axis_uart.v

AUTHORS

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DATES

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INFORMATION

Brief

Core for interfacing with simple UART communications. Output is always the size of DATA_BITS.

License MIT

axis_uart

```
module axis_uart #(
parameter
BAUD_CLOCK_SPEED
 =
2000000,
parameter
BAUD_RATE
 =
2000000,
parameter
PARITY_ENA
 =
0,
parameter
```

```
PARITY_TYPE
  =
0,
parameter
STOP_BITS
  =
1,
parameter
DATA_BITS
  =
8,
parameter
RX_DELAY
  =
0,
parameter
RX_BAUD_DELAY
  =
0,
parameter
TX_DELAY
  =
0,
parameter
TX_BAUD_DELAY
  =
0,
parameter
BUS_WIDTH
  =
1
) ( input aclk, input arstn, output parity_err, output frame_err, input [BUS
```

AXIS UART, simple UART with AXI Streaming interface.

Parameters

BAUD_CLOCK_SPEED
parameter
This is the aclk frequency in Hz

BAUD_RATE
parameter
Serial Baud, this can be any value including non-standard.

PARITY_ENA
parameter
Enable Parity for the data in and out.

PARITY_TYPE
parameter
Set the parity type, 0 = even, 1 = odd, 2 = mark, 3 = space.

STOP_BITS
parameter
Number of stop bits, 0 to crazy non-standard amounts.

DATA_BITS
parameter
Number of data bits, 1 to crazy non-standard amounts.

RX_DELAY
parameter
Delay in rx data input.

RX_BAUD_DELAY
parameter
Delay in rx baud enable. This will delay when we sample a bit (default is midpoint when rx delay is 0).

TX_DELAY
parameter
Delay in tx data output. Delays the time to output of the data.

TX_BAUD_DELAY
parameter
Delay in tx baud enable. This will delay the time the bit output starts.

BUS_WIDTH
parameter
AXIS data bus width in bytes.

Ports

aclk	Clock for AXIS
arstn	Negative reset for AXIS
parity_err	Indicates error with parity check (active high)
frame_err	Indicates error with frame (active high)
s_axis_tdata	Input data for UART TX.
s_axis_tvalid	When set active high the input data is valid
s_axis_tready	When active high the device is ready for input data.
m_axis_tdata	Output data from UART RX
m_axis_tvalid	When active high the output data is valid
m_axis_tready	When set active high the output device is ready for data.
uart_clk	Clock used for BAUD rate generation
uart_rstn	Negative reset for UART, for anything clocked on uart_clk
tx	transmit for UART (output to RX)
rx	receive for UART (input from TX)
rts	request to send is a loop with CTS
cts	clear to send is a loop with RTS

INSTANTIATED MODULES

uart_baud_gen_tx

```
mod_clock_ena_gen #(
                                                                                .
CLOCK_SPEED(BAUD_CLOCK_SPEED),
                                                                                .
DELAY(TX_BAUD_DELAY)
) uart_baud_gen_tx ( .clk(uart_clk), .rstn(uart_rstn), .start0(1'b1), .clr(u
```

Generates TX BAUD rate for UART modules using modulo divide method.

uart_baud_gen_rx

```
mod_clock_ena_gen #(
                                                                                .
CLOCK_SPEED(BAUD_CLOCK_SPEED),
                                                                                .
DELAY(RX_BAUD_DELAY)
) uart_baud_gen_rx ( .clk(uart_clk), .rstn(uart_rstn), .start0(1'b0), .clr(u
```

Generates RX BAUD rate for UART modules using modulo divide method.

uart_tx

```
axis_uart_tx #(
                                                                                .
PARITY_ENA(PARITY_ENA),
```

```
                                                                        .
 PARITY_TYPE(PARITY_TYPE),                                              .
 STOP_BITS(STOP_BITS),                                                  .
 DATA_BITS(DATA_BITS),                                                  .
 DELAY(TX_DELAY)
) uart_tx ( .aclk(aclk), .arstn(arstn), .s_axis_tdata(s_axis_tdata), .s_axis
```

Produces transmit data for tx UART from AXIS.

uart_rx

```
 axis_uart_rx #(
                                                                        .
 PARITY_ENA(PARITY_ENA),                                                .
 PARITY_TYPE(PARITY_TYPE),                                              .
 STOP_BITS(STOP_BITS),                                                  .
 DATA_BITS(DATA_BITS),                                                  .
 DELAY(RX_DELAY)
) uart_rx ( .aclk(aclk), .arstn(arstn), .parity_err(parity_err), .frame_err(
```

Consumes receive data for rx UART to AXIS.