

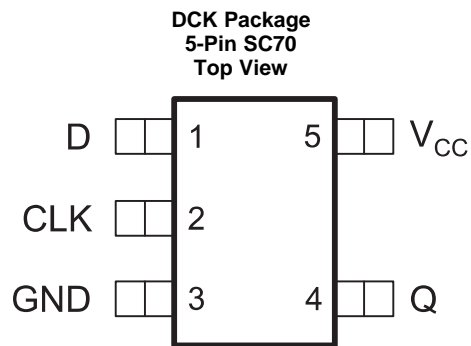
Table of Contents

| | | | | | |
|----------|--|----------|-----------|---|-----------|
| 1 | Features | 1 | 8 | Detailed Description | 11 |
| 2 | Applications | 1 | 8.1 | Overview | 11 |
| 3 | Description | 1 | 8.2 | Functional Block Diagram | 11 |
| 4 | Revision History | 2 | 8.3 | Feature Description | 11 |
| 5 | Pin Configuration and Functions | 3 | 8.4 | Device Functional Modes | 12 |
| 6 | Specifications | 4 | 9 | Application and Implementation | 13 |
| 6.1 | Absolute Maximum Ratings | 4 | 9.1 | Application Information | 13 |
| 6.2 | ESD Ratings | 4 | 9.2 | Typical Application | 13 |
| 6.3 | Recommended Operating Conditions | 5 | 10 | Power Supply Recommendations | 14 |
| 6.4 | Thermal Information | 5 | 11 | Layout | 14 |
| 6.5 | Electrical Characteristics | 6 | 11.1 | Layout Guidelines | 14 |
| 6.6 | Timing Requirements | 6 | 11.2 | Layout Example | 14 |
| 6.7 | Timing Requirements | 6 | 12 | Device and Documentation Support | 15 |
| 6.8 | Switching Characteristics: $C_L = 15$ pF, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ | 7 | 12.1 | Documentation Support | 15 |
| 6.9 | Switching Characteristics: $C_L = 30$ or 50 pF, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ | 7 | 12.2 | Receiving Notification of Documentation Updates | 15 |
| 6.10 | Switching Characteristics: $C_L = 30$ pF or 50 pF, $T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$ | 7 | 12.3 | Community Resources | 15 |
| 6.11 | Operating Characteristics | 7 | 12.4 | Trademarks | 15 |
| 6.12 | Typical Characteristics | 8 | 12.5 | Electrostatic Discharge Caution | 15 |
| 7 | Parameter Measurement Information | 9 | 12.6 | Glossary | 15 |
| | | | 13 | Mechanical, Packaging, and Orderable Information | 15 |

4 Revision History

| DATE | REVISION | NOTES |
|------------|----------|------------------|
| March 2017 | * | Initial release. |

5 Pin Configuration and Functions



See mechanical drawings for dimensions.

Pin Functions

| PIN | | I/O | DESCRIPTION |
|-----------------|-----|-----|-------------------------------------|
| NAME | DCK | | |
| D | 1 | I | Data input |
| CLK | 2 | I | Positive-Edge-Triggered Clock input |
| GND | 3 | — | Ground |
| Q | 4 | O | Non-inverted output |
| V _{CC} | 5 | — | Positive Supply |

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 | 6.5 | V |
| V _I | Input voltage ⁽²⁾ | -0.5 | 6.5 | V |
| V _O | Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾ | -0.5 | 6.5 | V |
| V _O | Voltage range applied to any output in the high or low state ⁽²⁾⁽³⁾ | -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 |
| T _{stg} | Storage temperature | -65 | 150 | °C |
| T _J | Junction Temperature | | 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 negative-voltage and output 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.

6.2 ESD Ratings

| | | VALUE | UNIT |
|--------------------|-------------------------|---|-------|
| V _(ESD) | Electrostatic discharge | Human-body model (HBM), per AEC Q100-002 ⁽¹⁾ | ±4000 |
| | | Charged-device model (CDM), per AEC Q100-011 | ±1000 |

- (1) AEC Q100-002 indicates that HBM stressing shall be in accordance with the ANSI/ESDA/JEDEC JS-001 specification.

6.3 Recommended Operating Conditions

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

| | | MIN | MAX | UNIT | |
|-----------------|------------------------------------|---|------------------------|------|------|
| V _{CC} | Supply voltage | Operating | 1.65 | 5.5 | V |
| | | Data retention only | 1.5 | | |
| V _{IH} | High-level input voltage | V _{CC} = 1.65 V to 1.95 V | 0.65 × V _{CC} | | V |
| | | V _{CC} = 2.3 V to 2.7 V | 1.7 | | |
| | | V _{CC} = 3 V to 3.6 V | 2 | | |
| | | V _{CC} = 4.5 V to 5.5 V | 0.7 × V _{CC} | | |
| V _{IL} | Low-level input voltage | V _{CC} = 1.65 V to 1.95 V | 0.35 × V _{CC} | | V |
| | | V _{CC} = 2.3 V to 2.7 V | 0.7 | | |
| | | V _{CC} = 3 V to 3.6 V | 0.8 | | |
| | | V _{CC} = 4.5 V to 5.5 V | 0.3 × V _{CC} | | |
| V _I | Input voltage | 0 | 5.5 | V | |
| V _O | Output voltage | 0 | V _{CC} | V | |
| I _{OH} | High-level output current | V _{CC} = 1.65 V | –4 | | mA |
| | | V _{CC} = 2.3 V | –8 | | |
| | | V _{CC} = 3 V | –16 | | |
| | | | –24 | | |
| | | V _{CC} = 4.5 V | –32 | | |
| I _{OL} | Low-level output current | V _{CC} = 1.65 V | 4 | | mA |
| | | V _{CC} = 2.3 V | 8 | | |
| | | V _{CC} = 3 V | 16 | | |
| | | | 24 | | |
| | | V _{CC} = 4.5 V | 32 | | |
| Δt/Δv | Input transition rise or fall rate | V _{CC} = 1.8 V ± 0.15 V, 2.5 V ± 0.2 V | 20 | | ns/V |
| | | V _{CC} = 3.3 V ± 0.3 V | 10 | | |
| | | V _{CC} = 5 V ± 0.5 V | 5 | | |
| T _A | Operating free-air temperature | –40 | 125 | °C | |

