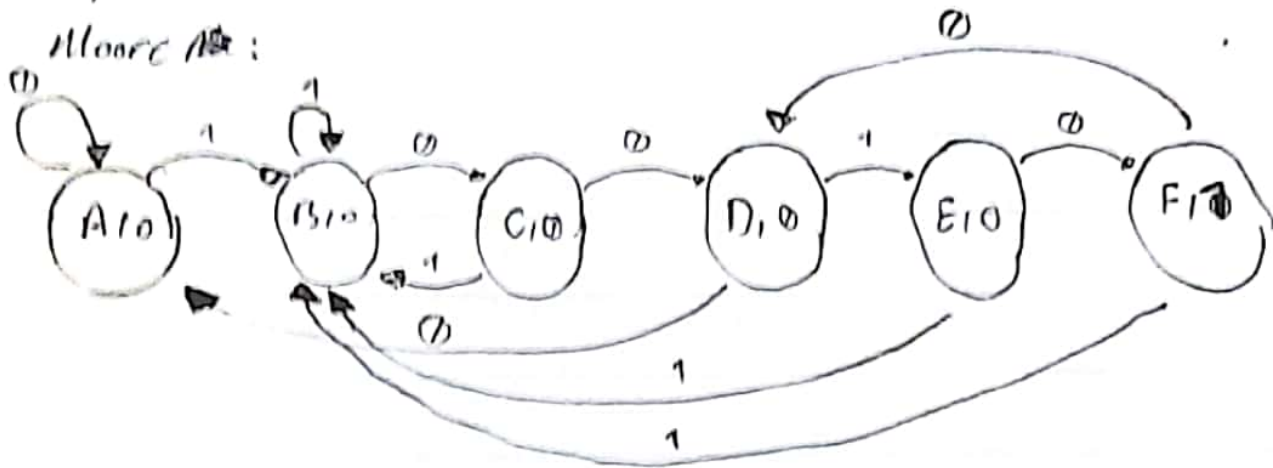


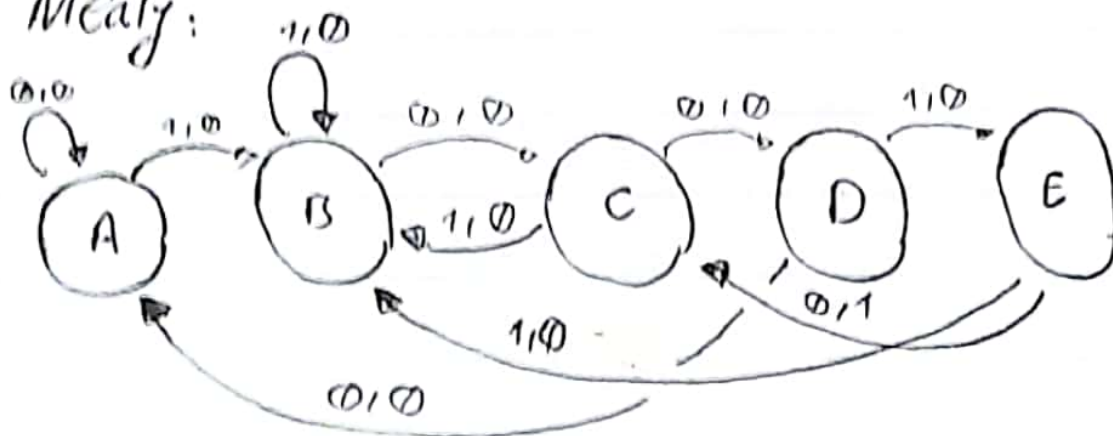
Q. 1

Sequence: 10010

Moore A:



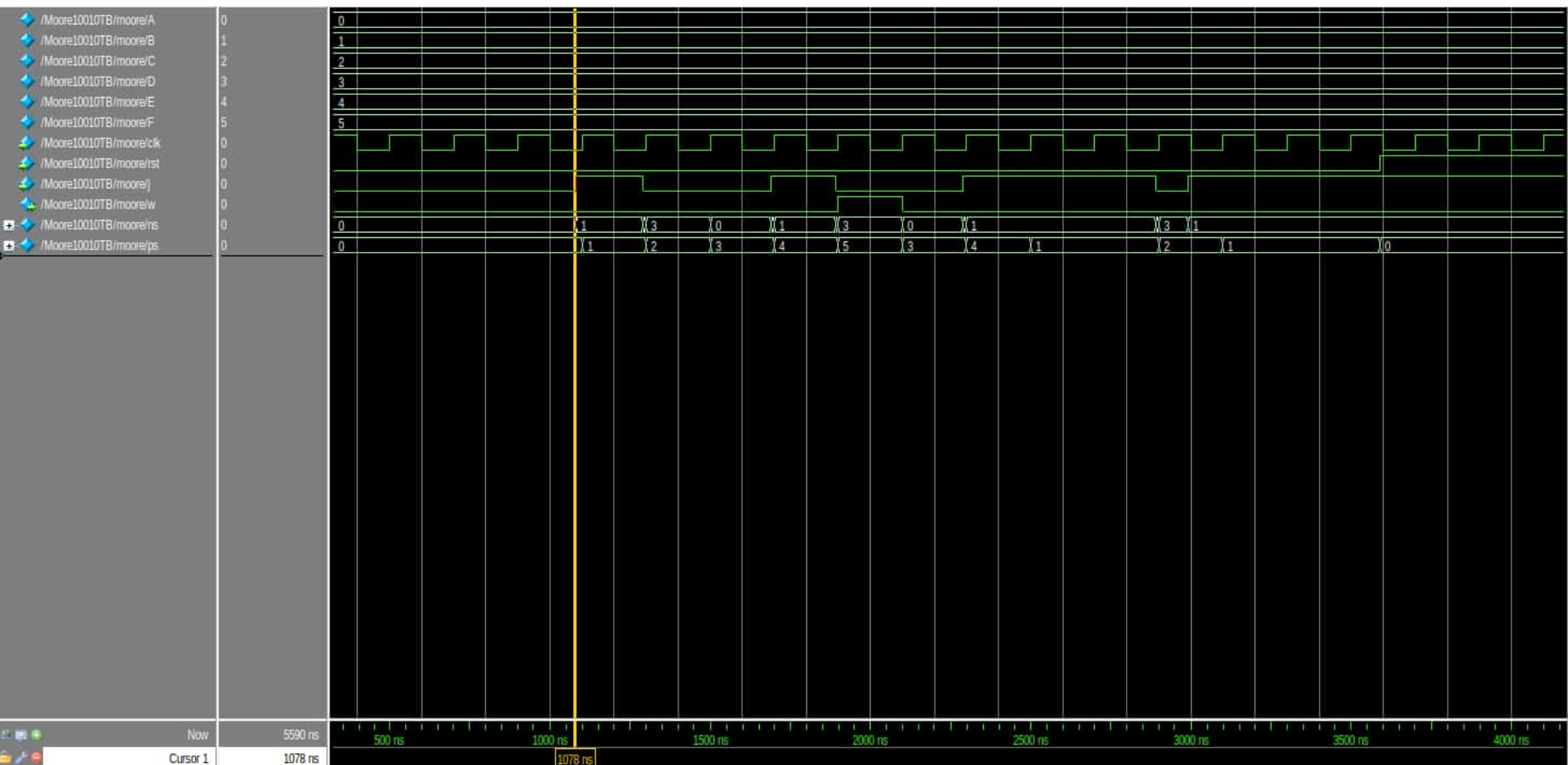
Mealy:

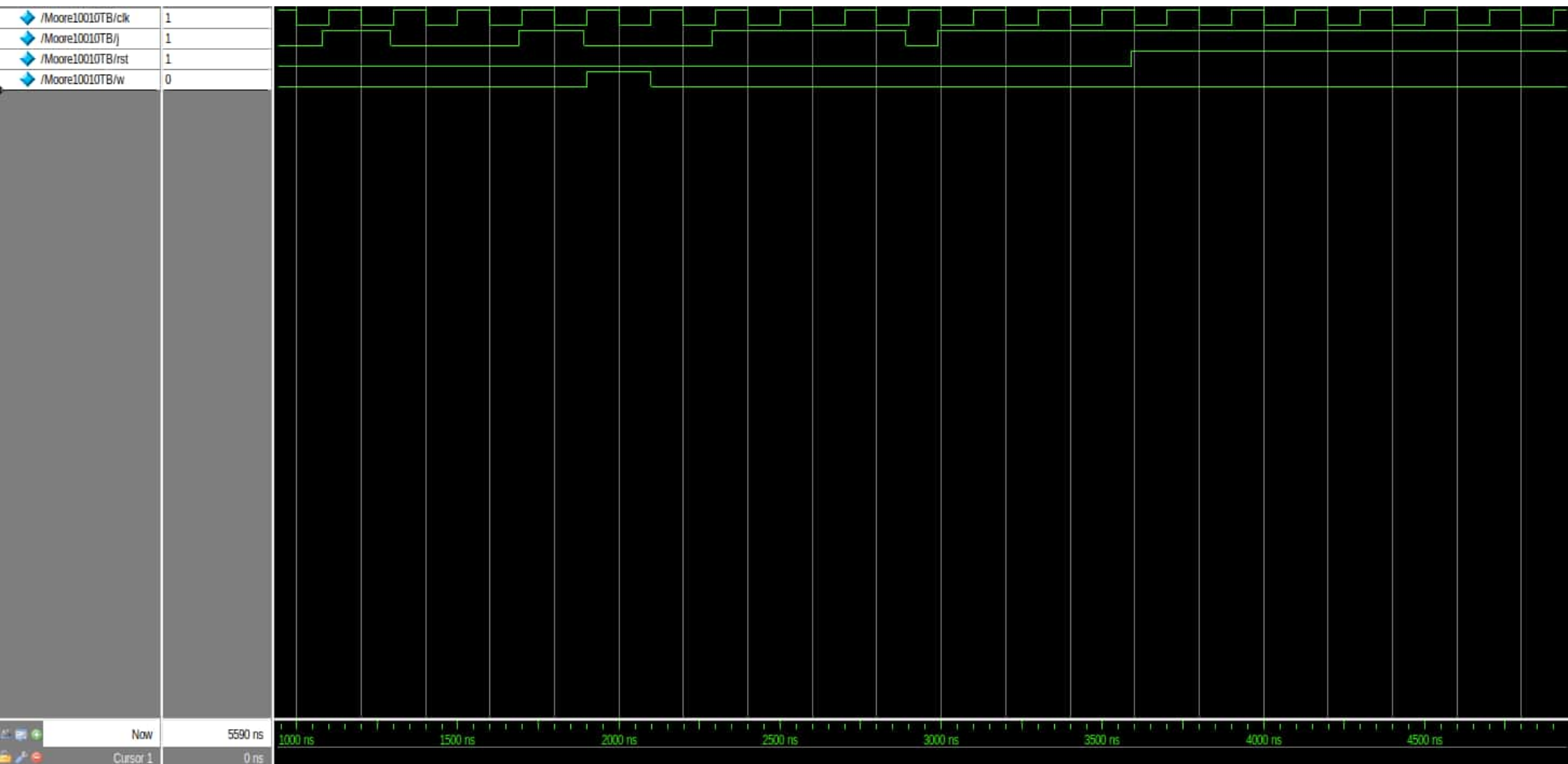


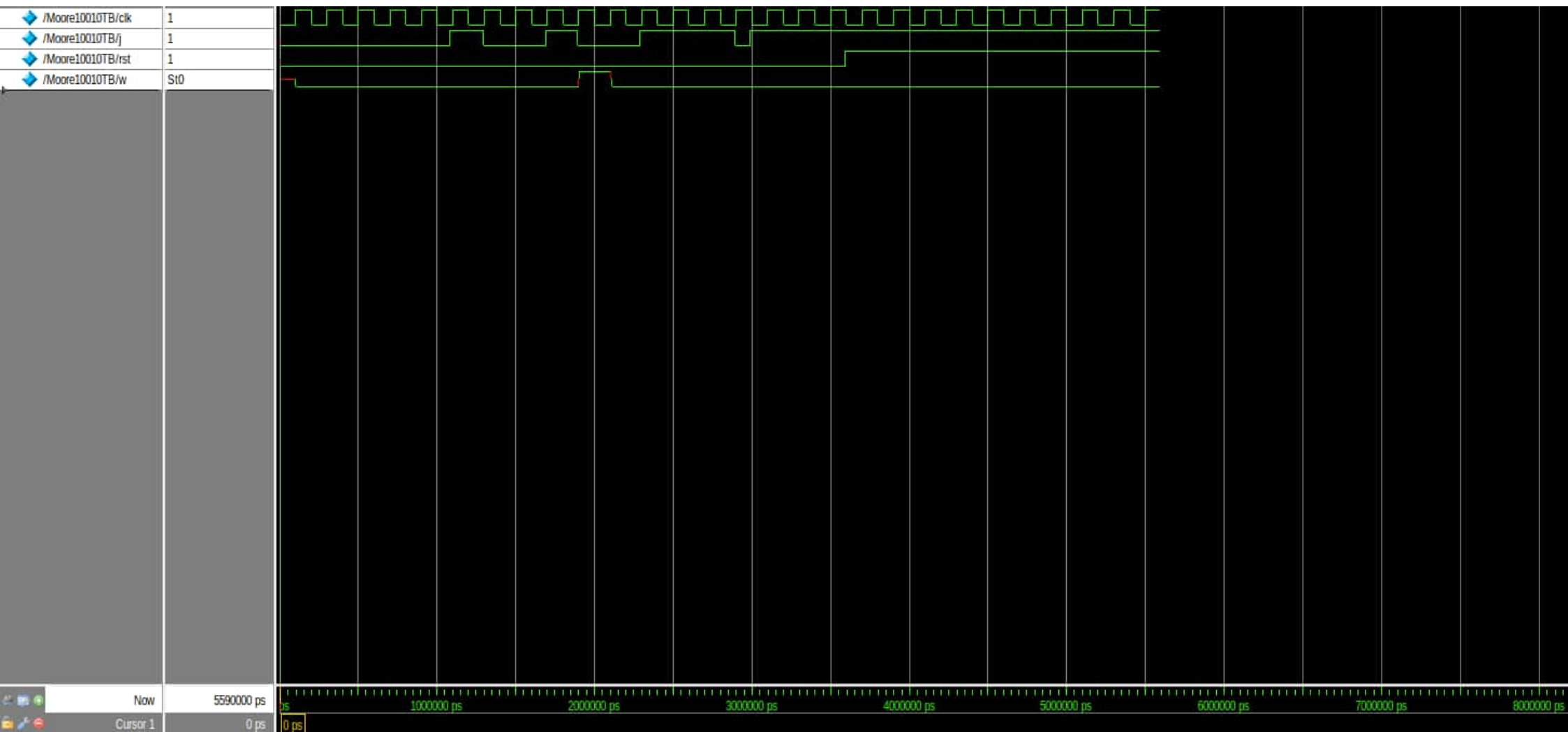
```

1 `timescale 1ns/1ns
2
3 module Moore10010 (input clk, rst, j, output w);
4     reg [3:0] ns, ps;
5     parameter [3: 0] A = 4'd0, B = 4'd1, C = 4'd2, D = 4'd3, E = 4'd4, F = 4'd5;
