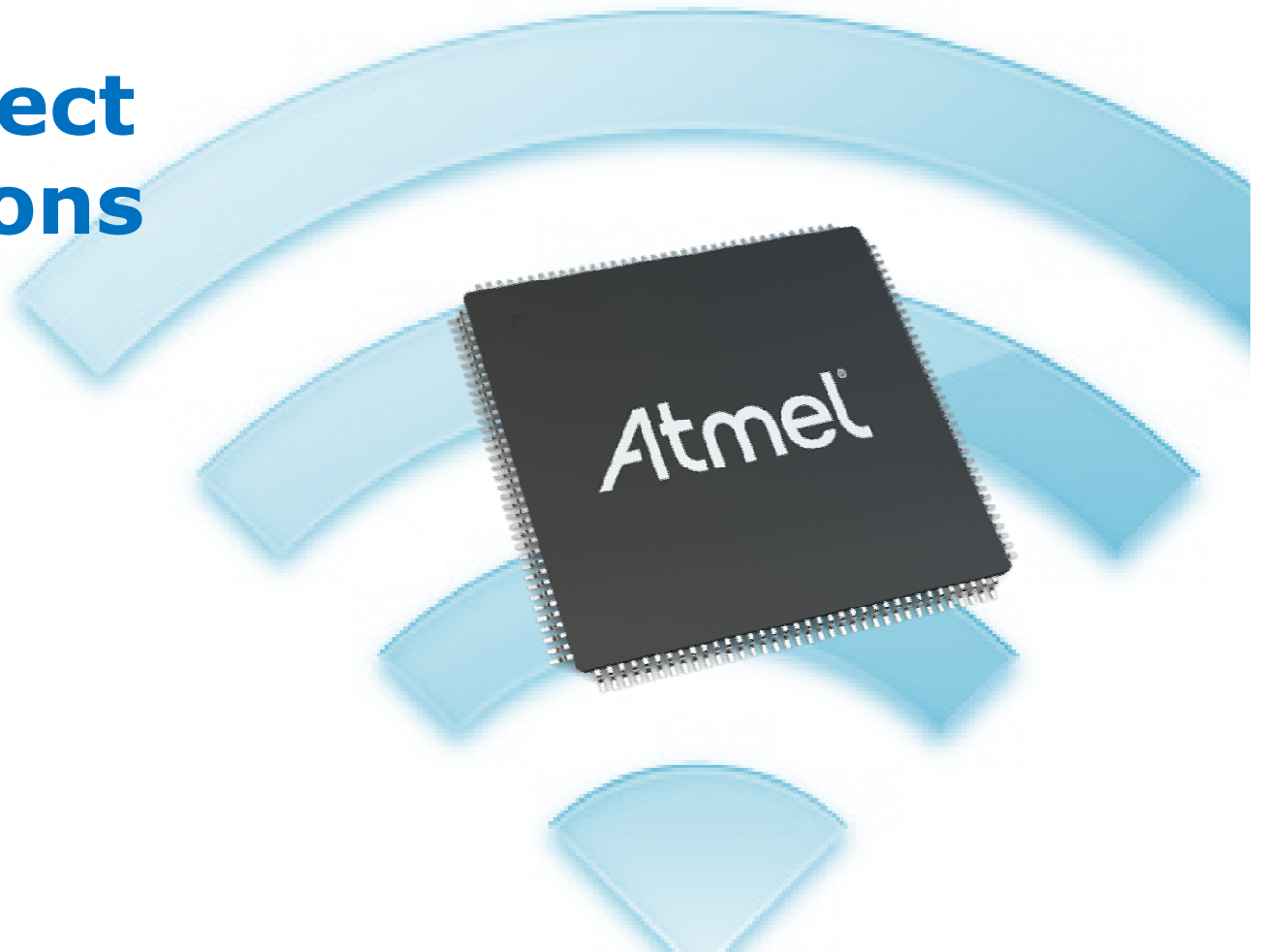




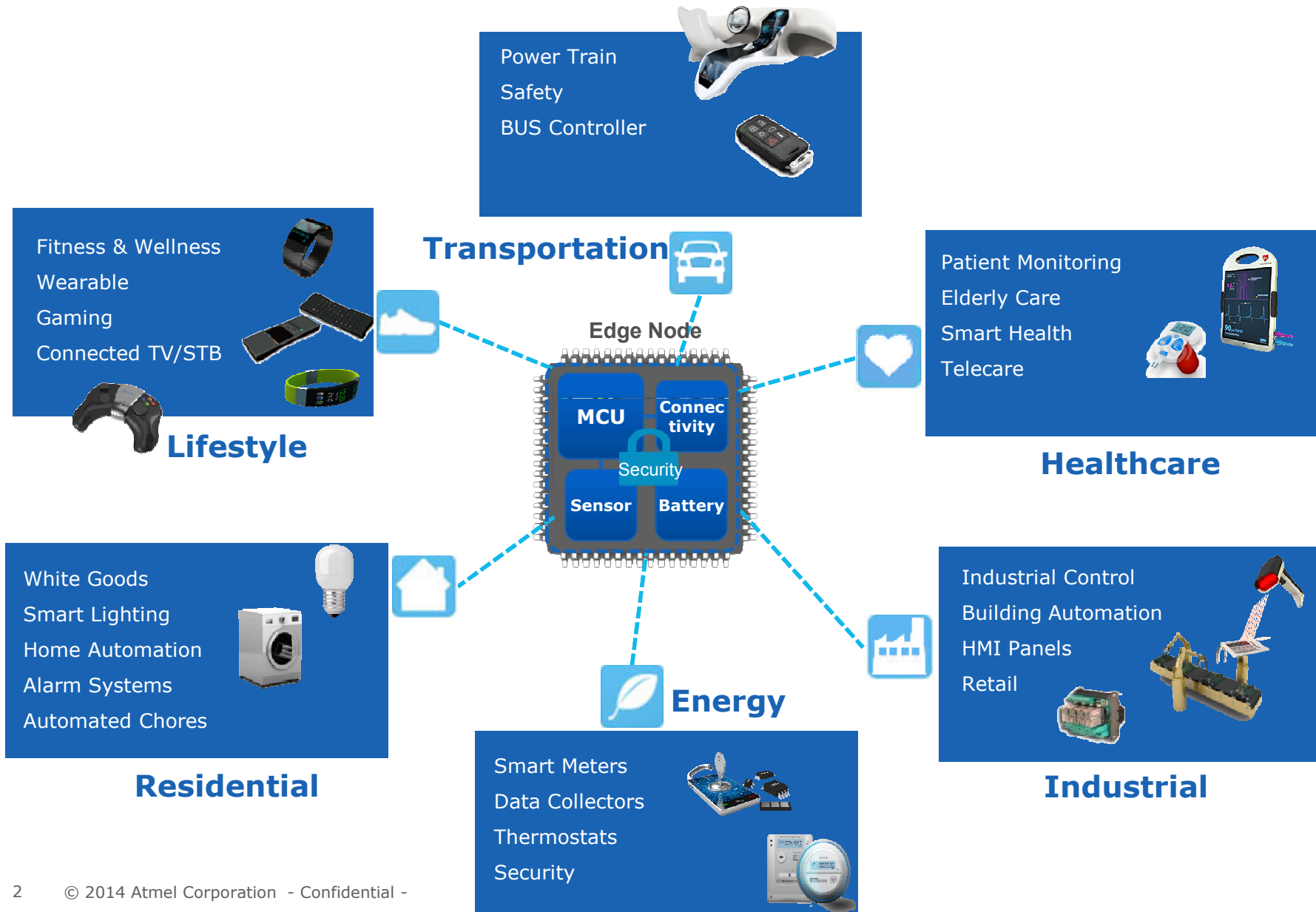
