Simpler Sensor Structures Coming to Projected Capacitive Touch Screens in 2012

General Electric

Santa Clara, Calif., October 27, 2011—Projected capacitive, the predominant touch screen technology, has many different structures. Over the next few years, these structures will be simplified as sensor substrate layers are reduced, according to the DisplaySearch *Touch Panel Market Analysis* [1]*: October 2011 Update*. These simpler touch panel structures will bring the benefit of thinner and lighter devices.

“Two approaches are emerging to simplify projected capacitive sensor designs,” said Jennifer Colegrove [2], PhD, Vice President of Emerging Display Technologies for DisplaySearch. “One is sensor-on-cover and the other is in/on-cell.”

In-cell and on-cell sensors are typically integrated during the display manufacturing process, whereas sensor-on-cover involves coordination between touch sensor and cover glass makers. While Apple products use glass-based sensors with ITO (indium tin oxide, the typical transparent conductor) layers on both sides, most sensors use one or two layers of ITO on the same side of the glass; this is required for sensor-on-cover because the outer side is the exterior of the product.

As projected capacitive touch screen shipments grow by more than 100% Y/Y, cover glass has become a key component in touch screens. Regardless of the type used—sensor-on-cover or in/on-cell—cover glass is a must for projected capacitive touch for both cosmetic and protection purposes. Cover glass finishing is very labor-intensive and, depending on the processes required and specifications, has yield rates in the 70% range. Process challenges will be an increasingly strategic issue for the industry. Depending on the technology and supply chain, cover glass finishers and touch module makers will be working together by contract or informal relationship, while tier-one touch module makers are integrating and expanding their in-house cover glass finishing capacities.

Price Trends by Region and Size

The touch screen supply chain is evolving differently in each region, based on variations in technologies and supply chain variables. Although sensor patterning and lamination processes are mostly automated, manpower is still necessary, especially for inspection. Japan, with high labor costs as well as a complex supply chain, tends to have the highest cost structure. China offers the lowest prices for mature mobile phone sensors, and Taiwan has lower prices for tablet PC sensors. This is due to greater availability of glass and better access to Gen 4.5 and larger equipment for sensor deposition and photolithography.

For popular mobile PC sizes (9.7” and 10.1”), average selling prices (ASPs) per unit are in the range of $1.00-1.50 per inch; however, DisplaySearch anticipates ASPs

will fall as popularity increases. ASPs of regular notebook sizes (>11.6”) are still higher due to challenges in scaling production.

Other Key Findings from the *Touch Panel Market Analysis: October 2011 Update*

- Curved or shaped cover glass—referred to as 2.5D if along one axis and 3D if along both axes—is a new design trend. Many touch-enabled smart phones look very similar, so brands are looking to use curved cover glass to differentiate their products. Due to its more complicated processes and costs, DisplaySearch expects curved cover glass to be used primarily in high-end models.
- While touch module makers are likely to outsource larger-sized sensors if volumes increase, DisplaySearch expects tier-one touch module makers to integrate cover glass finishing because it is critical for sensor-on-cover production and for decreasing substrate weight and thickness.
- Moving into the holiday season, DisplaySearch forecasts that the tablet PC market will be increasingly important for the touch panel industry, particularly as lower-priced products, like the Amazon Kindle Fire, enter the market.

The October 2011 Update serves as a supplement to the DisplaySearch 2011 *Touch Panel Market Analysis* [1]. This report covers the progress of the fast-growing touch industry, including touch suppliers, newly-launched touch products, trends, trade show/conference reviews, price trends and revised forecasts for rapidly changing categories.

For more information on this report, please contact Charles Camaroto at 1.888.436.7673 or 1.516.625.2452, or contact@displaysearch.com [3] or contact your regional DisplaySearch office [4] in China, Japan, Korea or Taiwan.

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