VGA Basics

Last updated 5/20/20

VGA Basics

These slides describe the operation of a VGA display

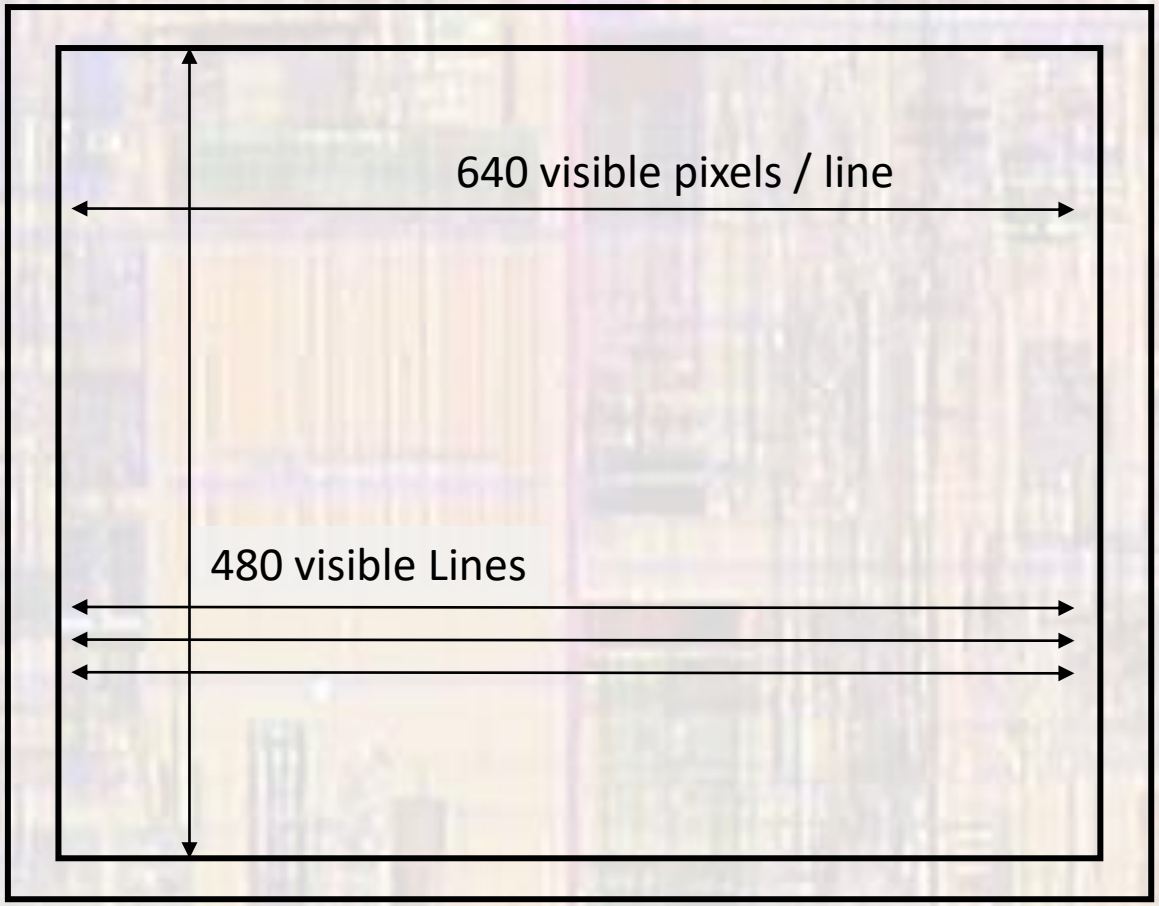
Upon completion: You should be able to describe and operation of a VGA display