SmartConnect WiFi Solutions

August 2014



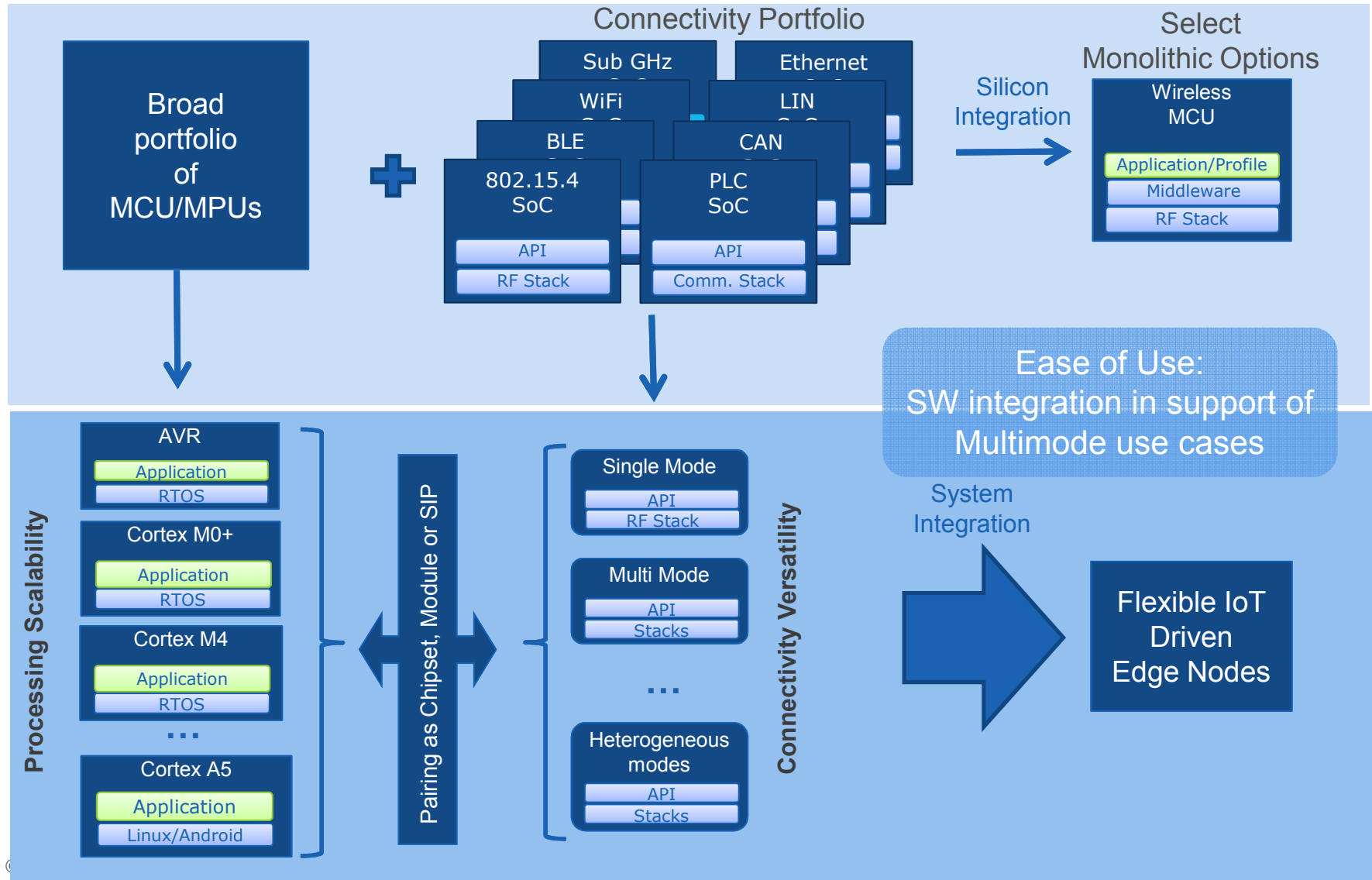
Key Driving Trend For Wireless and Embedded MCUs:

Internet of Things (IoT) – Up to 50B Units by 2020



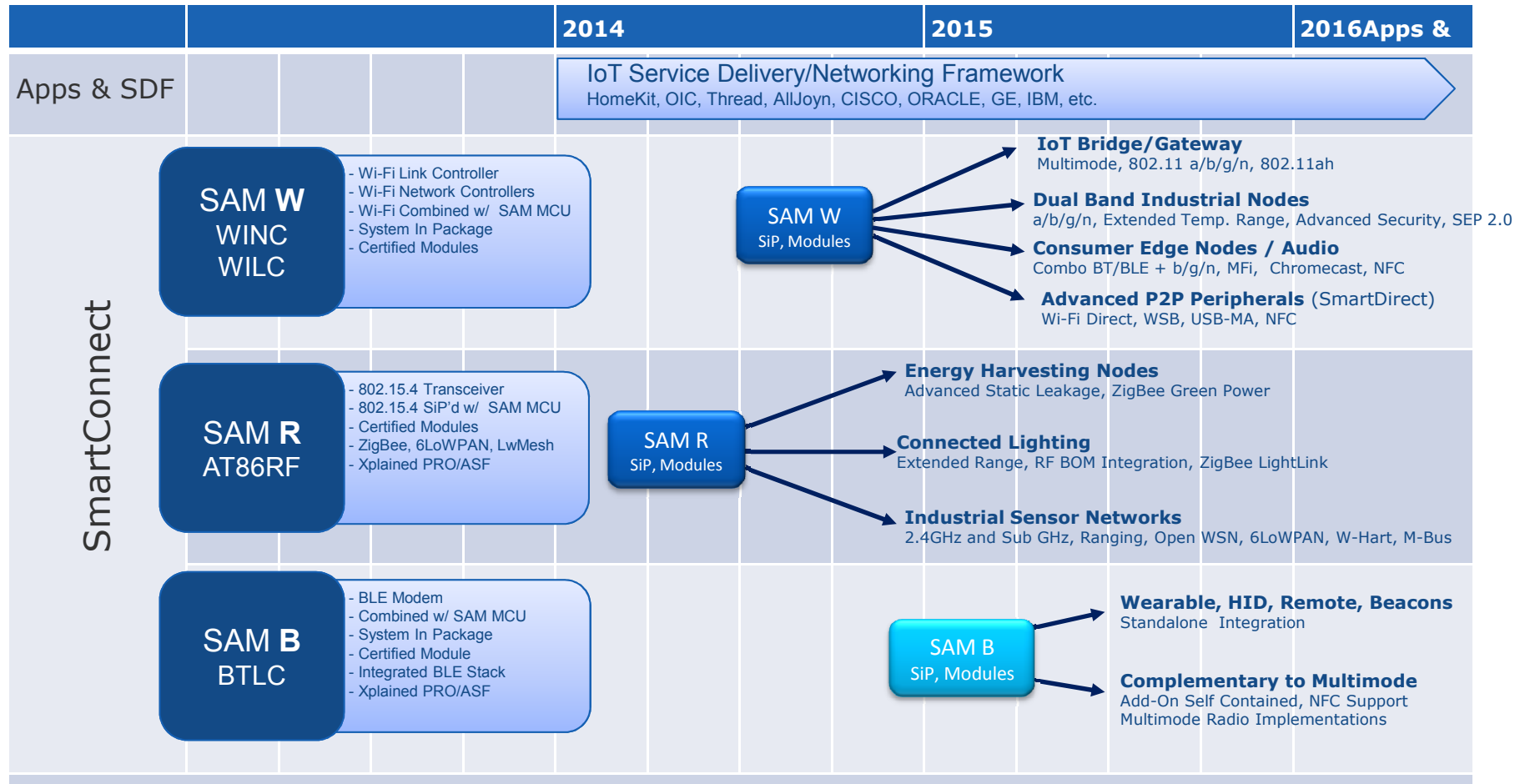
SmartConnect Connectivity Approach

