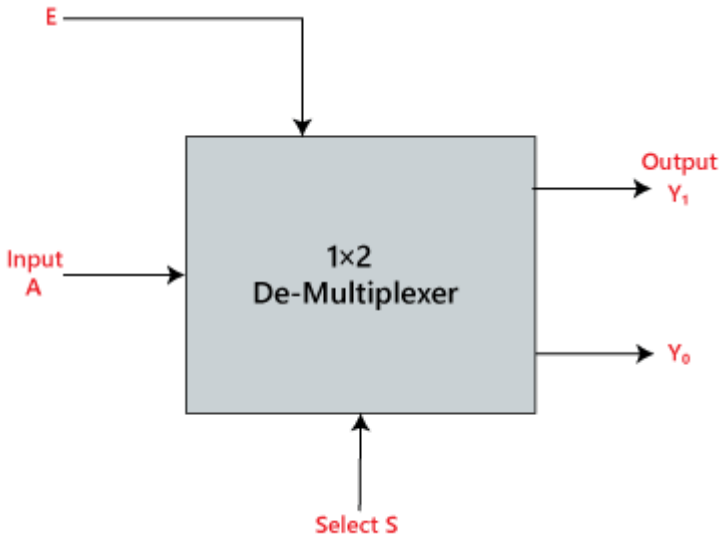
DE-MULTIPLEXER

1X2 DE-MUX:

In the 1 to 2 De-multiplexer, there are only two outputs, i.e., Y_0, and Y_1, 1 selection lines, i.e., S_0, and single input, i.e., A. On the basis of the selection value, the input will be connected to one of the outputs.

Block Diagram:



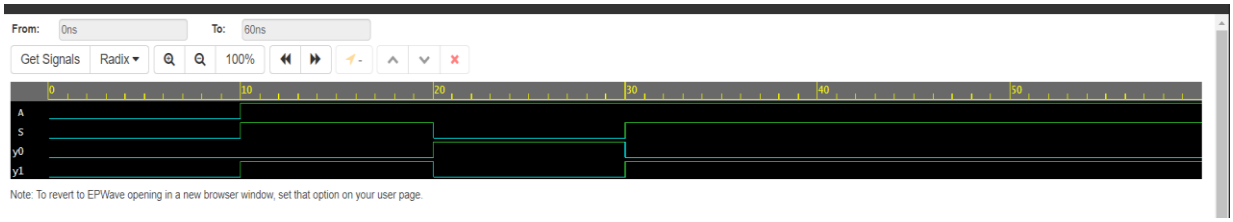
RTL CODE:

```
module de_mux(input A, input S, output y0, output y1);
  assign y0 = (S == 1'b0) ? A : 1'b0;
  assign y1 = (S == 1'b1) ? A : 1'b0;
endmodule
```

TEST BENCH:

```
module testbench;
  wire y0,y1;
  reg A,S;
```

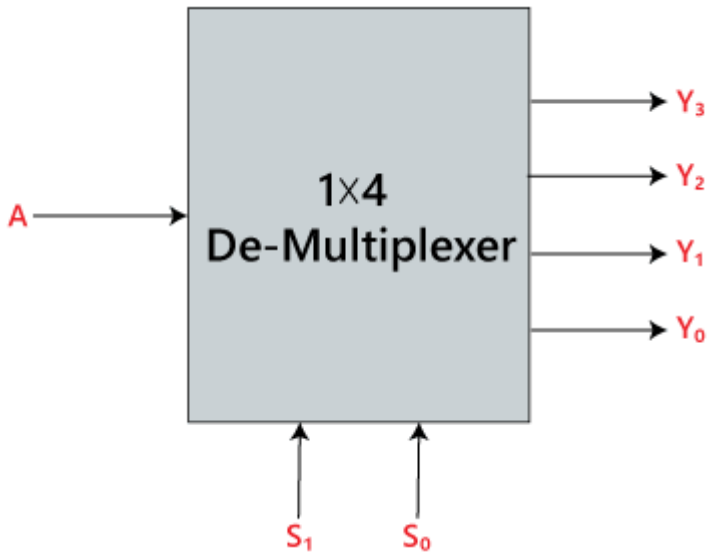
```
  de_mux a1 (A,S,y0,y1);
  initial
    begin
      $dumpfile(".vcd");
      $dumpvars(1);
    end
  initial
    begin
      repeat(5);
      begin
        A=0; S=0;
        #10 S=1;A=1;
         #10 S=0;A=1;
         #10 S=1;A=1;
      end
    end
  initial
    begin
      #60 $finish();
    end
endmodule
```



1x4 DE- MULTIPLEXER:

In 1 to 4 De-multiplexer, there are total of four outputs, i.e., Y_0, Y_1, Y_2, and Y_3, 2 selection lines, i.e., S_0 and S_1 and single input, i.e., A. On the basis of the combination of inputs which are present at the selection lines S_0 and S_1, the input be connected to one of the outputs. ..

Block Diagram:



RTL CODE:

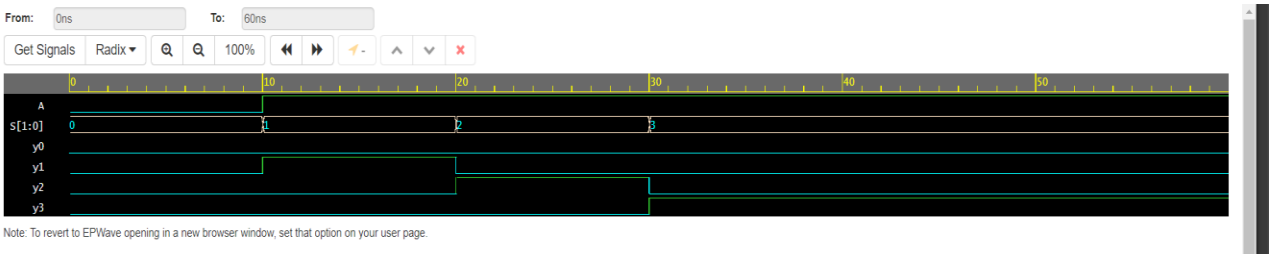
```
module de_mux(input A, input [1:0] S, output  reg y3,y2,y1,y0);
  always @(*)
  begin
    case(S)
      2'b00: {y3,y2,y1,y0} = {3'b0, A};
      2'b01: {y3,y2,y1,y0} = {2'b0, A, 1'b0};
      2'b10: {y3,y2,y1,y0} = {1'b0, A, 2'b0};
      2'b11: {y3,y2,y1,y0} = {A, 3'b0};
```

```
    endcase
  end
endmodule
```

TEST BENCH:

```
module testbench;
  wire y3,y2,y1,y0;
  reg A;
  reg [1:0]S;
  de_mux a1 (A,S,y3,y2,y1,y0);
  initial
    begin
      $dumpfile(".vcd");
      $dumpvars(1);
    end
  initial
    begin
      S=2'b00;A=0;
      #10 S=2'b01;A=1;
      #10 S=2'b10;A=1;
      #10 S=2'b11;A=1;
    end
  initial
    begin
      #60 $finish();
    end
```

endmodule


From:
0ns
To:
60ns
Get Signals
Radix
100%
0
10
20
30
40
50
A
S[1:0]
0
1
2
3
y0
y1
y2
y3
Note: To revert to EPWave opening in a new browser window, set that option on your user page.