(1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. See [Implications of Slow or Floating CMOS Inputs](#), SCBA004.

6.4 Thermal Information

| THERMAL METRIC ⁽¹⁾ | | SN74LVC1G79-Q1 | | UNIT |
|-------------------------------|--|----------------|--|------|
| | | DCK | | |
| | | 5 PINS | | |
| R _{θJA} | Junction-to-ambient thermal resistance | 277.6 | | °C/W |
| R _{θJC(top)} | Junction-to-case (top) thermal resistance | 179.5 | | °C/W |
| R _{θJB} | Junction-to-board thermal resistance | 75.9 | | °C/W |
| Ψ _{JT} | Junction-to-top characterization parameter | 49.7 | | °C/W |
| Ψ _{JB} | Junction-to-board characterization parameter | 75.1 | | °C/W |

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

6.5 Electrical Characteristics

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

| PARAMETER | TEST CONDITIONS | V _{CC} | –40°C to +85°C | | | –40°C to +125°C | | | UNIT |
|------------------|---------------------------|--|-----------------------|--------------------|-----|-----------------------|--------------------|-----|------|
| | | | MIN | TYP ⁽¹⁾ | MAX | MIN | TYP ⁽¹⁾ | MAX | |
| V _{OH} | I _{OH} = –100 μA | 1.65 V to 5.5 V | V _{CC} – 0.1 | | | V _{CC} – 0.1 | | | V |
| | I _{OH} = –4 mA | 1.65 V | 1.2 | | | 1.2 | | | |
| | I _{OH} = –8 mA | 2.3 V | 1.9 | | | 1.9 | | | |
| | I _{OH} = –16 mA | 3 V | 2.4 | | | 2.4 | | | |
| | I _{OH} = –24 mA | | 2.3 | | | 2.3 | | | |
| | I _{OH} = –32 mA | 4.5 V | 3.8 | | | 3.8 | | | |
| V _{OL} | I _{OL} = 100 μA | 1.65 V to 5.5 V | 0.1 | | | 0.1 | | | V |
| | I _{OL} = 4 mA | 1.65 V | 0.45 | | | 0.45 | | | |
| | I _{OL} = 8 mA | 2.3 V | 0.3 | | | 0.3 | | | |
| | I _{OL} = 16 mA | 3 V | 0.4 | | | 0.4 | | | |
| | I _{OL} = 24 mA | | 0.55 | | | 0.55 | | | |
| | I _{OL} = 32 mA | 4.5 V | 0.55 | | | 0.55 | | | |
| I _I | All inputs | V _I = 5.5 V or GND | 0 to 5.5 V | | | ±10 | | | μA |
| I _{off} | | V _I or V _O = 5.5 V | 0 | | | ±10 | | | μA |
| I _{CC} | | V _I = 5.5 V or GND, I _O = 0 | 1.65 V to 5.5 V | | | 10 | | | μA |
| ΔI _{CC} | | One input at V _{CC} – 0.6 V, Other inputs at V _{CC} or GND | 3 V to 5.5 V | | | 500 | | | μA |
| C _i | | V _I = V _{CC} or GND | 3.3 V | | | 4 | | | pF |

 (1) All typical values are at V_{CC} = 3.3 V, T_A = 25°C.

6.6 Timing Requirements

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

| PARAMETER | | –40°C to +85°C | | | | | | | | UNIT | |
|--------------------|---------------------------------|--------------------------------|-----|-------------------------------|-----|---------------------------------|-----|-------------------------------|-----|------|----|
| | | V _{CC} = 1.8 ± 0.15 V | | V _{CC} = 2.5 ± 0.2 V | | V _{CC} = 3.3 V ± 0.3 V | | V _{CC} = 5 V ± 0.5 V | | | |
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | |
| f _{clock} | Clock frequency | 160 | | 160 | | 160 | | 160 | | MHz | |
| t _w | Pulse duration, CLK high or low | 2.5 | | 2.5 | | 2.5 | | 2.5 | | ns | |
| t _{su} | Setup time before CLK↑ | Data high | 2.2 | | 1.4 | | 1.3 | | 1.2 | | ns |
| | | Data low | 2.6 | | 1.4 | | 1.3 | | 1.2 | | |
| t _h | Hold time, data after CLK↑ | 0.3 | | 0.4 | | 1 | | 0.5 | | ns | |

