

Analog Ferroelectric Liquid Crystals

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Analog FLC devices have a frequency dependant nature such that the same digital pixel value will give different polarization rotations at different frequencies. This is illustrated in Figure 1 through Figure 3. An analog FLC cell was driven with peak-to-peak voltage levels associated with each curve in the charts. The cell was placed between crossed polarizers and illuminated with a 635-nm LED. The result was measured with a photodetector and oscilloscope. For this reason the voltage on the y-axis is analogous to light intensity. Figure 1 shows the measured response when switching the cell at a 30-Hz rate, Figure 2 shows the response at 300-Hz, and Figure 3 shows the response at 1000-Hz. Note the drop in light intensity as the frequency is increased. This shows that the FLC is not reaching the same tilt angles when given the same drive voltages at differing frequencies. Although these quantitative measurements were taken with a glass test cell, similar trends will apply to the spatial light modulators. As a result of this frequency dependant response the user is cautioned to exercise care when selecting the appropriate optical response curve.

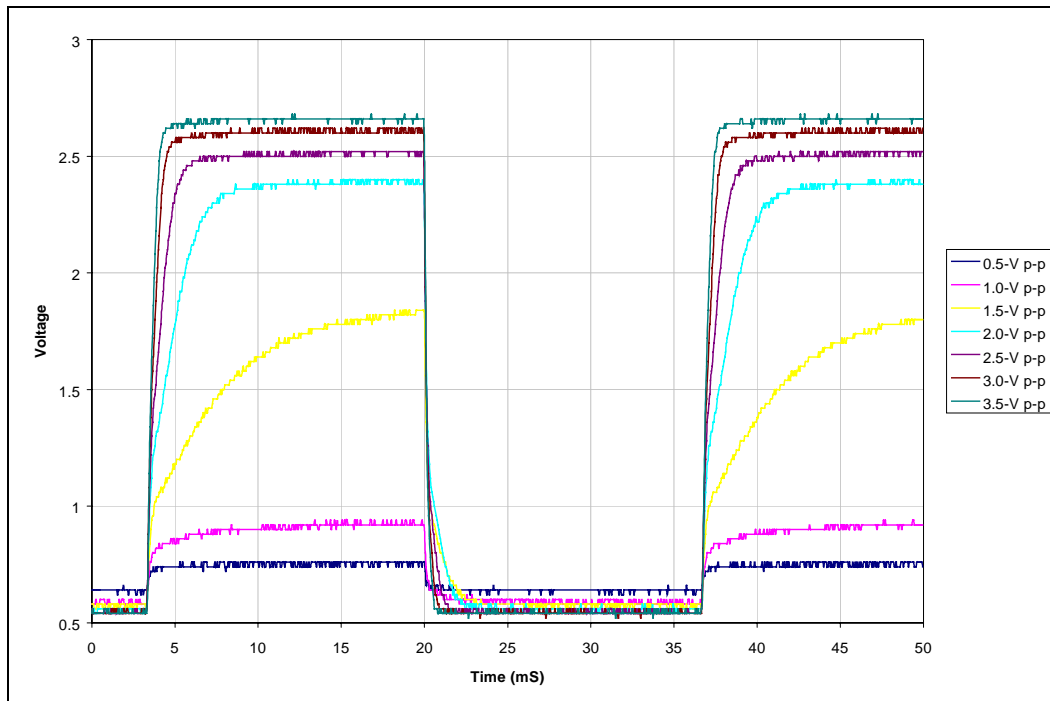


Figure 1 – Analog FLC response at 30-Hz.

