

CYPRESS

# CAPSENSE<sup>®</sup> PLUS<sup>™</sup> CONTROLLER WITH INTEGRATED HAPTICS AND SMARTSENSE<sup>™</sup> AUTO-TUNING TECHNOLOGY



## PRODUCT OVERVIEW

### CY8C20xx6H FOR DYNAMIC TACTILE FEEDBACK

The CY8C20xx6H product family enables dynamic tactile feedback providing immediate confirmation of touch. The solution integrates Immersion's TS2000 Haptic effects library for Eccentric Rotating Motor (ERM) drive control. Immersion's 14 pre-defined effects, allow dynamic tactile feedback that enables users to experience a "touch back," supplying intuitive yet unmistakable confirmation. This feature enables a unique bi-directional communication channel that provides tremendous benefits that include user interface paradigms that are either impossible or extremely difficult to produce without it. Tactile feedback can help to offload visual channels, thereby reducing stress to improve efficiency of applications and personnel.

In addition to Haptic effects, the CY8C20xx6H series is enabled with Cypress's revolutionary SmartSense<sup>™</sup> auto-tuning technology, which eliminates the need for manual tuning and dynamically compensates for environmental variations during run time. SmartSense tunes each CapSense sensor automatically at power up and then monitors and maintains optimum sensor performance during run time. It incorporates automatic determination of the sensor capacitance threshold level to dynamically optimize system performance. This technology adapts for manufacturing variation in PCBs, overlays and noise sources such as LCD inverters, AC line noise, and switch mode power supplies and automatically tunes them out. The robust Capacitive Sigma Delta (CSD) algorithm ensures proper sensor performance in noisy environments by eliminating false triggers.

The CY8C20xx6H operates over a wide voltage range of 1.71 to 5.5 volts making it ideal for a broad range of end products. This product makes the most of Cypress's broad technology portfolio and years of user interface know-how so designers can focus on end product development and timely market introductions.

### APPLICATIONS BEST SUITED FOR CY8C20xx6H

- White goods
- Small home appliances
- Printers
- Industrial control
- LCD/LED TVs
- Portable navigation devices
- Media players
- POS terminals
- Portable medical devices
- Tablet PCs

### ADVANTAGES

INTEGRATED WITH IMMERSION TS2000 HAPTICS TECHNOLOGY FOR SUPERIOR USER EXPERIENCE

- The "touch back" feature supplies intuitive yet unmistakable confirmation of touch with accuracy
- Supports operation by feel, easing use when users are engaged in other activities - for example, using a GPS while driving
- Can improve device lifetime by eliminating repeated and forceful taps

### ROBUST SYSTEM PERFORMANCE

- High sensitivity, low noise CSD algorithm
- Strong immunity to radio frequency (RF) and alternating current (AC) noise
- Low radiated EMC tension

### SMARTSENSE ENABLED

- No manual tuning required
- Supports wide range of input capacitance (5 pf to 40 pf)
- All CapSense parameters are dynamically set in run time

### WIDE OPERATING RANGE

- 1.71 V to 5.5 V ideal for a wide range of regulated and unregulated battery applications

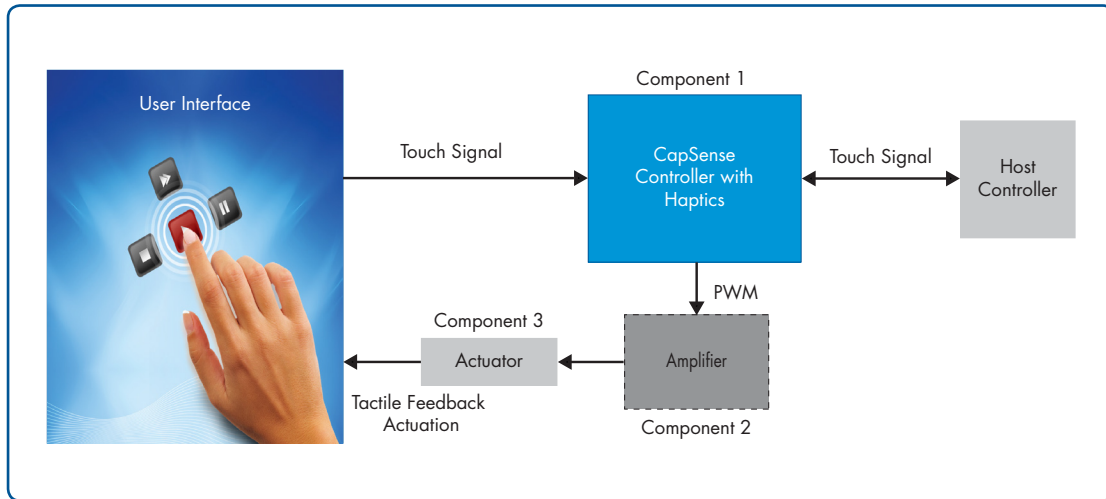
### LOW POWER CONSUMPTION

- Supply current in run mode as low as 15 $\mu$ A/button
- Deep sleep mode: 100 nA

INDUSTRIAL TEMPERATURE: -40 °C TO + 85 °C

INTERFACE SUPPORT I<sup>2</sup>C, SPI

AVAILABLE IN 24 & 32 QFN PACKAGES



Cypress Haptics Ecosystem

PRODUCT INFORMATION

Features	Benefits
Integrated with Immersion's TS2000 Haptic effects library	14 pre-defined Haptic effects enabled with buttons, sliders, and wheels
SmartSense auto-tuning technology	No tuning required. Faster design cycle, no additional external components.
Built-in noise filtering techniques	Robust capacitive sensing in noisy environments. No false triggers.

Part Number	Description	Operating Voltage (V)	Package
CY8C20xx6H	Haptic effects library enabled with SmartSense auto-tuning features	1.71 to 5.5	24 and 32 QFN

CYPRESS AND THE COMPETITION

Cypress Haptics Solution	Competing Haptics Solution
No manual tuning required. Cypress's SmartSense auto-tuning ensures robust sensing.	Manual tuning required via external resistors or software tools.
Besides the actuator and the required op-amp for additional current drive, only one external component (C <sub>MOD</sub> ) required for implementation	Competing solutions require four external capacitors, eight to 12 resistors, a voltage regulator and eight pins besides the required actuator and op-amp
Device operating voltage (min.) is 1.71 V	Device operating voltage (min.) is 2.0 V
Four options for the two additional Haptic control signals	Two fixed pins for Haptic control signals
Supports up to 23 capacitive buttons or five sliders	Supports up to eight sensors
Supports I <sup>2</sup> C/SPI communication protocols	Supports only SPI

GET STARTED NOW

Go to [www.cypress.com/go/capsense](http://www.cypress.com/go/capsense) for more information.

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