6.7 Timing Requirements

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

| PARAMETER | | –40°C to +125°C | | | | | | | | UNIT | |
|--------------------|---------------------------------|--------------------------------|-----|-------------------------------|-----|---------------------------------|-----|-------------------------------|-----|------|----|
| | | V _{CC} = 1.8 ± 0.15 V | | V _{CC} = 2.5 ± 0.2 V | | V _{CC} = 3.3 V ± 0.3 V | | V _{CC} = 5 V ± 0.5 V | | | |
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | |
| f _{clock} | Clock frequency | 160 | | 160 | | 160 | | 160 | | MHz | |
| t _w | Pulse duration, CLK high or low | 2.5 | | 2.5 | | 2.5 | | 2.5 | | ns | |
| t _{su} | Setup time before CLK↑ | Data high | 2.2 | | 1.4 | | 1.3 | | 1.2 | | ns |
| | | Data low | 2.6 | | 1.4 | | 1.3 | | 1.2 | | |
| t _h | Hold time, data after CLK↑ | 0.3 | | 0.4 | | 1 | | 0.5 | | ns | |

6.8 Switching Characteristics: $C_L = 15\text{ pF}$, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$

over recommended operating free-air temperature range, $C_L = 15\text{ pF}$ (unless otherwise noted) (see [Figure 3](#))

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ | | | | | | | | UNIT |
|------------------|-----------------|----------------|--|-----|---|-----|---|-----|---|-----|------|
| | | | $V_{CC} = 1.8\text{ V}$ $\pm 0.15\text{ V}$ | | $V_{CC} = 2.5\text{ V}$ $\pm 0.2\text{ V}$ | | $V_{CC} = 3.3\text{ V}$ $\pm 0.3\text{ V}$ | | $V_{CC} = 5\text{ V}$ $\pm 0.5\text{ V}$ | | |
| | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| f_{max} | | | 160 | | 160 | | 160 | | 160 | | MHz |
| t_{pd} | CLK | Q | 2.5 | 9.1 | 1.2 | 6 | 1 | 4 | 0.8 | 3.8 | ns |

6.9 Switching Characteristics: $C_L = 30$ or 50 pF , $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$

over recommended operating free-air temperature range, $C_L = 30\text{ pF}$ or 50 pF (unless otherwise noted) (see [Figure 4](#))

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ | | | | | | | | UNIT |
|------------------|-----------------|----------------|--|-----|---|-----|---|-----|---|-----|------|
| | | | $V_{CC} = 1.8\text{ V}$ $\pm 0.15\text{ V}$ | | $V_{CC} = 2.5\text{ V}$ $\pm 0.2\text{ V}$ | | $V_{CC} = 3.3\text{ V}$ $\pm 0.3\text{ V}$ | | $V_{CC} = 5\text{ V}$ $\pm 0.5\text{ V}$ | | |
| | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| f_{max} | | | 160 | | 160 | | 160 | | 160 | | MHz |
| t_{pd} | CLK | Q | 3.9 | 9.9 | 2 | 7 | 1.7 | 5 | 1 | 4.5 | ns |

6.10 Switching Characteristics: $C_L = 30\text{ pF}$ or 50 pF , $T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$

over recommended operating free-air temperature range, $C_L = 30\text{ pF}$ or 50 pF (unless otherwise noted) (see [Figure 4](#))

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$ | | | | | | | | UNIT |
|------------------|-----------------|----------------|---|-----|---|-----|---|-----|---|-----|------|
| | | | $V_{CC} = 1.8\text{ V}$ $\pm 0.15\text{ V}$ | | $V_{CC} = 2.5\text{ V}$ $\pm 0.2\text{ V}$ | | $V_{CC} = 3.3\text{ V}$ $\pm 0.3\text{ V}$ | | $V_{CC} = 5\text{ V}$ $\pm 0.5\text{ V}$ | | |
| | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| f_{max} | | | 160 | | 160 | | 160 | | 160 | | MHz |
| t_{pd} | CLK | Q | 3.9 | 12 | 2 | 8.5 | 1.7 | 6 | 1 | 5 | ns |

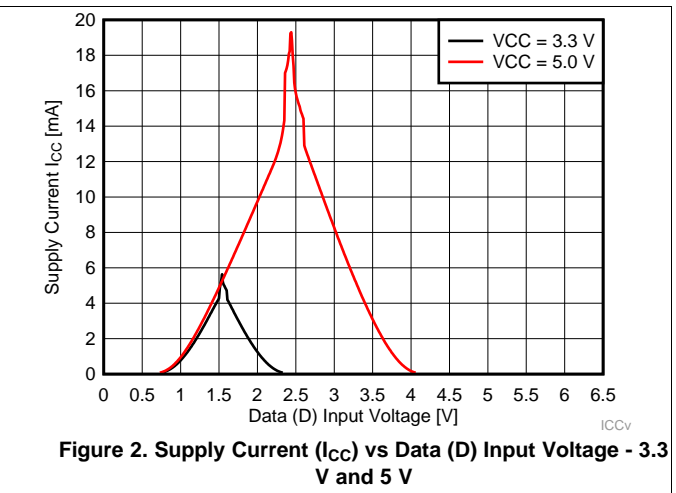
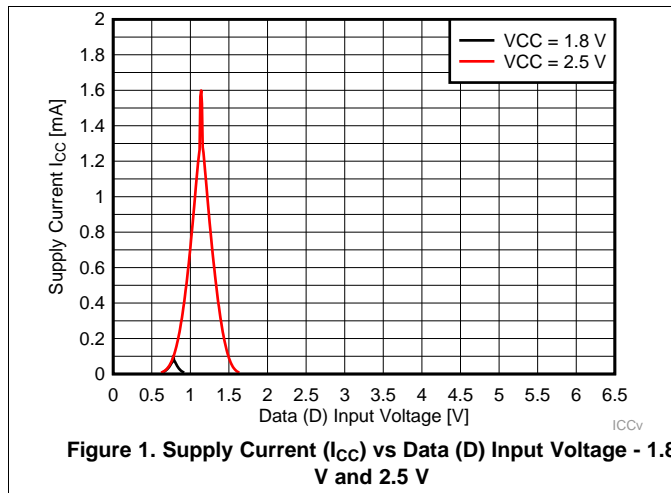
6.11 Operating Characteristics

