

3.3 V Zero Delay Clock Buffer

Features

- 10 MHz to 100–133 MHz operating range
- Zero input and output propagation delay
- Multiple low skew outputs
- One input drives five outputs (CY2305C)
- One input drives nine outputs, grouped as 4 + 4 + 1 (CY2309C)
- 50 ps typical cycle-to-cycle jitter (15 pF, 66 MHz)
- Test mode to bypass phase locked loop (PLL) (CY2309C) only, see [Select Input Decoding on page 6](#)
- Available in space saving 16-pin 150 Mil small outline integrated circuit (SOIC) or 4.4 mm thin shrunk small outline package (TSSOP) packages (CY2309C), and 8-pin, 150 Mil SOIC package (CY2305C)
- 3.3 V operation
- Commercial, industrial and automotive-A flows available

Functional Description

The CY2305C and CY2309C are die replacement parts for CY2305 and CY2309.

The CY2309C is a low-cost 3.3 V zero delay buffer designed to distribute high speed clocks and is available in a 16-pin SOIC or TSSOP package. The CY2305C is an 8-pin version of the CY2309C. It accepts one reference input and drives out five low skew clocks. The -1H versions of each device operate up to

100 MHz–133 MHz frequencies and have higher drive than the -1 devices. All parts have on-chip phase locked loops (PLLs) which lock to an input clock on the REF pin. The PLL feedback is on-chip and is obtained from the CLKOUT pad.

The CY2309C has two banks of four outputs each that are controlled by the select inputs as shown in the [Select Input Decoding on page 6](#). If all output clocks are not required, Bank B is three-stated. The input clock is directly applied to the outputs by the select inputs for chip and system testing purposes.

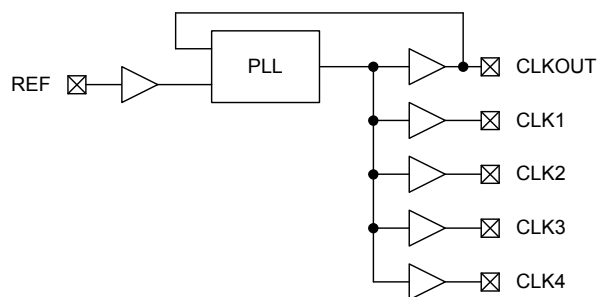
The CY2305C and CY2309C PLLs enter a power down mode when there are no rising edges on the REF input. In this state, the outputs are three-stated and the PLL is turned off. This results in less than 12.0 μ A of current draw for commercial temperature devices and 25.0 μ A for industrial and automotive-A temperature parts. The CY2309C PLL shuts down in one additional case as shown in the [Select Input Decoding on page 6](#).

In the special case when S2:S1 is 1:0, the PLL is bypassed and REF is output from DC to the maximum allowable frequency. The part behaves as a non-zero delay buffer in this mode and the outputs are not three-stated.

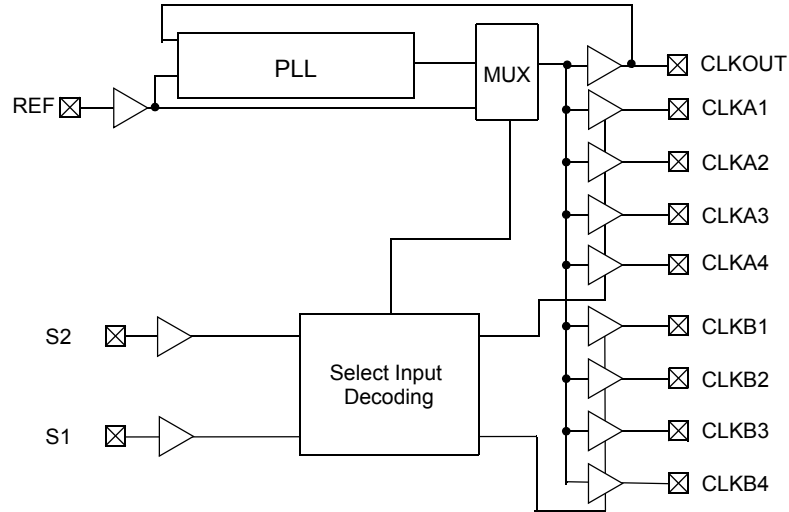
The CY2305C or CY2309C is available in two or three different configurations as shown in the [Ordering Information on page 15](#). The CY2305C-1 or CY2309C-1 is the base part. The CY2305-1H or CY2309-1H is the high drive version of the -1. Its rise and fall times are much faster than the -1.

For a complete list of related documentation, click [here](#).

Logic Block Diagram – CY2305C



Logic Block Diagram – CY2309C

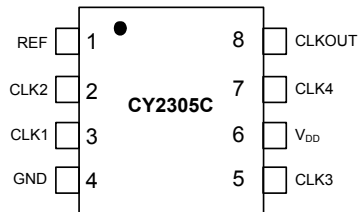


Contents

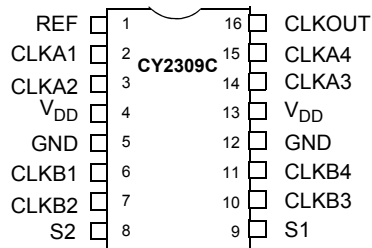
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Pinouts

**Figure 1. 8-pin SOIC pinout (Top View)
CY2305C**



**Figure 2. 16-pin SOIC / TSSOP pinout (Top View)
CY2309C**



Pin Definitions

8-pin SOIC

| Pin | Signal | Description |
|-----|-----------------------|--|
| 1 | REF ^[1] | Input reference frequency |
| 2 | CLK2 ^[2] | Buffered clock output |
| 3 | CLK1 ^[2] | Buffered clock output |
| 4 | GND | Ground |
| 5 | CLK3 ^[2] | Buffered clock output |
| 6 | V _{DD} | 3.3 V supply |
| 7 | CLK4 ^[2] | Buffered clock output |
| 8 | CLKOUT ^[2] | Buffered clock output, internal feedback on this pin |

