

## SN74LVC1G29 2-of-3 Decoder/Demultiplexer

Check for Samples: [SN74LVC1G29](#)

### FEATURES

- Available in the Texas Instruments NanoFree™ Package
- Supports 5-V  $V_{CC}$  Operation
- Inputs Accept Voltages to 5.5 V
- Supports Down Translation to  $V_{CC}$
- Max  $t_{pd}$  of 5.1 ns at 3.3 V
- Low Power Consumption, 10- $\mu$ A Max  $I_{CC}$
- $\pm 24$ -mA Output Drive at 3.3 V
- Typical  $V_{OLP}$  (Output Ground Bounce)  $< 0.8$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot)  $> 2$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- $I_{off}$  Supports Live Insertion, Partial-Power-Down Mode, and Back-Drive Protection
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

### DESCRIPTION

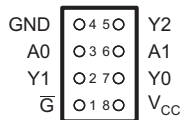
This decoder is designed for 1.65-V to 5.5-V  $V_{CC}$  operation.

The SN74LVC1G29 device is a 2-of-3 decoder/demultiplexer. When the enable ( $\overline{G}$ ) input signal is low, only one of the outputs is in the low state, depending on the input levels of A0 and A1. When  $\overline{G}$  is high, Y0, Y1, and Y2 are high, regardless of the input states.

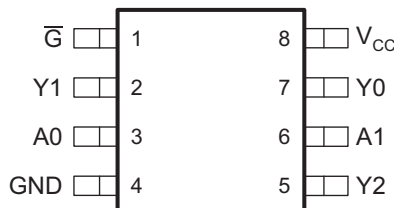
This device is fully specified for partial-power-down applications using  $I_{off}$ . The  $I_{off}$  circuitry disable the outputs, preventing damaging current backflow through the device when it is powered down.

NanoFree™ package technology is a major breakthrough in IC packaging concepts, using the die as the package.

**YZP PACKAGE  
(BOTTOM VIEW)**

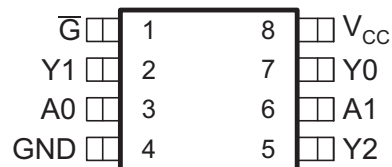


**DCT PACKAGE  
(TOP VIEW)**



See mechanical drawings for dimensions.

**DCU PACKAGE  
(TOP VIEW)**



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.

NanoFree is a trademark of Texas Instruments.

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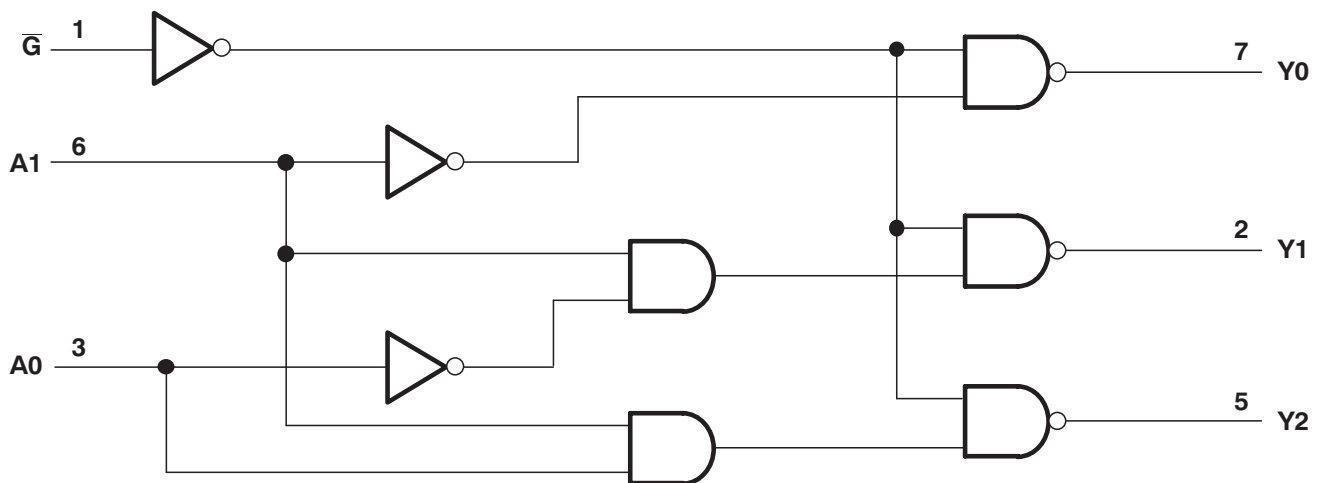


