

Four Output PCI-X and General Purpose Buffer

Features

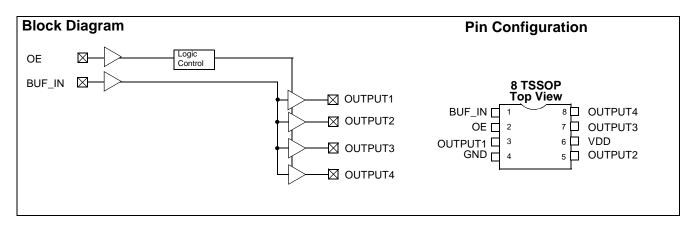
- One input to four output buffer/driver
- General-purpose or PCI-X clock buffer
- Buffers all frequencies from DC to 140 MHz
- Output-to-output skew less than 100 ps
- Space-saving 8-pin TSSOP package
- 3.3V operation

Functional Description

The CY2304NZ is a low-cost buffer designed to distribute high-speed clocks for PCI-X and other applications. The device operates at 3.3V and outputs can run up to 140 MHz.

Table 1. Function Table.

Inputs	Outputs	
BUF_IN	OE	Output [1:4]
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Pin Description for CY2304NZ

Signal	Pin	Description
V _{DD}	6	3.3V voltage supply
GND	4	Ground
BUF_IN	1	Input clock
OUTPUT [1:4]	3, 5, 7, 8	Outputs
OE	2	Input pin for output enable, active HIGH.

3901 North First Street • San Jose • CA 95134 • 408-943-2600 Revised December 14, 2002



Maximum Ratings

Supply Voltage to Ground Potential0.5V to V_{DD} +0.5V
DC Input Voltage (Except REF)–0.5V to $\mathrm{V_{DD}}$ +0.5V
DC Input Voltage REF0.5V to $\rm V_{DD}$ +0.5V

Operating Conditions

Storage Temperature	–65°C to +150°C
Max. Soldering Temperature (10 sec.)	260°C
Junction Temperature	150°C
Static Discharge Voltage (per MIL-STD-883, Method 3015)	>2,000V

Parameter	Parameter Description		Max.	Unit
V _{DD}	Supply Voltage	3.0	3.6	V
T _A	Operating Temperature (Ambient Temperature)	-40	85	°C
CL	Load Capacitance		25	pF
C _{IN}	Input Capacitance		7	pF
BUF_IN, OUTPUT [1:4]	Operating Frequency	DC	140	MHz
t _{PU}	Power-up time for all VDD's to reach minimum specifie voltage (power ramps must be monotonic)		50	ms

Electrical Characteristics

Parameter	Description	Test Conditions	Min.	Max.	Unit
V _{IL}	Input LOW Voltage ^[1]			0.8	V
V _{IH}	Input HIGH Voltage ^[1]		2.0		V
IIL	Input LOW Current	V _{IN} = 0V	-5	5	μΑ
I _{IH}	Input HIGH Current	$V_{IN} = V_{DD}$	-5	5	μΑ
V _{OL}	Output LOW Voltage ^[2]	I _{OL} = 24 mA		0.8	V
		I _{OL} = 12 mA		0.55	V
V _{OH}	Output HIGH Voltage ^[2]	I _{OH} = -24 mA	2.0		V
		$I_{OH} = -12 \text{ mA}$	2.4		V
I _{DD}	Supply Current	Unloaded outputs at 66.66 MHz		25	mA

Switching Characteristics^[3] for Commercial and Industrial Temperature Devices

Parameter	Name	Name Description		Тур.	Max.	Unit
	Duty Cycle ^[2] = $t_2 \div t_1$	Measured at 1.5V	40.0	50.0	60.0	%
t ₃	Rise Time ^[2]	Measured between 0.8V and 2.0V			1.50	ns
t ₄	Fall Time ^[2]	Measured between 0.8V and 2.0V			1.50	ns
t ₅	Output to Output Skew ^[2]	All outputs equally loaded			100	ps
t ₆	Propagation Delay, BUF_IN Rising Edge to OUTPUT Rising Edge ^[2]	Measured at V _{DD} /2	2.5	3.5	5	ns

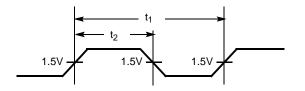
Notes:

BUF_IN input has a threshold voltage of V_{DD}/2.
Parameter is guaranteed by design and characterization. It is not 100% tested in production.
All parameters specified with loaded outputs.

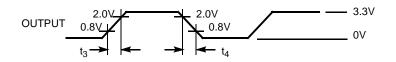


Switching Waveforms

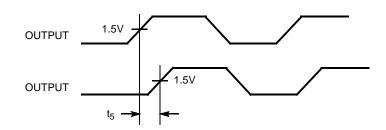
Duty Cycle Timing



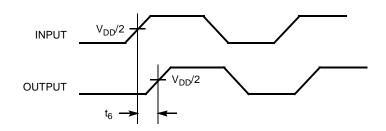
All Outputs Rise/Fall Time



Output-Output Skew



Input-Output Propagation Delay



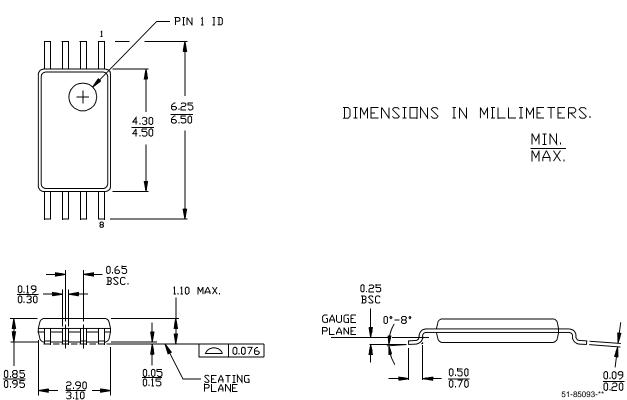


Ordering Information

Ordering Code	Package Type	Operating Range
CY2304NZZC-1	8-pin TSSOP	Commercial, 0°C to 70°C
CY2304NZZC-1T	8-pin TSSOP - Tape and Reel	Commercial, 0°C to 70°C
CY2304NZZI-1	8-pin TSSOP	Industrial, –40°C to 85°C
CY2304NZZI-1T	8-pin TSSOP - Tape and Reel	Industrial, -40°C to 85°C

Package Diagram





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Document History Page

Document Title: CY2304NZ Four Output PCI-X and General Purpose Buffer Document Number: 38-07099				
REV.	ECN NO.	Issue Date	Orig. of Change	Description of Change
**	111420	02/12/02	IKA	New Data Sheet
*A	118610	09/25/02	HWT	Added Industrial Temperature Range in the Ordering Information
*В	121820	12/14/02	RBI	Power up requirements added to Operating Conditions Information