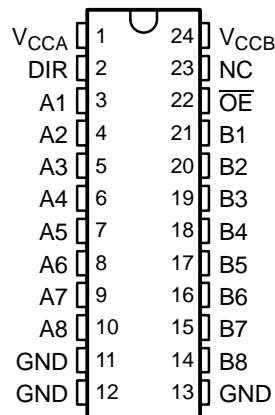


## FEATURES

- Bidirectional Voltage Translator
- 4.5 V to 5.5 V on A Port and 2.7 V to 5.5 V on B Port
- Control Inputs  $V_{IH}/V_{IL}$  Levels Are Referenced to  $V_{CCA}$  Voltage
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

DB, DW, NS, OR PW PACKAGE  
(TOP VIEW)



NC - No internal connection

## DESCRIPTION/ORDERING INFORMATION

This 8-bit (octal) noninverting bus transceiver uses two separate power-supply rails. The A port,  $V_{CCA}$ , is dedicated to accepting a 5-V supply level, and the configurable B port, which is designed to track  $V_{CCB}$ , accepts voltages from 3 V to 5 V. This allows for translation from a 3.3-V to a 5-V environment and vice versa.

The SN74LVCC4245A is designed for asynchronous communication between data buses. The device transmits data from the A bus to the B bus or from the B bus to the A bus, depending on the logic level at the direction-control (DIR) input. The output-enable ( $\overline{OE}$ ) input can be used to disable the device so the buses effectively are isolated. The control circuitry (DIR,  $\overline{OE}$ ) is powered by  $V_{CCA}$ .

## ORDERING INFORMATION

| $T_A$         | PACKAGE <sup>(1)</sup> |                  | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|---------------|------------------------|------------------|-----------------------|------------------|
| –40°C to 85°C | SOIC – DW              | Tube of 25       | SN74LVCC4245ADW       | LVCC4245A        |
|               |                        | Reel of 2000     | SN74LVCC4245ADWR      |                  |
|               | SOP – NS               | Reel of 2000     | SN74LVCC4245ANSR      | LVCC4245A        |
|               | SSOP – DB              | Reel of 2000     | SN74LVCC4245ADBR      | LG245A           |
|               | TSSOP – PW             | Tube of 60       | SN74LVCC4245APW       | LG245A           |
|               |                        | Reel of 2000     | SN74LVCC4245APWR      |                  |
| Reel of 250   |                        | SN74LVCC4245APWT |                       |                  |

(1) Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).

## FUNCTION TABLE (EACH TRANSCEIVER)

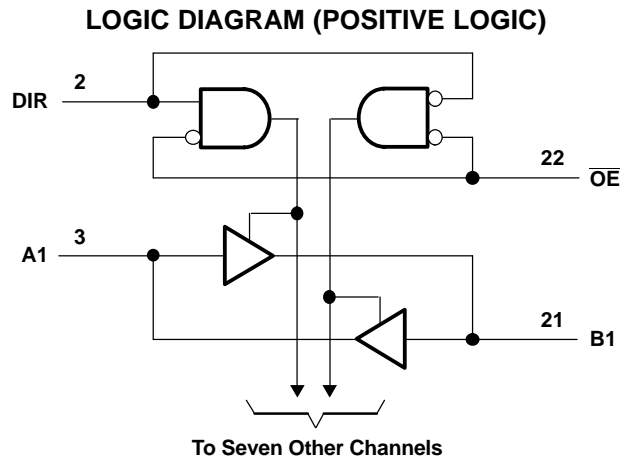
| INPUTS          |     | OPERATION       |
|-----------------|-----|-----------------|
| $\overline{OE}$ | DIR |                 |
| L               | L   | B data to A bus |
| L               | H   | A data to B bus |
| H               | X   | Isolation       |



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

**SN74LVCC4245A**  
**OCTAL DUAL-SUPPLY BUS TRANSCEIVER**  
**WITH CONFIGURABLE OUTPUT VOLTAGE AND 3-STATE OUTPUTS**

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**Absolute Maximum Ratings<sup>(1)</sup>**

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

|                        |   | MIN                | MAX       | UNIT            |      |
|------------------------|---|--------------------|-----------|-----------------|------|
| $V_{CCA}$<br>$V_{CCB}$ | Supply voltage range                                      | -0.5               | 6         | V               |      |
| $V_I$                  | Input voltage range <sup>(2)</sup>                        | I/O ports (A port) | -0.5      | $V_{CCA} + 0.5$ | V    |
|                        |   | I/O ports (B port) | -0.5      | $V_{CCB} + 0.5$ |      |
|                        |   | Except I/O ports   | -0.5      | $V_{CCA} + 0.5$ |      |
| $V_O$                  | Output voltage range <sup>(2)</sup>                       | A port             | -0.5      | $V_{CCA} + 0.5$ | V    |
|                        |   | B port             | -0.5      | $V_{CCB} + 0.5$ |      |
| $I_{IK}$               | Input clamp current                                       |                    | $V_I < 0$ | -50             | mA   |
| $I_{OK}$               | Output clamp current                                      |                    | $V_O < 0$ | -50             | mA   |
| $I_O$                  | Continuous output current                                 |                    |           | ±50             | mA   |
|                        | Continuous current through $V_{CCA}$ , $V_{CCB}$ , or GND |                    |           | ±100            | mA   |
| $\theta_{JA}$          | Package thermal impedance <sup>(3)</sup>                  | DB package         |           | 63              | °C/W |
|                        |   | DW package         |           | 46              |      |
|                        |   | NS package         |           | 65              |      |
|                        |   | PW package         |           | 88              |      |
| $T_{stg}$              | Storage temperature range                                 | -65                | 150       | °C              |      |

- (1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) This value is limited to 6 V maximum.
- (3) The package thermal impedance is calculated in accordance with JESD 51-7.