These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

**Function Table**

| INPUTS    |    |    | OUTPUTS |    |    |
|-----------|----|----|---------|----|----|
| $\bar{G}$ | A1 | A0 | Y0      | Y1 | Y2 |
| L         | L  | X  | L       | H  | H  |
| L         | H  | L  | H       | L  | H  |
| L         | H  | H  | H       | H  | L  |
| H         | X  | X  | H       | H  | H  |

**Logic Diagram (Positive Logic)**



## Absolute Maximum Ratings

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

|               |   | MIN         | MAX            | UNIT    |
|---------------|---|-------------|----------------|---------|
| $V_{CC}$      | Supply voltage range  | -0.5        | 6.5            | V       |
| $V_I$         | Input voltage range <sup>(2)</sup>  | -0.5        | 6.5            | V       |
| $V_O$         | Voltage range applied to any output in the high-impedance or power-off state <sup>(2)</sup> | -0.5        | 6.5            | V       |
| $V_O$         | Voltage range applied to any output in the high or low state <sup>(2)(3)</sup>              | -0.5        | $V_{CC} + 0.5$ | V       |
| $I_{IK}$      | 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 $V_{CC}$ or GND  |             |                | ±100 mA |
| $\theta_{JA}$ | Package thermal impedance <sup>(4)</sup>  | DCT package |                | 220     |
|               |   | DCU package |                | 227     |
|               |   | YZP package |                | 102     |
| $T_{stg}$     | 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) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

(3) The value of  $V_{CC}$  is provided in the *Recommended Operating Conditions* table.

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

## Recommended Operating Conditions

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

|                 |                                    | MIN   | MAX                    | UNIT                   |      |
|-----------------|------------------------------------|---|------------------------|------------------------|------|
| V <sub>CC</sub> | Supply voltage                     | Operating                                       | 1.65                   | 5.5                    | V    |
|                 |                                    | Data retention only                             | 1.5                    |                        |      |
| V <sub>IH</sub> | High-level input voltage           | V <sub>CC</sub> = 1.65 V to 1.95 V              | 0.65 × V <sub>CC</sub> |                        | V    |
|                 |                                    | V <sub>CC</sub> = 2.3 V to 2.7 V                | 1.7                    |                        |      |
|                 |                                    | V <sub>CC</sub> = 3.0 V to 3.6 V                | 2                      |                        |      |
|                 |                                    | V <sub>CC</sub> = 4.5 V to 5.5 V                | 0.7 × V <sub>CC</sub>  |                        |      |
| V <sub>IL</sub> | Low-level input voltage            | V <sub>CC</sub> = 1.65 V to 1.95 V              |                        | 0.35 × V <sub>CC</sub> | V    |
|                 |                                    | V <sub>CC</sub> = 2.3 V to 2.7 V                |                        | 0.7                    |      |
|                 |                                    | V <sub>CC</sub> = 3.0 V to 3.6 V                |                        | 0.8                    |      |
|                 |                                    | V <sub>CC</sub> = 4.5 V to 5.5 V                |                        | 0.3 × V <sub>CC</sub>  |      |
| V <sub>I</sub>  | Input voltage                      | 0   | 5.5                    | V                      |      |
| V <sub>O</sub>  | Output voltage                     | 0   | V <sub>CC</sub>        | V                      |      |
| I <sub>OH</sub> | High-level output current          | V <sub>CC</sub> = 1.65 V                        |                        | –4                     | mA   |
|                 |                                    | V <sub>CC</sub> = 2.3 V                         |                        | –8                     |      |
|                 |                                    | V <sub>CC</sub> = 3 V                           |                        | –16                    |      |
|                 |                                    |   |                        | –24                    |      |
|                 |                                    | V <sub>CC</sub> = 4.5 V                         |                        | –32                    |      |
| I <sub>OL</sub> | Low-level output current           | V <sub>CC</sub> = 1.65 V                        |                        | 4                      | mA   |
|                 |                                    | V <sub>CC</sub> = 2.3 V                         |                        | 8                      |      |
|                 |                                    | V <sub>CC</sub> = 3 V                           |                        | 16                     |      |
|                 |                                    |   |                        | 24                     |      |
|                 |                                    | V <sub>CC</sub> = 4.5 V                         |                        | 32                     |      |
| Δt/Δv           | Input transition rise or fall rate | V <sub>CC</sub> = 1.8 V ± 0.15 V, 2.5 V ± 0.2 V |                        | 20                     | ns/V |
|                 |                                    | V <sub>CC</sub> = 3.3 V ± 0.3 V                 |                        | 10                     |      |
|                 |                                    | V <sub>CC</sub> = 5 V ± 0.5 V                   |                        | 5                      |      |
| T <sub>A</sub>  | Operating free-air temperature     | –40   | 85                     | °C                     |      |

