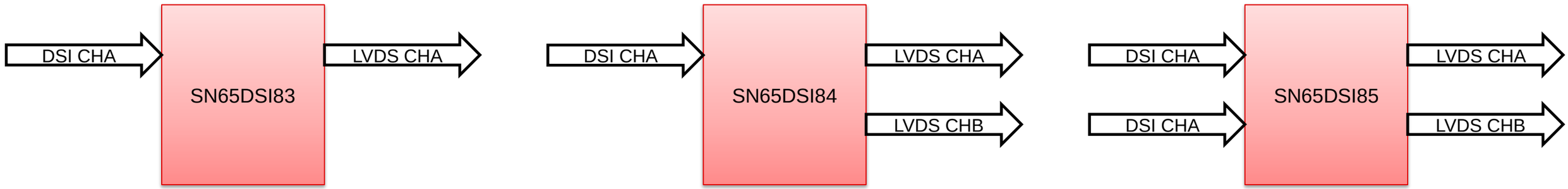
SN65DSI83/84/85- Device Description and Design Guidelines

Ikechukwu (I.K.) Anyiam

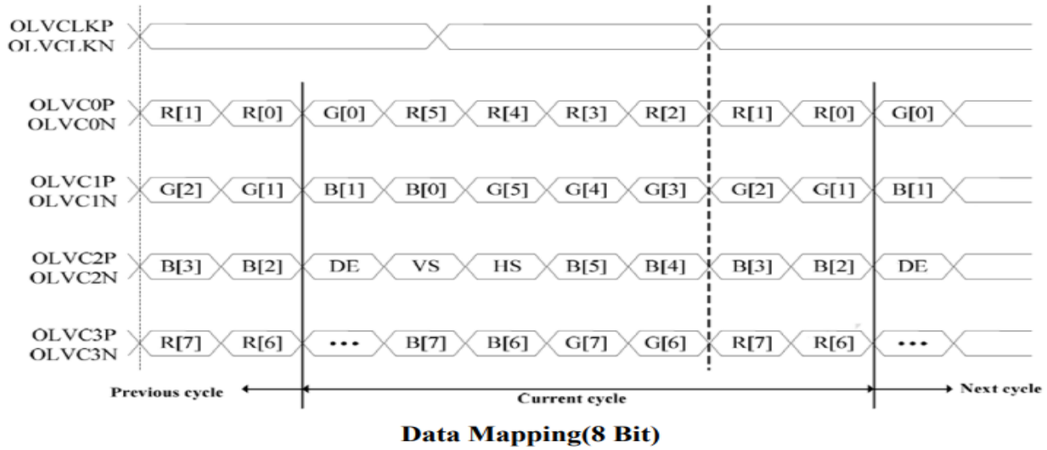
SN65DSI83/84/85 Comparison

Part Name	Description	Max Resolution	Device Configuration
SN65DSI83	Single Channel DSI to Single-Link LVDS/OLDI	1366x768 @ 60fps at 24bpp/18bp, Max resolution up to 1920x1200 @ 60fps at 24bpp with reduced blanking	I2C
SN65DSI84	Single Channel DSI to Dual-Link LVDS/OLDI	1920x1200 @ 60fps at 24bpp/18bpp	I2C
SN65DSI85	Dual Channel DSI to two Single-Link or Dual-Link LVDS/OLDI	2560x1600 @ 60fps 1920x1080 @ 120fps at 24bpp/18bpp	I2C



Data mapping format

- Identify data mapping format and bpp (bits per pixel) format on display datasheet
- SN65DSI8x only supports JEIDA (Format 1) and VESA (Format 2) mapping, and 18bpp (6-bit RGB) or 24bpp (8-bit RGB)



Data Mapping(8 Bit)

