

阅读申明

- 1.本站收集的数据手册和产品资料都来自互联网，版权归原作者所有。如读者和版权方有任何异议请及时告之，我们将妥善解决。
- 2.本站提供的中文数据手册是英文数据手册的中文翻译，其目的是协助用户阅读，该译文无法自动跟随原稿更新，同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
- 3.本站提供的产品资料，来自厂商的技术支持或者使用者的心得体会等，其内容可能存在描述上的差异，建议读者做出适当判断。
- 4.如需与我们联系，请发邮件到marketing@iczoom.com，主题请标有“数据手册”字样。

Read Statement

1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.
2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.
3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.
4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets" .



NINE OUTPUT 3.3V CLOCK BUFFER

IDT2309NZ

FEATURES:

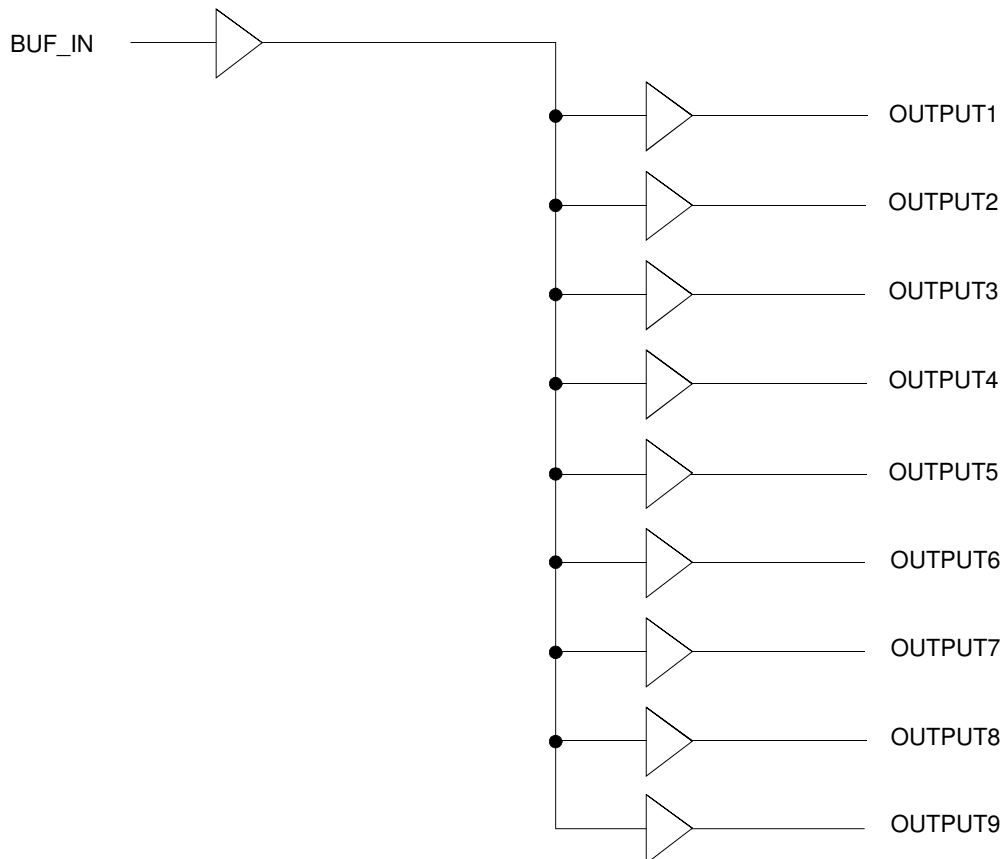
- One input to nine output buffer/driver
- Supports two DIMMs or four SO-DIMMs with one additional output for feedback to an external or chipset PLL
- Low power consumption for mobile applications: less than 32mA at 66.6MHz with unloaded outputs
- 8.7ns input-output delay
- Buffers all frequencies from DC to 133.33MHz
- Output-output skew < 250ps
- Multiple V_{DD} and V_{SS} pins for noise and EMI reduction
- 3.3V operation
- High drive capability
- Available in SOIC and TSSOP packages

DESCRIPTION:

The IDT2309NZ is a low-cost buffer designed to distribute high-speed clocks in mobile PC systems and desktop PC systems with SDRAM support. This part has nine outputs, eight of which can be used to drive two DIMMs or four SO-DIMMs, and the remaining can be used for external feedback to a PLL. The IDT2309NZ operates at 3.3V and outputs can run up to 133.33MHz

The IDT2309NZ is designed for low EMI and power optimization. It has multiple V_{DD} and V_{SS} pins for noise optimization and consumes less than 32mA at 66.6MHz, making it ideal for the low power requirements of mobile systems.