**Recommended Operating Conditions<sup>(1)</sup>**

|           |  | $V_{CCA}$ | $V_{CCB}$      | MIN  | NOM | MAX       | UNIT |
|-----------|--|-----------|----------------|------|-----|-----------|------|
| $V_{CCA}$ | Supply voltage   |           |                | 4.5  | 5   | 5.5       | V    |
| $V_{CCB}$ | Supply voltage   |           |                | 2.7  | 3.3 | 5.5       | V    |
| $V_{IHA}$ | High-level input voltage   | 4.5 V     | 2.7 V          | 2    |     |           | V    |
|           |  |           | 3.6 V          | 2    |     |           |      |
|           |  | 5.5 V     | 5.5 V          | 2    |     |           |      |
| $V_{IHB}$ | High-level input voltage   | 4.5 V     | 2.7 V          | 2    |     |           | V    |
|           |  |           | 3.6 V          | 2    |     |           |      |
|           |  | 5.5 V     | 5.5 V          | 3.85 |     |           |      |
| $V_{ILA}$ | Low-level input voltage  | 4.5 V     | 2.7 V          |      |     | 0.8       | V    |
|           |  |           | 3.6 V          |      |     | 0.8       |      |
|           |  | 5.5 V     | 5.5 V          |      |     | 0.8       |      |
| $V_{ILB}$ | Low-level input voltage  | 4.5 V     | 2.7 V          |      |     | 0.8       | V    |
|           |  |           | 3.6 V          |      |     | 0.8       |      |
|           |  | 5.5 V     | 5.5 V          |      |     | 1.65      |      |
| $V_{IH}$  | High-level input voltage (control pins) (referenced to $V_{CCA}$ ) | 4.5 V     | 2.7 V          | 2    |     |           | V    |
|           |  |           | 3.6 V          | 2    |     |           |      |
|           |  | 5.5 V     | 5.5 V          | 2    |     |           |      |
| $V_{IL}$  | Low-level input voltage (control pins) (referenced to $V_{CCA}$ )  | 4.5 V     | 2.7 V          |      |     | 0.8       | V    |
|           |  |           | 3.6 V          |      |     | 0.8       |      |
|           |  | 5.5 V     | 5.5 V          |      |     | 0.8       |      |
| $V_{IA}$  | Input voltage  |           |                | 0    |     | $V_{CCA}$ | V    |
| $V_{IB}$  | Input voltage  |           |                | 0    |     | $V_{CCB}$ | V    |
| $V_{OA}$  | Output voltage   |           |                | 0    |     | $V_{CCA}$ | V    |
| $V_{OB}$  | Output voltage   |           |                | 0    |     | $V_{CCB}$ | V    |
| $I_{OHA}$ | High-level output current  | 4.5 V     | 3 V            |      |     | –24       | mA   |
| $I_{OHB}$ | High-level output current  | 4.5 V     | 2.7 V to 4.5 V |      |     | –24       | mA   |
| $I_{OLA}$ | Low-level output current   | 4.5 V     | 3 V            |      |     | 24        | mA   |
| $I_{OLB}$ | Low-level output current   | 4.5 V     | 2.7 V to 4.5 V |      |     | 24        | mA   |
| $T_A$     | Operating free-air temperature                                     |           |                | –40  |     | 85        | °C   |

(1) All unused inputs of the device must be held at the associated  $V_{CC}$  or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

**SN74LVCC4245A**  
**OCTAL DUAL-SUPPLY BUS TRANSCEIVER**  
**WITH CONFIGURABLE OUTPUT VOLTAGE AND 3-STATE OUTPUTS**



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**Electrical Characteristics**