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

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## Electrical Characteristics

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

| PARAMETER        | TEST CONDITIONS  | V <sub>CC</sub> | MIN                   | TYP <sup>(1)</sup> | MAX  | UNIT |
|------------------|--|-----------------|-----------------------|--------------------|------|------|
| V <sub>OH</sub>  | I <sub>OH</sub> = -100 μA  | 1.65 V to 5.5 V | V <sub>CC</sub> - 0.1 |                    |      | V    |
|                  | I <sub>OH</sub> = -4 mA  | 1.65 V          | 1.2                   |                    |      |      |
|                  | I <sub>OH</sub> = -8 mA  | 2.3 V           | 1.9                   |                    |      |      |
|                  | I <sub>OH</sub> = -16 mA   | 3 V             | 2.4                   |                    |      |      |
|                  | I <sub>OH</sub> = -24 mA   |                 | 2.3                   |                    |      |      |
|                  | I <sub>OH</sub> = -32 mA   | 4.5 V           | 3.8                   |                    |      |      |
| V <sub>OL</sub>  | I <sub>OL</sub> = 100 μA   | 1.65 V to 5.5 V |                       |                    | 0.1  | V    |
|                  | I <sub>OL</sub> = 4 mA   | 1.65 V          |                       |                    | 0.45 |      |
|                  | I <sub>OL</sub> = 8 mA   | 2.3 V           |                       |                    | 0.3  |      |
|                  | I <sub>OL</sub> = 16 mA  | 3 V             |                       |                    | 0.4  |      |
|                  | I <sub>OL</sub> = 24 mA  |                 |                       |                    | 0.55 |      |
|                  | I <sub>OL</sub> = 32 mA  | 4.5 V           |                       |                    | 0.55 |      |
| I <sub>I</sub>   | V <sub>I</sub> = 5.5 V or GND  | 0 to 5.5 V      |                       |                    | ±1   | μA   |
| I <sub>off</sub> | V <sub>I</sub> or V <sub>O</sub> = 5.5 V                                     | 0               |                       |                    | ±10  | μA   |
| I <sub>CC</sub>  | V <sub>I</sub> = 5.5 V or GND, I <sub>O</sub> = 0                            | 1.65 V to 5.5 V |                       |                    | 10   | μA   |
| ΔI <sub>CC</sub> | One input at V <sub>CC</sub> - 0.6 V, Other inputs at V <sub>CC</sub> or GND | 3 V to 5.5 V    |                       |                    | 500  | μA   |
| C <sub>I</sub>   | V <sub>I</sub> = V <sub>CC</sub> or GND                                      | 3.3 V           | 3.5                   |                    |      | pF   |

(1) All typical values are at V<sub>CC</sub> = 3.3 V, T<sub>A</sub> = 25°C.