Pin Definitions

16-pin SOIC / TSSOP

| Pin | Signal | Description |
|-----|-----------------------|--|
| 1 | REF ^[1] | Input reference frequency |
| 2 | CLKA1 ^[2] | Buffered clock output, Bank A |
| 3 | CLKA2 ^[2] | Buffered clock output, Bank A |
| 4 | V _{DD} | 3.3 V supply |
| 5 | GND | Ground |
| 6 | CLKB1 ^[2] | Buffered clock output, Bank B |
| 7 | CLKB2 ^[2] | Buffered clock output, Bank B |
| 8 | S2 ^[3] | Select input, bit 2 |
| 9 | S1 ^[3] | Select input, bit 1 |
| 10 | CLKB3 ^[2] | Buffered clock output, Bank B |
| 11 | CLKB4 ^[2] | Buffered clock output, Bank B |
| 12 | GND | Ground |
| 13 | V _{DD} | 3.3 V supply |
| 14 | CLKA3 ^[2] | Buffered clock output, Bank A |
| 15 | CLKA4 ^[2] | Buffered clock output, Bank A |
| 16 | CLKOUT ^[2] | Buffered output, internal feedback on this pin |

Notes

1. Weak pull down.
2. Weak pull down on all outputs.
3. Weak pull ups on these inputs.

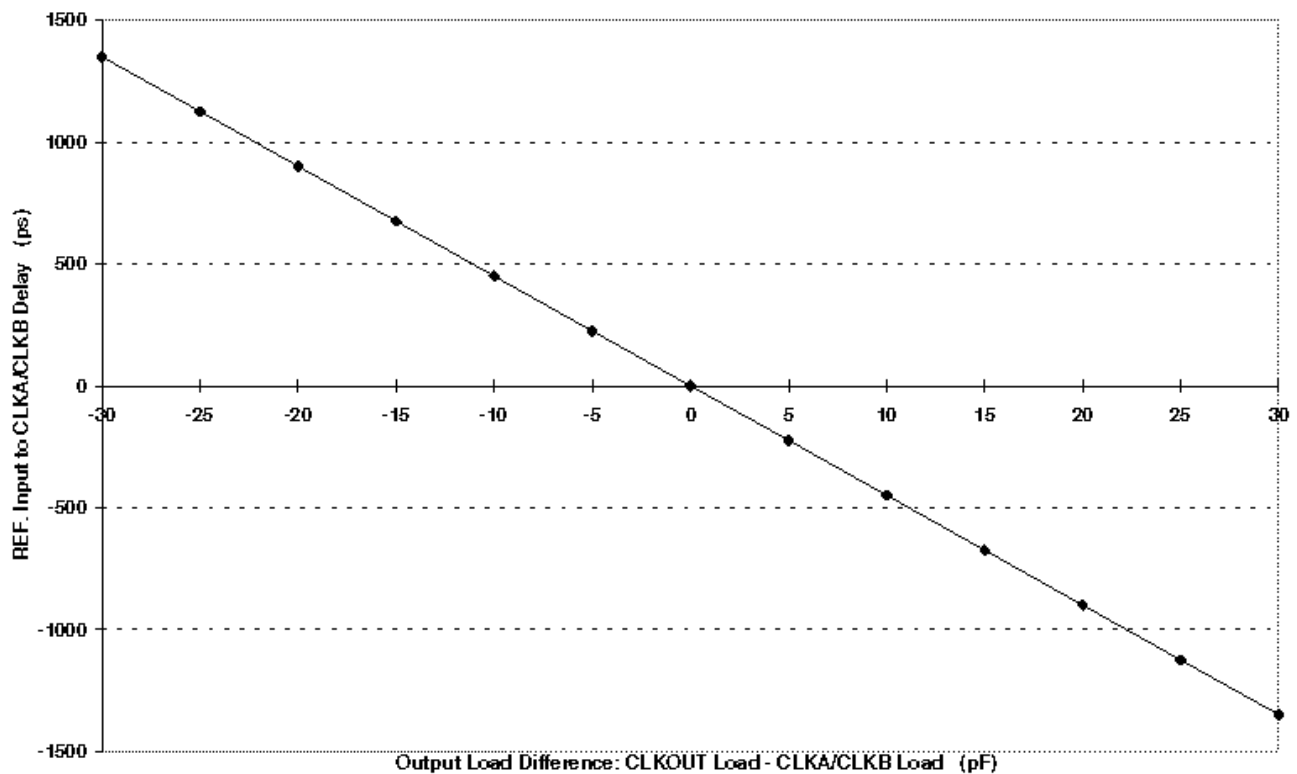
Functional Overview

Select Input Decoding

For CY2309C

| S2 | S1 | CLOCK A1–A4 | CLOCK B1–B4 | CLKOUT ^[4] | Output Source | PLL Shutdown |
|----|----|-------------|-------------|-----------------------|---------------|--------------|
| 0 | 0 | Three state | Three state | Driven | PLL | N |
| 0 | 1 | Driven | Three state | Driven | PLL | N |
| 1 | 0 | Driven | Driven | Driven | Reference | Y |
| 1 | 1 | Driven | Driven | Driven | PLL | N |

Figure 3. REF. Input to CLKA/CLKB Delay vs. Loading Difference between CLKOUT and CLKA/CLKB pins



Zero Delay and Skew Control

All outputs must be uniformly loaded to achieve Zero Delay between the input and output. Since the CLKOUT pin is the internal feedback to the PLL, its relative loading can adjust the input or output delay.

For applications requiring zero input or output delay, all outputs including CLKOUT are equally loaded. Even if CLKOUT is not used, it must have a capacitive load equal to that on other outputs for obtaining zero input or output delay.

For zero output to output skew, all outputs must be loaded equally.

Even if CLKOUT is not used, it must have a capacitive load, equal to that on other outputs, for obtaining zero input-output delay. If input to output delay adjustments are required, use Figure 3 to calculate loading differences between the CLKOUT pin and other outputs.

Note

- This output is driven and has an internal feedback for the PLL. The load on this output is adjusted to change the skew between the reference and output.

