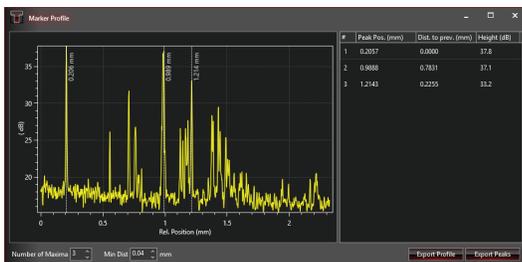# Displays

APPLICATION

Modern displays are made up of several layers and micron-sized features. For quality control of such devices, a fast and non-destructive technique is desired.
In recent years, Optical Coherence Tomography (OCT) has emerged as such a technique to measure layer thicknesses and detect defects in the micron regime.

QUICK FACTS

- OCT is a nondestructive imaging technique used for quality control.

- OCT can be used to visualize the individual layers of a display.

- OCT can be used to image structures such as electrodes or pixels within a display.

- Individual depth scans only take a few microseconds, while 2D cross sections take a few milliseconds.

- OCT can acquire 3D volumetric images.

- A Software Development Kit (SDK) included with all systems allows for easy integration with other devices.

- Automated peak detection can measure the thickness of individual layers with sub-micron precision.

Peak Detection in OCT Software

TYPICAL SETUP

To image small areas of the display, the display can simply be placed underneath the probe. The probe can image areas of up to 16 mm x 16 mm without the need to move the sample.

To image larger areas, the display can be placed on an automated translation stage. This stage then moves the region of interest under the imaging probe, as shown below.
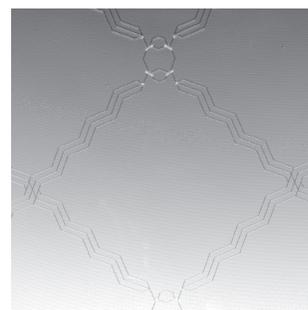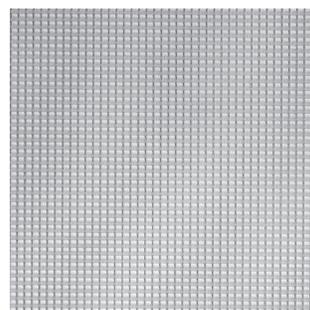

* Images were taken using the TEL221C1 system and several commercial smartphones.

EXAMPLE IMAGES
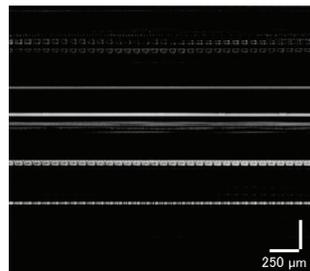
Left: Individual layers (horizontal lines represent interfaces) and pixels (squares in the middle of the images) of a smartphone.*

250 µm

Left: Top view of a layer with individual pixels of a smartphone display. Each pixel is about 78 µm wide. Right: Top view of a 3D volume in a display of a smartphone (5 mm x 5 mm). A clear picture of electrodes within the display emerges.*
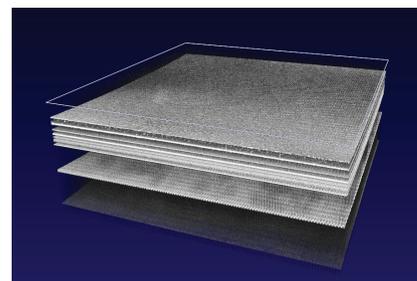
Right: 3D Volume of Smartphone Display with Various Layers*

RECOMMENDED ITEMS

Choice of OCT System:

- **TEL221C1(/M):** For Large Imaging Depth

- **GAN632C1(/M):** For High Resolution Imaging

TEL221C1

Useful Accessories:

- Additional Lenses for Larger Field of View: **OCT-LK3** (10 mm x 10 mm) and **OCT-LK4** (16 mm x 16 mm)

- Translation Stage for Moving Display and Increasing the Area Under Inspection: **MLS203**

Interested? Email OCT@thorlabs.com for more information.