

# Investigation and Application of Polarization Shielded Smectic (PSS) Liquid Crystal Display

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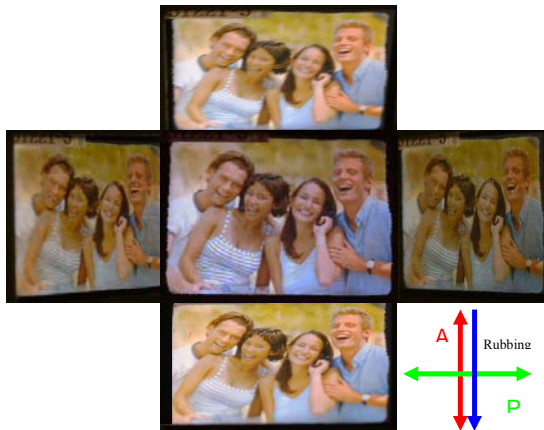
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## Abstract

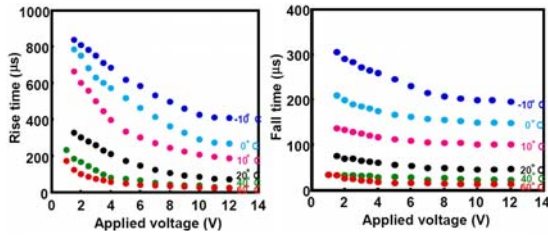
The investigation and application of 1.5" low temperature poly-silicon (LTPS) backplane for polarization shielded smectic (PSS) liquid crystal displays are described in this paper. Due to the induced polarization nature of smectic C (SmC) layer, the PSS mode exhibits analog gray scale capability and native wide viewing characteristics under specific molecular alignment. Especially, the PSS phase is very broad in temperature range thereby it can be operated during -20 to 80°C. The inter-gray level response time and contrast ratio of panel are successfully demonstrated to be 500µs and 240:1, respectively. Moreover, the ultra-fast optical switching behavior and blur free image quality, as well as simple pixel design enable it becoming a promising candidate in niche market for car navigation and high-end mobile device application.

### Wide viewing performance at ± 45°

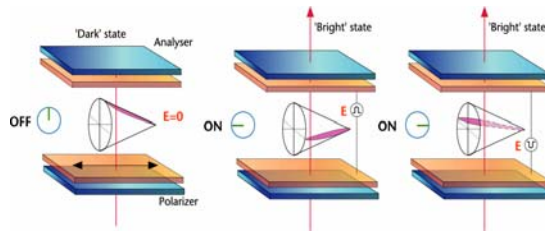


### Specification of LTPS PSS-LCD

<b>Form Factor</b>	Panel size	1.5"
	Active area (mm)	30.6 x 22.8
	Resolution (dot)	502 x 240
	Dot pitch (µm)	61 x 95
<b>PSS Mode</b>	No. of colors	262K
	Transmittance	3.60%
	Brightness	175 nit (3 LED)
	Contrast ratio	120 @ 3.3V; 240 @ 6.5V
	Response time	500 µs (inter-gray)
	Color gamut	50 % NTSC
Viewing angle	H 160°; V 160°	



Response time at various temperatures



Dynamic switching behavior of PSS-LCD