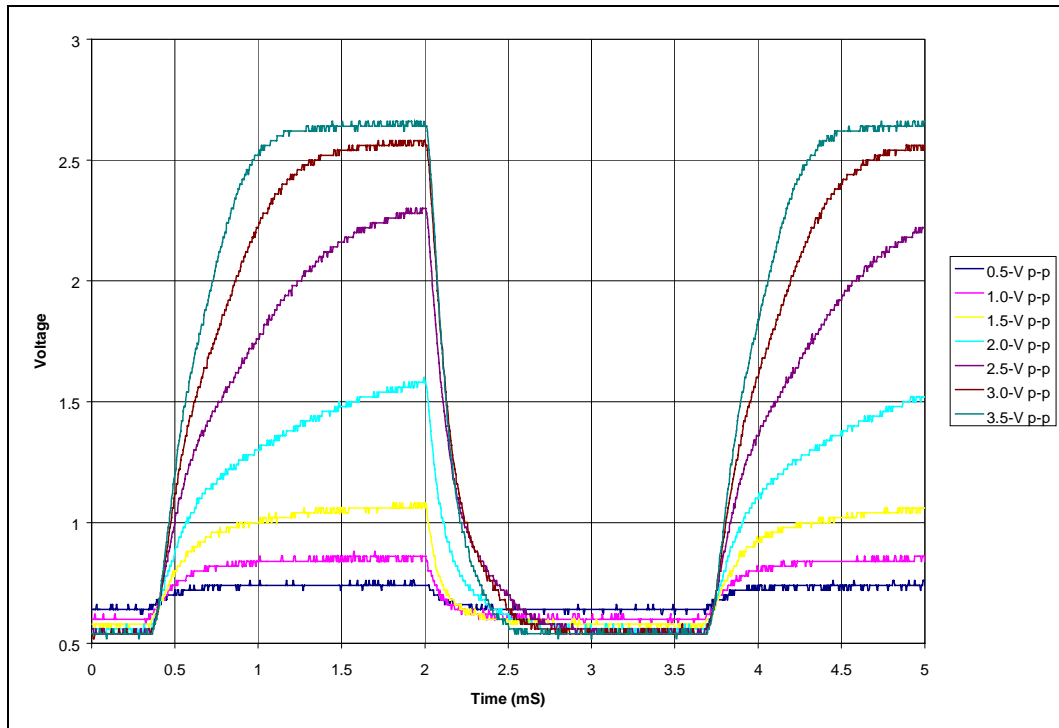


Figure 2 - Analog FLC response at 300-Hz.

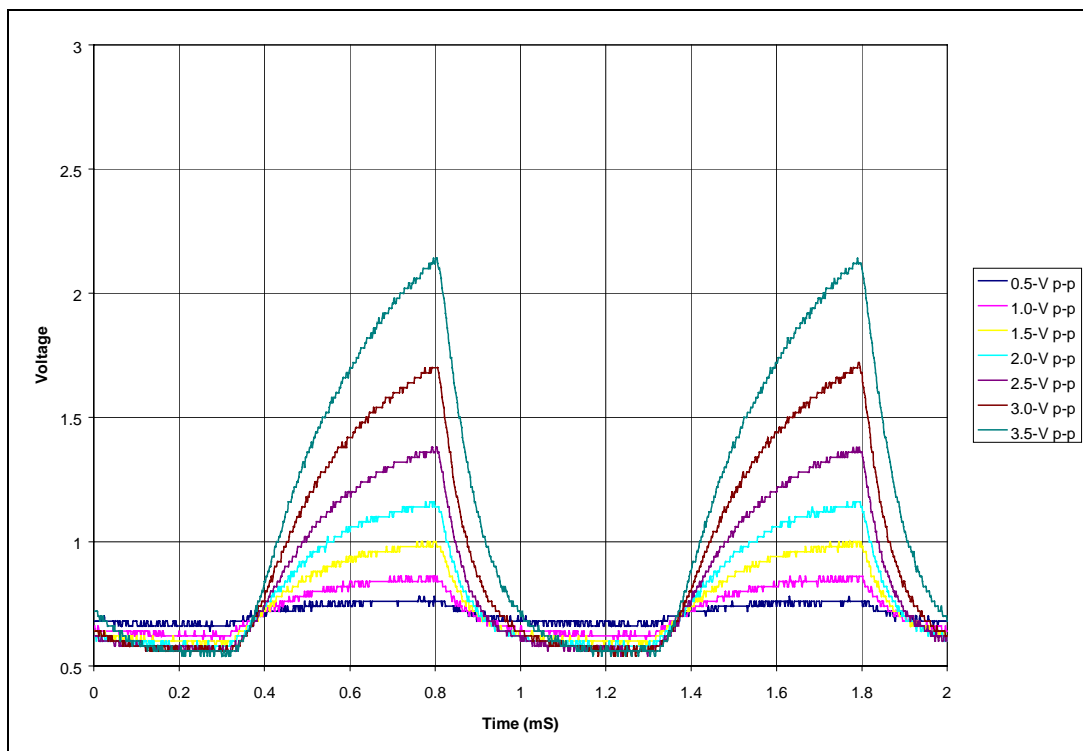


Figure 3 - Analog FLC response at 1000-Hz.