VGA Basics

Video Graphics Array

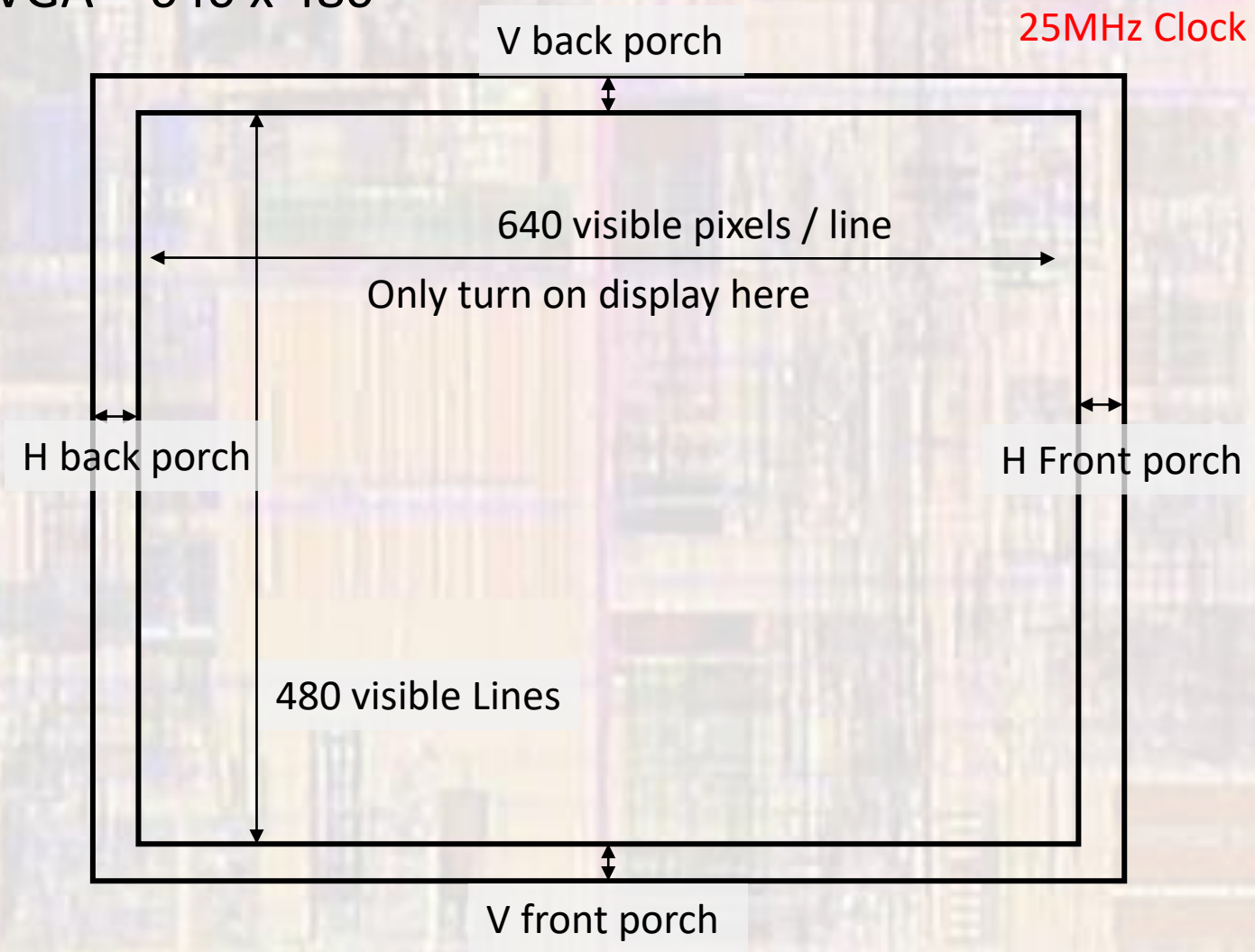
VGA Basics

- VGA – 640 x 480



VGA Basics

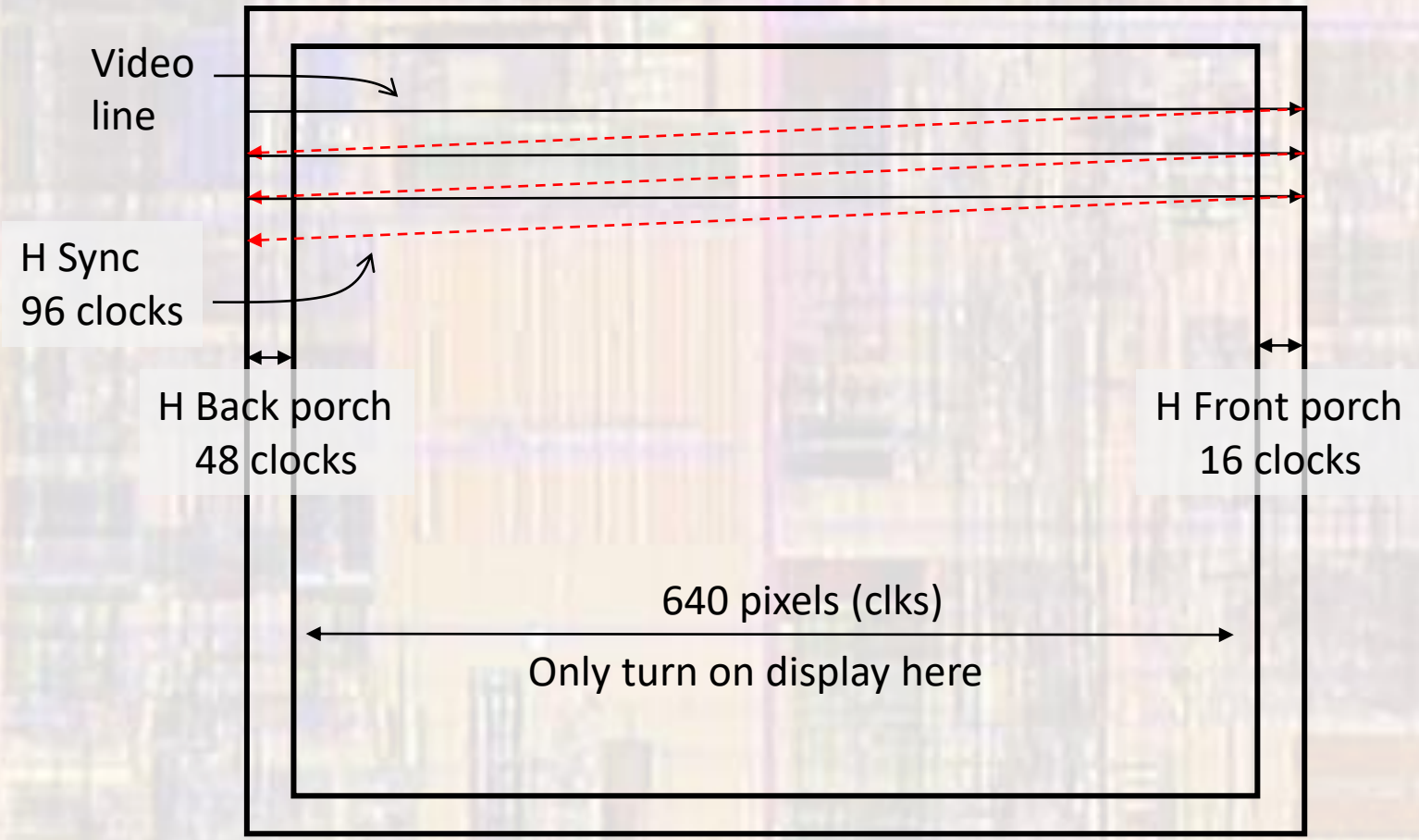
- VGA – 640 x 480



VGA Basics