## Switching Characteristics

over recommended operating free-air temperature range, C<sub>L</sub> = 15 pF (unless otherwise noted) (see Figure 1)

| PARAMETER       | FROM (INPUT)        | TO (OUTPUT) | V <sub>CC</sub> = 1.8 V ± 0.15 V |      | V <sub>CC</sub> = 2.5 V ± 0.2 V |     | V <sub>CC</sub> = 3.3 V ± 0.3 V |     | V <sub>CC</sub> = 5 V ± 0.5 V |     | UNIT |
|-----------------|---------------------|-------------|----------------------------------|------|---------------------------------|-----|---------------------------------|-----|-------------------------------|-----|------|
|                 |                     |             | MIN                              | MAX  | MIN                             | MAX | MIN                             | MAX | MIN                           | MAX |      |
| t <sub>pd</sub> | A or $\overline{G}$ | Y           | 2.5                              | 15.4 | 1.5                             | 7.1 | 1                               | 5.1 | 0.5                           | 4.2 | ns   |

## Switching Characteristics

over recommended operating free-air temperature range, C<sub>L</sub> = 30 pF or 50 pF (unless otherwise noted) (see Figure 2)

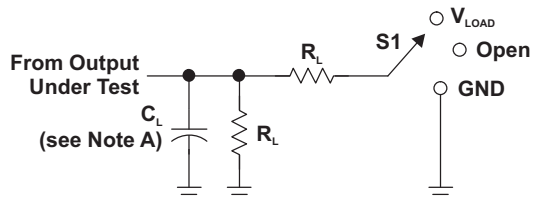
| PARAMETER       | FROM (INPUT)        | TO (OUTPUT) | V <sub>CC</sub> = 1.8 V ± 0.15 V |      | V <sub>CC</sub> = 2.5 V ± 0.2 V |     | V <sub>CC</sub> = 3.3 V ± 0.3 V |     | V <sub>CC</sub> = 5 V ± 0.5 V |     | UNIT |
|-----------------|---------------------|-------------|----------------------------------|------|---------------------------------|-----|---------------------------------|-----|-------------------------------|-----|------|
|                 |                     |             | MIN                              | MAX  | MIN                             | MAX | MIN                             | MAX | MIN                           | MAX |      |
| t <sub>pd</sub> | A or $\overline{G}$ | Y           | 2.5                              | 15.8 | 1.5                             | 7.5 | 1                               | 6.1 | 0.5                           | 5.1 | ns   |

## Operating Characteristics

T<sub>A</sub> = 25°C

| PARAMETER       |                               | TEST CONDITIONS | V <sub>CC</sub> = 1.8 V | V <sub>CC</sub> = 2.5 V | V <sub>CC</sub> = 3.3 V | V <sub>CC</sub> = 5 V | UNIT |
|-----------------|-------------------------------|-----------------|-------------------------|-------------------------|-------------------------|-----------------------|------|
|                 |                               |                 | TYP                     | TYP                     | TYP                     | TYP                   |      |
| C <sub>pd</sub> | Power dissipation capacitance | f = 10 MHz      | 17                      | 17                      | 18                      | 19                    | pF   |
|                 |                               |                 | 33                      | 33                      | 33                      | 35                    |      |