FUNCTIONAL BLOCK DIAGRAM

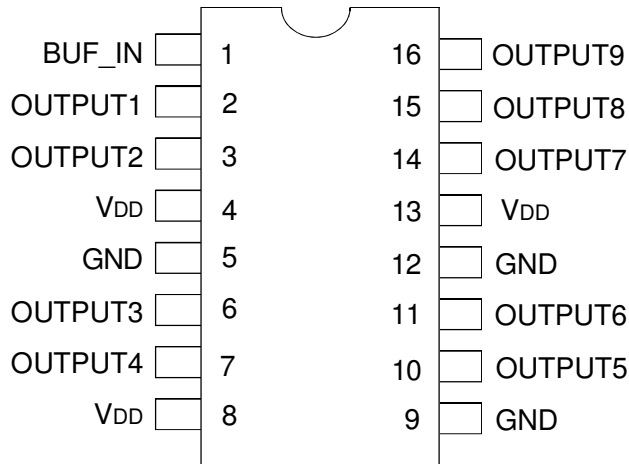


The IDT logo is a registered trademark of Integrated Device Technology, Inc.

COMMERCIAL AND INDUSTRIAL TEMPERATURE RANGES

MAY 2010

PIN CONFIGURATION



SOIC/ TSSOP
TOP VIEW

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Symbol	Rating	Max.	Unit
V _{DD}	Supply Voltage Range	-0.5 to +4.6	V
V _I ⁽²⁾	Input Voltage Range (REF)	-0.5 to +5.5	V
V _I	Input Voltage Range (except REF)	-0.5 to V _{DD} +0.5	V
I _{IK} (V _I < 0)	Input Clamp Current	-50	mA
I _O (V _O = 0 to V _{DD})	Continuous Output Current	±50	mA
V _{DD} or GND	Continuous Current	±100	mA
T _A = 55°C (in still air) ⁽³⁾	Maximum Power Dissipation	0.7	W
T _{STG}	Storage Temperature Range	-65 to +150	°C
Operating Temperature	Commercial Temperature Range	0 to +70	°C
Operating Temperature	Industrial Temperature Range	-40 to +85	°C

NOTES:

1. Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
2. The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
3. The maximum package power dissipation is calculated using a junction temperature of 150°C and a board trace length of 750 mils.

PIN DESCRIPTION

Pin Name	Pin Number	Functional Description
V _{DD}	4, 8, 13	3.3V Digital Voltage Supply
GND	5, 9, 12	Ground
BUF_IN	1	Input clock
OUTPUT _[1:9]	2, 3, 6, 7, 10, 11, 14, 15, 16	Outputs

OPERATING CONDITIONS - COMMERCIAL

Symbol	Parameter	Min.	Max.	Unit
V _{DD}	Supply Voltage	3	3.6	V
T _A	Operating Temperature (Ambient Temperature)	0	70	°C
C _L	Load Capacitance, F _{OUT} < 100MHz	—	30	pF
	Load Capacitance 100MHz < F _{OUT} < 133.33MHz	—	15	
C _{IN}	Input Capacitance	—	7	pF
BUF_IN, SDRAM _[1:9]	Operating Frequency	DC	133.33	MHz

OPERATING CONDITIONS - INDUSTRIAL

Symbol	Parameter	Min.	Max.	Unit
V _{DD}	Supply Voltage	3	3.6	V
T _A	Operating Temperature (Ambient Temperature)	-40	+85	°C
C _L	Load Capacitance, F _{OUT} < 100MHz	—	30	pF
	Load Capacitance 100MHz < F _{OUT} < 133.33MHz	—	15	
C _{IN}	Input Capacitance	—	7	pF
BUF_IN, SDRAM[1:9]	Operating Frequency	DC	133.33	MHz

