

ASM2P2304NZ

Four Output PCI-X and General Purpose Buffer

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



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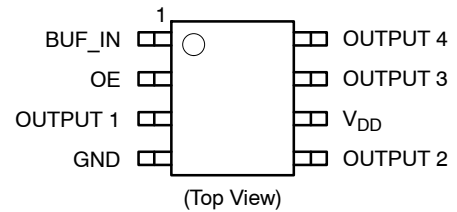


SOIC-8
S SUFFIX
CASE 751BD



TSSOP-8
T SUFFIX
CASE 948AL

PIN CONFIGURATION



ORDERING INFORMATION

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

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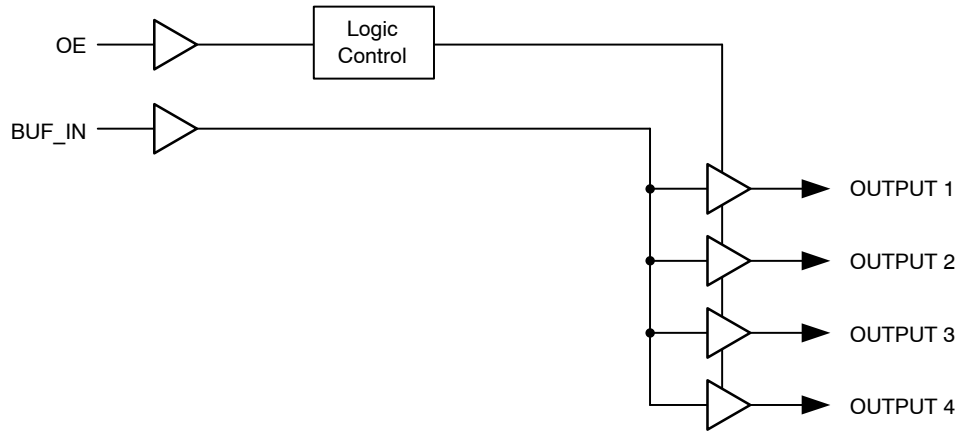


Figure 1. Block Diagram

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.

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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 ÷ 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.

