ADDING PROXIMITY DETECTION

TO A STANDARD ANALOG-RESISTIVE TOUCHSCREEN

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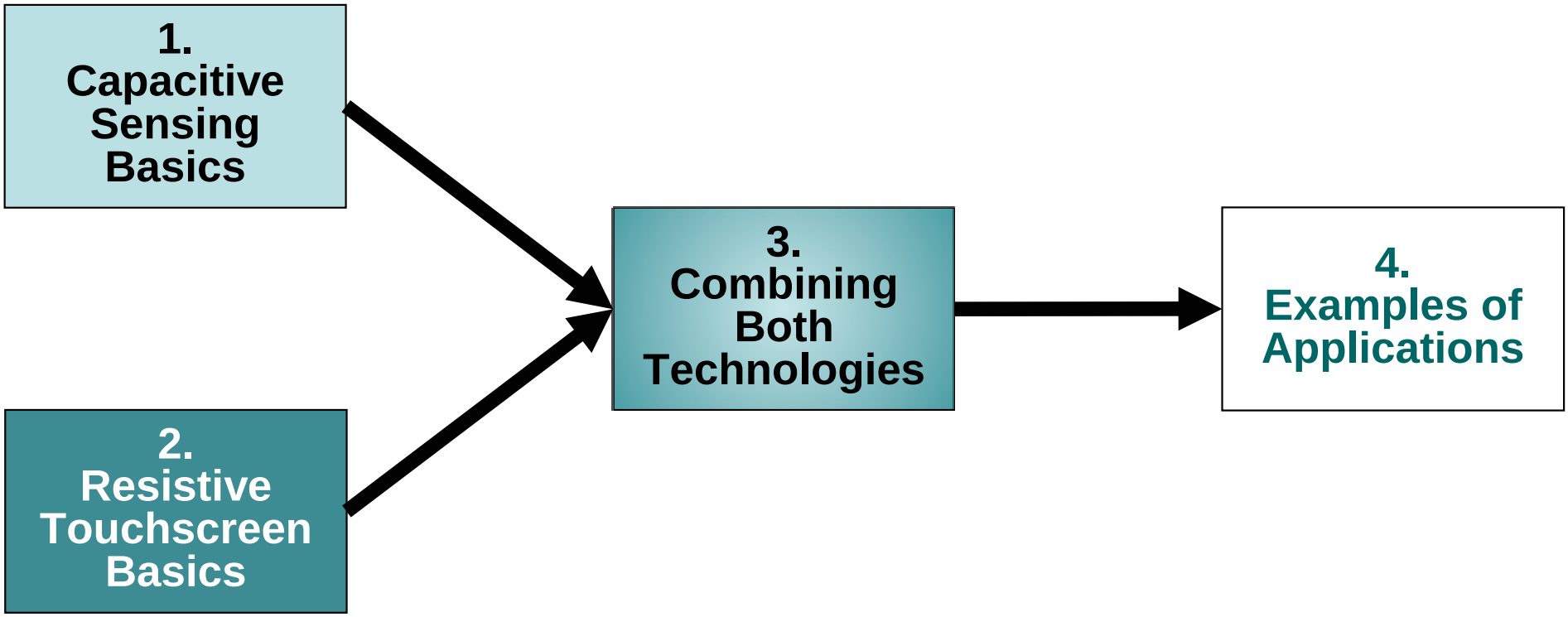
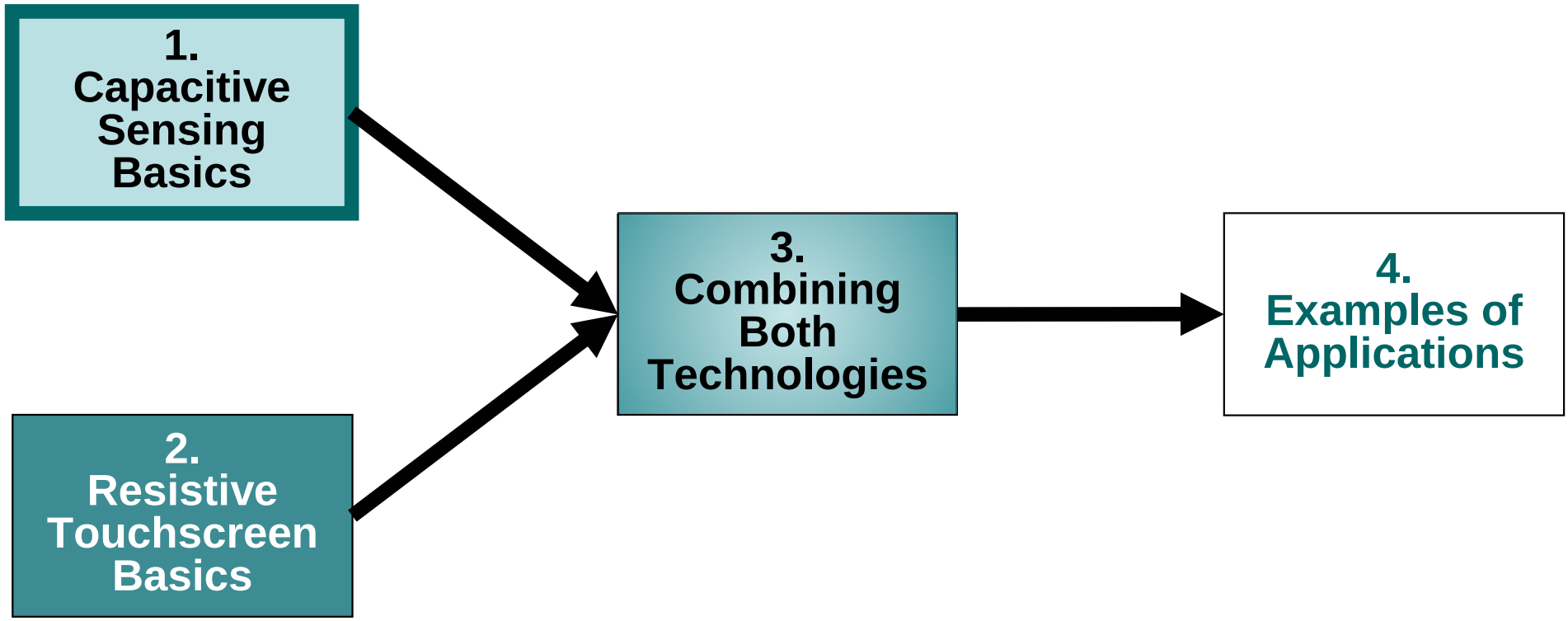
SID Display Week – June 2012

