

Release 14.7 - xst P.20131013 (nt64)
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--> Parameter TMPDIR set to xst/projnav.tmp

Total REAL time to Xst completion: 1.00 secs
Total CPU time to Xst completion: 0.13 secs

--> Parameter xsthdmdir set to xst

Total REAL time to Xst completion: 1.00 secs
Total CPU time to Xst completion: 0.13 secs

--> Reading design: rx_uart.prj

TABLE OF CONTENTS

- 1) Synthesis Options Summary
- 2) HDL Compilation
- 3) Design Hierarchy Analysis
- 4) HDL Analysis
- 5) HDL Synthesis
 - 5.1) HDL Synthesis Report
- 6) Advanced HDL Synthesis
 - 6.1) Advanced HDL Synthesis Report
- 7) Low Level Synthesis
- 8) Partition Report
- 9) Final Report
 - 9.1) Device utilization summary
 - 9.2) Partition Resource Summary
 - 9.3) TIMING REPORT

* Synthesis Options Summary *

---- Source Parameters

Input File Name	: "rx_uart.prj"
Input Format	: mixed
Ignore Synthesis Constraint File	: NO

---- Target Parameters

Output File Name	: "rx_uart"
Output Format	: NGC
Target Device	: xc3s200-4-ft256

---- Source Options

Top Module Name	: rx_uart
Automatic FSM Extraction	: YES
FSM Encoding Algorithm	: Auto
Safe Implementation	: No
FSM Style	: LUT
RAM Extraction	: Yes
RAM Style	: Auto
ROM Extraction	: Yes
Mux Style	: Auto
Decoder Extraction	: YES
Priority Encoder Extraction	: Yes
Shift Register Extraction	: YES
Logical Shifter Extraction	: YES
XOR Collapsing	: YES

ROM Style : Auto
Mux Extraction : Yes
Resource Sharing : YES
Asynchronous To Synchronous : NO
Multiplier Style : Auto
Automatic Register Balancing : No

---- Target Options

Add IO Buffers : YES
Global Maximum Fanout : 100000
Add Generic Clock Buffer (BUFG) : 8
Register Duplication : YES
Slice Packing : YES
Optimize Instantiated Primitives : NO
Use Clock Enable : Yes
Use Synchronous Set : Yes
Use Synchronous Reset : Yes
Pack IO Registers into IOBs : Auto
Equivalent register Removal : YES

---- General Options

Optimization Goal : Speed
Optimization Effort : 1
Keep Hierarchy : No
Netlist Hierarchy : As_Optimized
RTL Output : Yes
Global Optimization : AllClockNets
Read Cores : YES
Write Timing Constraints : NO
Cross Clock Analysis : NO
Hierarchy Separator : /
Bus Delimiter : <>
Case Specifier : Maintain
Slice Utilization Ratio : 100
BRAM Utilization Ratio : 100
Verilog 2001 : YES
Auto BRAM Packing : NO
Slice Utilization Ratio Delta : 5

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* HDL Compilation *

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[WARNING](#):HDLParasers:3607 - Unit work/rx_uart is now defined in a different file. It was defined in "C:/CPE_USERS/-ESE-VHDL-UART-master/UART/rx_uart.vhd", and is now defined in "F:/Mes Documents/GitHub/-ESE-VHDL-UART/UART/rx_uart.vhd".
[WARNING](#):HDLParasers:3607 - Unit work/rx_uart/Behavioral is now defined in a different file. It was defined in "C:/CPE_USERS/-ESE-VHDL-UART-master/UART/rx_uart.vhd", and is now defined in "F:/Mes Documents/GitHub/-ESE-VHDL-UART/UART/rx_uart.vhd".
Compiling vhdl file "F:/Mes Documents/GitHub/-ESE-VHDL-UART/UART/rx_uart.vhd" in Library work.
Architecture behavioral of Entity rx_uart is up to date.

=====

* Design Hierarchy Analysis *

=====

Analyzing hierarchy for entity <rx_uart> in library <work> (architecture <behavioral>).

```
=====
*                               HDL Analysis                               *
=====
```

Analyzing Entity <rx_uart> in library <work> (Architecture <behavioral>).