An MCU approach to Connectivity

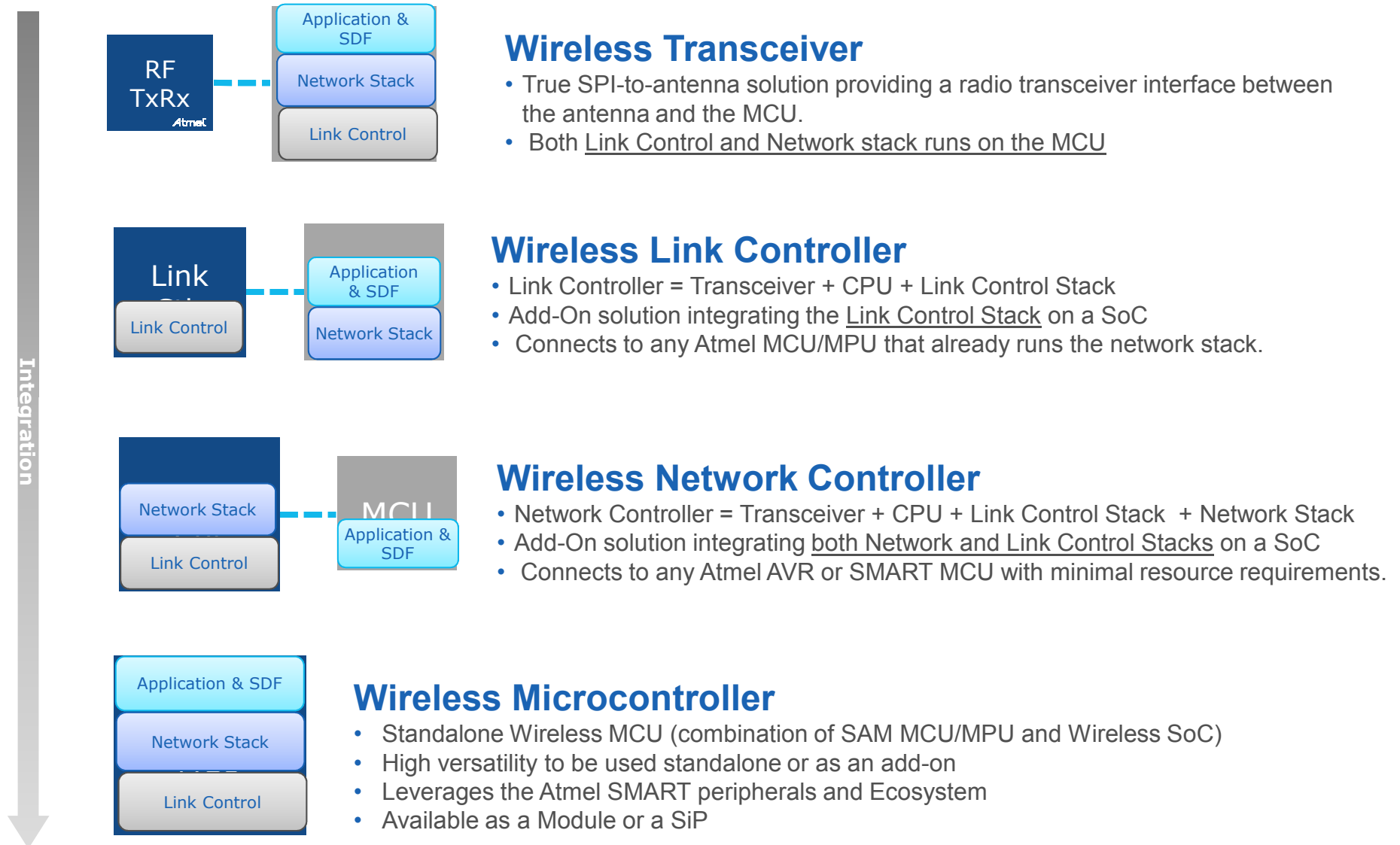


Atmel Wireless – Products and Silicon Roadmap

Major Projects Realizing