Display Datasheet

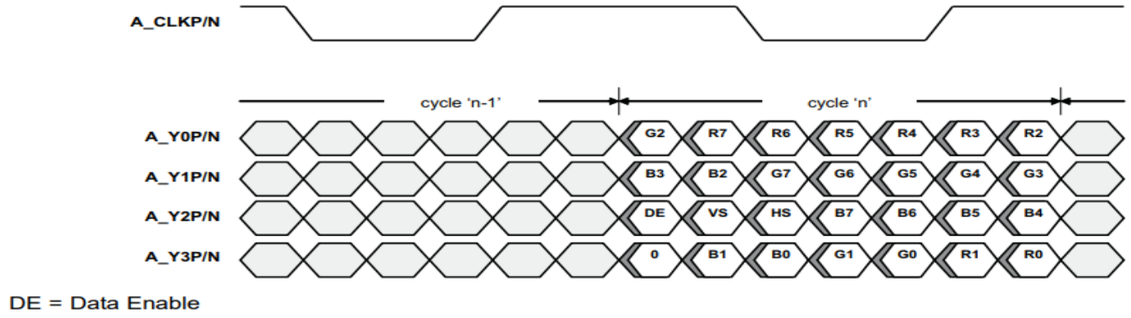
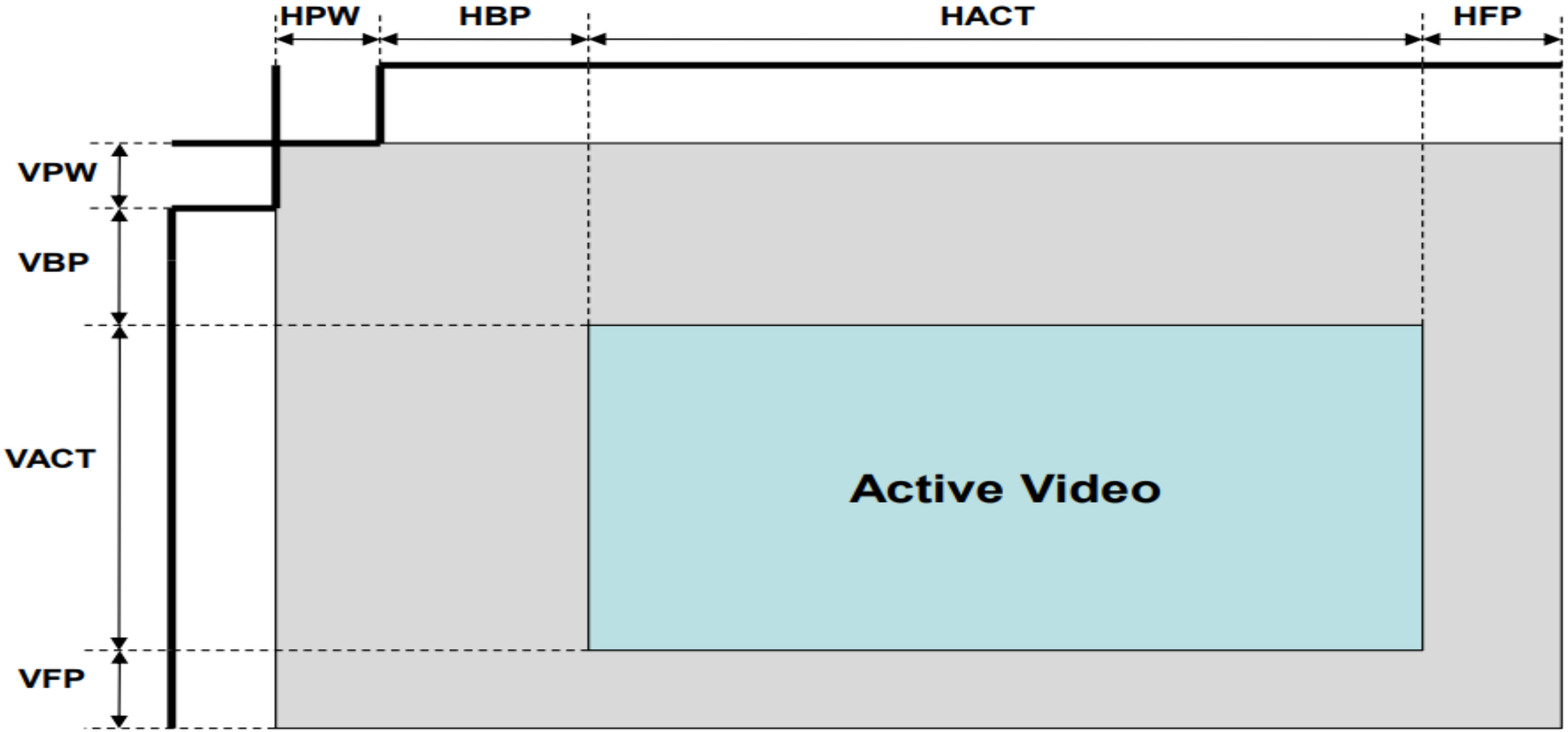


