



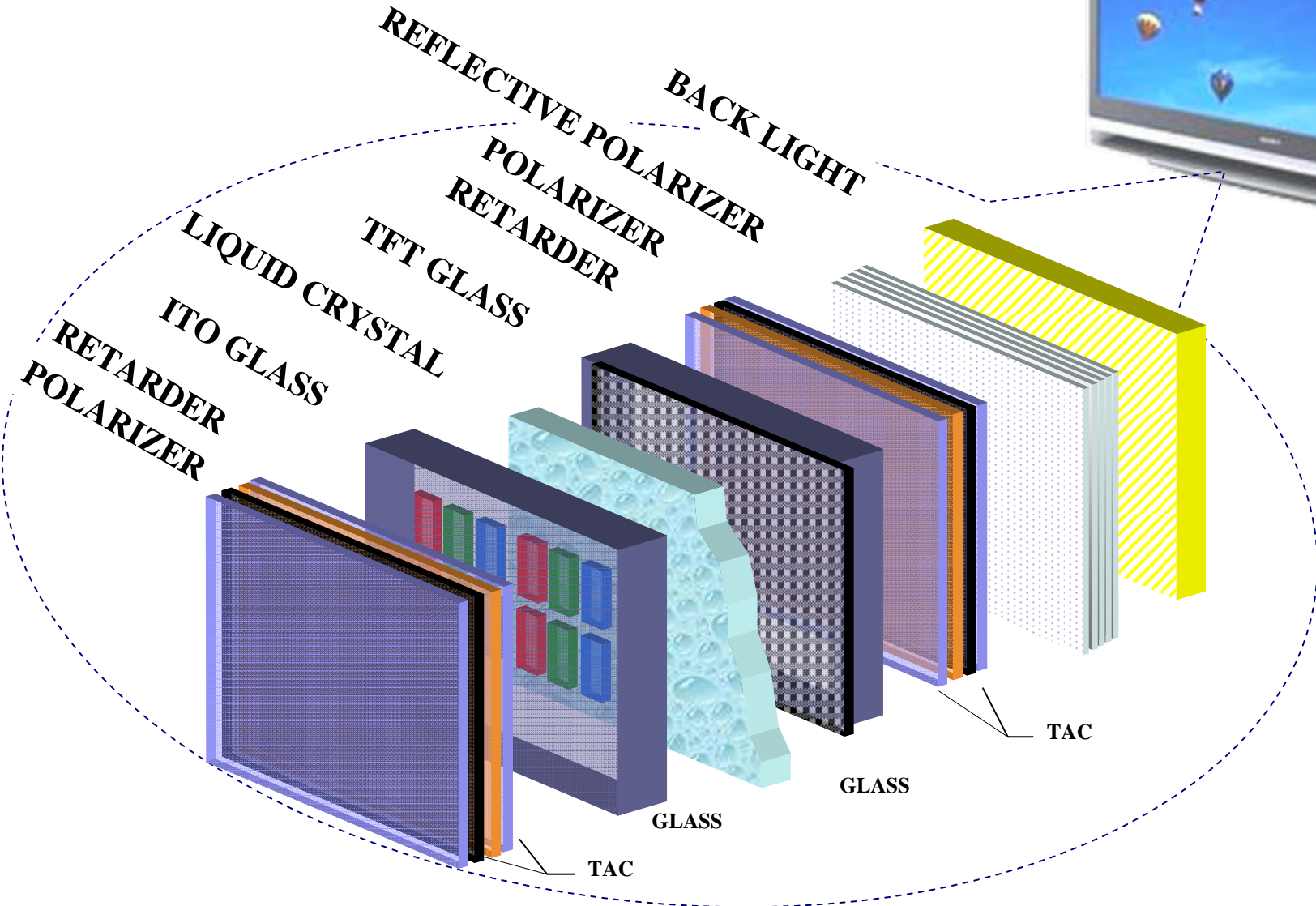
HOME TV LCD

cost reduction and light efficiency
enhancement
program

Kontrakt Technology Ltd.