Absolute Maximum Conditions

Supply voltage to ground potential-0.5 V to +4.6 V
 DC input voltage (Except REF)-0.5 V to $V_{DD} + 0.5$ V
 DC input voltage REF-0.5 V to $V_{DD} + 0.5$ V

Storage temperature -65 °C to +150 °C
 Junction temperature 150 °C
 Static discharge voltage
 (per MIL-STD-883, Method 3015) > 2,000 V

Operating Conditions

Operating Conditions Table for CY2305CSXC-XX and CY2309CSXC-XX Commercial Temperature devices.

| Parameter | Description | Min | Max | Unit |
|-----------|---|------|-----|------|
| V_{DD} | Supply voltage | 3.0 | 3.6 | V |
| T_A | Operating temperature (ambient temperature) | 0 | 70 | °C |
| C_L | Load capacitance, below 100 MHz | – | 30 | pF |
| C_L | Load capacitance, from 100 MHz to 133 MHz | – | 10 | pF |
| C_{IN} | Input capacitance | – | 7 | pF |
| t_{PU} | Power-up time for all V_{DD} s to reach minimum specified voltage (power ramps are monotonic) | 0.05 | 50 | ms |

Operating Conditions

Operating Conditions Table for CY2305CSXI-XX, CY2305CSXA-XX and CY2309CSXI-XX Industrial / Automotive-A Temperature devices.

| Parameter | Description | Min | Max | Unit |
|-----------|---|------|-----|------|
| V_{DD} | Supply voltage | 3.0 | 3.6 | V |
| T_A | Operating temperature (ambient temperature) | -40 | 85 | °C |
| C_L | Load capacitance, below 100 MHz | – | 30 | pF |
| C_L | Load capacitance, from 100 MHz to 133 MHz | – | 10 | pF |
| C_{IN} | Input capacitance | – | 7 | pF |
| t_{PU} | Power-up time for all V_{DD} s to reach minimum specified voltage (power ramps are monotonic) | 0.05 | 50 | ms |

Electrical Characteristics

Electrical Characteristics Table for CY2305CSXC-XX and CY2309CSXC-XX Commercial Temperature devices.

| Parameter | Description | Test Conditions | Min | Max | Unit |
|---------------------------|------------------------------------|--|-----|-----|------|
| V _{IL} | Input LOW voltage ^[5] | | – | 0.8 | V |
| V _{IH} | Input HIGH voltage ^[5] | | 2.0 | – | V |
| I _{IL} | Input LOW current | V _{IN} = 0 V | – | 50 | μA |
| I _{IH} | Input HIGH current | V _{IN} = V _{DD} | – | 100 | μA |
| V _{OL} | Output LOW voltage ^[6] | I _{OL} = 8 mA (–1) | – | 0.4 | V |
| | | I _{OL} = 12 mA (–1H) | | | |
| V _{OH} | Output HIGH voltage ^[6] | I _{OH} = –8 mA (–1) | 2.4 | – | V |
| | | I _{OH} = –12 mA (–1H) | | | |
| I _{DD} (PD mode) | Power-down supply current | REF = 0 MHz | – | 12 | μA |
| I _{DD} | Supply current | Unloaded outputs at 66.67 MHz, SEL inputs at V _{DD} | – | 32 | mA |

Electrical Characteristics

Electrical Characteristics Table for CY2305CSXI-XX, CY2305CSXA-XX and CY2309CSXI-XX Industrial / Automotive-A Temperature devices.

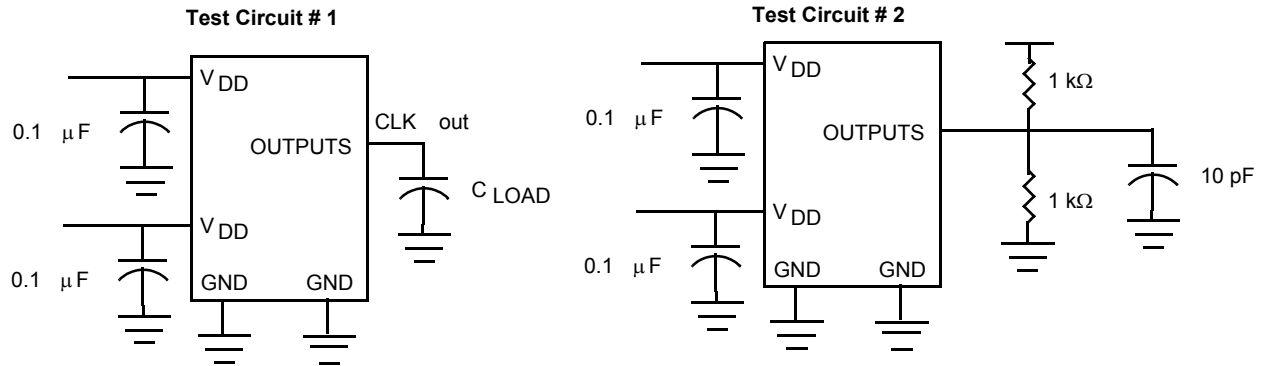
| Parameter | Description | Test Conditions | Min | Max | Unit |
|---------------------------|------------------------------------|--|-----|-----|------|
| V _{IL} | Input LOW voltage ^[5] | | – | 0.8 | V |
| V _{IH} | Input HIGH voltage ^[5] | | 2.0 | – | V |
| I _{IL} | Input LOW current | V _{IN} = 0 V | – | 50 | μA |
| I _{IH} | Input HIGH current | V _{IN} = V _{DD} | – | 100 | μA |
| V _{OL} | Output LOW voltage ^[6] | I _{OL} = 8 mA (–1) | – | 0.4 | V |
| | | I _{OL} = 12 mA (–1H) | | | |
| V _{OH} | Output HIGH voltage ^[6] | I _{OH} = –8 mA (–1) | 2.4 | – | V |
| | | I _{OH} = –12 mA (–1H) | | | |
| I _{DD} (PD mode) | Power-down supply current | REF = 0 MHz | – | 25 | μA |
| I _{DD} | Supply current | Unloaded outputs at 66.67 MHz, SEL inputs at V _{DD} | – | 35 | mA |

Notes

5. REF input has a threshold voltage of V_{DD}/2.
6. Parameter is guaranteed by design and characterization. Not 100% tested in production.

