

## Monolayer Rotating Ball Electronic Paper Display

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‘Electronic paper (EP)’ provides desirable viewing characteristics of paper with being thin, lightweight, flexible, and recordable with minimal power consumption. Currently, a number of different technologies to realize the EP are actively competing.

Here we demonstrate a newly developed monolayer rotating ball (MRB) electronic paper display where optically anisotropic rotating balls were disposed in a monolayer, and controllably closely packed with respect to one another. The close packed monolayer configuration provides high brightness and improved contrast with better electrical and optical features in comparison with the typical (Gyrion) rotating ball display. In this talk, we present characteristics of the MRB display in terms of performance, with particular emphasis on the response time as a function of the electric field.

**Keywords:** Electronic Paper Display, Monolayer Rotating Ball (MRB)

## Development of MEMS based Piezoelectric Inkjet Print Head and Its Applications

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Recently inkjet printing technology has been developed in the areas of low cost fabrication in environmentally friendly manufacturing processes. Although inkjet printing requires the interdisciplinary researches including development of materials, manufacturing processes and printing equipment and peripherals, manufacturing a printhead is still core of inkjet technology. In this study, a piezoelectric driven DOD (drop on demand) inkjet printhead has been fabricated on three layers of the silicon wafer in MEMS Technology because of its chemical resistance to industrial inks, strong mechanical properties and dimensional accuracy to meet the drop volume uniformity in printed electronics and display industries. The flow passage, filter and nozzles are precisely etched on the layers of the silicon wafers and assembled through silicon fusion bonding without additional adhesives. The piezoelectric is screen-printed on the top the pressure chamber and the nozzle plate surface is treated with non-wetting coating for jetting fluids. Printheads with nozzle number of 16 to 256 have been developed to get the drop volume range from 5 pL to 80 pL in various industrial applications. Currently our printheads are successfully utilized to fabricating color-filters and PI alignment layers in LCD Flat Panel Display and legend marking for PCB in Samsung Electronics.

**Keywords:** Inkjet, Print Head, Material deposition, Inkjet Printing