

ΓΙΩΡΓΟΣ ΧΑΤΖΗΛΙΓΟΣ ΑΜ4835 2<sup>ο</sup> ΕΤΟΣ

$F(a,b,c,d)=\Sigma(0,1,2,4,5,6,8,10)$

Χρησιμοποιω πινακα Karnaugh

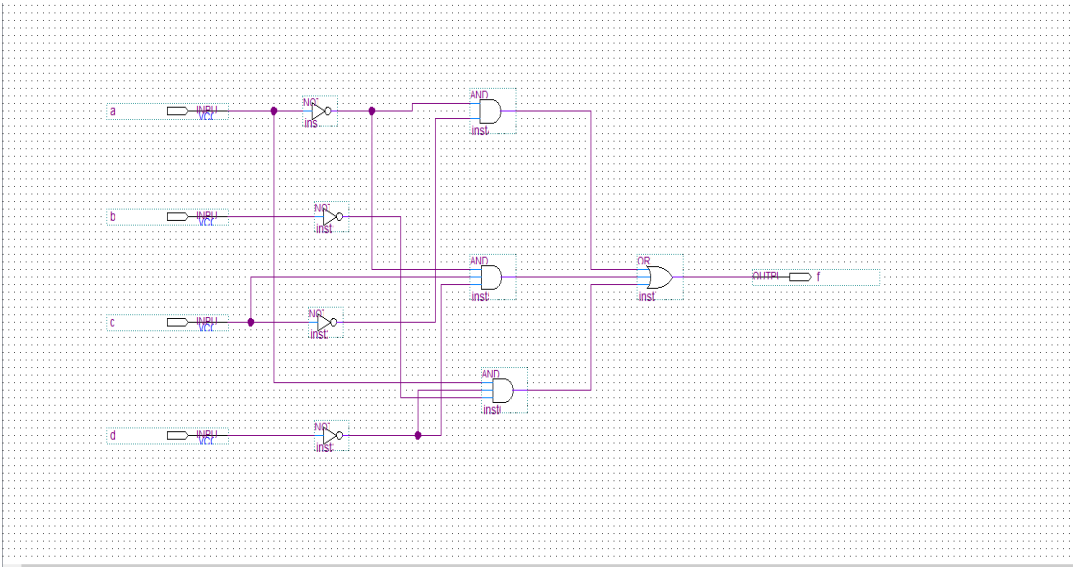
AB\CD	0	1	11	10	
0	1	1	0	1	
1	1	1	0	1	
11	0	0	0	0	
10	1	0	0	1	

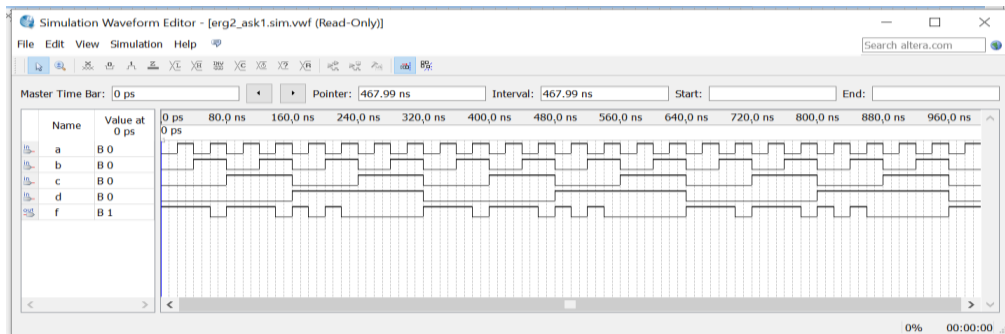
$$F=a'b'c'd'+a'b'c'd+a'b'cd'+a'bc'd'+a'bc'd+a'bcd'+ab'c'd+ab'cd' =$$

$$=a'b'c'(d+d')+a'cd'(b+b')+a'bc'(d+d')+ab'd'(c+c')$$

$$=a'c'(b+b')+a'cd'+ab'd'=a'c'+a'cd'+ab'd'$$

a	b	c	d	a'c'	a'cd'	ab'd'	f
0	0	0	0	1	0	0	1
1	0	0	0	0	0	1	1
0	1	0	0	1	1	0	1
0	0	1	0	1	1	0	1
0	0	0	1	1	0	0	1
1	1	0	0	0	0	0	0
1	0	1	0	0	0	1	1
1	0	0	1	0	0	0	0
0	1	1	0	0	1	0	1
0	1	0	1	1	0	0	1
0	0	1	1	0	0	0	0
1	1	1	0	0	0	0	0
1	0	1	1	0	0	0	0
1	1	0	1	0	0	0	0
1	1	1	1	0	0	0	0





