

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
- Available in 8-pin TSSOP and SOIC Packages
- 3.3V operation

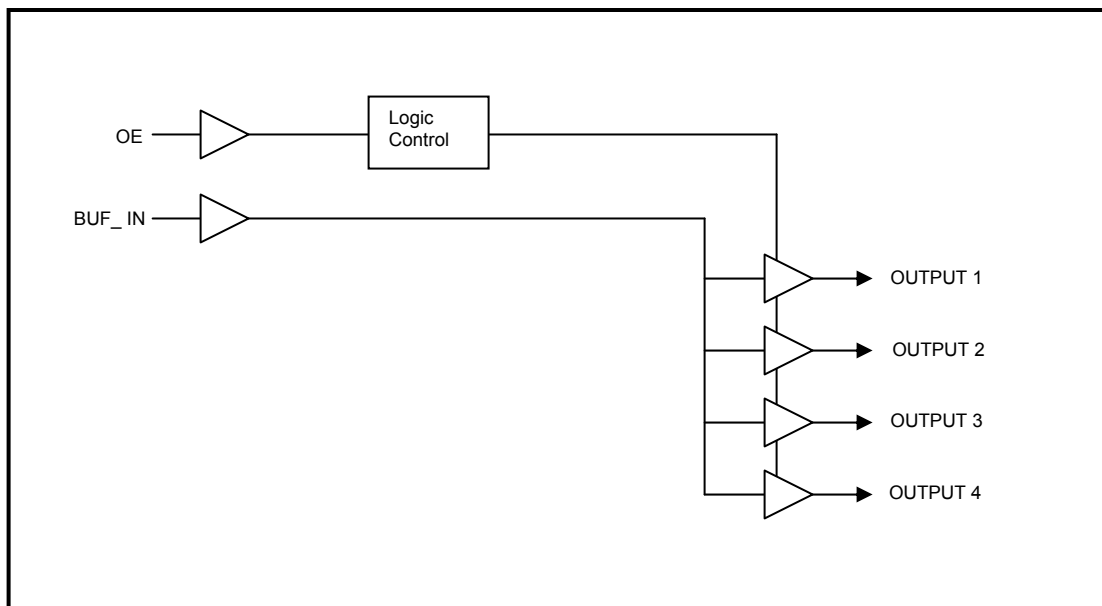
Functional Description

The ASM2P2304NZ 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]
L	L	L
H	L	L
L	H	L
H	H	H

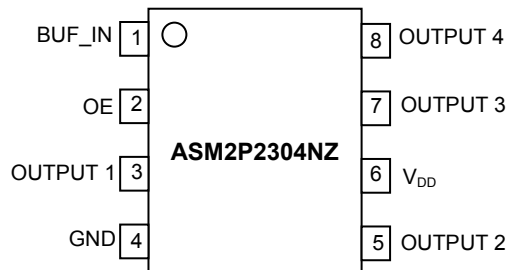
Block Diagram



January 2007

rev 1.1

Pin Configuration



Pin Description

Pin #	Pin Name	Type	Description
1	BUF_IN ¹	I	Input clock. 5V Tolerant Input
2	OE	I	Input pin for Output Enable, active HIGH. Connect to V _{DD}
3	Output 1 ²	O	Output 1
4	GND	P	Ground
5	Output 2 ²	O	Output 2
6	V _{DD}	P	3.3V Voltage Supply
7	Output 3 ²	O	Output 3
8	Output 4 ²	O	Output 4

Notes :

1. Weak pull down on input
2. Weak pull down on all outputs

Absolute Maximum Ratings

Parameter	Description	Min	Max
Supply Voltage to Ground Potential	-0.5	7	V
DC Input Voltage (Except BUF_IN)	-0.5	V _{DD} + 0.5	V
DC Input Voltage (BUF_IN)	-0.5	7	V
Storage Temperature	-65	+150	°C
Max. Soldering Temperature (10 sec)		260	°C
Junction Temperature		150	°C
Static Discharge Voltage (As per JEDEC STD22- A114-B)		2000	V
Note: These are stress ratings only and functional usage is not implied. Exposure to absolute maximum ratings for prolonged periods can affect device reliability.			

