



Human Machine Interfaces for Smart Home Applications with PSoC[®] 6 MCUs

Infineon's virtual show 2020



IoT HMI Solutions are evolving – Touch → See → Talk



1) Touch and Sense



2) Display + Graphics



3) Voice



4) Connectivity



5) Security



PSoC[®] 6: Purpose-Built for the IoT

Emerging IoT devices require increased processing and security without a power or cost penalty



Cypress' PSoC[®] 6 portfolio bridges the gap between application processors and standard microcontrollers

- › 150-MHz and 100-MHz dual-core Arm[®] Cortex[®]-M4 and Arm Cortex[®]-M0+ ultra-low-power 40-nm architecture
- › Industry-leading ultra-low-power design that consumes as little as 22-μA/MHz in active power mode¹
- › Best-in-class flexibility with wired and wireless connectivity options, software defined peripherals and industry-leading [CapSense[®]](#)
- › Integrated, hardware-based Trusted Execution Environment (TEE) with secure data storage

*Linked terms are defined in the [Glossary](#)

1 Power specifications are based on the Arm Cortex[®]-M4 CPU

CapSense®: Industry Leading Capacitive Sensing Technology

CapSense® is Cypress's capacitive-sensing technology

- › CapSense is the industry's #1 solution in sales by 4x over No.2
- › Over 2 billion CapSense controllers have replaced more than five billion mechanical buttons
- › CapSense is found everywhere, including smartphones, wearables, automotive HMI, home appliances and printers

Touch Buttons: 2003



LG Chocolate Mobile Phone

Cypress's CapSense research and development begins with buttons and sliders

Liquid Tolerance: 2008



Whirlpool Dishwasher

CapSense algorithms offer Liquid Tolerance, proximity sensing and improved noise immunity

Noise Immunity: 2010



HP TouchSmart Printer

SmartSense™ Auto-tuning revolutionizes CapSense design by removing Manual Tuning and improving noise immunity

Configurability: 2011



Microsoft Arc Touch Mouse

CapSense Express™ offers configurable solutions that do not require Firmware Development

1B Units: 2013



Samsung Galaxy Note 3

One billionth CapSense controller shipped with stylus-activated buttons

2B Units: 2018



Fitbit Charge 3

Two billionth CapSense controller shipped with Ultra Low Power CapSense

MSC: 2H 2020



CY launches ULP Autonomous Edge Based Next Gen Multi-Sense Convertor (MSC)

Capacitive Sensing Applications



CapSense Buttons



CapSense Slider



Capacitive Trackpad



Proximity Detection



Touch screen



Capacitive Liquid Level Sense



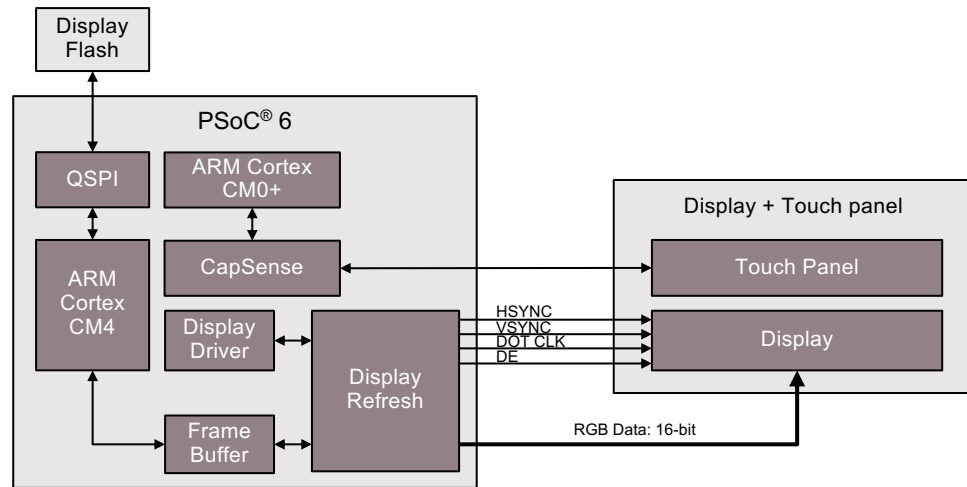
Specific Absorption Rate



Capacitive Force sensing

PSoC® 6 Solution for Parallel Display

- › Integrated display controller with support for up to 16-bit parallel interface
 - RGB direct drive
 - 8080 interface
 - 6800 interface
- › Supports Dot Clock up to 20MHz
- › Configurable refresh rate up to 60Hz
- › 0% CPU utilization to refresh display
- › Easy evaluation using ready-to-use development platforms:
 - PSoC® 6 Wi-Fi BT Pioneer Kit w/ TFT Display
 - PSoC® 6 Smart Home Solution Demo