## ΑΣΚΗΣΗ 2:

$$F = xy + xz + yz$$

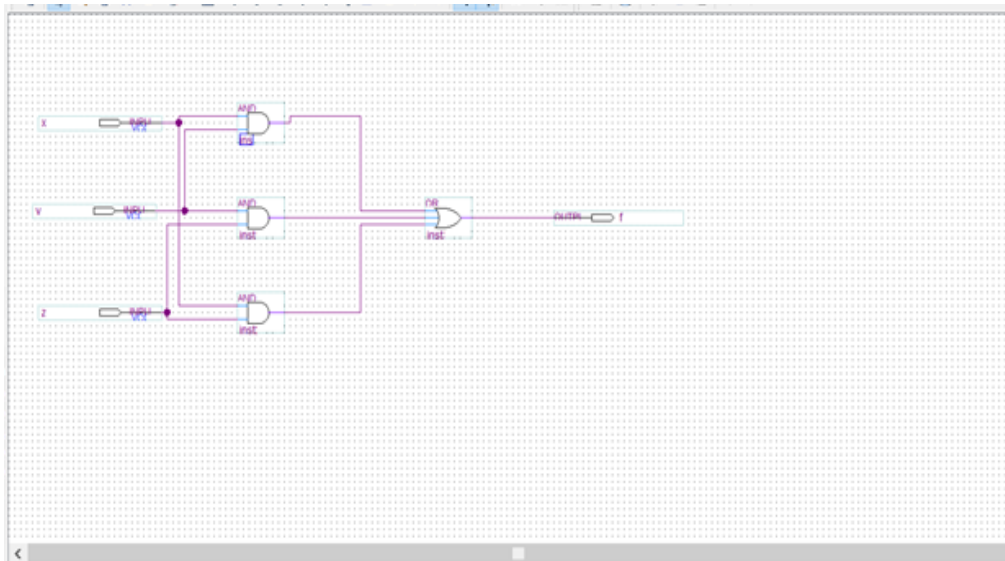
### ΠΙΝΑΚΑΣ ΑΛΗΘΕΙΑΣ

x	y	z	f
0	0	0	0
0	0	1	0
0	1	0	0
1	0	0	0
1	1	0	0
1	0	1	1
0	1	1	1
1	1	1	1

### ΠΙΝΑΚΑΣ KARNAUGH

x\yz	0	1	11	10
0	0	0	1	0
1	0	1	1	1

ΟΠΟΤΕ  $f(x,y,z) = \Sigma(3,5,6,7)$



Quartus II 64-Bit - C:/altera/13.0sp1/Digital\_Design\_Ergastirio\_2 - Digital\_Design\_Ergastirio\_2

File Edit View Project Assignments Processing Tools Window Help

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Project Navigator

Entity	Logic Cells	Dedicated Log
Cyclone II: EP2C35F672C6		
Digital_Design_Ergastirio_2 (1)	0 (0)	

Tasks

Flow: Compilation Customize...

Task	Time
Compile Design	00:00:13
Analysis & Synthesis	00:00:02
Fitter (Place & Route)	00:00:05
Assembler (Generate programming files)	00:00:03
TimeQuest Timing Analysis	00:00:01
EDA Netlist Writer	00:00:02
Program Device (Open Programmer)	

Table ...

Flow Summary

Flow Status	Successful - Sat Oct 31 16:11:47 2020
Quartus II 64-Bit Version	13.0.1 Build 232 06/12/2013 SP 1 SJ Web Edition
Revision Name	Digital_Design_Ergastirio_2
Top-level Entity Name	Digital_Design_Ergastirio_2
Family	Cyclone II
Device	EP2C35F672C6
Timing Models	Final
Total logic elements	1 / 33,216 (< 1 %)
Total combinational functions	1 / 33,216 (< 1 %)
Dedicated logic registers	0 / 33,216 (0 %)
Total registers	0
Total pins	4 / 475 (< 1 %)
Total virtual pins	0
Total memory bits	0 / 483,840 (0 %)
Embedded Multiplier 9-bit elements	0 / 70 (0 %)
Total PLLs	0 / 4 (0 %)

