‘More on Capacitance Measurements Layer 1 Sensors’

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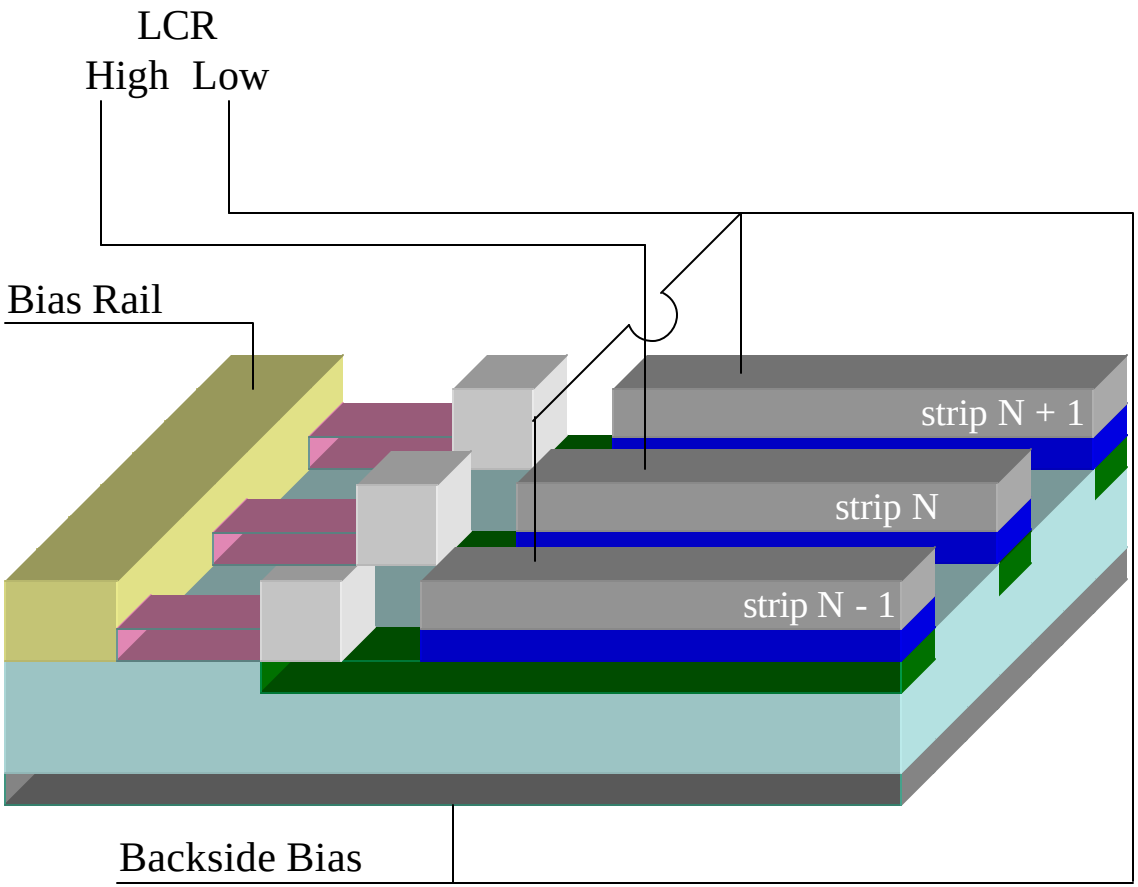
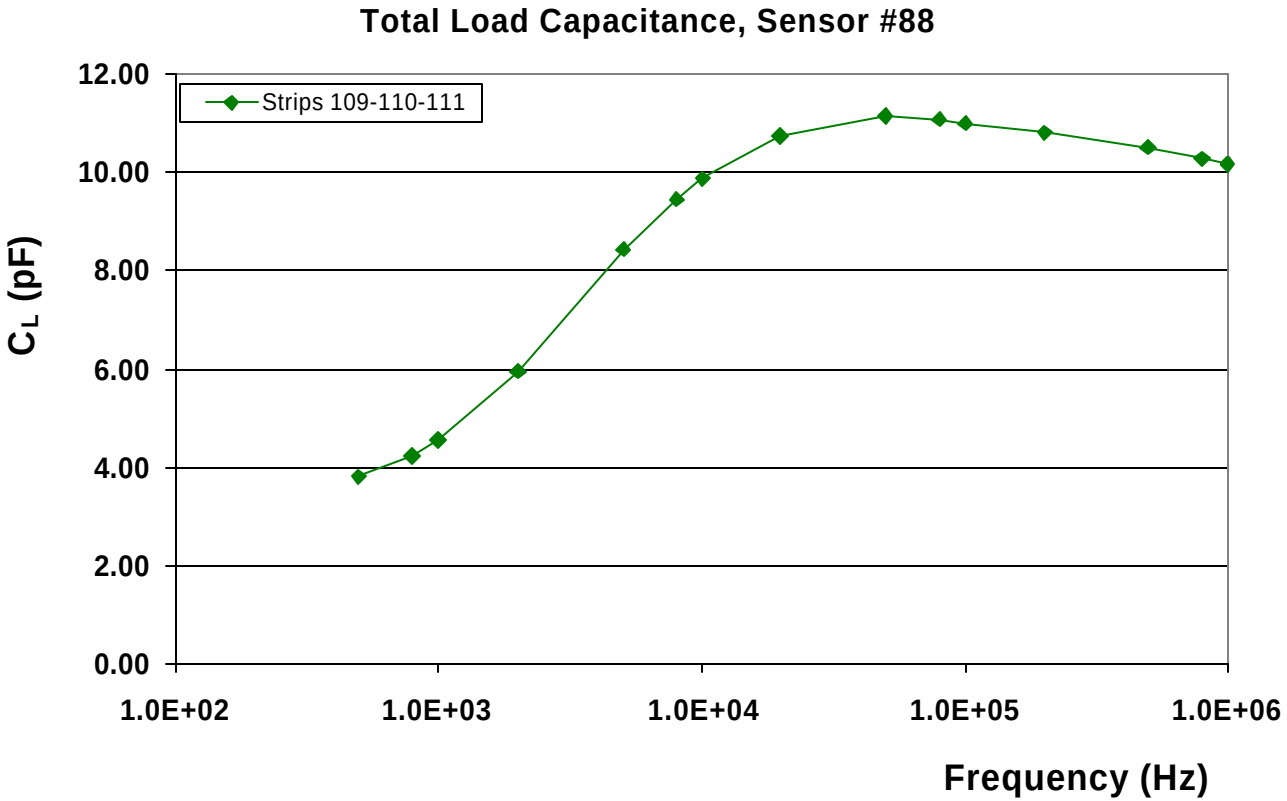
Interstrip and Load Capacitance