[WARNING](#):Xst:819 - "F:/Mes Documents/GitHub/-ESE-VHDL-UART/UART/rx_uart.vhd" line 65: One or more signals are missing in the process sensitivity list. To enable synthesis of FPGA/CPLD hardware, XST will assume that all necessary signals are present in the sensitivity list. Please note that the result of the synthesis may differ from the initial design specification. The missing signals are:

<s>, <current_state>, <rx>, <internal_dout>

Entity <rx_uart> analyzed. Unit <rx_uart> generated.

```
=====
*                               HDL Synthesis                               *
=====
```

Performing bidirectional port resolution...

Synthesizing Unit <rx_uart>.

Related source file is "F:/Mes Documents/GitHub/-ESE-VHDL-UART/UART/rx_uart.vhd".

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_0>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_1>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_2>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_3>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_4>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_5>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_6>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

[WARNING](#):Xst:737 - Found 1-bit latch for signal <internal_dout_7>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

Using one-hot encoding for signal <current_state>.

[WARNING](#):Xst:737 - Found 4-bit latch for signal <next_state>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

INFO:Xst:2371 - HDL ADVISOR - Logic functions respectively driving the data and gate enable inputs of this latch share common terms. This situation will potentially lead to setup/hold violations and, as a result, to simulation problems. This situation may come from an incomplete case statement (all selector values are not covered). You should carefully review if it was in your intentions to describe such a latch.

[WARNING](#):Xst:737 - Found 3-bit latch for signal <n>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

INFO:Xst:2371 - HDL ADVISOR - Logic functions respectively driving the data and gate enable inputs of this latch share common terms. This situation will potentially lead to setup/hold violations and, as a result, to simulation problems. This situation may come from an incomplete case statement (all selector values are not covered). You should

carefully review if it was in your intentions to describe such a latch.

WARNING:Xst:737 - Found 4-bit latch for signal <s>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

INFO:Xst:2371 - HDL ADVISOR - Logic functions respectively driving the data and gate enable inputs of this latch share common terms. This situation will potentially lead to setup/hold violations and, as a result, to simulation problems. This situation may come from an incomplete case statement (all selector values are not covered). You should carefully review if it was in your intentions to describe such a latch.

WARNING:Xst:737 - Found 8-bit latch for signal <dout>. Latches may be generated from incomplete case or if statements. We do not recommend the use of latches in FPGA/CPLD designs, as they may lead to timing problems.

INFO:Xst:2371 - HDL ADVISOR - Logic functions respectively driving the data and gate enable inputs of this latch share common terms. This situation will potentially lead to setup/hold violations and, as a result, to simulation problems. This situation may come from an incomplete case statement (all selector values are not covered). You should carefully review if it was in your intentions to describe such a latch.

Found 4-bit register for signal <current_state>.

Found 4-bit comparator greatequal for signal <internal_dout_0\$cmp_ge0000> created at line 138.

Found 3-bit adder for signal <n\$addsub0000> created at line 141.

Found 4-bit comparator less for signal <n\$cmp_lt0000> created at line 138.

Found 4-bit comparator less for signal <next_state\$cmp_lt0000> created at line 107.

Found 4-bit adder for signal <s_int\$add0000> created at line 101.

Summary:

inferred	2	Adder/Subtractor(s).
inferred	3	Comparator(s).

Unit <rx_uart> synthesized.

HDL Synthesis Report

Macro Statistics

# Adders/Subtractors	: 2
3-bit adder	: 1
4-bit adder	: 1
# Registers	: 1
4-bit register	: 1
# Latches	: 12
1-bit latch	: 8
3-bit latch	: 1
4-bit latch	: 2
8-bit latch	: 1
# Comparators	: 3
4-bit comparator greatequal	: 1
4-bit comparator less	: 2

* Advanced HDL Synthesis *

Advanced HDL Synthesis Report

Macro Statistics

# Adders/Subtractors	: 2
3-bit adder	: 1

4-bit adder	: 1
# Registers	: 4
Flip-Flops	: 4
# Latches	: 12
1-bit latch	: 8
3-bit latch	: 1
4-bit latch	: 2
8-bit latch	: 1
# Comparators	: 3
4-bit comparator greatequal	: 1
4-bit comparator less	: 2

```
=====
*                               Low Level Synthesis                               *
=====
```

Optimizing unit <rx_uart> ...