Operating Conditions

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	-	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 V _{DD} 's to reach minimum specified Voltage (Power ramps must be monotonic)	0.05	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
I _{IL}	Input LOW Current	V _{IN} = 0V	-5	5	μA
I _{IH}	Input HIGH Current	V _{IN} = V _{DD}	-5	12	μA
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 mA	2.4	-	V
I _{DD}	Supply Current	Unloaded outputs at 66.66 MHz	-	25	mA

Switching Characteristics for Commercial and Industrial Temperature Devices³

Parameter	Name	Description	Min	Typ	Max	Unit	
t _D	Duty Cycle ² = t ₂ ÷ 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 2.0V and 0.8V	-	-	1.50	nS	
t ₅	Output to Output Skew ²	All outputs equally loaded	For Commercial parts	-	-	100	pS
			For Industrial parts	-	-	150	
t ₆	Propagation Delay, BUF_IN Rising Edge to OUTPUT Rising Edge ²	Measured at V _{DD} /2	2.5	3.5	5	nS	

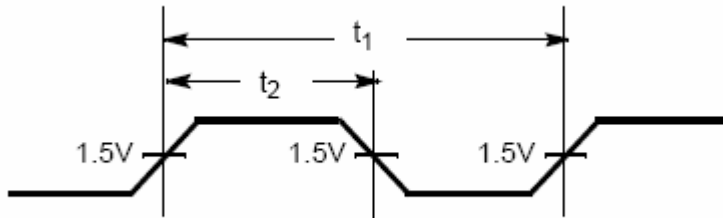
Note:

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

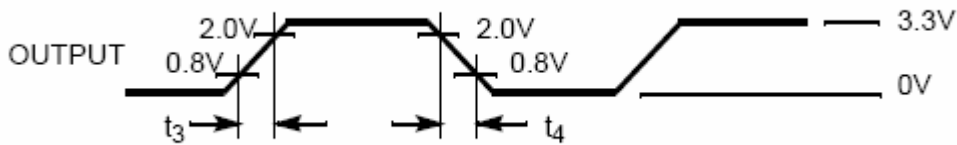
rev 1.1

Switching Waveforms

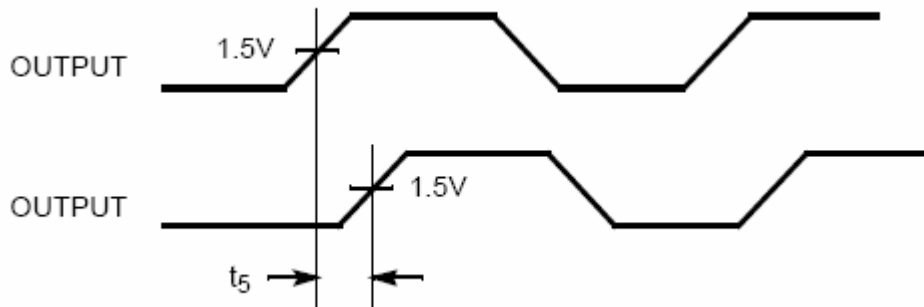
Duty Cycle Timing



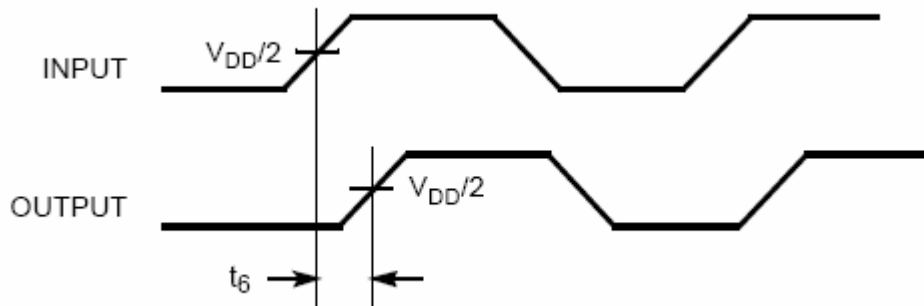
All Outputs Rise/Fall Time



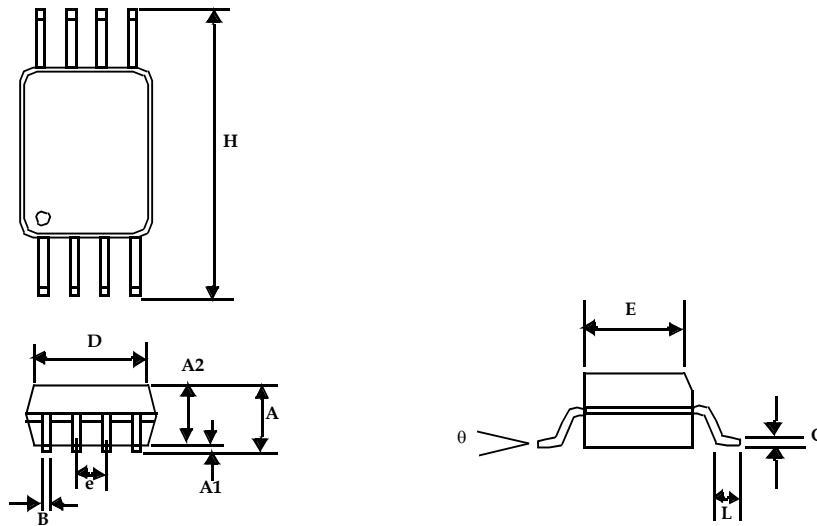
Output-Output Skew



Input-Output Propagation Delay



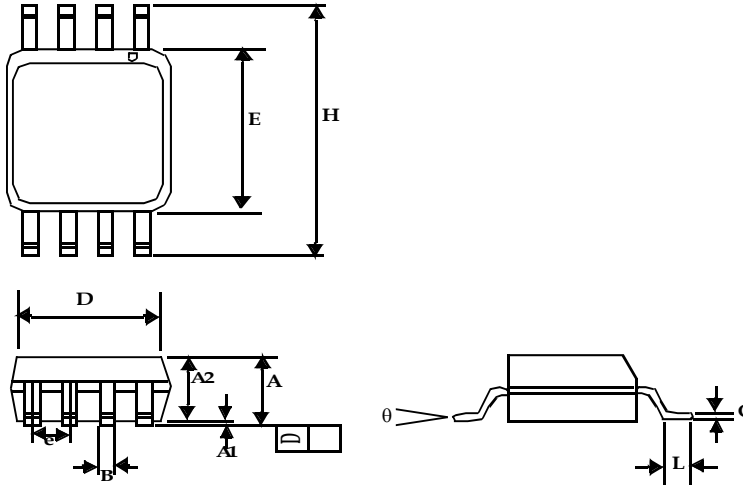
8-lead Thin Shrunk Small Outline Package (4.40-MM Body)



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A		0.043		1.10
A1	0.002	0.006	0.05	0.15
A2	0.033	0.037	0.85	0.95
B	0.008	0.012	0.19	0.30
c	0.004	0.008	0.09	0.20
D	0.114	0.122	2.90	3.10
E	0.169	0.177	4.30	4.50
e	0.026 BSC		0.65 BSC	
H	0.252 BSC		6.40 BSC	
L	0.020	0.028	0.50	0.70
θ	0°	8°	0°	8°

