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1  `timescale 1ns / 1ps
2  /*****
3   * File Name: pixel_generator.v
4   * Project: VGA Object Mapped
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7   * Rev. Date: 23 October, 2017
8   *
9   * Purpose: This module will generate the objects specified. These objects
10  *           are a Wall, a Ball , and a Bar(Paddle). Each object will have
11  *           a specified region.The Wall shall occupy the region from
12  *           horizontal scan count 32 through 35.The Paddle shall occupy
13  *           the region from horizontal scan count 600 through 603 and
14  *           vertical scan count 204 to 276. The Ball shall occupy
15  *           the region from horizontal scan count 580 through 588 and
16  *           vertical scan count 238 through 246.
17  *
18  * Notes:   - This module has no reset, the reset comes from vga sync
19  *           - vide_on enables objects to be displayed
20  *****/
21 module pixel_generator(input  video_on,
22                       input [9:0] pixel_x, pixel_y,
23                       output reg[11:0] rgb);
24
25   wire wall, bar, ball;
26   wire [11:0] wall_rgb, bar_rgb, ball_rgb;
27
28   /*****
29   * generate WALL
30   *****/
31   assign wall = (pixel_x >= 32) && ( pixel_x <= 35);
32   assign wall_rgb = 12'hF00;//wall blue
33
34   /*****
35   * generate BAR
36   *****/
37   assign bar = (pixel_x >= 600) && (pixel_x <=603)
38               &&(pixel_y >= 204) && (pixel_y <=276);
39   assign bar_rgb = 12'h0F0;//bar green
40
41   /*****
42   * generate BALL
43   *****/
44   assign ball = (pixel_x >= 580) && (pixel_x <=588)
45               &&(pixel_y >= 238) && (pixel_y <=246);
46   assign ball_rgb = 12'h00F;//ball red
47
48   /*****
49   * generate display
50   *****/
51   always @ (*) begin
52     if (video_on)
53       if (wall)
54         rgb = wall_rgb; else
55       if (bar)
56         rgb = bar_rgb; else
57       if (ball)
```

```
58         rgb = ball_rgb;
59     else
60         rgb = 12'h000;//blank
61     else
62         rgb = 12'h000;//blank
63     end
64 endmodule
65
```