Test Circuits

Figure 4. Test Circuits



For parameter t_g (output slew rate) on -1H devices

Thermal Resistance

| Parameter ^[7] | Description | Test Conditions | 8-pin SOIC | 16-pin SOIC | 16-pin TSSOP | Unit |
|--------------------------|--|---|------------|-------------|--------------|------|
| θ_{JA} | Thermal resistance (junction to ambient) | Test conditions follow standard test methods and procedures for measuring thermal impedance, in accordance with EIA/JESD51. | 145 | 121 | 111 | °C/W |
| θ_{JC} | Thermal resistance (junction to case) | | 62 | 53 | 26 | °C/W |

Note

7. These parameters are guaranteed by design and are not tested.

Switching Characteristics

Switching Characteristics Table for CY2305CSXC-1 and CY2309CSXC-1 Commercial Temperature devices. All parameters are specified with loaded outputs.

| Parameter | Description | Test Conditions | Min | Typ | Max | Unit |
|-------------------|--|---|-----|-----|--------|------|
| t ₁ | Output frequency | 30 pF load | 10 | – | 100 | MHz |
| | | 10 pF load | 10 | – | 133.33 | MHz |
| t _{DC} | Output duty cycle ^[8] = t ₂ ÷ t ₁ | Measured at 1.4 V, F _{out} > 50 MHz | 40 | 50 | 60 | % |
| | | Measured at 1.4 V, F _{out} ≤ 50 MHz | 45 | 50 | 55 | % |
| t ₃ | Rise time ^[8] | Measured between 0.8 V and 2.0 V | – | – | 2.25 | ns |
| t ₄ | Fall time ^[8] | Measured between 0.8 V and 2.0 V | – | – | 2.25 | ns |
| t ₅ | Output-to-output skew ^[8] | All outputs equally loaded | – | – | 200 | ps |
| t _{6A} | Delay, REF rising edge to CLKOUT rising edge ^[8] | Measured at V _{DD} /2 | – | 0 | ±350 | ps |
| t _{6B} | Delay, REF rising edge to CLKOUT rising edge ^[8] | Measured at V _{DD} /2. Measured in PLL Bypass mode, CY2309C device only. | 1 | 5 | 8.7 | ns |
| t ₇ | Device-to-device skew ^[8] | Measured at V _{DD} /2 on the CLKOUT pins of devices | – | 0 | 700 | ps |
| t _J | Cycle-to-cycle jitter, peak ^[8] | Measured at 66.67 MHz, loaded outputs | – | 50 | 175 | ps |
| t _{LOCK} | PLL lock time ^[8] | Stable power supply, valid clock presented on REF pin | – | – | 1.0 | ms |

Note

8. Parameter is guaranteed by design and characterization. Not 100% tested in production.

Switching Characteristics

Switching Characteristics Table for CY2305CSXC-1H and CY2309CSXC-1H Commercial Temperature devices. All parameters are specified with loaded outputs.

| Parameter | Description | Description | Min | Typ | Max | Unit |
|-------------------|--|---|-----|-----|--------|------|
| t ₁ | Output frequency | 30 pF load | 10 | – | 100 | MHz |
| | | 10 pF load | 10 | – | 133.33 | MHz |
| t _{DC} | Output duty cycle ^[9] = t ₂ ÷ t ₁ | Measured at 1.4 V, F _{out} > 50 MHz | 40 | 50 | 60 | % |
| | | Measured at 1.4 V, F _{out} ≤ 50 MHz | 45 | 50 | 55 | % |
| t ₃ | Rise time ^[9] | Measured between 0.8 V and 2.0 V | – | – | 1.5 | ns |
| t ₄ | Fall time ^[9] | Measured between 0.8 V and 2.0 V | – | – | 1.5 | ns |
| t ₅ | Output-to-output skew ^[9] | All outputs equally loaded | – | – | 200 | ps |
| t _{6A} | Delay, REF rising edge to CLKOUT rising edge ^[9] | Measured at V _{DD} /2 | – | 0 | ±350 | ps |
| t _{6B} | Delay, REF rising edge to CLKOUT rising edge ^[9] | Measured at V _{DD} /2. Measured in PLL Bypass mode, CY2309C device only. | 1 | 5 | 8.7 | ns |
| t ₇ | Device-to-device skew ^[9] | Measured at V _{DD} /2 on the CLKOUT pins of devices | – | 0 | 700 | ps |
| t ₈ | Output slew rate ^[9] | Measured between 0.8 V and 2.0 V using Test circuit #2 | 1 | – | – | V/ns |
| t _J | Cycle-to-cycle jitter, peak ^[9] | Measured at 66.67 MHz, loaded outputs | – | – | 175 | ps |
| t _{LOCK} | PLL lock time ^[9] | Stable power supply, valid clock presented on REF pin | – | – | 1.0 | ms |

Note

9. Parameter is guaranteed by design and characterization. Not 100% tested in production.

Switching Characteristics

Switching Characteristics Table for CY2305CSXI-1, CY2305CSXA-1, and CY2309CSXI-1 Industrial Temperature devices. All parameters are specified with loaded outputs.

| Parameter | Description | Test Conditions | Min | Typ | Max | Unit |
|-------------------|---|---|-----|-----|--------|------|
| t ₁ | Output frequency | 30 pF load | 10 | – | 100 | MHz |
| | | 10 pF load | 10 | – | 133.33 | MHz |
| t _{DC} | Output duty cycle ^[10] = t ₂ ÷ t ₁ | Measured at 1.4 V, F _{out} > 50 MHz | 40 | 50 | 60 | % |
| | | Measured at 1.4 V, F _{out} ≤ 50 MHz | 45 | 50 | 55 | % |
| t ₃ | Rise time ^[10] | Measured between 0.8 V and 2.0 V | – | – | 2.25 | ns |
| t ₄ | Fall time ^[10] | Measured between 0.8 V and 2.0 V | – | – | 2.25 | ns |
| t ₅ | Output-to-output skew ^[10] | All outputs equally loaded | – | – | 200 | ps |
| t _{6A} | Delay, REF rising edge to CLKOUT rising edge ^[10] | Measured at V _{DD} /2 | – | 0 | ±350 | ps |
| t _{6B} | Delay, REF rising edge to CLKOUT rising edge ^[10] | Measured at V _{DD} /2. Measured in PLL Bypass mode, CY2309C device only. | 1 | 5 | 8.7 | ns |
| t ₇ | Device-to-device skew ^[10] | Measured at V _{DD} /2 on the CLKOUT pins of devices | – | 0 | 700 | ps |
| t _J | Cycle-to-cycle jitter, peak ^[10] | Measured at 66.67 MHz, loaded outputs | – | 50 | 175 | ps |
| t _{LOCK} | PLL lock time ^[10] | Stable power supply, valid clock presented on REF pin | – | – | 1.0 | ms |