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

| PARAMETER                        |                 | TEST CONDITIONS  | V <sub>CCA</sub> | V <sub>CCB</sub> | MIN  | TYP  | MAX  | UNIT |
|----------------------------------|-----------------|--|------------------|------------------|------|------|------|------|
| V <sub>OHA</sub>                 |                 | I <sub>OH</sub> = -100 μA  | 4.5 V            | 3 V              | 4.4  | 4.49 |      | V    |
|                                  |                 | I <sub>OH</sub> = -24 mA   | 4.5 V            | 3 V              | 3.76 | 4.25 |      |      |
| V <sub>OHB</sub>                 |                 | I <sub>OH</sub> = -100 μA  | 4.5 V            | 3 V              | 2.9  | 2.99 |      | V    |
|                                  |                 | I <sub>OH</sub> = -12 mA   | 4.5 V            | 2.7 V            | 2.2  | 2.5  |      |      |
|                                  |                 |  |                  | 3 V              | 2.46 | 2.85 |      |      |
|                                  |                 | I <sub>OH</sub> = -24 mA   | 4.5 V            | 2.7 V            | 2.1  | 2.3  |      |      |
|                                  |                 |  |                  | 3 V              | 2.25 | 2.65 |      |      |
|                                  | 4.5 V           |  |                  | 3.76             | 4.25 |      |      |      |
| V <sub>OLA</sub>                 |                 | I <sub>OL</sub> = 100 μA   | 4.5 V            | 3 V              |      |      | 0.1  | V    |
|                                  |                 | I <sub>OL</sub> = 24 mA  | 4.5 V            | 3 V              |      | 0.21 | 0.44 |      |
| V <sub>OLB</sub>                 |                 | I <sub>OL</sub> = 100 μA   | 4.5 V            | 3 V              |      |      | 0.1  | V    |
|                                  |                 | I <sub>OL</sub> = 12 mA  | 4.5 V            | 2.7 V            |      | 0.11 | 0.44 |      |
|                                  |                 |  |                  | 2.7 V            |      | 0.22 | 0.5  |      |
|                                  |                 | I <sub>OL</sub> = 24 mA  | 4.5 V            | 3 V              |      | 0.21 | 0.44 |      |
|                                  |                 |  |                  | 4.5 V            |      | 0.18 | 0.44 |      |
|                                  |                 |  |                  |                  |      |      |      |      |
| I <sub>I</sub>                   | Control inputs  | V <sub>I</sub> = V <sub>CCA</sub> or GND   | 5.5 V            | 3.6 V            |      | ±0.1 | ±1   | μA   |
|                                  |                 |  |                  | 5.5 V            |      | ±0.1 | ±1   |      |
| I <sub>OZ</sub> <sup>(1)</sup>   | A or B ports    | V <sub>O</sub> = V <sub>CCA/B</sub> or GND, V <sub>I</sub> = V <sub>IL</sub> or V <sub>IH</sub>  | 5.5 V            | 3.6 V            |      | ±0.5 | ±5   | μA   |
| I <sub>CCA</sub>                 | B to A          | A <sub>n</sub> = V <sub>CC</sub> or GND  | 5.5 V            | Open             |      | 8    | 80   | μA   |
|                                  |                 | I <sub>O</sub> (A port) = 0, B <sub>n</sub> = V <sub>CCB</sub> or GND  | 5.5 V            | 3.6 V            |      | 8    | 80   |      |
|                                  |                 |  |                  | 5.5 V            |      | 8    | 80   |      |
| I <sub>CCB</sub>                 | A to B          | A <sub>n</sub> = V <sub>CCA</sub> or GND, I <sub>O</sub> (B port) = 0  | 5.5 V            | 3.6 V            |      | 5    | 50   | μA   |
|                                  |                 |  |                  | 5.5 V            |      | 8    | 80   |      |
| ΔI <sub>CCA</sub> <sup>(2)</sup> | A port          | V <sub>I</sub> = V <sub>CCA</sub> - 2.1 V, Other inputs at V <sub>CCA</sub> or GND, $\overline{OE}$ at GND and DIR at V <sub>CCA</sub> | 5.5 V            | 5.5 V            |      | 1.35 | 1.5  | mA   |
|                                  | $\overline{OE}$ | V <sub>I</sub> = V <sub>CCA</sub> - 2.1 V, Other inputs at V <sub>CCA</sub> or GND, DIR at V <sub>CCA</sub> or GND                     | 5.5 V            | 5.5 V            |      | 1    | 1.5  |      |
|                                  | DIR             | V <sub>I</sub> = V <sub>CCA</sub> - 2.1 V, Other inputs at V <sub>CCA</sub> or GND, $\overline{OE}$ at V <sub>CCA</sub> or GND         | 5.5 V            | 3.6 V            |      | 1    | 1.5  |      |
| ΔI <sub>CCB</sub> <sup>(2)</sup> | B port          | V <sub>I</sub> = V <sub>CCB</sub> - 0.6 V, Other inputs at V <sub>CCB</sub> or GND, $\overline{OE}$ at GND and DIR at GND              | 5.5 V            | 3.6 V            |      | 0.35 | 0.5  | mA   |
| C <sub>i</sub>                   | Control inputs  | V <sub>I</sub> = V <sub>CCA</sub> or GND   | Open             | Open             |      | 5    |      | pF   |
| C <sub>io</sub>                  | A or B ports    | V <sub>O</sub> = V <sub>CCA/B</sub> or GND   | 5 V              | 3.3 V            |      | 11   |      | pF   |

(1) For I/O ports, the parameter I<sub>OZ</sub> includes the input leakage current.

(2) This is the increase in supply current for each input that is at one of the specified TTL voltage levels, rather than 0 V or the associated V<sub>CC</sub>.