- Mapped C_{int} and C_L extensively for a few sensors
- Two measurements taken
  - $C_1 = C_L$: total load capacitance
    - » strips N+1, N-1 tied together
  - C_2 : capacitance to one neighbor
    - » strip N+1 or strip N-1 disconnected
  - $C_1 = 2\ C_i + C_b$
    $C_2 = \quad C_i + C_b$



Load Capacitance (Outer Layers)

- Frequency dependence of load capacitance

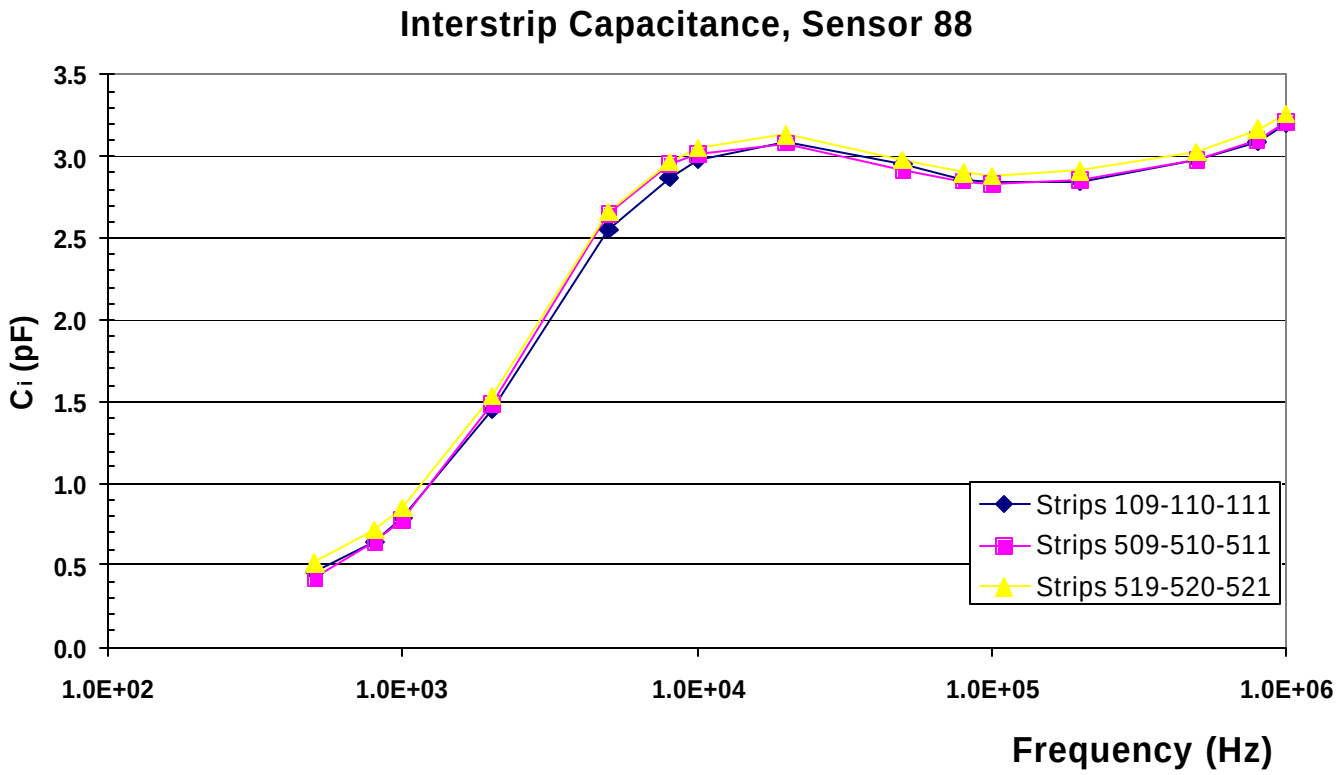


  - C_L = ~1 pF/cm at frequencies of interest for SVX4

- Capacitance should approach constant value asymptotically quality of measurements was called into question

Interstrip Capacitance (Outer Layers)

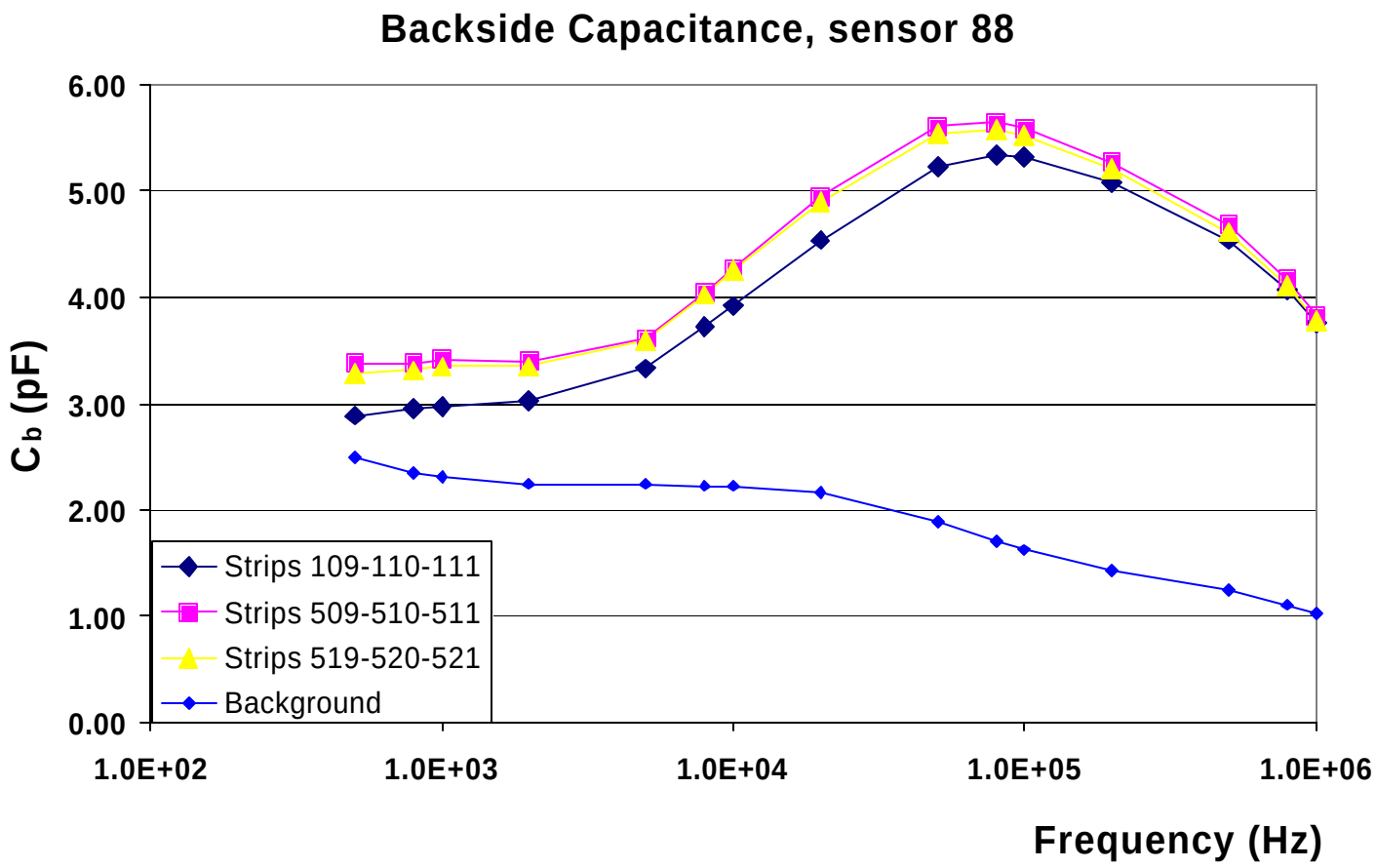
- measured for various triplets of strips on multiple sensors