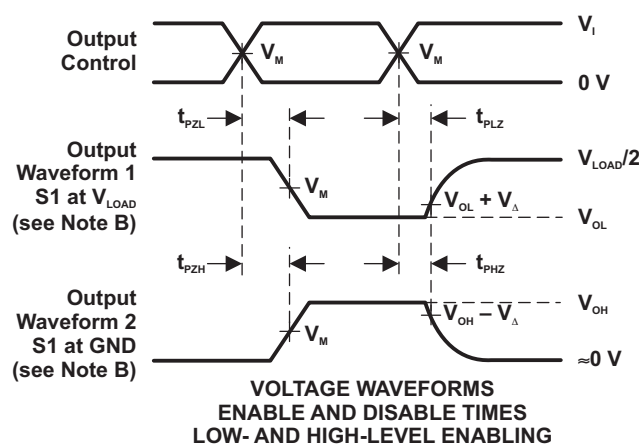
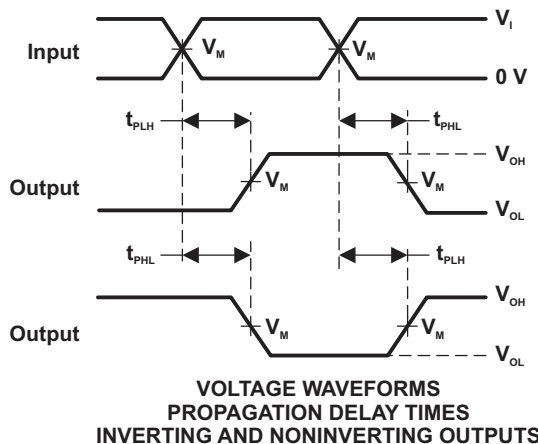
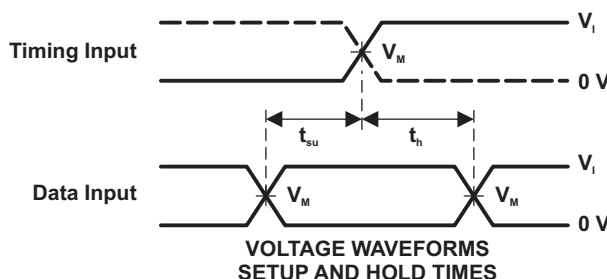
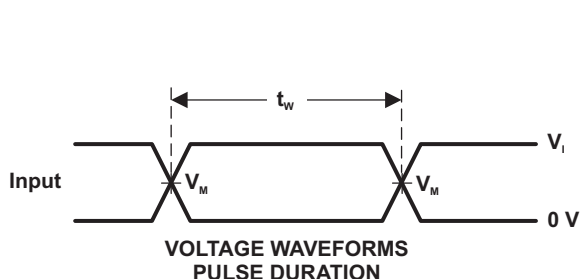
Parameter Measurement Information



LOAD CIRCUIT

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

| $V_{CC}$                         | INPUTS   |                      | $V_M$      | $V_{LOAD}$        | $C_L$ | $R_L$        | $V_{\Delta}$ |
|----------------------------------|----------|----------------------|------------|-------------------|-------|--------------|--------------|
|                                  | $V_I$    | $t_r/t_f$            |            |                   |       |              |              |
| $1.8\text{ V} \pm 0.15\text{ V}$ | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 15 pF | 1 M $\Omega$ | 0.15 V       |
| $2.5\text{ V} \pm 0.2\text{ V}$  | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 15 pF | 1 M $\Omega$ | 0.15 V       |
| $3.3\text{ V} \pm 0.3\text{ V}$  | 3 V      | $\leq 2.5\text{ ns}$ | 1.5 V      | 6 V               | 15 pF | 1 M $\Omega$ | 0.3 V        |
| $5\text{ V} \pm 0.5\text{ V}$    | $V_{CC}$ | $\leq 2.5\text{ ns}$ | $V_{CC}/2$ | $2 \times V_{CC}$ | 15 pF | 1 M $\Omega$ | 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 MHz,  $Z_o = 50\ \Omega$ .  
 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.

