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ON Semiconductor®

P2P2305NZ

3.3V 1:5 Clock Buffer

Features

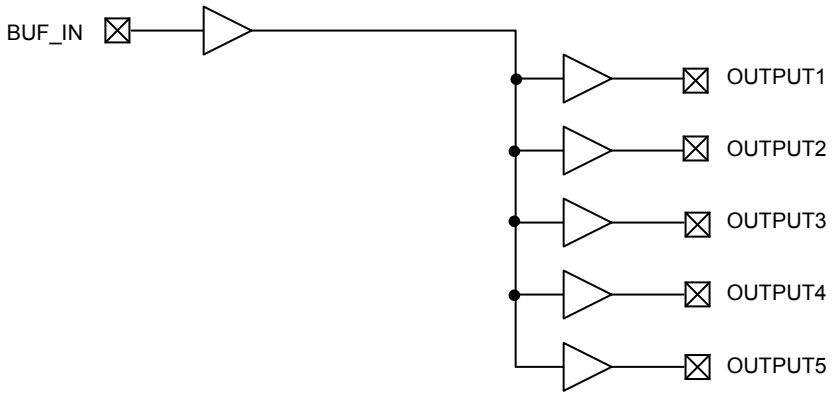
- One-Input to Five-Output Buffer/Driver
- Buffers all frequencies from DC to 133.33MHz
- Low power consumption for mobile applications
  Less than 32mA at 66.6MHz with unloaded outputs
- Input-Output delay: 6nS(max)
- Output-output skew less than 250pS
- 8-pin SOIC Package
- Supply Voltage: 3.3V ± 0.3V

Functional Description

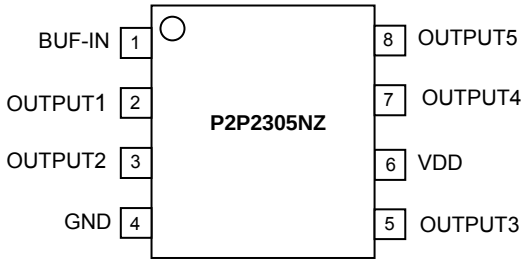
P2P2305NZ is a low-cost high-speed buffer designed to accept one clock input and distribute up to five clocks in mobile PC systems and desktop PC systems. The device operates at 3.3V and outputs can run up to 133.33MHz.

P2P2305NZ is designed for low EMI and power optimization and consumes less than 32mA at 66.6MHz, making it ideal for the low-power requirements of mobile systems. It is available in an 8-pin SOIC Package.

Block Diagram



Pin Configuration



Pin Description

Pin#	Pin Name	Description
6	V_{DD}	3.3V Digital Voltage Supply
4	GND	Ground
1	BUF_IN	Input Clock
2, 3, 5, 7, 8	OUTPUT [1:5]	Outputs

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Supply Voltage to Ground Potential	-0.5	+4.6	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	℃
Max. Soldering Temperature (10 sec)		260	℃
Junction Temperature		150	℃
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	-40	85	℃
C_L	Load Capacitance, Fout < 100MHz		30	pF
	Load Capacitance,100MHz < Fout < 133.33MHz		15	pF
C_{IN}	Input Capacitance		7	pF
BUF_IN, OUTPUT [1:5]	Operating Frequency	DC	133.33	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

Symbol	Parameter		Test Conditions	Min	Max	Unit
V_{IL}	Input LOW Voltage[1]				0.8	V
V_{IH}	Input HIGH Voltage[1]			2.2		V
I_{IL}	Input LOW Current		V_{IN} = 0V		50.0	μA
I_{IH}	Input HIGH Current		V_{IN} = V_{DD}		100.0	μA
V_{OL}	Output LOW Voltage[2]		I_{OL} = 12mA		0.4	V
V_{OH}	Output HIGH Voltage[2]		I_{OH} = -12mA	2.4		V
I_{DD}	Supply Current	0℃ to +70℃	Unloaded outputs at 66.66MHz		30	mA
		-40℃ to +85℃			32	

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.

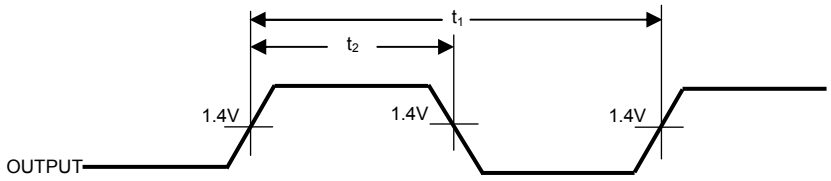
Switching Characteristics [1]

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
t_3	Rise Time[2]	Measured between 0.8V and 2.0V		1.5	2	nS
t_4	Fall Time[2]	Measured between 2.0V and 0.8V		1.5	2	nS
t_D	Duty Cycle[2] = $t_2 \div t_1$	Measured at 1.4V (For an Input Clock Duty Cycle 50%)	45	50	55	%
t_5	Output to Output Skew[2]	All outputs equally loaded			±250	pS
t_6	Propagation Delay, BUF_IN Rising Edge to OUTPUT Rising Edge[2]	Measured at V_{DD}/2		4	6	nS

