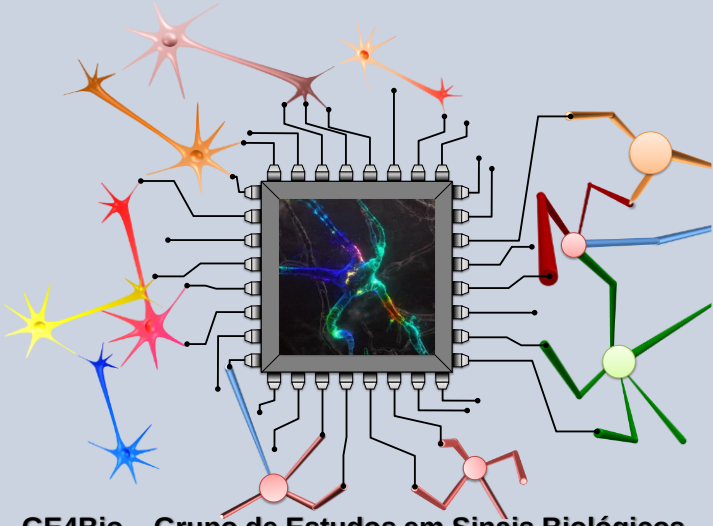
Universidade de São Paulo
Instituto de Ciências Matemáticas e de Computação
Departamento de Sistemas de Computação

SSC512
Elementos de Lógica Digital



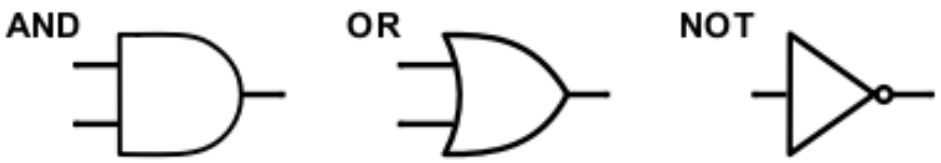
Tutorial Configuração Quartus

Prof.Dr. Danilo Spatti

São Carlos - 2018

- A Álgebra de Boole pode ser desenvolvida a partir de símbolos pré-definidos, tabela de funcionamento (verdade) e equações lógicas.

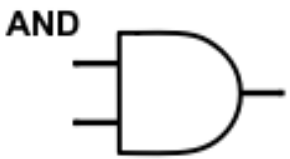
- As ditas operações lógicas primitivas são formadas por AND, OR e NOT, sendo as demais derivadas a partir destas.



- Resulta em verdadeira se, e somente se, todas as proposições forem verdadeiras.

- A operação AND (E) é dita conjunção ou também produto lógico e é representada pela conectiva "." (ponto).

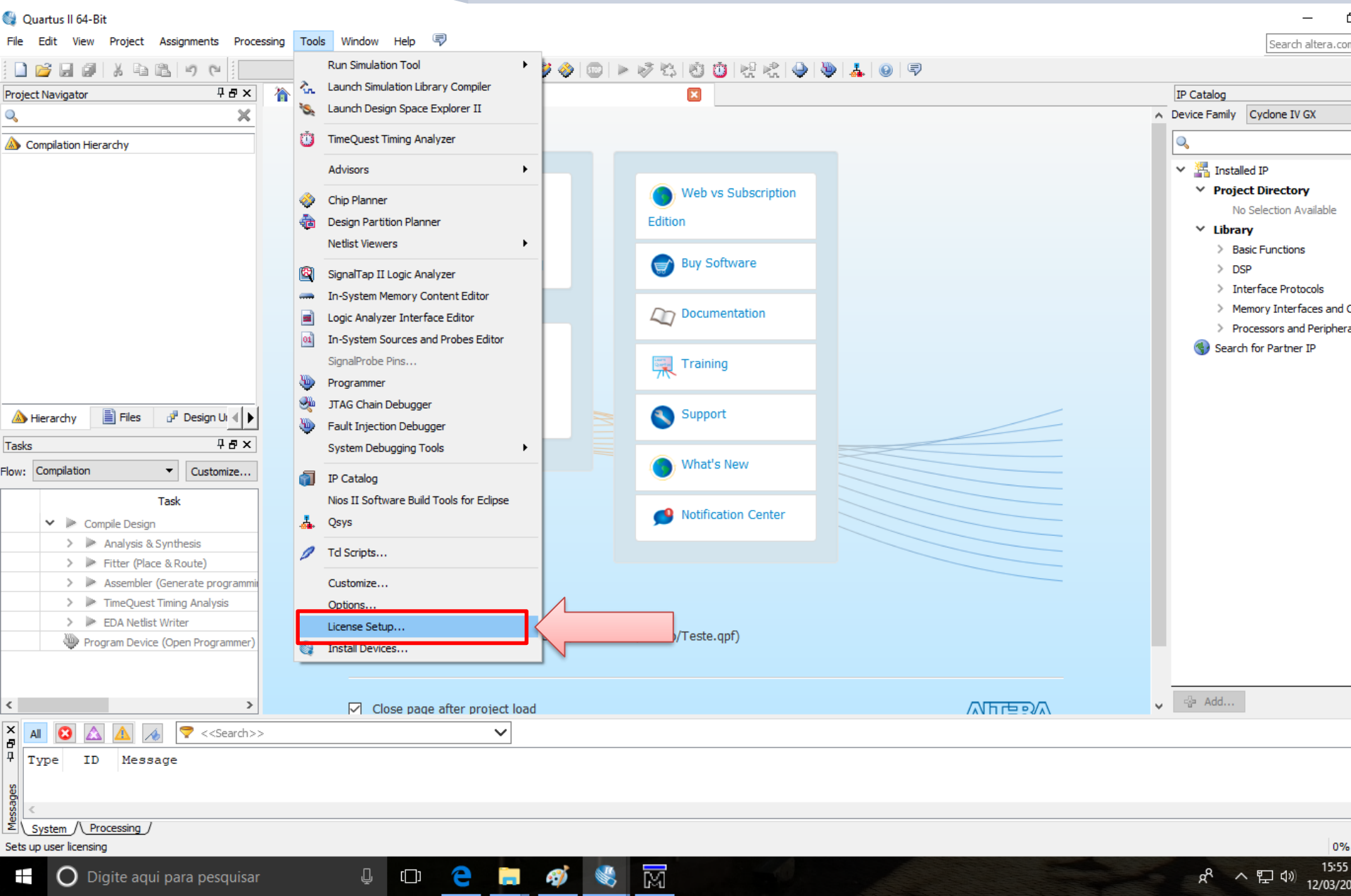
$$S(a,b) = a \cdot b$$



a	b	S
0	0	0
0	1	0
1	0	0
1	1	1

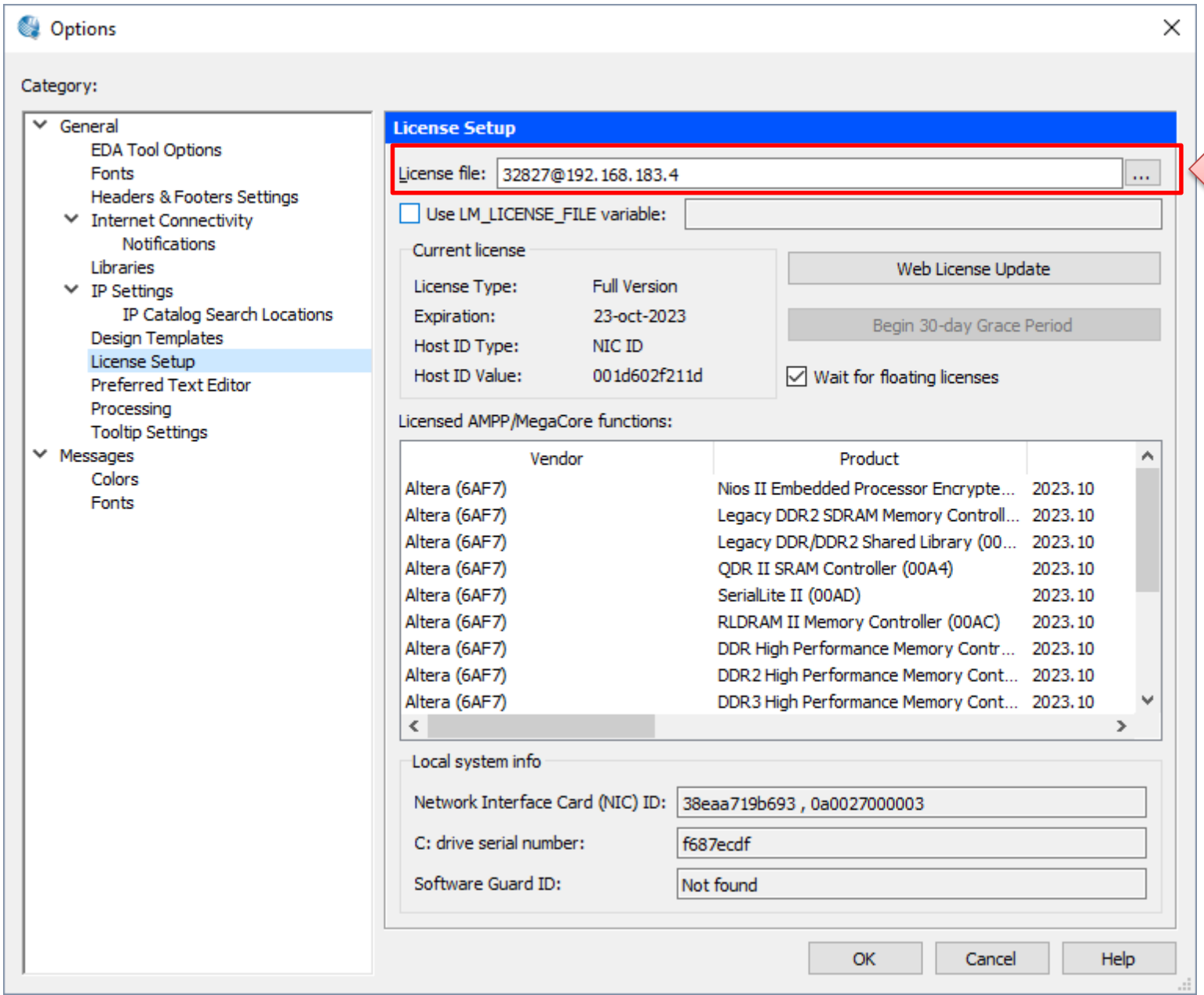
Configuração do Quartus

1 - Licença (I)



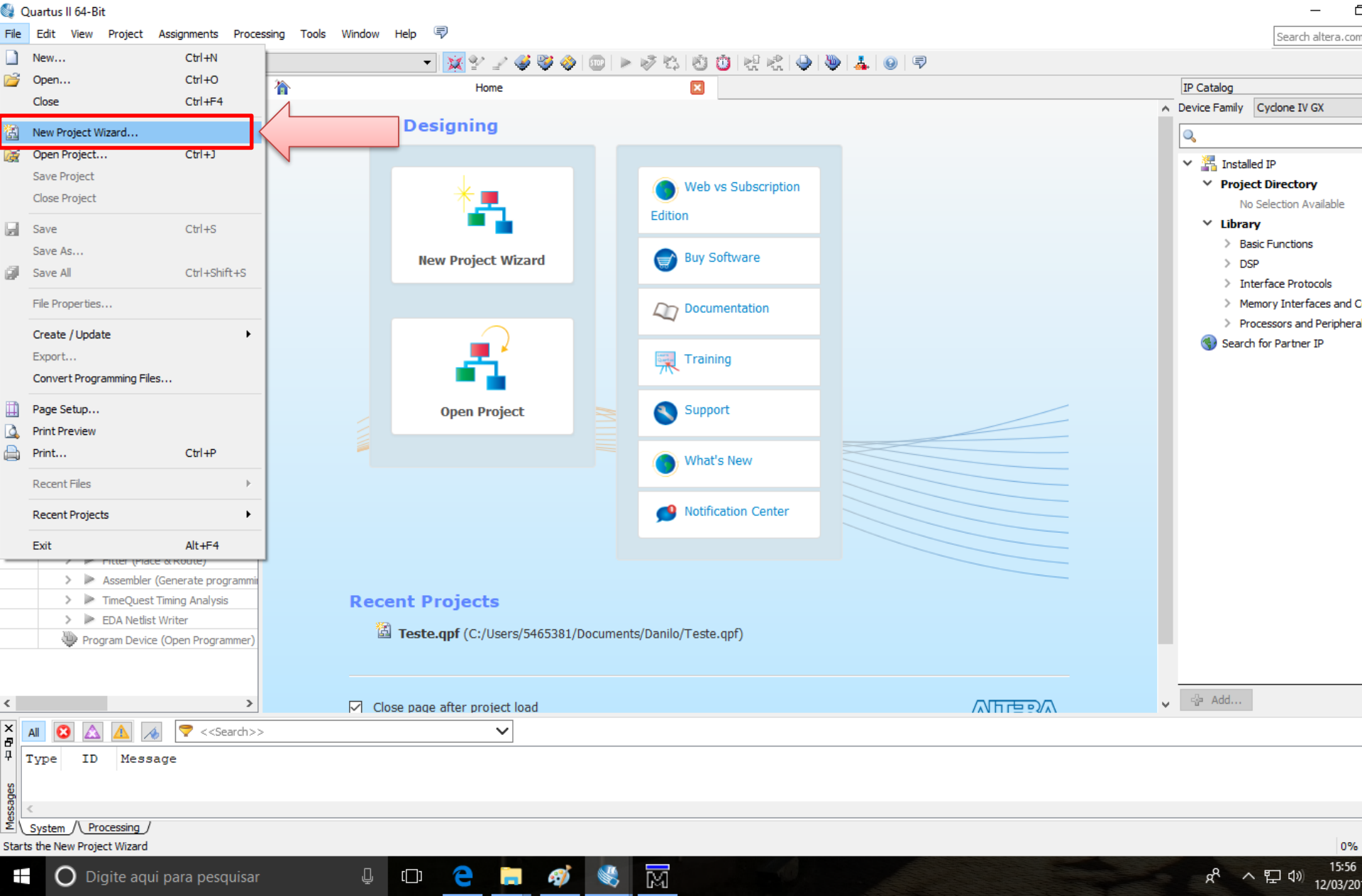
Configuração do Quartus

1 - Licença (II)