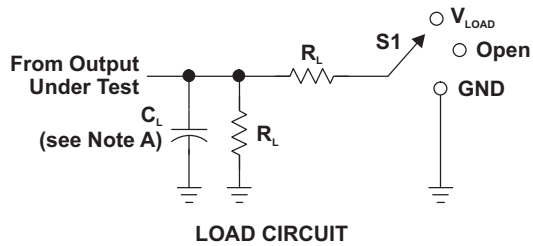
Figure 1. Load Circuit and Voltage Waveforms

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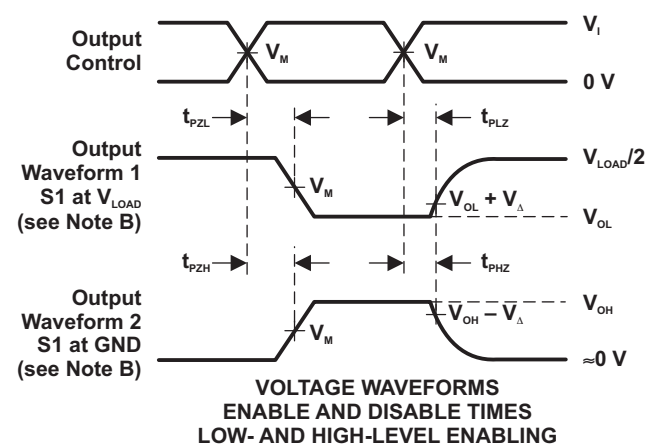
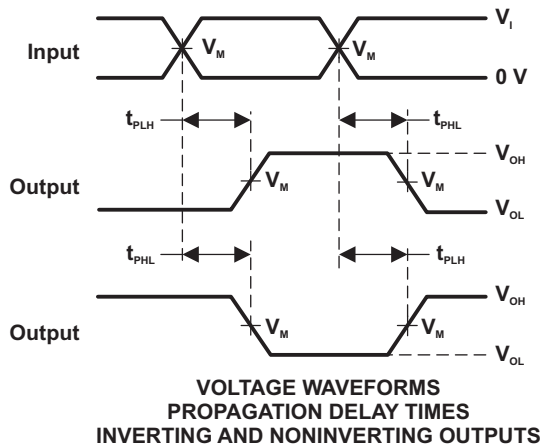
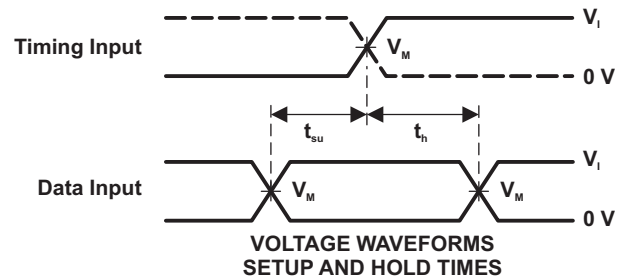
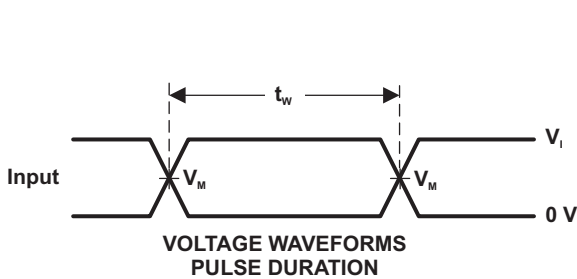
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## Parameter Measurement Information (continued)



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

| $V_{CC}$                         | INPUTS   |                      | $V_M$      | $V_{LOAD}$        | $C_L$ | $R_L$        | $V_{\Delta}$ |
|----------------------------------|----------|----------------------|------------|-------------------|-------|--------------|--------------|
|                                  | $V_i$    | $t_r/t_f$            |            |                   |       |              |              |
| $1.8\text{ V} \pm 0.15\text{ V}$ | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 30 pF | 1 k $\Omega$ | 0.15 V       |
| $2.5\text{ V} \pm 0.2\text{ V}$  | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 30 pF | 500 $\Omega$ | 0.15 V       |
| $3.3\text{ V} \pm 0.3\text{ V}$  | 3 V      | $\leq 2.5\text{ ns}$ | 1.5 V      | 6 V               | 50 pF | 500 $\Omega$ | 0.3 V        |
| $5\text{ V} \pm 0.5\text{ V}$    | $V_{CC}$ | $\leq 2.5\text{ ns}$ | $V_{CC}/2$ | $2 \times V_{CC}$ | 50 pF | 500 $\Omega$ | 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 MHz,  $Z_o = 50\ \Omega$ .
  - 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  $t_{on}$ .
  - G.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .
  - H. All parameters and waveforms are not applicable to all devices.

