THE DATASHEET OF

PI6C2404A-1WE

Zero-Delay Clock Buffer

Features

- Maximum rated frequency: 133 MHz
- Low cycle-to-cycle jitter
- Input to output delay, less than 200ps
- External feedback pin allows outputs to be synchronized to the clock input
- 5V tolerant input*
- Operates at 3.3V V_{DD}
- Test mode allows bypass of the PLL for system testing purposes (e.g., IBIS measurements)
- Space-saving Packaging (Pb-free and Green Available):
  — 8-pin, 150-mil SOIC (W)

** FB_IN and CLKIN must reference the same voltage thresholds for the PLL to deliver zero delay skewing*

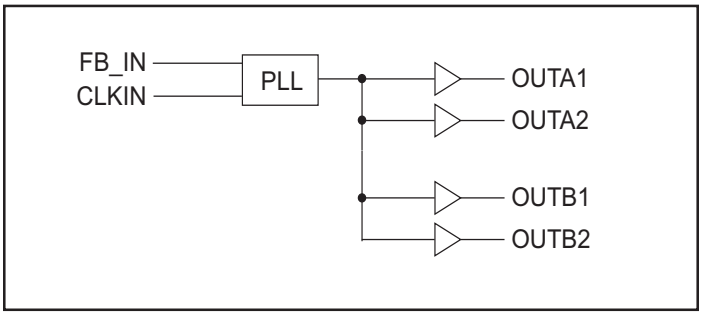
Description

The PI6C2404A-1 is a PLL-based, zero-delay buffer, with the ability to distribute four outputs of up to 133 MHz at 3.3V. Two banks of two outputs exist, OUTA[1–2] and OUTB[1–2].

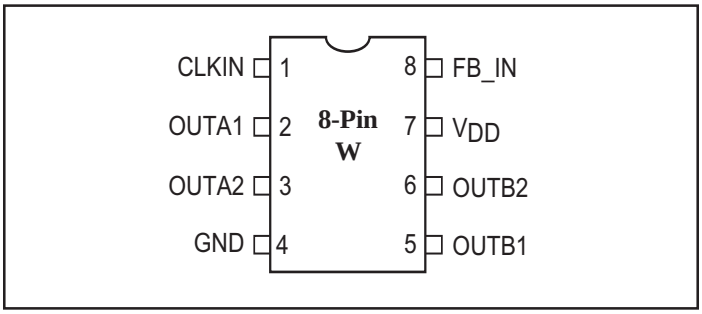
An external feedback pin is used to synchronize the outputs to the input; the relationship between loading of this signal and the other outputs determines the input-output delay.

The PI6C2404A-1 is characterized for both commercial and industrial operation.

Block Diagram



Pin Configuration

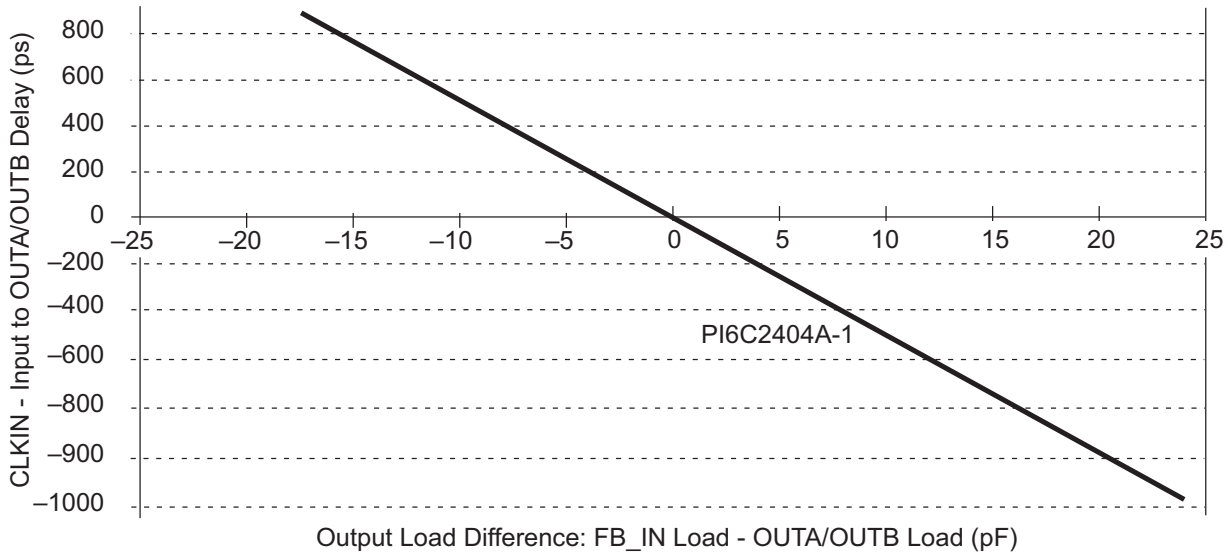


Pin Description

Pin	Signal	Description
1	CLKIN	Input clock reference frequency (weak pull-down)
2, 3	OUTA[1-2]	Clock output, Bank A
7	V_{DD}	3.3V supply
4	GND	Ground
5, 6	OUTB[1-2]	Clock output, Bank B
8	FB_IN	PLL feedback input