Note

10. Parameter is guaranteed by design and characterization. Not 100% tested in production.

Switching characteristics

Switching Characteristics Table for CY2305CSXI-1H, CY2305CSXA-1H and CY2309CSXI-1H Industrial / Automotive-A Temperature devices. All parameters are specified with loaded outputs.

| Parameter | Description | Description | Min | Typ | Max | Unit |
|-------------------|---|---|-----|-----|--------|------|
| t ₁ | Output frequency | 30 pF load | 10 | – | 100 | MHz |
| | | 10 pF load | 10 | – | 133.33 | MHz |
| t _{DC} | Output duty cycle ^[11] = t ₂ ÷ t ₁ | Measured at 1.4 V, F _{out} > 50 MHz | 40 | 50 | 60 | % |
| | | Measured at 1.4 V, F _{out} ≤ 50 MHz | 45 | 50 | 55 | % |
| t ₃ | Rise time ^[11] | Measured between 0.8 V and 2.0 V | – | – | 1.5 | ns |
| t ₄ | Fall time ^[11] | Measured between 0.8 V and 2.0 V | – | – | 1.5 | ns |
| t ₅ | Output-to-output skew ^[11] | All outputs equally loaded | – | – | 200 | ps |
| t _{6A} | Delay, REF rising edge to CLKOUT rising edge ^[11] | Measured at V _{DD} /2 | – | 0 | ±350 | ps |
| t _{6B} | Delay, REF rising edge to CLKOUT rising edge ^[11] | Measured at V _{DD} /2. Measured in PLL Bypass mode, CY2309C device only. | 1 | 5 | 8.7 | ns |
| t ₇ | Device-to-device skew ^[11] | Measured at V _{DD} /2 on the CLKOUT pins of devices | – | 0 | 700 | ps |
| t ₈ | Output slew rate ^[11] | Measured between 0.8 V and 2.0 V using Test circuit #2 | 1 | – | – | V/ns |
| t _J | Cycle-to-cycle jitter, peak ^[11] | Measured at 66.67 MHz, loaded outputs | – | – | 175 | ps |
| t _{LOCK} | PLL lock time ^[11] | Stable power supply, valid clock presented on REF pin | – | – | 1.0 | ms |

Note

11. Parameter is guaranteed by design and characterization. Not 100% tested in production.

Switching Waveforms

Figure 5. Duty Cycle Timing

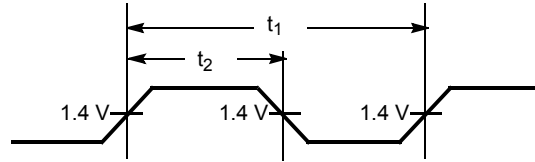


Figure 6. All Outputs Rise/Fall Time

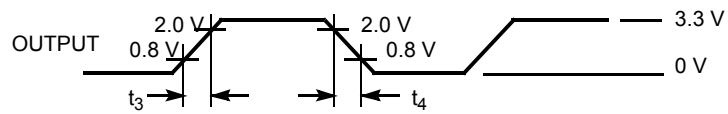


Figure 7. Output-Output Skew

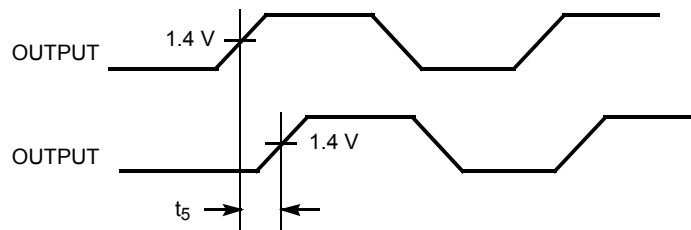


Figure 8. Input-Output Propagation Delay

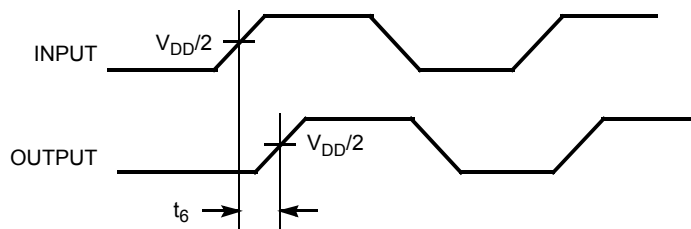
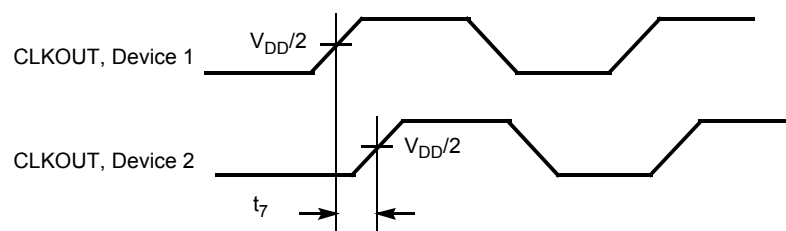