PSoC® 6 Wi-Fi BT Pioneer Kit

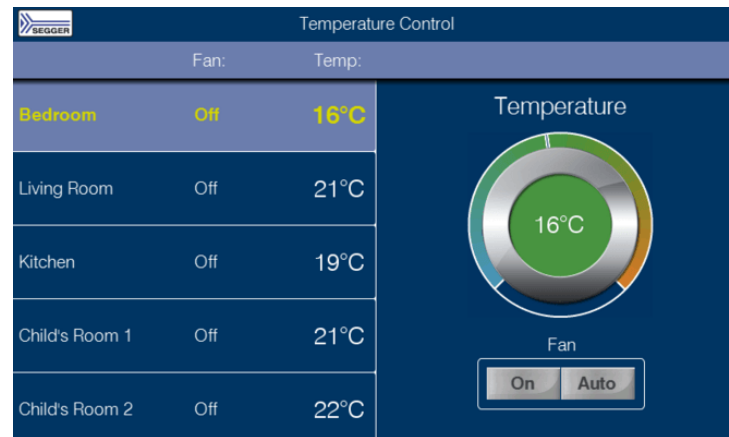


PSoC® 6 Smart Home Solution Demo

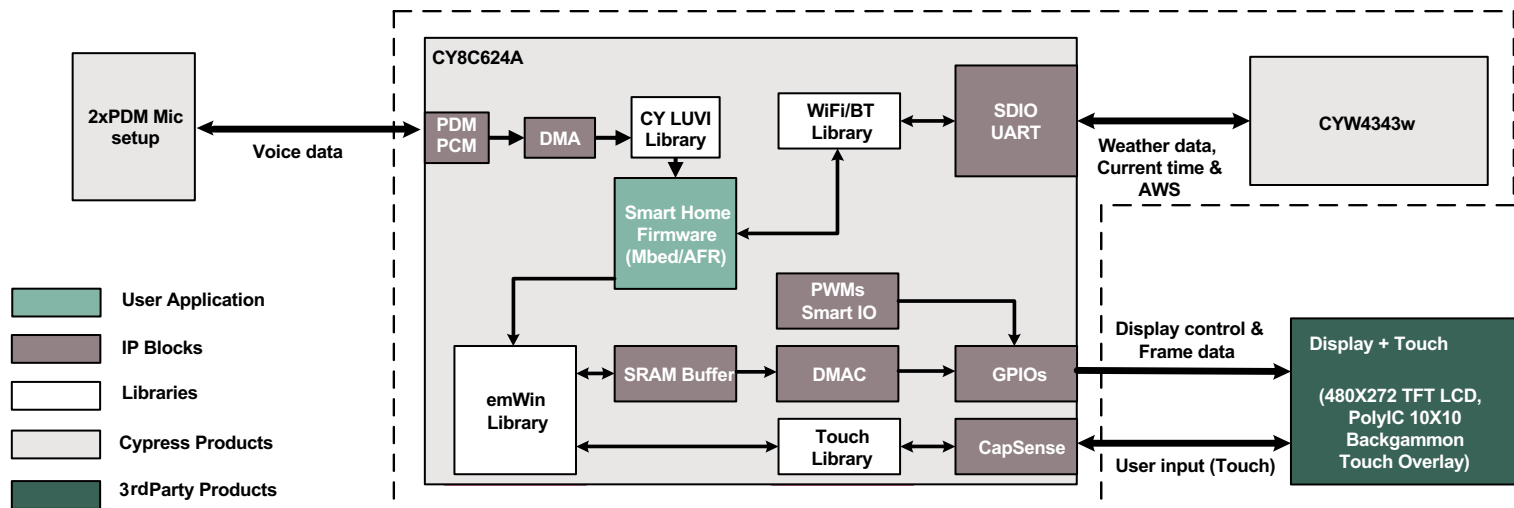


Segger emWin Library for PSoC® devices

- › Provides royalty-free full support for 2D graphics library (template examples below)
- › Support for all bitmaps format and the conversion tool
- › Supports for various fonts and majority of the color formats
- › Full support for windows manager and windows widgets
- › Optional support for RTOS and touchscreen features



Smart Home Solution Platform



- › The solution demonstrates the suitability of PSoC® 6 2M and CYW4343W/CYW43012 for Smart Home Applications
- › The demo features: CapSense based touch screen, Graphics display interface, Wi-Fi connectivity
- › Smart Thermostat like user-interface (UI) providing Indoor, Outdoor conditions
- › Wi-Fi connectivity to fetch weather condition and current date & time
- › Voice commands to control the room temperature locally (without internet connectivity)





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