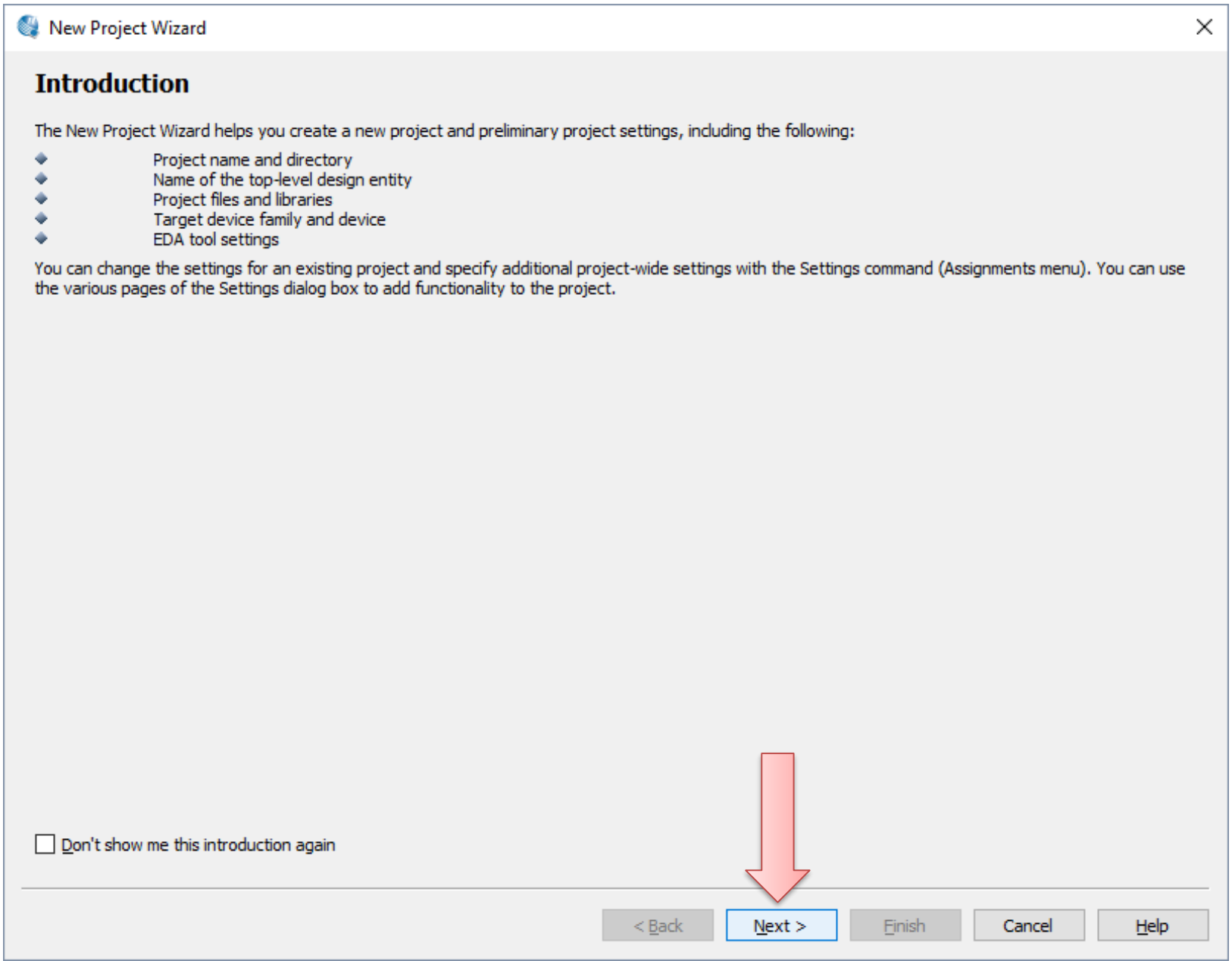
Configuração do Quartus

2 - Criando um Novo Projeto (I)



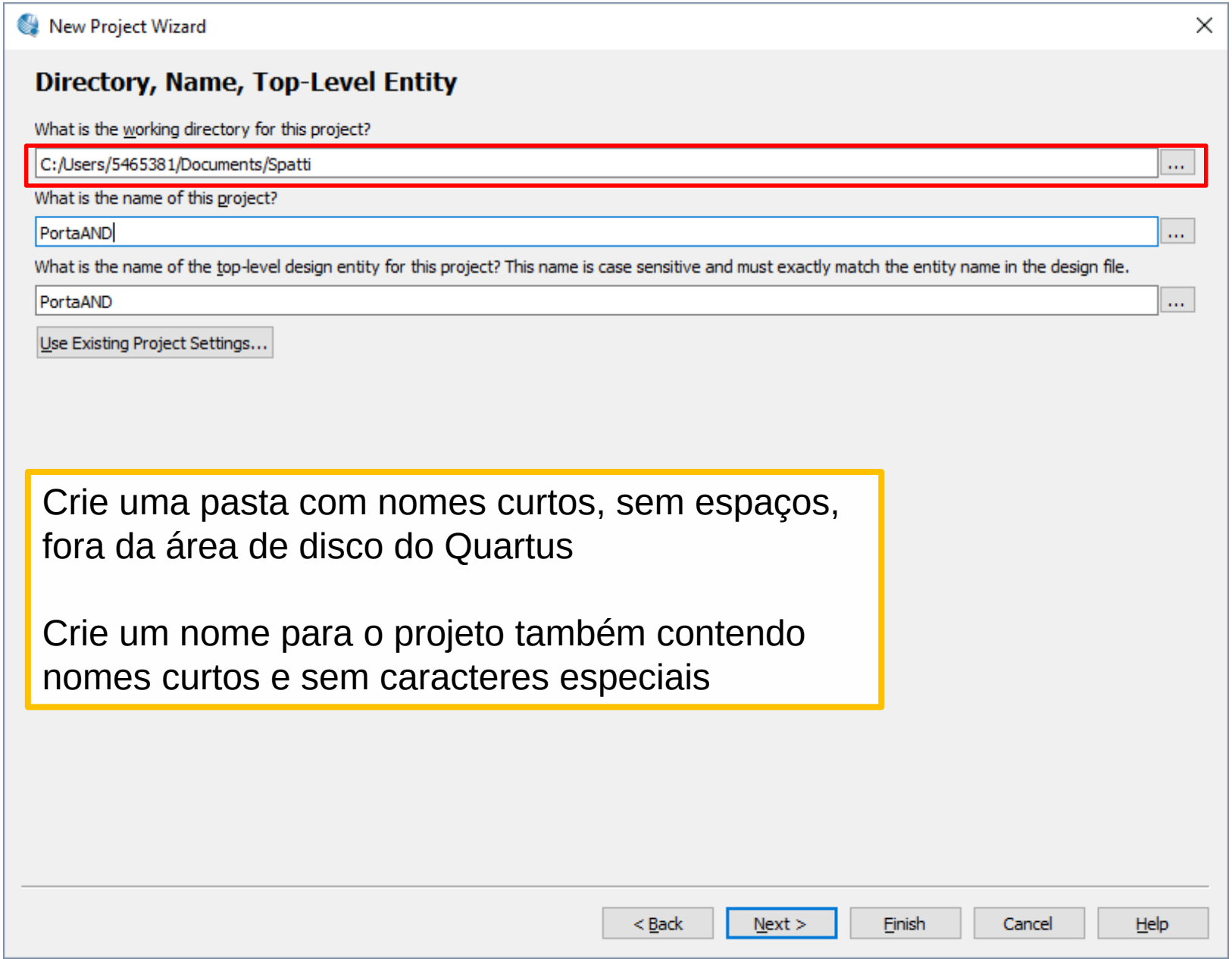
Configuração do Quartus

2 - Criando um Novo Projeto (II)



Configuração do Quartus

2 - Criando um Novo Projeto (III)

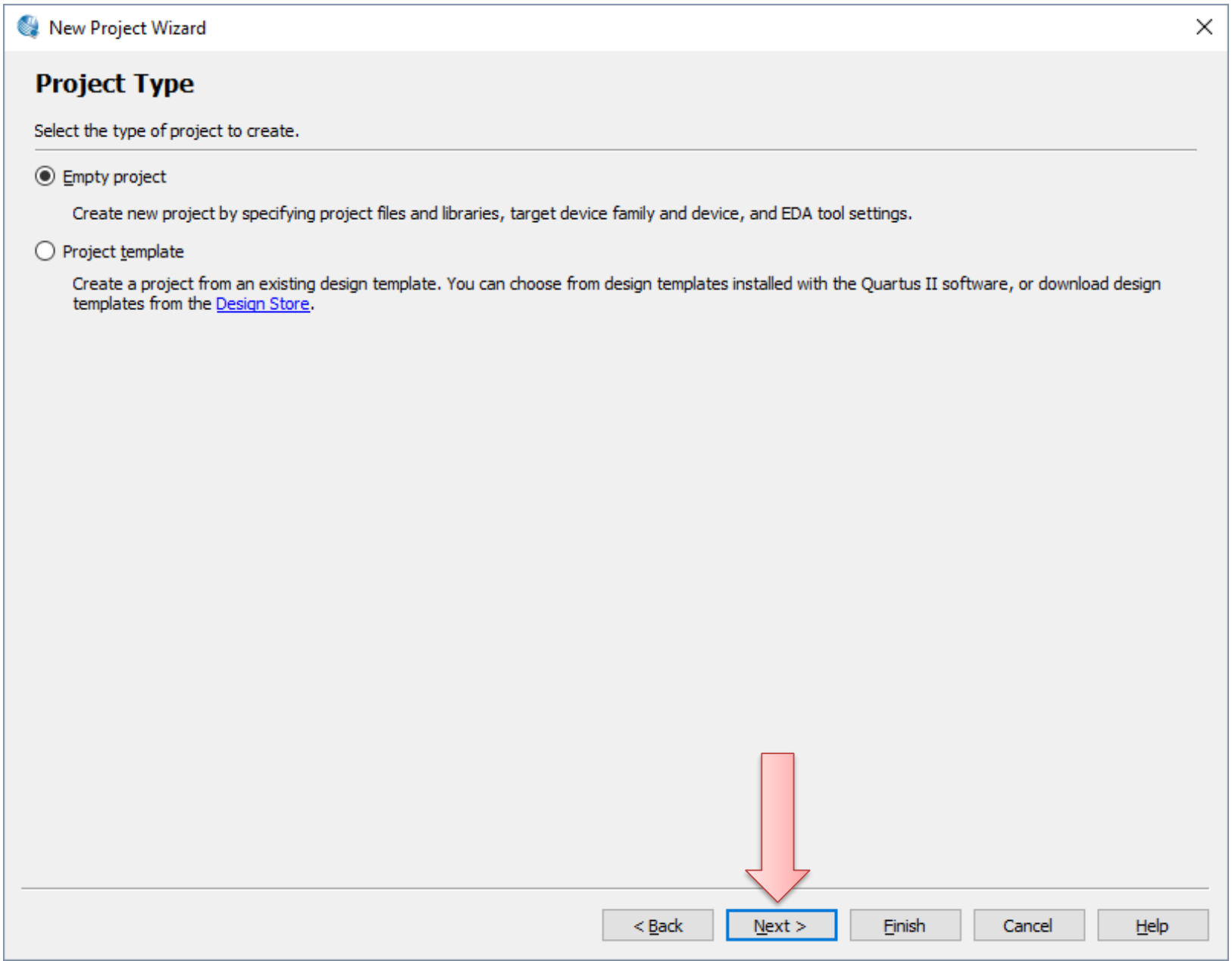


Crie uma pasta com nomes curtos, sem espaços, fora da área de disco do Quartus

Crie um nome para o projeto também contendo nomes curtos e sem caracteres especiais

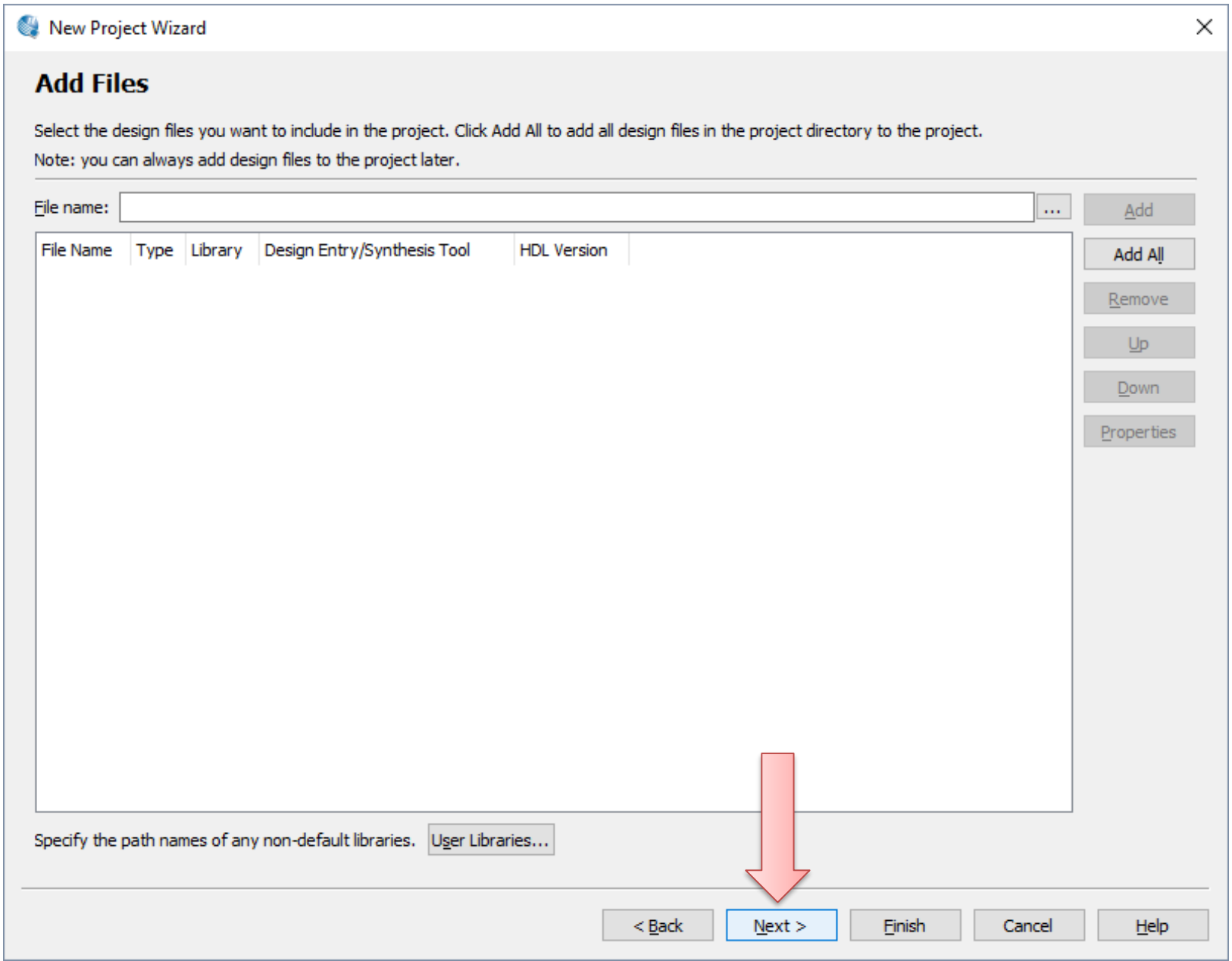
Configuração do Quartus

2 - Criando um Novo Projeto (IV)



