

# Simple UART Core

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Version: 0.0

Creation Date:2020.08.17

Update Date:2020.08.17

# Content

1.Introduction .....	3
2.Notice For Use.....	3
2.1 How to Use This Core .....	3
2.2 Calculation For Baud Rate.....	3
2.3 Simulation and Test .....	3
3.Simulation and Test .....	4

# 1.Introduction

This Simple UART Core is capable of simple serial port communication and can be used for FPGA beginners to develop the serial port driver on the development board. This Core, which is modified based on UART to Bus Core in OpenCores(<https://opencores.org/projects/uart2bus>), is better suited for driver development with novices. The core is based on Quartus II 17.1 release. If you need to do driver development, you only need to compile the files in the folder which is named **Compiling file**.

## 2.Notice For Use

### 2.1 How to Use This Core

The way to use this kernel is very simple! You only need to change the parameter: D\_BAUD\_FREQ and D\_BAUD\_FREQ depending on your baud rate(such as 9600,115200) and clock freq(such as 50M). And then map the **clock,reset,ser\_in(uart\_rx),ser\_out(uart\_tx)** to the corresponding pin. That is all!

### 2.2 Calculation For Baud Rate

$$D\_BAUD\_FREQ = 16 * baud\_rate / gcd(global\_clock\_freq, 16 * baud\_rate)$$
$$D\_BAUD\_FREQ = (global\_clock\_freq / gcd(global\_clock\_freq, 16 * baud\_rate)) - baud\_freq$$

If you can't understand it, you can go to my blog:

<https://blog.csdn.net/a792544191/article/details/108016377>.

### 2.3 Simulation and Test

#### (1) Test Uart Receiving

In the folder named **simulation**, there are two testbenches. You can use them to test Uart receiving based on Modelsim. And pay attention to the file name, one is for **uart\_top** and another is for **uart2bus\_top**.

#### (2) Test Uart Sending

In the folder which is named **Compiling file**, the file named **uart2bus\_top** contains the serial port send test. Pay attention to the annotation.

### (3) Test Uart Sending and Receiving

In the folder which is named **Compiling file**, the file named **uart2bus\_top** contains the serial port send and receive test. Pay attention to the annotation.

## 3.Result

If you want to make sure that your simulation results are correct, please come to my blog:

<https://blog.csdn.net/a792544191/article/details/108016377>.