nRFready 2.4GHz RF Smart Remote Reference Design for Advanced Browsing Control

Ultra low power (ULP) RF specialist Nordic Semiconductor announces the nRFready 2.4GHz RF Smart Remote, a complete hardware and software reference design for advanced browsing control of the latest Internet-enabled and Web 2.0-enabled TVs and set-top boxes (STBs).

The reference design includes native support for a multi-gesture TouchPad, QWERTY keyboard, and motion control that all combine to deliver a rich, intuitive, and engaging end-user experience for advanced control and browsing of all types of modern digital content and services including audio, video, gaming, web browsing, social media, and online shopping.

According to DisplaySearch the market for Internet-enabled TV sets (commonly called 'connected TVs') is forecast to exceed 123 million shipments by 2014 reflecting a sustained 30 percent compound annual growth rate over that period. And this 123 million shipment number does not include other increasingly popular types of Internet-enabled consumer electronics (CE) devices such as STBs and media players. An essential part of all these products, however, is the remote control because it enables consumer end users to take advantage of, and enjoy with

ease, the full range and potential of digital content and services such products now support.

Designed specifically for the above applications, the nRFready 2.4GHz RF remote control features a multi-touch enabled TouchPad from Synaptics, a miniaturized QWERTY keyboard, a 6-axis motion sensing solution from Invensense, an ultra low power accelerometer from STMicroelectronics, and leverages Nordic's nRF24LE1 SoC (see 'About nRF24LE1' below) and Gazell 2.4GHz RF protocol stack. These component parts combine to offer a class-leading and almost turn-key solution for the development of advanced RF remote controls.

The combination of Nordic's nRF24LE1 SoC and Gazell 2.4GHz RF protocol stack also ensures a high performance, ultra low power, and cost efficient remote control implementation. Originally designed for PC peripherals, this radio and protocol combination delivers the bandwidth, latency, and co-existence performance necessary to seamlessly support all the nRFready RF Smart Remote's advanced features in even the most challenging 2.4GHz operating environments (e.g. due to other active nearby Wi-Fi and Bluetooth 2.4GHz wireless technology communicating devices). The nRFready RF Smart Remote reference design even features an IR (Infrared) LED that can be used to add support for legacy IR-controlled equipment too.

To let end users easily navigate through the rich content available on Internet-enabled TVs, the Synaptics multi-touch-enabled TouchPad provides both a familiar and modern user experience to consumers by supporting standard pointing, scrolling and tapping gestures; a range of more sophisticated multi-touch gestures including scroll, zoom, flick, and rotate; plus custom gestures with an enhanced user interface. This helps to create a fully interactive and intuitive Internet-enabled TV experience.

The ultra low power accelerometer from ST Microelectronics is used by the nRFready Smart Remote for intelligent power management, and can also support additional advanced control and browsing features such as orientation detection.

The nRFready RF Smart Remote's motion sensing is based on an InvenSense MPU-6050 MotionProcessing solution that InvenSense claims is the world's first and smallest integrated 3-axis gyroscope plus 3-axis accelerometer combination, and includes InvenSense's Digital MotionProcessor and 9-axis MotionFusion algorithms built-in. This is said to make it an ideal implementation for the remote control of products such as Smart TVs and game consoles because it enables point-and-click intuitiveness and gesture-based shortcuts for advanced navigation and control. The included InvenSense embedded MotionApps software also provides platform support for Microsoft Windows, Linux, and Android.

"With the growing popularity of Internet-enabled TVs and set-top boxes we are seeing an explosion in demand for advanced remote controls based on ultra low power radio solutions," comments Nordic's Product Manager, Thomas Embla Bonnerud. "The technical requirements for these remotes is very similar to that of wireless PC peripherals for which Nordic Semiconductor is well-established as the

leading vendor with its nRF24L Series SoC solutions. With the nRFready Smart Remote reference design, Nordic is providing a complete solution to customers delivering a unique combination of advanced functionality, cost efficiency, low power, and high performance."

"Touch and multi-touch gestures are extending to products and markets beyond the PC, and the Synaptics TouchPad is ideal for remote controls in digital home solutions, including the TV, set-top box, and other devices for the living room," states Ted Theocheung, Vice-President of PC & Digital Home Solutions at Synaptics. "The partnership with Nordic, a leader in ultra low power wireless technology, has resulted in a Smart Remote reference design that is representative of the future potential that gesture-enabled remote controls can offer the consumer electronics market."

"We are very pleased that Nordic selected our MPU-6050 MotionProcessing solution, that offers low current consumption and reduces the processor performance requirements for remote controls by offloading complex computation using the InvenSense on-chip Digital MotionProcessor," adds Joseph Jiang, Vice President of the MotionProcessing Business Unit at InvenSense. "Our embedded MotionApps software also provides auto sensor calibration algorithms that removes the necessity for user calibration facilitating advantageous performance for Smart TV motion controller applications."

The nRFready 2.4GHz RF Smart Remote reference design kit (Nordic product code: nRF6920) includes a Nordic Smart Remote baseboard, Smart Remote 2.4GHz RF radio module, 2.4GHz RF USB dongle, programming adapter, and a complete set of design files, software source code, and supporting documentation. It is available today.

About nRF24LE1
[1]

Posted by Janine E. Mooney, Editor

December 1, 2011

Source URL (retrieved on *12/11/2013 - 9:53pm*):
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