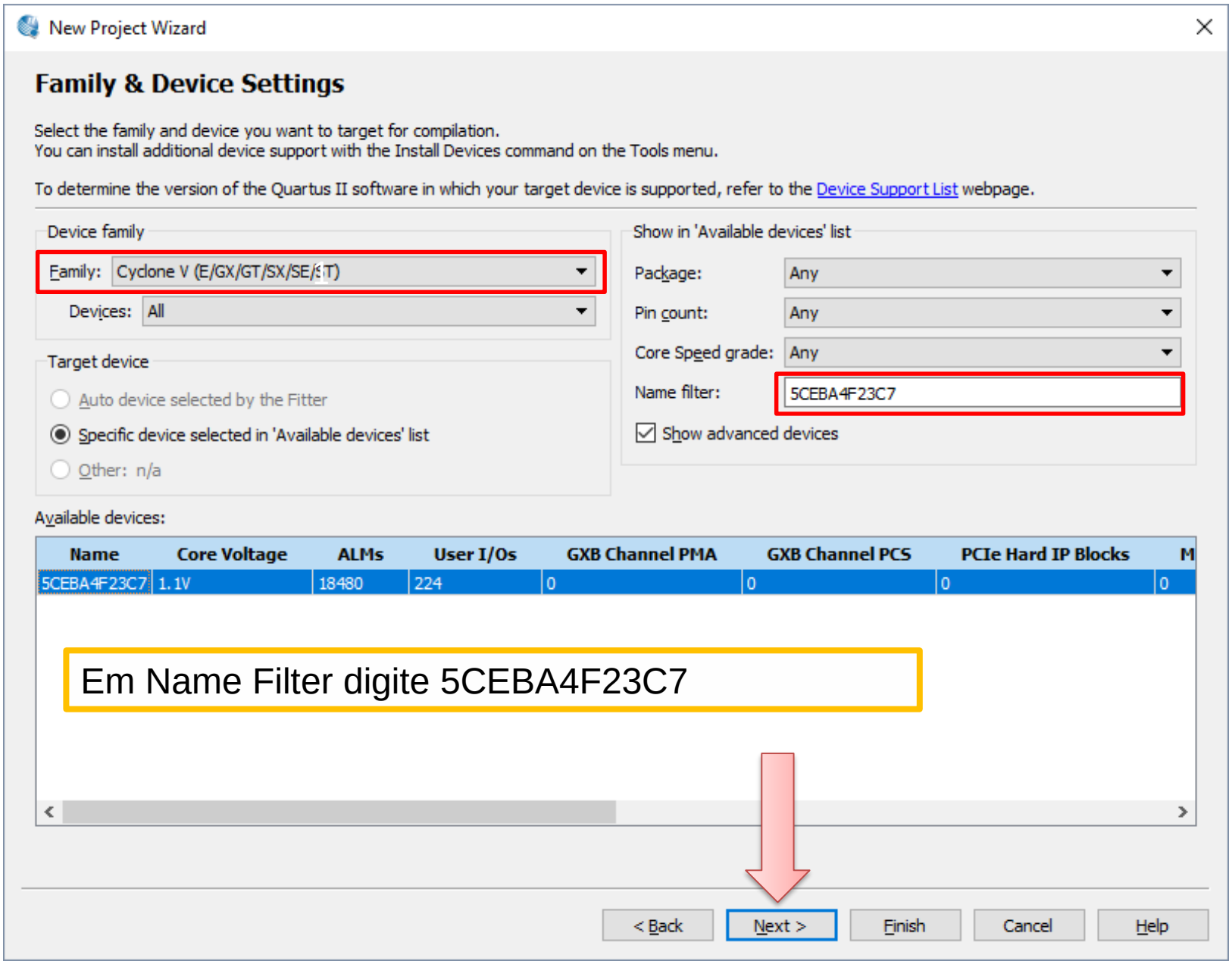
Configuração do Quartus

2 - Criando um Novo Projeto (V)



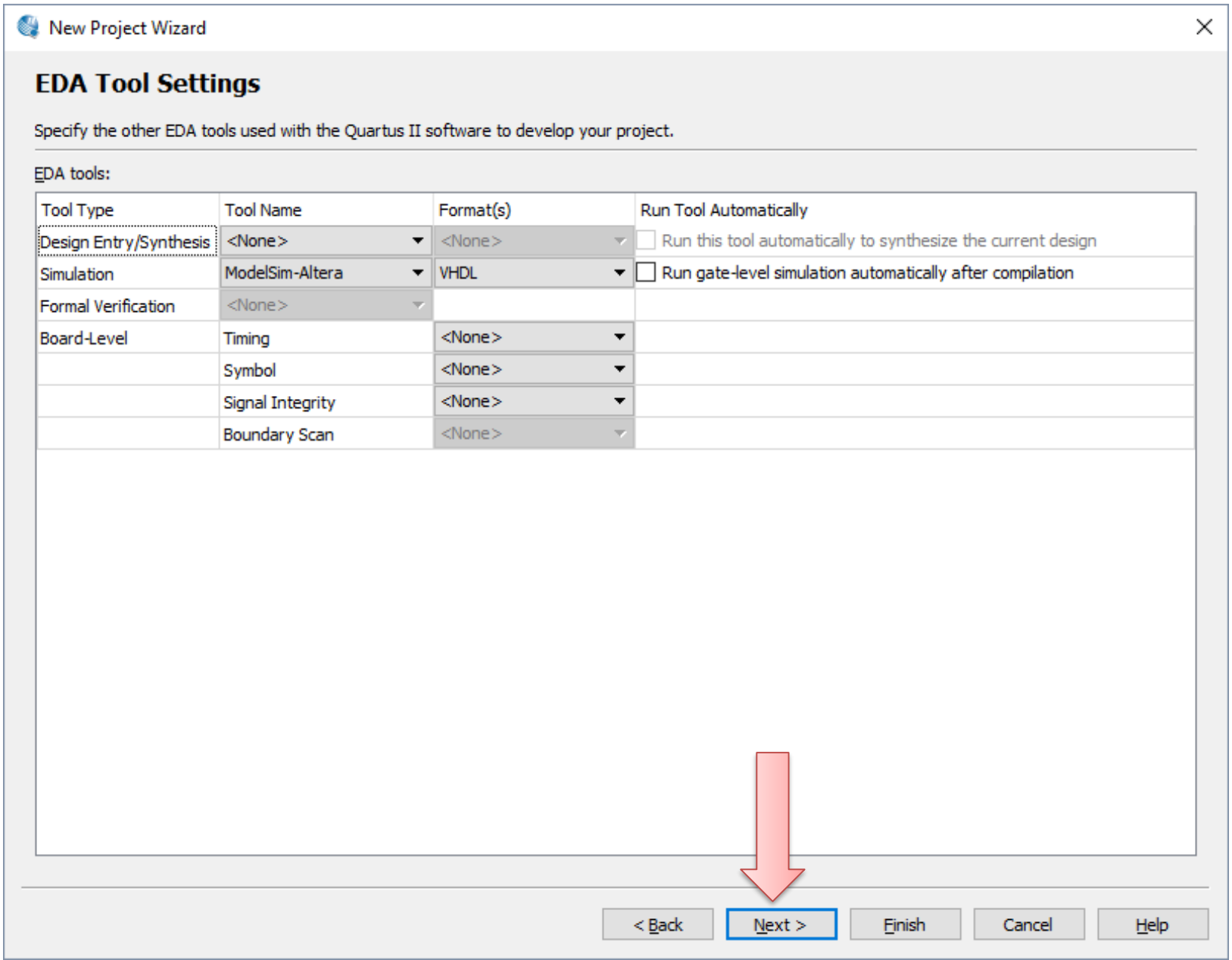
Configuração do Quartus

2 - Criando um Novo Projeto (VI)



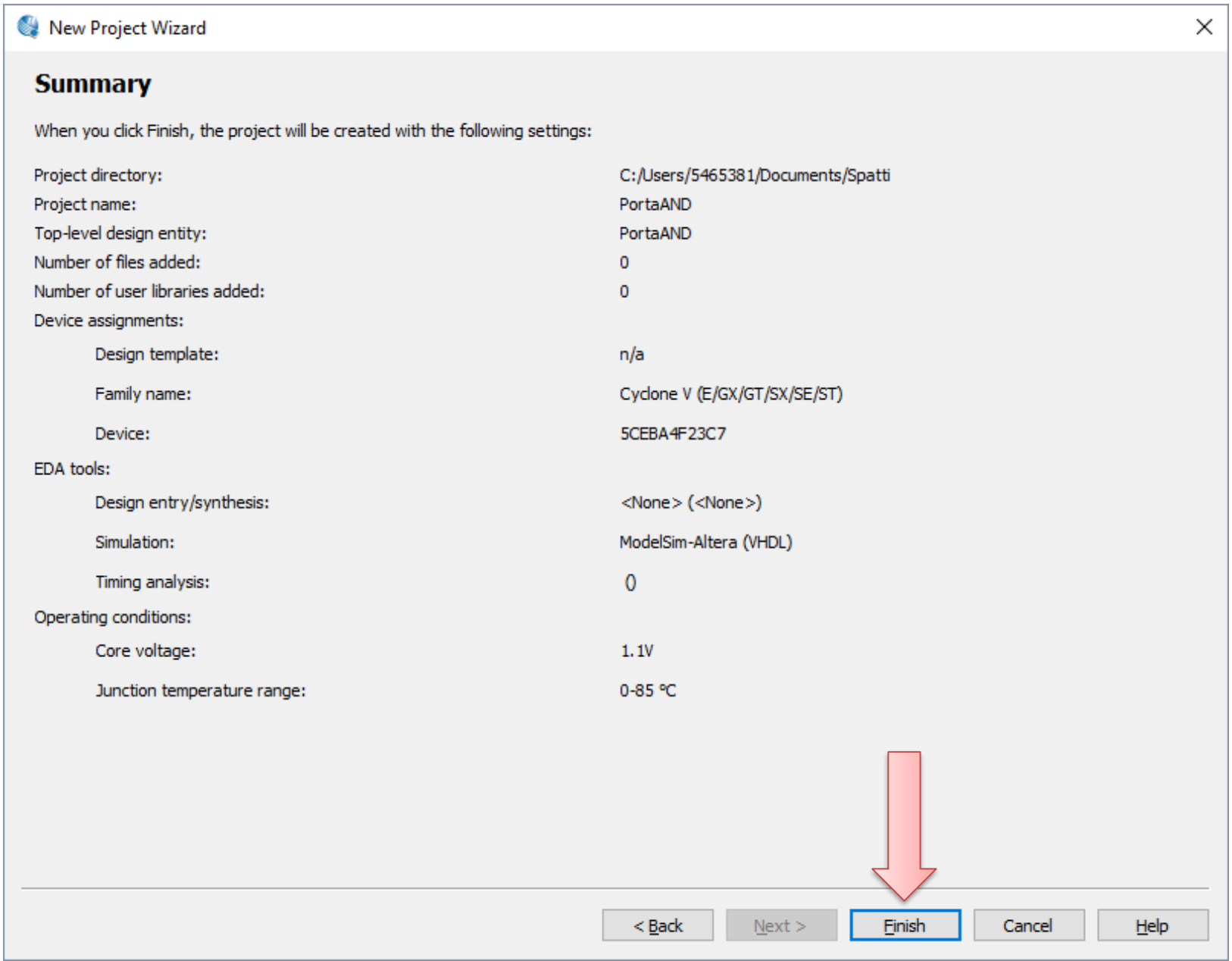
Configuração do Quartus

2 - Criando um Novo Projeto (VII)



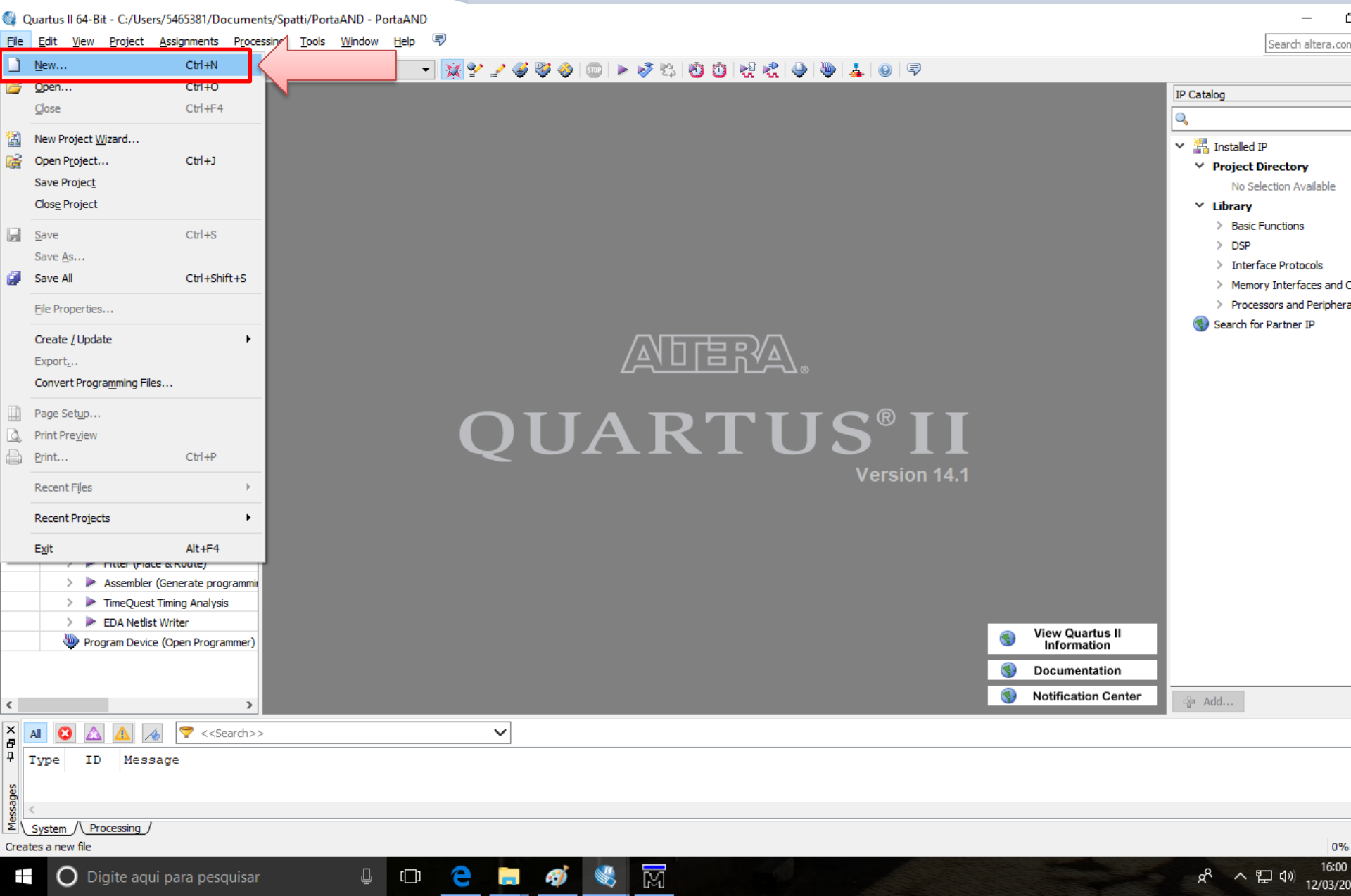
Configuração do Quartus

2 - Criando um Novo Projeto (VIII)



