

Discord In the Touch Industry



It's Not Always About Technology

Geoff Walker
Owner & Principal Consultant
Walker Mobile, LLC

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Thesis

“One-Glass Solution” vs. On-Cell Touch isn’t really about technology, it’s about

The Touch-Panel Industry

vs.

The LCD Industry

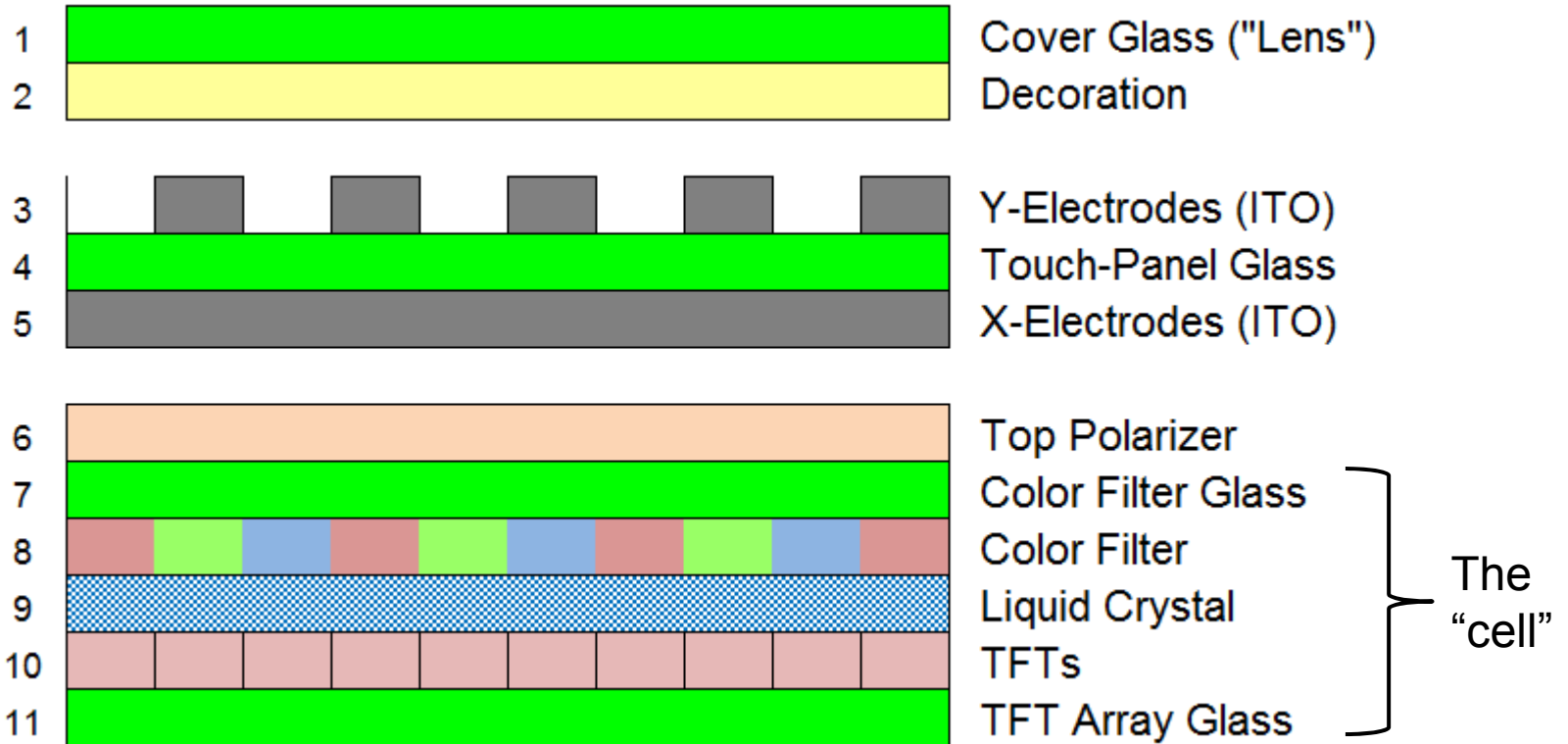
NOTE: *In the context of this presentation, in-cell touch isn’t part of the discussion. It’s a future battle.*



Definitions...1

❖ “Standard” p-cap stack-up

◆ **Four** pieces of glass (rows 1, 4, 7 & 11)



