Design Document

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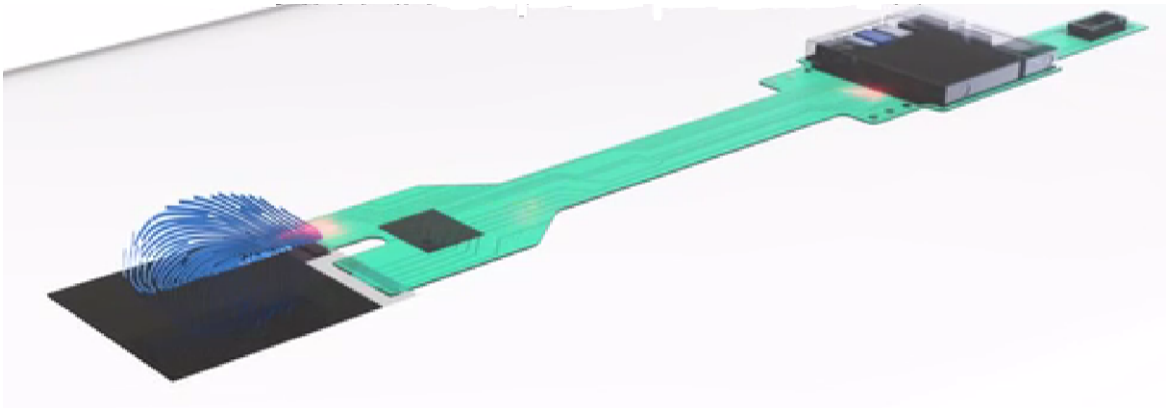
Reducing Latency in Fingerprint Sensor

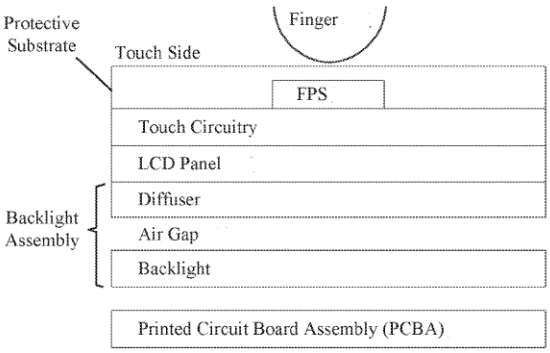
There are different types of fingerprint sensors used for security authentication,such as optical,capacitive and Ultrasonic sensor.
Basically, capacitive sensor uses capacitor in form of sensor which will use the ridge and valley for sensing the data, optical sensor uses light and capture the image of finger and process it will the preloaded data. Atlast, ultrasonic sensors uses sound wave for authentication.
With the increase in the use of OLED screen in mobile,the use of Optical fingerprint sensor increased rapidly. Previously, Capacitive sensor were for fingerprint but is replaced with optical sensors.

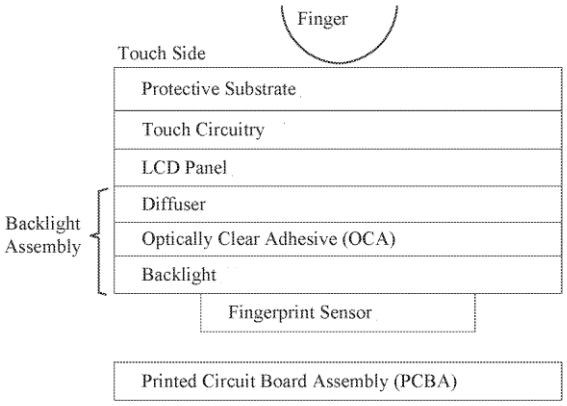
On a very basic level for reducing delay,we can reduce the length of bus used to transfer data between sensor and processor. For that purpose, we have to place the processor somewhat more closer than what actually it is.Also the data from the sensor will be send to the processor in form of interrupt and we can also give higher priority interrupt for the given data so that the processor can directly process the data and this will also reduce the delay.Its also depends on how fast the data is captured by sensor.



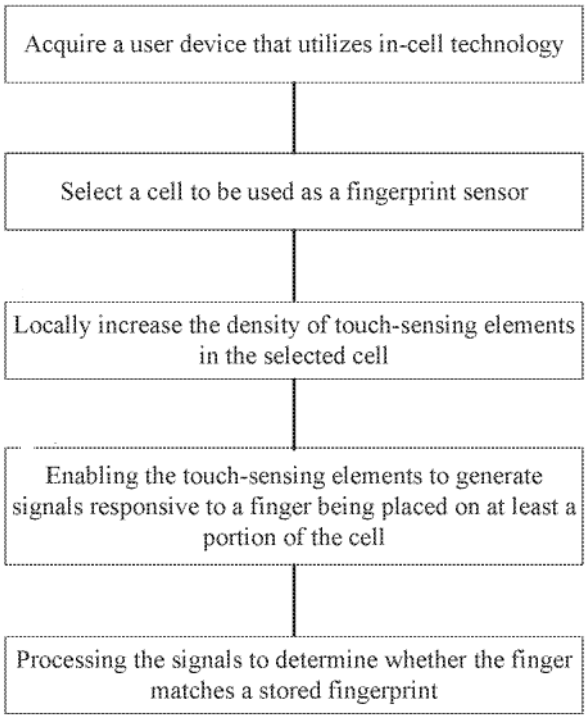
The device screen provides illumination when capturing fingerprints through local high brightness mode (LHBM).However, on device screens that suffer from first frame dimming (FFD),this causes latency in reaching the target luminance required to accurately capture the fingerprint. For instance, one pivotal adjustment involves the replacement of the customary air gap found within the backlight structure. This transformation entails the substitution of the air gap with a specially formulated, optically clear adhesive. This transparent adhesive is engineered with precision to enable the unhindered propagation of waves emitted by the fingerprint sensor. This innovation ensures that the sensor can effectively penetrate and interact with the display assembly while preserving optical clarity and integrity.

Moreover, an alternative approach involves enhancing the touch-sensing capabilities of a display assembly that employs in-cell technology. By strategically augmenting the density of touch-sensing elements within specific regions of the display, the device can effectively replicate the functionality of a traditional fingerprint sensor. This innovative technique permits the seamless integration of biometric security features into the display, offering a sophisticated and unobtrusive user authentication solution while maintaining the display's high standards of performance and aesthetics.





The following flow chart shows how fingerprint sensor collects data and process it.



FFD and LHBM plays a major role for the data collection in the sensor.Fast the data is collected, unlock also become fast.
We are still reading about FFD and LHBM which will be updated in upcoming draft.