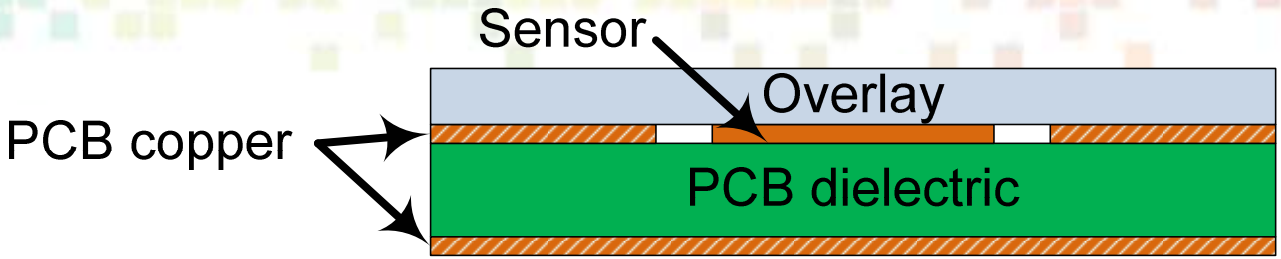
Presentation Framework



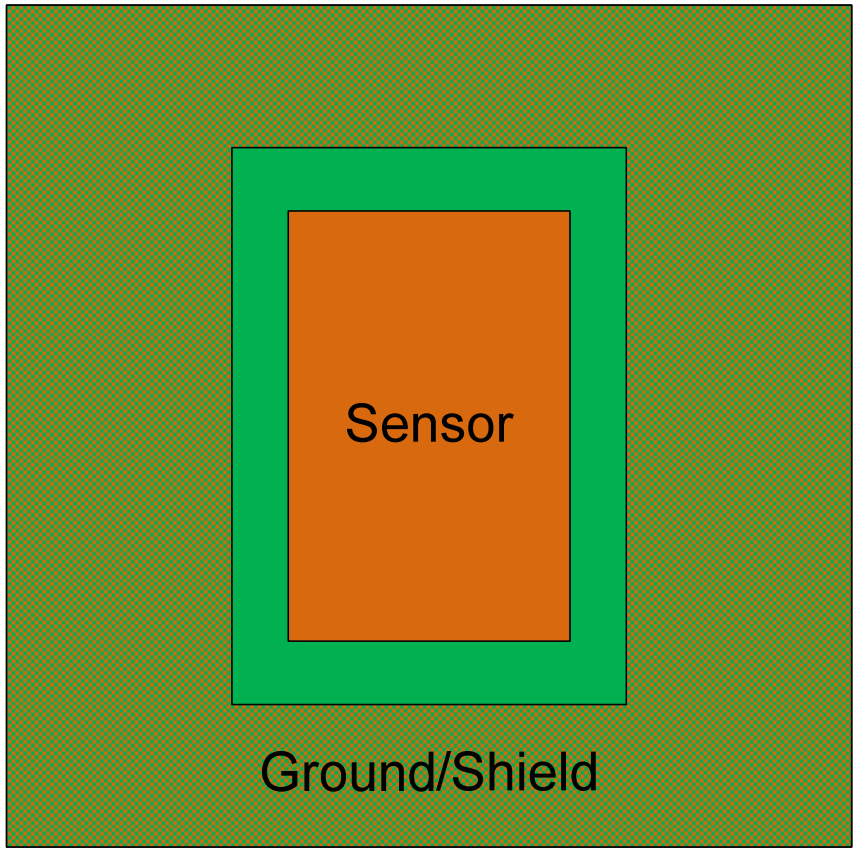
Capacitive Sensing Basics



Capacitive Sensing Basics 1

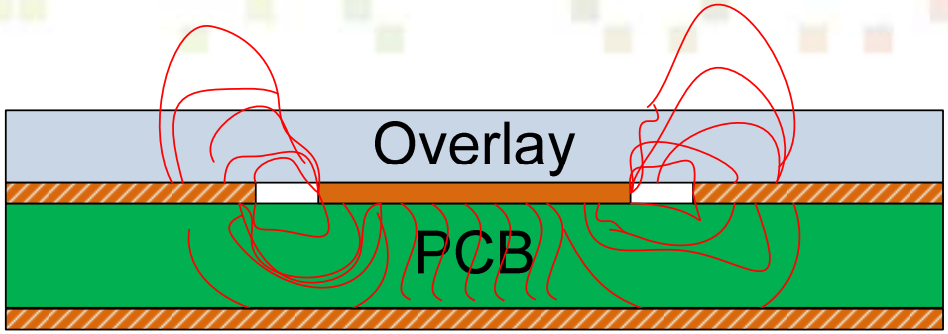


Cut view

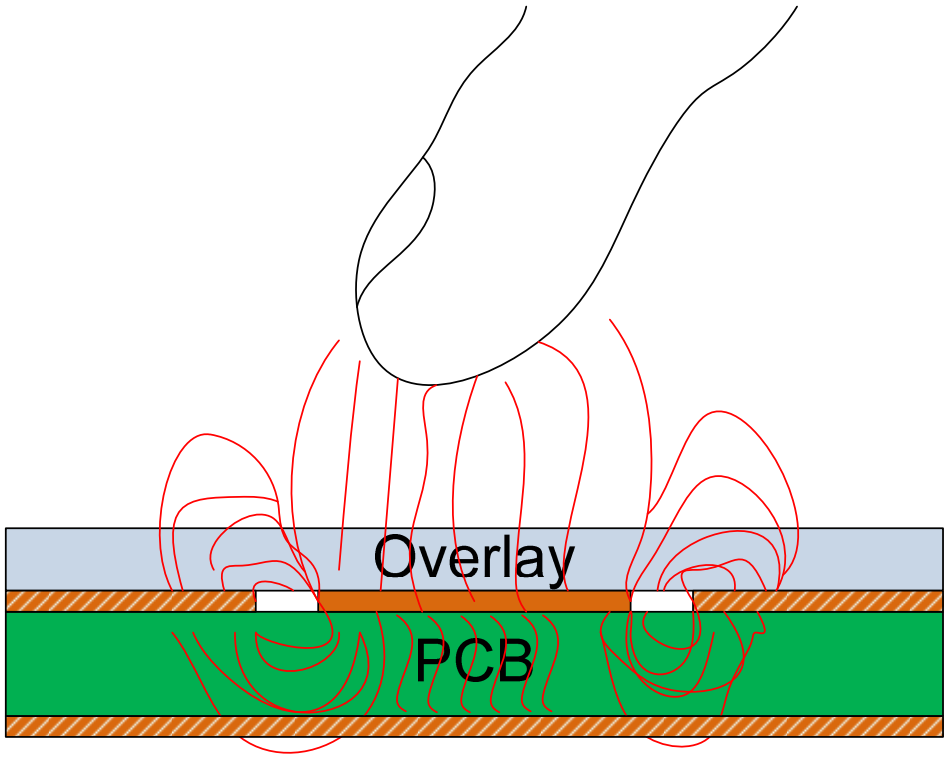


Top view

Capacitive Sensing Basics 2



$C_{Sensor} = C_{Env}$