**Figure 2. Load Circuit and Voltage Waveforms**

**REVISION HISTORY**

| <b>Changes from Revision B (January 2007) to Revision C</b> | <b>Page</b> |
|---|-------------|
| • Updated document to new TI data sheet format. ....        | 1           |
| • Deleted Ordering Information table. ....                  | 1           |
| • Updated Features. ....                                    | 1           |
| • Added ESD warning. ....                                   | 2           |

**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                 |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|--------------------------------------|----------------------|--------------|-------------------------|-------------------------|
| SN74LVC1G29DCTR  | ACTIVE        | SM8          | DCT             | 8    | 3000        | RoHS & Green    | NIPDAU   SN                          | Level-1-260C-UNLIM   | -40 to 85    | (2WD5, C29)<br>(R, Z)   | <a href="#">Samples</a> |
| SN74LVC1G29DCUR  | ACTIVE        | VSSOP        | DCU             | 8    | 3000        | RoHS & Green    | NIPDAU   SN                          | Level-1-260C-UNLIM   | -40 to 85    | (C29J, C29Q, C29R)      | <a href="#">Samples</a> |
| SN74LVC1G29DCUT  | ACTIVE        | VSSOP        | DCU             | 8    | 250         | RoHS & Green    | NIPDAU   SN                          | Level-1-260C-UNLIM   | -40 to 85    | (C29J, C29Q, C29R)      | <a href="#">Samples</a> |
| SN74LVC1G29YZPR  | ACTIVE        | DSBGA        | YZP             | 8    | 3000        | RoHS & Green    | SNAGCU                               | Level-1-260C-UNLIM   | -40 to 85    | D9N                     | <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.

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

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

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

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

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(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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**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 |
|-----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LVC1G29DCTR | SM8          | DCT             | 8    | 3000 | 180.0              | 13.0               | 3.35    | 4.5     | 1.55    | 4.0     | 12.0   | Q3            |
| SN74LVC1G29DCTR | SM8          | DCT             | 8    | 3000 | 180.0              | 12.4               | 3.15    | 4.35    | 1.55    | 4.0     | 12.0   | Q3            |
| SN74LVC1G29DCUR | VSSOP        | DCU             | 8    | 3000 | 178.0              | 9.5                | 2.25    | 3.35    | 1.05    | 4.0     | 8.0    | Q3            |
| SN74LVC1G29DCUR | VSSOP        | DCU             | 8    | 3000 | 178.0              | 9.0                | 2.25    | 3.35    | 1.05    | 4.0     | 8.0    | Q3            |
| SN74LVC1G29DCUR | VSSOP        | DCU             | 8    | 3000 | 180.0              | 8.4                | 2.25    | 3.35    | 1.05    | 4.0     | 8.0    | Q3            |
| SN74LVC1G29DCUT | VSSOP        | DCU             | 8    | 250  | 178.0              | 9.0                | 2.25    | 3.35    | 1.05    | 4.0     | 8.0    | Q3            |
| SN74LVC1G29DCUT | VSSOP        | DCU             | 8    | 250  | 178.0              | 9.5                | 2.25    | 3.35    | 1.05    | 4.0     | 8.0    | Q3            |
| SN74LVC1G29YZPR | DSBGA        | YZP             | 8    | 3000 | 178.0              | 9.2                | 1.02    | 2.02    | 0.63    | 4.0     | 8.0    | Q1            |