### Switching Characteristics

over recommended operating free-air temperature range,  $C_L = 50$  pF (unless otherwise noted) (see Figure 1 through Figure 4)

| PARAMETER | FROM (INPUT)    | TO (OUTPUT) | $V_{CCA} = 5\text{ V} \pm 0.5\text{ V}$ ,<br>$V_{CCB} = 5\text{ V} \pm 0.5\text{ V}$ |     | $V_{CCA} = 5\text{ V} \pm 0.5\text{ V}$ ,<br>$V_{CCB} = 2.7\text{ V to } 3.6\text{ V}$ |      | UNIT |
|-----------|-----------------|-------------|--|-----|--|------|------|
|           |                 |             | MIN  | MAX | MIN  | MAX  |      |
| $t_{PHL}$ | A               | B           | 1  | 7.1 | 1  | 7    | ns   |
| $t_{PLH}$ |                 |             | 1  | 6   | 1  | 7    |      |
| $t_{PHL}$ | B               | A           | 1  | 6.8 | 1  | 6.2  | ns   |
| $t_{PLH}$ |                 |             | 1  | 6.1 | 1  | 5.3  |      |
| $t_{PZL}$ | $\overline{OE}$ | A           | 1  | 9   | 1  | 9    | ns   |
| $t_{PZH}$ |                 |             | 1  | 8.3 | 1  | 8    |      |
| $t_{PZL}$ | $\overline{OE}$ | B           | 1  | 8.2 | 1  | 10   | ns   |
| $t_{PZH}$ |                 |             | 1  | 8.1 | 1  | 10.2 |      |
| $t_{PLZ}$ | $\overline{OE}$ | A           | 1  | 4.7 | 1  | 5.2  | ns   |
| $t_{PHZ}$ |                 |             | 1  | 4.9 | 1  | 5.2  |      |
| $t_{PLZ}$ | $\overline{OE}$ | B           | 1  | 5.4 | 1  | 5.4  | ns   |
| $t_{PHZ}$ |                 |             | 1  | 6.3 | 1  | 7.4  |      |

### Operating Characteristics

$V_{CCA} = 5\text{ V}$ ,  $V_{CCB} = 3.3\text{ V}$ ,  $T_A = 25^\circ\text{C}$

| PARAMETER |   | TEST CONDITIONS  | TYP | UNIT |
|-----------|---|------------------|-----|------|
| $C_{pd}$  | Power dissipation capacitance per transceiver | Outputs enabled  | 20  | pF   |
|           |   | Outputs disabled | 6.5 |      |

### Power-Up Considerations<sup>(1)</sup>

TI level-translation devices offer an opportunity for successful mixed-voltage signal design. A proper power-up sequence always should be followed to avoid excessive supply current, bus contention, oscillations, or other anomalies caused by improperly biased device pins. Take these precautions to guard against such power-up problems:

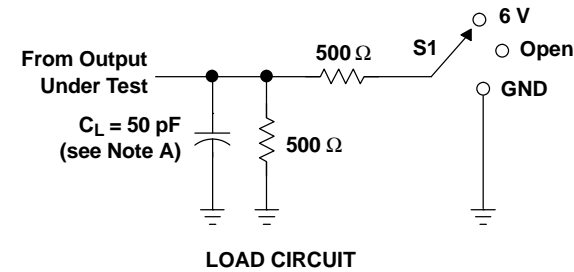
1. Connect ground before any supply voltage is applied.
2. Power up the control side of the device ( $V_{CCA}$  for all four of these devices).
3. Tie  $\overline{OE}$  to  $V_{CCA}$  with a pullup resistor so that it ramps with  $V_{CCA}$ .
4. Depending on the direction of the data path, DIR can be high or low. If DIR high is needed (A data to B bus), ramp it with  $V_{CCA}$ . Otherwise, keep DIR low.

(1) Refer to the TI application report, *Texas Instruments Voltage-Level-Translation Devices*, literature number SCEA021.

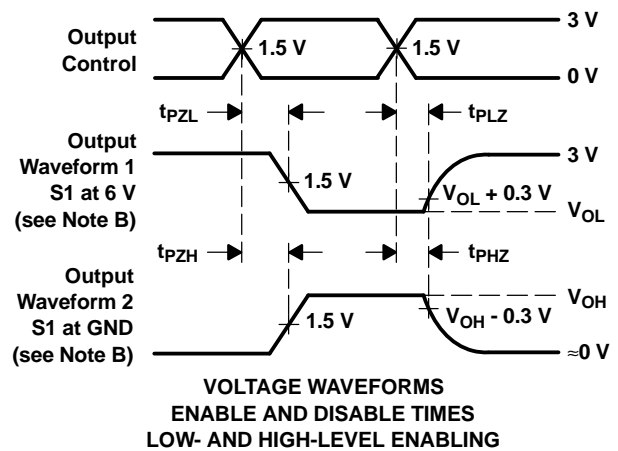
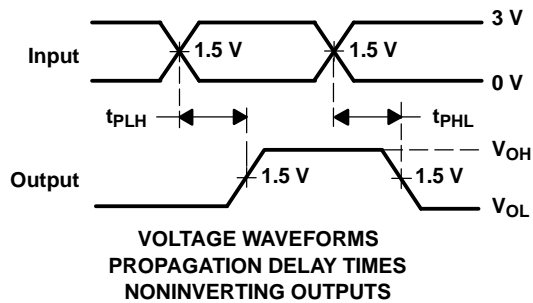
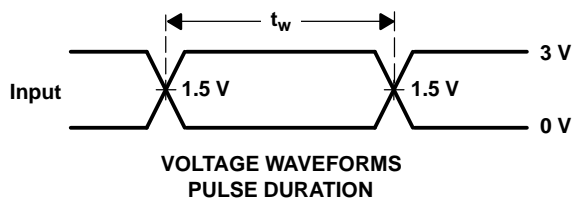
**SN74LVCC4245A**  
**OCTAL DUAL-SUPPLY BUS TRANSCEIVER**  
**WITH CONFIGURABLE OUTPUT VOLTAGE AND 3-STATE OUTPUTS**