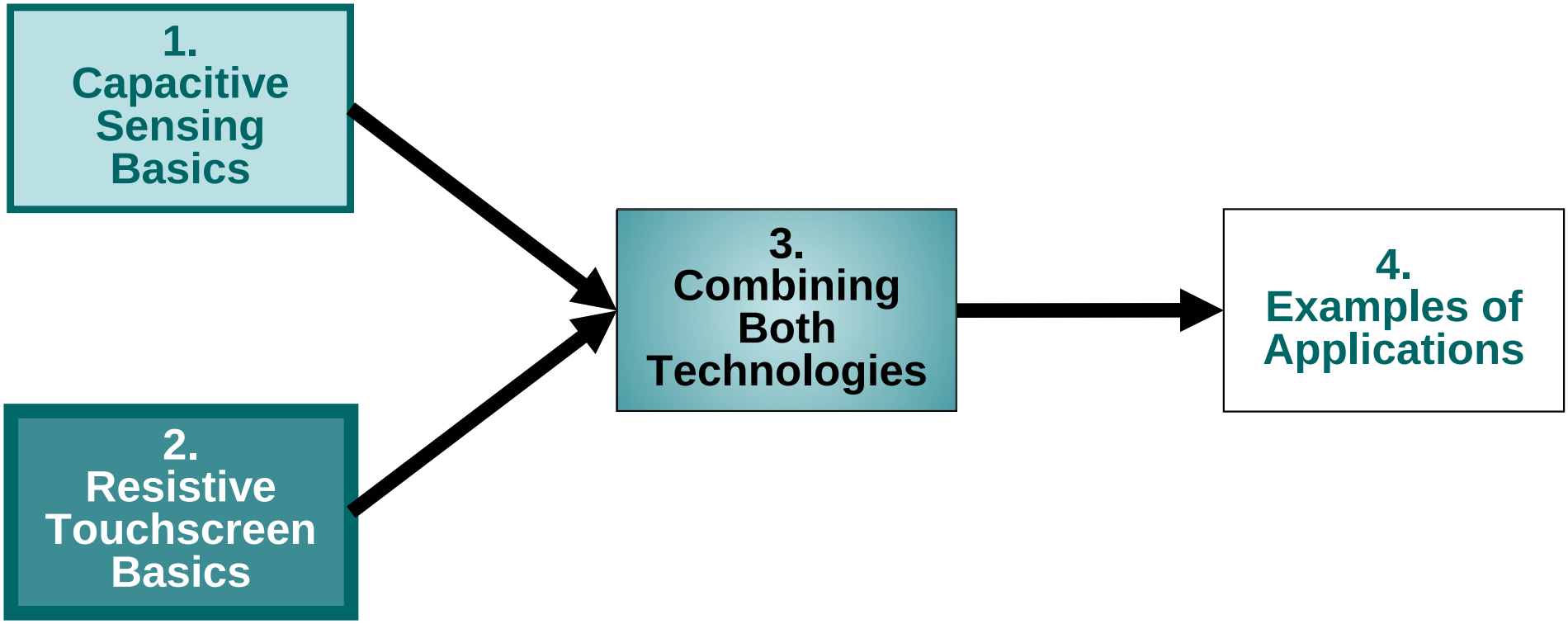
$C_{Sensor} = C_{Env} + C_{User}$

Capacitive Sensing Basics 3

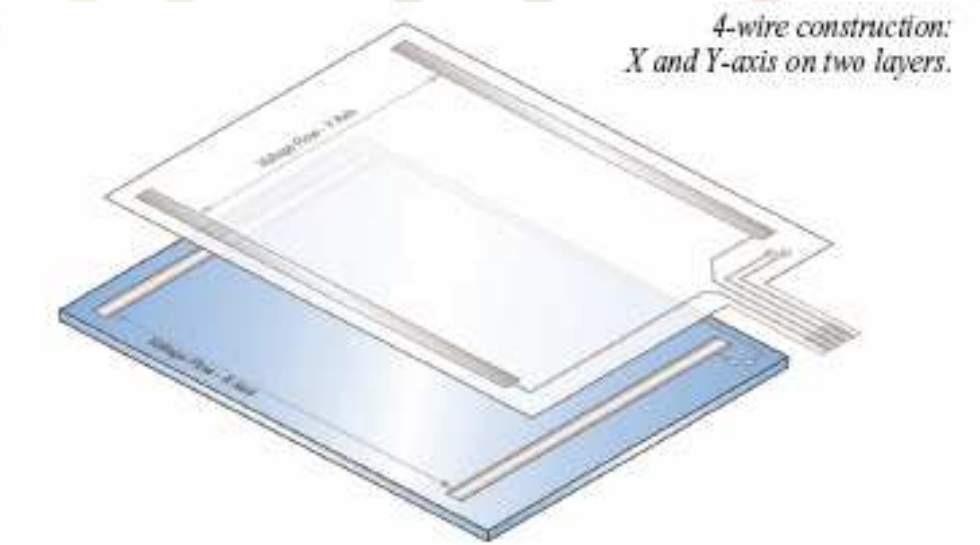
$$C_{User} = \frac{\varepsilon_0 \cdot \varepsilon_r \cdot A}{d}$$

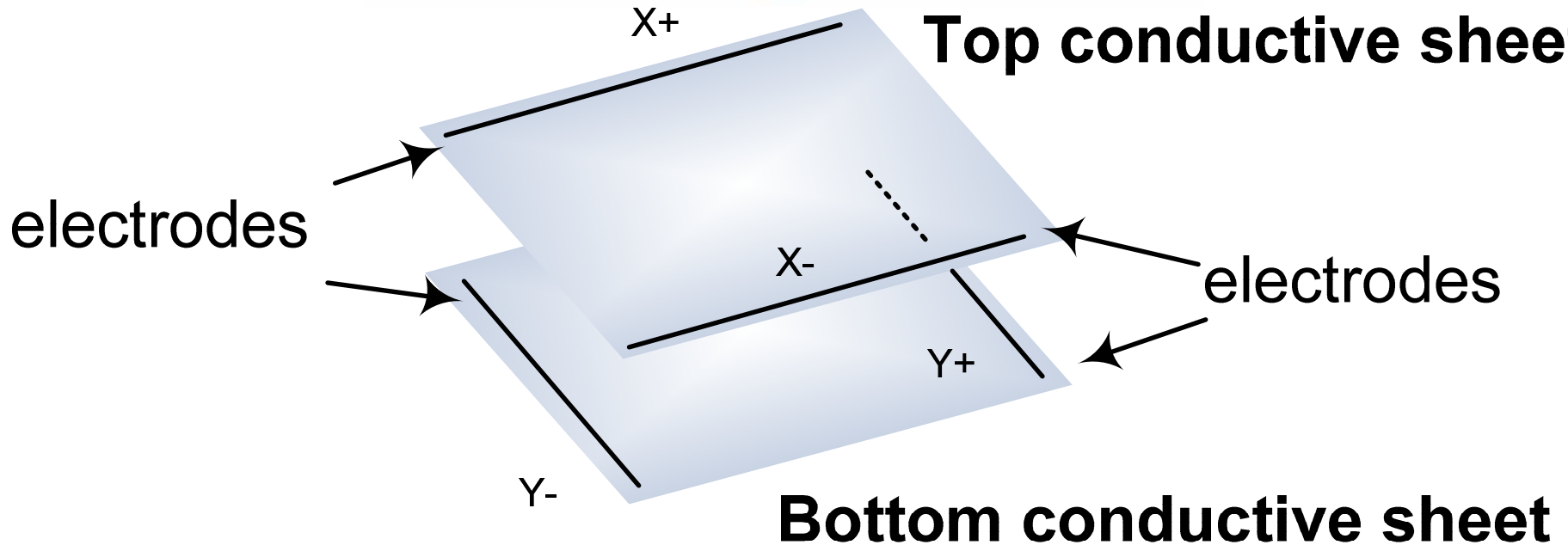
Material	Typical ε_r
Glass	8
FR4	5
Acrylic Glass	3
Wood	2
Air	**1**