Zero-Delay and Skew Control

CLKIN Input to Output Bank Delay vs. Difference in Loading between FB_IN pin and OUTA/OUTB pins



The relationship between loading of the FB_IN signal and other outputs determines the input-output delay. Zero delay is achieved when all outputs, including feedback, are loaded equally.

Maximum Ratings

Supply Voltage to Ground Potential	–0.5V to +7.0V
DC Input Voltage (Except CLKIN)	–0.5V to V_{DD} +0.5V
DC Input Voltage CLKIN	–0.5 to 7V
Storage Temperature	–65ºC to +150ºC
Maximum Soldering Temperature (10 seconds)	260ºC
Junction Temperature	150ºC
Static Discharge Voltage (per MIL-STD-883, Method 3015)	>2000V

Operating Conditions (V_{CC} = 3.3V ±0.3V)

Parameter	Description	Min.	Max.	Units
V_{DD}	Supply Voltage	3.0	3.6	V
T_A	Commerical Operating Temperature	0	70	ºC
	Industrial Operating Temperature	–40	85	
C_L	Load Capacitance, below 100 MHz	—	30	pF
	Load Capacitance, from 100 MHz to 133 MHz	—	15	
C_{IN}	Input Capacitance	—	7.3	

DC Electrical Characteristics for Industrial Temperature Devices

Parameter	Description	Test Conditions	Min.	Max.	Units
V_{IL}	Input LOW Voltage			0.8	V
V_{IH}	Input HIGH Voltage		2.0		
I_{IL}	Input LOW Current	V_{IN} = 0V		50	µA
I_{IH}	Input HIGH Current	V_{IN} = V_{DD}		112	
V_{OL}	Output LOW Voltage	I_{OL} = 8mA		0.4	V
V_{OH}	Output HIGH Voltage	I_{OH} = –8mA	2.4		
I_{DD}	Supply Current	Unloaded outputs 100 MHz, Select inputs at V_{DD} or GND		54	mA
		Unloaded outputs 66 MHz, CLKIN		39	
		Unloaded outputs 33MHz, CLKIN		22	

AC Electrical Characteristics for Industrial Temperature Devices

Parameters	Name	Test Conditions	Min.	Typ.	Max.	Units
F_O	Output Frequency	30pF load	10		100	MHz
		15pF load			133	
t_{DC}	Duty Cycle(1)	Measured at V_{DD}/2, F_{OUT} <66.67MHz 30pF load	40	50	60	%
		Measured at V_{DD}/2, F_{OUT} <50MHz 15pF load	45		55	
t_R	Rise Time(1)	Measured between 0.8V and 2.0V, 30pF load			2.2	ns
		Measured between 0.8V and 2.0V, 15pF load			1.5	
t_F	Fall Time(1)	Measured between 0.8V and 2.0V, 30pF load			2.2	
		Measured between 0.8V and 2.0V, 15pF load			1.5	
$t_{SK(O)}$	Output to Output Skew within same bank(1)	All outputs equally loaded			200	ps
	OUTA to OUTB Skew(1)					
t_0	Delay, CLKIN Rising Edge to FB_IN Rising Edge(1)	Measured at V_{DD}/2			275	
$t_{SK(D)}$	Device-to-Device Skew(1)	Measured at V_{DD}/2 on FB_IN pins of devices		0	500	
t_{JIT}	Cycle-to-Cycle Jitter(1)	Measured at 66.67 MHz, loaded 30pF load			200	ps
		Measured at 133 MHz, loaded 15pF load			150	
t_{LOCK}	PLL Lock Time(1)	Stable power supply, valid clocks presented on CLKIN and FB_IN pins			1.0	ms

Notes:
1. CLKIN and FB_IN inputs have a threshhold voltage of V_{DD}/2.