Package Information

8-lead (150-mil) SOIC Package

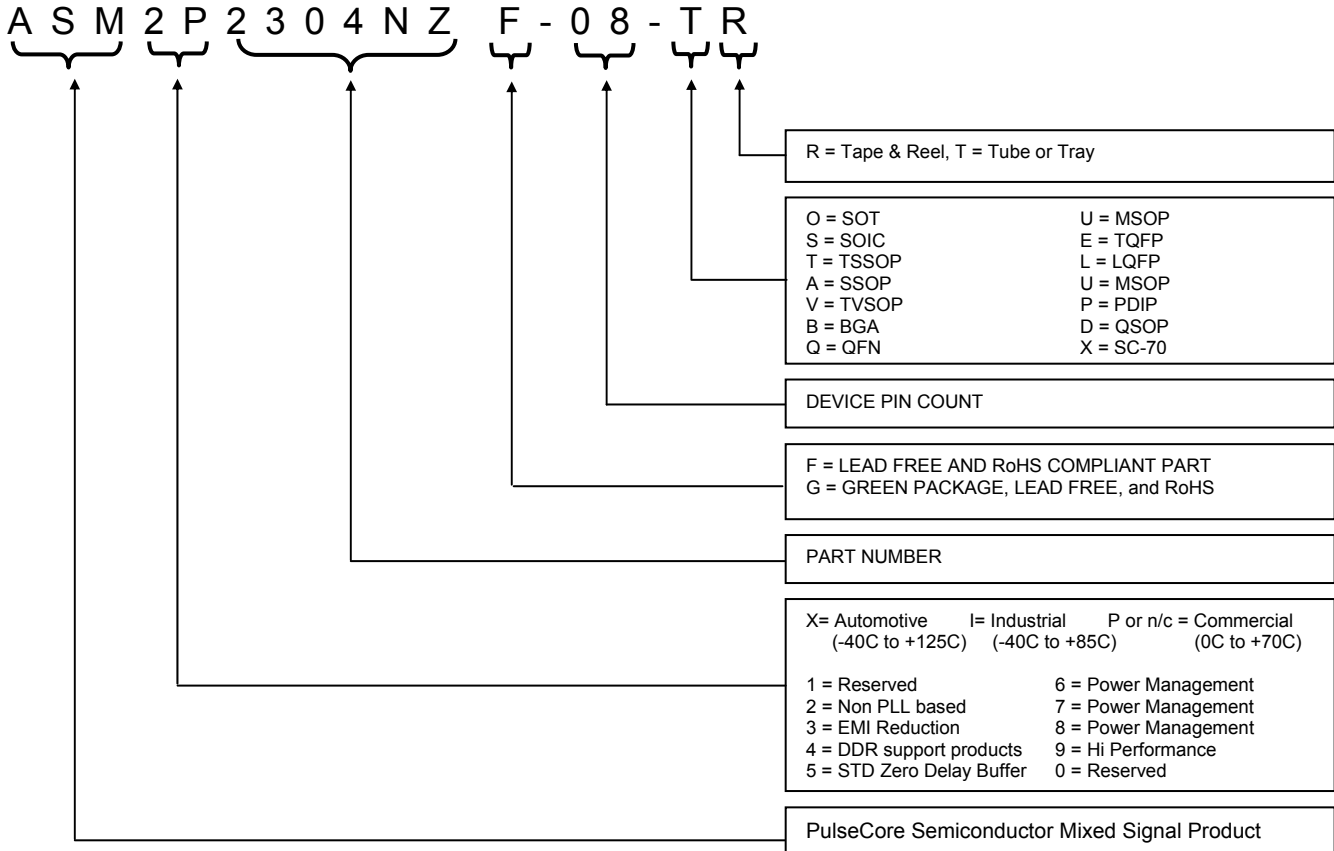


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A1	0.004	0.010	0.10	0.25
A	0.053	0.069	1.35	1.75
A2	0.049	0.059	1.25	1.50
B	0.012	0.020	0.31	0.51
C	0.007	0.010	0.18	0.25
D	0.193 BSC		4.90 BSC	
E	0.154 BSC		3.91 BSC	
e	0.050 BSC		1.27 BSC	
H	0.236 BSC		6.00 BSC	
L	0.016	0.050	0.41	1.27
θ	0°	8°	0°	8°