Figure 11. FlatLink Output Data (Format 1); Single-Link 24 bpp

SN65DSI83 Datasheet

Interface timing



Interface timing

- Look for table with timing specifications on the display datasheet
- Identify:

Horizontal:

1. LVDS Clock Frequency
2. Horizontal Active Time (HA)
3. HSYNC Pulse Width (HPW)
4. Horizontal Back Porch (HBP)
5. Horizontal Front Porch (HFP)
6. Total Horizontal Time (HA+HPW+HBP+HFP)

Vertical:

1. Frame Rate
2. Vertical Active Time (VA)
3. VSYNC Pulse Width (VPW)
4. Vertical Back Porch (VBP)
5. Vertical Front Porch (VFP)
6. Total Vertical Time (VA+VPW+VBP+VFP)

Parameter	Symbol	Unit	Min.	Typ.	Max.
LVDS Clock Frequency	Fclk	MHz	50	65	80
H Total Time	HT	Clocks	1100	1344	2047
H Active Time	HA	Clocks	1024	1024	1024
H Blanking Time	HBL	Clocks	76	320	1023
V Total Time	VT	Lines	776	806	1023
V Active Time	VA	Lines	768	768	768
V Blanking Time	VBL	Lines	8	38	255
Frame Rate	Vsync	Hz	55	60	65

Interface timing

- The below are blanking parameters:

Horizontal:

1. HSYNC Pulse Width (HPW)
2. Horizontal Back Porch (HBP)
3. Horizontal Front Porch (HFP)

Vertical:

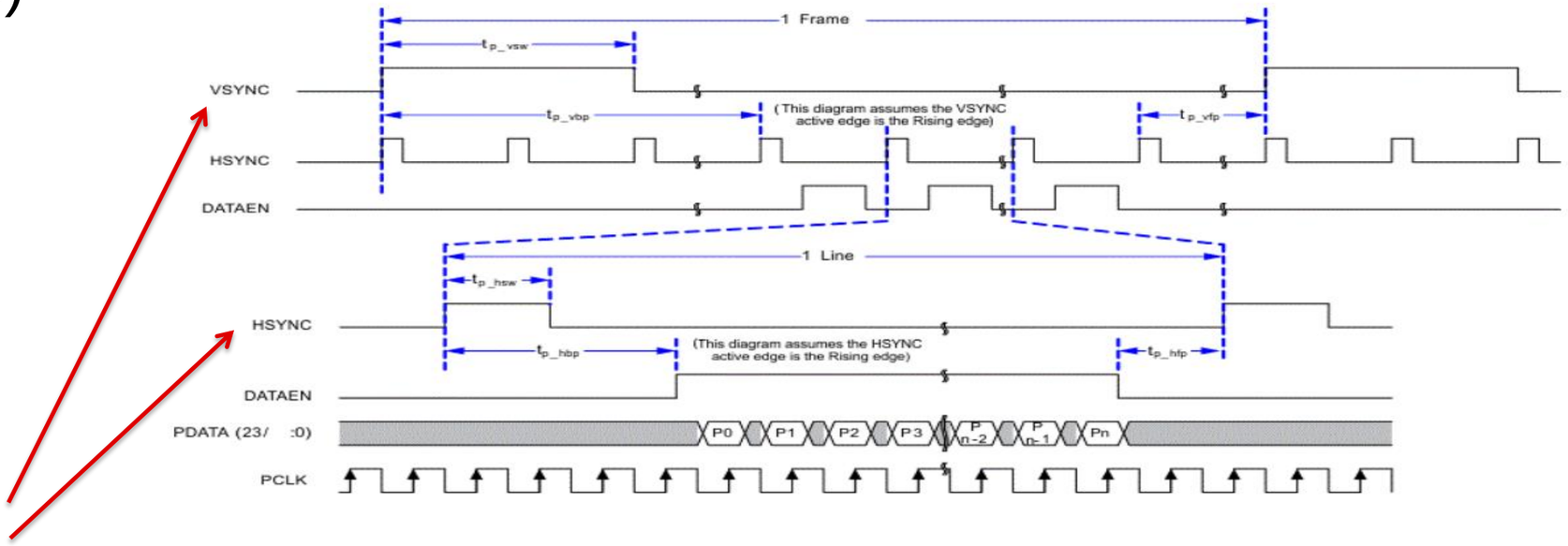
3. VSYNC Pulse Width (VPW)
4. Vertical Back Porch (VBP)
5. Vertical Front Porch (VFP)