Mapping all equations...

Building and optimizing final netlist ...

Found area constraint ratio of 100 (+ 5) on block rx_uart, actual ratio is 1.

FlipFlop current_state_1 has been replicated 1 time(s) to handle iob=true attribute.

Final Macro Processing ...

```
=====
Final Register Report
```

Macro Statistics

# Registers	: 5
Flip-Flops	: 5

```
=====
*                               Partition Report                               *
=====
```

Partition Implementation Status

No Partitions were found in this design.

```
=====
*                               Final Report                               *
=====
```

Final Results

RTL Top Level Output File Name	: rx_uart.ngr
Top Level Output File Name	: rx_uart
Output Format	: NGC
Optimization Goal	: Speed
Keep Hierarchy	: No

Design Statistics

# IOs	: 13
-------	------

Cell Usage :

```

# BELS : 63
# LUT2 : 5
# LUT2_D : 2
# LUT2_L : 1
# LUT3 : 19
# LUT4 : 28
# LUT4_D : 2
# LUT4_L : 3
# MUXF5 : 3
# FlipFlops/Latches : 32
# FDC : 4
# FDP : 1
# LD : 19
# LDE : 8
# Clock Buffers : 1
# BUFGP : 1
# IO Buffers : 12
# IBUF : 3
# OBUF : 9
=====

```

Device utilization summary:

Selected Device : 3s200ft256-4

Number of Slices:	33	out of	1920	1%
Number of Slice Flip Flops:	23	out of	3840	0%
Number of 4 input LUTs:	60	out of	3840	1%
Number of IOs:	13			
Number of bonded IOBs:	13	out of	173	7%
IOB Flip Flops:	9			
Number of GCLKs:	1	out of	8	12%

Partition Resource Summary:

No Partitions were found in this design.

TIMING REPORT

NOTE: THESE TIMING NUMBERS ARE ONLY A SYNTHESIS ESTIMATE.
 FOR ACCURATE TIMING INFORMATION PLEASE REFER TO THE TRACE REPORT
 GENERATED AFTER PLACE-and-ROUTE.

Clock Information:

Clock Signal	Clock buffer (FF name)	Load
internal_dout_0_cmp_ge0000 (internal_dout_0_cmp_ge00001:O)	NONE (*) (internal_dout_7)	8
s_not0001 (s_not00011:O)	NONE (*) (s_0)	4
n_not0001 (n_not00011:O)	NONE (*) (n_0)	3
next_state_not0001 (next_state_not00012:O)	NONE (*) (next_state_0)	4
clk	BUFGP	5
dout_or0000 (dout_or00001:O)	NONE (*) (dout_0)	8

(*) These 5 clock signal(s) are generated by combinatorial logic, and XST is not able to identify which are the primary clock signals. Please use the CLOCK_SIGNAL constraint to specify the clock signal(s) generated by combinatorial logic.
 INFO:Xst:2169 - HDL ADVISOR - Some clock signals were not automatically buffered by XST with BUFG/BUFR resources. Please use the buffer_type constraint in order to insert these buffers to the clock signals to help prevent skew problems.

Asynchronous Control Signals Information:

Control Signal	Buffer (FF name)	Load
rst	IBUF	5

Timing Summary:

Speed Grade: -4

Minimum period: 6.616ns (Maximum Frequency: 151.149MHz)
 Minimum input arrival time before clock: 8.685ns
 Maximum output required time after clock: 7.165ns
 Maximum combinational path delay: No path found

Timing Detail:

All values displayed in nanoseconds (ns)

Timing constraint: Default period analysis for Clock 'internal_dout_0_cmp_ge0000'
 Clock period: 3.867ns (frequency: 258.598MHz)
 Total number of paths / destination ports: 10 / 8

Delay: 3.867ns (Levels of Logic = 2)
 Source: internal_dout_4 (LATCH)
 Destination: internal_dout_4 (LATCH)
 Source Clock: internal_dout_0_cmp_ge0000 falling
 Destination Clock: internal_dout_0_cmp_ge0000 falling

