Capacitive Touch Screen Panel Readout Circuit against Display Noise

Duhyun Jeon, Hyun-Woo Kim, and Byong-Deok Choi

Department of Electronic Engineering, Hanyang University, Seoul 133-791, Korea
E-mail: bdchoi@hanyang.ac.kr

Recently, the distance between a touch screen panel (TSP) and a LCD panel is becoming closer for compact devices. This trend increases the effect of a display noise on the touch performance, which is coupled from LCD common-electrode to TSP RX lines when data or gate line voltage changes. To make the TSP robust against this noise, there are several approaches are proposed such as synchronization of readout circuit with display driver IC [1] and subtracting the similar noise current from the adjacent reference line [2]. The designed readout circuit for touch screen panel consists of sensing block, ADC, excitation driver and timing controller as shown in Fig. 1(a). In the sensing block, a charge amplifier converts the RX line-induced-charge from TX to a voltage. After then a touch event can be detected depending on charges amplified to the output node. The timing controller is responsible for synchronization between sensing block, excitation driver control signal with VSYNC and HSYNC signals from the display driver IC. This synchronization is done such that detection of a touch event is performed to avoid a display noise. Sensing block measurement result is shown in Fig. 1(b).

Fig 1. (a) Block diagram of designed chip (b) Sensing block measurement result