Touch Screens Resistive

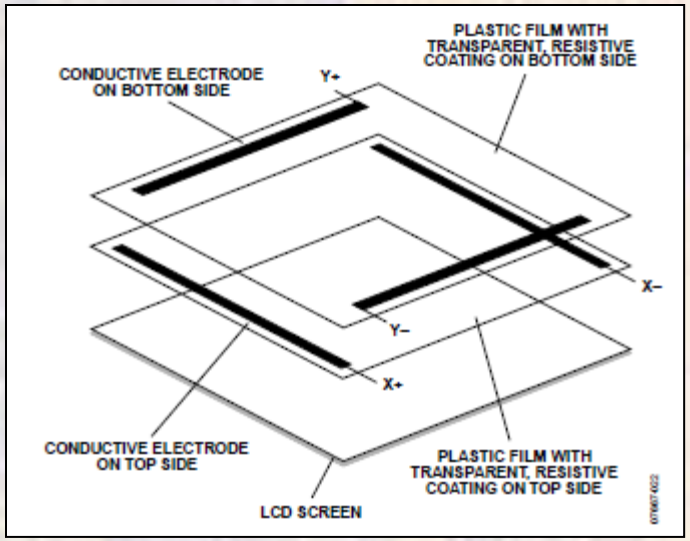
Last updated 2/29/24

Touch Screens

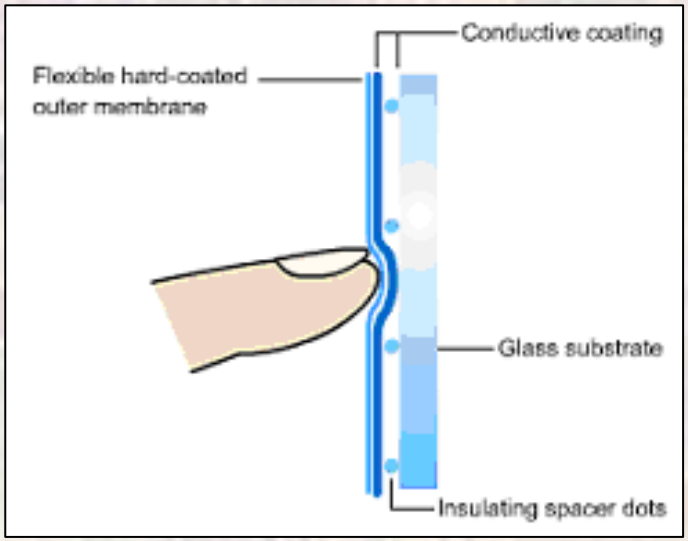
- Technologies
  - Resistive
  - Capacitive
  - Optical
  - Surface wave

Resistive Touch Screens

- Resistive Touch – 4 wire
  - 2 sheets of resistive material
    - 1 with connections at top/bottom
    - 1 with connections at sides
    - Separated by air/spacers