Data Path: internal_dout_4 to internal_dout_4

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
LDE:G->Q	3	0.633	1.102	internal_dout_4 (internal_dout_4)
LUT3:I1->O	1	0.551	0.827	internal_dout_4_mux0001_SW0 (N01)
LUT4:I3->O	1	0.551	0.000	internal_dout_4_mux0001
(internal_dout_4_mux0001)				
LDE:D		0.203		internal_dout_4
Total		3.867ns (1.938ns logic, 1.929ns route) (50.1% logic, 49.9% route)		

Timing constraint: Default period analysis for Clock 's_not0001'
 Clock period: 6.616ns (frequency: 151.149MHz)
 Total number of paths / destination ports: 69 / 4

Delay: 6.616ns (Levels of Logic = 4)
 Source: s_0 (LATCH)

Destination: s_1 (LATCH)
Source Clock: s_not0001 falling
Destination Clock: s_not0001 falling

Data Path: s_0 to s_1

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
LD:G->Q	13	0.633	1.365	s_0 (s_0)
LUT2_L:I1->LO	1	0.551	0.126	internal_dout_0_cmp_ge00001_SW2 (N27)
LUT4:I3->O	15	0.551	1.214	internal_dout_0_cmp_ge00001
(internal_dout_0_cmp_ge00000)				
LUT4:I3->O	1	0.551	0.801	s_mux0000<1>_SW0_SW1 (N15)
MUXF5:S->O	1	0.621	0.000	s_mux0000<1> (s_mux0000<1>)
LD:D		0.203		s_1

Total		6.616ns (3.110ns logic, 3.506ns route) (47.0% logic, 53.0% route)		

=====
Timing constraint: Default period analysis for Clock 'n_not0001'

Clock period: 3.782ns (frequency: 264.410MHz)
Total number of paths / destination ports: 6 / 3

Delay: 3.782ns (Levels of Logic = 2)
Source: n_0 (LATCH)
Destination: n_2 (LATCH)
Source Clock: n_not0001 falling
Destination Clock: n_not0001 falling

Data Path: n_0 to n_2

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
LD:G->Q	7	0.633	1.405	n_0 (n_0)
LUT2_D:I0->LO	1	0.551	0.439	internal_dout_3_cmp_eq000011 (N59)
LUT4:I0->O	1	0.551	0.000	n_mux0000<2>1 (n_mux0000<2>)
LD:D		0.203		n_2

Total		3.782ns (1.938ns logic, 1.844ns route) (51.2% logic, 48.8% route)		

=====
Timing constraint: Default OFFSET IN BEFORE for Clock 'internal_dout_0_cmp_ge0000'

Total number of paths / destination ports: 8 / 8

Offset: 4.335ns (Levels of Logic = 3)
Source: rx (PAD)
Destination: internal_dout_0 (LATCH)
Destination Clock: internal_dout_0_cmp_ge0000 falling

Data Path: rx to internal_dout_0

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
IBUF:I->O	14	0.821	1.382	rx_IBUF (rx_IBUF)
LUT3:I1->O	1	0.551	0.827	internal_dout_0_mux0001_SW0 (N21)
LUT4:I3->O	1	0.551	0.000	internal_dout_0_mux0001
(internal_dout_0_mux0001)				
LDE:D		0.203		internal_dout_0

Total 4.335ns (2.126ns logic, 2.209ns route)
(49.0% logic, 51.0% route)

Timing constraint: Default OFFSET IN BEFORE for Clock 's_not0001'

Total number of paths / destination ports: 27 / 4

Offset: 7.322ns (Levels of Logic = 5)

Source: s_tick (PAD)

Destination: s_2 (LATCH)

Destination Clock: s_not0001 falling

Data Path: s_tick to s_2

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
IBUF:I->O	18	0.821	1.756	s_tick_IBUF (s_tick_IBUF)
LUT2:I0->O	1	0.551	1.140	Madd_s_int_add0000_cy<1>11_SW0 (N33)
LUT4:I0->O	2	0.551	1.072	s_mux0000<2>_SW0_SW1_SW0 (N31)
LUT4_L:I1->LO	1	0.551	0.126	s_mux0000<2>_SW0_SW1 (N18)
LUT4:I3->O	1	0.551	0.000	s_mux0000<2> (s_mux0000<2>)
LD:D		0.203		s_2

