ASM2P2304NZ

ON Semiconductor®

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 140MHz
- Output-to-output skew less than 100pS
- Available in 8-pin TSSOP and SOIC Packages
- 3.3V operation

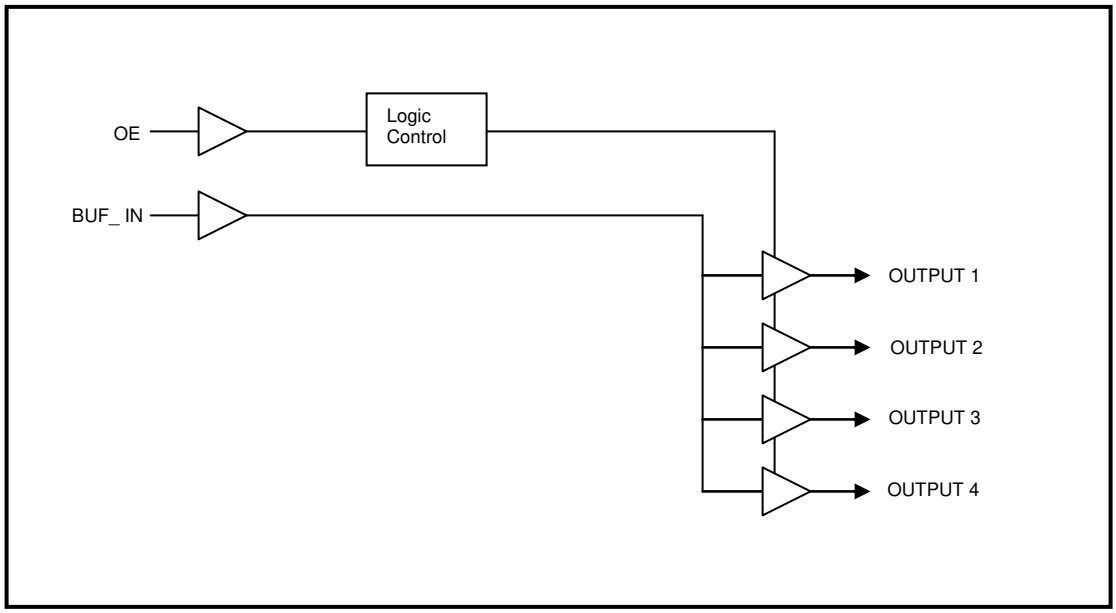
Functional Description

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 140MHz.

Table 1. Function Table.

Inputs		Outputs
BUF_IN	**OE**	**Output [1:4]**
L	L	L
H	L	L
L	H	L
H	H	H

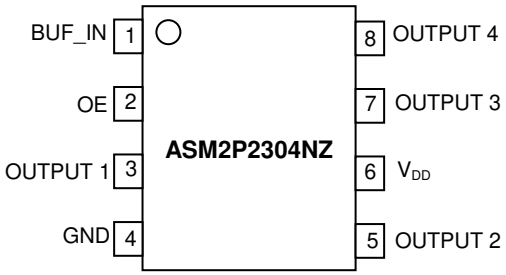
Block Diagram



JANUARY 2010 – Rev. 2

Publication Order Number:
ASM2P2304/D

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} = 24mA		0.8	V
		I_{OL} = 12mA		0.55	V
V_{OH}	Output HIGH Voltage[2]	I_{OH} = -24mA	2.0		V
		I_{OH} = -12mA	2.4		V
I_{DD}	Supply Current	Unloaded outputs at 66.66MHz		25	mA

Notes: 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.

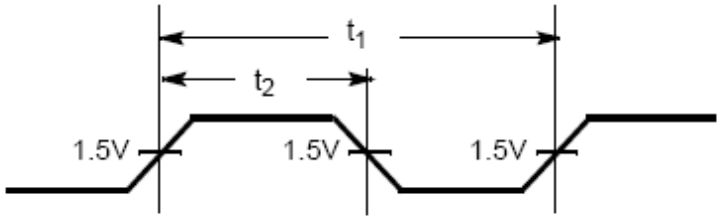
Switching Characteristics for Commercial and Industrial Temperature Devices[3]

Parameter	Name	Description		Min	Typ	Max	Unit
t_D	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 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

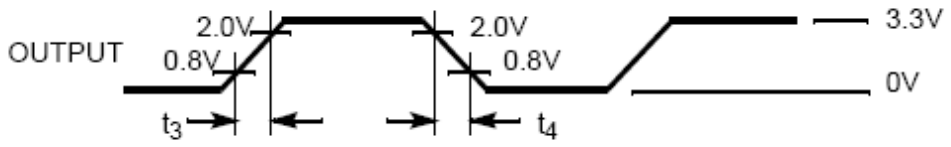
Notes: 1. BUF_IN input has a threshold voltage of V_{DD}/2.
2. Parameter is guaranteed by design and characterization. It is not 100% tested in production.
3. All parameters specified with loaded outputs.