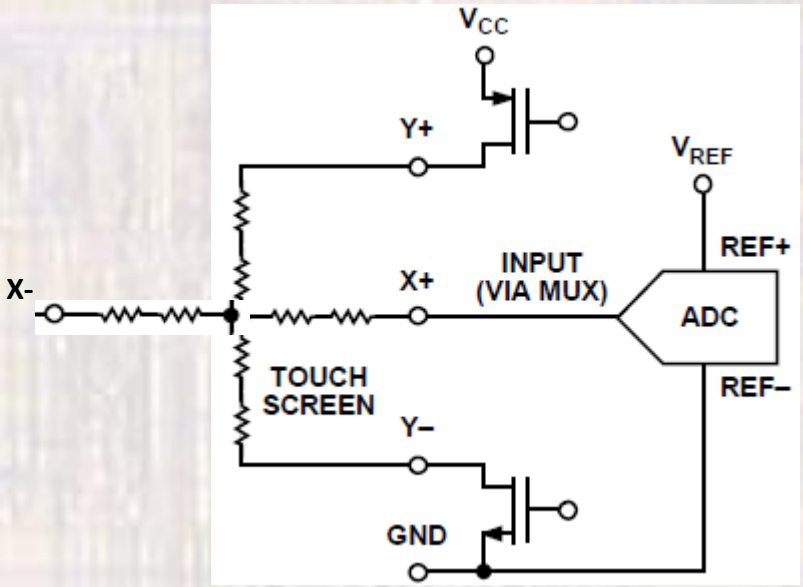
Src: Analog Devices



Src: ELO

Resistive Touch Screens

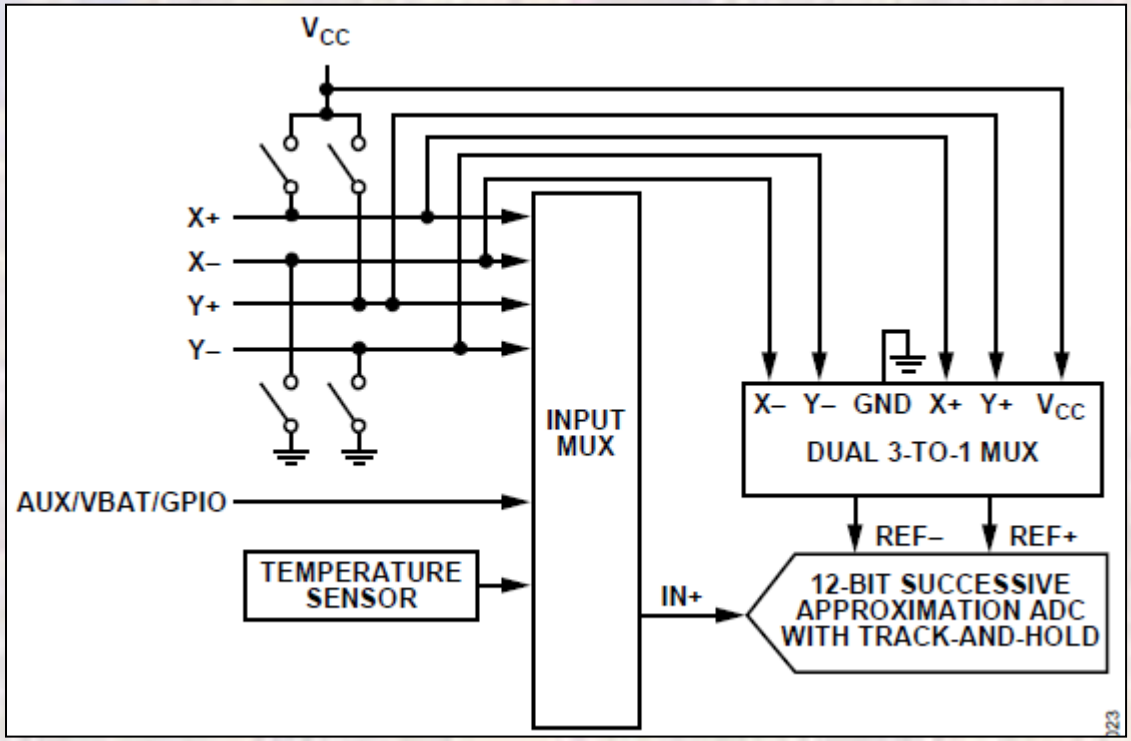
- Resistive Touch – 4 wire
  - Measurements
    - Voltage dividers
  - Measure Y position
    - Place a voltage across Y terminals
    - Where touched, X+ terminal will measure relative voltage
  - Measure X position
    - Place a voltage across X terminals
    - Where touched, Y+ terminal will measure relative voltage