11-2008

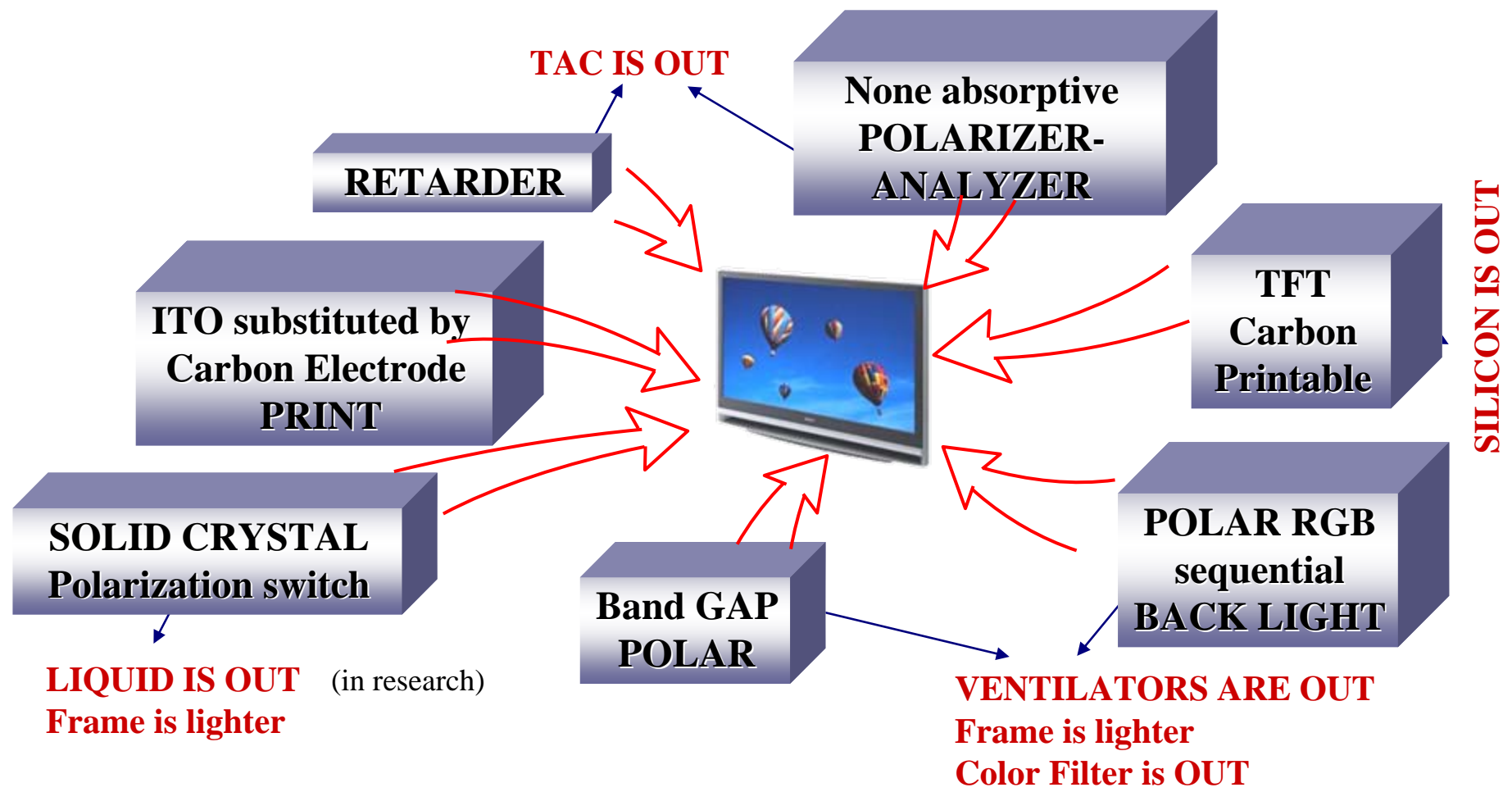
Home TV LCD Structure



System Solution for Home TV

LCD

TASK: 10 times cost reduction



Cost reduction strategy in LCD

- RGB Alternating Polar Backlight –
eliminate back Polar and Color Filter
- Coatable inside-cell Optical Films:
“Polarizer Analyzer/Retarder”–
eliminate plastic films
- Coatable Switch material
eliminate liquid crystal
- Coatable Carbon-Based
 - Semiconductor for TFT
 - Interconnects in TFT plate
 - Electrodes in front plate
 - eliminate vacuum deposition.