- VGA – 640 x 480

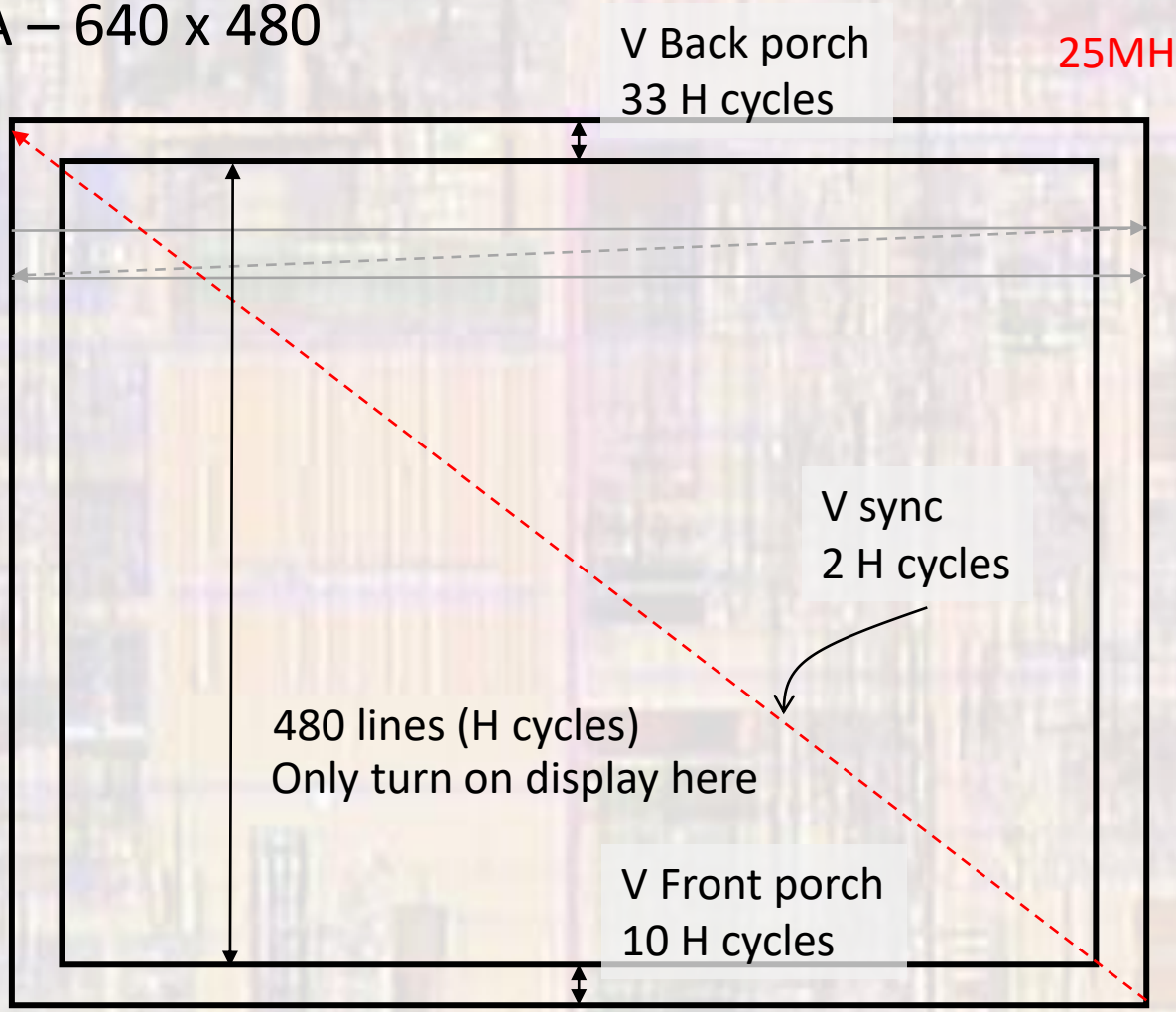
25MHz Clock Rate



1 H cycle = (48 + 640 + 16 + 96 = 800) clock cycles

VGA Basics

- VGA – 640 x 480

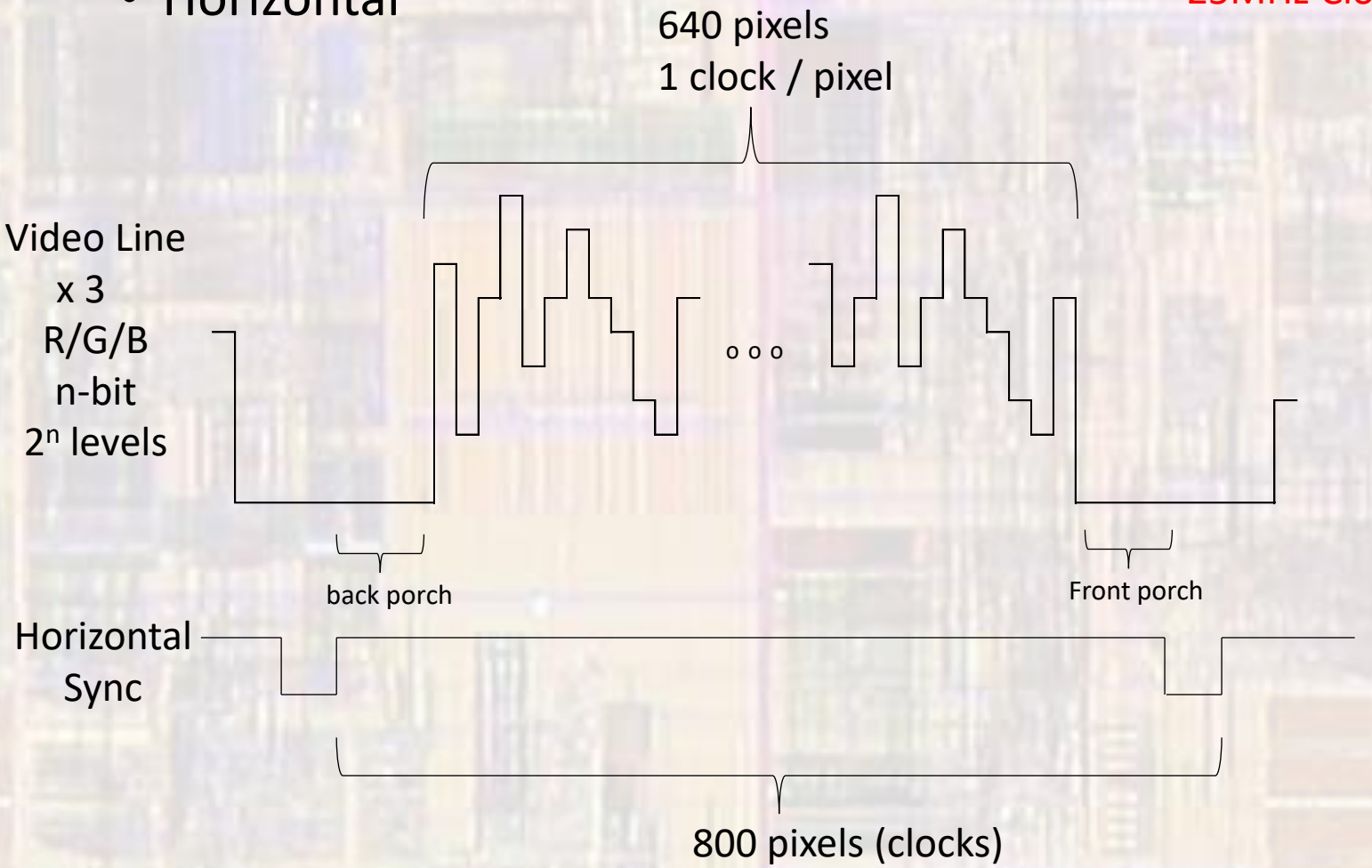


