Plasma Display Panels – Solution Note

Background

A **Plasma Display Panel** (PDP) is a type of flat panel display commonly used for high-definition television sets. An inert mixture of noble gases (neon and xenon) is present in hundreds of thousands of tiny cells (pixels) that are sandwiched between two plates of glass. Each plate is lined with electrodes which create a grid.

- **Address electrodes** are located behind the cells, along the rear glass plate.
- **Transparent display electrodes** are mounted in front of the cell, along the front glass plate.

Control circuitry charges the electrodes that cross paths at a cell, creating a voltage difference between front and back and causing the gas to ionize and form a plasma. As the gas ions rush to the electrodes and collide, photons are emitted.

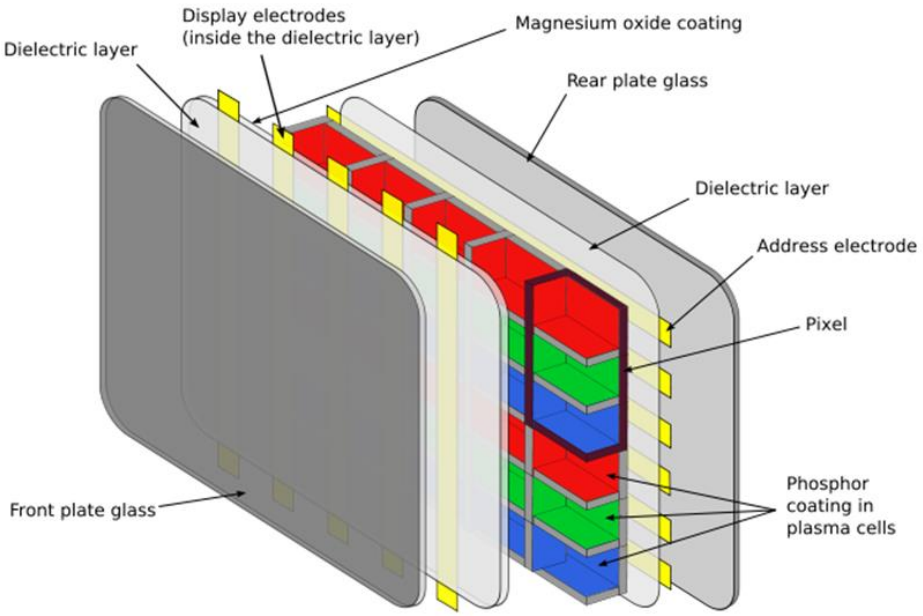

Figure 1: PDP Electrode Configuration Scheme

Every cell is made up of three subcells, one containing a red light phosphor, one a green light phosphor and one a blue light phosphor. The light phosphors blend together to create the overall color of the pixel. By varying the pulses of current flowing through the different cells thousands of times per second, the control system causes each cell to produce millions of different combinations of red, green and blue.

Requirement

You can use the **Tabor *Wonder Wave* AWG** to test the color generation of a PDP system. In order to produce the required waveforms, a signal source with at least 3 channels (2 for the transparent display electrodes, 1 for the address electrodes) is required. In the example shown in Figure 2 below, a 4th channel applies a trigger to the surrounding electrical circuits.

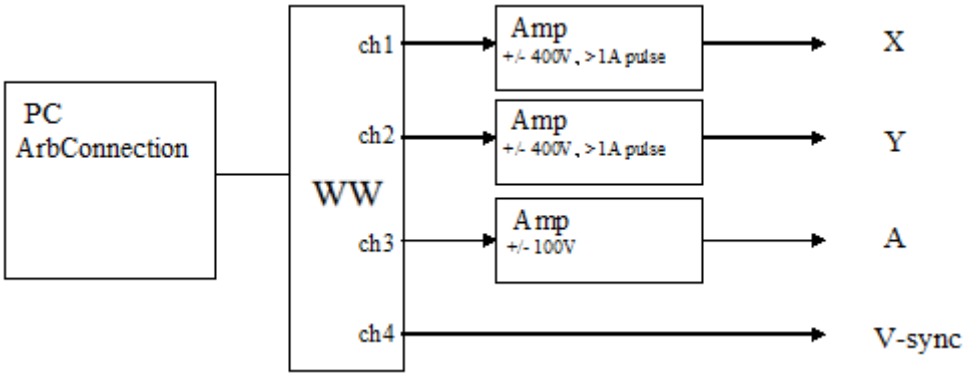

Figure 2: Allocation of Signal Source Channels

An example of the types of waveforms used to control the electrodes is shown below. There are three stages to the activation scheme that appears in Figure 3 below.

- **Reset** – to initialize the cell so that light is emitted when discharge occurs.
- An **address period**, during which a pulse is added to the cells where discharge should not emit light – in order to erase the electric charge that was formed during the initialization period.
- The **discharge period**, during which the discharge emits light from the cell. The discharge waveform is repeated 1000 times.

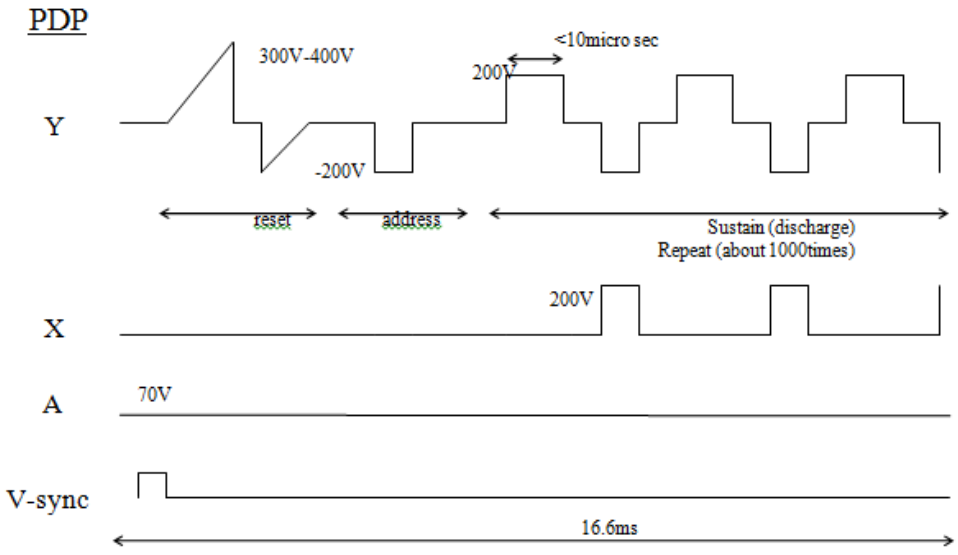

Figure 3: PDP Control Waveforms

Solution

Tabor Electronics' *Wonder Wave* family of Arbitrary Waveform Generators (AWGs) serves as an excellent platform for the testing of PDP systems, providing four channels of synchronous output.

Wonder Wave's advanced sequencing capabilities allows you to quickly create and edit complex waveforms, which can be easily combined and repeated as required by the application.

Tabor's *ArbConnection* control and waveform-editing software includes *Pulse Composer* – a powerful, graphically-based tool that is perfectly suited for the generation of PDP signals.

For More Information

To learn more about Tabor's solutions or to schedule a demo, please contact your local Tabor representative or email your request to info@tabor.co.il. More information can be found at our website at www.taborelec.com.