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

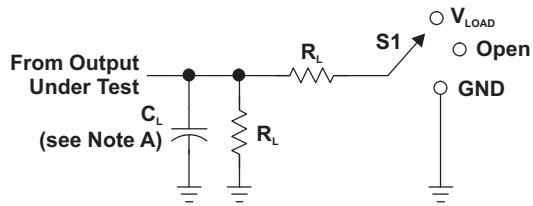
| PARAMETER | TEST CONDITIONS | $V_{CC} = 1.8\text{ V}$ | $V_{CC} = 2.5\text{ V}$ | $V_{CC} = 3.3\text{ V}$ | $V_{CC} = 5\text{ V}$ | UNIT | |
|-----------------|-------------------------------|-------------------------|-------------------------|-------------------------|-----------------------|------|----|
| | | TYP | TYP | TYP | TYP | | |
| C_{pd} | Power dissipation capacitance | f = 10 MHz | 26 | 26 | 27 | 30 | pF |

6.12 Typical Characteristics

This plot shows the different I_{CC} values for various voltages on the data input (D). Voltage sweep on the input is from 0 V to 6.5 V.



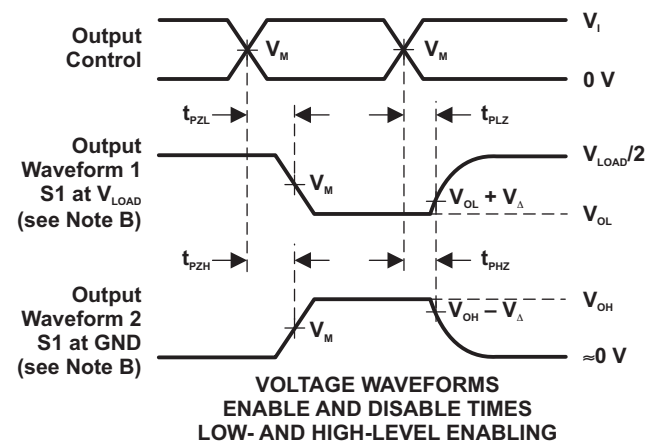
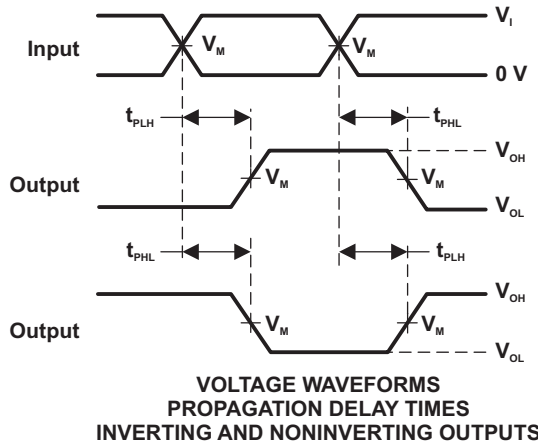
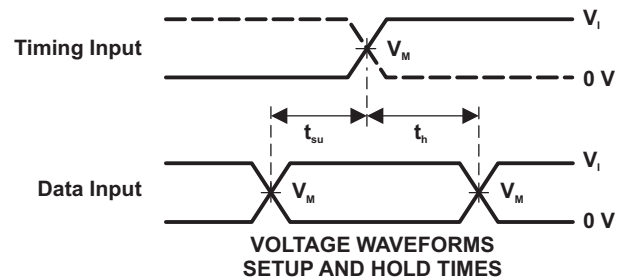
7 Parameter Measurement Information



LOAD CIRCUIT

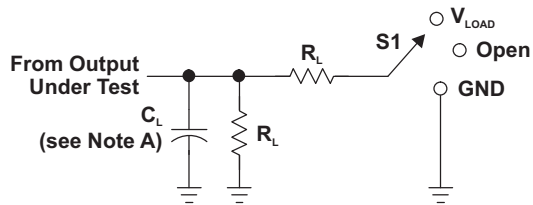
| TEST | S1 |
|------------------------------------|-------------------|
| t _{PLH} /t _{PHL} | Open |
| t _{PLZ} /t _{PZL} | V _{LOAD} |
| t _{PHZ} /t _{PZH} | GND |

| V _{CC} | INPUTS | | V _M | V _{LOAD} | C _L | R _L | V _Δ |
|-----------------|-----------------|--------------------------------|--------------------|---------------------|----------------|----------------|----------------|
| | V _I | t _r /t _f | | | | | |
| 1.8 V ± 0.15 V | V _{CC} | ≤ 2 ns | V _{CC} /2 | 2 × V _{CC} | 15 pF | 1 MΩ | 0.15 V |
| 2.5 V ± 0.2 V | V _{CC} | ≤ 2 ns | V _{CC} /2 | 2 × V _{CC} | 15 pF | 1 MΩ | 0.15 V |
| 3.3 V ± 0.3 V | 3 V | ≤ 2.5 ns | 1.5 V | 6 V | 15 pF | 1 MΩ | 0.3 V |
| 5 V ± 0.5 V | V _{CC} | ≤ 2.5 ns | V _{CC} /2 | 2 × V _{CC} | 15 pF | 1 MΩ | 0.3 V |