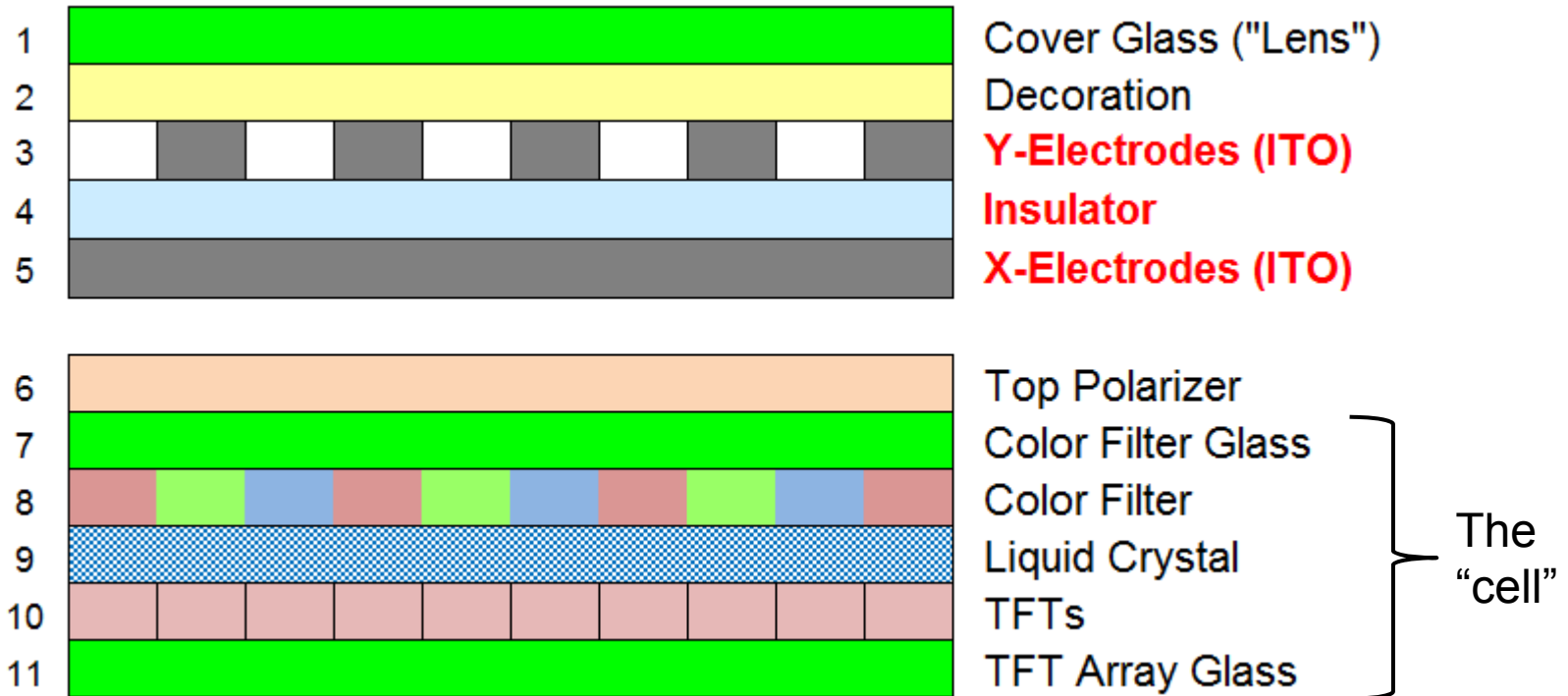
Source: Author



Definitions...2

❖ “One-Glass Solution” (OGS)* p-cap

◆ **Three** pieces of glass (rows 1, 7 & 11)