Resistive Touchscreen Basics

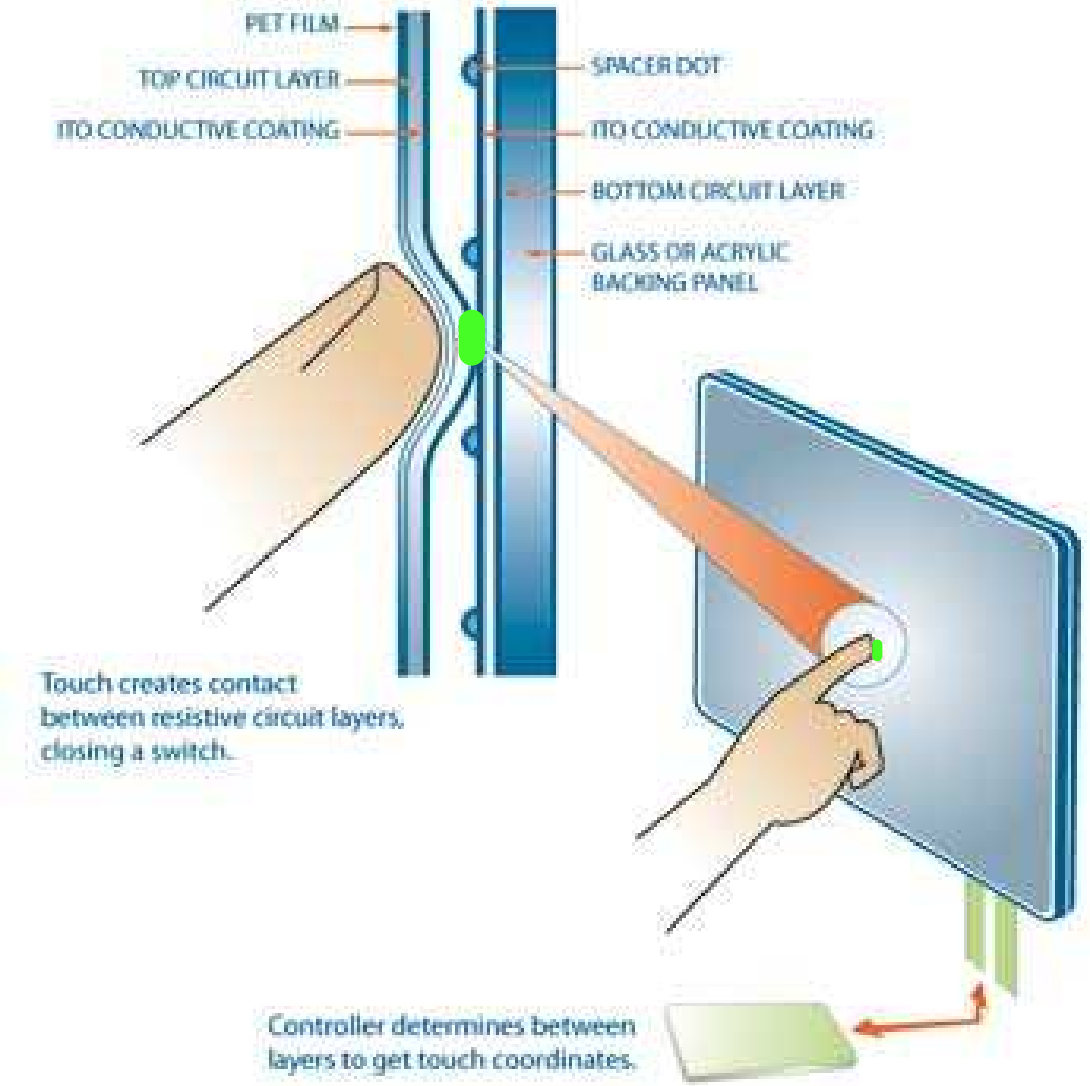


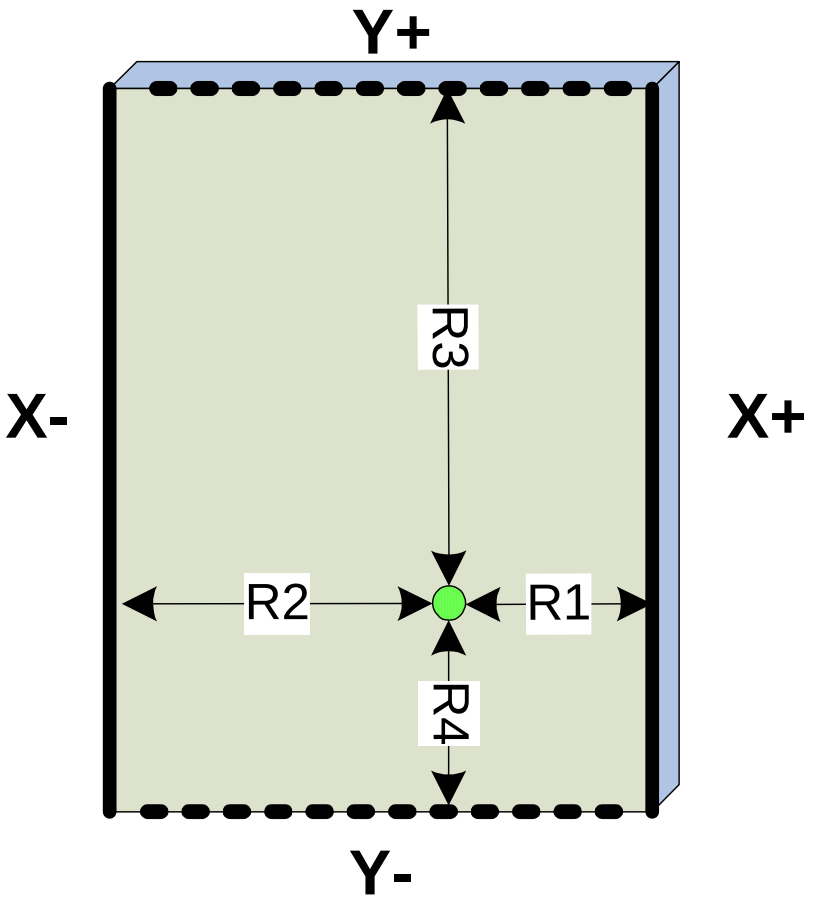
Resistive Touchscreen Basics 1



