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

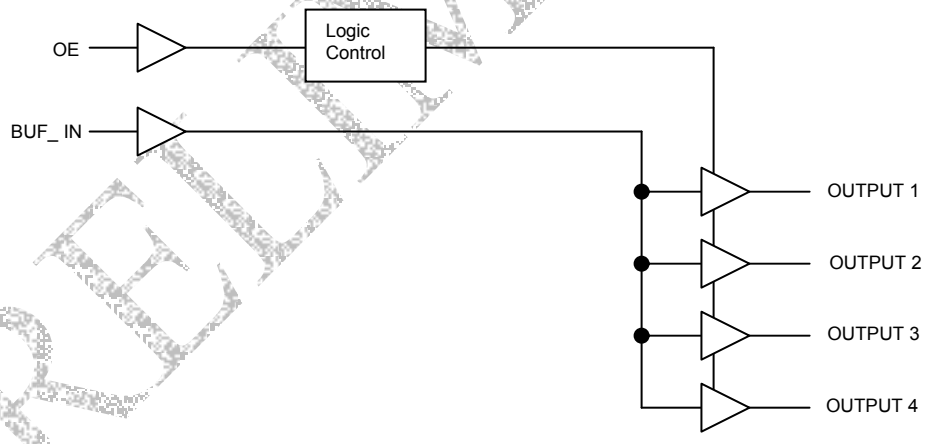
Functional Description

The 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.

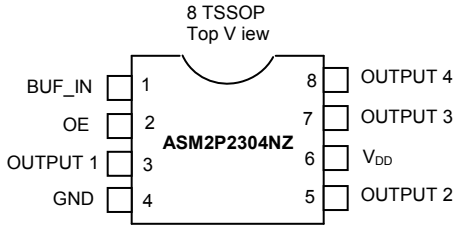
Table 1. Function Table.

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

Block Diagram



Pin Configuration



Pin Description

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

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Supply Voltage to Ground Potential	-0.5	7	V
DC Input Voltage (Except REF)	-0.5	V_{DD} + 0.5	V
DC Input Voltage (REF)	-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	5	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

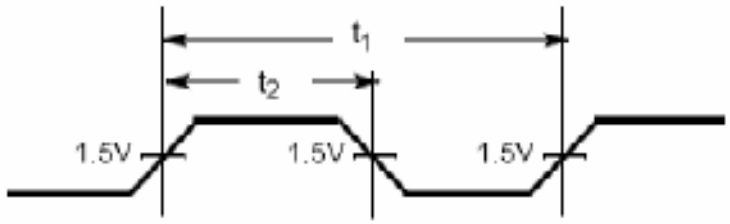
Switching Characteristics for Commercial and Industrial Temperature Devices[3]

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 0.8V and 2.0V	-	-	1.50	nS
t_5	Output to Output Skew[2]	All outputs equally loaded	-	-	200	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

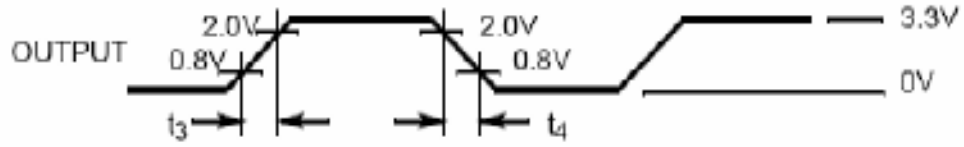
Note:
1. BUF_IN input has a threshold voltage of V_{DD}/2.
2. Parameter is guaranteed by design and characterization. It is not 100% tested in production.
3. All parameters specified with loaded outputs.