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**PARAMETER MEASUREMENT INFORMATION FOR A TO B**  
 $V_{CCA} = 4.5 \text{ V TO } 5.5 \text{ V AND } V_{CCB} = 2.7 \text{ V TO } 3.6 \text{ V}$



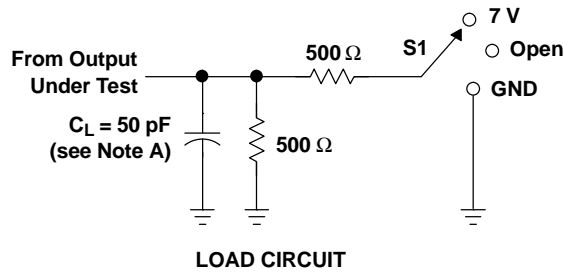
| TEST              | S1   |
|-------------------|------|
| $t_{PLH}/t_{PHL}$ | Open |
| $t_{PLZ}/t_{PZL}$ | 6 V  |
| $t_{PHZ}/t_{PZH}$ | GND  |



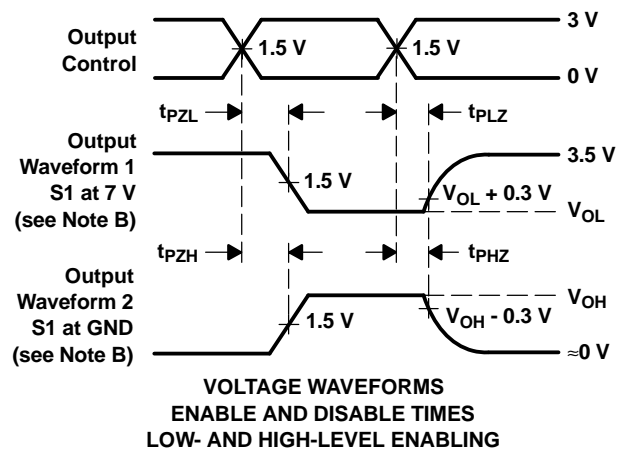
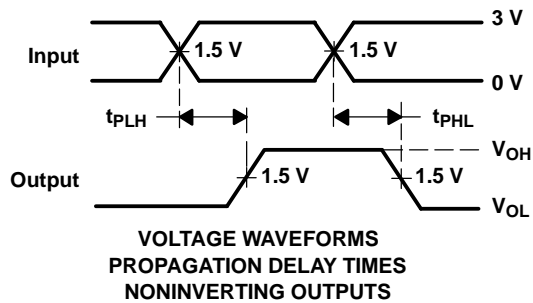
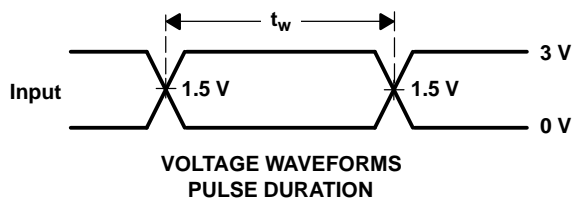
- NOTES: A.  $C_L$  includes probe and jig capacitance.  
B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.  
C. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 10 \text{ MHz}$ ,  $Z_O = 50 \Omega$ ,  $t_r \leq 2.5 \text{ ns}$ ,  $t_f \leq 2.5 \text{ ns}$ .  
D. The outputs are measured one at a time, with one transition per measurement.  
E. All parameters and waveforms are not applicable to all devices.

**Figure 1. Load Circuit and Voltage Waveforms**

PARAMETER MEASUREMENT INFORMATION FOR A TO B  
 $V_{CCA} = 4.5\text{ V TO }5.5\text{ V}$  AND  $V_{CCB} = 3.6\text{ V TO }5.5\text{ V}$



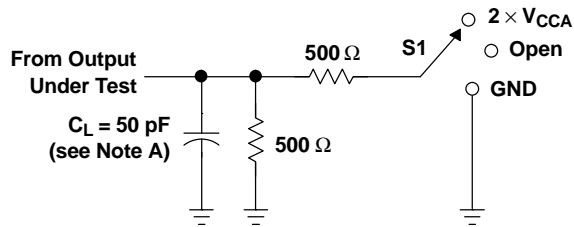
| TEST              | S1   |
|-------------------|------|
| $t_{PLH}/t_{PHL}$ | Open |
| $t_{PLZ}/t_{PZL}$ | 7 V  |
| $t_{PHZ}/t_{PZH}$ | GND  |



- 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:  $PRR \leq 10\text{ MHz}$ ,  $Z_O = 50\ \Omega$ ,  $t_r \leq 2.5\text{ ns}$ ,  $t_f \leq 2.5\text{ ns}$ .  
D. The outputs are measured one at a time, with one transition per measurement.  
E. All parameters and waveforms are not applicable to all devices.

