

1. 桌球單人

The image displays the Quartus II software interface, showing the compilation process and timing analysis results for a project named 'ping'.

Entity: ping

Tasks: Compilation

Task	Time
Compile Design	00:00:18
Analysis & Synthesis	00:00:05
Fitter (Place & Route)	00:00:08
Assembler (Generate programming files)	00:00:02
TimeQuest Timing Analysis	00:00:03
EDA Netlist Writer	
Program Device (Open Programmer)	

Messages:

- 332123 Deriving Clock Uncertainty. Please refer to rep...
- 332148 Timing requirements not met
- 332146 Worst-case setup slack is -2.284
- 332146 Worst-case hold slack is -0.284
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- Analyzing Fast 1200mV OC Model
- 332123 Deriving Clock Uncertainty. Please refer to rep...
- 332148 Timing requirements not met
- 332146 Worst-case setup slack is -1.031
- 332146 Worst-case hold slack is -0.234
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- 332102 Design is not fully constrained for setup requi...
- 332102 Design is not fully constrained for hold requir...
- Quartus II 64-Bit TimeQuest Timing Analyzer was

Code:

```
1 library ieee;
2 use ieee.std_logic_1164.all;
3 use ieee.std_logic_unsigned.all;
4
5 entity ping is
6 port(
7     clk:in std_logic;
8     reset:in std_logic;
9     a,b:in std_logic;
10    led:buffer std_logic_vector(9 downto 0);
11    hex0:out std_logic_vector(7 downto 0);
12    hex2:out std_logic_vector(7 downto 0)
13 );
14 end ping;
15
16 architecture ping of ping is
17 type state is (s0,s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11,s12,s13,s14,s15,s16,s17,s
18 signal next_state:state;
19 signal present_state:state;
20 signal clk2hz:std_logic;
21 signal cnt:std_logic_vector(24 downto 0);
22 signal cntA:std_logic_vector(3 downto 0);
23 signal cntB:std_logic_vector(3 downto 0);
24 signal point0:std_logic;
25 signal point1:std_logic;
26
27 begin
28     process(clk)
29     begin
30         if clk'event and clk='1' then
31             if cnt="101111010111100001000000" then
32                 cnt <= (others=>'0');
33             else
34                 cnt <= cnt+1;
35             end if;
36         end if;
37     end process;
38     clk2hz <= cnt(24);
39
40     process(clk2hz,reset)
41     begin
42         if reset = '0' then
43             present_state <= s0;
44         elsif clk2hz'event and clk2hz = '1' then
45             present_state <= next_state;
46         end if;
47     end process;
48
49     process(a,b,present_state)
50     begin
51         case present_state is
52             when s0 =>
53                 if a = '1' then
54                     point0 <= '0';
55                     point1 <= '0';
56                     next_state <= s0;
57                 else
58                     next_state <= s1;
59                 end if;
60                 led <= "0000000000";
61             when s1 =>
62                 next_state <= s2;
63                 point0 <= '0';
64                 point1 <= '0';
65                 led <= "0000000001";
66             when s2 =>
67                 next_state <= s3;
68                 point0 <= '0';
69                 point1 <= '0';
70                 led <= "0000000010";
71             when s3 =>
72                 next_state <= s4;
73                 led <= "0000000100";
74             when s4 =>
75                 next_state <= s5;
76                 led <= "0000001000";
77             when s5 =>
78                 next_state <= s6;
79                 led <= "0000010000";
80             when s6 =>
81                 next_state <= s7;
82                 led <= "0000100000";
83             when s7 =>
84                 next_state <= s8;
85                 led <= "0001000000";
86             when s8 =>
87                 next_state <= s9;
88                 led <= "0010000000";
89             when s9 =>
90                 next_state <= s10;
91                 led <= "0010000000";
92                 point0 <= '0';
93                 if b = '1' then
94                     next_state <= s0;
95                     point0 <= '1';
96                 else
97                     point0 <= '0';
98                     next_state <= s10;
99                 end if;
100            when s10 =>
```

Tasks

Task	Time
Complete Design	00:00:18
Analysis & Synthesis	00:00:05
Fitter (Place & Route)	00:00:08
Assembler (Generate programming files)	00:00:02
TimeQuest Timing Analysis	00:00:03
EDA Netlist Writer	
Program Device (Open Programmer)	

Messages

Type ID Message

- 332123 Deriving Clock Uncertainty. Please refer to rep...
- 332148 Timing requirements not met
- 332146 Worst-case setup slack is -2.284
- 332146 Worst-case hold slack is -0.284
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- Analyzing Fast 1200mV OC Model
- 332123 Deriving Clock Uncertainty. Please refer to rep...
- 332148 Timing requirements not met
- 332146 Worst-case setup slack is -1.031
- 332146 Worst-case hold slack is -0.234
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- 332102 Design is not fully constrained for setup requi...
- 332102 Design is not fully constrained for hold requir...
- Quartus II 64-Bit TimeQuest Timing Analyzer was
- 293000 Quartus II Full Compilation was successful. 0 e...

```

101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200