- C_{int} = 0.3 pF/cm ; specifications call for C_{int} < 0.5*1.2 pF/cm

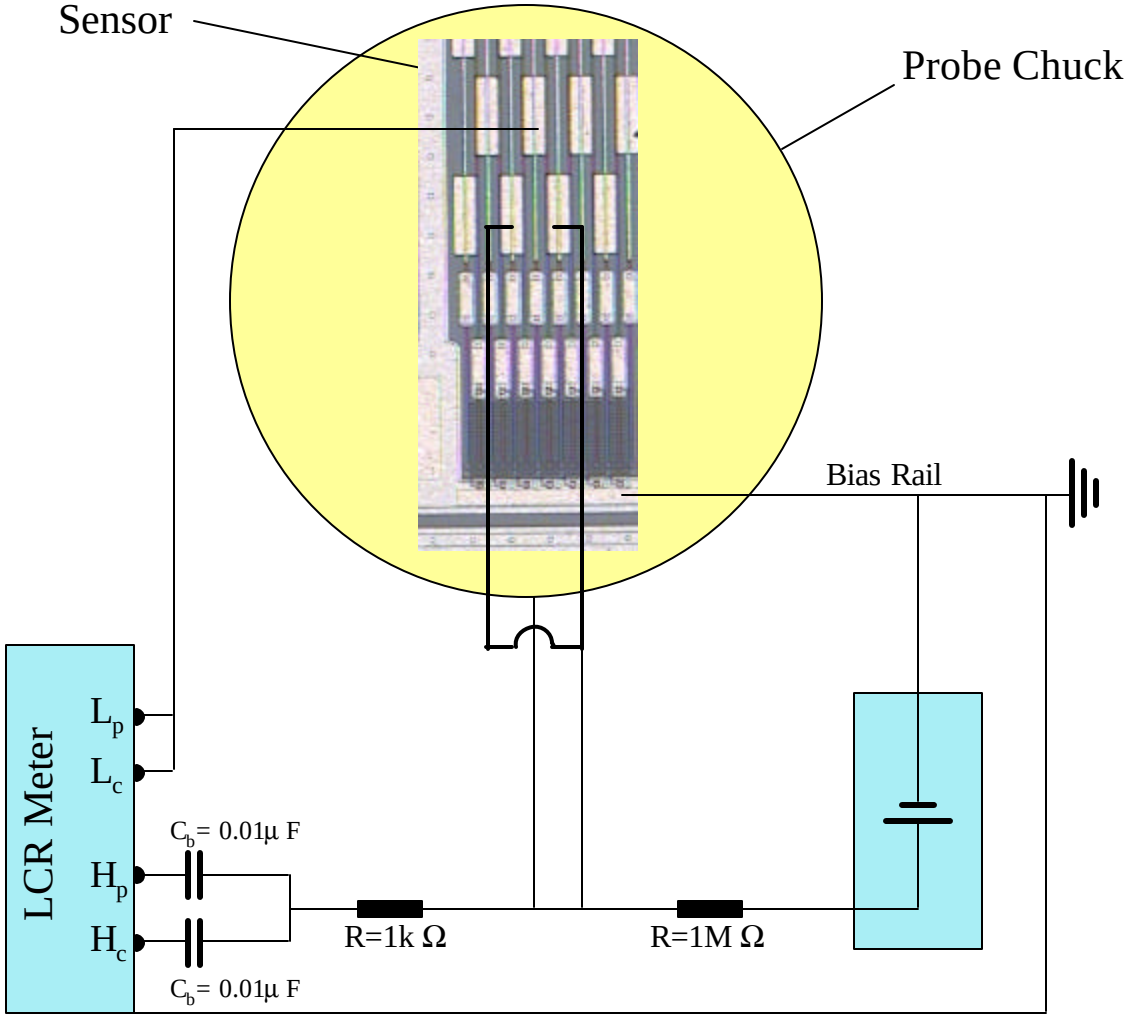
Backplane Capacitance (Outer Layers)