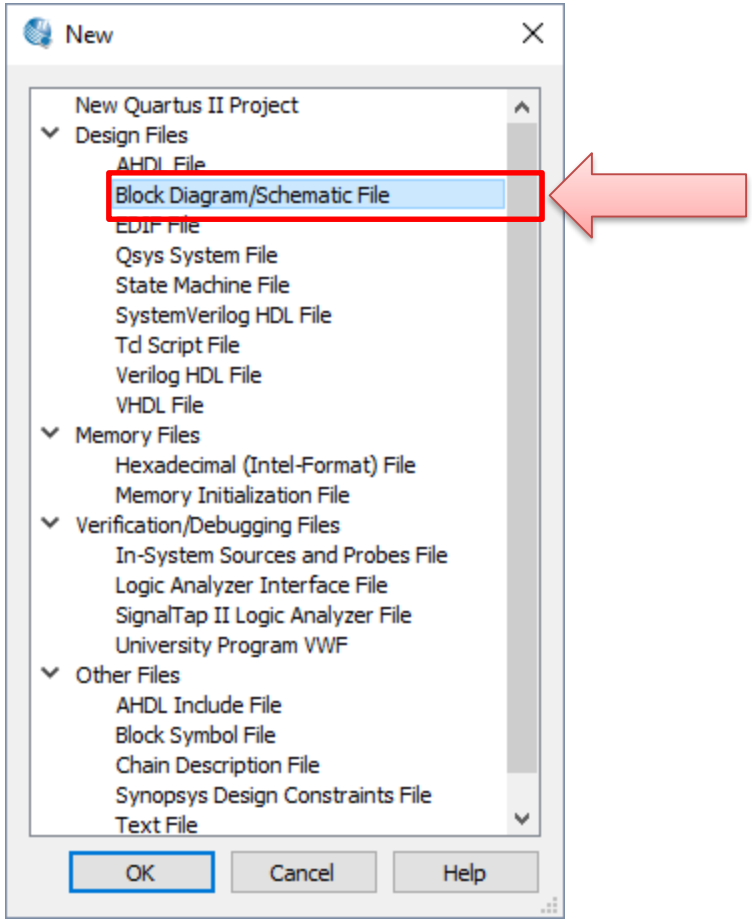
Configuração do Quartus

3 - Criando um Novo Esquemático (I)



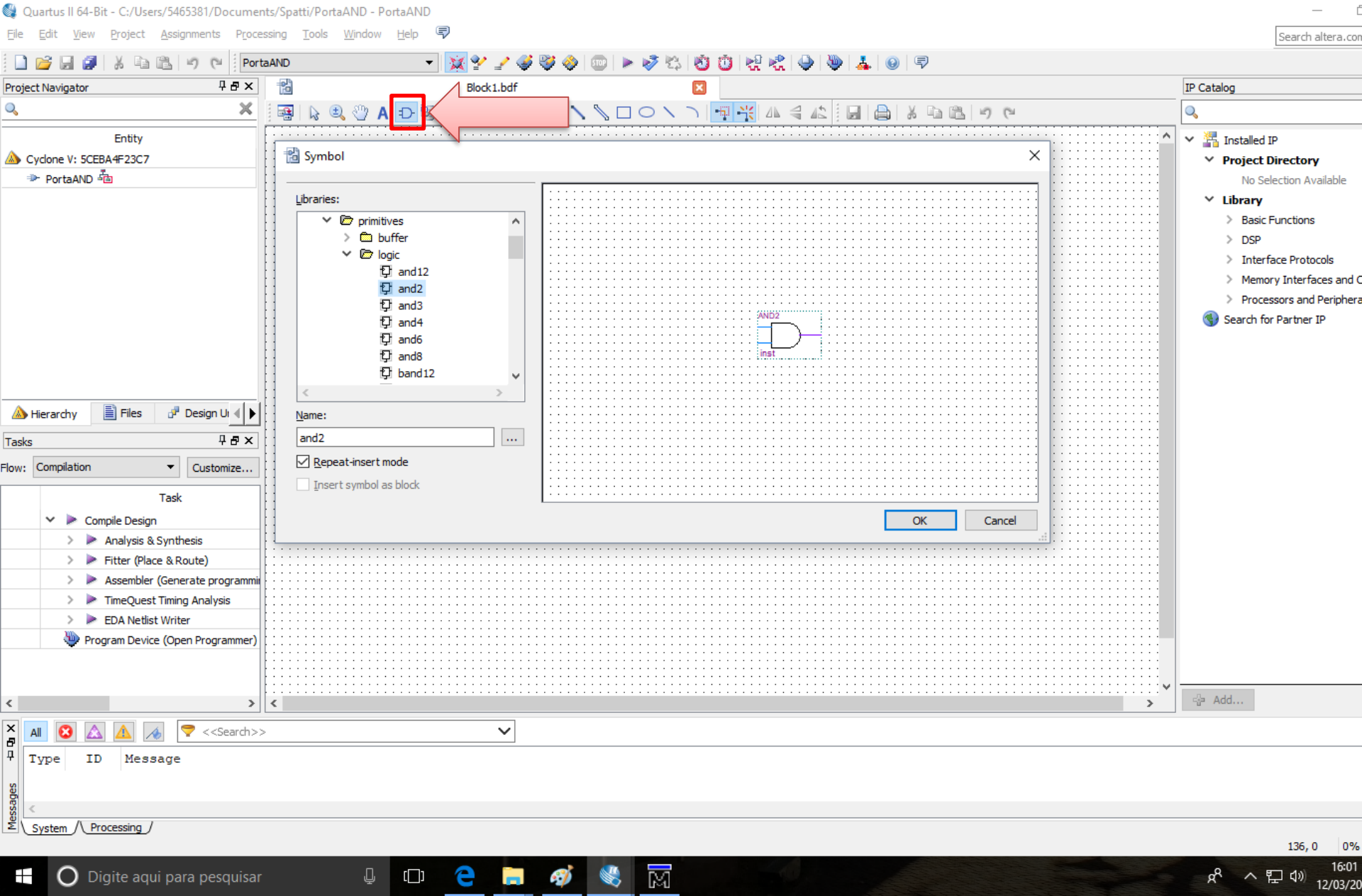
Configuração do Quartus

3 - Criando um Novo Esquemático (II)



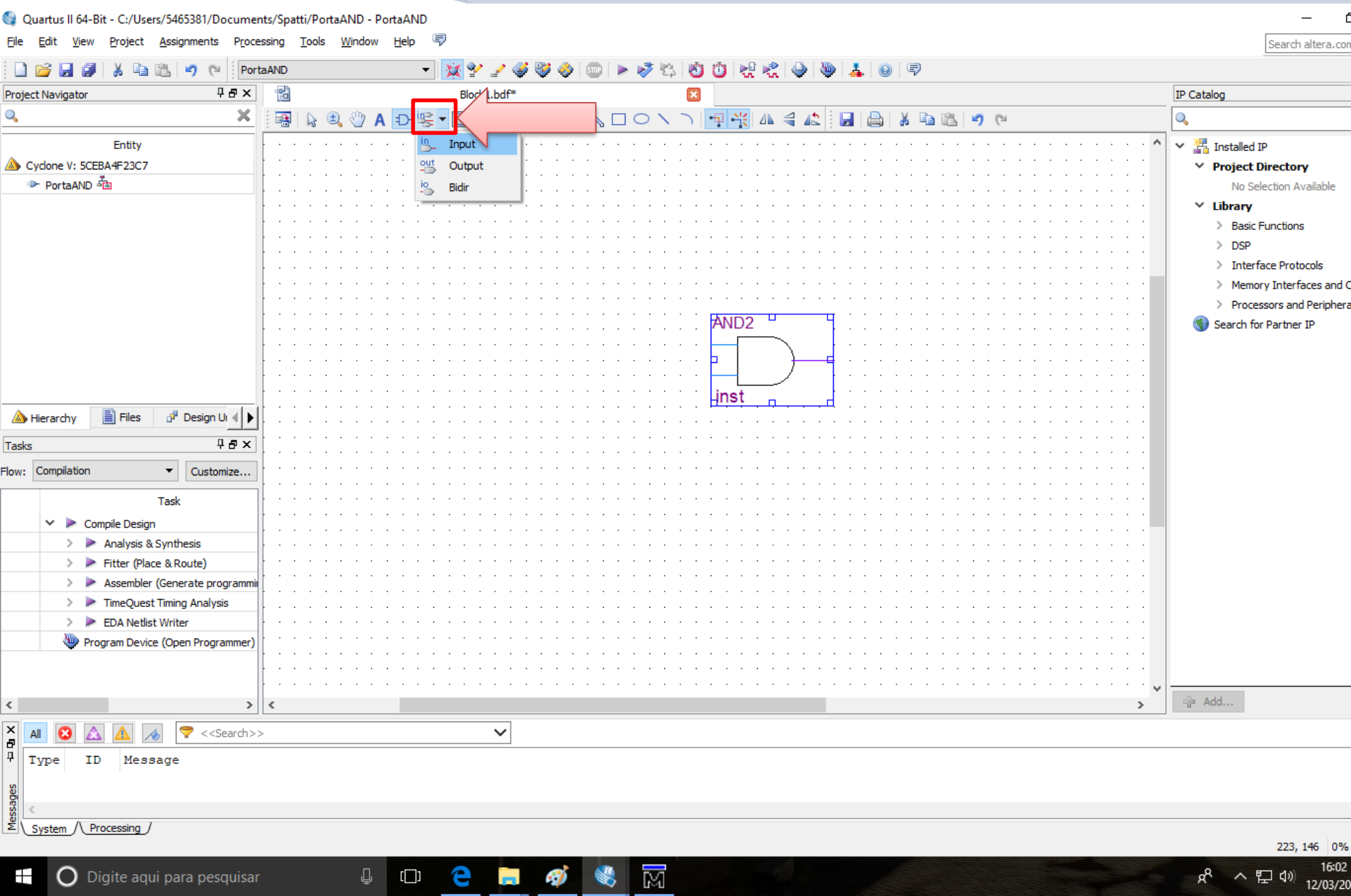
Configuração do Quartus

4 - Adicionando Portas Lógicas



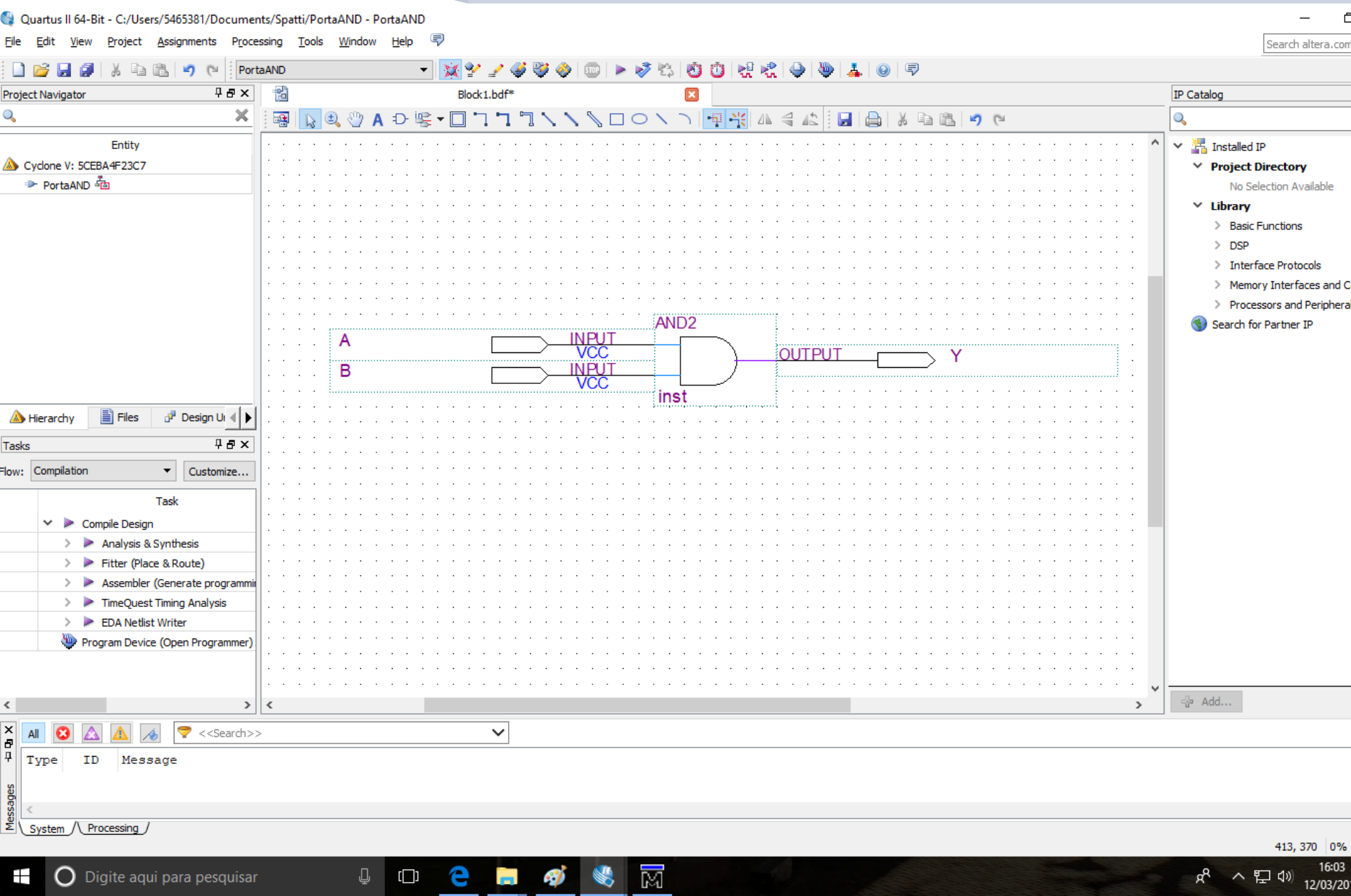
Configuração do Quartus

4 - Adicionando Entradas / Saídas (I)



