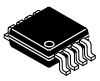
ASM2P2304NZ

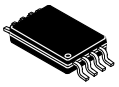
Four Output PCI-X and General Purpose Buffer

ON Semiconductor®

http://onsemi.com



SOIC−8
S SUFFIX
CASE 751BD



TSSOP−8
T SUFFIX
CASE 948AL

Description

The ASM2P2304NZ is a low−cost buffer designed to distribute high−speed clocks for PCI−X and other applications. The device operates at 3.3 V and outputs can run up to 140 MHz.

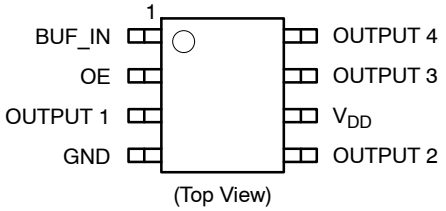
Features

- 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
- 3.3 V Operation
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Table 1. FUNCTION TABLE

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

PIN CONFIGURATION



(Top View)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

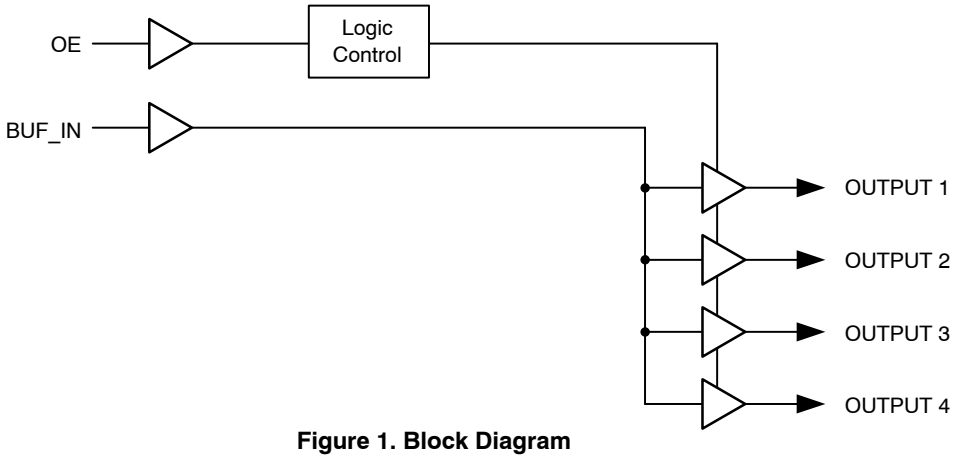


Figure 1. Block Diagram

Table 2. PIN DESCRIPTION

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

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

Table 3. 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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 4. 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

Table 5. ELECTRICAL CHARACTERISTICS

Parameter	Description	Test Conditions	Min	Max	Unit
V_{IL}	Input LOW Voltage (Note 3)			0.8	V
V_{IH}	Input HIGH Voltage (Note 3)		2.0		V
I_{IL}	Input LOW Current	V_{IN} = 0 V	−5	5	μA
I_{IH}	Input HIGH Current	V_{IN} = V_{DD}	−5	12	μA
V_{OL}	Output LOW Voltage (Note 4)	I_{OL} = 24 mA		0.8	V
		I_{OL} = 12 mA		0.55	V
V_{OH}	Output HIGH Voltage (Note 4)	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

Table 6. SWITCHING CHARACTERISTICS (for Commercial and Industrial Temperature Devices) (Note 5)

Parameter	**Name** (Note 4)	**Description**		Min	Typ	Max	Unit
t_D	Duty Cycle = $t_2 \div t_1$	Measured at 1.5 V		40.0	50.0	60.0	%
t_3	Rise Time	Measured between 0.8 V and 2.0 V				1.50	nS
t_4	Fall Time	Measured between 2.0 V and 0.8 V				1.50	nS
t_5	Output to Output Skew	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	Measured at V_{DD}/2		2.5	3.5	5	nS