Parameter	Symbol	Unit	Min.	Typ.	Max.
LVDS Clock Frequency	Fclk	MHz	50	65	80
H Total Time	HT	Clocks	1100	1344	2047
H Active Time	HA	Clocks	1024	1024	1024
H Blanking Time	HBL	Clocks	76	320	1023
V Total Time	VT	Lines	776	806	1023
V Active Time	VA	Lines	768	768	768
V Blanking Time	VBL	Lines	8	38	255
Frame Rate	Vsync	Hz	55	60	65

- It’s fine if the display datasheet does not explicitly list them. They are the sum of the horizontal blanking (HBL) and vertical blanking (VBL)

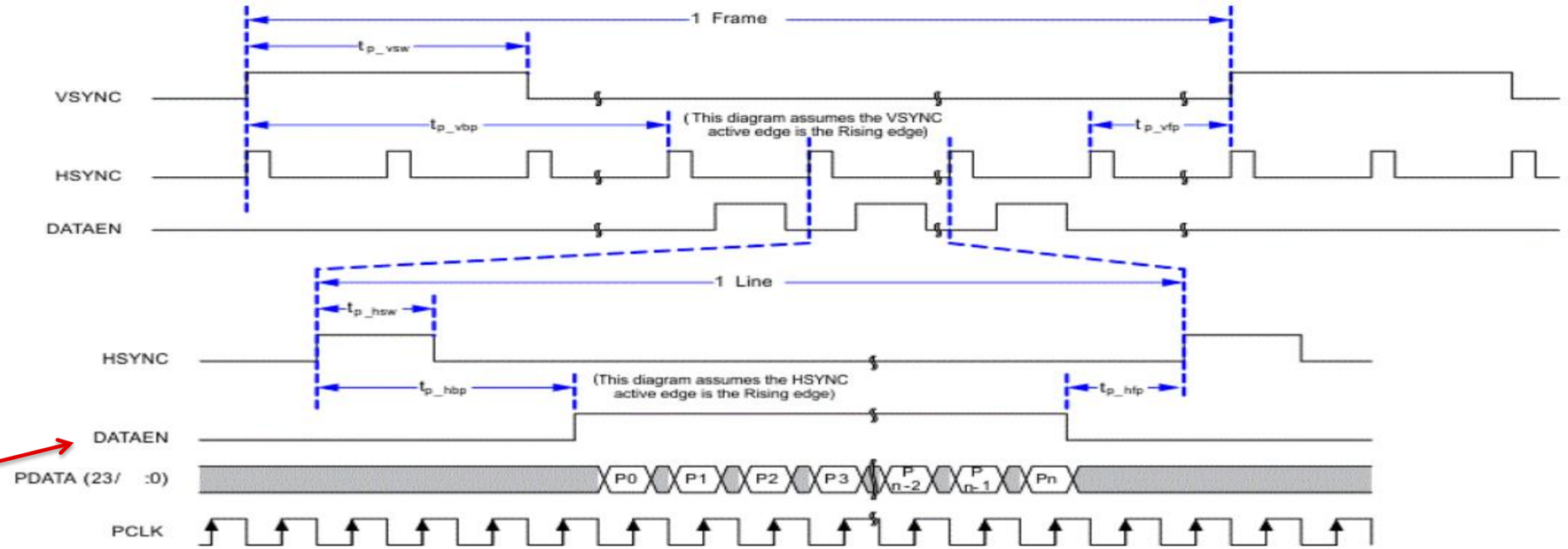
HSYNC, VSYNC, DE polarity

- Identify polarity of HSYNC, VSYNC, DE (Data Enable) when video data is active
- In below diagram:
  - VSYNC is positive polarity driven 1 when data transitions from blanking to active (once per frame)
