

## Supplementary Material

# Enhancing the Signal Contrast Ratio and Stability of Liquid Crystal-based Sensors by Using Fine Grids Made by Photolithography of Photoresist

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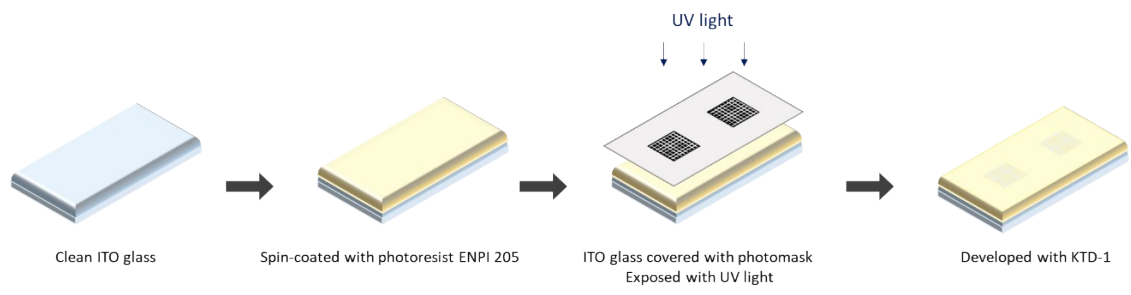
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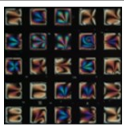
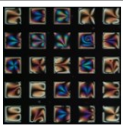
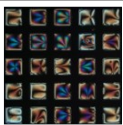
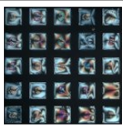
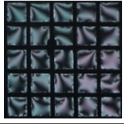
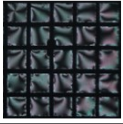
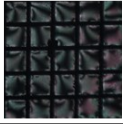
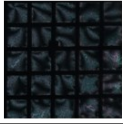








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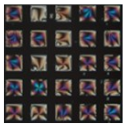
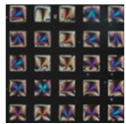
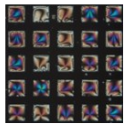
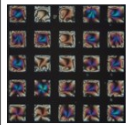
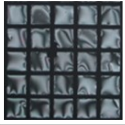
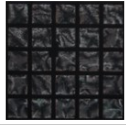
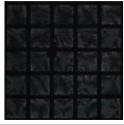
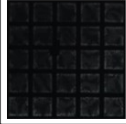
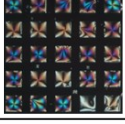
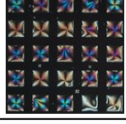
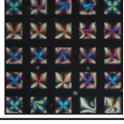
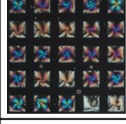
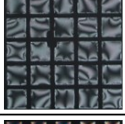
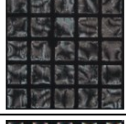
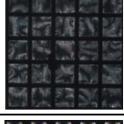
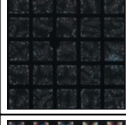
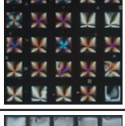
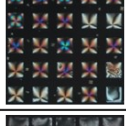
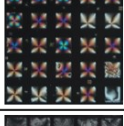
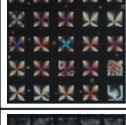
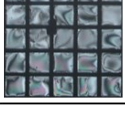
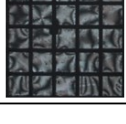
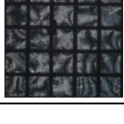
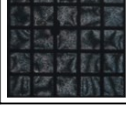
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**Figure S1.** The process diagram of photolithography.

		0 min	2 h	8 h	24 h
PR grid 3 $\mu\text{m}$	Planar				
Cu grid 20 $\mu\text{m}$	Homeotropic				
PR grid 3 $\mu\text{m}$	Planar				
Cu grid 20 $\mu\text{m}$	Homeotropic				

**Figure S2.** The POM images of the photoresist grids and copper grids filled with 5CB in planar orientation (immersing in the deionized water) and homeotropic orientation (immersing in the deionized water containing 0.01% SDS) for long-term stability testing.

PBS + HCl/NaOH		0 min	2 hr	8 hr	24 hr
<b>pH 4</b>	PR grid				
	Cu grid				
<b>pH 7</b>	PR grid				
	Cu grid				
<b>pH 10</b>	PR grid				
	Cu grid				

**Figure S3.** The POM images of the photoresist grids and copper grids filled with 5CB immersing in the aqueous solution at pH 4, pH 7 and pH 10 prepared with PBS buffer solution.



**Figure S4.** The layout of the experiments using a smart phone to capture the LC images under ambient light.