

# Realtek creates WiMedia UWB chips to meet standards of today... and tomorrow

## Client

**Realtek Semiconductor Corp.**

Irvine, CA

www.realtek.com.tw



## Challenge

To design compliant Certified Wireless USB and WiMedia LLC Protocol chipsets for a vast array of products expected to come to market by 2009.

## Solution

To save time in debugging and pre-compliance testing, Realtek uses Ellisys Wireless USB Explorer 300 protocol analyzers and UWB 320 Generators.

## Benefits

Chip designers saved more than two months off the development of the first UWB chipset, and were able to show prototypes at more industry events sooner.

## Quote

*"The Ellisys equipment was essential for us to get where we are. Every aspect of working with Ellisys has been excellent."*

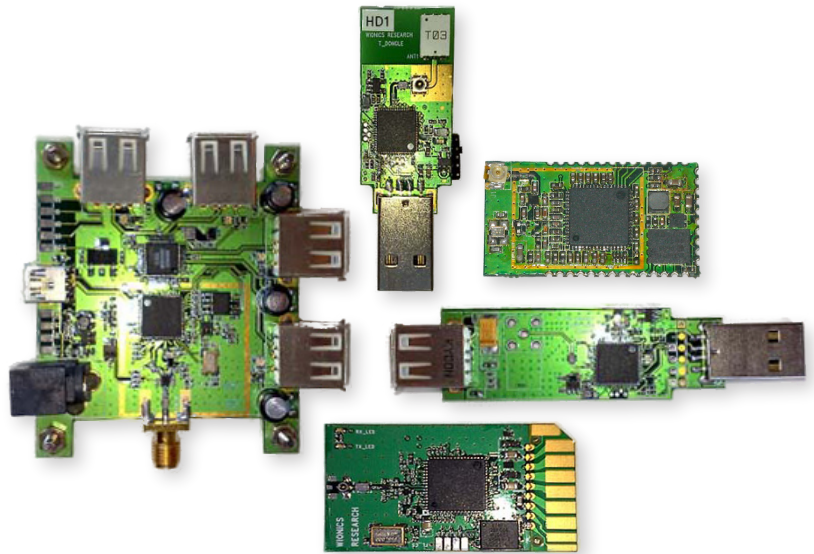
Venkatesh Rajendran  
Director MAC & Protocol Development  
Realtek

One of the world's leading chip-makers based in Taiwan, Realtek, sees a huge opportunity for WiMedia UWB personal area networking chips in the near future.

So the company needed to create chips that comply with the Certified Wireless USB and WiMedia LLC Protocol standards, even while some test specifications were still being developed. To help create a compliant chipset, Realtek uses wireless test equipment from Ellisys.

## Getting in early

Realtek has succeeded in many mature markets by manufacturing parts more economically than anyone else, achieving a dominant market share in several products.



With WiMedia UWB, the company saw a wide-open field with major potential, so it aimed to stake out a leadership position. Emphasizing time-to-market sometimes meant developing WiMedia-based chipsets before the specifications and regulations were completely frozen.

"There are two main ways to approach a standard," says Sean Coffey, the company's Director of Business Development and Standards. "The low-risk path is to wait until it matures, and then compete on price. The high-risk, high-reward approach is to get in early, aim at technology leadership, but take the risk of expending engineering development on a standard that's in flux."

The huge promise of this market prompted Realtek to get in early.

"We're looking at significant market uptake in 2008 and a truly mass market in 2009, and we'd like to be there with enough standards-based products for that entire market," says Coffey.



Ellisys is a leading supplier of cutting-edge USB, Wireless USB and Ultrawideband Protocol Analyzers. The company's products help hardware, software and test engineers save development effort, improve quality, and accelerate time to market. Ellisys protocol analyzers range from simple and cost-effective tools to high-end fully-featured equipment.



Realtek Semiconductor Corp. is one of the world's leading IC providers. It designs and develops a wide range of IC products for communications network, computer peripheral, and multimedia applications. Products include 10/100 and Gigabit Ethernet controllers, wireless LAN controllers and AP/router SoCs, ADSL2+ chips, VoIP solutions, WiMedia-based UWB chips, AC'97/high definition audio codecs, and LCD controllers.