Src: Analog Devices

Resistive Touch Screens

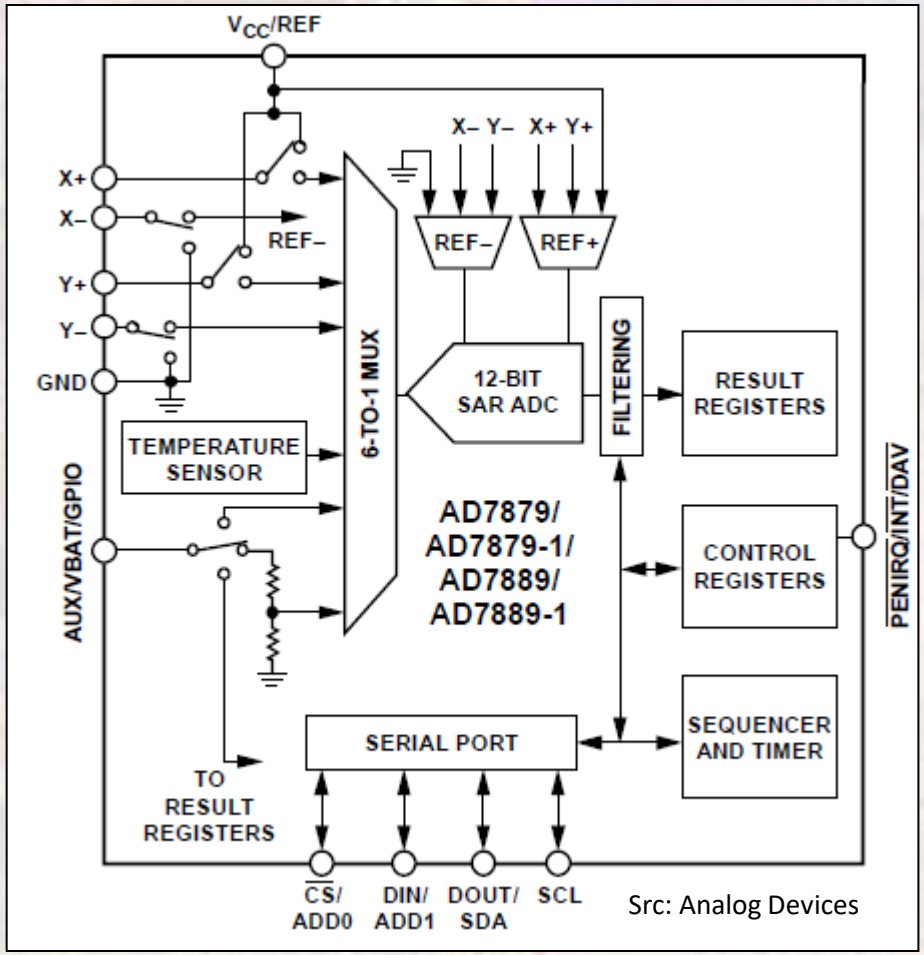
- Resistive Touch – 4 wire
  - Measurement Configuration