```

```

end if;
led <= "0100000000";
when s10 =>
  point0<='0';
  if b='1' then
    point0<='1';
    next_state<=s0;
  else
    point0<='0';
    next_state <= s11;
    led <= "1000000000";
  end if;
when s11 =>
  next_state <= s12;
led <= "0100000000";
when s12 =>
  next_state <= s13;
led <= "0010000000";
when s13 =>
  next_state <= s14;
led <= "0001000000";
when s14 =>
  next_state <= s15;
led <= "0000100000";
when s15 =>
  next_state <= s16;
led <= "0000010000";
when s16 =>
  next_state <= s17;
led <= "0000001000";
when s17 =>
  next_state <= s18;
led <= "0000000100";
when s18 =>
  point1<='0';
  if a='0' then
    next_state<=s20;
  else
    next_state <= s19;
    led <= "0000000010";
  end if;
when s19 =>
  point1<='0';

```

Tasks

Task	Time
Complete Design	00:00:18
Analysis & Synthesis	00:00:05
Fitter (Place & Route)	00:00:08
Assembler (Generate programming files)	00:00:02
TimeQuest Timing Analysis	00:00:03
EDA Netlist Writer	
Program Device (Open Programmer)	

Messages

Type ID Message

- 332123 Deriving Clock Uncertainty. Please refer to rep...
- 332148 Timing requirements not met
- 332146 Worst-case setup slack is -2.284
- 332146 Worst-case hold slack is -0.284
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- Analyzing Fast 1200mV OC Model
- 332123 Deriving Clock Uncertainty. Please refer to rep...
- 332148 Timing requirements not met
- 332146 Worst-case setup slack is -1.031
- 332146 Worst-case hold slack is -0.234
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- 332102 Design is not fully constrained for setup requi...
- 332102 Design is not fully constrained for hold requir...
- Quartus II 64-Bit TimeQuest Timing Analyzer was
- 293000 Quartus II Full Compilation was successful. 0 e...

```

149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200

```

```

point1<='0';
if a='1' then
  point1<='1';
  next_state<=s20;
else
  point1<='0';
  next_state<=s2;
end if;
led <= "0000000001";
when s20 =>
  if b = '1' then
    next_state <= s20;
  else
    point1<='0';
    next_state <= s21;
  end if;
when s21 =>
  next_state <= s11;
  led <= "1000000000";
end case;
end process;
process(point0)
begin
  if reset='0' then
    cntB<="0000";
  elsif point0'event and point0='1' then
    if cntB="1001" then
      cntB<="1001";
    else
      cntB<=cntB+1;
    end if;
  end if;
end process;
process(point1)
begin
  if reset='0' then
    cntA<="0000";
  elsif point1'event and point1='1' then
    if cntA="1001" then
      cntA<="1001";
    else
      cntA<=cntA+1;
    end if;
  end if;
end process;
hex0 <= x"00" when cntB = "0000" else
x"f5" when cntB = "0001" else
x"a6" when cntB = "0010" else
x"b0" when cntB = "0011" else
x"80" when cntB = "1000" else
x"99" when cntB = "0100" else
x"92" when cntB = "0101" else

```

Messages

- 332146 Worst-case hold slack is -0.284
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- Analyzing Fast 1200mV OC Model
- 332123 Deriving Clock Uncertainty. Please refer to rep...
- 332148 Timing requirements not met
- 332146 Worst-case setup slack is -1.031
- 332146 Worst-case hold slack is -0.234
- 332140 No Recovery paths to report
- 332140 No Removal paths to report
- 332146 Worst-case minimum pulse width slack is -3.000
- 332102 Design is not fully constrained for setup requir...
- 332102 Design is not fully constrained for hold requir...
- Quartus II 64-Bit TimeQuest Timing Analyzer was
- 293000 Quartus II Full Compilation was successful. 0 e...

```

200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219

```

```

A <= x"04" when cntB = "0101" else
x"82" when cntB = "0110" else
x"f8" when cntB = "0111" else
x"80" when cntB = "1000" else
x"90" when cntB = "1001" else
x"ff";
hex2 <= x"00" when cntA = "0000" else
x"f9" when cntA = "0001" else
x"a4" when cntA = "0010" else
x"b0" when cntA = "0011" else
x"99" when cntA = "0100" else
x"92" when cntA = "0101" else
x"82" when cntA = "0110" else
x"f8" when cntA = "0111" else
x"80" when cntA = "1000" else
x"90" when cntA = "1001" else
x"ff";
end ping;

```