Crysoptix Printable Films

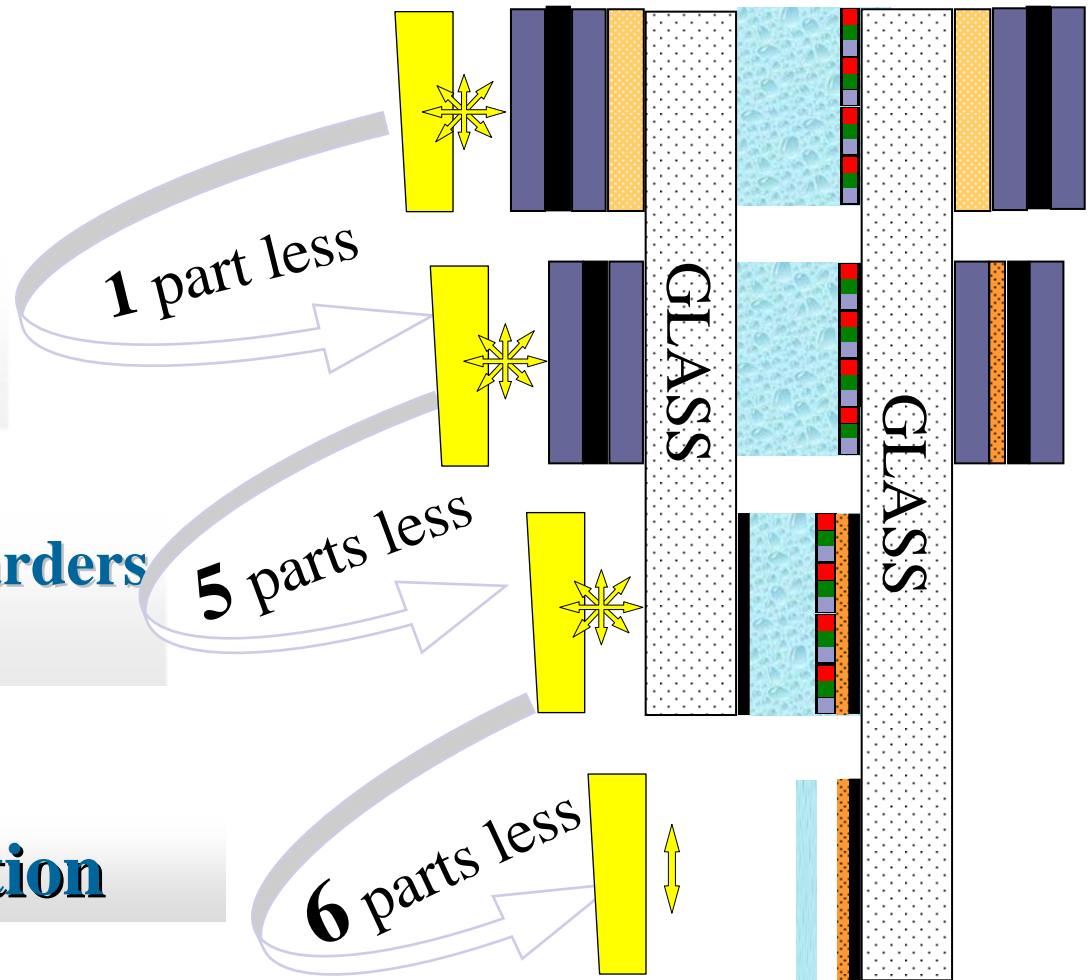
– Ultimate Integration of LCD Cell

Typical configuration

Single Crysoptix retarder printed onto polarizer

Crysoptix polars and retarders printed on-glass

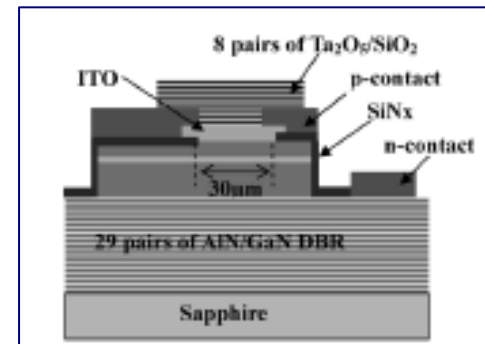
Future configuration



Candidate solution

■ Light emitter:

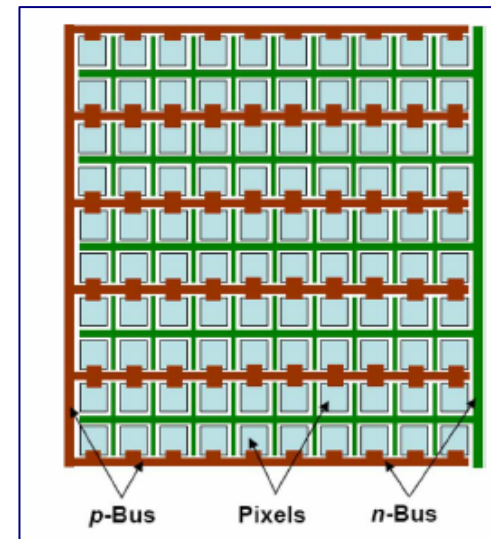