DC Electrical Characteristics for Commercial Temperature Devices

Parameter	Description	Test Conditions	Min.	Max.	Units
V_{IL}	Input LOW Voltage		—	0.8	V
V_{IH}	Input HIGH Voltage		2.0	—	
I_{IL}	Input LOW Current	V_{IN} = 0V	—	50	µA
I_{IH}	Input HIGH Current	V_{IN} = V_{DD}	—	112	
V_{OL}	Output LOW Voltage	I_{OL} = 8mA	—	0.4	V
V_{OH}	Output HIGH Voltage	I_{OH} = –8mA	2.4	—	
I_{DD}	Supply Current	Unloaded outputs 100 MHz Select Inputs @ V_{DD} or GND	—	54	
I_{DD}	Supply Current	Unloaded outputs, 66.67 MHz, Select inputs at V_{DD} or GND	—	39	mA

AC Electrial Characteristics for Commercial Temperature Device

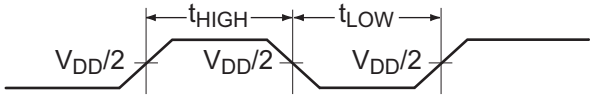
Parameters	Name	Test Conditions	Min.	Typ.	Max.	Units
F_O	Output Frequency	30pF load	10		100	MHz
		15pF load,			133	
t_{DC}	Duty Cycle(2)	Measured at V_{DD}/2, F_O <66.67MHz, 30pF load	40	50	60	%
		Measured at V_{DD}/2, F_O <50MHz, 15pF load	45	50	55	
t_R	Rise Time(1) @30pF	Measured between 0.8V and 2.0V			2.2	ns
	Rise Time(1) @15pF				1.5	
t_F	Fall Time(1) @30pF				2.2	
	Fall Time(1) @15pF				1.5	
$t_{SK(O)}$	Output to Output Skew(1) within same bank	All outputs equally loaded, V_{DD}/2			200	ps
	OUTA to OUTB Skew(1)	All outputs equally loaded, V_{DD}/2			200	
t_0	Input to Output Delay, CLKIN Rising Edge to FB_IN Rising Edge(1)	Measured at V_{DD}/2			275	
$t_{SK(D)}$	Device to Device Skew(1)	Measured at V_{DD}/2 on FB_IN pins of devices		0	500	
t_{JIT}	Cycle-to-Cycle Jitter(1)	Measured at 66.67 MHz, loaded 30pF outputs			200	
		Measured at 133 MHz, loaded 15pF outputs			150	
t_{LOCK}	PLL Lock Time(1)	Stable power supply, valid clocks presented on CLKIN and FB_IN pins			1.0	ms

Notes:

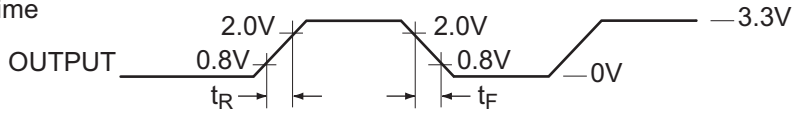
1. CLKIN and FB_IN inputs have a threshhold voltage of V_{DD}/2.
2. $t_{DC} = \frac{t_{HIGH}}{t_{HIGH} + t_{LOW}}$