Switching Waveforms

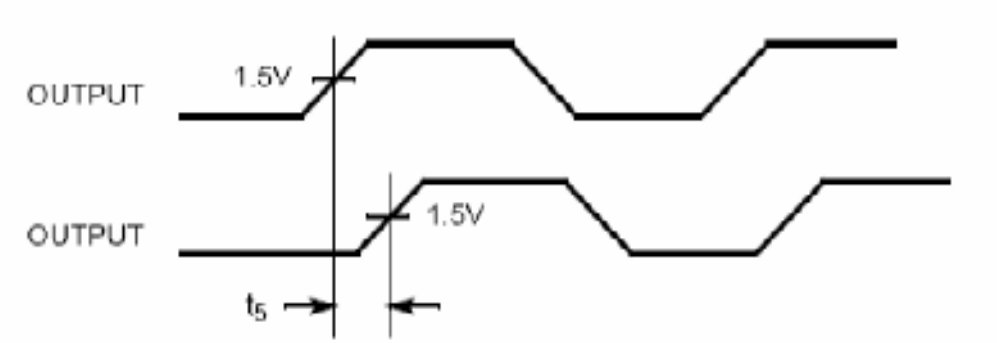
Duty Cycle Timing



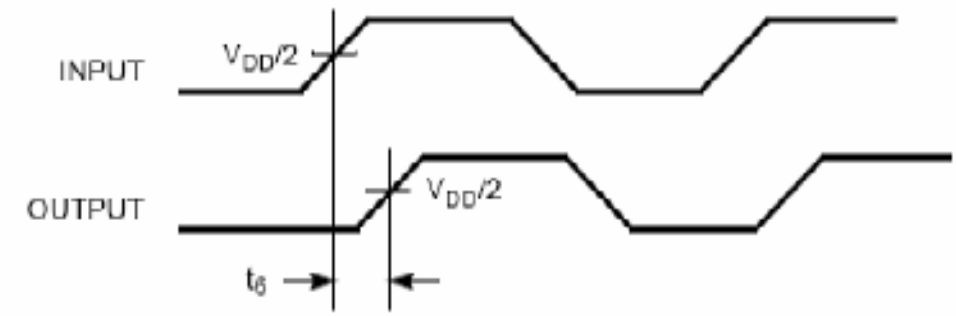
All Outputs Rise/Fall Time



Output-Output Skew

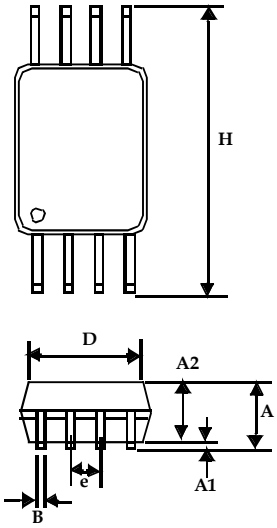


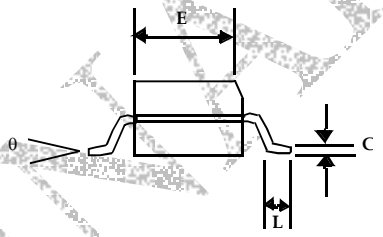
Input-Output Propagation Delay



Package Information

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



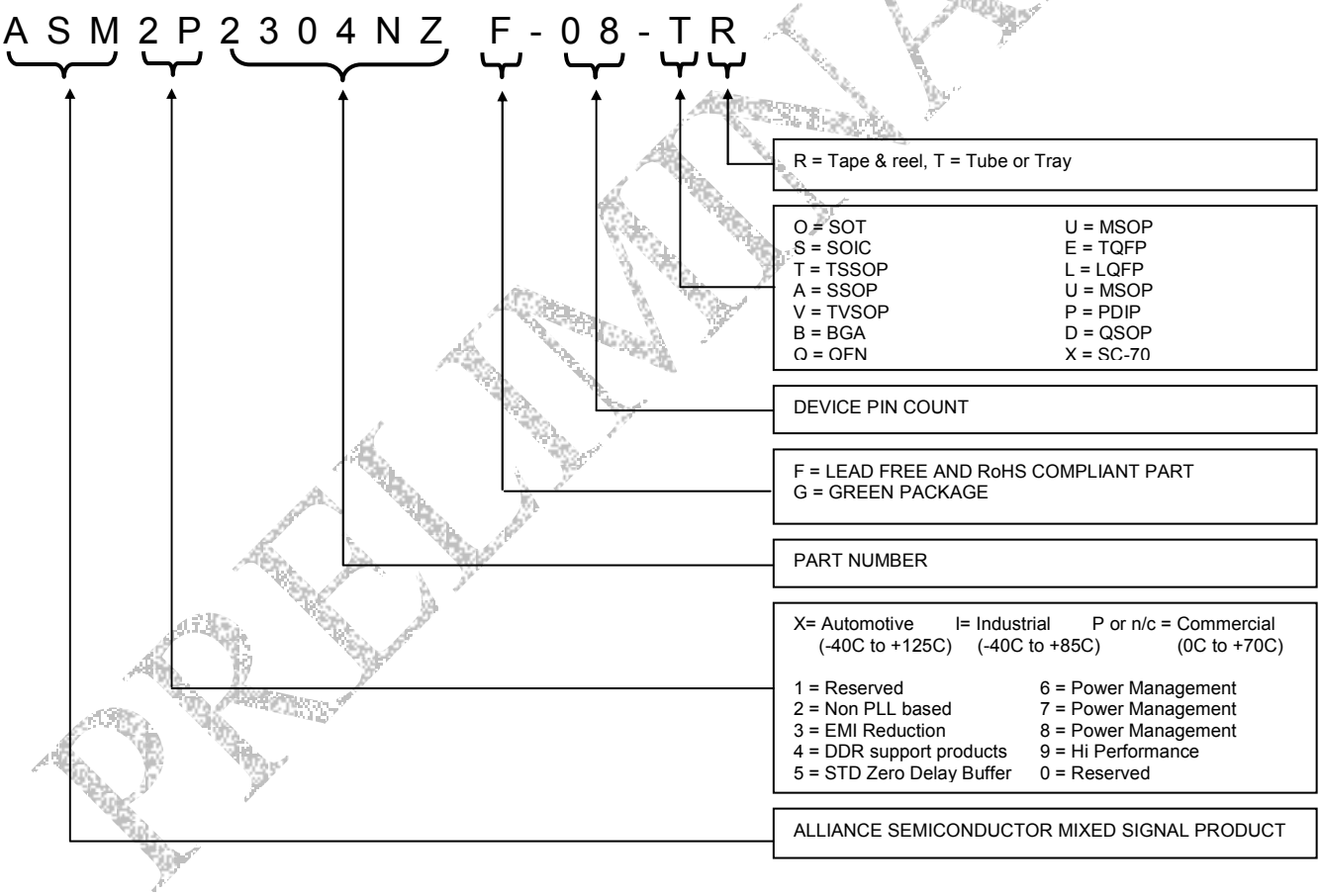


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A		0.043		1.10
A1	0.002	0.006	0.05	0.15
A2	0.033	0.037	0.85	0.95
B	0.008	0.012	0.19	0.30
c	0.004	0.008	0.09	0.20
D	0.114	0.122	2.90	3.10
E	0.169	0.177	4.30	4.50
e	0.026 BSC		0.65 BSC	
H	0.252 BSC		6.40 BSC	
L	0.020	0.028	0.50	0.70
θ	0°	8°	0°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

Ordering Codes

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

Device Ordering Information



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Part Number: ASM2P2304NZ
Document Version: 0.4

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