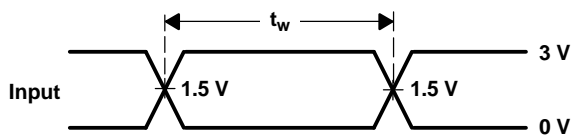
Figure 2. Load Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION FOR B TO A  
 $V_{CCA} = 4.5\text{ V to }5.5\text{ V}$  AND  $V_{CCB} = 2.7\text{ V TO }3.6\text{ V}$

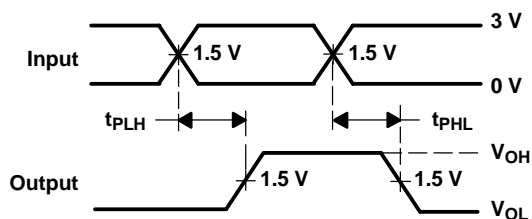


LOAD CIRCUIT

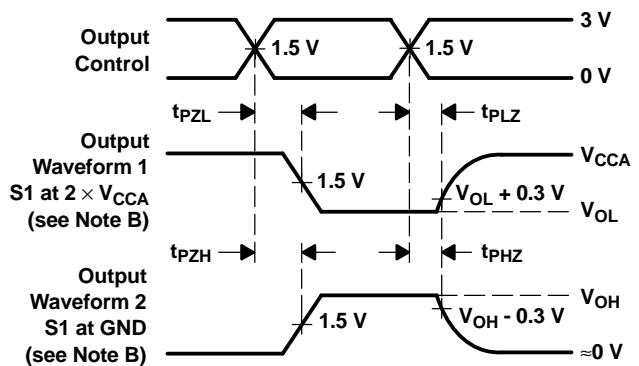
| TEST              | S1                 |
|-------------------|--------------------|
| $t_{PLH}/t_{PHL}$ | Open               |
| $t_{PLZ}/t_{PZL}$ | $2 \times V_{CCA}$ |
| $t_{PHZ}/t_{PZH}$ | GND                |



VOLTAGE WAVEFORMS  
 PULSE DURATION



VOLTAGE WAVEFORMS  
 PROPAGATION DELAY TIMES  
 NONINVERTING OUTPUTS



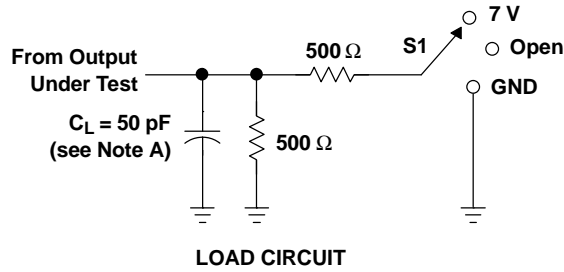
VOLTAGE WAVEFORMS  
 ENABLE AND DISABLE TIMES  
 LOW- AND HIGH-LEVEL ENABLING

- 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:  $PRR \leq 10\text{ MHz}$ ,  $Z_O = 50\ \Omega$ ,  $t_r \leq 2.5\text{ ns}$ ,  $t_f \leq 2.5\text{ ns}$ .  
 D. The outputs are measured one at a time, with one transition per measurement.  
 E. All parameters and waveforms are not applicable to all devices.

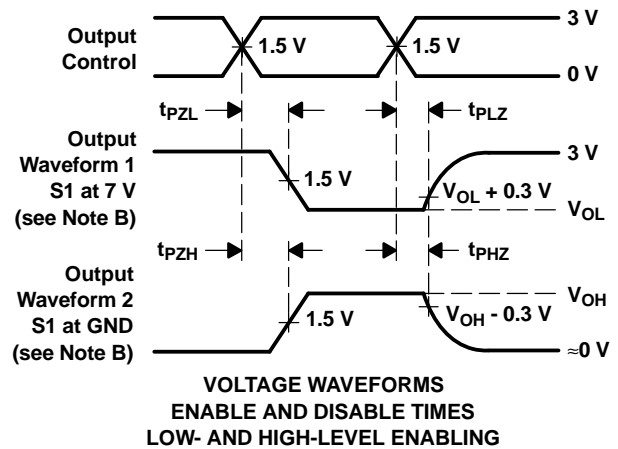
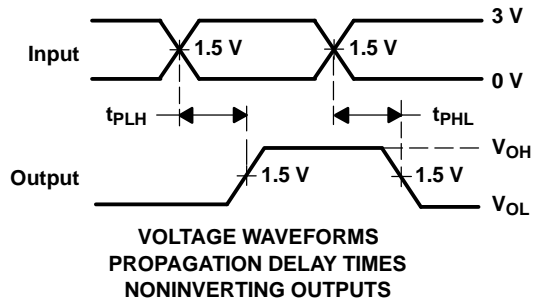
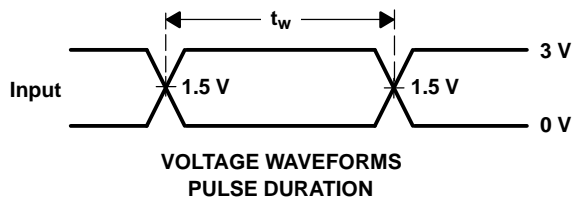
Figure 3. Load Circuit and Voltage Waveforms



PARAMETER MEASUREMENT INFORMATION FOR B TO A  
 $V_{CCA} = 4.5\text{ V TO }5.5\text{ V}$  AND  $V_{CCB} = 3.6\text{ V TO }5.5\text{ V}$



| TEST              | S1   |
|-------------------|------|
| $t_{PLH}/t_{PHL}$ | Open |
| $t_{PLZ}/t_{PZL}$ | 7 V  |
| $t_{PHZ}/t_{PZH}$ | GND  |



- 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:  $PRR \leq 10\text{ MHz}$ ,  $Z_O = 50\ \Omega$ ,  $t_r \leq 2.5\text{ ns}$ ,  $t_f \leq 2.5\text{ ns}$ .  
D. The outputs are measured one at a time, with one transition per measurement.  
E. All parameters and waveforms are not applicable to all devices.

Figure 4. Load Circuit and Voltage Waveforms

**PACKAGING INFORMATION**

| Orderable Device   | Status<br>(1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan<br>(2) | Lead finish/<br>Ball material<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|--------------------|---------------|--------------|-----------------|------|-------------|-----------------|--------------------------------------|----------------------|--------------|-------------------------|-------------------------|
| SN74LVCC4245ADBR   | ACTIVE        | SSOP         | DB              | 24   | 2000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LG245A                  | <a href="#">Samples</a> |
| SN74LVCC4245ADW    | ACTIVE        | SOIC         | DW              | 24   | 25          | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LVCC4245A               | <a href="#">Samples</a> |
| SN74LVCC4245ADWE4  | ACTIVE        | SOIC         | DW              | 24   | 25          | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LVCC4245A               | <a href="#">Samples</a> |
| SN74LVCC4245ADWR   | ACTIVE        | SOIC         | DW              | 24   | 2000        | RoHS & Green    | NIPDAU   SN                          | Level-1-260C-UNLIM   | -40 to 85    | LVCC4245A               | <a href="#">Samples</a> |
| SN74LVCC4245ADWRG4 | ACTIVE        | SOIC         | DW              | 24   | 2000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LVCC4245A               | <a href="#">Samples</a> |
| SN74LVCC4245ANSR   | ACTIVE        | SO           | NS              | 24   | 2000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LVCC4245A               | <a href="#">Samples</a> |
| SN74LVCC4245APW    | ACTIVE        | TSSOP        | PW              | 24   | 60          | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LG245A                  | <a href="#">Samples</a> |
| SN74LVCC4245APWR   | ACTIVE        | TSSOP        | PW              | 24   | 2000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LG245A                  | <a href="#">Samples</a> |
| SN74LVCC4245APWRE4 | ACTIVE        | TSSOP        | PW              | 24   | 2000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LG245A                  | <a href="#">Samples</a> |
| SN74LVCC4245APWRG4 | ACTIVE        | TSSOP        | PW              | 24   | 2000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LG245A                  | <a href="#">Samples</a> |
| SN74LVCC4245APWT   | ACTIVE        | TSSOP        | PW              | 24   | 250         | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LG245A                  | <a href="#">Samples</a> |
| SN74LVCC4245APWTE4 | ACTIVE        | TSSOP        | PW              | 24   | 250         | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | LG245A                  | <a href="#">Samples</a> |

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

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

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

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

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

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

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

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

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

- (3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.
- (4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.
- (5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.
- (6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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**OTHER QUALIFIED VERSIONS OF SN74LVCC4245A :**

- Enhanced Product : [SN74LVCC4245A-EP](#)

NOTE: Qualified Version Definitions:

- Enhanced Product - Supports Defense, Aerospace and Medical Applications

**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 |
|--------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LVCC4245ADBR   | SSOP         | DB              | 24   | 2000 | 330.0              | 16.4               | 8.2     | 8.8     | 2.5     | 12.0    | 16.0   | Q1            |
| SN74LVCC4245ADWR   | SOIC         | DW              | 24   | 2000 | 330.0              | 24.4               | 10.75   | 15.7    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74LVCC4245ADWR   | SOIC         | DW              | 24   | 2000 | 330.0              | 24.4               | 10.75   | 15.7    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74LVCC4245ADWRG4 | SOIC         | DW              | 24   | 2000 | 330.0              | 24.4               | 10.75   | 15.7    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74LVCC4245ANSR   | SO           | NS              | 24   | 2000 | 330.0              | 24.4               | 8.3     | 15.4    | 2.6     | 12.0    | 24.0   | Q1            |
| SN74LVCC4245APWR   | TSSOP        | PW              | 24   | 2000 | 330.0              | 16.4               | 6.95    | 8.3     | 1.6     | 8.0     | 16.0   | Q1            |
| SN74LVCC4245APWT   | TSSOP        | PW              | 24   | 250  | 330.0              | 16.4               | 6.95    | 8.3     | 1.6     | 8.0     | 16.0   | Q1            |

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

| Device             | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|--------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LVCC4245ADBR   | SSOP         | DB              | 24   | 2000 | 356.0       | 356.0      | 35.0        |
| SN74LVCC4245ADWR   | SOIC         | DW              | 24   | 2000 | 350.0       | 350.0      | 43.0        |
| SN74LVCC4245ADWR   | SOIC         | DW              | 24   | 2000 | 364.0       | 361.0      | 36.0        |
| SN74LVCC4245ADWRG4 | SOIC         | DW              | 24   | 2000 | 350.0       | 350.0      | 43.0        |
| SN74LVCC4245ANSR   | SO           | NS              | 24   | 2000 | 367.0       | 367.0      | 45.0        |
| SN74LVCC4245APWR   | TSSOP        | PW              | 24   | 2000 | 356.0       | 356.0      | 35.0        |
| SN74LVCC4245APWT   | TSSOP        | PW              | 24   | 250  | 356.0       | 356.0      | 35.0        |