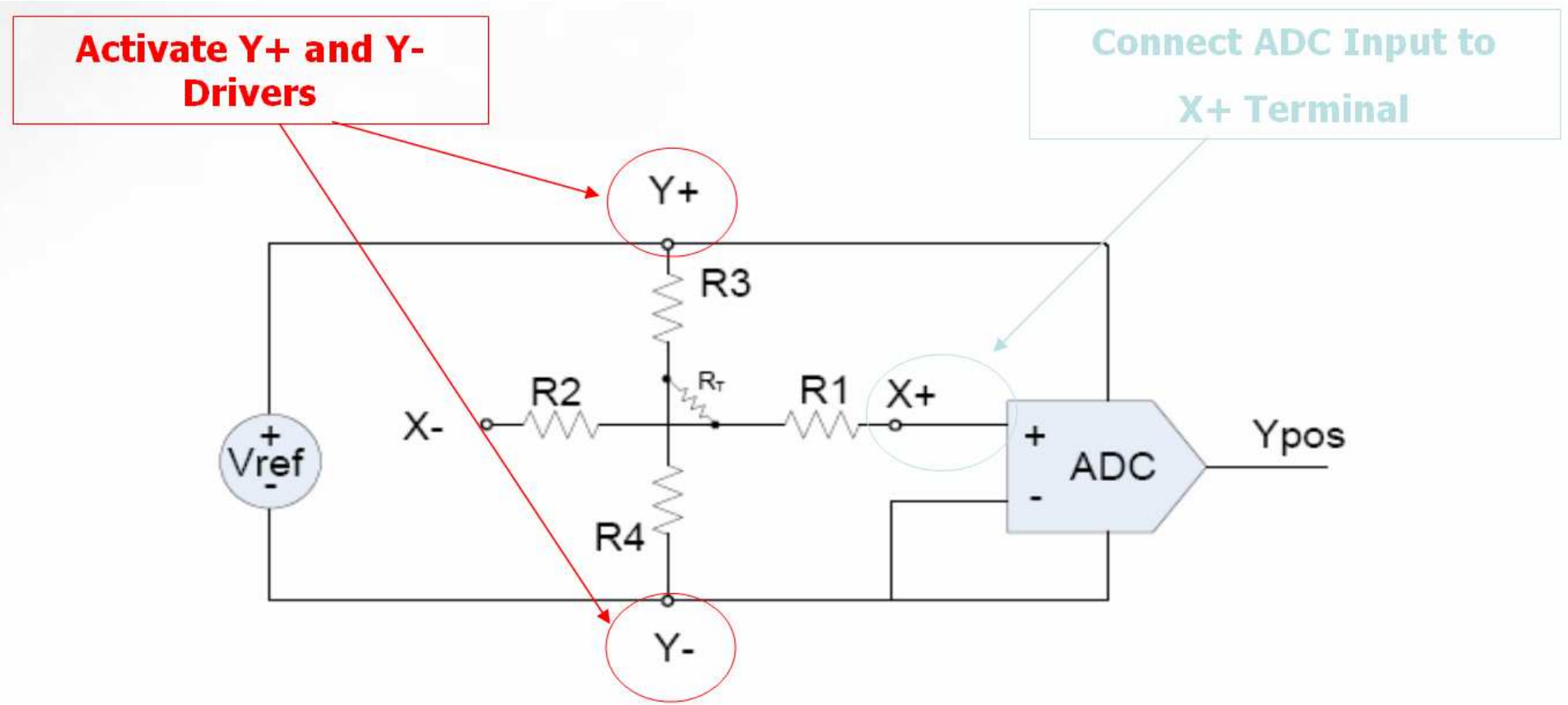


Resistive Touchscreen Basics 2

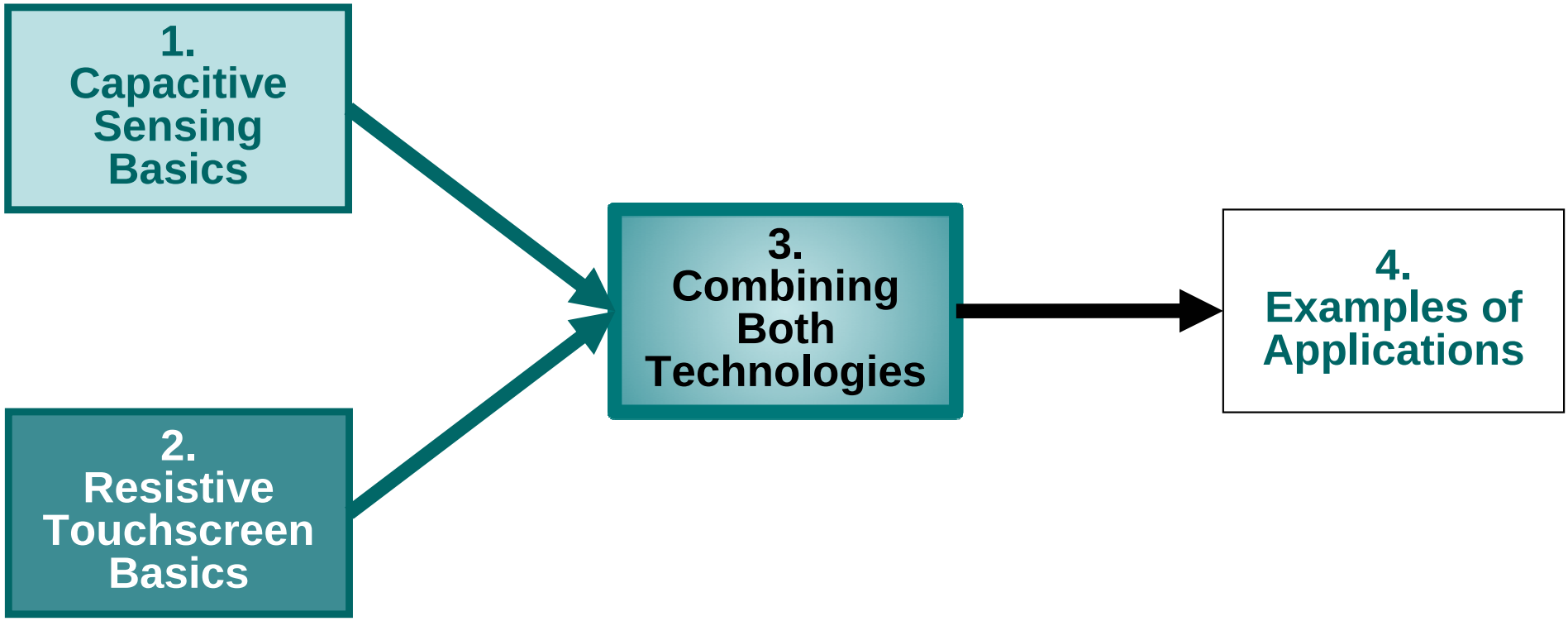




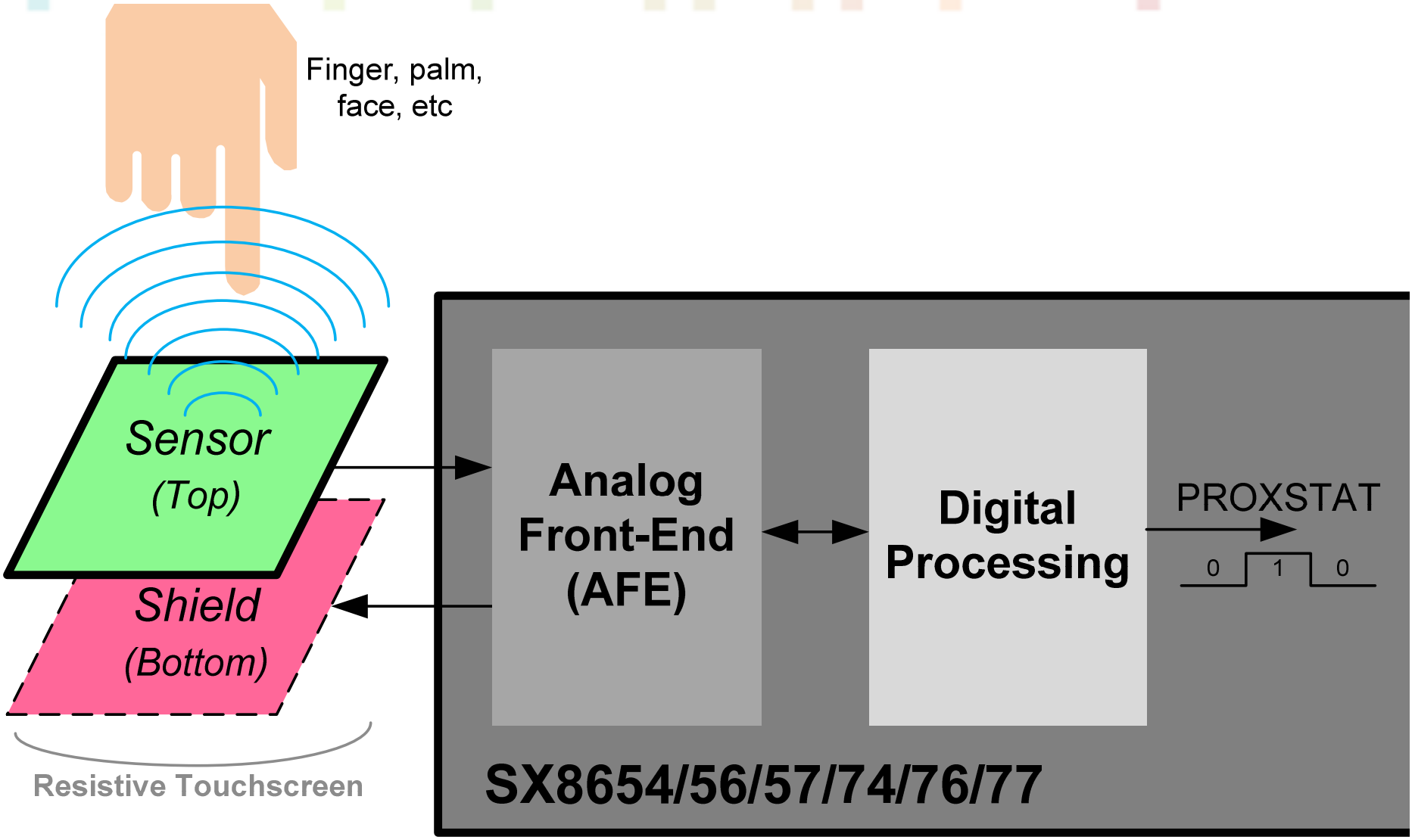