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

Switching Waveforms

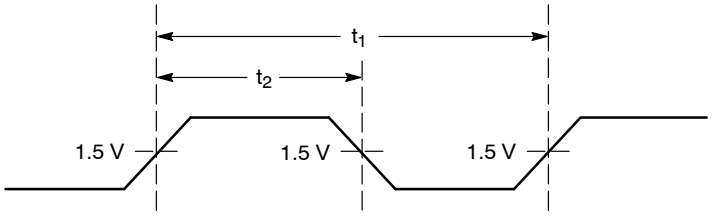


Figure 2. Duty Cycle Timing

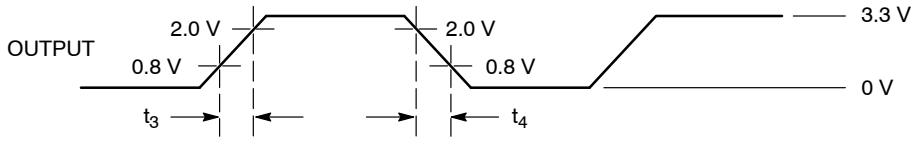


Figure 3. All Outputs Rise/Fall Time

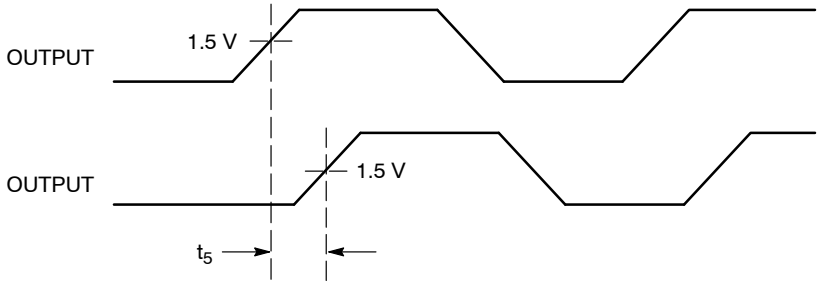


Figure 4. Output−Output Skew

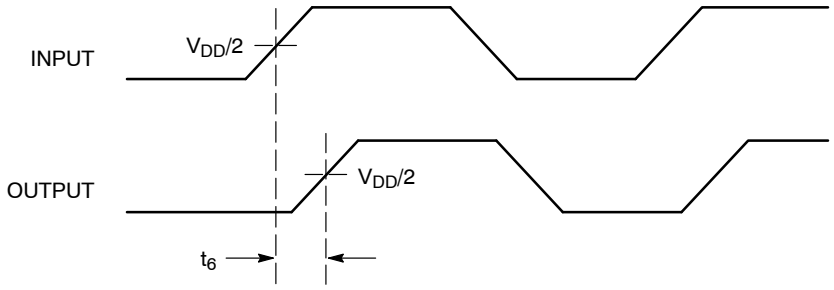
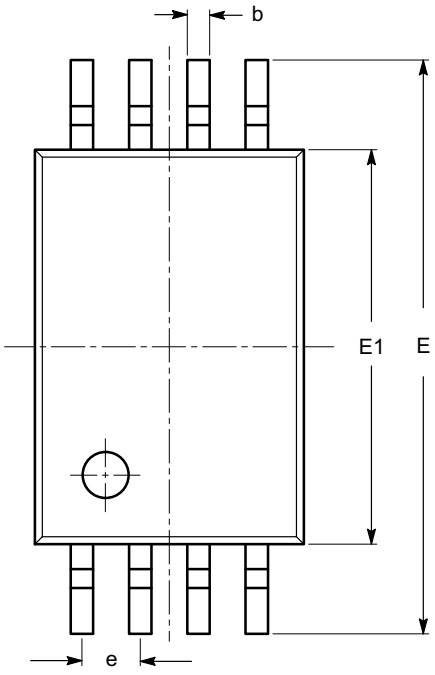


Figure 5. Input−Output Propagation Delay

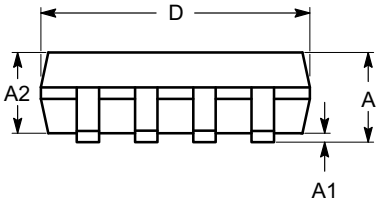
PACKAGE DIMENSIONS

TSSOP8, 4.4x3
CASE 948AL−01
ISSUE O

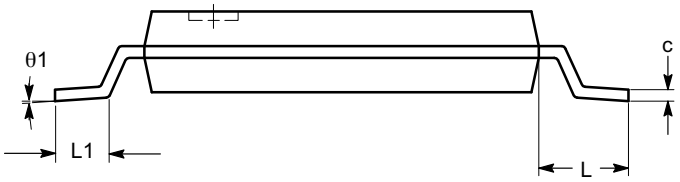


TOP VIEW

SYMBOL	MIN	NOM	MAX
A			1.20
A1	0.05		0.15
A2	0.80	0.90	1.05
b	0.19		0.30
c	0.09		0.20
D	2.90	3.00	3.10
E	6.30	6.40	6.50
E1	4.30	4.40	4.50
e	0.65 BSC		
L	1.00 REF		
L1	0.50	0.60	0.75
θ	0º		8º



SIDE VIEW



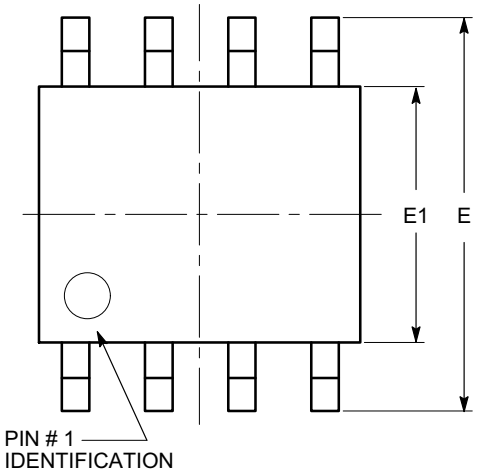
END VIEW

Notes:

(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MO-153.

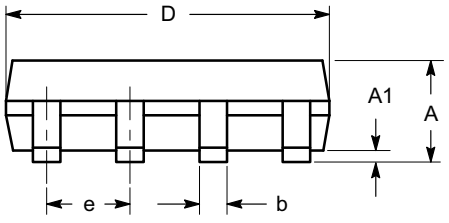
PACKAGE DIMENSIONS

SOIC 8, 150 mils
CASE 751BD−01
ISSUE O

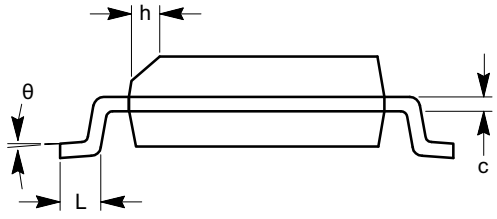


TOP VIEW

SYMBOL	MIN	NOM	MAX
A	1.35		1.75
A1	0.10		0.25
b	0.33		0.51
c	0.19		0.25
D	4.80		5.00
E	5.80		6.20
E1	3.80		4.00
e	1.27 BSC		
h	0.25		0.50
L	0.40		1.27
θ	0º		8º



SIDE VIEW



END VIEW

Notes:
(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MS-012.

Table 7. ORDERING INFORMATION

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

PUBLICATION ORDERING INFORMATION

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