Source: Author

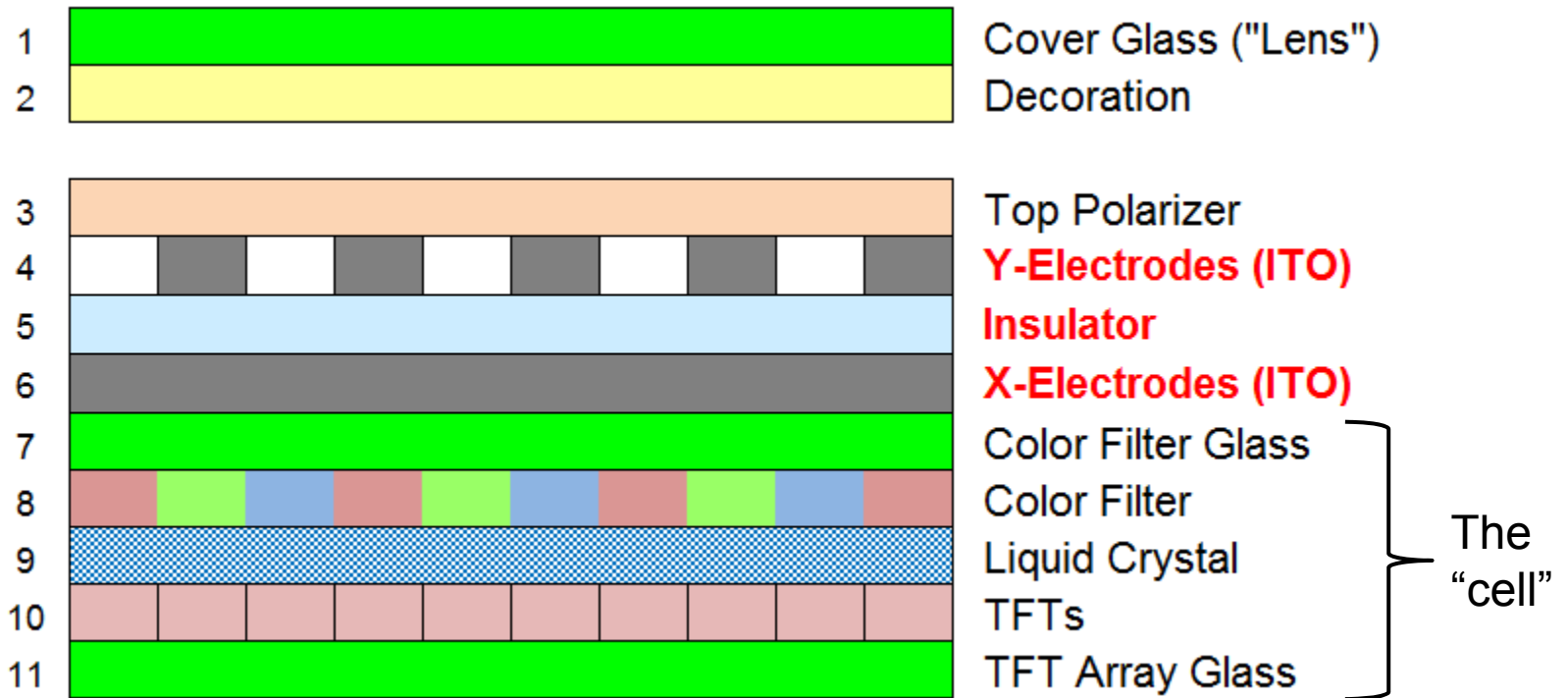
* “Sensor on Lens”, “Window Integrated Sensor”, “Direct Patterned Window”, etc.



Definitions...3

❖ On-cell p-cap

- ❖ Electrodes are moved to between the top polarizer and color filter



Source: Author



Comparison...1

❖ Thickness

- ◆ Same

❖ Weight

- ◆ Same

❖ Off-screen buttons

- ◆ On-cell can't do this; OGS can

❖ Performance

- ◆ Approximately the same

❖ Controller

- ◆ Same

❖ Cost

- ◆ Approximately the same
- ◆ Current yields are roughly equal

**The end-user
can't tell the
difference**

(except for the
off-screen buttons)



Comparison...2

❖ What the device OEM buys

◆ OGS

- Touch-panel/cover-glass from TP supplier
- Standard LCD from LCD supplier
- **Nothing from CG supplier**

This is a relatively small business already being attacked from multiple directions

◆ On-cell

- Special LCD with on-cell touch from LCD supplier
- Cover glass from CG supplier
- **NOTHING from TP supplier**

This is a robust **\$7B** business that's not going to give up without a fight



Comparison...3

❖ What the device OEM would like to buy

- ◆ Laminated LCD/touch-panel/cover-glass module

❖ Problem

- ◆ LCD suppliers don't want to get into the cover-glass business – each device's cover-glass is unique

❖ Solution

- ◆ Touch-panel suppliers are very willing to get into the cover-glass business (vertical integration)
 - e.g., TPK spent \$250M capex on cover-glass equipment in 2011
- ◆ Touch-panel suppliers can get LCDs on consignment and build the complete module

The Influence of the Touch-Controller Suppliers

❖ It's the same controller for OGS & on-cell

- ◆ However, with on-cell, the touch controller can be integrated with the display driver

- Great performance, but it's a specialized, resolution-specific ASIC

❖ The controller supplier can swing the pendulum

- ◆ Synaptics is very willing to work very closely with LCD suppliers to create optimum on-cell & in-cell designs (→ see paper #37.1)

- ◆ Atmel just announced XSense, a sensor made with an ITO-replacement material (metal mesh)

- They seem to want to become a touch-module supplier

- ◆ Cypress?

- ◆ The 20+ other controller suppliers?

❖ Do the controller suppliers want to trade 30 module customers for 5 LCD customers?