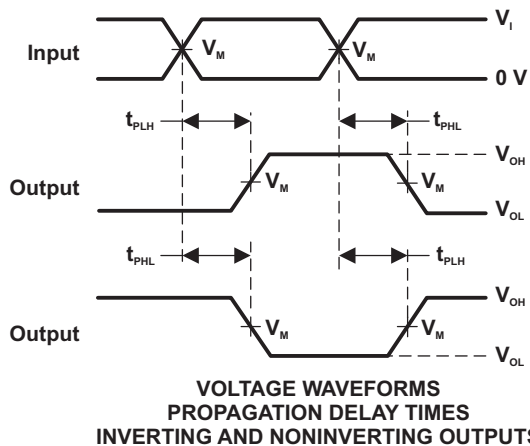
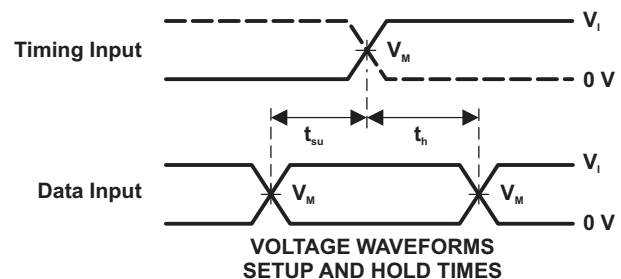
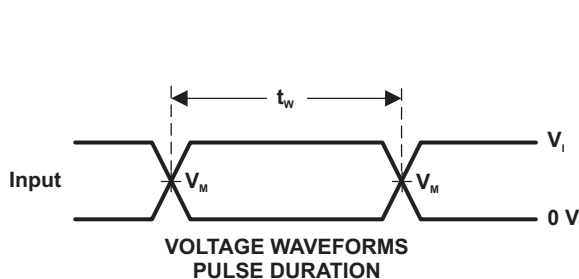
- NOTES:
- A. C_L includes probe and jig capacitance.
 - B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
 - C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_o = 50 Ω.
 - 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 3. Load Circuit and Voltage Waveforms

Parameter Measurement Information (continued)

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_{Δ} |
|----------------------------------|----------|----------------------|------------|-------------------|-------|--------------|--------------|
| | 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 Ω | 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 Ω | 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 Ω | 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 Ω | 0.3 V |



- NOTES: A. C_L includes probe and jig capacitance.
 B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
 C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10\text{ MHz}$, $Z_o = 50\ \Omega$.
 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.

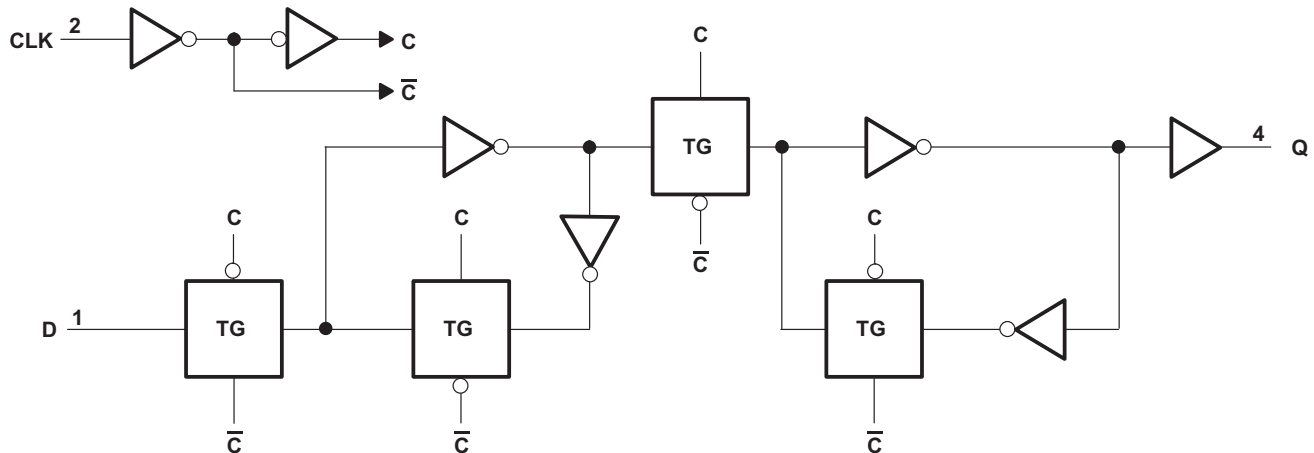
Figure 4. Load Circuit and Voltage Waveforms

8 Detailed Description

8.1 Overview

The SN74LVC1G79-Q1 is a single positive-edge-triggered D-type flip-flop and is AEC-Q100 qualified for automotive applications. Data at the input (D) is transferred to the output (Q) on the positive-going edge of the clock pulse when the setup time requirement is met. Because the clock triggering occurs at a voltage level, it is not directly related to the rise time of the clock pulse. This allows for data at the input to be changed without affecting the level at the output, following the hold-time interval.

8.2 Functional Block Diagram



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Figure 5. Logic Diagram (Positive Logic)

8.3 Feature Description

8.3.1 Balanced High-Drive CMOS Push-Pull Outputs

A balanced output allows the device to sink and source similar currents. The high drive capability of this device creates fast edges into light loads so routing and load conditions should be considered to prevent ringing. Additionally, the outputs of this device are capable of driving larger currents than the device can sustain without being damaged. It is important for the power output of the device to be limited to avoid thermal runaway and damage due to over-current. The electrical and thermal limits defined in the [Absolute Maximum Ratings](#) must be followed at all times.