**TUBE**


\*All dimensions are nominal

| Device            | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|-------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| SN74LVCC4245ADW   | DW           | SOIC         | 24   | 25  | 506.98 | 12.7   | 4826   | 6.6    |
| SN74LVCC4245ADWE4 | DW           | SOIC         | 24   | 25  | 506.98 | 12.7   | 4826   | 6.6    |
| SN74LVCC4245APW   | PW           | TSSOP        | 24   | 60  | 530    | 10.2   | 3600   | 3.5    |

PW0024A



# PACKAGE OUTLINE

## TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



4220208/A 02/2017

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

PW0024A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



SOLDER MASK DETAILS

4220208/A 02/2017

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

PW0024A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



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

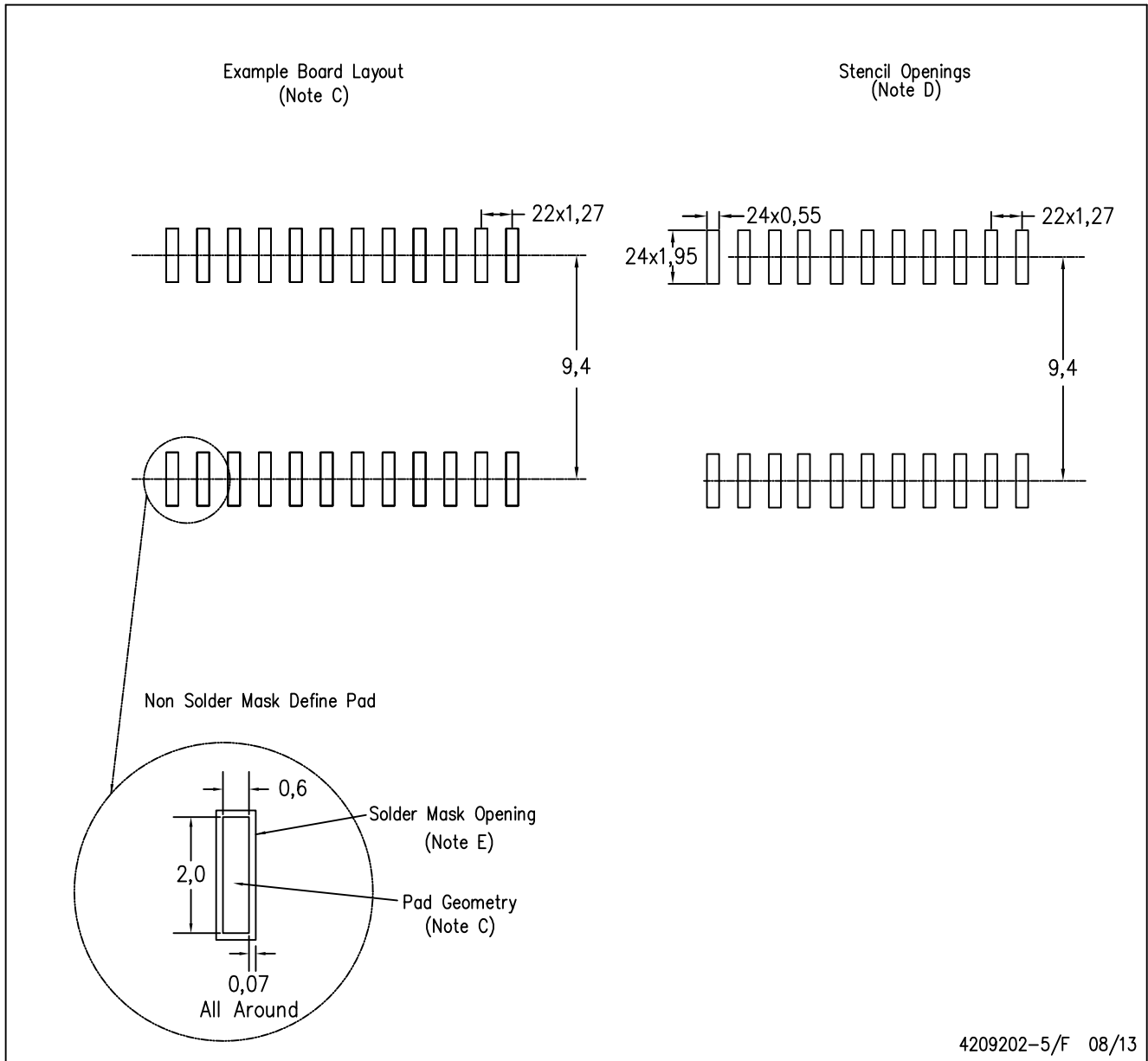


- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



DW (R-PDSO-G24)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Refer to IPC7351 for alternate board design.
  - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525
  - Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

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

PLASTIC SMALL-OUTLINE

28 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.  
 D. Falls within JEDEC MO-150

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