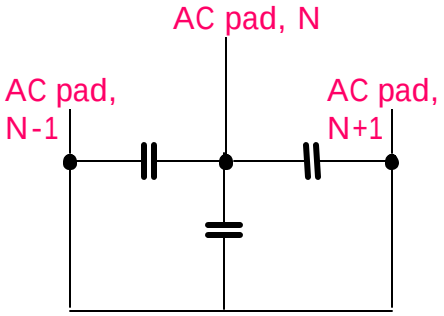
- Extract backplane capacitance



Measurement Method

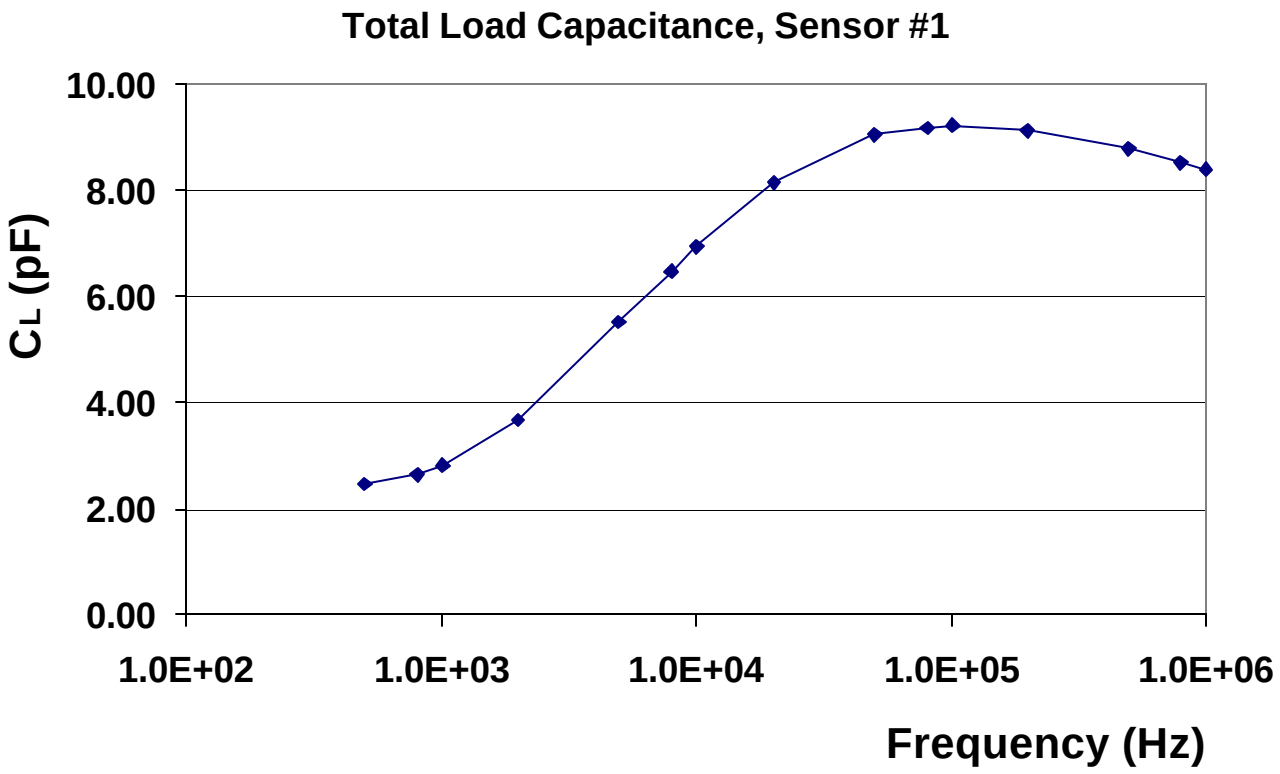
- Method 1:
  - Neighbors at bias voltage