6
7     always @(ps, j) begin
8         ns = A;
9         case(ps)
10             A: ns = j ? B : A;
11             B: ns = j ? B : C;
12             C: ns = j ? B : D;
13             D: ns = j ? E : A;
14             E: ns = j ? B : F;
15             F: ns = j ? B : D;
16             default: ns = A;
17         endcase
18     end
19     assign w = (ps == F) ? 1'b1 : 1'b0;
20
21     always @(posedge clk, posedge rst) begin
22         if(rst)
23             ps <= 0;
24         else
25             ps <= ns;
26     end
27 endmodule
28

```



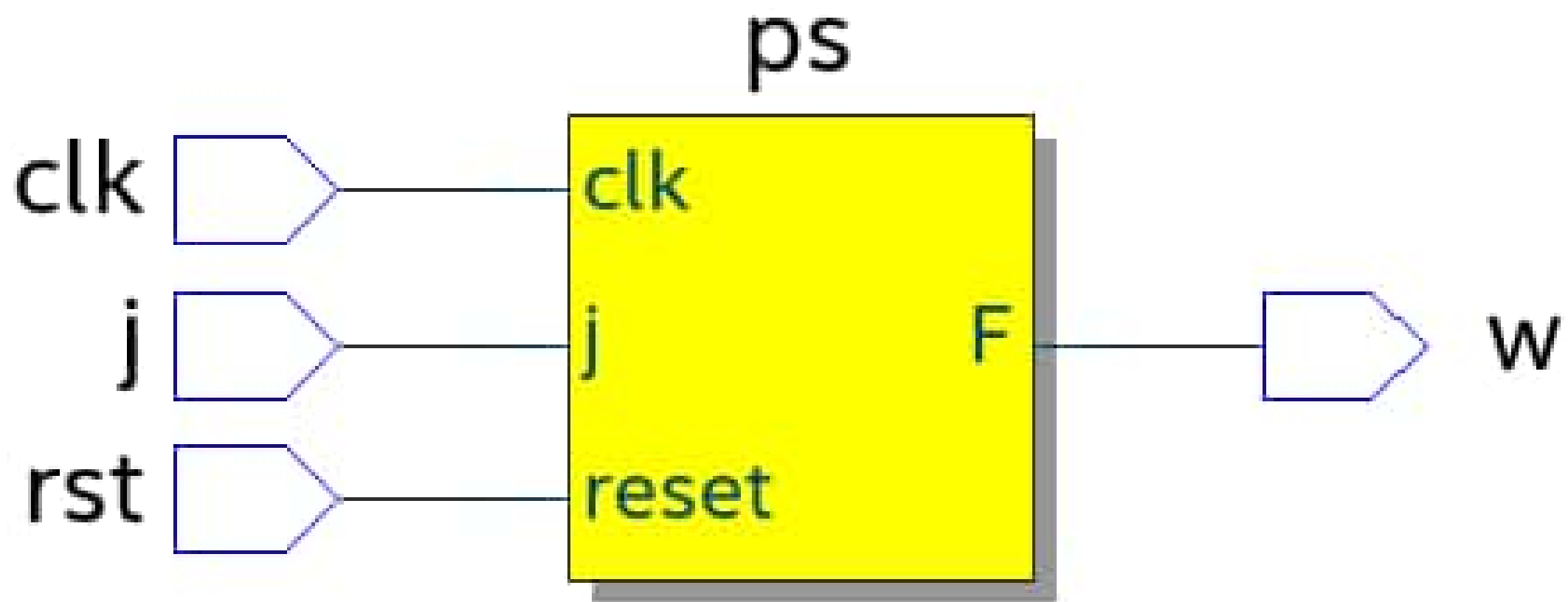




```

1  `include "Moore10010.v"
2  `timescale 1ns/1ns
3
4
5  module Moore10010TB ();
6      reg clk = 0, j = 0, rst = 0;
7      wire w;
8
9      Moore10010 moore(clk, rst, j, w);
10
11     always #100 clk = ~clk;
12
13     initial begin
14         #1000
15             #80 j = 1;