Switching Waveforms

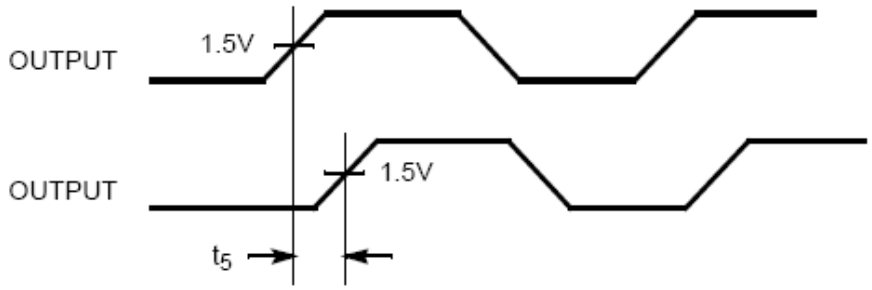
Duty Cycle Timing



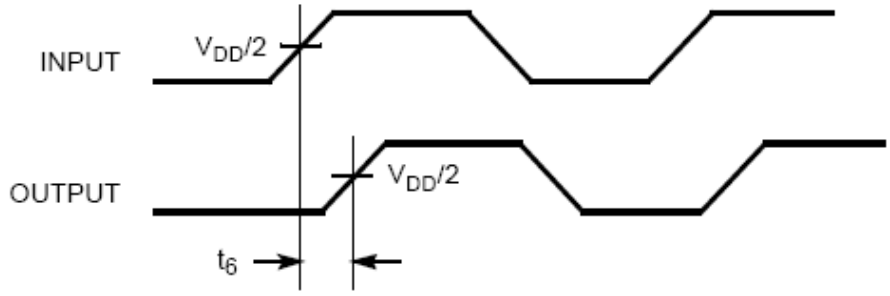
All Outputs Rise/Fall Time



Output-Output Skew

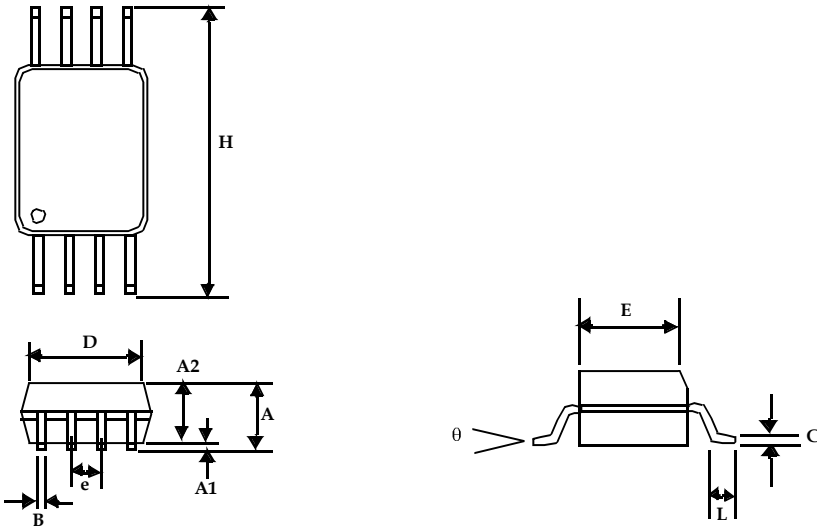


Input-Output Propagation Delay



Package Information

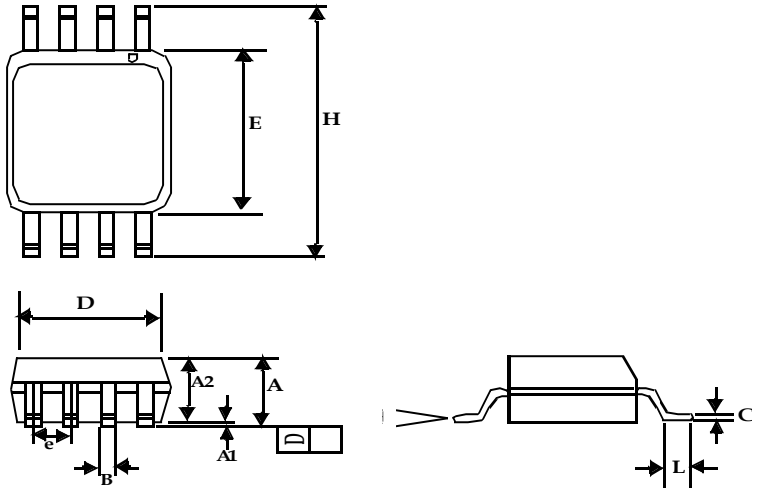
8-lead Thin Shrunk Small Outline Package (4.40-MM Body)