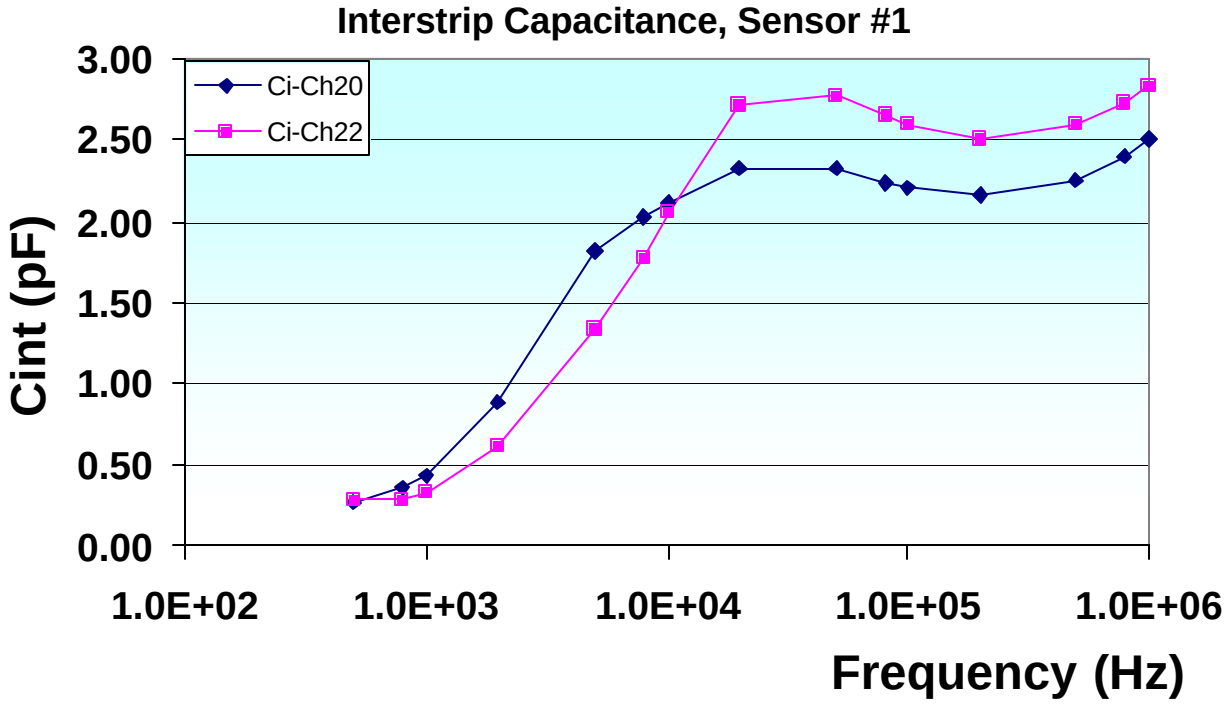
Layer 1: C_L

- Total load capacitance sensor #1, strips 20, 21, 22



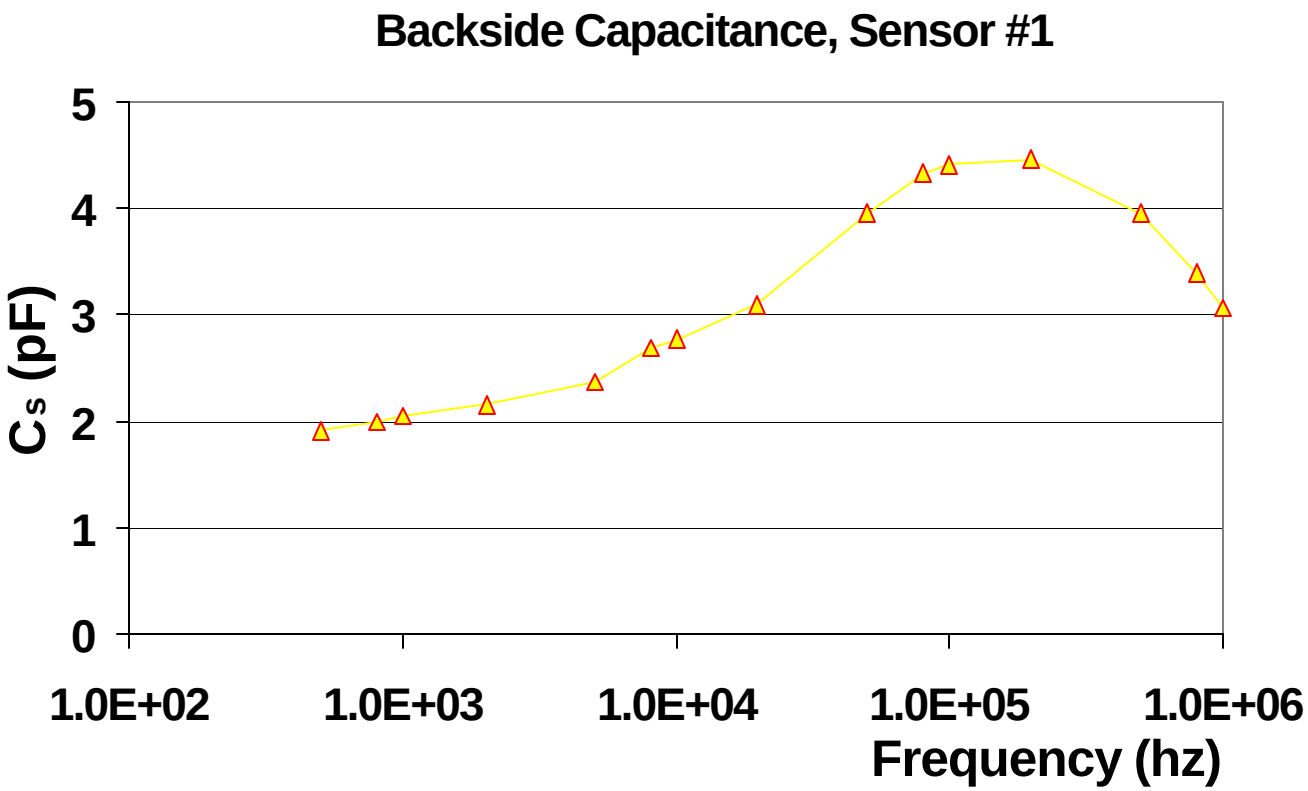
Layer 1: C_{int}

- Interstrip capacitance



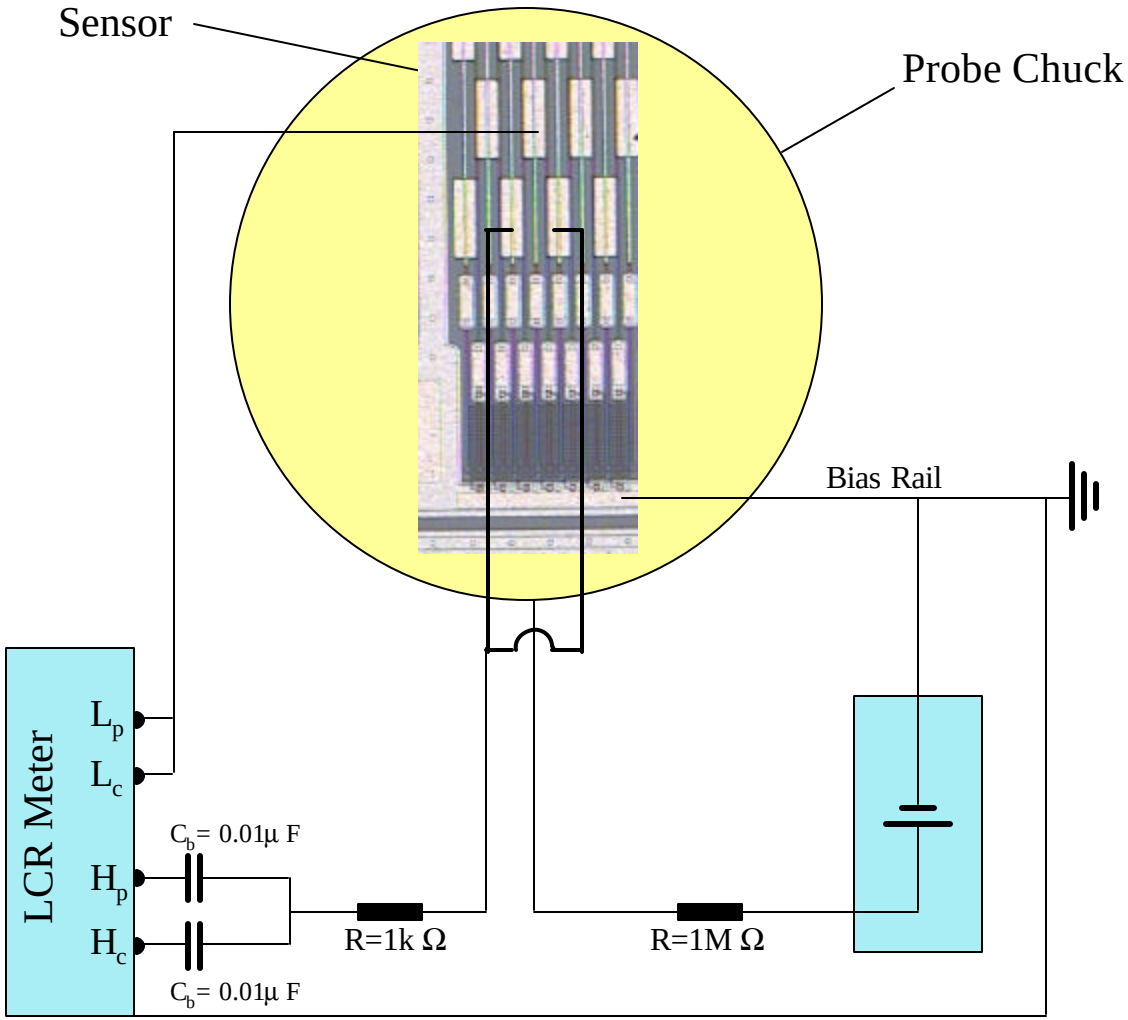
Layer 1: C_s

- Capacitance to the substrate

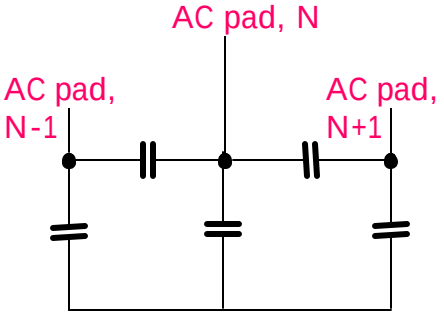


Measurement Method

- Method 2:
  - All AC pad 'floating'

