

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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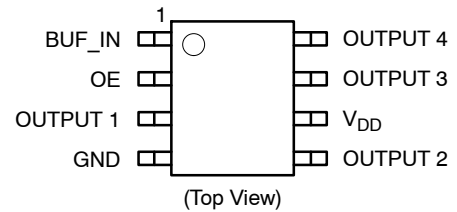


SOIC-8
S SUFFIX
CASE 751BD



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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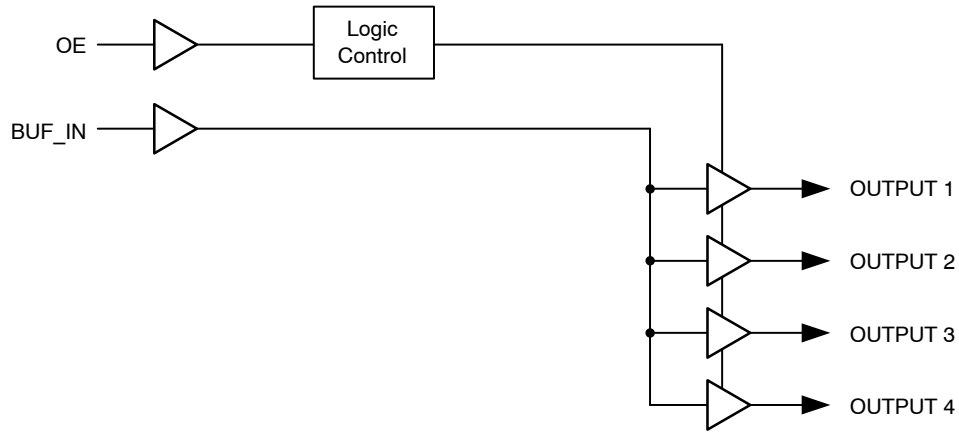