Switching Waveforms

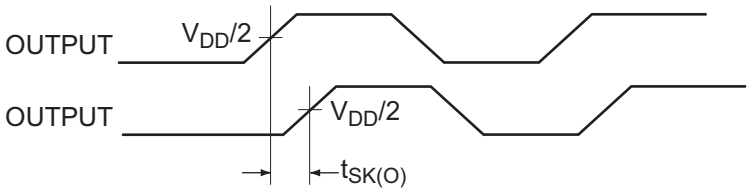
Duty Cycle Timing



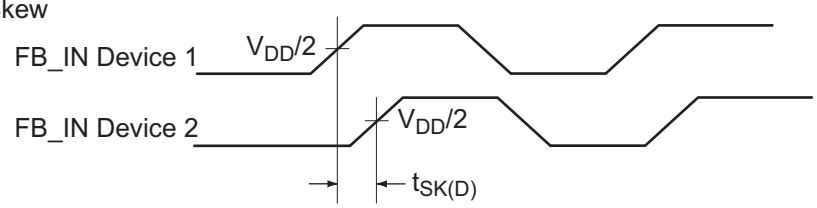
All Outputs Rise/Fall Time



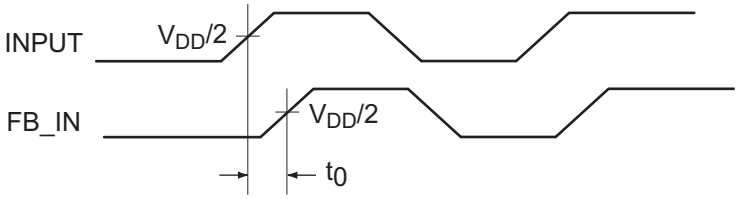
Output-Output Skew



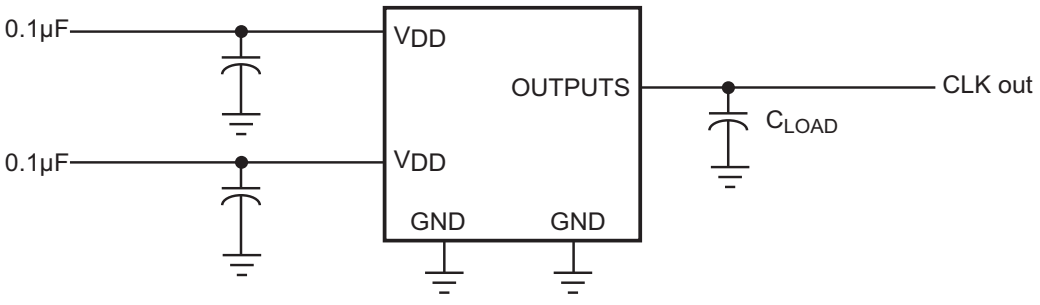
Device-Device Skew



Input-Output Propagation Delay



Test Circuit

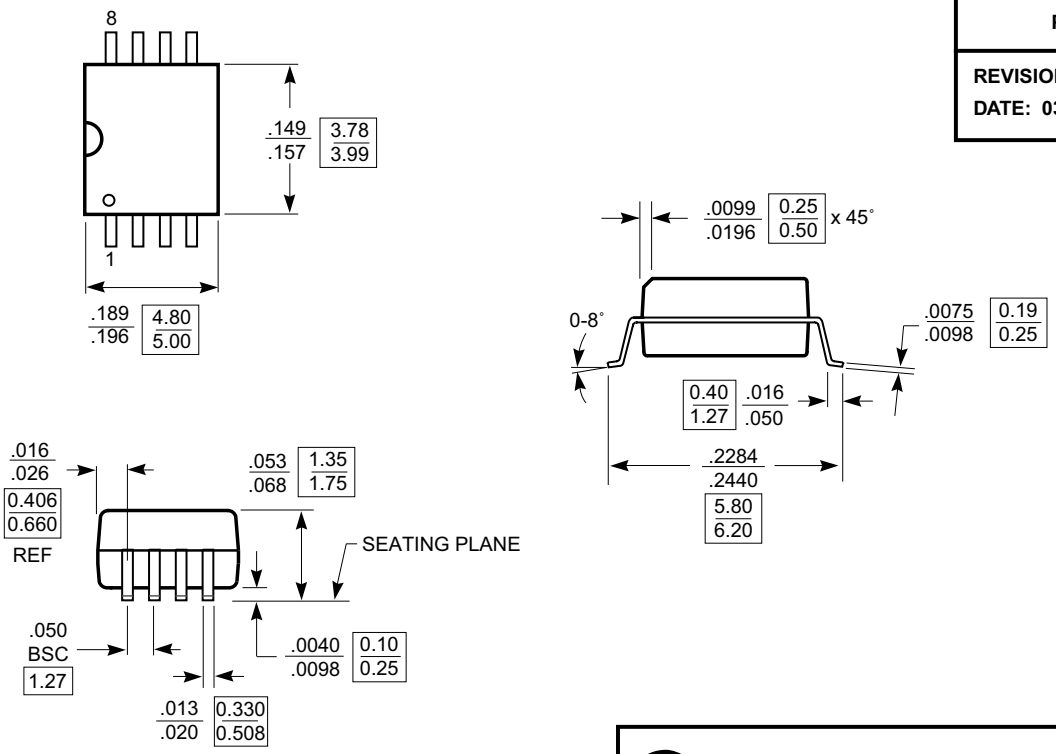


Test Circuit for all parameters

Packaging Mechanical: 8-Pin SOIC (W)

DOCUMENT CONTROL NO.
PD - 1001

REVISION: F
DATE: 03/09/05



X.XX / X.XX DENOTES DIMENSIONS IN MILLIMETERS

Notes:
1) Controlling dimensions in millimeters.
2) Ref: JEDEC MS-012D/AA

Pericom Semiconductor Corporation
3545 N. 1st Street, San Jose, CA 95134
1-800-435-2335 • www.pericom.com

DESCRIPTION: 8-Pin, 150-Mil Wide, SOIC

PACKAGE CODE: W

Ordering Information

Ordering Code	Package Code	Package Description	Operating Range
PI6C2404A-1WE	W	Pb-free and Green 8-pin 150-mil SOIC	Commercial
PI6C2404A-1WIE	W	Pb-free and Green 8-pin 150-mil SOIC	Industrial

Notes:

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
2. X = Tape/Reel
3. E = Pb-free & Green

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- View PI6C2404A-1WE on WIN SOURCE
- Diodes Incorporated Information

Optimize Your Supply Chain with WIN SOURCE Solutions

- Global Sourcing Solution
- Obsolete Management
- Cost Control Management
- Shortage Management
- Alternative Solution
- Excess Inventory Management