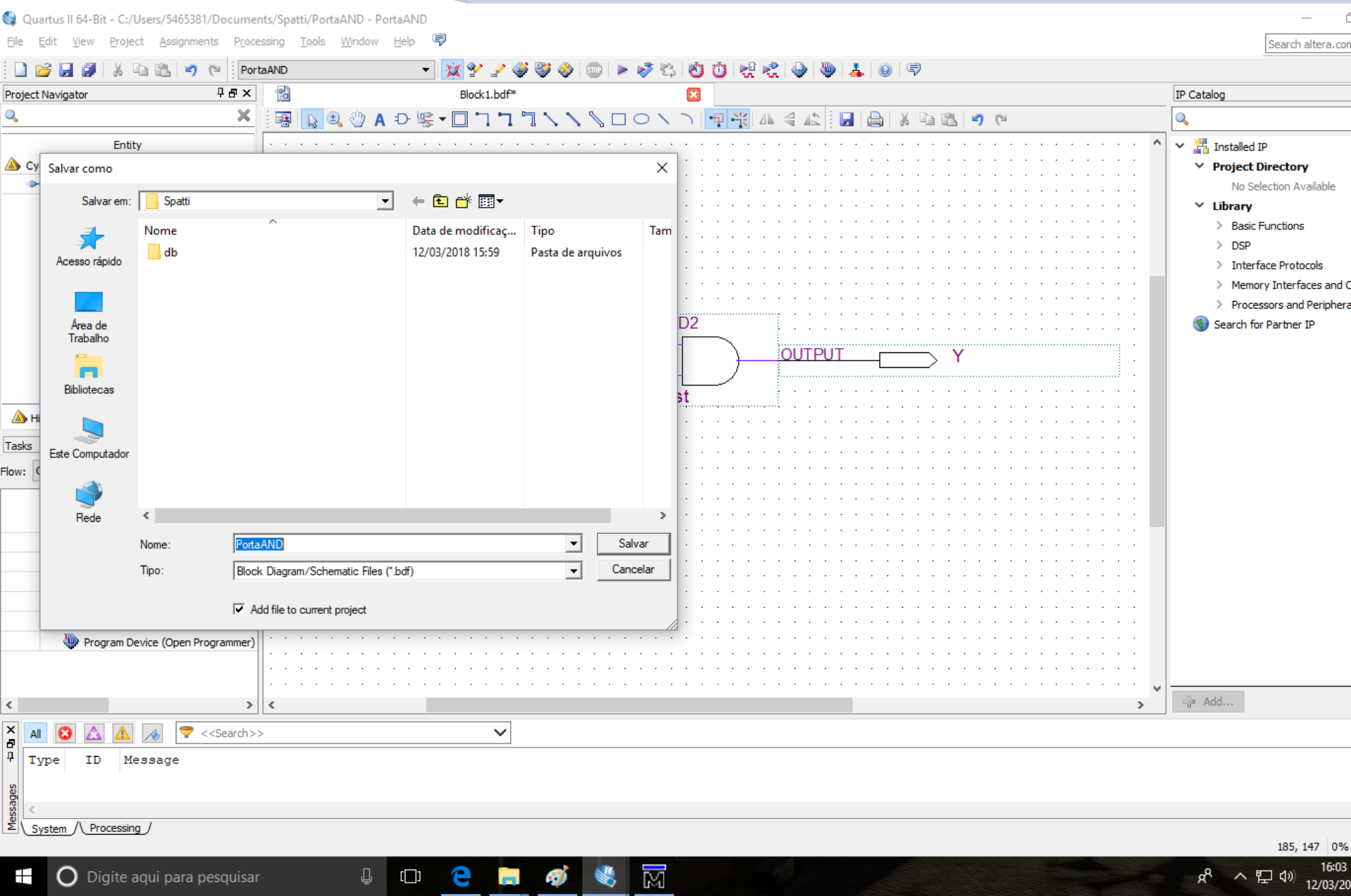
Configuração do Quartus

4 - Adicionando Entradas / Saídas (II)



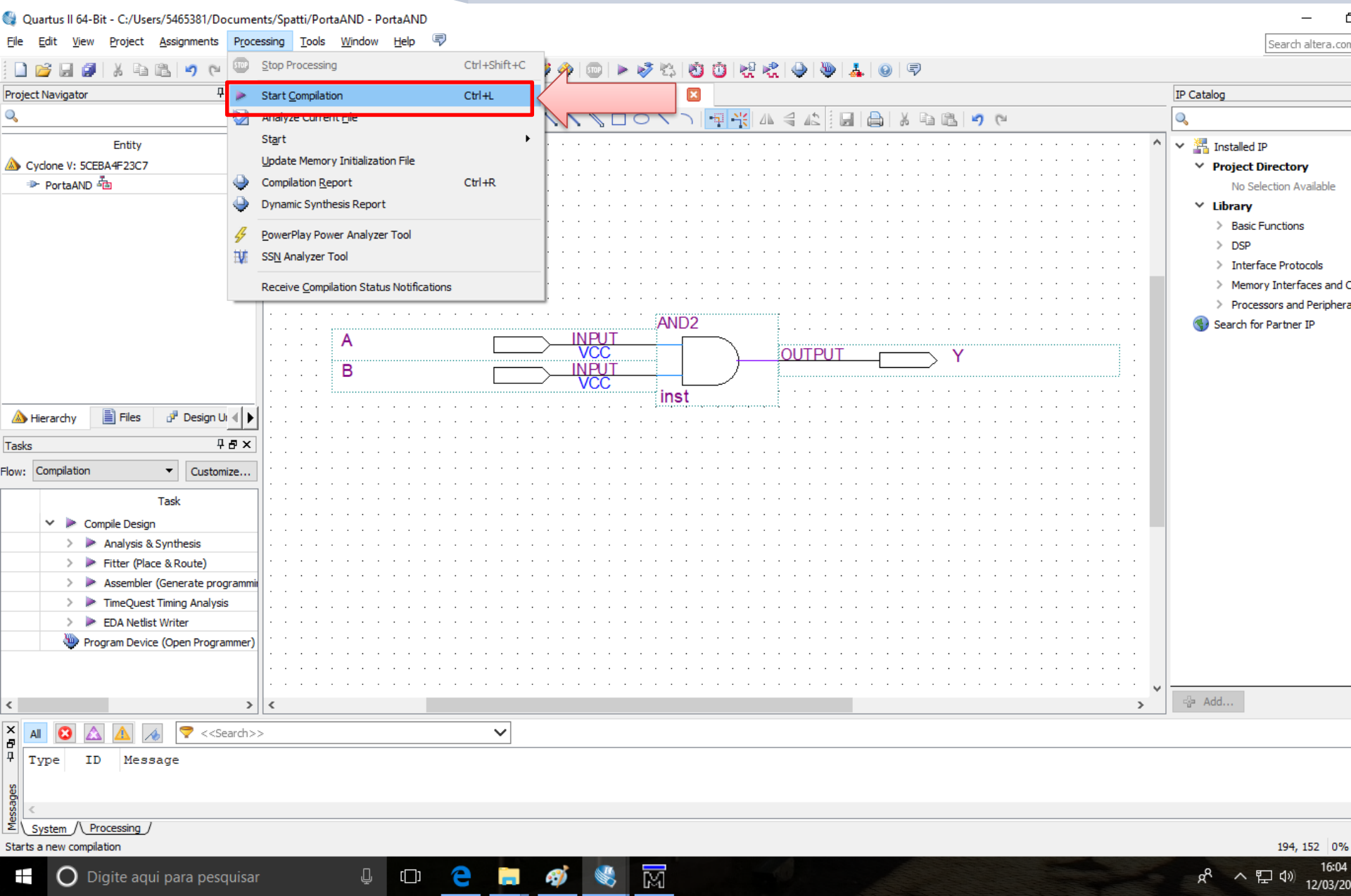
Configuração do Quartus

4 - Salvar o Esquemático



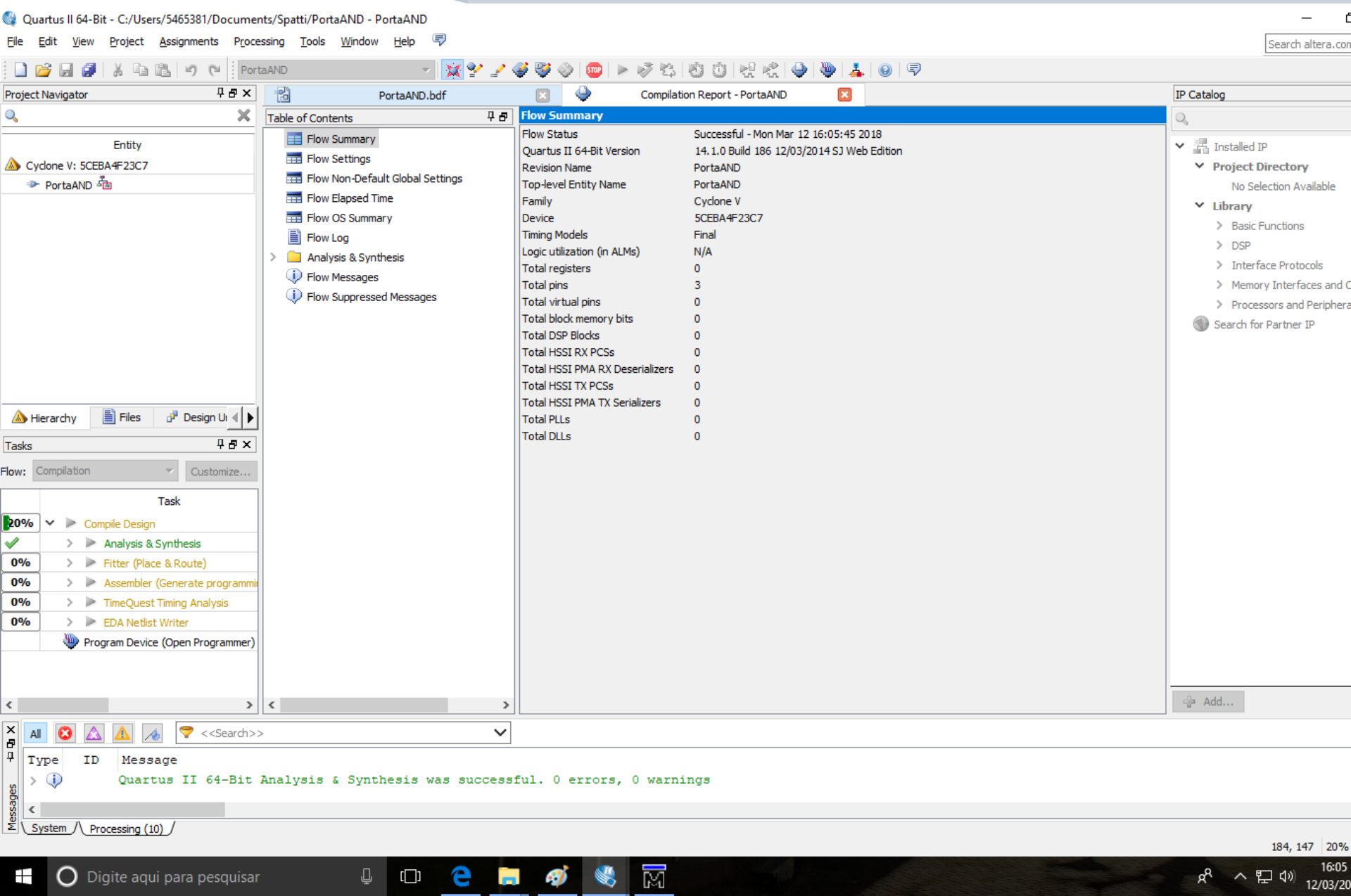
Configuração do Quartus

5 - Compilar (I)



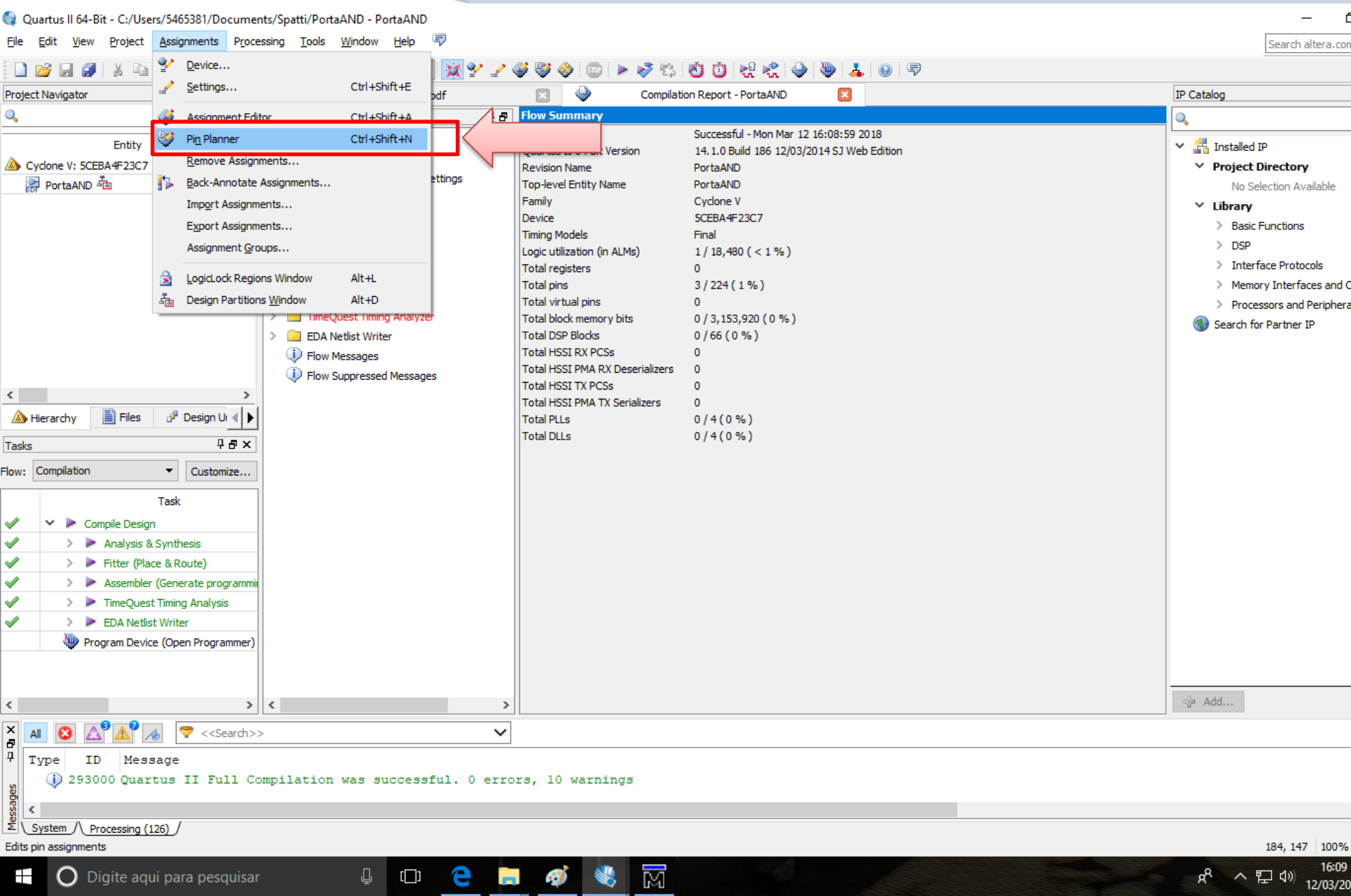
Configuração do Quartus

5 - Compilar (II)