1 V cycle = (33 + 480 + 10 + 2) H cycles

VGA Basics

- VGA Signal Timing – 640x480
  - Horizontal

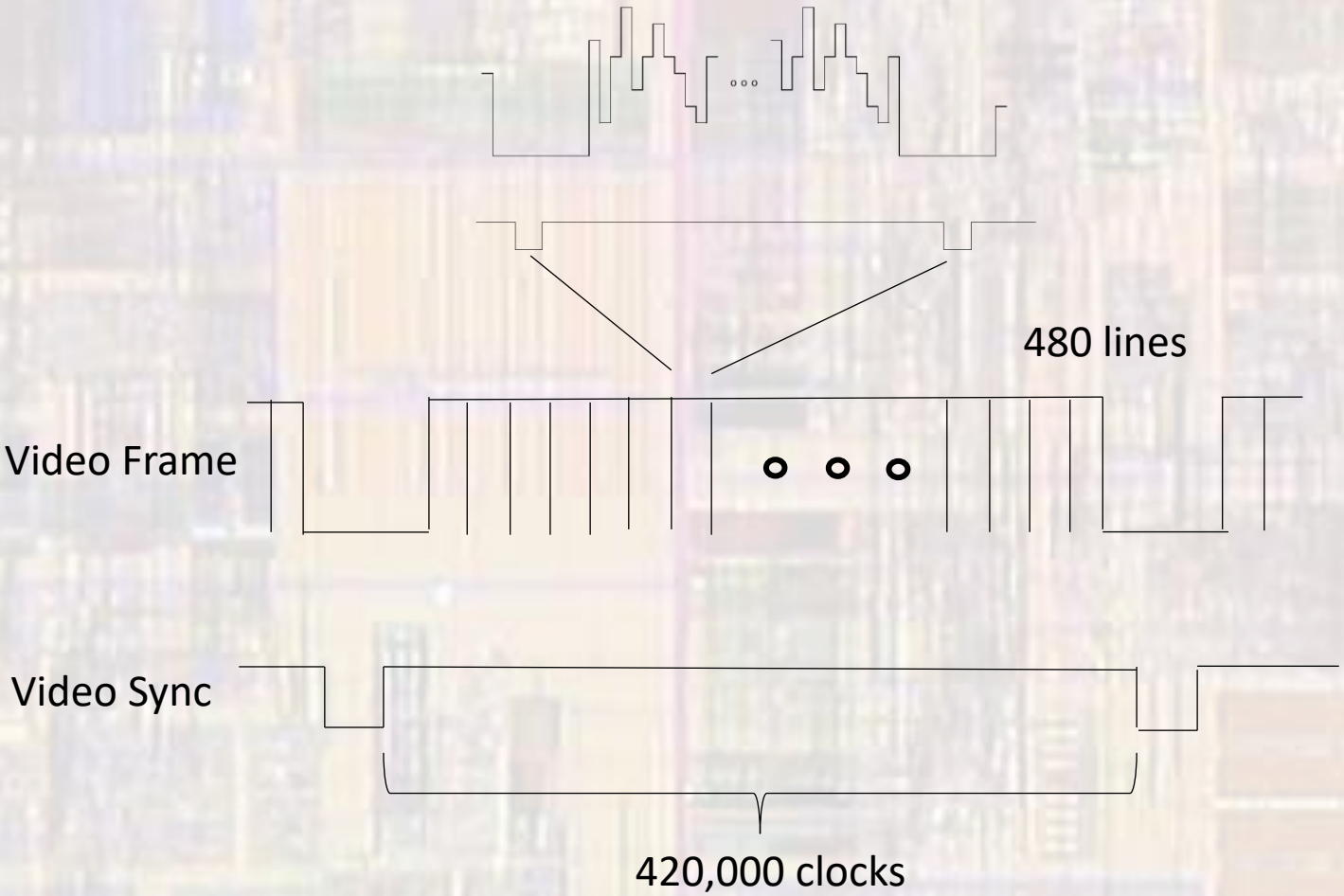
25MHz Clock Rate



VGA Basics

- VGA Signal Timing – 640x480