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Switching Waveforms

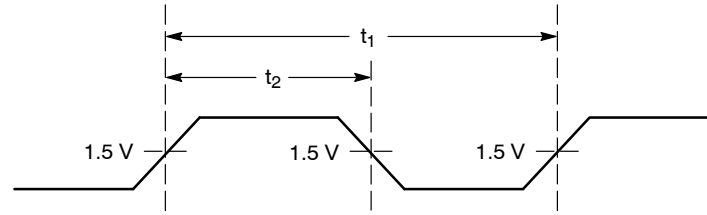


Figure 2. Duty Cycle Timing

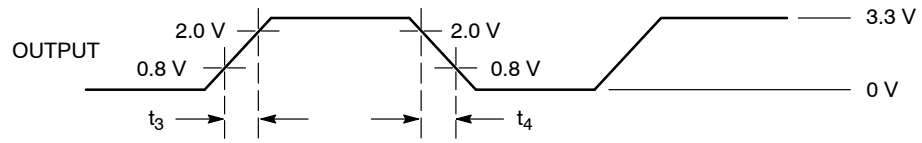


Figure 3. All Outputs Rise/Fall Time

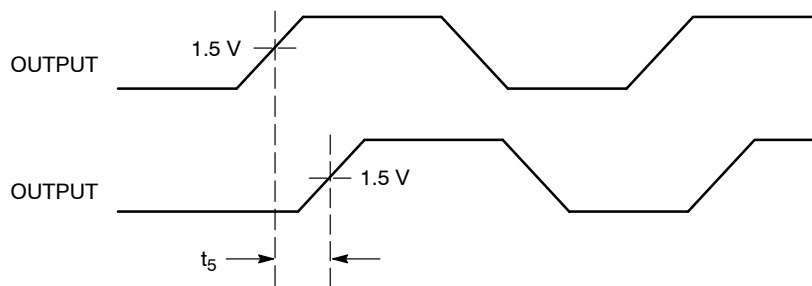


Figure 4. Output-Output Skew

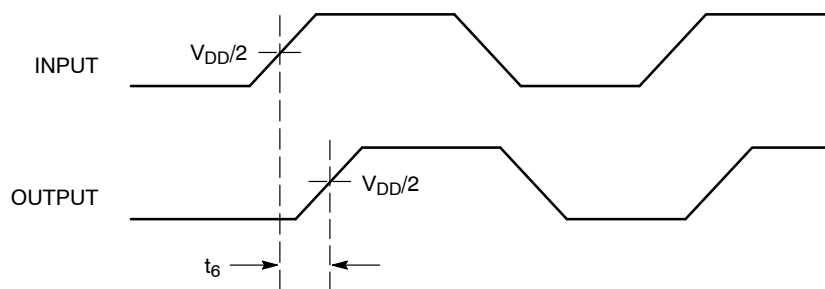
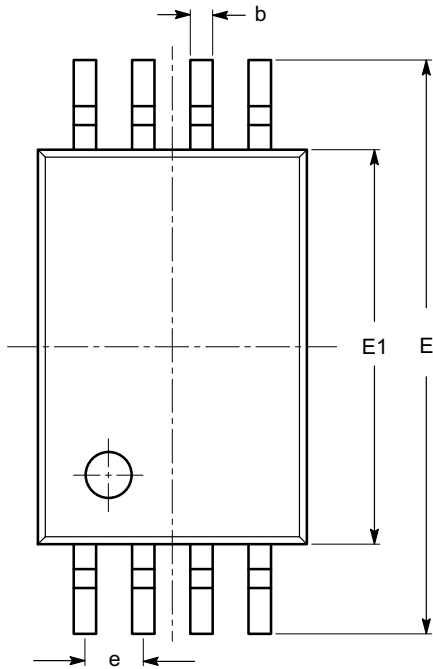


Figure 5. Input-Output Propagation Delay

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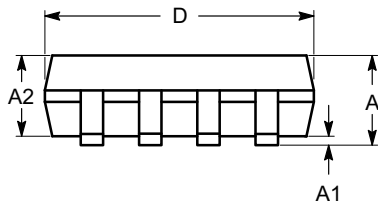
PACKAGE DIMENSIONS

TSSOP8, 4.4x3
CASE 948AL-01
ISSUE O

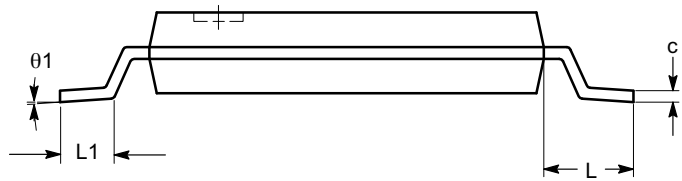


SYMBOL	MIN	NOM	MAX
A			1.20
A1	0.05		0.15
A2	0.80	0.90	1.05
b	0.19		0.30
c	0.09		0.20
D	2.90	3.00	3.10
E	6.30	6.40	6.50
E1	4.30	4.40	4.50
e	0.65 BSC		
L	1.00 REF		
L1	0.50	0.60	0.75
θ	0°		8°

TOP VIEW



SIDE VIEW



END VIEW

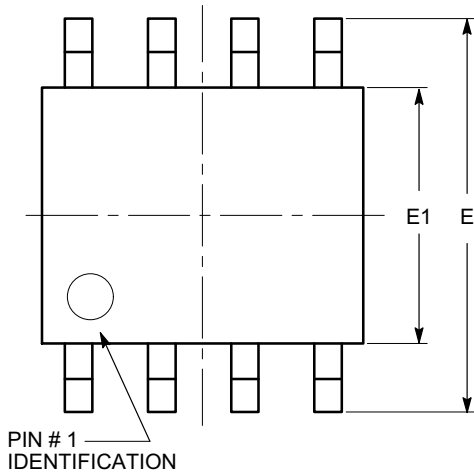
Notes:

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

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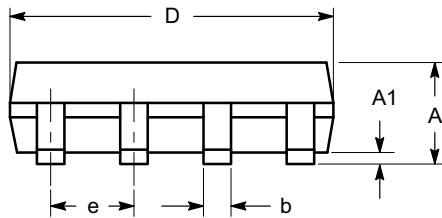
PACKAGE DIMENSIONS

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

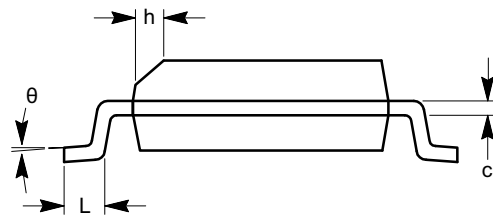


TOP VIEW

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	0°		8°



SIDE VIEW



END VIEW


Notes:

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

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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

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