Configuração do Quartus

6 - Escolher os Pinos (I)



Configuração do Quartus

6 - Escolher os Pinos (II)

Pin Planner - C:/Users/5465381/Documents/Spatti/PortaAND - PortaAND

File Edit View Processing Tools Window Help

Search altera.com

Report

Report not available

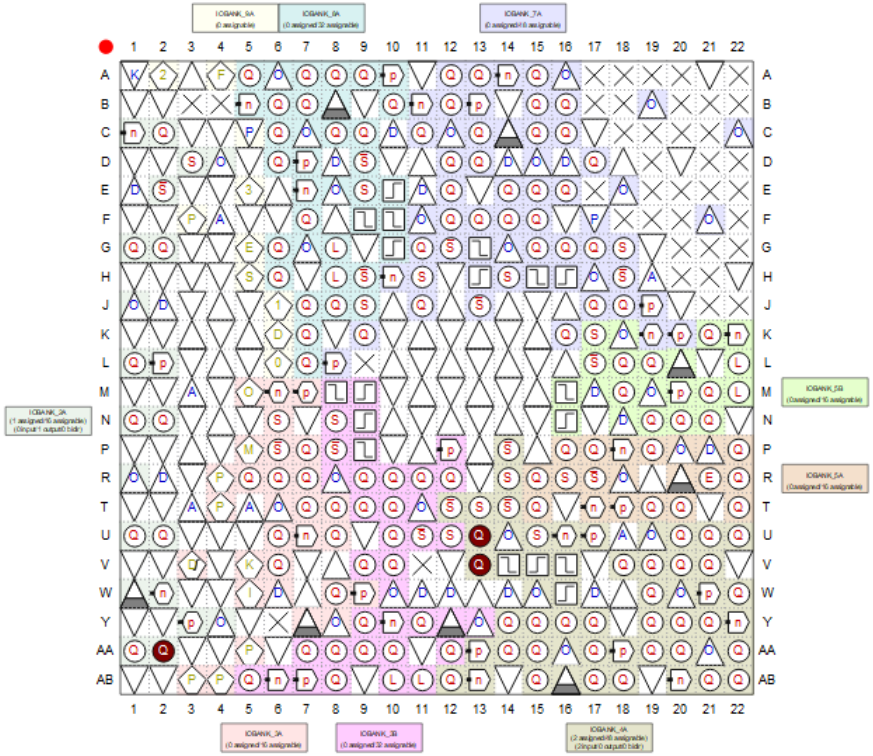
Groups Report

Tasks

- Early Pin Planning
  - Early Pin Planning...
  - Run I/O Assignment Analysis
  - Export Pin Assignments...
- Pin Finder...
- Highlight Pins
  - I/O Banks
  - VREF Groups
  - Edges
  - Clock Pins
    - Clock
    - PLL/DLL Input

Top View - Wire Bond

Cyclone V - 5CEBA4F23C7



Named: * Edit: Filter: Pins: al

Node Name	Direction	Location	I/O Bank	VREF Group	Fitter Location	I/O Standard	Reserved	Current Strength	Slew Rate	Differential Pair	/er Analog Settings	_GXB/VCCT_G
in A	Input	PIN_U13		B2A_N0	PIN_L17	2.5 V (default)		12mA (default)				
in B	Input	PIN_V13		B2A_N0	PIN_K17	2.5 V (default)		12mA (default)				
out Y	Output	PIN_AA2		B2A_N0	PIN_M21	2.5 V (default)		12mA (default)	1 (default)			
<<new node>>												

All Pins

0%

Digite aqui para pesquisar

16:10
12/03/20

Table 3-3 Pin Assignment of Slide Switches

Signal Name	FPGA Pin No.	Description
SW0	PIN_U13	Slide Switch[0]
SW1	PIN_V13	Slide Switch[1]
SW2	PIN_T13	Slide Switch[2]
SW3	PIN_T12	Slide Switch[3]
SW4	PIN_AA15	Slide Switch[4]
SW5	PIN_AB15	Slide Switch[5]
SW6	PIN_AA14	Slide Switch[6]
SW7	PIN_AA13	Slide Switch[7]
SW8	PIN_AB13	Slide Switch[8]
SW9	PIN_AB12	Slide Switch[9]

Configuração do Quartus

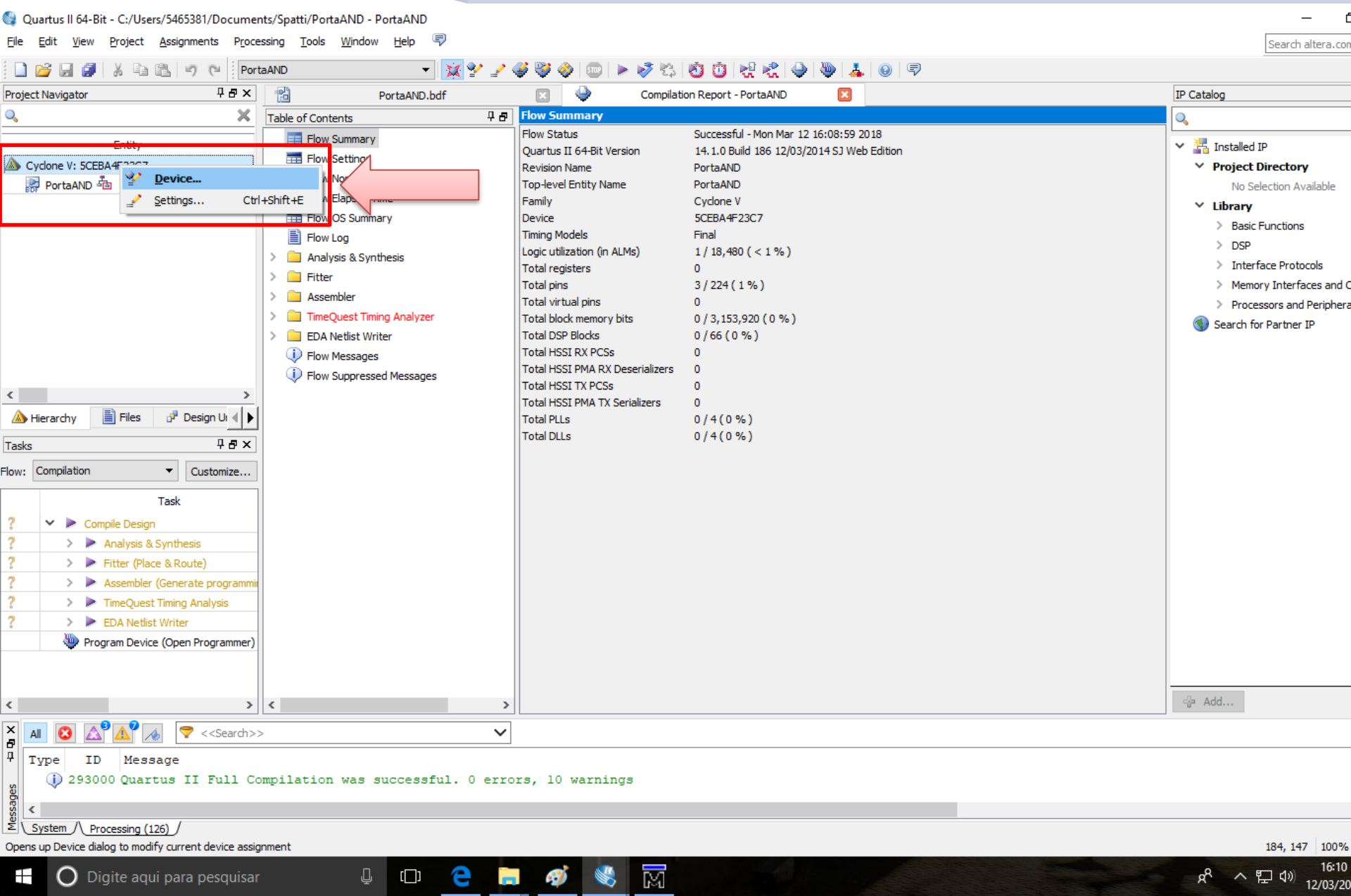
6 - Escolher os Pinos (IV)

Table 3-4 Pin Assignment of LEDs

Signal Name	*FPGA Pin No.*	*Description*
LEDR0	PIN_AA2	LED [0]
LEDR1	PIN_AA1	LED [1]
LEDR2	PIN_W2	LED [2]
LEDR3	PIN_Y3	LED [3]
LEDR4	PIN_N2	LED [4]
LEDR5	PIN_N1	LED [5]
LEDR6	PIN_U2	LED [6]
LEDR7	PIN_U1	LED [7]
LEDR8	PIN_L2	LED [8]
LEDR9	PIN_L1	LED [9]

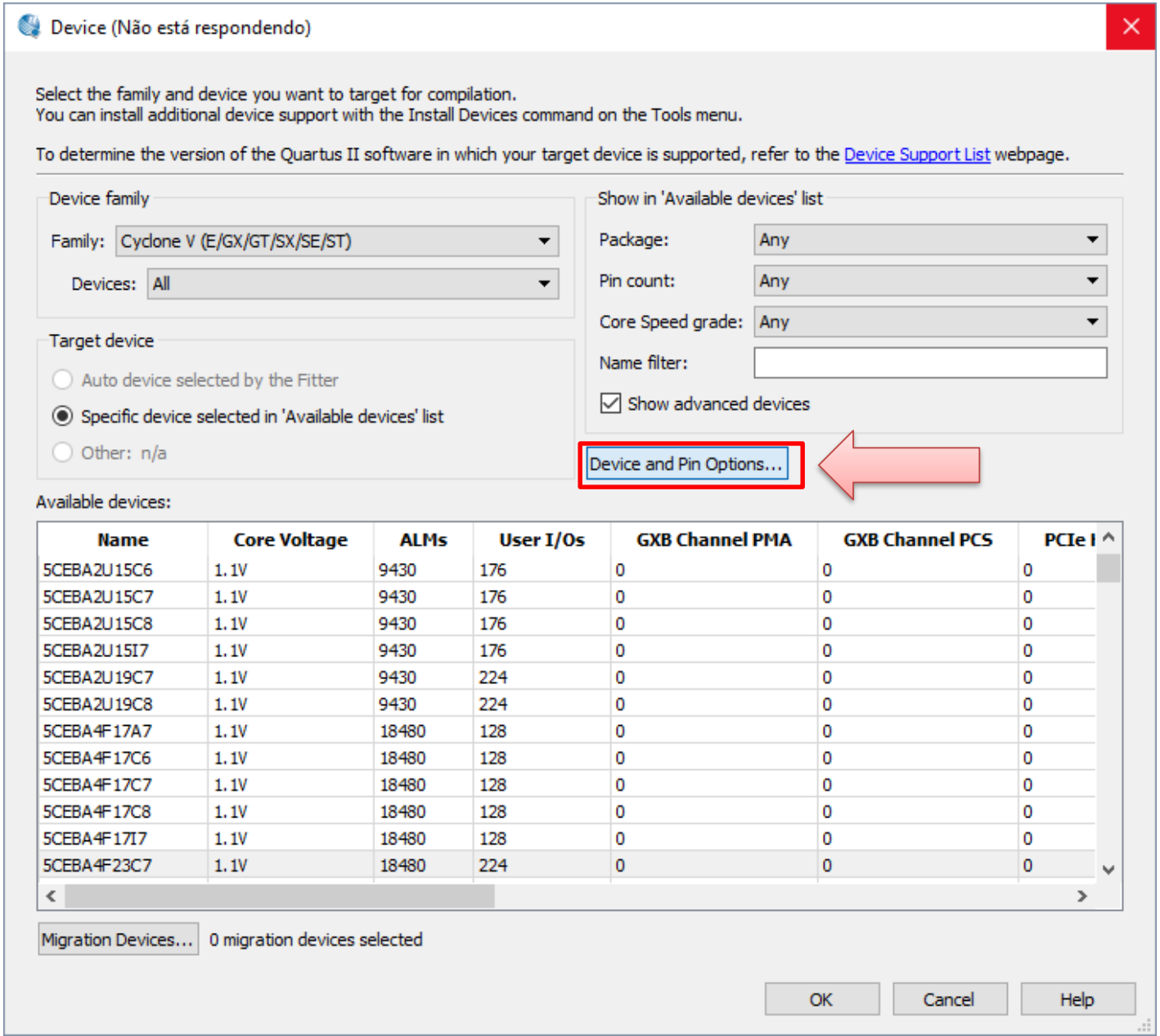
Configuração do Quartus

6 - Escolher os Pinos (V)