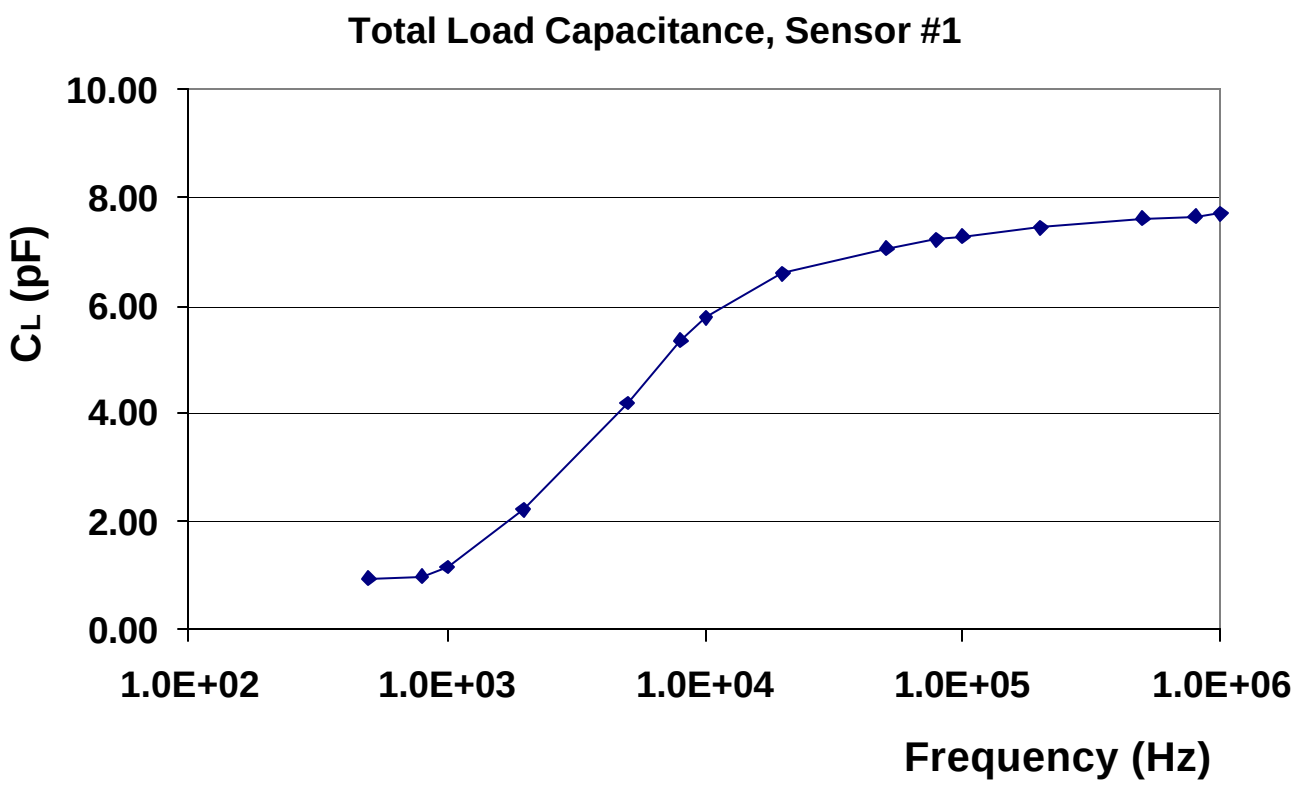


- $C_1 = 2\ C_i + ?\ \ C_b$
- $C_2 = C_i + ½\ C_b$.