Product Strategy and Releases

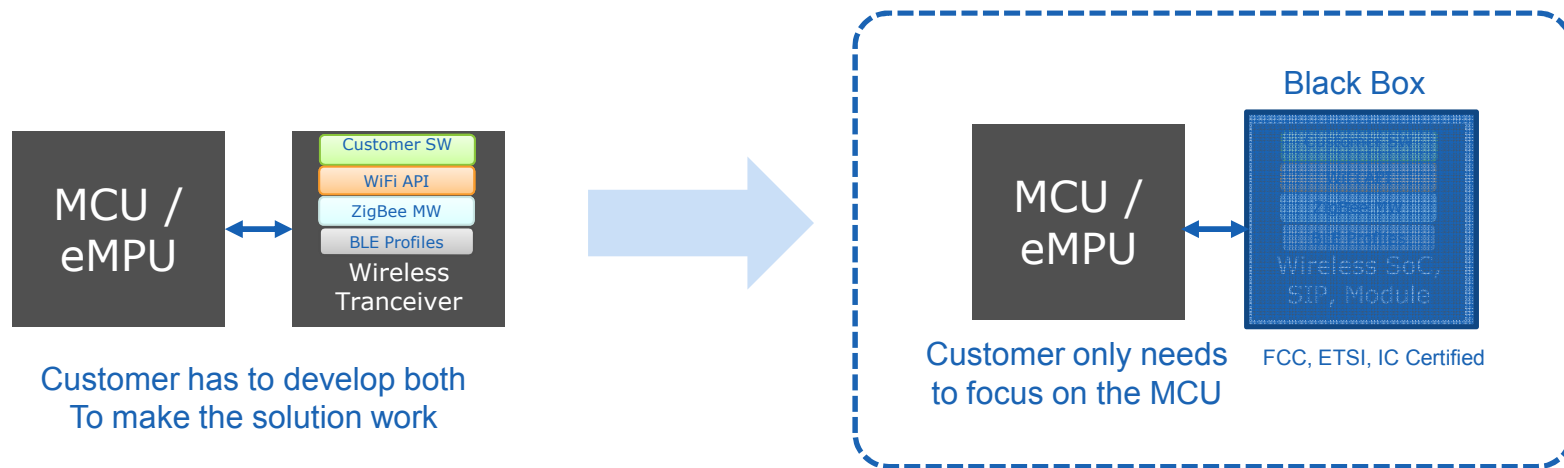


Enabling Embedded Wireless Solutions



What is SmartConnect?