Resistive Touchscreen Basics 3



Combining Both Technologies

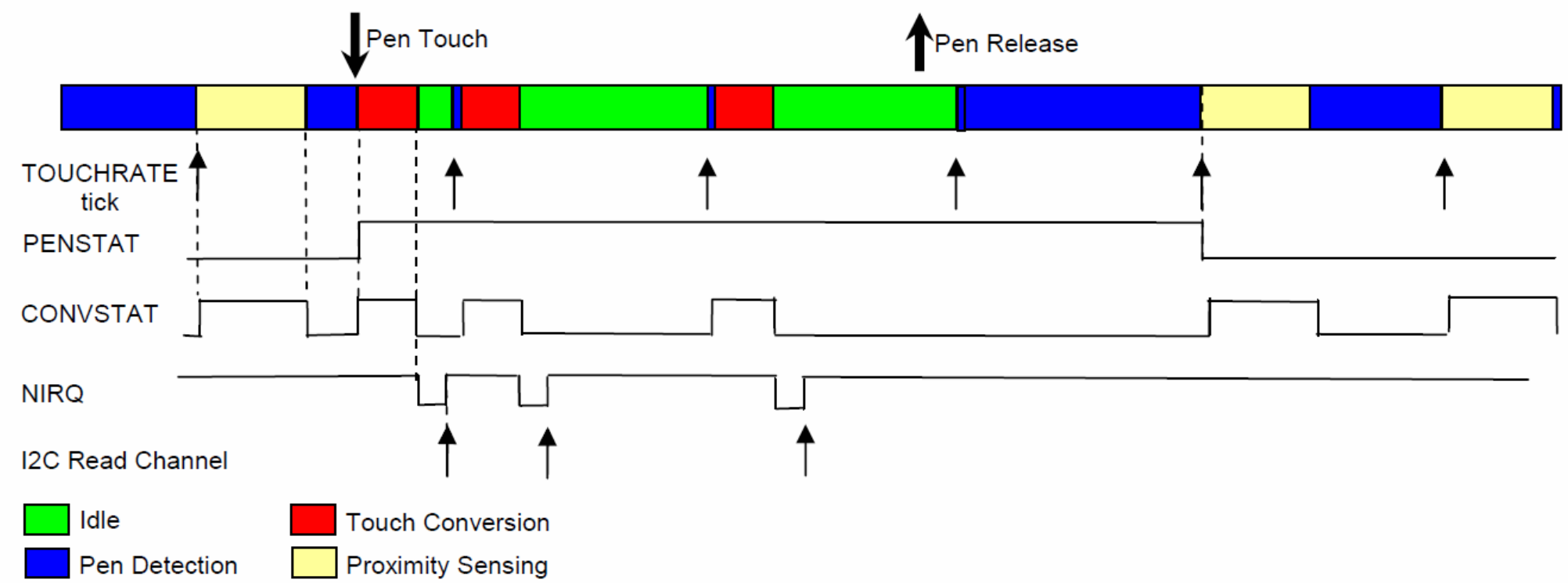


Combining Both Technologies 1

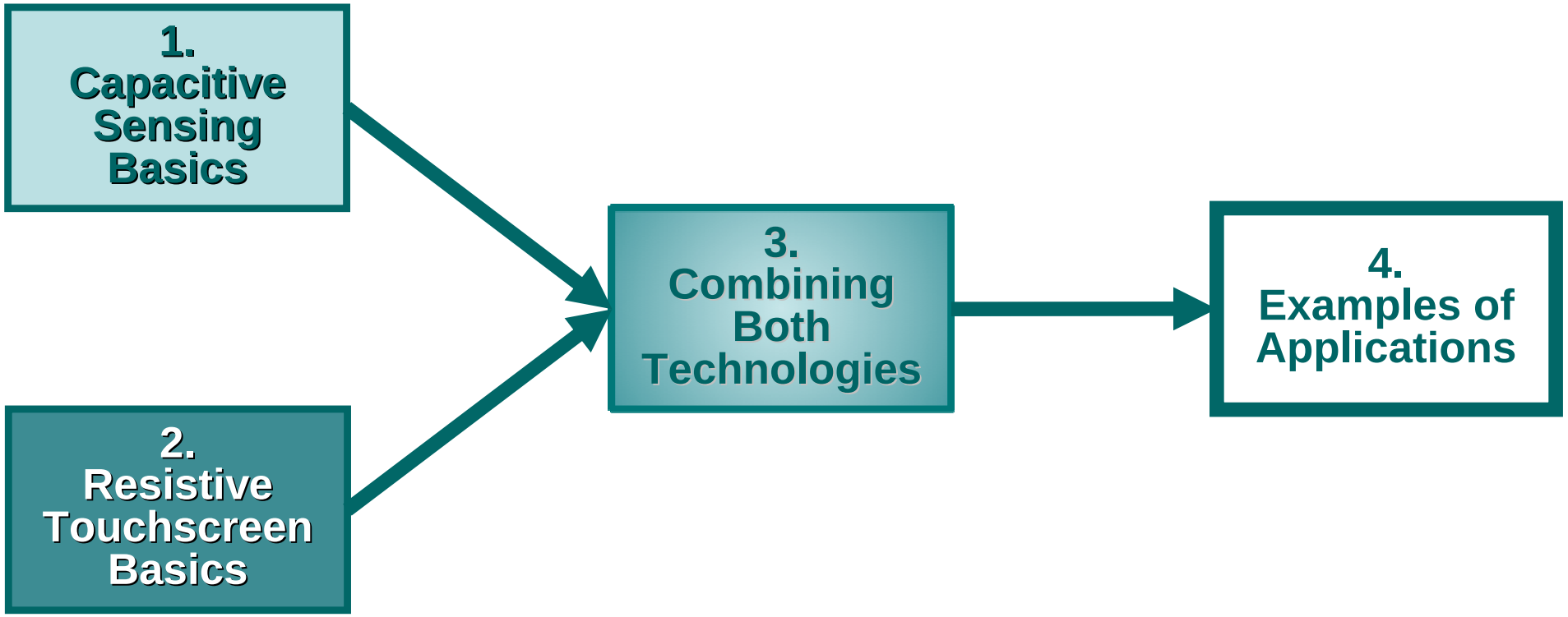