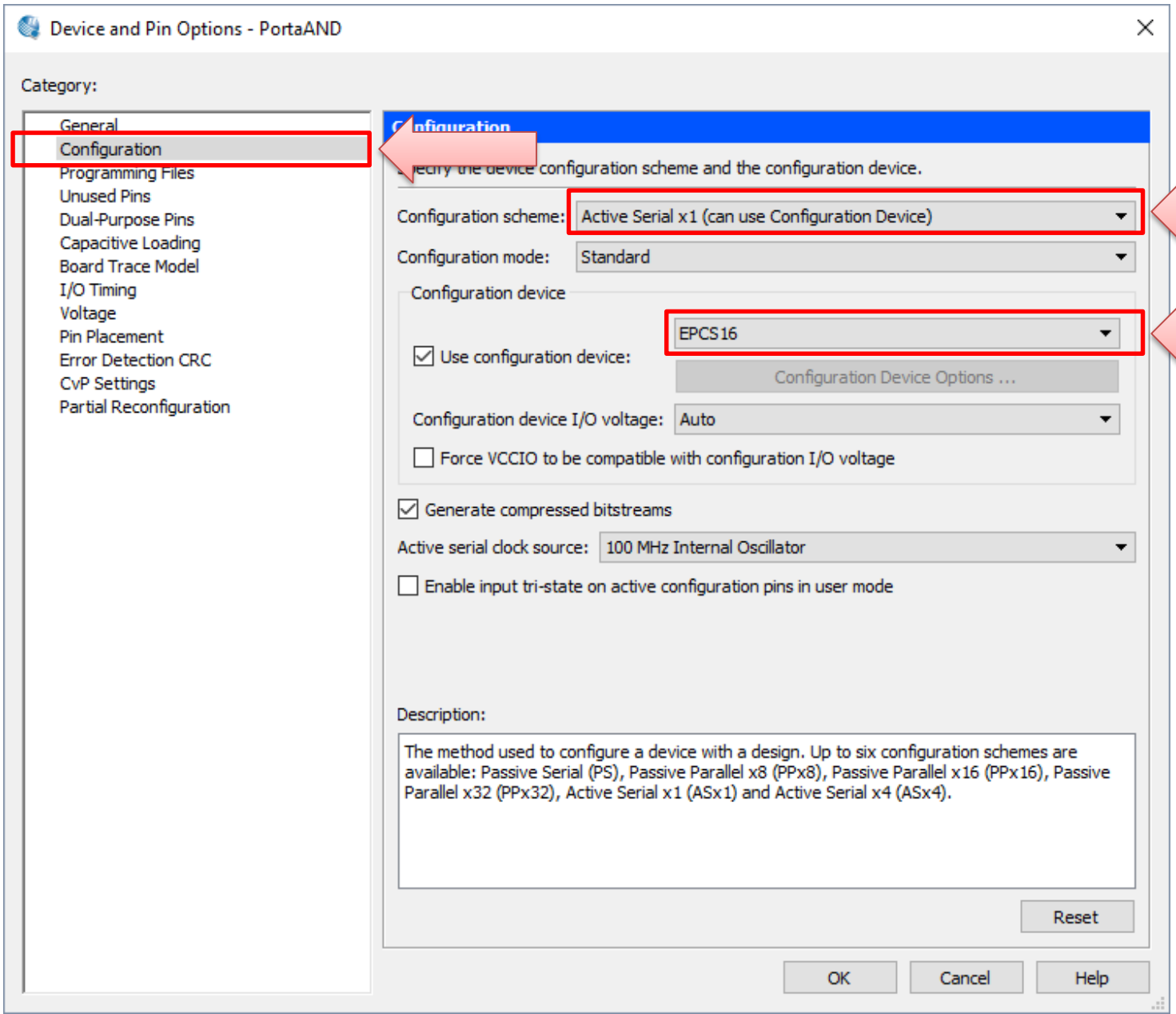
Configuração do Quartus

6 - Escolher os Pinos (VI)



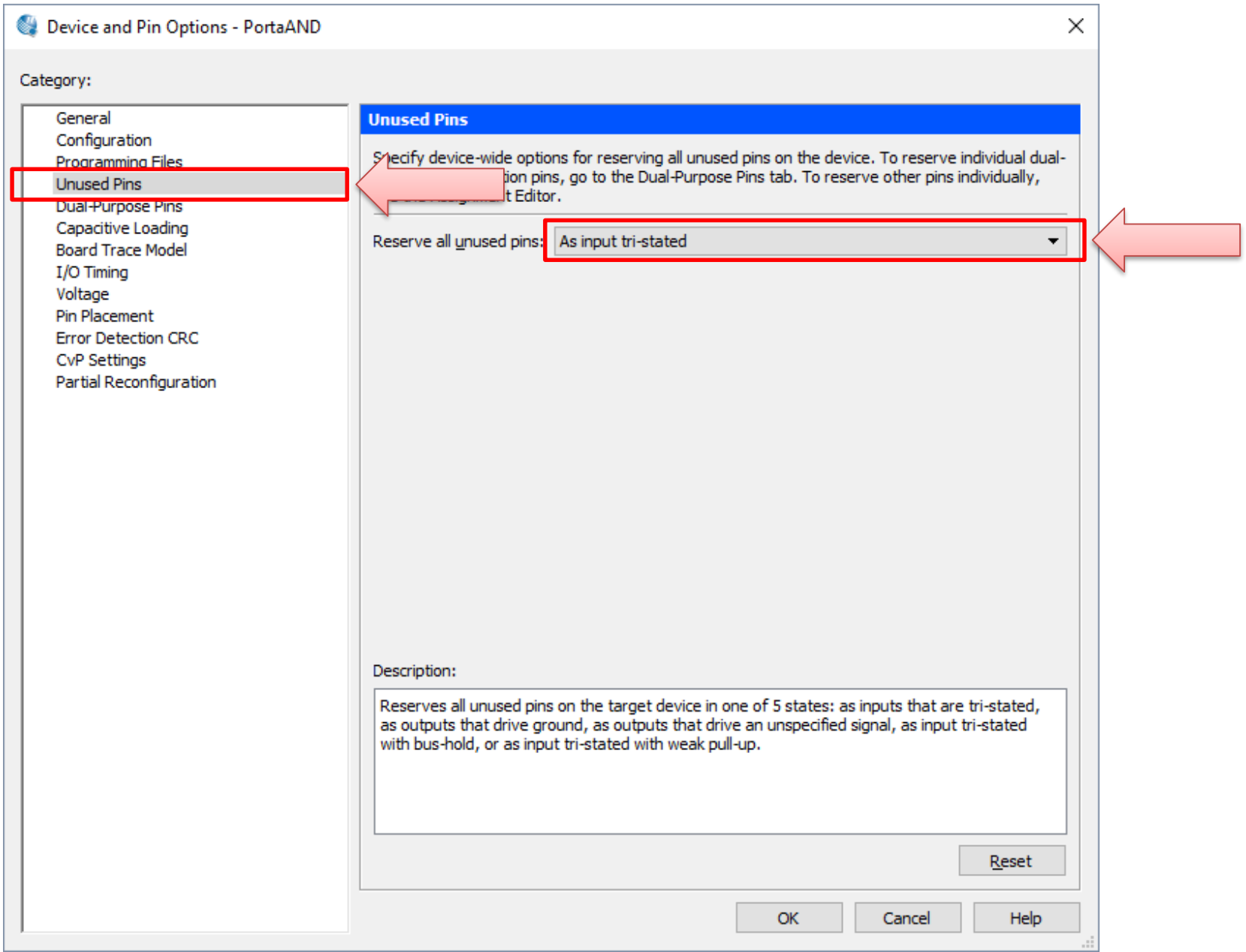
Configuração do Quartus

6 - Escolher os Pinos (VII)



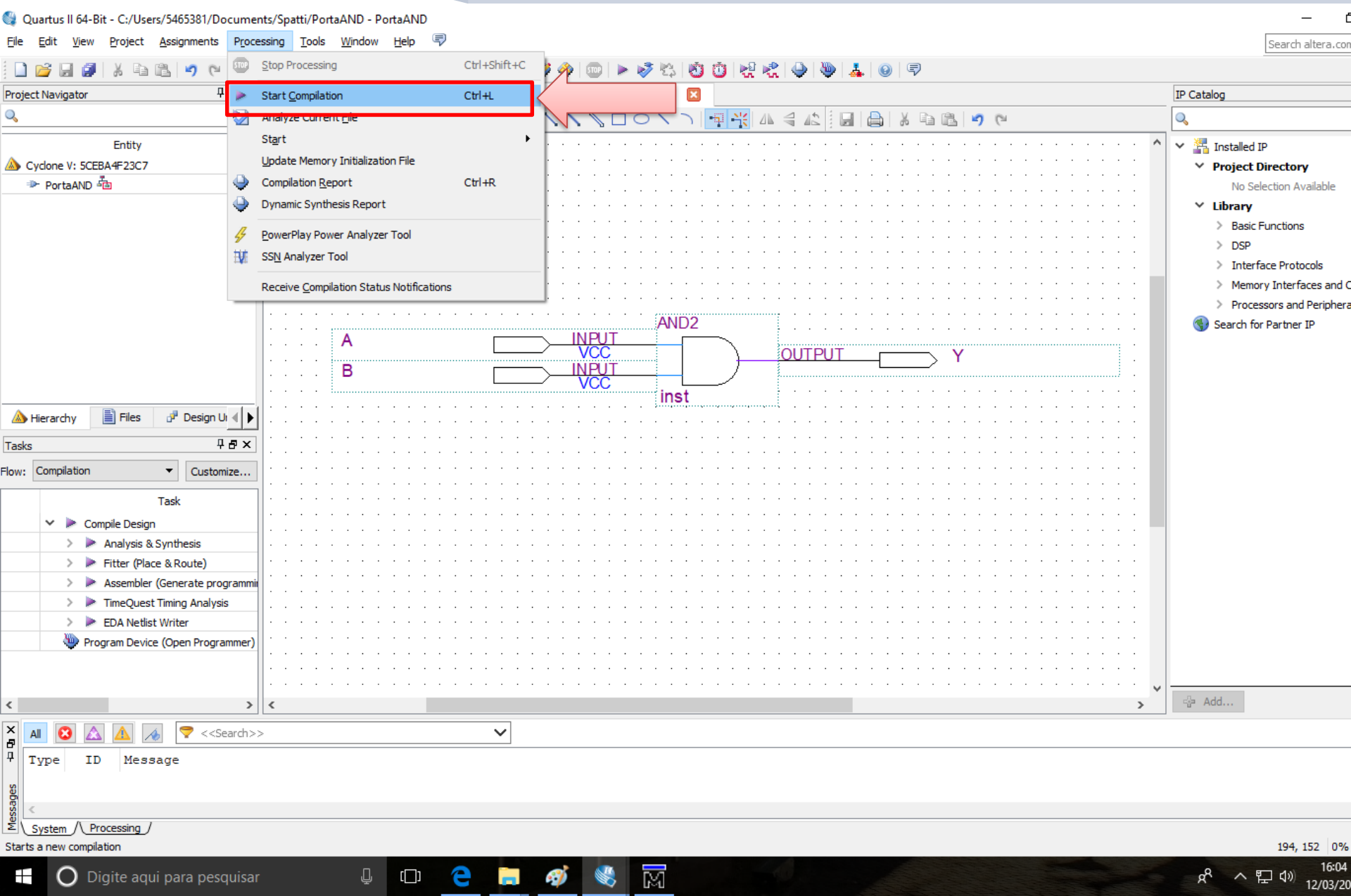
Configuração do Quartus

6 - Escolher os Pinos (VIII)