Quartus II

Full Compilation was successful (12 warnings)

OK

Messages

Quartus II 64-Bit EDA Netlist Writer was successful. 0 errors, 0 warnings

Quartus II Full Compilation was successful. 0 errors, 12 warnings

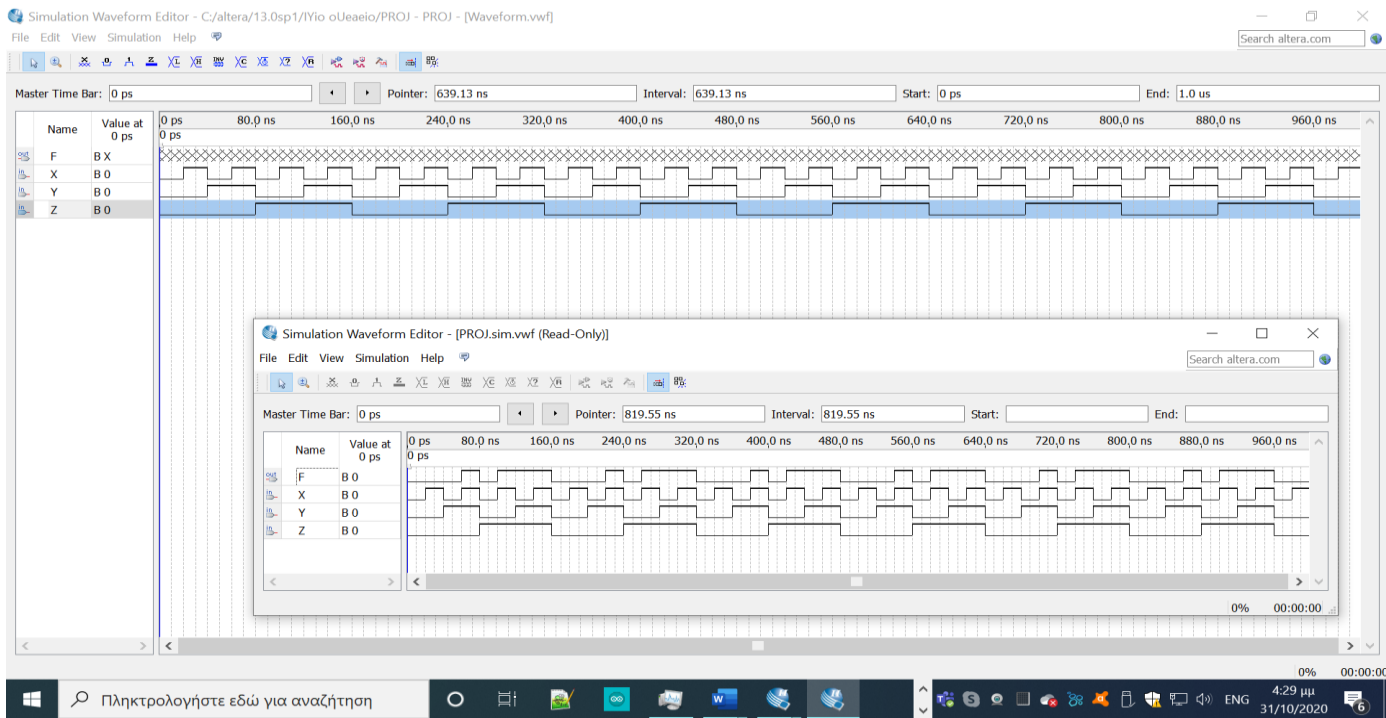
System Processing (100)

Πληκτρολογήστε εδώ για αναζήτηση

144,1 100% 00:00:13

4:14 μμ

31/10/2020



### ΑΣΚΗΣΗ 3

$$F=AB+CD$$

ΠΙΝΑΚΑΣ ΑΛΗΘΕΙΑΣ

a	b	c	d	ab	cd	ab+cd
p0	0	0	0	0	0	0
1	0	0	0	0	0	0
0	1	0	0	0	0	0
0	0	1	0	0	0	0
0	0	0	1	0	0	0
1	1	0	0	1	0	1
1	0	1	0	0	0	0
1	0	0	1	0	0	0
0	1	1	0	0	0	0
0	1	0	1	0	0	0



Quartus II 64-Bit - C:/altera/13.0sp1/ergsthrio2/Ergasthrio\_Aksisi3 - Ergasthrio\_Aksisi3

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Ergasthrio\_Aksisi3

Project Navigator

Files  
Ergasthrio\_Aksisi3.bdf  
Waveform.vwf

Hierarchy Files Design Units

Tasks

Flow: Compilation Customize...