Combining Both Technologies 2

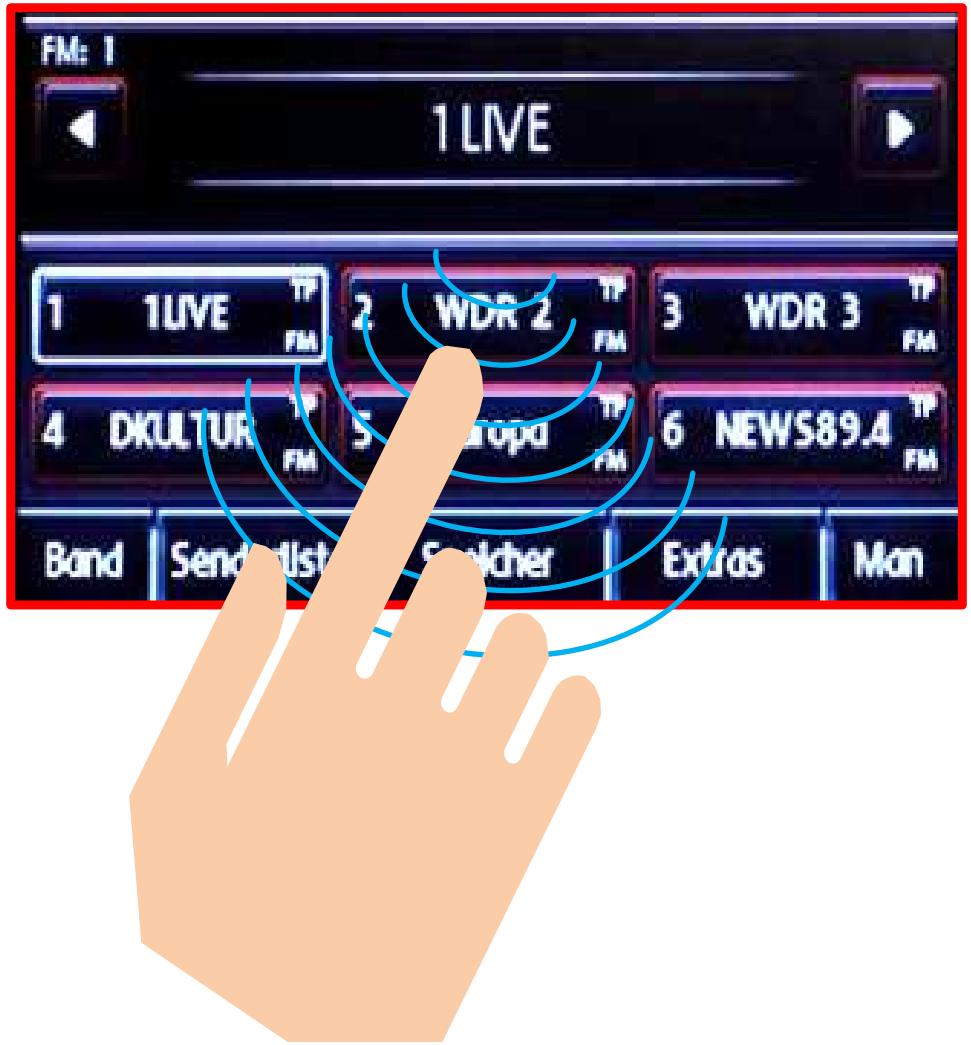
Touchscreen Status	ADC Measurement
Touched	Resistive
Not-touched	Capacitive