DC ELECTRICAL CHARACTERISTICS - COMMERCIAL

Symbol	Parameter	Conditions	Min.	Max.	Unit
V _{IL}	Input LOW Voltage ⁽¹⁾		—	0.8	V
V _{IH}	Input HIGH Voltage ⁽¹⁾		2	—	V
I _{IL}	Input LOW Current	V _{IN} = 0V	—	50	μA
I _{IH}	Input HIGH Current	V _{IN} = V _{DD}	—	100	μA
V _{OL}	Output LOW Voltage ⁽²⁾	I _{OL} = 8mA	—	0.4	V
V _{OH}	Output HIGH Voltage ⁽²⁾	I _{OH} = -8mA	2.4	—	V
I _{DD}	Supply Current	Unloaded Outputs at 66.66MHz	—	32	mA

NOTES:

1. BUF_IN input has a threshold voltage of V_{DD}/2.
2. Parameter is guaranteed by design but not production tested.

DC ELECTRICAL CHARACTERISTICS - INDUSTRIAL

Symbol	Parameter	Conditions	Min.	Max.	Unit
V _{IL}	Input LOW Voltage ⁽¹⁾		—	0.8	V
V _{IH}	Input HIGH Voltage ⁽¹⁾		2	—	V
I _{IL}	Input LOW Current	V _{IN} = 0V	—	50	μA
I _{IH}	Input HIGH Current	V _{IN} = V _{DD}	—	100	μA
V _{OL}	Output LOW Voltage ⁽²⁾	I _{OL} = 8mA	—	0.4	V
V _{OH}	Output HIGH Voltage ⁽²⁾	I _{OH} = -8mA	2.4	—	V
I _{DD}	Supply Current	Unloaded Outputs at 66.66MHz	—	35	mA

NOTES:

1. BUF_IN input has a threshold voltage of V_{DD}/2.
2. Parameter is guaranteed by design but not production tested.

SWITCHING CHARACTERISTICS - COMMERCIAL ⁽¹⁾

Symbol	Parameter ⁽²⁾	Conditions	Min.	Typ.	Max.	Unit
t _r	Rise Time	Measured between 0.8V and 2V	—	—	1.5	ns
t _f	Fall Time	Measured between 0.8V and 2V	—	—	1.5	ns
t _s	Output to Output Skew	All outputs equally loaded	—	—	250	ps
t _p	Propagation Delay, BUF_IN Rising Edge to OUTPUT Rising Edge	Measured at V _{DD} /2	1	5	8.7	ns

NOTES:

1. All parameters specified with loaded outputs.
2. Parameter is guaranteed by design but not production tested.

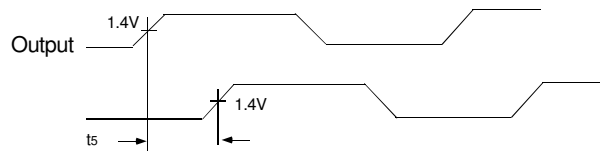
SWITCHING CHARACTERISTICS - INDUSTRIAL ⁽¹⁾

Symbol	Parameter ⁽²⁾	Conditions	Min.	Typ.	Max.	Unit
t_3	Rise Time	Measured between 0.8V and 2V	—	—	1.5	ns
t_4	Fall Time	Measured between 0.8V and 2V	—	—	1.5	ns
t_5	Output to Output Skew	All outputs equally loaded	—	—	250	ps
t_6	Propagation Delay, BUF_IN Rising Edge to OUTPUT Rising Edge	Measured at $V_{DD}/2$	1	5	8.7	ns

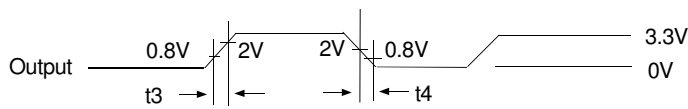
NOTES:

