The Tinker's Toolbox - Bart Giordano of Marvell on Wireless Systems

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Hosted by Alix Paultre, the Tinker's Toolbox is the Advantage Design Group's web-based interview show where we talk about the latest technology, components, and design issues for the electronic design engineering community.

In today's podcast we talk to Bart Giordano, Director of Product Marketing for Wireless at Marvell about wireless architectures, industry standards issues, and the rise of older tech in new places like beamforming in smaller systems. Marvell recently released the 88MZ100 ZigBee microcontroller system on a chip (SoC), presented as the industry’s first SoC with this high level of integrated features for home automation and LED lighting control applications.

Right-click to download the podcast [1]

Here's a link to the podcast in case the play button is inoperative: Bart Giordano Interview [1]

For more information on Marvell products, visit http://www.marvell.com/wireless/ [2]

Here is a recent news item on their 88MZ100 ZigBee microcontroller:

Marvell (Nasdaq: MRVL), a worldwide leader in integrated silicon solutions, today announced the Marvell 88MZ100 ZigBee microcontroller system on a chip (SoC), the industry’s first SoC with the highest level of integrated features for home automation and LED lighting control applications historically found in four separate

chips:

- Certified ZigBee Pro stack and IEEE802.15.4-2003 / 2006 transceiver.
- 32-bit ARM Cortex® -M3 microcontroller running at 32- or 64 MHz with Marvell’s proven peripheral IPs and up to 31 GPIOs that enable rich microcontroller applications.
- On-chip DC / DC converter, which can directly take battery input from 2 to 3.6 volts.
- In package 512 KB serial flash with QSPI interface to the ARM Cortex-M3.

With high-performance, low-power consumption and rich microcontroller peripherals at an affordable price point, the 88MZ100 is designed to offer unparalleled advantages for home automation and LED lighting control applications enabling original equipment manufacturers (OEMs) and original design manufacturers (ODMs) to easily, quickly and cost-effectively reach the market with new, innovative products in this rapidly growing space.

In addition, Marvell announced today the new 88MC200 Wi-Fi microcontroller SoC which, together with Marvell's Avastar™ 88W878x 802.11n Wi-Fi SoC and comprehensive Smart Energy software stack, is designed to provide a highly cost-effective, flexible and easy-to-use hardware/software solution enabling smart connectivity for a variety of devices and appliances that are not designed with high performance host processors, ranging from refrigerators to thermostats.

“Original equipment manufacturers of smart energy devices and lighting need an integrated solution that combines a microcontroller and wireless connectivity for the correct balance of performance, power consumption and wireless networking that enables these devices to be controlled and accessed from anywhere at any time,” said Yonghua Song, vice president of Central Engineering at Marvell Semiconductor, Inc. “Marvell’s 88MZ100 is a total system solution that enables superior smart LED lighting control for the mass market. This easy-to-install solution is manufacture-ready for both consumer and commercial audiences at a low bill of materials cost.”

The 88MZ100 ZigBee SoC leverages the company’s proven strengths in powerful, energy-efficient computing and wireless networking, and combines it with Marvell’s LED drivers to provide a total solution for LED lighting control and home automation applications. The SoC’s ZigBee gateway acts as an adaptor that facilitates control of both ZigBee and Wi-Fi enabled smart devices using a standard IP network infrastructure.

The 88MZ100 provides best-in-class coexistence performance in the 2.4GHz ISM band where Wi-Fi and Bluetooth devices reside, through Marvell’s leading RF, DSP and software strengths in wireless connectivity. Furthermore, with superior sensitivity (-104dBm), the 88MZ100 does not sacrifice receive sensitivity as a coexistence solution.

The 88MZ100 ZigBee software stack features a set of host APIs that provide users full control of the light bulb via the Marvell Wi-Fi / ZigBee Gateway reference design. Using ZigBee’s cost-effective green and global wireless networking standard, the

88MZ100 and Marvell Wi-Fi/ZigBee gateway enable consumers to seamlessly control their household devices from their mobile phone, connected consumer electronics device or dedicated website through an intuitive user interface (UI).

The Marvell 88MC200 high performance microcontroller uses an advanced 55nm process with 512KB SRAM, and integrates a rich set of I/O interfaces including I2S, SDIO and USB. Marvell’s new Smart-Energy Platform is driven by the 88MC200 and Marvell’s second-generation Smart-Energy Software Platform to provide a flexible, cost-effective solution that further enables the mass-market adoption of smart appliances and devices ranging from thermostats to refrigerators. Current devices implemented with the Marvell 88MC200 include heating and cooling systems; household appliances such as refrigerators, dishwashers, washers and dryers; plug-load controllers; lighting controls; smart-meters and sensors; and irrigations systems.

Marvell 88MZ100 Overview:

The Marvell 88MZ100 is the industry’s first SoC with the highest level of integration for home automation and LED lighting control applications, including features historically found in four separate chips. The ZigBee SoC’s extremely high integration level, best-in-class transceiver performance and power consumption, and reduced bill of materials (BOM), allows manufacturers to lower the total system cost significantly while also improving system performance and robustness.

Details Include:

- 48 pin QFN package, 31 GPIOs, out of which 29 support external IRQ
- 32 MHz crystal with on-chip clock generation
- ARM Cortex-M3 core, running at 32MHz or 64MHz with software programmability
- 512KB in-package QSPI serial flash with 1MB option
- 160KB configurable code/data RAM
- DMA with six configurable channels for peripheral data transfer
- Serial communication port: 2 UART, 2 SPI and 2 I2C
- Two general purpose 32 bit timer modules, each supporting 5 PWM channels
- RTC / WDT
- 16-bit Analog to Digital Converter with configurable throughput up to 250ksps and conversion range from 0 to 3.6V; 8 single channels or 4 differential channels
- 10-bit 500 ksps Digital to Analog Converter, 2 single channels or 1 differential channel
- Two Analog Comparator with programmable speed/current
- On-chip temperature sensor
- On-chip battery monitoring

- Hardware 16 bit CRC and 128 bit AES engine shared between MAC and applications

Marvell 88MC200 Overview:

The Marvell 88MC200 microcontroller enables high-performance computing for a variety of smart devices at a cost-efficient price point. It provides a 55nm process with CPU clock up to 200MHz and 512kB SRAM, and offers a rich I/O capability with on chip DC / DC converter, which significantly lowers BOM cost. The Marvell 88MC2000 further enables innovative, energy-efficient applications and services for the mass market.

Details Include:

- 32-bit ARM Cortex-M3 microprocessor
- On Chip DC / DC converter to lower BOM cost
- QFN / LQFP / 64 / 80 / 100 pin packaging
- In-package QSPI Flash
- QSPI interface for external Serial Flash support
- QSPI (1) SSP / SPI / I2S (2), I2C (3), UART (4)
- GPIOs (up to 60)
- SDIO; USB OTG FS with integrated PHY
- Multi-channel PWMs
- ADC (2 x 16 bit), DAC (2 x 10 bit)
- Analog comparators (2)
- 128-bit AES hardware engine
- 55nm process

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