"Ellisys equipment has saved us a lot of time and increased our productivity. It is a pleasure to work with."

Getting in early means finding every way to compress development schedules, while still producing fully compliant chips.

Realtek managers saw Ellisys wireless test equipment at a trade show in 2006, and quickly decided it was just what they needed. The company now has many Ellisys wireless protocol analyzers, which are much in demand among its engineers.

### A pleasure to work with

Among the many innovative features of the Ellisys equipment is the Instant Beacons™ view, which displays a table of all devices and their recognition status by other devices in the network.

"When we need to see how many devices are in a network, and make sure they are synchronizing,

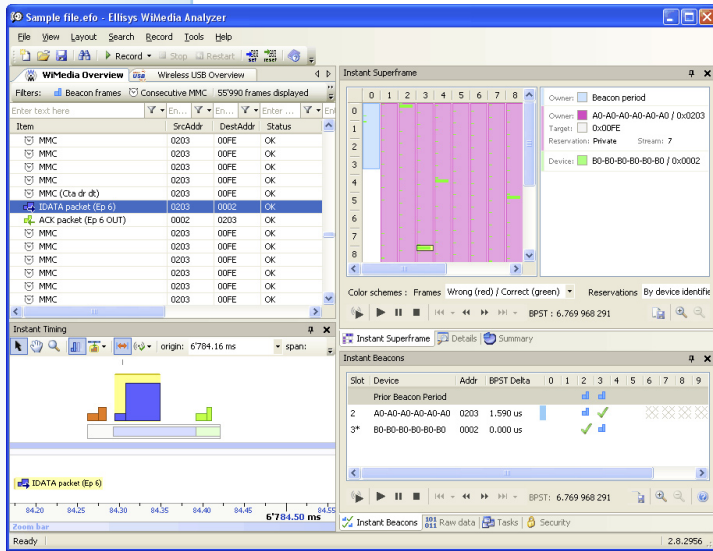
timings, superframes, and compliance analysis, and it's been essential in debugging all kind of problems.

"It has saved us a lot of time and increased our productivity," he says. "It's a pleasure to work with."

Before the Ellisys equipment, Realtek had a test device designed in-house which gave modest results but was complicated to use. Potential partners and customers had built their own testers as well, which meant everyone was evaluating prototype setups with a different system.

"If you have your own homegrown thing, and they have their own homegrown thing, it's very difficult. It's much easier to have a third-party analyzer and be standardized," says Rajendran.

The wireless analyzers from Ellisys confirm beyond a doubt what's going out over the air, and display it in an intuitive way. In a few short years, Ellisys has become the de-facto standard in the industry.



### Complete single-chip solutions

Realtek's first two complete products were announced in mid-2007.

These include a single-chip CMOS device, the RTU7105, supporting both Wireless USB Device functionality and the WiMedia LLC Protocol. It has integrated MAC, baseband, and two RF transceivers, supporting both low-band (< 5 GHz) and high-band (> 6 GHz) operation: the first device on the market with this combination of features.

Both the RTU7105 and the RTU7300 were among the first set of devices formally certified by WiMedia in 2007 for compliance with the WiMedia platform specification.

Realtek was also among the first to receive WiMedia approval for the underlying UWB radio technology with its single-chip CMOS UWB physical layer device, comprising digital baseband and radio.

"The WiMedia common radio platform is novel, flexible, and ideally tailored to the challenges of personal area networking," said Rajendran.

"However, as with all new MAC protocols, it required a considerable amount of testing, verification, and interoperability analysis to produce fully compliant products. The Ellisys equipment was essential for us to achieve it. Every aspect of working with Ellisys has been excellent."



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This screenshot shows WiMedia traffic in the Ellisys WiMedia analysis software. The Instant Superframe, Instant Timing and Instant Beacons show precise information in real time.

Ellisys has a very good timing analysis which helps us to figure out what is going on," says Venkatesh Rajendran, Realtek's Director of MAC and Protocol Development.

He says the Ellisys software is easy to use, and his engineers can quickly browse traces and drill down to analyze issues. He particularly likes the Instant Timing view, an industry first that Ellisys introduced in the summer of 2006.

Rajendran adds that the Ellisys equipment is very powerful, with advanced features for