1. All parameters specified with loaded outputs.
2. Parameter is guaranteed by design but not production tested.

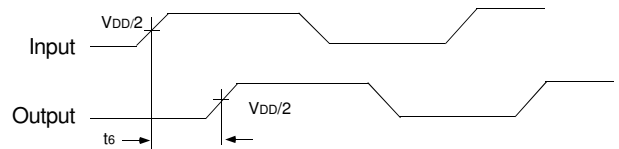
SWITCHING WAVEFORMS



Output to Output Skew

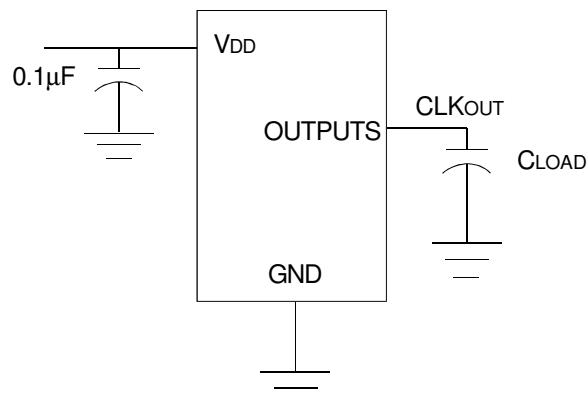


All Outputs Rise/Fall Time

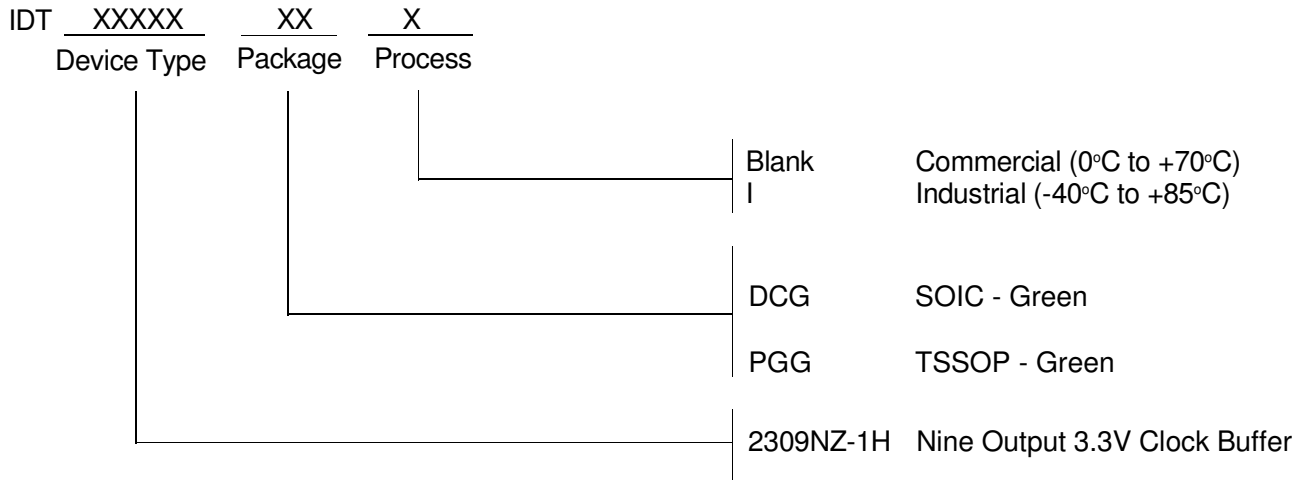


Input to Output Propagation Delay

TEST CIRCUIT



ORDERING INFORMATION



Part / Order Number	Shipping Packaging	Package	Temperature
2309NZ-1HDCG	Tubes	16-pin SOIC	0° to +70° C
2309NZ-1HDCG8	Tape and Reel	16-pin SOIC	0° to +70° C
2309NZ-1HDCGI	Tubes	16-pin SOIC	-40° to +85° C
2309NZ-1HDCGI8	Tape and Reel	16-pin SOIC	-40° to +85° C
2309NZ-1HPGG	Tubes	16-pin TSSOP	0° to +70° C
2309NZ-1HPGG8	Tape and Reel	16-pin TSSOP	0° to +70° C
2309NZ-1HPGGI	Tubes	16-pin TSSOP	-40° to +85° C
2309NZ-1HPGGI8	Tape and Reel	16-pin TSSOP	-40° to +85° C



CORPORATE HEADQUARTERS
6024 Silver Creek Valley Road
San Jose, CA 95138

for SALES:
800-345-7015 or 408-284-8200
fax: 408-284-2775
www.idt.com

for Tech Support:
clockhelp@idt.com