	Task	Time
✓	Compile Design	00:00:12
✓	> Analysis & Synthesis	00:00:02
✓	> Fitter (Place & Route)	00:00:05
✓	> Assembler (Generate programming files)	00:00:02
✓	> TimeQuest Timing Analysis	00:00:02
✓	> EDA Netlist Writer	00:00:01
	Program Device (Open Programmer)	

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All <<Search>>

Message  
> Quartus II 64-Bit EDA Netlist Writer was successful. 0 errors, 0 warnings  
> 293000 Quartus II Full Compilation was successful. 0 errors, 12 warnings

< >

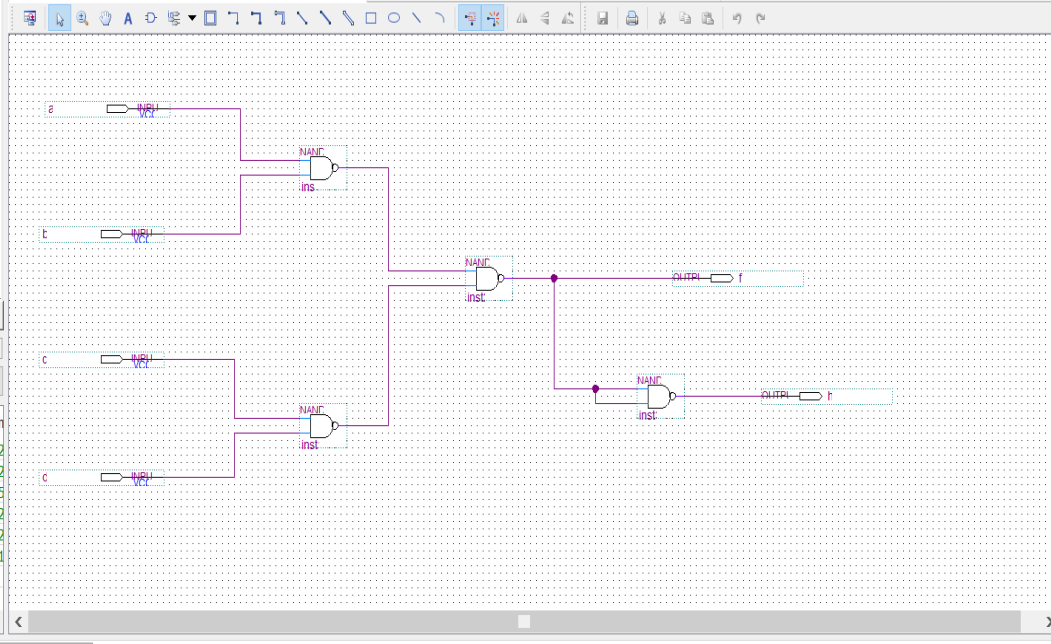
System Processing (100)

Start TimeQuest Timing Analyzer

Πληκτρολογήστε εδώ για αναζήτηση

Ergasthrio\_Aksisi3.bdf

Compilation Report - Ergasthrio\_Aksisi3



Quartus II 64-Bit - C:/altera/13.0sp1/ergsthrio2/Ergasthrio\_Aksisi3 - Ergasthrio\_Aksisi3

File Edit View Project Assignments Processing Tools Window Help

Ergasthrio\_Aksisi3

Project Navigator

- Files
  - Ergasthrio\_Aksisi3.bdf
  - Waveform.vwf

Flow Summary

Flow Status	Successful - Sat Oct 31 11:57:27 2020
Quartus II 64-Bit Version	13.0.1 Build 232 06/12/2013 SP 1 SJ Web Edition
Revision Name	Ergasthrio_Aksisi3
Top-level Entity Name	Ergasthrio_Aksisi3
Family	Cyclone II
Device	EP2C35F672C6
Timing Models	Final
Total logic elements	1 / 33,216 ( < 1 % )
Total combinational functions	1 / 33,216 ( < 1 % )
Dedicated logic registers	0 / 33,216 ( 0 % )
Total registers	0
Total pins	0
Total virtual pins	0
Total memory bits	0
Embedded Multiplier	0
Total PLLs	0

Quartus II

Full Compilation was successful (12 warnings)

OK

Tasks

Flow: Compilation Customize...