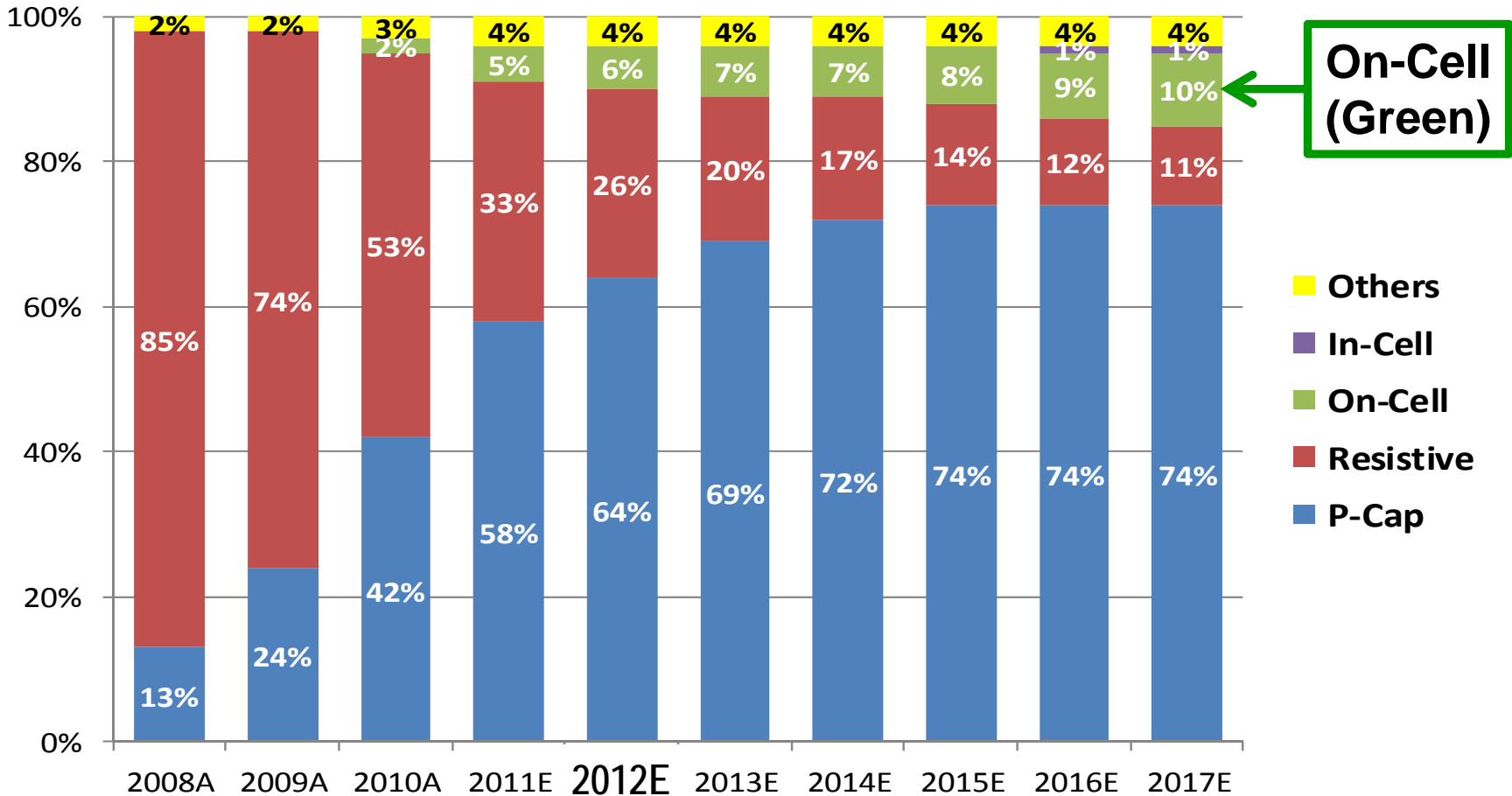
The Problem of LCD Product-Management

❖ An LCD with on-cell touch is a different product

- ◆ In many cases the LCD supplier will have two versions of a given LCD – one with touch and one without
- ◆ The touch version will cost more, so it can't be the only version

One Forecast for On-Cell

% of Units Shipped



Source: Guoxin Securities, TPK, DisplaySearch



Discussion

What do you think the touch-panel suppliers will do to prevent the destruction of their business by on-cell touch?



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Thank You!

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Walker Mobile, LLC
799 Valencia Drive
Milpitas, CA 95035

408-945-1221 office
408-945-7904 fax
408-506-7556 mobile

geoff@walkermobile.com
www.walkermobile.com