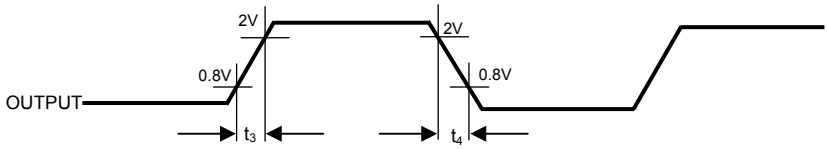
Notes: 1. All parameters specified with loaded outputs.
2. Parameter is guaranteed by design and characterization. It is not 100% tested in production.

Switching Waveforms

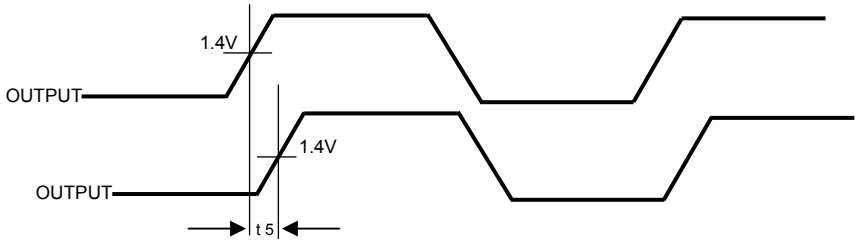
Duty Cycle Timing



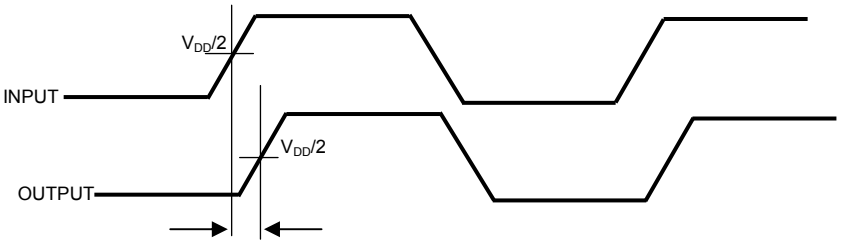
All Outputs Rise/Fall Time



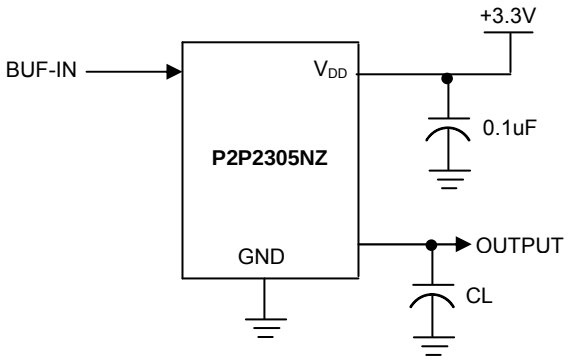
Output-Output Skew



Input-Output Propagation Delay

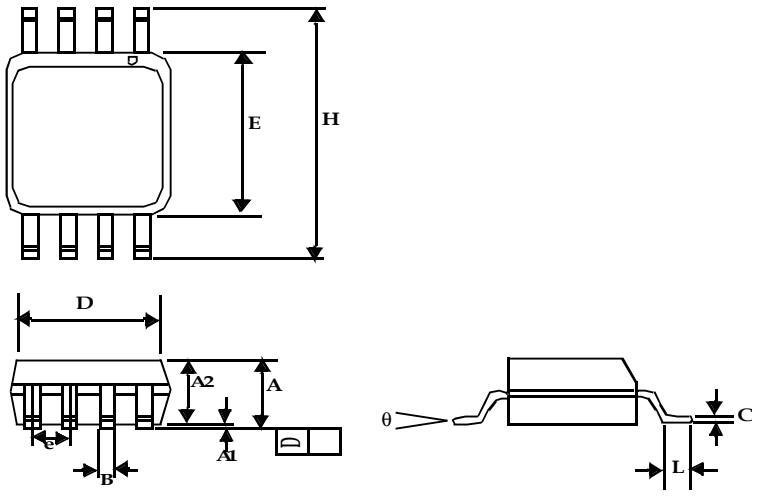


Test Circuit



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
P2P2305NZG-08SR	ADA	08-pin 150-mil SOIC, Tape and Reel, Pb Free	0℃ to +70℃
P2I2305NZG-08ST	ADB	08-pin 150-mil SOIC, Tube, Pb Free	-40℃ to +85℃
P2I2305NZG-08SR	ADB	08-pin 150-mil SOIC, Tape and Reel, Pb Free	-40℃ to +85℃

A “microdot” placed at the end of last row of marking or just below the last row toward the center of package indicates Pb-free.

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