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

| Device          | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|-----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LVC1G29DCTR | SM8          | DCT             | 8    | 3000 | 182.0       | 182.0      | 20.0        |
| SN74LVC1G29DCTR | SM8          | DCT             | 8    | 3000 | 190.0       | 190.0      | 30.0        |
| SN74LVC1G29DCUR | VSSOP        | DCU             | 8    | 3000 | 202.0       | 201.0      | 28.0        |
| SN74LVC1G29DCUR | VSSOP        | DCU             | 8    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74LVC1G29DCUR | VSSOP        | DCU             | 8    | 3000 | 202.0       | 201.0      | 28.0        |
| SN74LVC1G29DCUT | VSSOP        | DCU             | 8    | 250  | 180.0       | 180.0      | 18.0        |
| SN74LVC1G29DCUT | VSSOP        | DCU             | 8    | 250  | 202.0       | 201.0      | 28.0        |
| SN74LVC1G29YZPR | DSBGA        | YZP             | 8    | 3000 | 220.0       | 220.0      | 35.0        |



4220784/C 06/2021

NOTES:

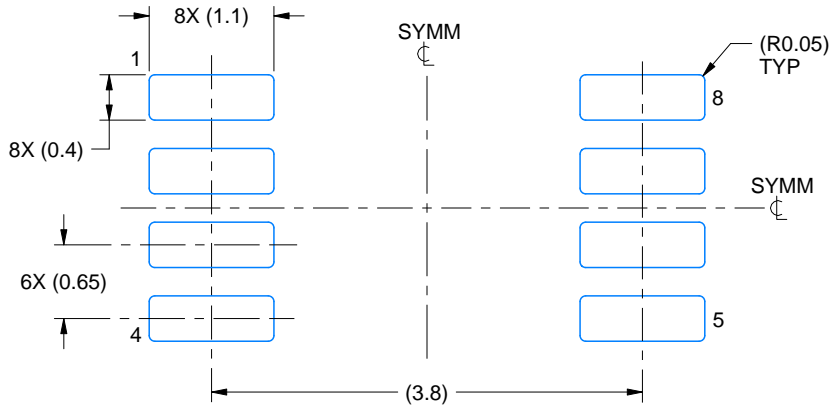
- All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
- This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
- This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.

# EXAMPLE BOARD LAYOUT

DCT0008A

SSOP - 1.3 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:15X



SOLDER MASK DETAILS

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NOTES: (continued)

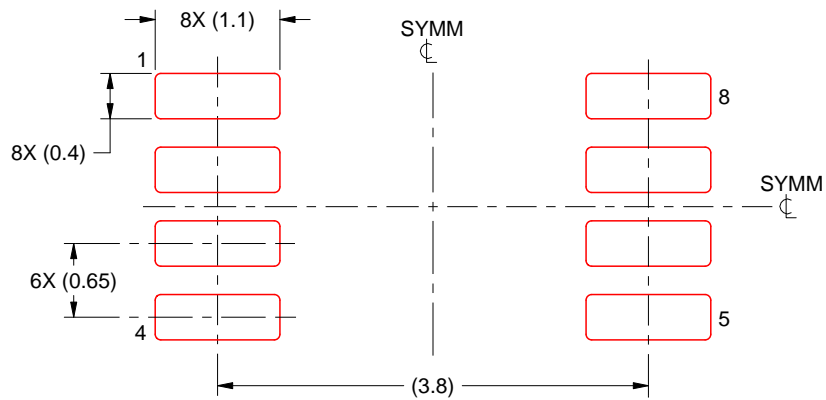
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DCT0008A

SSOP - 1.3 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:15X

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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

YZP0008

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



LAND PATTERN EXAMPLE  
SCALE:40X



SOLDER MASK DETAILS  
NOT TO SCALE

4223082/A 07/2016

NOTES: (continued)

- Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For more information, see Texas Instruments literature number SNVA009 ([www.ti.com/lit/snva009](http://www.ti.com/lit/snva009)).



# EXAMPLE STENCIL DESIGN

YZP0008

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



SOLDER PASTE EXAMPLE  
BASED ON 0.1 mm THICK STENCIL  
SCALE:40X

4223082/A 07/2016

NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.



4225266/A 09/2014

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



4225266/A 09/2014

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

4225266/A 09/2014

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.

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