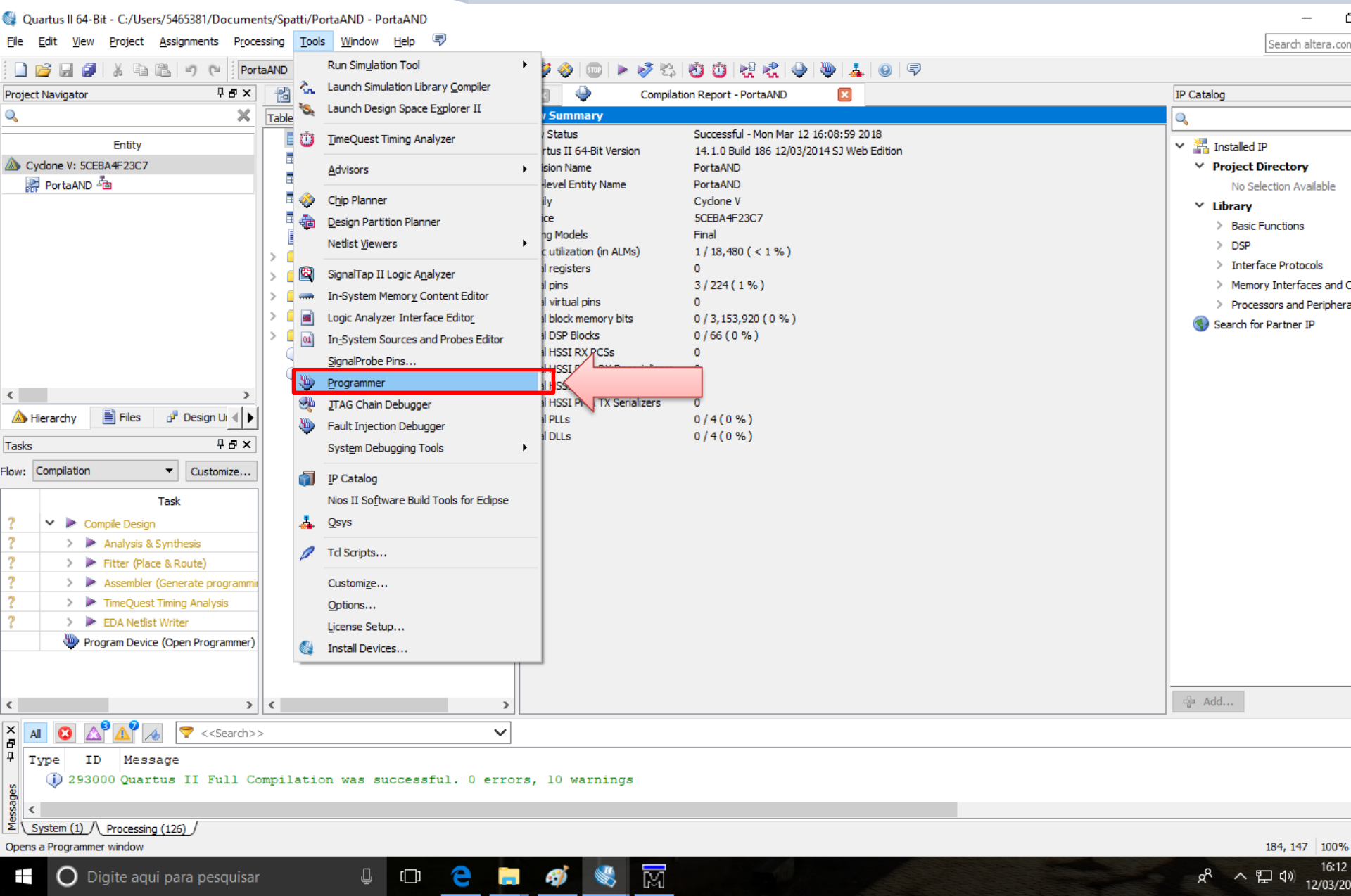
Configuração do Quartus

7 - Compilar Novamente



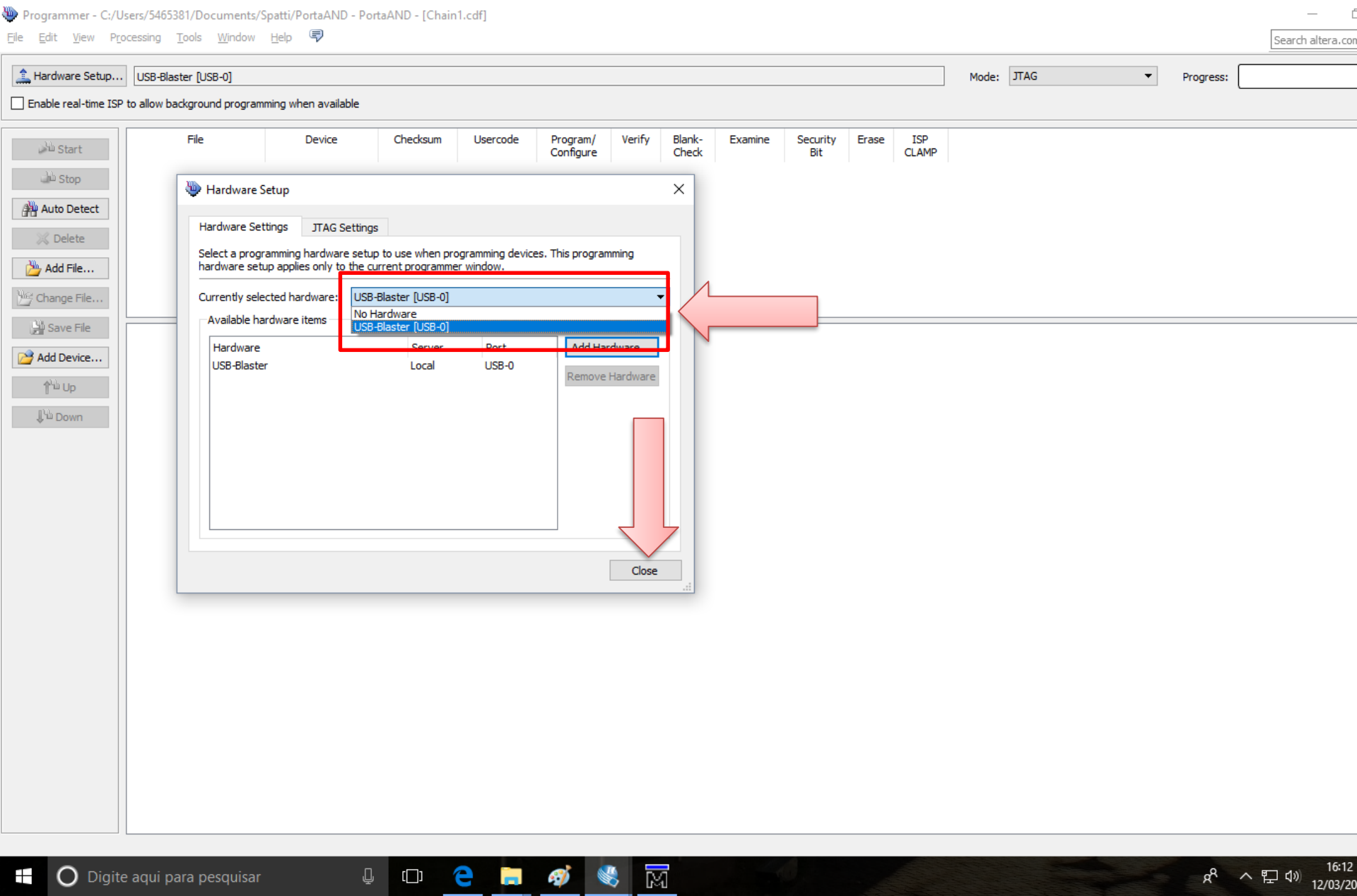
Configuração do Quartus

8 - Ligar a FPGA e Programar



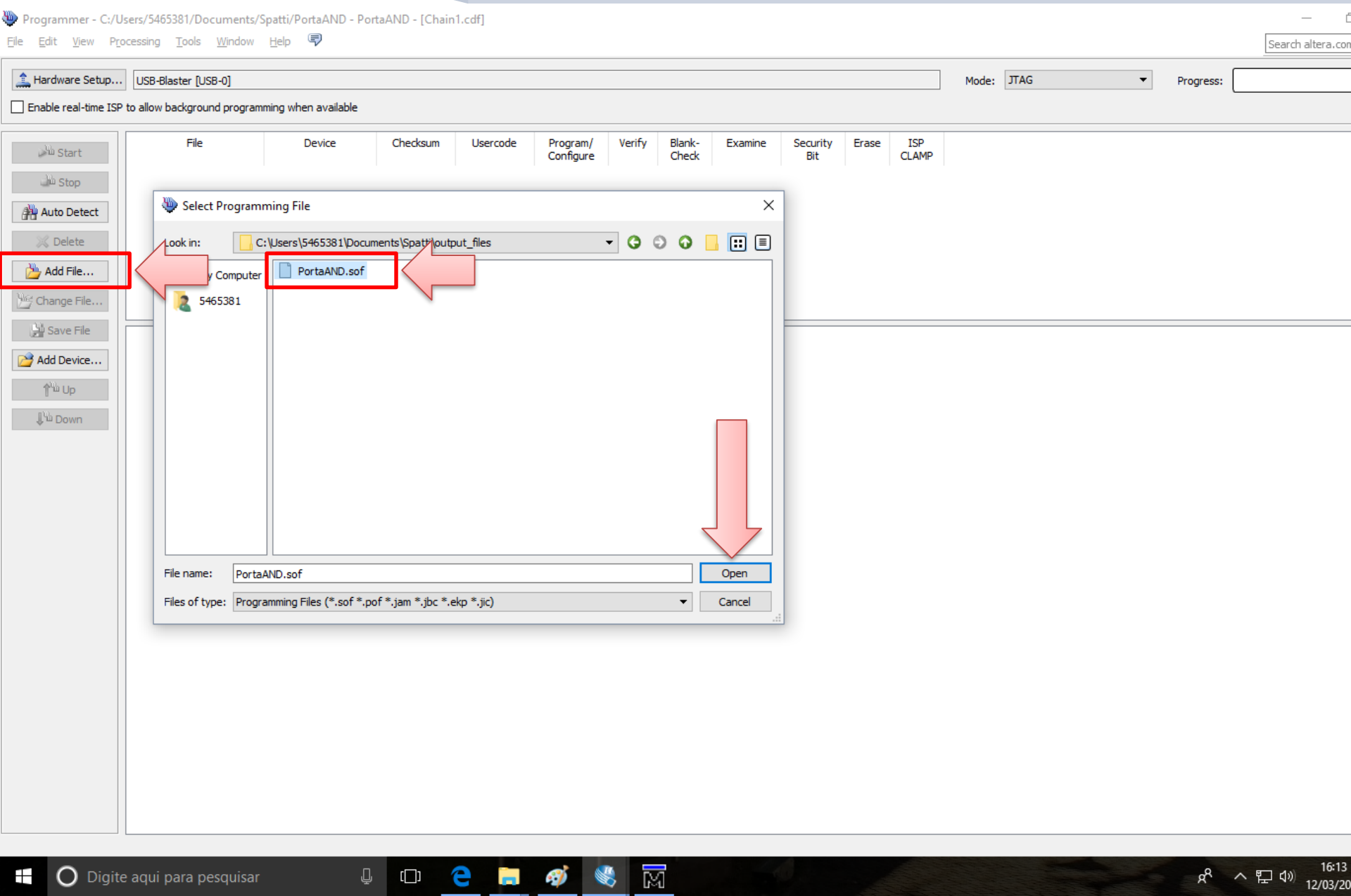
Configuração do Quartus

8 - Verificar se o Driver USB está Instalado



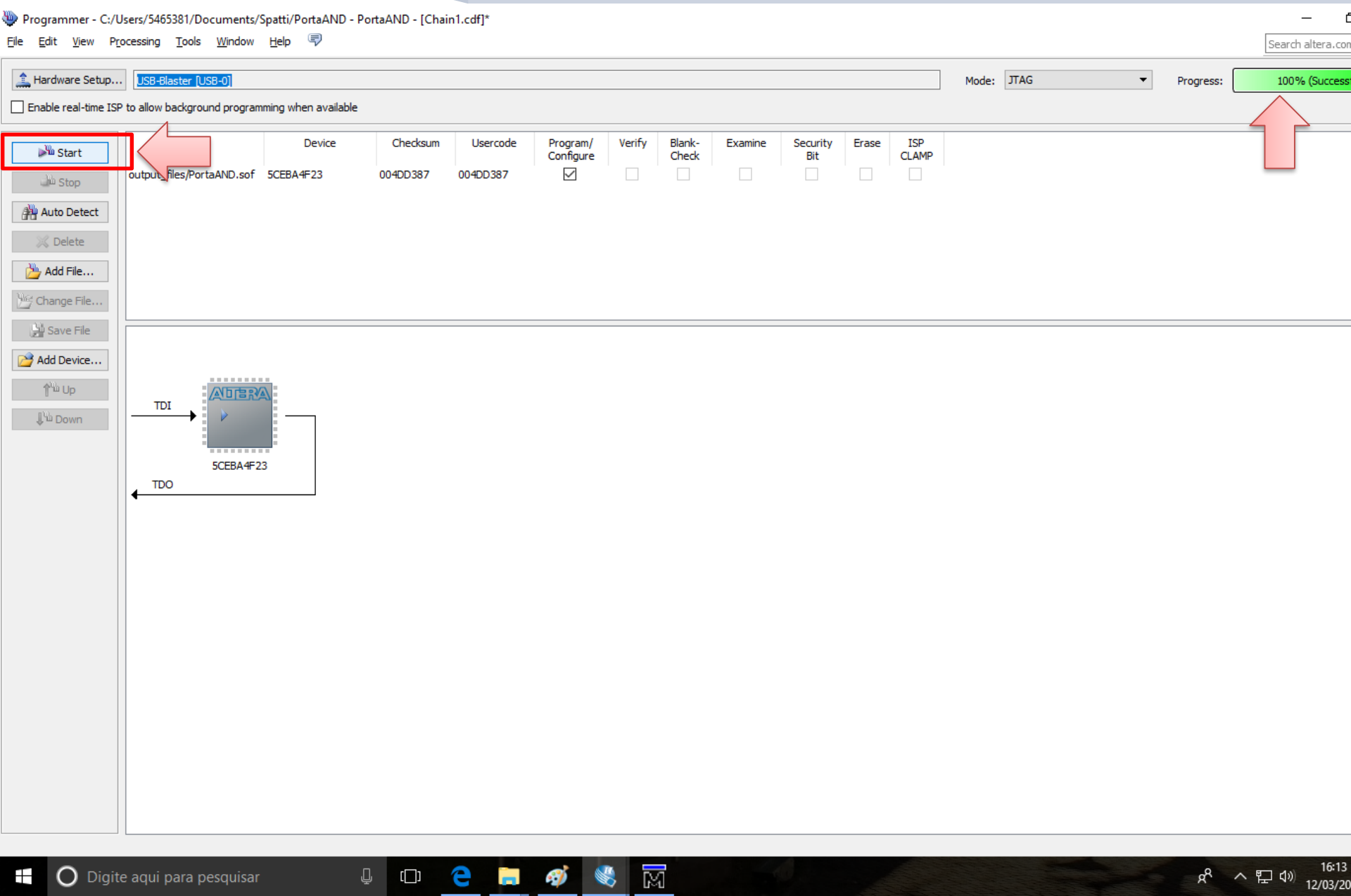
Configuração do Quartus

8 - Adicionar Esquemático para Execução



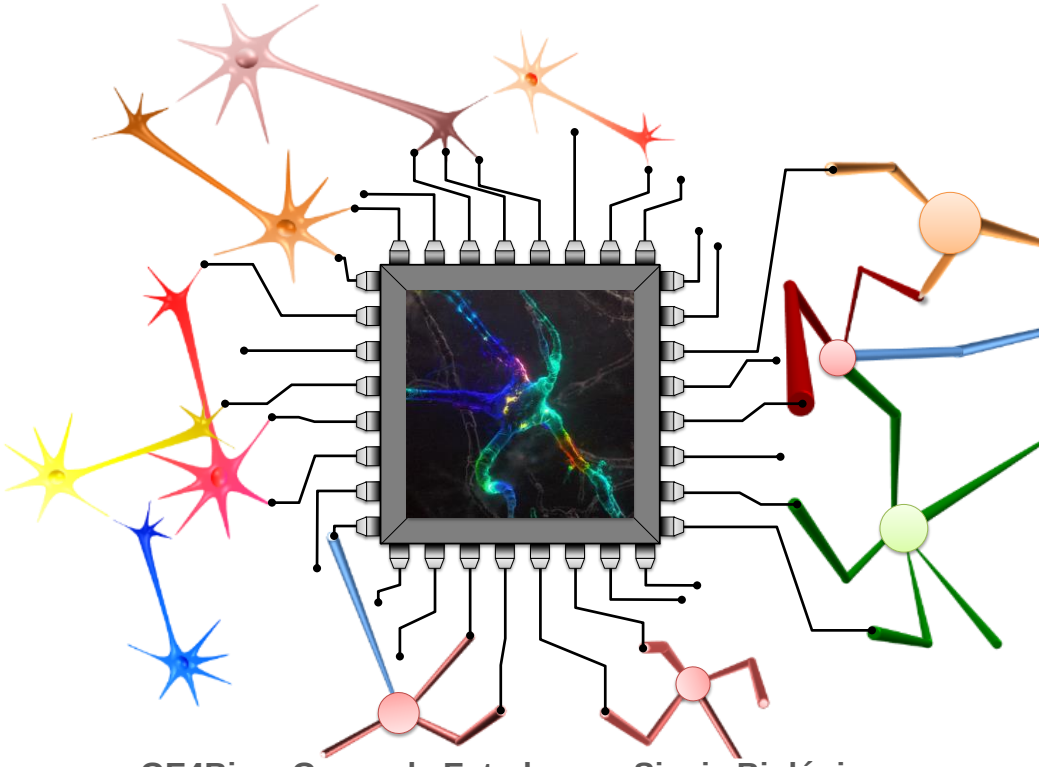
Configuração do Quartus

9 - Executar



Fim

spatti@icmc.usp.br



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