Figure 1. Block Diagram

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

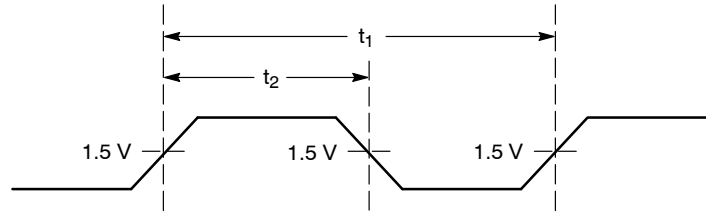


Figure 2. Duty Cycle Timing

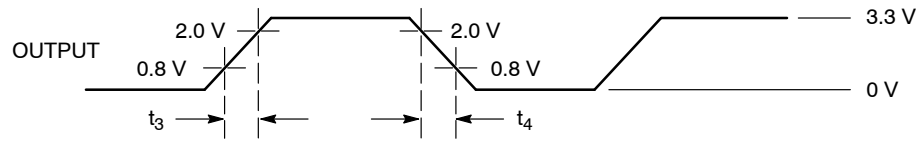


Figure 3. All Outputs Rise/Fall Time

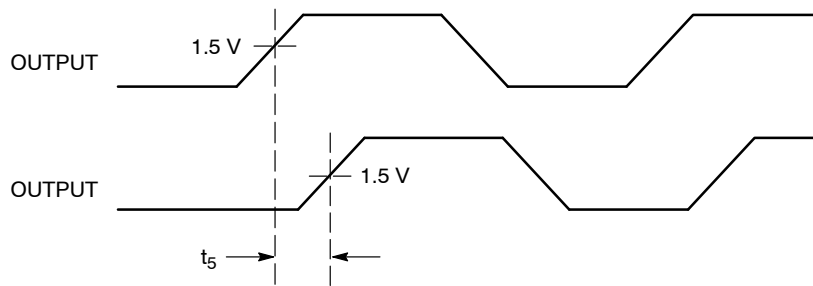


Figure 4. Output-Output Skew

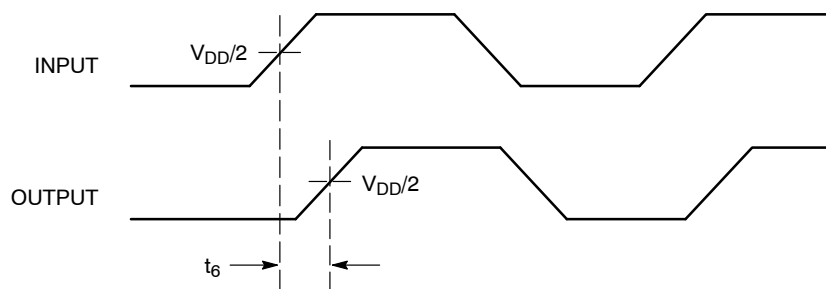
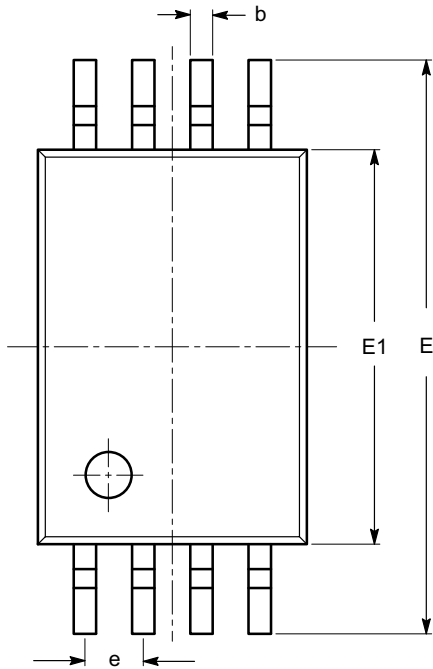


Figure 5. Input-Output Propagation Delay

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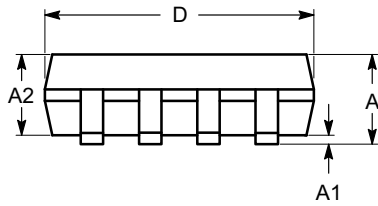
PACKAGE DIMENSIONS

TSSOP8, 4.4x3
CASE 948AL-01
ISSUE O

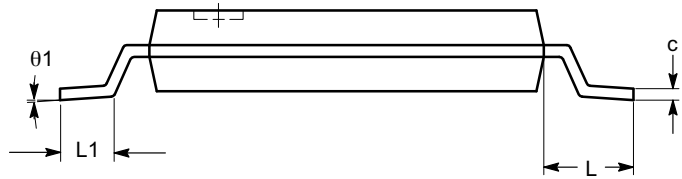


| SYMBOL | MIN | NOM | MAX |
|----------|----------|------|------|
| A | | | 1.20 |
| A1 | 0.05 | | 0.15 |
| A2 | 0.80 | 0.90 | 1.05 |
| b | 0.19 | | 0.30 |
| c | 0.09 | | 0.20 |
| D | 2.90 | 3.00 | 3.10 |
| E | 6.30 | 6.40 | 6.50 |
| E1 | 4.30 | 4.40 | 4.50 |
| e | 0.65 BSC | | |
| L | 1.00 REF | |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

TOP VIEW



SIDE VIEW



END VIEW

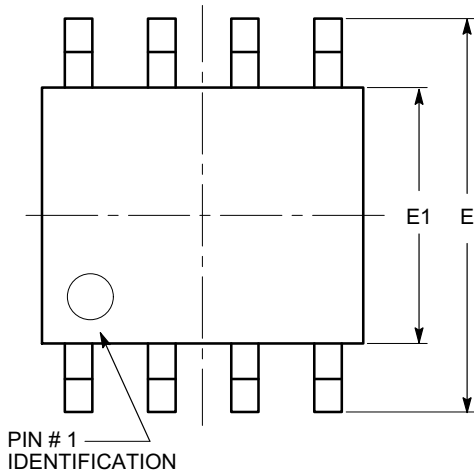
Notes:

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

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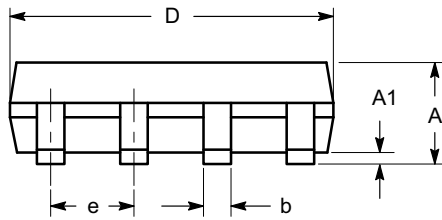
PACKAGE DIMENSIONS

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

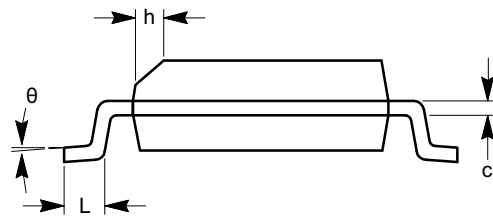


TOP VIEW

| 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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