

## PSII-5

### **In-Plane-Hybrid Mode for wide viewing angle characteristics**

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Liquid crystal displays (LCD) provide most of the displays currently used such as mobile displays, notebook computers, monitors and television sets. In the field of monitors and television sets, particularly large size and high display performance are required. Among them, wide viewing angle (WVA) characteristics are always issued as a critical problem in LCD because their operations are based on optical anisotropy of liquid crystal molecules. To achieve the WVA characteristics, various LC modes are studied such as in plane switching (IPS) mode and patterned vertical alignment (PVA) mode but each mode have different drawbacks. For example, IPS mode has very good WVA characteristics but brightness and contrast ratio are not sufficient. PVA mode have been enhanced the WVA performance by adopting multi-domain structure such as chevron structure but that is not enough for vertically oblique incident light.

To overcome these problems, we propose In-Plane-Hybrid (IPH) mode which composed with the PVA mode and IPS mode within one pixel. In this work, we improved the merits and overcame the demerits of each mode's characteristics such as viewing angle, brightness, and contrast ratio. The high brightness and contrast ratio characteristics of PVA mode and good wide viewing angle property of IPS mode are well combined, so we can realize the high display performances. From calculated results, our IPH mode has wider viewing angle characteristics about 25% than conventional PVA mode. We believe that our IPH mode could be a good candidate for high performance LCDs.

Keyword : wide viewing angle, liquid crystal display, in-plane-hybrid

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## **Book of Abstracts**

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