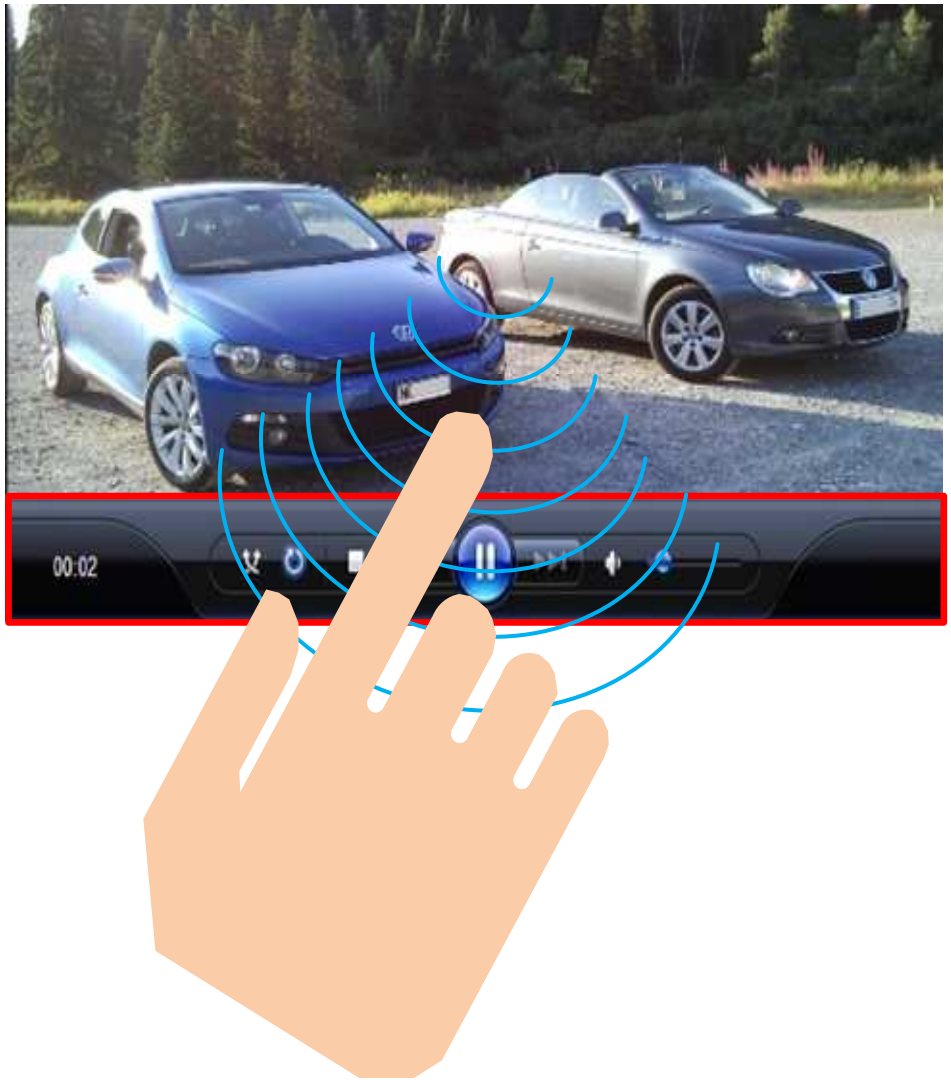
Examples of Applications



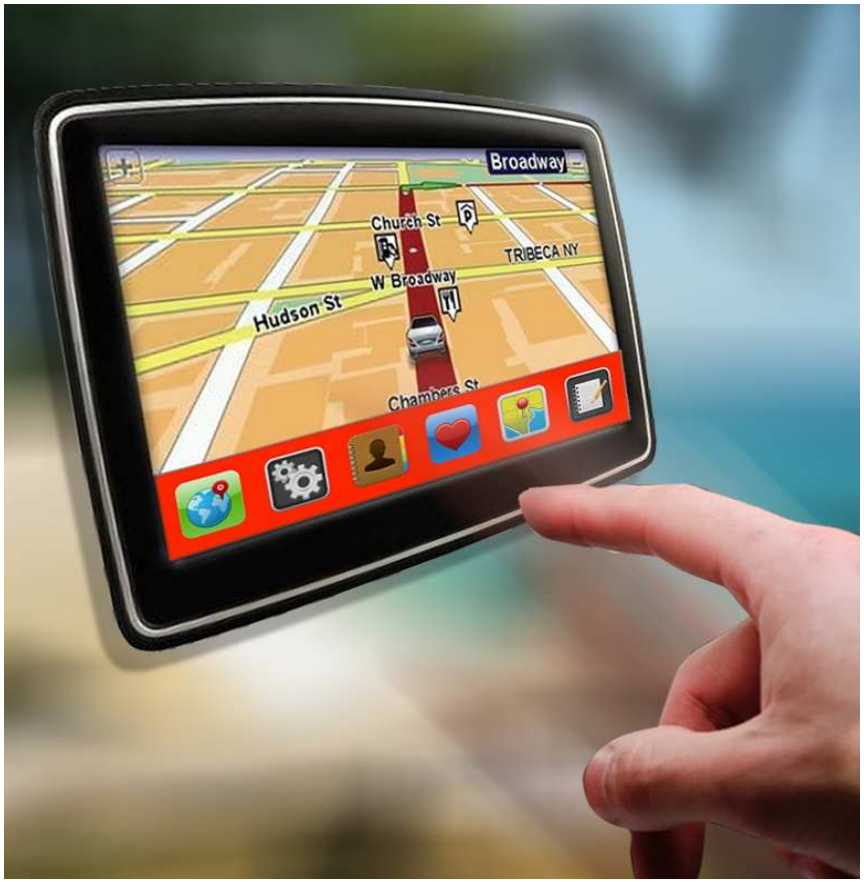
Examples of Applications 1



Examples of Applications 2



Examples of Applications 3



Conclusion 1

- Capacitive proximity sensing using the touchscreen can significantly contribute in making touch interfaces even more intuitive, comfortable and safe.
- By enabling built-in proximity sensing using ANY resistive panel, Semtech products will enable the OEM to upgrade a generally lower cost resistive touchscreen panel with high-end features.
- http://www.semtech.com/touch-interface/

World's First Resistive Touchscreen Controller Platform that Detects Proximity and Pressure with Haptics Feedback

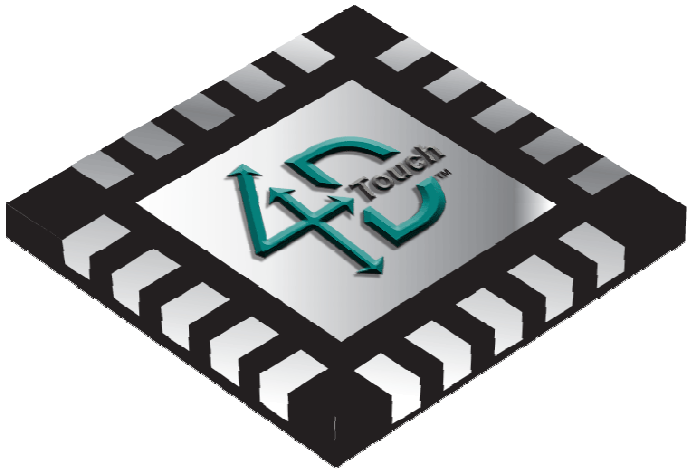
Conclusion 2

Proximity

Haptic Driver

immersion.

Small Footprint



Multi-touch

Low Power

Robust ESD Protection