Src: Analog Devices

Resistive Touch Screens

- Resistive Touch – 4 wire
  - Chip Configuration



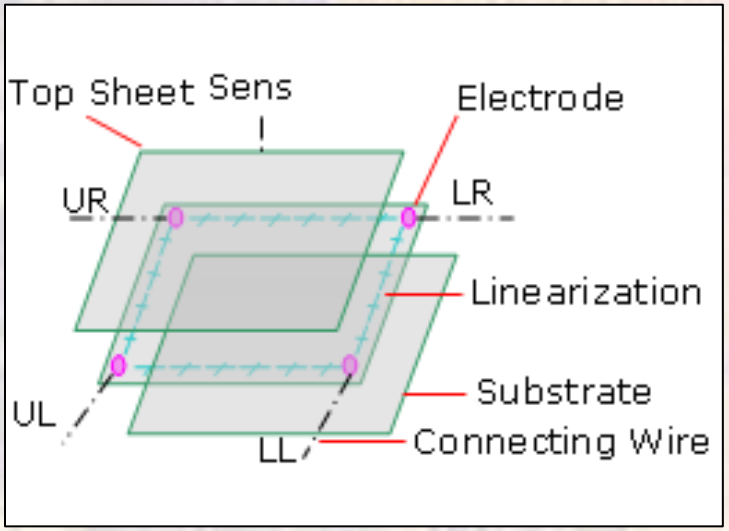
Src: Analog Devices

Resistive Touch Screens

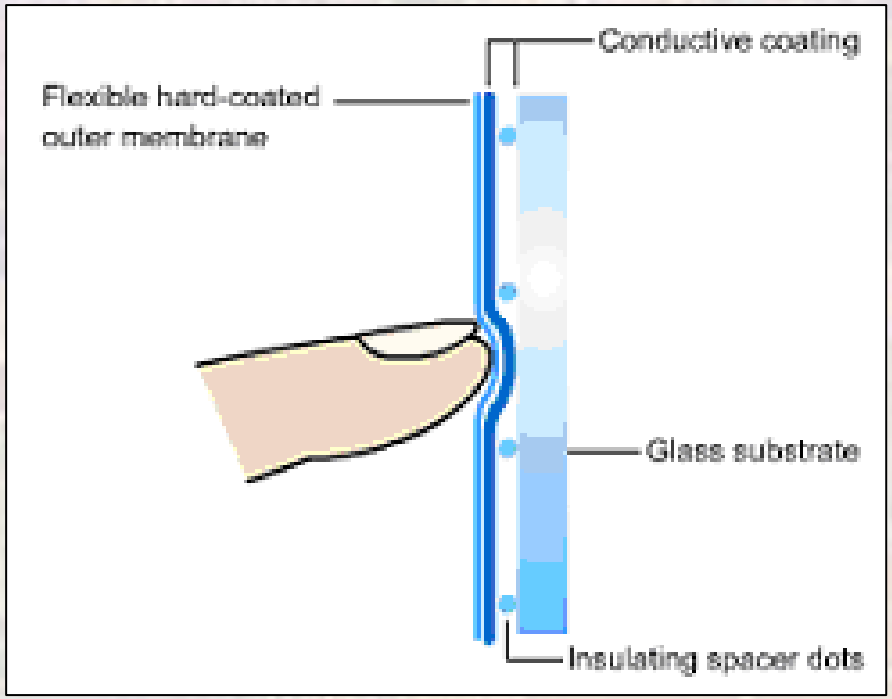
- Resistive Touch – 4 wire
  - Pro
    - Flexible screen material
    - Any material can be used for touch
    - Can be very accurate
  - Con
    - Surface easy to damage
    - Low endurance
    - Limited light transmission
    - SINGLE TOUCH

Resistive Touch Screens

- Resistive Touch – 5 wire
  - 1 sheet of resistive material
    - connections at 4 corners
  - 1 sheet of conductive material
  - Separated by air/spacers