Total 7.322ns (3.228ns logic, 4.094ns route)
(44.1% logic, 55.9% route)

Timing constraint: Default OFFSET IN BEFORE for Clock 'n_not0001'

Total number of paths / destination ports: 3 / 3

Offset: 6.086ns (Levels of Logic = 4)

Source: s_tick (PAD)

Destination: n_0 (LATCH)

Destination Clock: n_not0001 falling

Data Path: s_tick to n_0

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
IBUF:I->O	18	0.821	1.756	s_tick_IBUF (s_tick_IBUF)
LUT2_L:I0->LO	1	0.551	0.126	internal_dout_0_cmp_ge00001_SW2 (N27)
LUT4:I3->O	15	0.551	1.527	internal_dout_0_cmp_ge00001
(internal_dout_0_cmp_ge0000)				
LUT3:I0->O	1	0.551	0.000	n_mux0000<0>1 (n_mux0000<0>)
LD:D		0.203		n_0

Total 6.086ns (2.677ns logic, 3.409ns route)
(44.0% logic, 56.0% route)

Timing constraint: Default OFFSET IN BEFORE for Clock 'next_state_not0001'

Total number of paths / destination ports: 17 / 4

Offset: 8.685ns (Levels of Logic = 6)

Source: s_tick (PAD)

Destination: next_state_0 (LATCH)

Destination Clock: next_state_not0001 falling

Data Path: s_tick to next_state_0

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
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```

-----
      IBUF:I->O           18   0.821   1.756   s_tick_IBUF (s_tick_IBUF)
      LUT4:I0->O           4   0.551   1.256   s_int_mux0001<3>1 (s_int_mux0001<3>)
      LUT4:I0->O           1   0.551   0.000   next_state_cmp_lt000012
(next_state_cmp_lt000011)
      MUXF5:I0->O          2   0.360   0.945   next_state_cmp_lt00001_f5
(next_state_cmp_lt00000)
      LUT4:I2->O           1   0.551   1.140   next_state_mux0004<0>11_SW0 (N46)
      LUT4:I0->O           1   0.551   0.000   next_state_mux0004<0>11
(next_state_mux0004<0>)
      LD:D                  0.203           next_state_0
-----
Total                               8.685ns (3.588ns logic, 5.097ns route)
                                   (41.3% logic, 58.7% route)
=====

```

Timing constraint: Default OFFSET OUT AFTER for Clock 'clk'

Total number of paths / destination ports: 1 / 1

Offset: 7.165ns (Levels of Logic = 1)

Source: current_state_1_1 (FF)

Destination: rx_done (PAD)

Source Clock: clk rising

Data Path: current_state_1_1 to rx_done

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
FDC:C->Q	1	0.720	0.801	current_state_1_1 (current_state_1_1)
OBUF:I->O		5.644		rx_done_OBUF (rx_done)
Total		7.165ns	(6.364ns logic, 0.801ns route)	(88.8% logic, 11.2% route)

Timing constraint: Default OFFSET OUT AFTER for Clock 'dout_or0000'

Total number of paths / destination ports: 8 / 8

Offset: 7.078ns (Levels of Logic = 1)

Source: dout_7 (LATCH)

Destination: dout<7> (PAD)

Source Clock: dout_or0000 falling

Data Path: dout_7 to dout<7>

Cell:in->out	fanout	Gate Delay	Net Delay	Logical Name (Net Name)
LD:G->Q	1	0.633	0.801	dout_7 (dout_7)
OBUF:I->O		5.644		dout_7_OBUF (dout<7>)
Total		7.078ns	(6.277ns logic, 0.801ns route)	(88.7% logic, 11.3% route)

Total REAL time to Xst completion: 4.00 secs

Total CPU time to Xst completion: 3.93 secs

-->

Total memory usage is 4550288 kilobytes

Number of errors : 0 (0 filtered)

Number of warnings : 15 (0 filtered)

Number of infos : 5 (0 filtered)