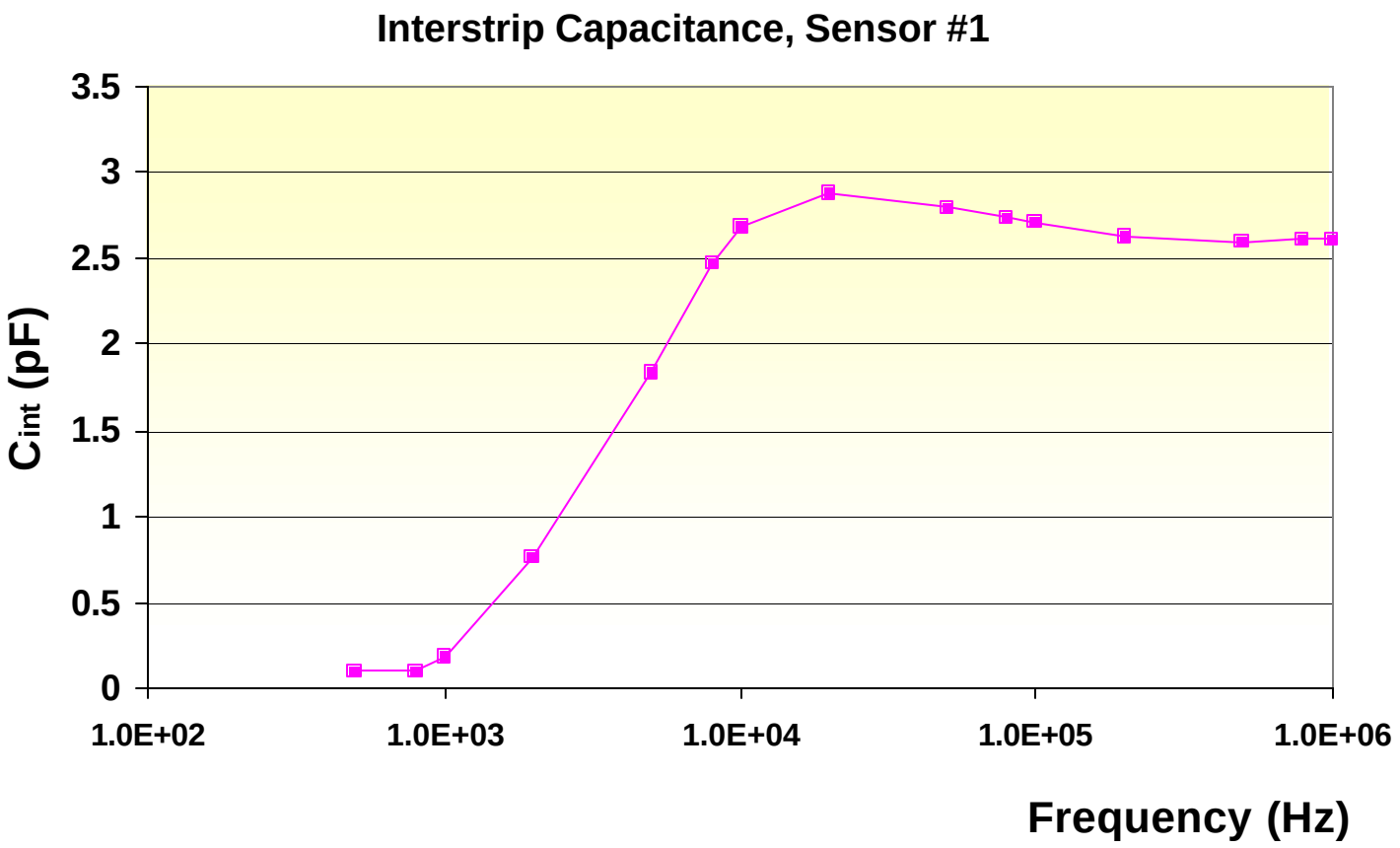
Layer 1: C_L

- Total load capacitance, method 2

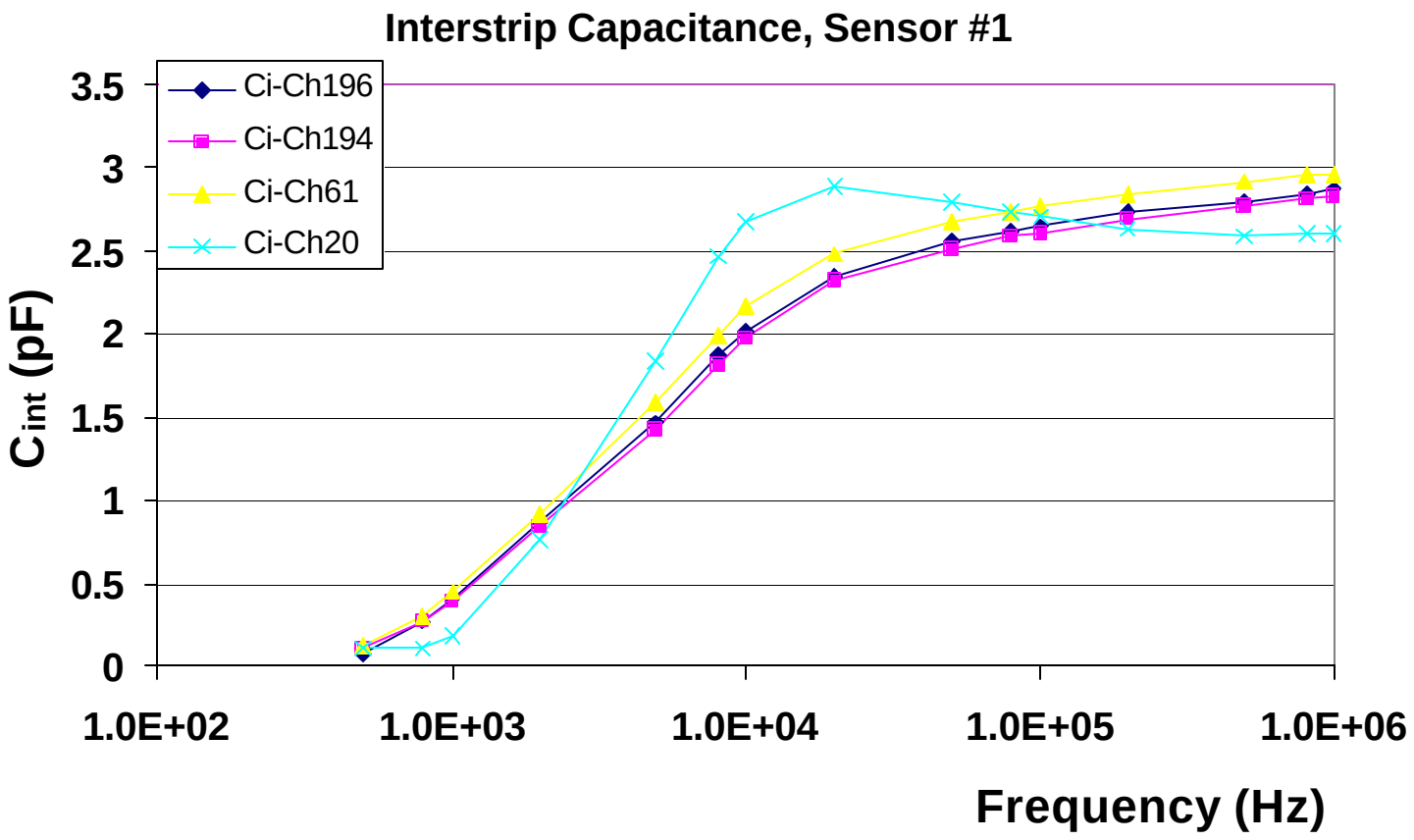


Layer 1: C_{int}