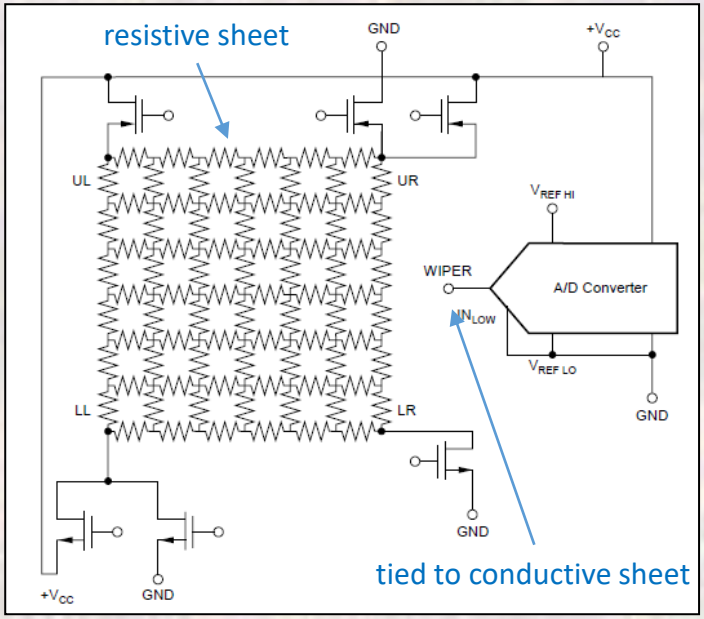
Src: ewinsonic



Src: ELO

Resistive Touch Screens

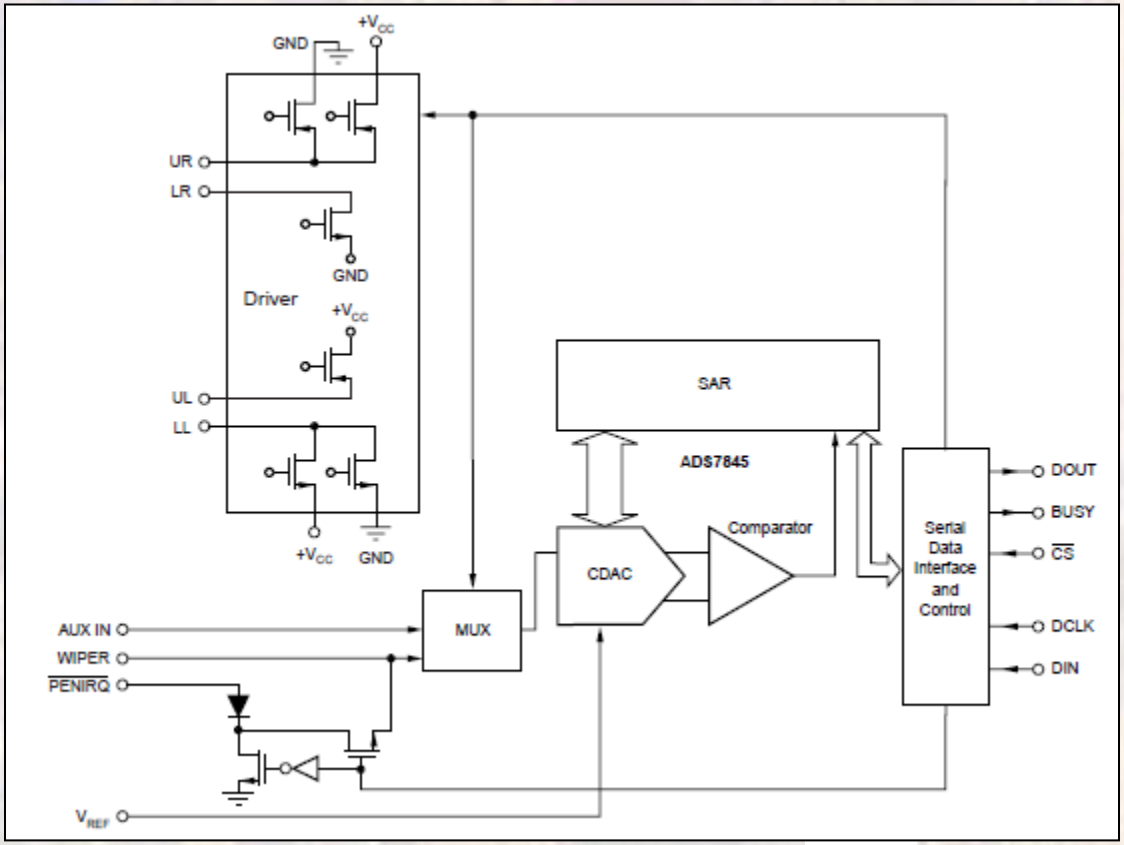
- Resistive Touch – 5 wire
  - Measure Y position
    - LR – gnd, UL - Vdd
    - LL – gnd, UR – Vdd
    - Where touched, wiper terminal will measure relative voltage
  - Measure X position
    - LR – gnd, UL - Vdd
    - LL – Vdd, UR – gnd
    - Where touched, wiper terminal will measure relative voltage



Src: TI

Resistive Touch Screens

- Resistive Touch – 5 wire
  - Configuration / Chip



Src: TI

Resistive Touch Screens

- Resistive Touch – 5 wire
  - Pro
    - Flexible screen material
    - Any material can be used for touch
    - Can be very accurate
  - Con
    - Surface easy to damage
    - Better but still limited endurance
      - Damage to the top layer does not impact performance
    - Better light transmission
    - SINGLE TOUCH

Resistive Touch Screens

- Sensor Comparison

Method	Linearity	Accuracy	Size Scalability	Optical Clarity	Damage Resistant	Multitouch
Infrared	★★★★★	★★★	★★★★★	★★★★★	★★★	Yes (expensive)
Surface Acoustic Wave (SAW)	★★★★	★★★★	★★	★★★	★★★★★	No
Surface Capacitance	★★	★★	★★	★★★★★	★★★★★	No
Resistive	★★★★	★★★★	★★★★	★★	★	Yes (expensive)
Projected Capacitance	★★★★★	★★★★	★★★	★★★★★	★★★★★	Yes

Src: Cypress