16             #210 j = 0;
17             #200 j = 0;
18             #200 j = 1;
19             #200 j = 0;
20             #200
21             repeat(10) #100 j = $random;
22             #500 rst = 1;
23             #2000 $stop;
24     end
25 endmodule
26

```



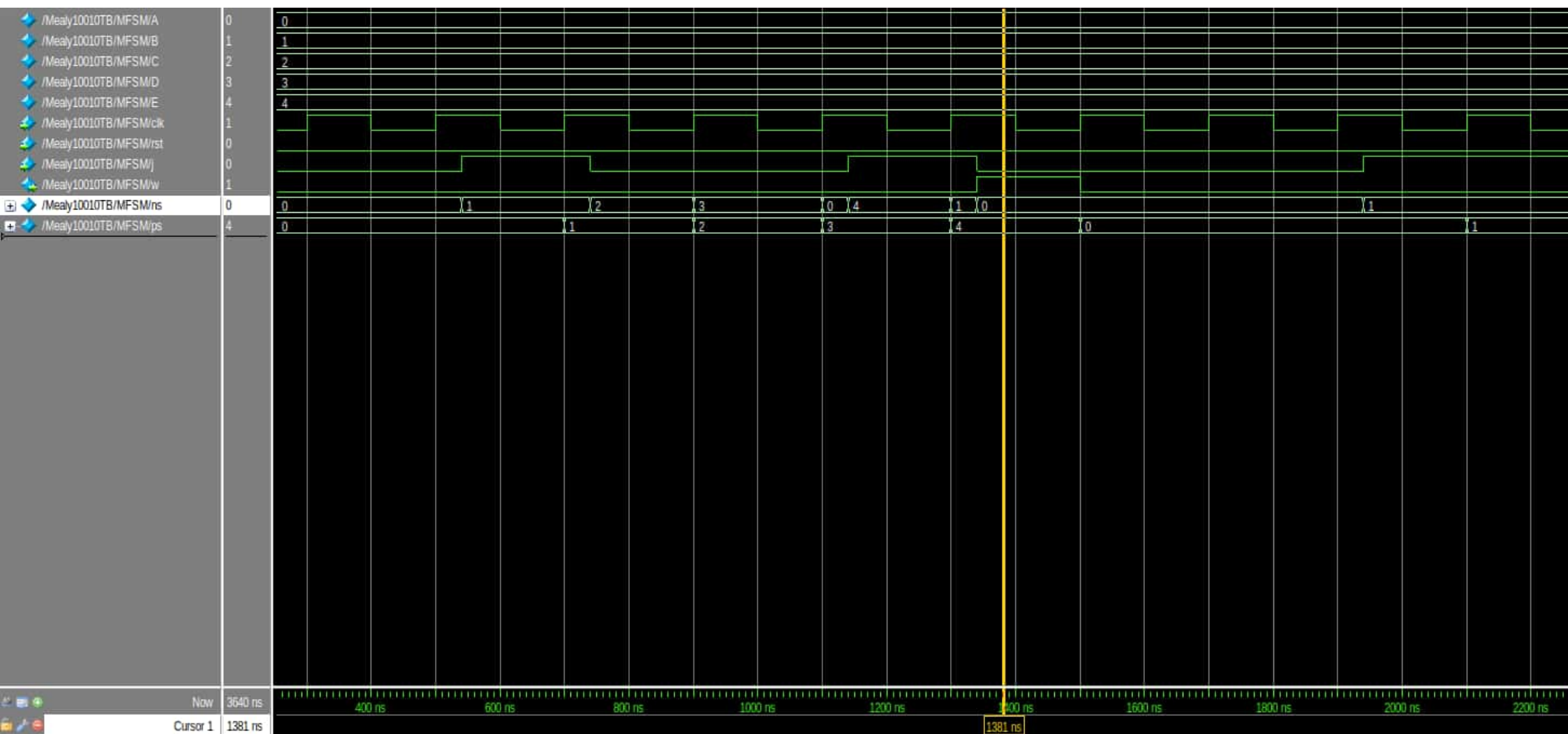
```

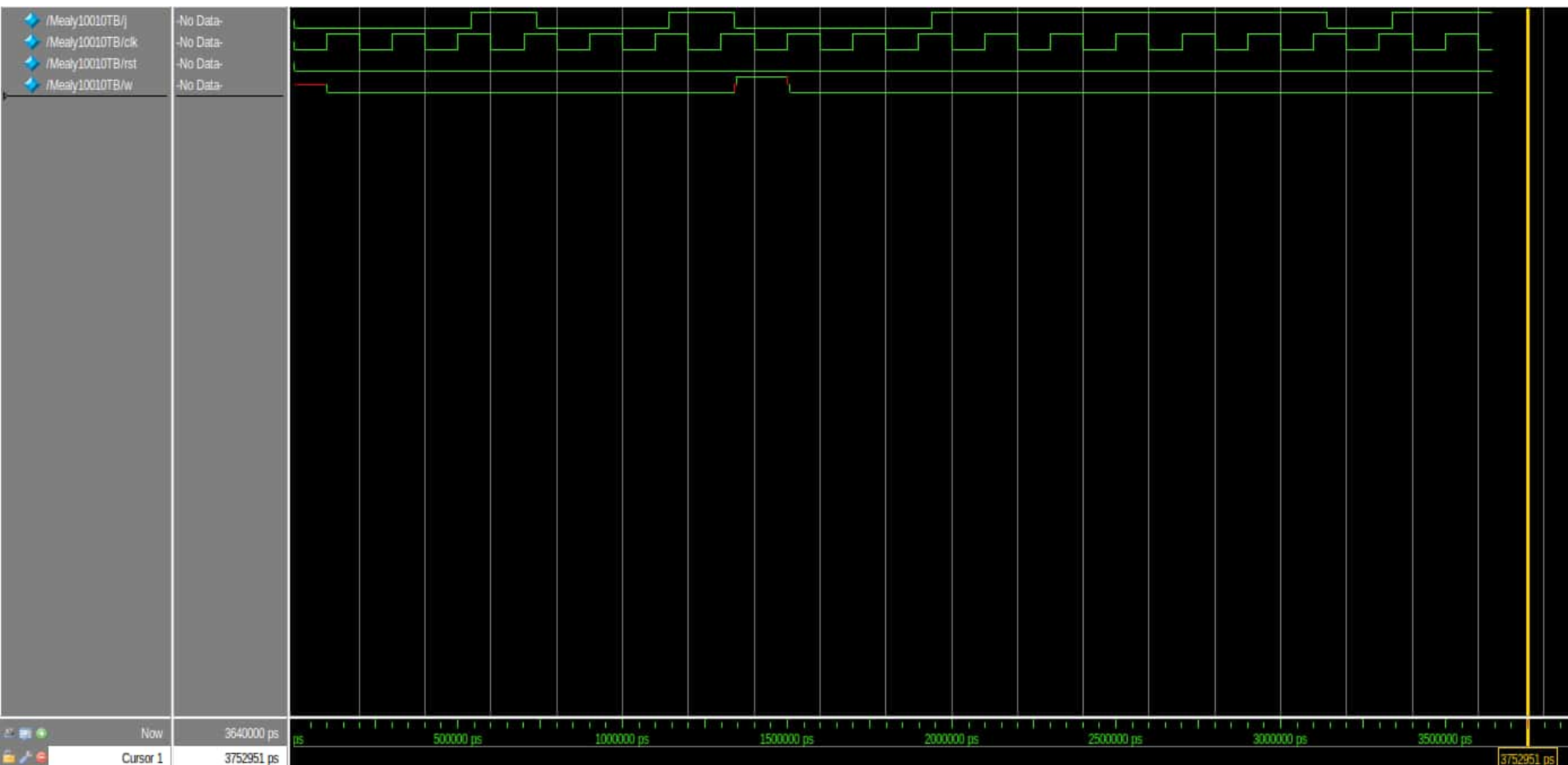
1 | `timescale 1ns/1ns
2
3 module Mealy10010 (
4     input clk, rst, j, output w