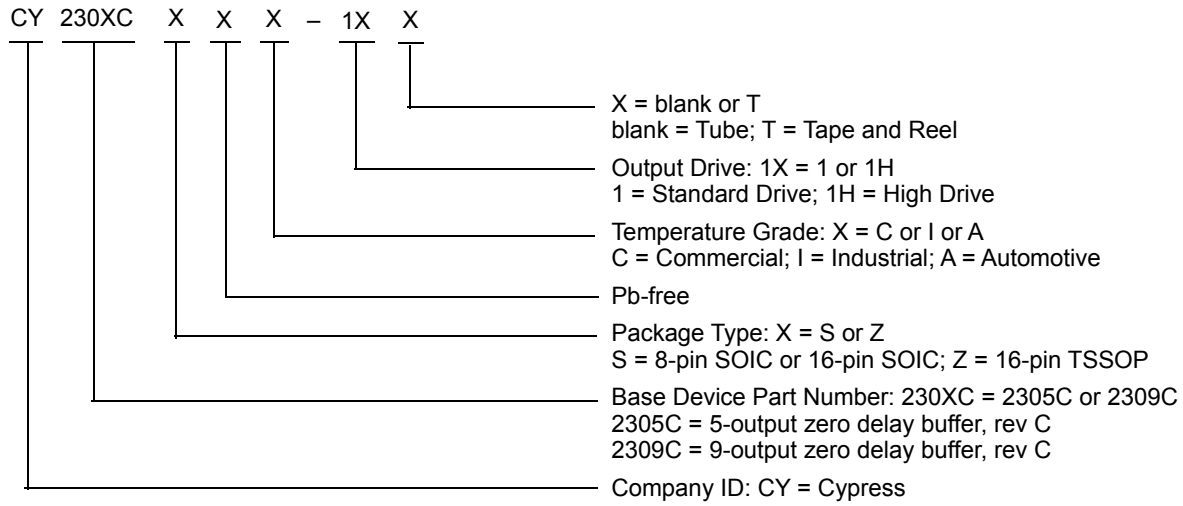
Figure 9. Device-Device Skew



Ordering Information

| Ordering Code | Package Type | Operating Range |
|--------------------------|---------------------------------------|-----------------|
| Pb-free - CY2305C | | |
| CY2305CSXC-1 | 8-pin SOIC (150 Mil) | Commercial |
| CY2305CSXC-1T | 8-pin SOIC (150 Mil) – Tape and Reel | Commercial |
| CY2305CSXC-1H | 8-pin SOIC (150 Mil) | Commercial |
| CY2305CSXC-1HT | 8-pin SOIC (150 Mil) – Tape and Reel | Commercial |
| CY2305CSXI-1 | 8-pin SOIC (150 Mil) | Industrial |
| CY2305CSXI-1T | 8-pin SOIC (150 Mil) – Tape and Reel | Industrial |
| CY2305CSXI-1H | 8-pin SOIC (150 Mil) | Industrial |
| CY2305CSXI-1HT | 8-pin SOIC (150 Mil) – Tape and Reel | Industrial |
| CY2305CSXA-1H | 8-pin SOIC (150 Mil) | Automotive-A |
| CY2305CSXA-1HT | 8-pin SOIC (150 Mil) – Tape and Reel | Automotive-A |
| Pb-free - CY2309C | | |
| CY2309CSXC-1 | 16-pin SOIC (150 Mil) | Commercial |
| CY2309CSXC-1T | 16-pin SOIC (150 Mil) – Tape and Reel | Commercial |
| CY2309CSXC-1H | 16-pin SOIC (150 Mil) | Commercial |
| CY2309CSXC-1HT | 16-pin SOIC (150 Mil) – Tape and Reel | Commercial |
| CY2309CSXI-1 | 16-pin SOIC (150 Mil) | Industrial |
| CY2309CSXI-1T | 16-pin SOIC (150 Mil) – Tape and Reel | Industrial |
| CY2309CSXI-1H | 16-pin SOIC (150 Mil) | Industrial |
| CY2309CSXI-1HT | 16-pin SOIC (150 Mil) – Tape and Reel | Industrial |
| CY2309CZXC-1 | 16-pin TSSOP (4.4 mm) | Commercial |
| CY2309CZXC-1T | 16-pin TSSOP (4.4 mm) – Tape and Reel | Commercial |
| CY2309CZXC-1H | 16-pin TSSOP (4.4 mm) | Commercial |
| CY2309CZXC-1HT | 16-pin TSSOP (4.4 mm) – Tape and Reel | Commercial |
| CY2309CZXI-1 | 16-pin TSSOP (4.4 mm) | Industrial |
| CY2309CZXI-1T | 16-pin TSSOP (4.4 mm) – Tape and Reel | Industrial |
| CY2309CZXI-1H | 16-pin TSSOP (4.4 mm) | Industrial |
| CY2309CZXI-1HT | 16-pin TSSOP (4.4 mm) – Tape and Reel | Industrial |

Ordering Code Definitions

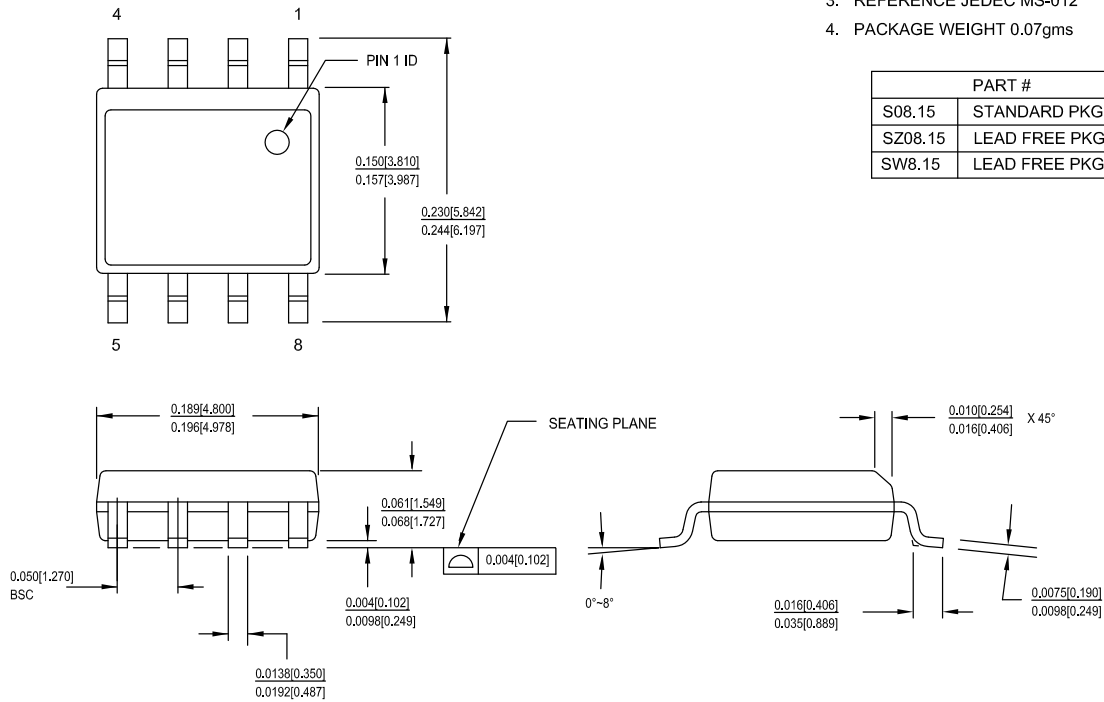


Package Diagrams

Figure 10. 8-pin SOIC (150 Mils) S0815/SZ815/SW815 Package Outline, 51-85066

1. DIMENSIONS IN INCHES[MM] MIN.
MAX.
2. PIN 1 ID IS OPTIONAL,
ROUND ON SINGLE LEADFRAME
RECTANGULAR ON MATRIX LEADFRAME
3. REFERENCE JEDEC MS-012
4. PACKAGE WEIGHT 0.07gms

