

IoT

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Smart Glass

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Week 4 and 5

## 1. Design

Three sensors are designed using a two-finger design with the dimension of 1.5 cm finger width, 1.5 cm finger gap, and 8cm finger length for the first design. The second design has the dimension of 2cm finger width, 2cm finger gap, and 8cm finger length. The dimensions for the third design are 2.5cm finger width, 2.5cm finger gap, and 8cm finger length. We used the copper tape as a bus for connecting the sensor



Figure 1. The designs of sensors

with the LCR meter to reduce the gap between the two glasses because the gap between the glasses may give some interference in the capacitance values.

## 2. Fabrication

In the last experiment, we soldered the electrodes with wire to be able to connect to the LCR meter. However, this may reduce the sensitivity if the welded material is thick and create a gap between the glasses. Therefore, we connected the electrodes with copper tape as a bus to eliminate the gap.

## 3. Results

The capacitance values for the following events are recorded. We eliminated the without-glass cover part here since our focus is the sandwich between two glasses.

Table 1. Results for 1.5cm width electrodes

<b>Capacitance (No touch)</b>	3.65 pF
<b>Capacitance (Touch between electrodes)</b>	2.86 pF
<b>Capacitance (Touch positive)</b>	3.27 pF
<b>Capacitance (Touch negative)</b>	3.27 pF

Table 1. Results for 2cm width electrodes

<b>Capacitance (No touch)</b>	3.28 pF
<b>Capacitance (Touch between electrodes)</b>	2.5 pF
<b>Capacitance (Touch positive)</b>	3.07 pF
<b>Capacitance (Touch negative)</b>	3.04 pF

Table 1. Results for 2.5cm width electrodes-1

<b>Capacitance (No touch)</b>	2.66 pF
<b>Capacitance (Touch between electrodes)</b>	1.87 pF
<b>Capacitance (Touch positive)</b>	2.44 pF
<b>Capacitance (Touch negative)</b>	2.47 pF