5 );
6
7 reg [3:0] ns, ps;
8 parameter [3:0] A = 3'd0, B = 3'd1, C = 3'd2, D = 3'd3, E = 3'd4;
9
10 always @(ps, j) begin
11     ns = A;
12     case(ps)
13         A: ns = j ? B : A;
14         B: ns = j ? B : C;
15         C: ns = j ? B : D;
16         D: ns = j ? E : A;
17         E: ns = j ? B : A;
18     endcase
19 end
20
21 assign w = (ps == E) ? ~j : 1'b0;
22
23 always @(posedge clk, posedge rst) begin
24     if(rst)
25         ps <= 0;
26     else
27         ps <= ns;
28 end
29
30 endmodule
31

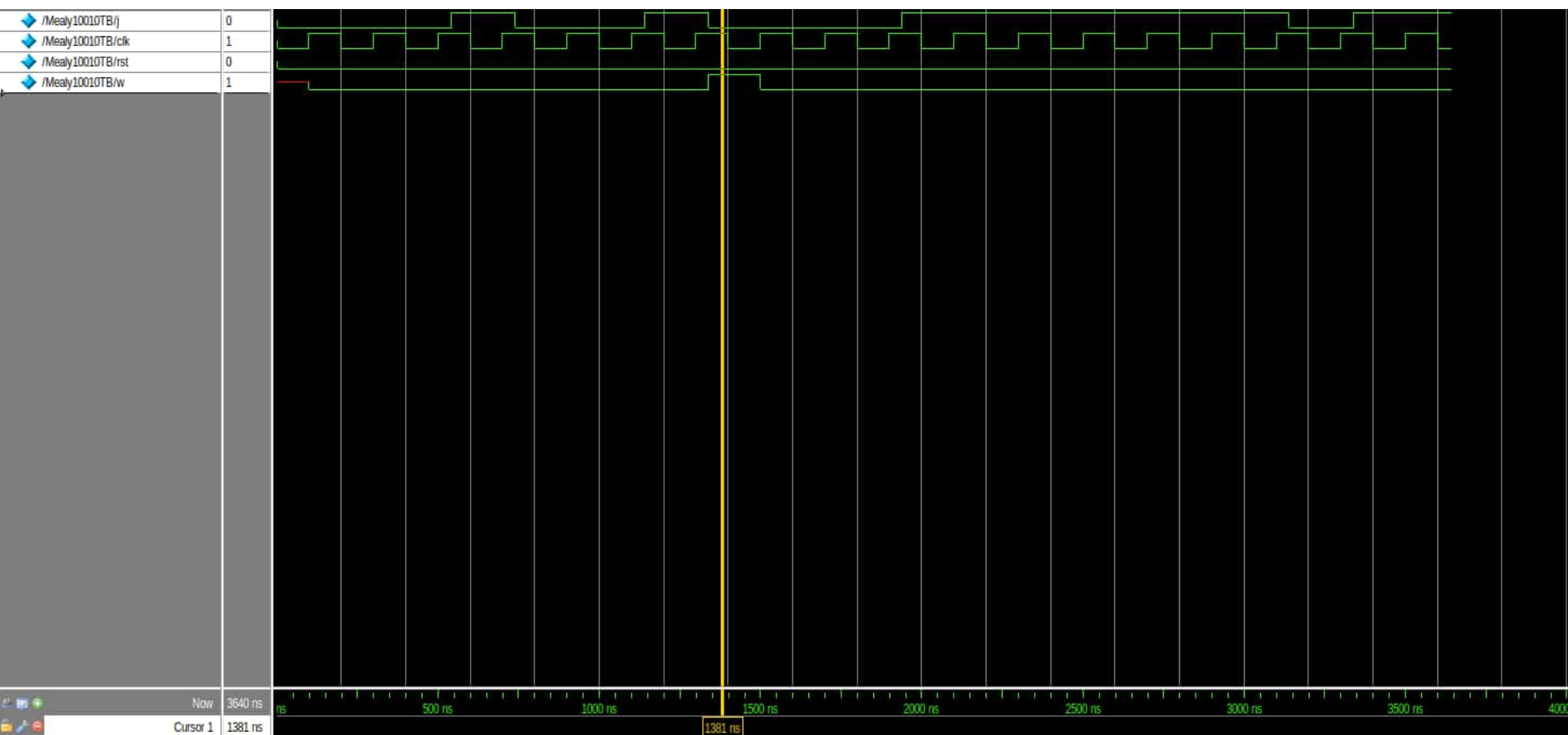
```



```
1  `include "Mealy10010.v"
2  `timescale 1ns/1ns
3  module Mealy10010TB ();
4      reg j = 0, clk = 0, rst = 0;
5      wire w;
6      Mealy10010 MFSM(clk, rst, j, w);
7      always #100 clk = ~clk;
8      initial begin
9          #500
10         #40 j = 1;
11         #200 j = 0;
12         #400 j = 1;
13         #200 j = 0;
14         #200
15         repeat(10) #200 j = $random;
16         #100 $stop;
17     end
18 endmodule
19
```







```

1  `include "Moore10010.v"
2  `include "Mealy10010.v"
3
4  `timescale 1ns/1ns
5  module MAMCSTB();
6      reg clk = 0;
7      reg rst;
8      reg j;
9      wire MealyOut;
10     wire MooreOut;
11     assign dif = MooreOut ^ MealyOut;
12     Moore10010 MOORE(clk, rst, j, MooreOut);
13     Mealy10010 MEALY(clk, rst, j, MealyOut);
14     always #50 clk = ~clk;
15     initial begin
16         #1 rst = 0;
17         #10 rst = 0;
18         #20 j = 1;
19         #30 j = 0;
20         #200 j = 1;
21         #100 j = 0;
22         #110 j = 0;
23         #110 j = 1;
24         #110 j = 0;
25         #20 j = 1;
26         #20 j = 0;
27         repeat(40) #110 j = $random;
28         #200 $stop;
29     end
30 endmodule
31

```