Task	Time
Compile Design	00:00:12
Analysis & Synthesis	00:00:02
Fitter (Place & Route)	00:00:05
Assembler (Generate programming files)	00:00:02
TimeQuest Timing Analysis	00:00:02
EDA Netlist Writer	00:00:01
Program Device (Open Programmer)	

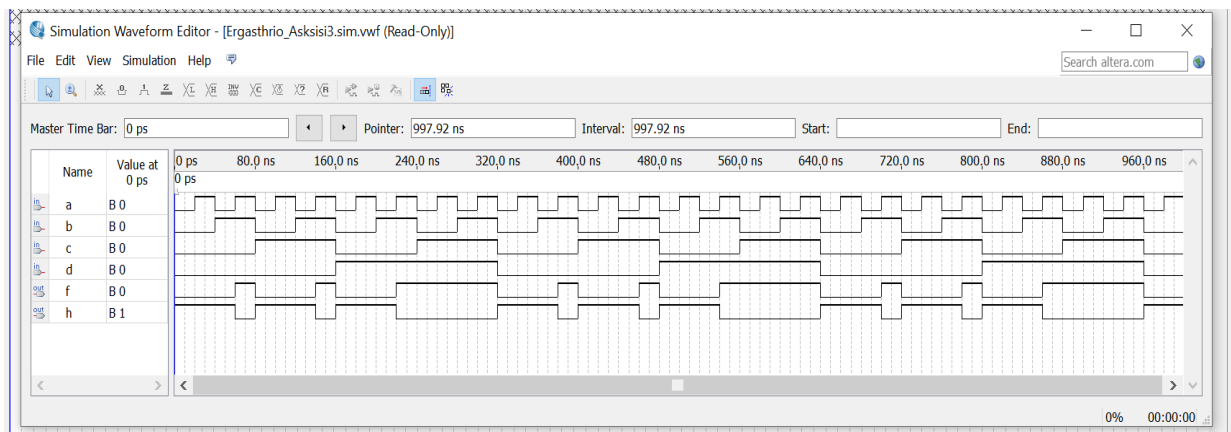
Messages

System / Processing (100) /

Πληκτρολογήστε εδώ για αναζήτηση

484,0 11:5 31/10

\*TO Η ΕΙΝΑΙ ΤΟ Ή



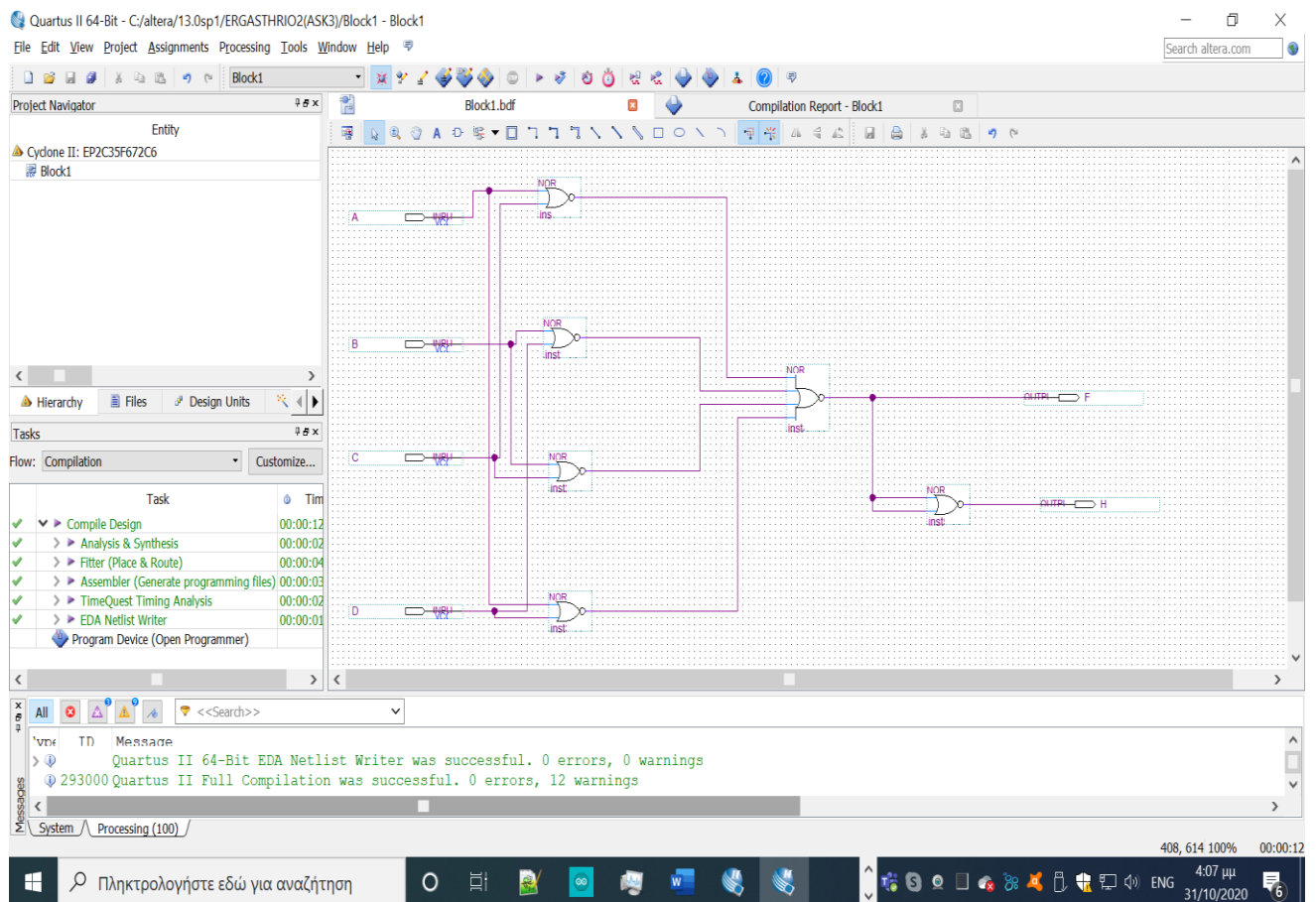


Η F από το προηγούμενο ερωτημα είναι  $f=((ab)'(cd)')'$

$$[(a'+b')(c'+d')] = (a'c' + a'd' + b'c' + b'd') = [(a+c)' + (a+d)' + (b+c)' + (b+d)']'$$

$$H f' = [[(a+c)' + (a+d)' + (b+c)' + (b+d)']']'$$

Οποτε κατασκευασαμε το κυκλωμα μας μονο με πυλες nor



Block1

Project Navigator

Entity

Cyclone II: EP2C35F672C6

Block1

Table ...

Flow Summary

Flow Status: Successful - Sat Oct 31 16:05:04 2020

Quartus II 64-Bit Version: 13.0.1 Build 232 06/12/2013 SP 1 SJ Web Edition

Revision Name: Block1

Top-level Entity Name: Block1

Family: Cyclone II

Device: EP2C35F672C6

Timing Models: Final

Total logic elements: 1 / 33,216 ( < 1 % )

Total combinational functions: 1 / 33,216 ( < 1 % )

Dedicated logic registers: 0 / 33,216 ( 0 % )

Total registers: 0

Total pins: 6 / 475 ( 1 % )

Total virtual pins: 0

Total memory bits: 0 / 483,840 ( 0 % )

Embedded Multiplier 9-bit elements: 0 / 70 ( 0 % )

Total PLLs: 0 / 4 ( 0 % )

Quartus II

Full Compilation was successful (12 warnings)

OK

Tasks

Flow: Compilation

Customize...

Task

Tim

Compile Design: 00:00:12

Analysis & Synthesis: 00:00:02

Fitter (Place & Route): 00:00:04

Assembler (Generate programming files): 00:00:03

TimeQuest Timing Analysis: 00:00:02

EDA Netlist Writer: 00:00:01

Program Device (Open Programmer)

Messages

System / Processing (100) /

Quartus II 64-Bit EDA Netlist Writer was successful. 0 errors, 0 warnings

293000 Quartus II Full Compilation was successful. 0 errors, 12 warnings