- III-V quantum wells on unique sapphire*
- Unique buffer layer*
- Resonant cavity



IEEE Photonics Tech. Letters, Vol. 19, No. 13, July 1, 2007

■ Device design:

- MicroPixel array
- Thermal management (heat sinks)
- Light distribution (light pipes)

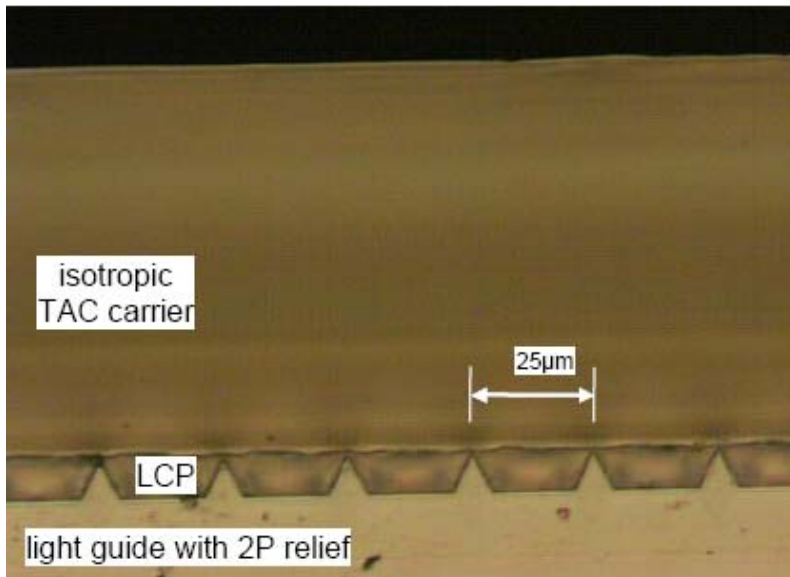
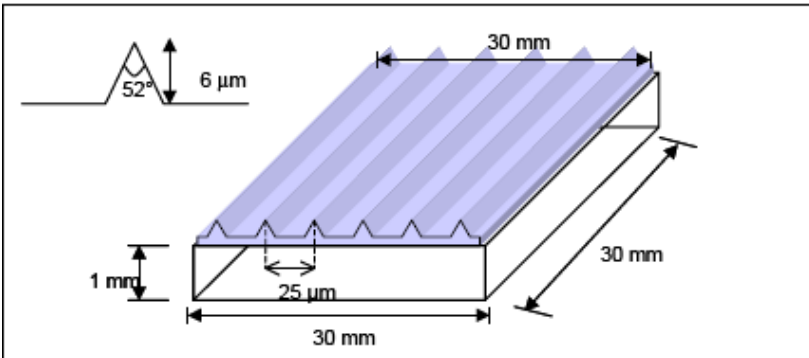