8.3.2 Standard CMOS Inputs

Standard CMOS inputs are high impedance and are typically modeled as a resistor in parallel with the input capacitance given in the [Electrical Characteristics](#). The worst case resistance is calculated with the maximum input voltage, given in the [Recommended Operating Conditions](#), and the maximum input leakage current, given in the [Electrical Characteristics](#), using ohm's law ($R = V \div I$).

Signals applied to the inputs need to have fast edge rates, as defined by $\Delta t/\Delta v$ in [Recommended Operating Conditions](#) to avoid excessive currents and oscillations. If tolerance to a slow or noisy input signal is required, a device with a Schmitt-trigger input should be utilized to condition the input signal prior to the standard CMOS input.

Feature Description (continued)

8.3.3 Clamp Diodes

The inputs and outputs to this device have negative clamping diodes.

CAUTION

Voltages beyond the values specified in the [Absolute Maximum Ratings](#) table can cause damage to the device. The input negative-voltage and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

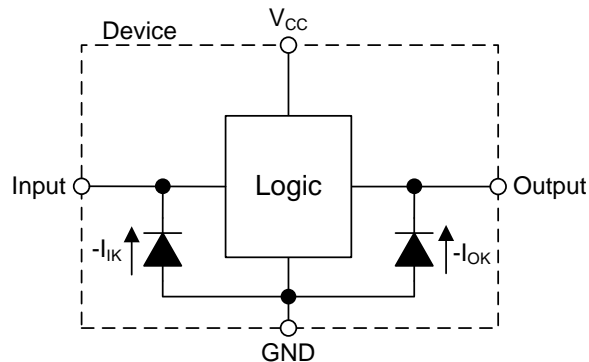


Figure 6. Electrical Placement of Clamping Diodes for Each Input and Output

8.3.4 Partial Power Down (I_{off})

The inputs and outputs for this device enter a high impedance state when the supply voltage is 0 V. The maximum leakage into or out of any input or output pin on the device is specified by I_{off} in the [Electrical Characteristics](#).

8.3.5 Over-Voltage Tolerant Inputs

Input signals to this device can be driven above the supply voltage so long as they remain below the maximum input voltage value specified in the [Absolute Maximum Ratings](#).

8.4 Device Functional Modes

[Table 1](#) shows the functional modes of SN74LVC1G79-Q1.

Table 1. Function Table

| INPUTS | | OUTPUT Y |
|--------|---|-------------|
| CLK | D | |
| ↑ | H | H |
| ↑ | L | L |
| L | X | Q_0 |

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

9.1 Application Information

A useful application for the SN74LVC1G79-Q1 is using it as a data latch with low-voltage data retention. This application implements the use of a microcontroller GPIO pin to act as a clock to set the output state and a second GPIO to provide the input data. If the SN74LVC1G79-Q1 is being powered from 1.8V and there is concern that a power glitch could exist as low as 1.5V, the device will retain the state of the Q output. An example of this data retention is shown in Figure 8 where the V_{CC} drops to 1.5V and the Q output maintains the HIGH output state when V_{CC} returns to 1.8V. If the V_{CC} voltage drops below 1.5V, data retention is not guaranteed.

9.2 Typical Application

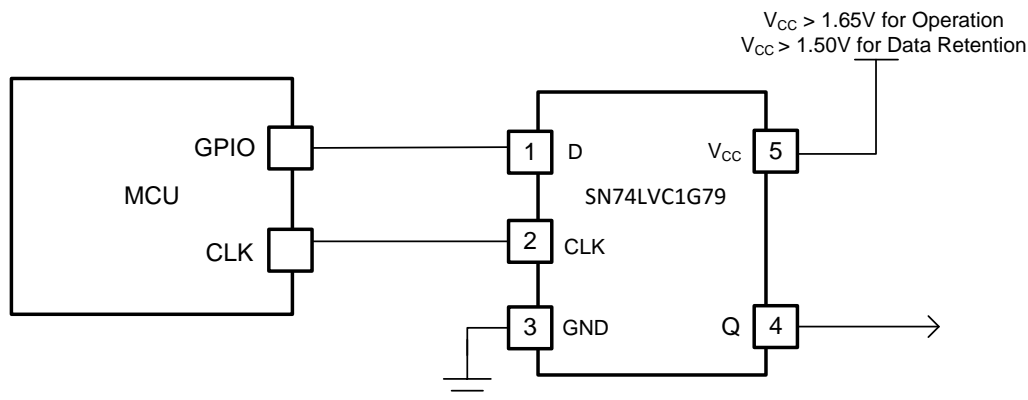


Figure 7. Low Voltage Data Retention with SN74LVC1G79-Q1

9.2.1 Design Requirements

The SN74LVC1G79-Q1 device uses CMOS technology and has balanced output drive. Take care to avoid bus contention because it can drive currents that would exceed maximum limits.

9.2.2 Detailed Design Procedure

1. Recommended input conditions:
 - For rise time and fall time specifications, see $\Delta t/\Delta v$ in [Recommended Operating Conditions](#).
 - For specified high and low levels, see V_{IH} and V_{IL} in [Recommended Operating Conditions](#).
 - Input voltages are recommended to not go below 0 V and not exceed 5.5 V for any V_{CC} . See [Recommended Operating Conditions](#).
2. Recommended output conditions:
 - Load currents should not exceed ± 50 mA. See [Absolute Maximum Ratings](#).
 - Output voltages are recommended to not go below 0 V and not exceed the V_{CC} voltage. See [Recommended Operating Conditions](#).