Ordering Codes

Part Number	Marking	Package Type	Temperature
ASM2P2304NZF-08-ST	2P2304NZF	8-pin SOIC - Tube, Pb Free	Commercial
ASM2P2304NZF-08-SR	2P2304NZF	8-pin SOIC - Tape and Reel, Pb Free	Commercial
ASM2I2304NZF-08-ST	2I2304NZF	8-pin SOIC - Tube, Pb Free	Industrial
ASM2I2304NZF-08-SR	2I2304NZF	8-pin SOIC - Tape and Reel, Pb Free	Industrial
ASM2P2304NZG-08-ST	2P2304NZG	8-pin SOIC - Tube, Green	Commercial
ASM2P2304NZG-08-SR	2P2304NZG	8-pin SOIC - Tape and Reel, Green	Commercial
ASM2I2304NZG-08-ST	2I2304NZG	8-pin SOIC - Tube, Green	Industrial
ASM2I2304NZG-08-SR	2I2304NZG	8-pin SOIC - Tape and Reel, Green	Industrial
ASM2P2304NZF-08-TT	2P2304NZF	8-pin TSSOP - Tube, Pb Free	Commercial
ASM2P2304NZF-08-TR	2P2304NZF	8-pin TSSOP - Tape and Reel, Pb Free	Commercial
ASM2I2304NZF-08-TT	2I2304NZF	8-pin TSSOP - Tube, Pb Free	Industrial
ASM2I2304NZF-08-TR	2I2304NZF	8-pin TSSOP - Tape and Reel, Pb Free	Industrial
ASM2P2304NZG-08-TT	2P2304NZG	8-pin TSSOP - Tube, Green	Commercial
ASM2P2304NZG-08-TR	2P2304NZG	8-pin TSSOP - Tape and Reel, Green	Commercial
ASM2I2304NZG-08-TT	2I2304NZG	8-pin TSSOP - Tube, Green	Industrial
ASM2I2304NZG-08-TR	2I2304NZG	8-pin TSSOP - Tape and Reel, Green	Industrial

Device Ordering Information



Licensed under US patent #5,488,627, #6,646,463 and #5,631,920.



PulseCore Semiconductor Corporation
1715 S. Bascom Ave Suite 200
Campbell, CA 95008
Tel: 408-879-9077
Fax: 408-879-9018
www.pulsecoresemi.com

Copyright © PulseCore Semiconductor
All Rights Reserved
Part Number: ASM2P2304NZ
Document Version: 1.1

Note: This product utilizes US Patent # 6,646,463 Impedance Emulator Patent issued to PulseCore Semiconductor, dated 11-11-2003

© Copyright 2006 PulseCore Semiconductor Corporation. All rights reserved. Our logo and name are trademarks or registered trademarks of PulseCore Semiconductor. All other brand and product names may be the trademarks of their respective companies. PulseCore reserves the right to make changes to this document and its products at any time without notice. PulseCore assumes no responsibility for any errors that may appear in this document. The data contained herein represents PulseCore's best data and/or estimates at the time of issuance. PulseCore reserves the right to change or correct this data at any time, without notice. If the product described herein is under development, significant changes to these specifications are possible. The information in this product data sheet is intended to be general descriptive information for potential customers and users, and is not intended to operate as, or provide, any guarantee or warranty to any user or customer. PulseCore does not assume any responsibility or liability arising out of the application or use of any product described herein, and disclaims any express or implied warranties related to the sale and/or use of PulseCore products including liability or warranties related to fitness for a particular purpose, merchantability, or infringement of any intellectual property rights, except as expressly agreed to in PulseCore's Terms and Conditions of Sale (which are available from PulseCore). All sales of PulseCore products are made exclusively according to PulseCore's Terms and Conditions of Sale. The purchase of products from PulseCore does not convey a license under any patent rights, copyrights; mask works rights, trademarks, or any other intellectual property rights of PulseCore or third parties. PulseCore does not authorize its products for use as critical components in life-supporting systems where a malfunction or failure may reasonably be expected to result in significant injury to the user, and the inclusion of PulseCore products in such life-supporting systems implies that the manufacturer assumes all risk of such use and agrees to indemnify PulseCore against all claims arising from such use.