* Unique feature (Combination of all features is unique)

RGB Polar LED specs

- RGB tunable wavelength
- $W(1/2) = 6\%$ of wavelength
- Time resolution in p-sec.
- Target polarization efficiency – 100%
- Form-factor → array
- Energy efficiency => 40%

Rectifying reflectors: Brewster reflector



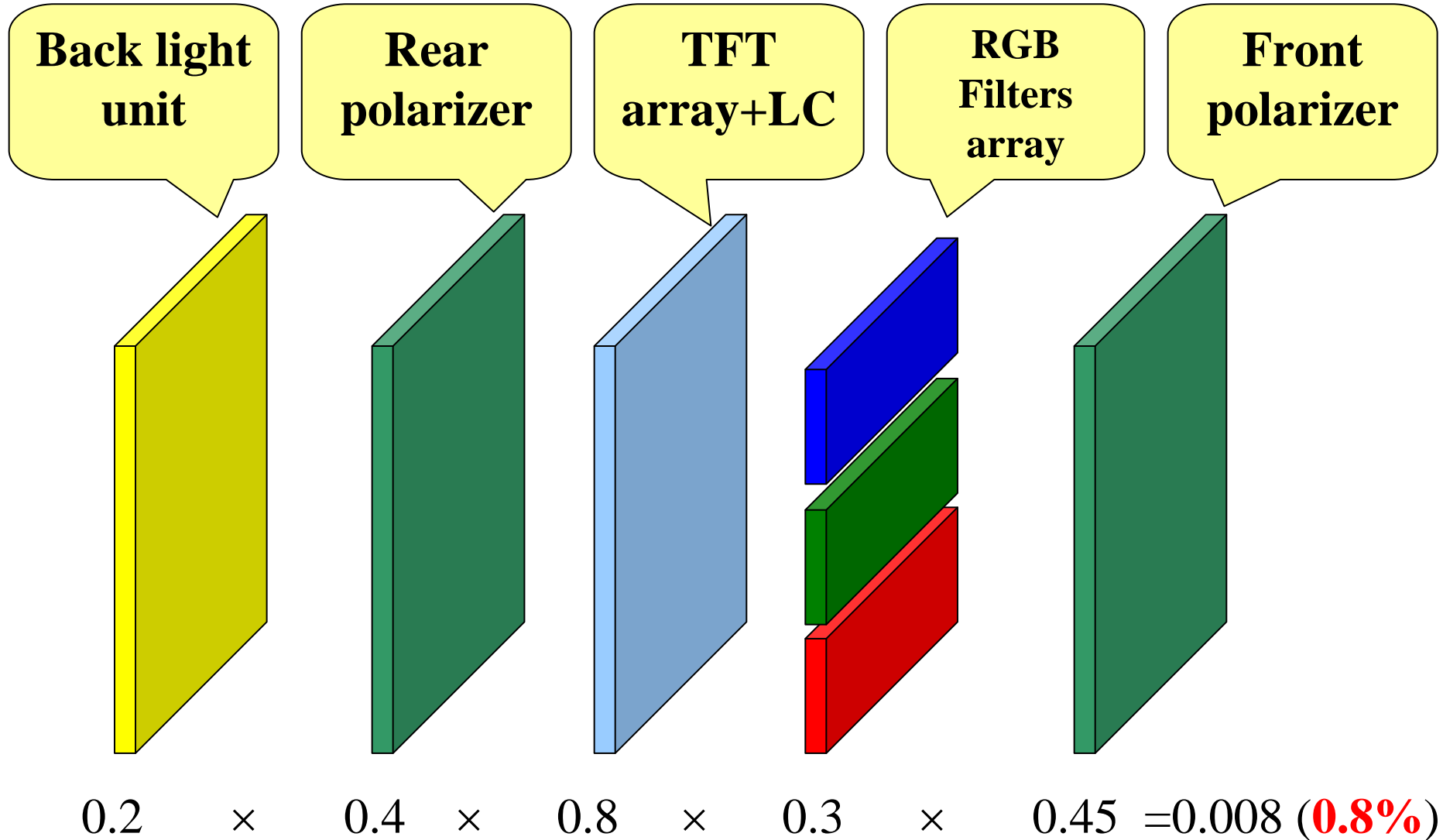
Polarization in Light source can be enhanced by additional polarizing Devices:

- Rectifying Brewster reflectors for Side-line source configuration
- Multilayer Bragg reflectors for all light source locations



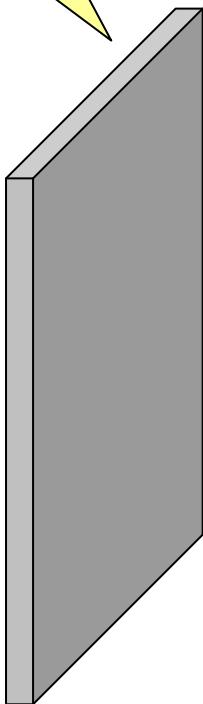
The End

Efficiency of typical LCD

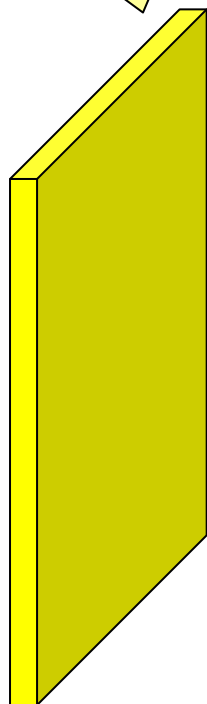


Efficient LCD design N2

Mirror for
light
recycling

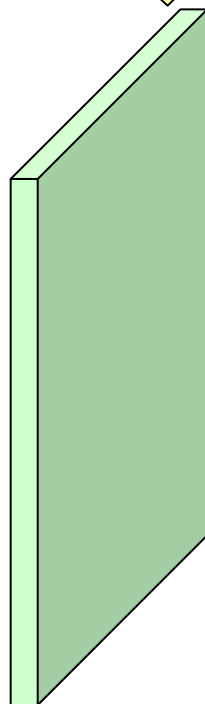


Time
multiplexed
LEDs RGB
unit



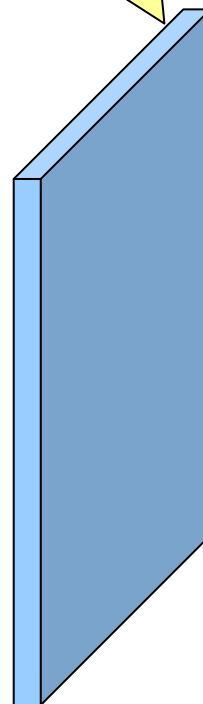
0.3 ×

PBG
reflective
polarizer



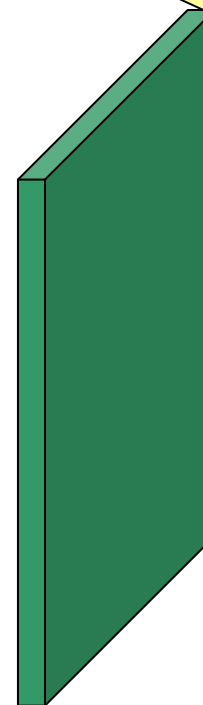
0.9 ×

TFT array+LC
(in time-
multiplexed
mode)



0.8 ×

Analyzer



0.45=0.1 (**10%**)

Q

- Target price for retarders
- Specs for future – dispersion?
- Cost decline
- Price decline
- Retarder & I-Polar Analyzer in Front plate
- RGB Pol BL-t - =
25%CF+31%BL+10%Polar=>66% BOM