Typical Application (continued)

9.2.3 Application Curve

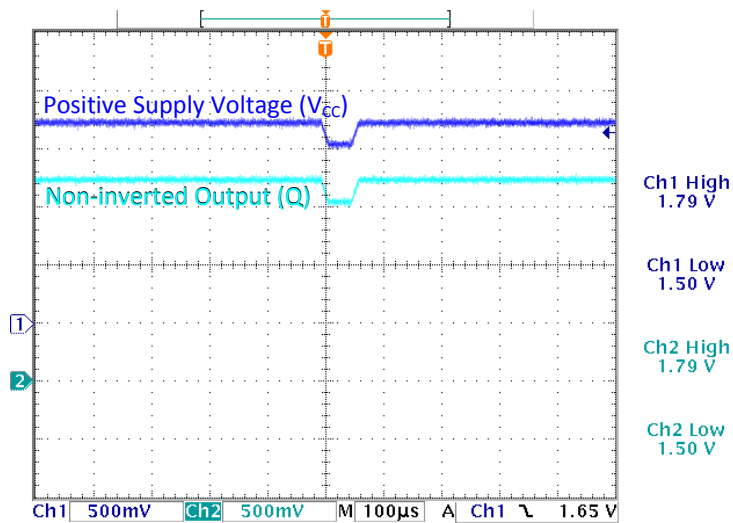


Figure 8. Data Retention with V_{CC} glitch down to 1.5V

10 Power Supply Recommendations

The power supply can be any voltage between the minimum and maximum supply voltage rating listed in [Recommended Operating Conditions](#). A 0.1- μF bypass capacitor is recommended to be connected from the VCC terminal to GND to prevent power disturbance. 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 must be installed as close to the power terminal as possible for best results.

11 Layout

11.1 Layout Guidelines

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 9](#) shows progressively better techniques of rounding corners. Only the last example (BEST) maintains constant trace width and minimizes reflections.

11.2 Layout Example



Figure 9. Trace Example

12 Device and Documentation Support

12.1 Documentation Support

12.1.1 Related Documentation

For related documentation see the following:

[Implications of Slow or Floating CMOS Inputs](#), SCBA004

[Understanding and Interpreting Standard Logic Data sheets](#) SZZA036

[Power-up Behavior of Clocked Devices](#) SCHA005A

12.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. In the upper right corner, click on *Alert me* 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 Community Resources

The following links connect to TI community resources. Linked contents are 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](#).

TI E2E™ Online Community *TI's Engineer-to-Engineer (E2E) Community*. Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

Design Support *TI's Design Support* Quickly find helpful E2E forums along with design support tools and contact information for technical support.

12.4 Trademarks

E2E is a trademark of Texas Instruments.

All other trademarks are the property of their respective owners.

12.5 Electrostatic Discharge Caution



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

12.6 Glossary

[SLYZ022](#) — *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) |
|------------------------------------|---------------|----------------------|----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|---------------------|
| SN74LVC1G79QDCKRQ1 | Active | Production | SC70 (DCK) 5 | 3000 LARGE T&R | Yes | SN | Level-2-260C-1 YEAR | -40 to 125 | 16S |
| SN74LVC1G79QDCKRQ1.A | Active | Production | SC70 (DCK) 5 | 3000 LARGE T&R | Yes | SN | Level-2-260C-1 YEAR | -40 to 125 | 16S |
| SN74LVC1G79QDCKRQ1.B | Active | Production | SC70 (DCK) 5 | 3000 LARGE T&R | Yes | SN | Level-2-260C-1 YEAR | -40 to 125 | 16S |
| SN74LVC1G79QDCKTQ1 | Active | Production | SC70 (DCK) 5 | 250 SMALL T&R | Yes | SN | Level-2-260C-1 YEAR | -40 to 125 | 16S |
| SN74LVC1G79QDCKTQ1.B | Active | Production | SC70 (DCK) 5 | 250 SMALL T&R | Yes | SN | Level-2-260C-1 YEAR | -40 to 125 | 16S |

(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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OTHER QUALIFIED VERSIONS OF SN74LVC1G79-Q1 :

- Catalog : [SN74LVC1G79](#)
- Enhanced Product : [SN74LVC1G79-EP](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- 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 |
|--------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LVC1G79QDCKRQ1 | SC70 | DCK | 5 | 3000 | 180.0 | 8.4 | 2.3 | 2.5 | 1.2 | 4.0 | 8.0 | Q3 |
| SN74LVC1G79QDCKRQ1 | SC70 | DCK | 5 | 3000 | 178.0 | 9.0 | 2.4 | 2.5 | 1.2 | 4.0 | 8.0 | Q3 |
| SN74LVC1G79QDCKTQ1 | SC70 | DCK | 5 | 250 | 180.0 | 8.4 | 2.3 | 2.5 | 1.2 | 4.0 | 8.0 | Q3 |

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|--------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LVC1G79QDCKRQ1 | SC70 | DCK | 5 | 3000 | 210.0 | 185.0 | 35.0 |
| SN74LVC1G79QDCKRQ1 | SC70 | DCK | 5 | 3000 | 180.0 | 180.0 | 18.0 |
| SN74LVC1G79QDCKTQ1 | SC70 | DCK | 5 | 250 | 210.0 | 185.0 | 35.0 |