  - HSYNC is positive polarity driven 1 when data transitions from blanking to active (once per line)



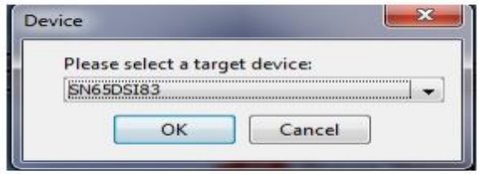
HSYNC, VSYNC, DE polarity

- Most displays are driven in “DE” mode, which means the HSYNC and VSYNC signals are ignored, and the display can figure out the timing from the DE signal
- In below diagram, DE is high **during active data**, so DE polarity is positive

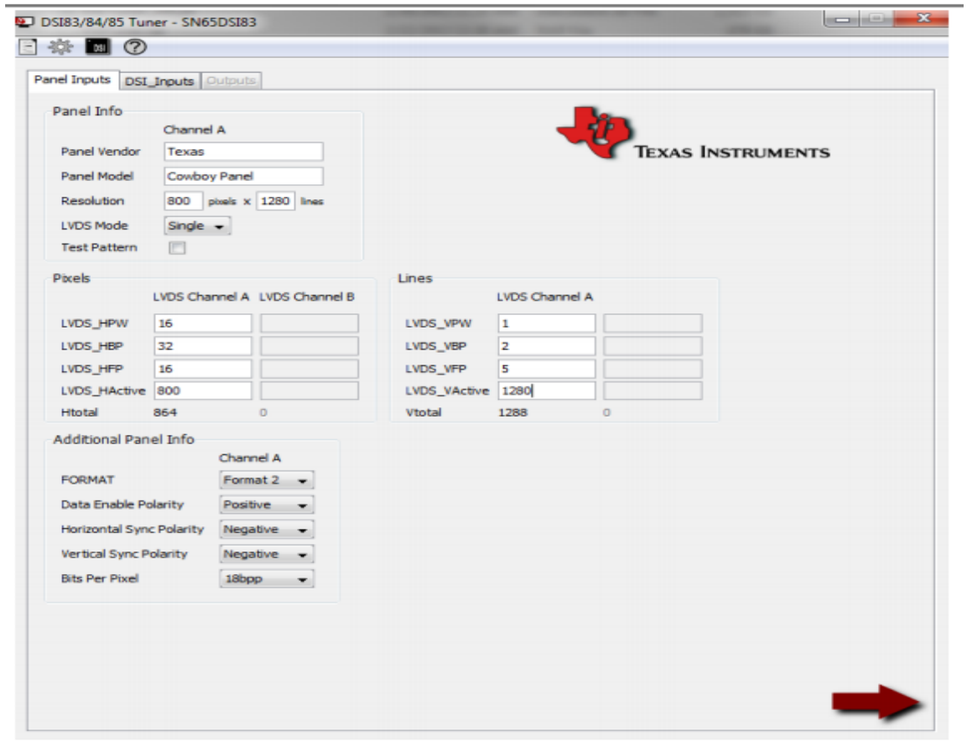


DSI-Tuner

- Download the DSI-Tuner from: http://www.ti.com/tool/DSI-TUNER
- After installing and running, select the target device:



- The “Panel Inputs” window should show up next :



Thanks for your time!