  - Vertical

25MHz Clock Rate



VGA Basics

- VGA Signal Timing – 640x480

800 clocks/H * 525H/V * (1/(25e^6 clocks/sec)) = 0.168sec/refresh

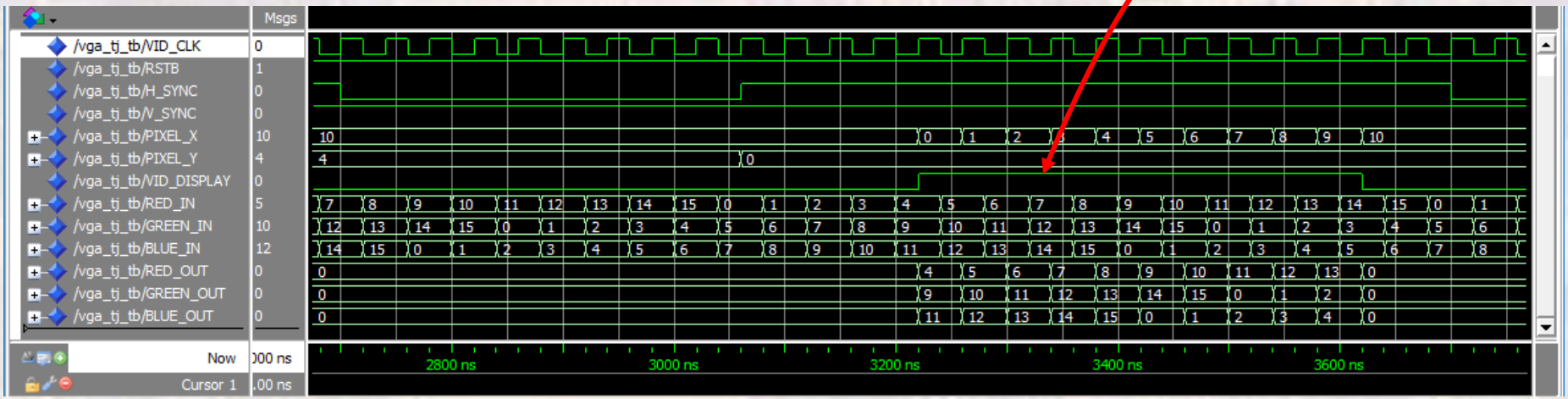
→ 59.524 Hz refresh rate