| PART # | |
|---------|---------------|
| S08.15 | STANDARD PKG |
| SZ08.15 | LEAD FREE PKG |
| SW8.15 | LEAD FREE PKG |



51-85066 *H

Package Diagrams (continued)

Figure 11. 16-pin SOIC (150 Mil) S16.15/SZ16.15 Package Outline, 51-85068

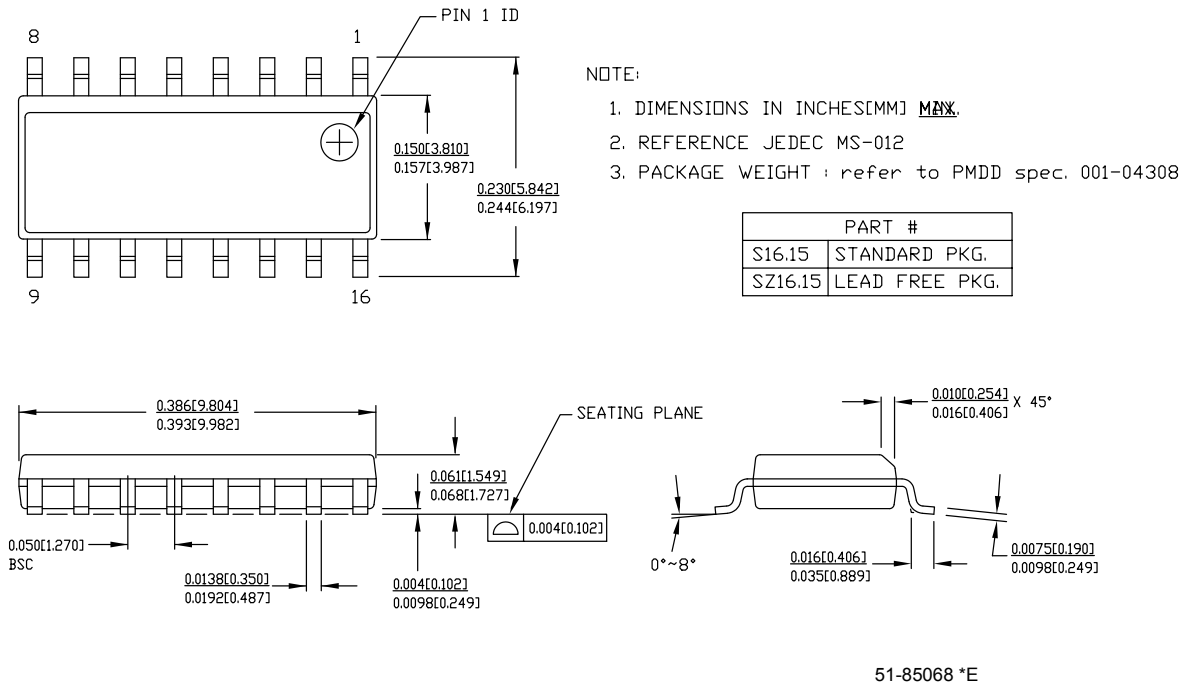
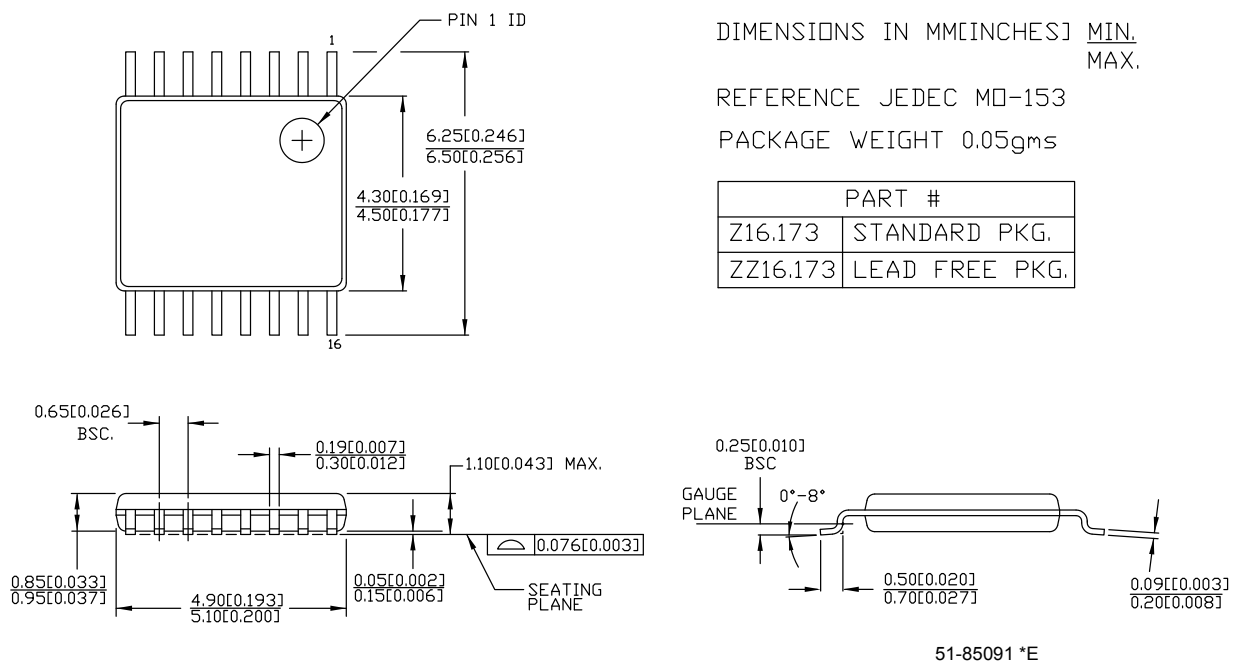