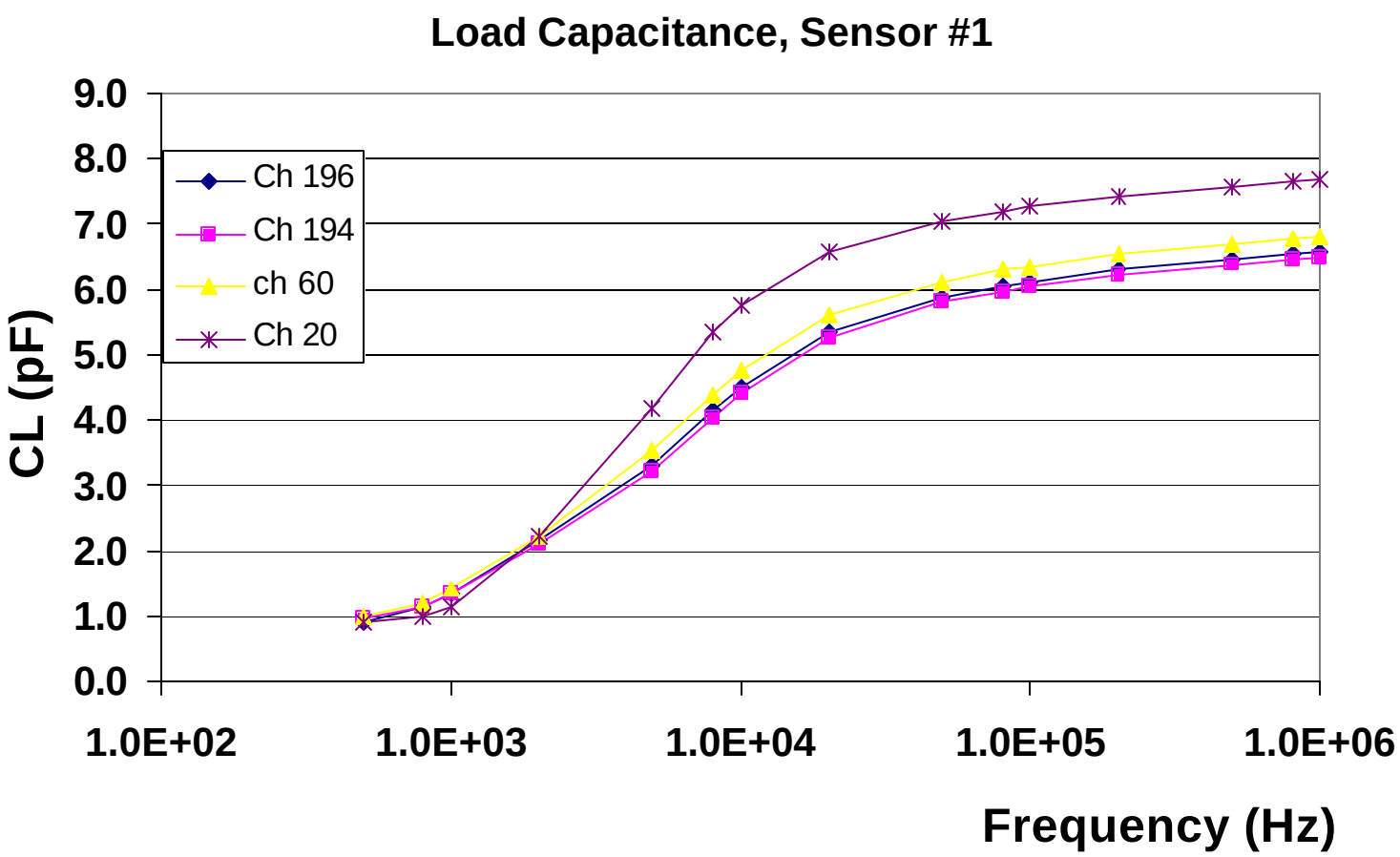
- Interstrip Capacitance

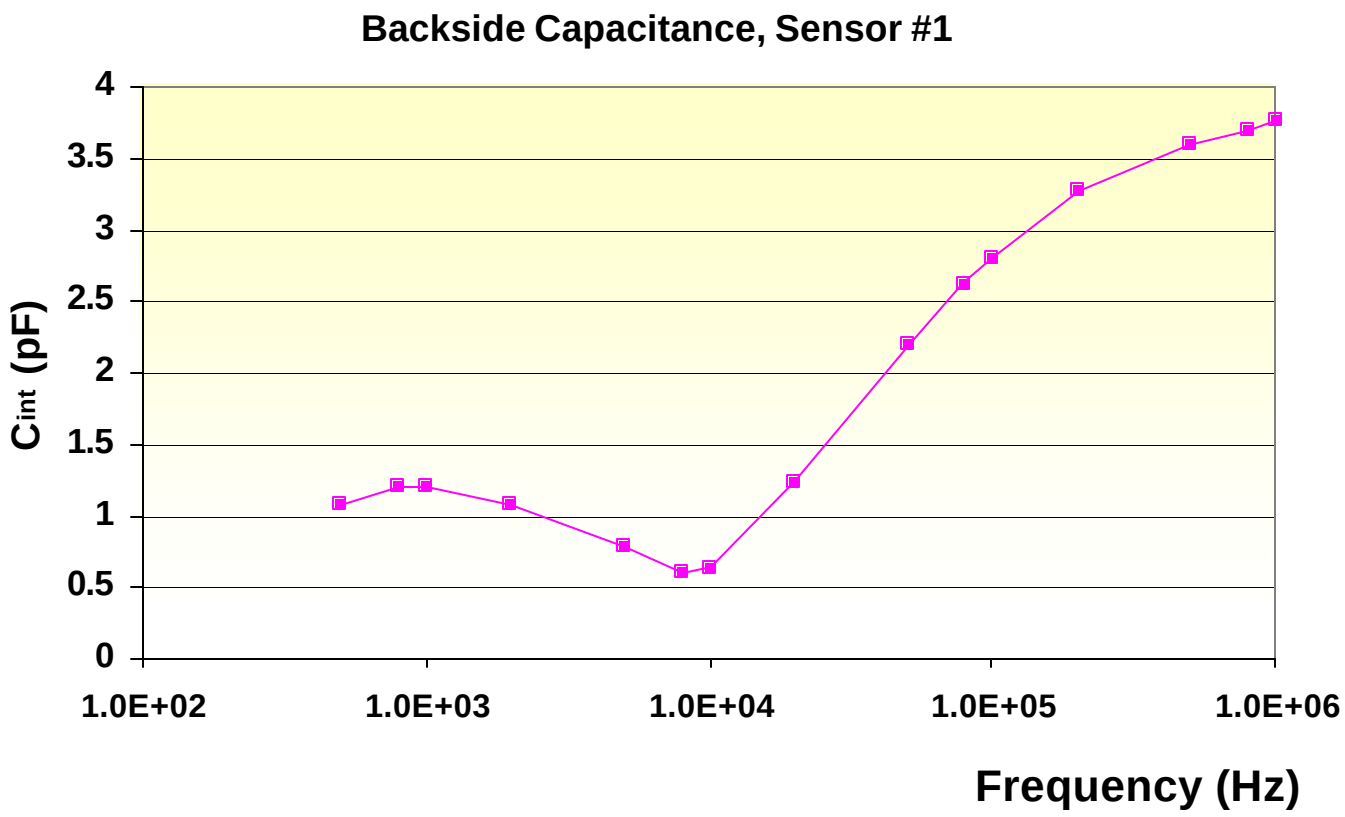


Interstrip Capacitance



Total Capacitance



Layer 1: C_s

- Backside capacitance