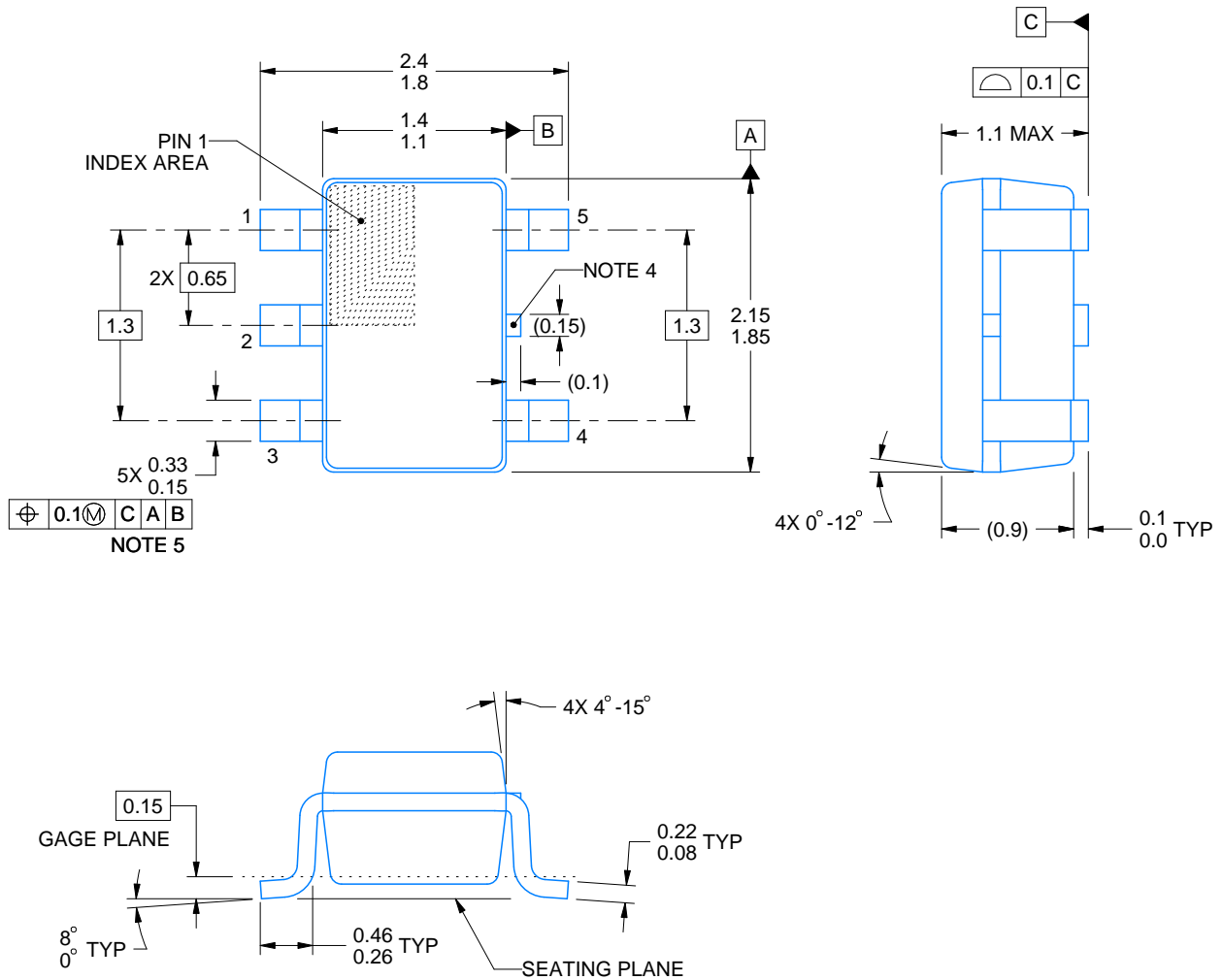
DCK0005A



PACKAGE OUTLINE

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



4214834/G 11/2024

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. Reference JEDEC MO-203.
4. Support pin may differ or may not be present.
5. Lead width does not comply with JEDEC.
6. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25mm per side

EXAMPLE BOARD LAYOUT

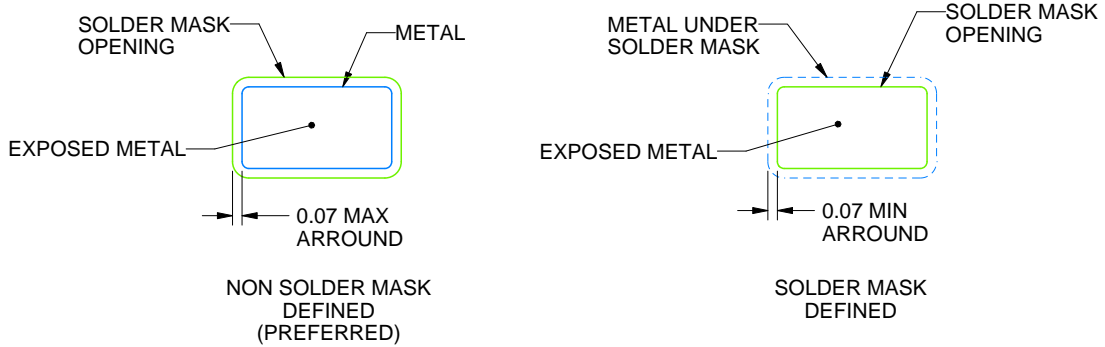
DCK0005A

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:18X



SOLDER MASK DETAILS

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NOTES: (continued)

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

EXAMPLE STENCIL DESIGN

DCK0005A

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



SOLDER PASTE EXAMPLE
BASED ON 0.125 THICK STENCIL
SCALE:18X

4214834/G 11/2024

NOTES: (continued)

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

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