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

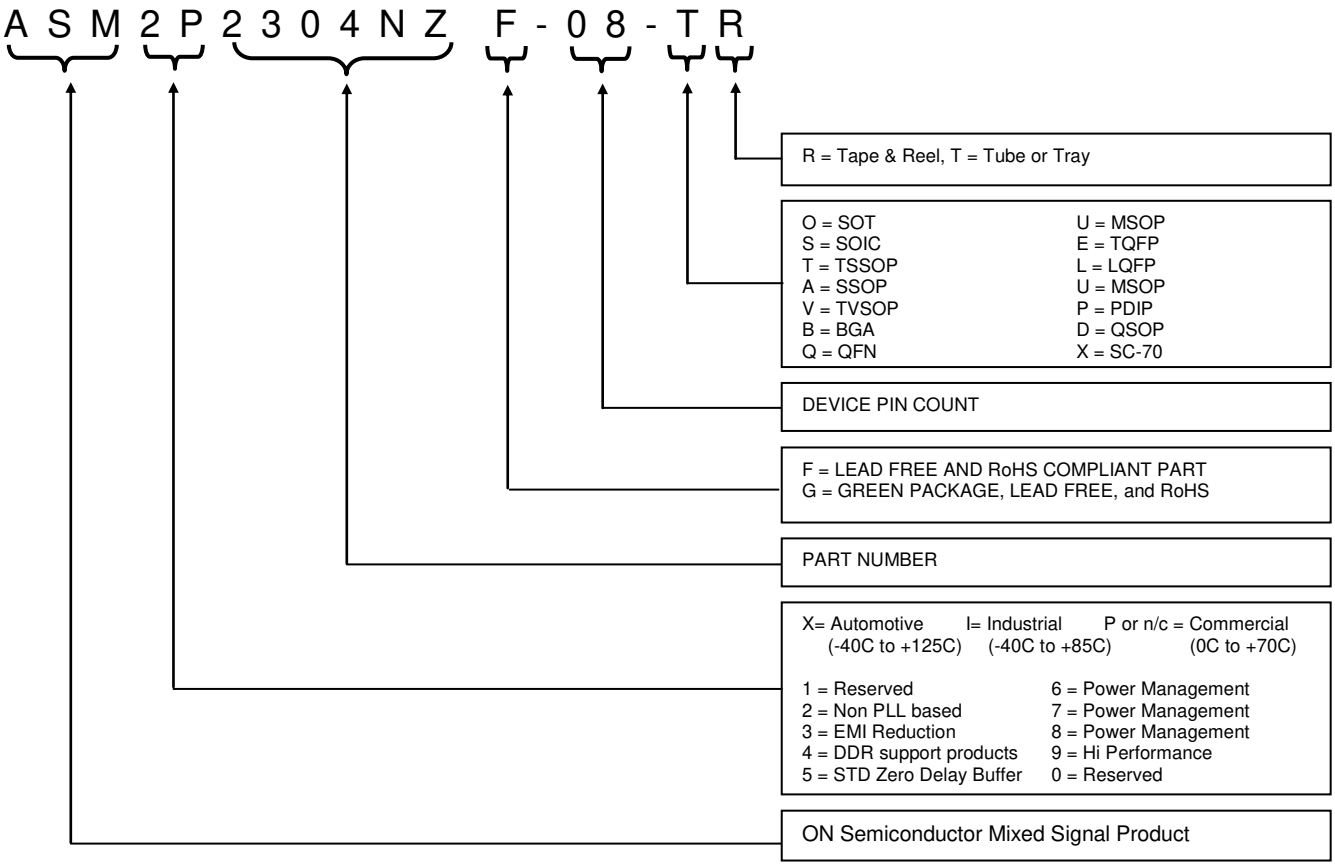


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A1	0.004	0.010	0.10	0.25
A	0.053	0.069	1.35	1.75
A2	0.049	0.059	1.25	1.50
B	0.012	0.020	0.31	0.51
C	0.007	0.010	0.18	0.25
D	0.193 BSC		4.90 BSC	
E	0.154 BSC		3.91 BSC	
e	0.050 BSC		1.27 BSC	
H	0.236 BSC		6.00 BSC	
L	0.016	0.050	0.41	1.27
θ	0°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

Ordering Code

Part Number	Marking	Package Type	Temperature
P2P2304NZF-08ST	2P2304NZF	8-pin SOIC - Tube, Pb Free	Commercial
P2P2304NZF-08SR	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
ASM2P2304NZF-08-TT	2P2304NZF	8-pin TSSOP - Tube, Pb Free	Commercial
P2P2304NZF-08TR	2P2304NZF	8-pin TSSOP - Tape and Reel, Pb Free	Commercial
P2I2304NZF-08TT	2I2304NZF	8-pin TSSOP - Tube, Pb Free	Industrial
P2I2304NZF-08-TR	2I2304NZF	8-pin TSSOP - Tape and Reel, Pb Free	Industrial

Device Ordering Information



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

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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative