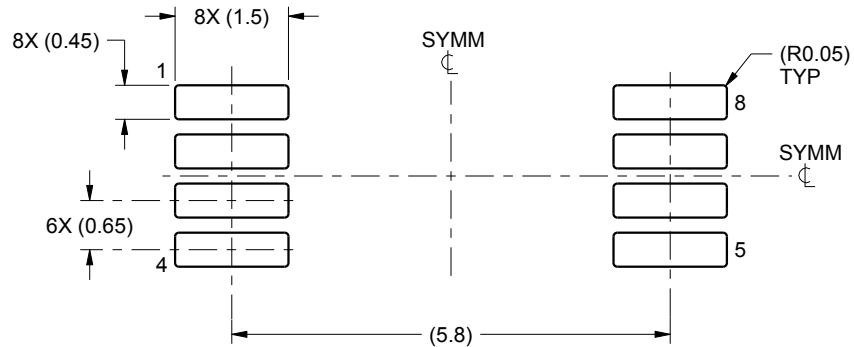
7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

EXAMPLE BOARD LAYOUT

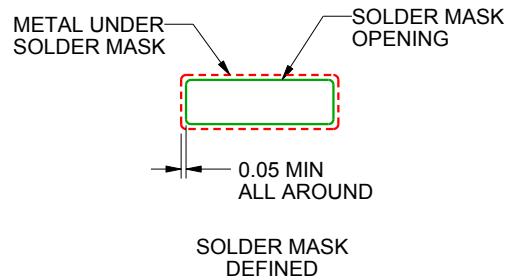
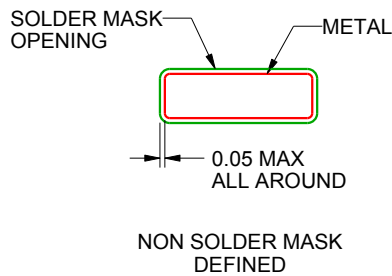
PW0008A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
SCALE:10X



SOLDER MASK DETAILS
NOT TO SCALE

4221848/A 02/2015

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

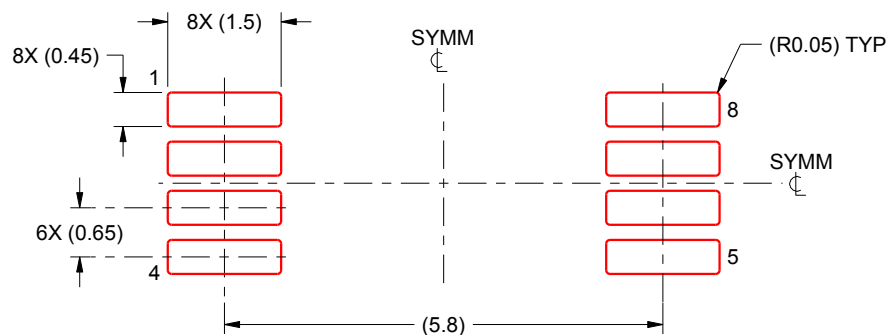
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

PW0008A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



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

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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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