Dependence of Sensing Signal on the Resistance of Bus Lines

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The security issues for personal mobile devices become more important. The security is required in the electronic commerce via the mobile device. In accordance with this request, they are using the biometric information such as fingerprint, iris, face, voice and blood vessel. Among these various biometric information technologies, fingerprint recognition has been used widely. Recently, smart phones and tablet PC are using fingerprint recognition technology. And also they suggested the fingerprint recognition on a display. However, adding a device for the fingerprint on the display in a mobile device has a problem that increasing the volume and thickness. Therefore, there is a need for technologies that reduces an extra space for the fingerprint recognition sensor and do not interfere with the display of a mobile device. Most mobile devices for fingerprint recognition adopt a sensor fabricated on Si-wafer. The thin film transistor (TFT) based sensor circuits on a glass have been developed because Si-wafer based process is relatively complex and expensive. The TFT based sensor circuit has advantage of transparency compared to the Si-wafer and transparancy can be improved by using transparent electrode. We compared the sensing signal between the metal wire and indium tin oxide (ITO) wire. Figure 1 shows simulation results for both the indium tin oxide and metal wiring. ITO increases transparency of the sensor array, however, it has disadvange of RC delay increse due to higher sheet resistance than the metal. Readout voltages are sensing voltages and R means ridge and V means valley of the figerprint. Figure 1 (a) is for the ITO wire and (b) is for the metal wire. Scan pulse delay is larger for the ITO wire and figure shows the larger RC delay for the ITO. Even though the RC delay is larger for the ITO, it did not affect much the output waveform.

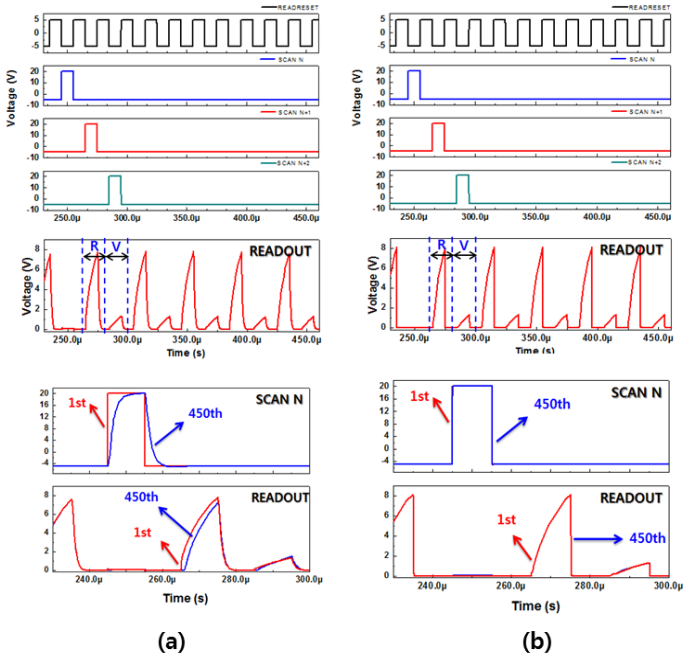

Fig. 1. Simulation results and input-output waveform, (a) the ITO wire and (b) the metal wire