VGA Basics

- VGA Signal Timing – test case
  - Horizontal

4 – H Back Porch
10 - Active
2 – H Front Porch
9 – H sync

Display On



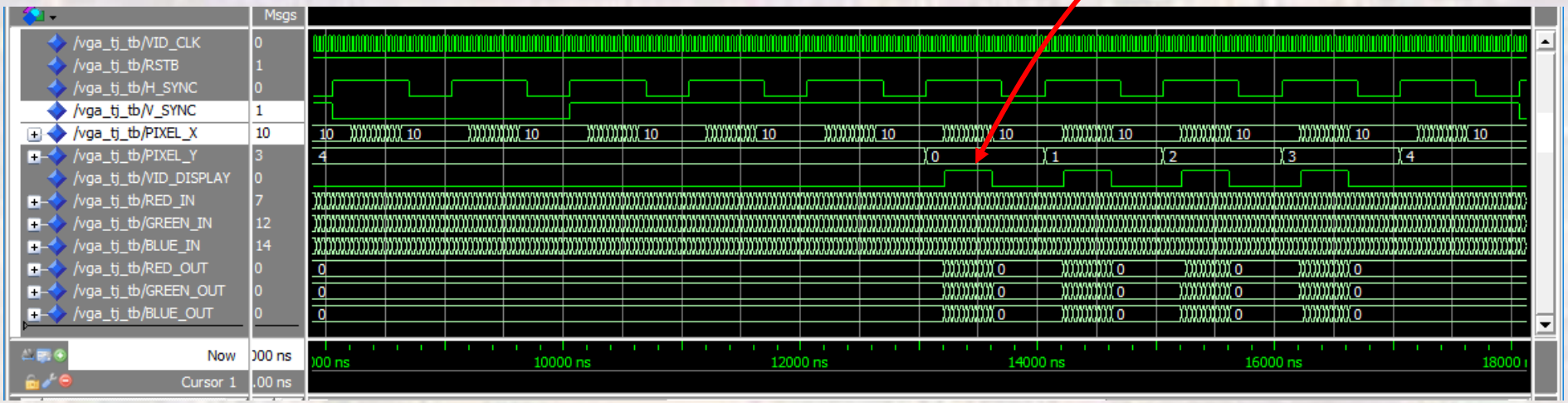
H sync | H back porch | Active | H front porch

VGA Basics

- VGA Signal Timing – test case
  - Vertical

3 – V Back Porch
4 - Active
1 – V Front Porch
2 – V sync

Display On



V sync | V back porch | Active | V front porch