Figure 12. 16-pin TSSOP (4.40 mm Body) Z16.173/ZZ16.173 Package Outline, 51-85091



Acronyms

| Acronym | Description |
|---------|---|
| CMOS | Complementary Metal Oxide Semiconductor |
| PLL | Phase Locked Loop |
| SOIC | Small Outline Integrated Circuit |
| TSSOP | Thin Shrunk Small Outline Package |

Document Conventions

Units of Measure

| Symbol | Unit of Measure |
|--------|-----------------|
| °C | degree Celsius |
| kHz | kilohertz |
| MHz | megahertz |
| μA | microampere |
| mA | milliampere |
| ms | millisecond |
| ns | nanosecond |
| pF | picofarad |
| ps | picosecond |
| V | volt |

Document History Page

| Document Title: CY2305C/CY2309C, 3.3 V Zero Delay Clock Buffer | | | | |
|--|---------|------------|------------------|---|
| Document Number: 38-07672 | | | | |
| Rev. | ECN No. | Issue Date | Orig. of Change | Description of Change |
| ** | 224421 | See ECN | RGL | New data sheet |
| *A | 268571 | See ECN | RGL | Added bullet for 5 V tolerant inputs in the features |
| *B | 276453 | See ECN | RGL | Minor Change: Moved one sentence from the features to the Functional Description |
| *C | 303063 | See ECN | RGL | Updated data sheet as per characterization data |
| *D | 318315 | See ECN | RGL | Data sheet rewrite |
| *E | 344815 | See ECN | RGL | Minor Error: Corrected the header of all the AC/DC tables with the right part numbers. |
| *F | 1279889 | See ECN | KVM | <p>Changed title from "CY2305C/CY2309C, Low Cost 3.3 V Zero Delay Buffer" to "CY2305C/CY2309C, 3.3 V Zero Delay Clock Buffer".</p> <p>Specified the VIL minimum value to -0.3 V</p> <p>Specified the VIH maximum value to VDD + 0.3 V</p> <p>Changed DC Input Voltage (REF) maximum value in Absolute Maximum section</p> <p>Removed references to 5 V tolerant inputs (pages 1 and 2)</p> <p>Removed Pentium compatibility reference</p> <p>Added CY2305C block diagram</p> <p>Added ,peak to the jitter specifications</p> <p>Changed typical jitter from 75 ps to 50 ps for standard drive devices</p> <p>For standard drive devices, tightened rise/fall times from 2.5 ns to 2.25 ns</p> <p>Tightened cycle-to-cycle jitter from 200 ps to 175 ps</p> <p>Tightened output-to-output skew from 250 ps to 200 ps</p> |
| *G | 1561504 | See ECN | KVM / NSI / AESA | <p>Changed status from Preliminary to Final.</p> <p>Added CY2305C Automotive-A grade devices</p> <p>Extended duty cycle specs to cover entire frequency range</p> |
| *H | 2558537 | 08/27/08 | KVM / AESA | <p>Updated Ordering Information:</p> <p>Added CY2305CSXA-1 and CY2305CSXA-1T parts under Pb-free CY2305C.</p> |
| *I | 2901743 | 03/30/2010 | VIVG | <p>Added Ordering Code Definitions under Ordering Information.</p> <p>Updated Package Diagrams.</p> |
| *J | 3080990 | 11/10/2010 | BASH | <p>Updated Pinouts:</p> <p>Updated Figure 1 (Modified pin diagram).</p> <p>Added Acronyms and Units of Measure.</p> <p>Updated to new template.</p> |
| *K | 3160535 | 02/03/2011 | BASH | <p>Updated Electrical Characteristics:</p> <p>Removed minimum value of V_{IL} parameter and maximum value of V_{IH} parameter.</p> <p>Updated Electrical Characteristics:</p> <p>Removed minimum value of V_{IL} parameter and maximum value of V_{IH} parameter.</p> <p>Updated Ordering Information:</p> <p>Removed Prune parts CY2305CSXA-1 and CY2305CSXA-1T.</p> |
| *L | 3822852 | 11/27/2012 | PURU | <p>Updated Functional Overview:</p> <p>Updated Select Input Decoding (Added Figure 3 only, no edits).</p> <p>Updated Zero Delay and Skew Control (Minor edits).</p> <p>Updated Package Diagrams:</p> <p>spec 51-85091 – Changed revision from *C to *D.</p> <p>spec 51-85068 – Changed revision from *C to *E.</p> <p>spec 51-85066 – Changed revision from *D to *E.</p> |

Document History Page *(continued)*

| Document Title: CY2305C/CY2309C, 3.3 V Zero Delay Clock Buffer | | | | |
|--|---------|------------|-----------------|---|
| Document Number: 38-07672 | | | | |
| Rev. | ECN No. | Issue Date | Orig. of Change | Description of Change |
| *M | 4201564 | 11/25/2013 | CINM | Updated Package Diagrams : spec 51-85066 – Changed revision from *E to *F. Updated to new template. Completing Sunset Review. |
| *N | 4578443 | 11/25/2014 | TAVA | Updated Functional Description : Added “For a complete list of related documentation, click here .” at the end. Updated Package Diagrams . |
| *O | 5242528 | 04/15/2016 | SDHK / PSR | Updated Electrical Characteristics : Updated details in “Test Conditions” column corresponding to V_{OL} and V_{OH} parameters. Updated Electrical Characteristics : Updated details in “Test Conditions” column corresponding to V_{OL} and V_{OH} parameters. Added Thermal Resistance . Updated Package Diagrams : spec 51-85066 – Changed revision from *F to *H. Updated to new template. |
| *P | 5553658 | 12/14/2016 | TAVA | Updated to new template. Completing Sunset Review. |
| *Q | 5708829 | 04/27/2017 | AESATMP7 | Updated Cypress Logo and Copyright. |