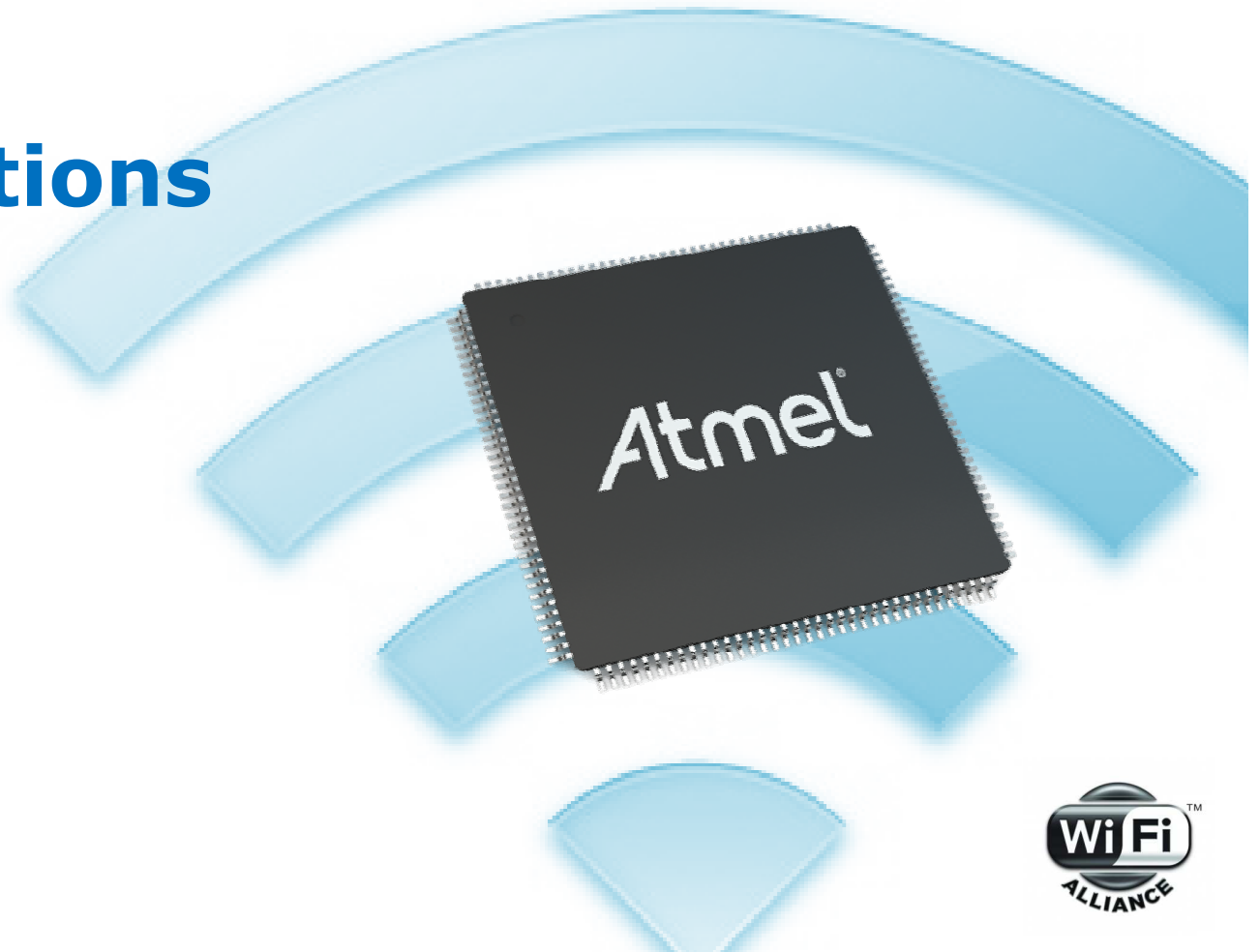
Solving today's IoT System Integration Challenge



SMARTCONNECT System Solution

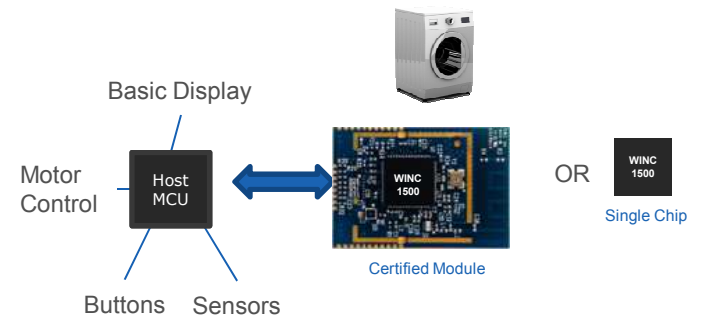
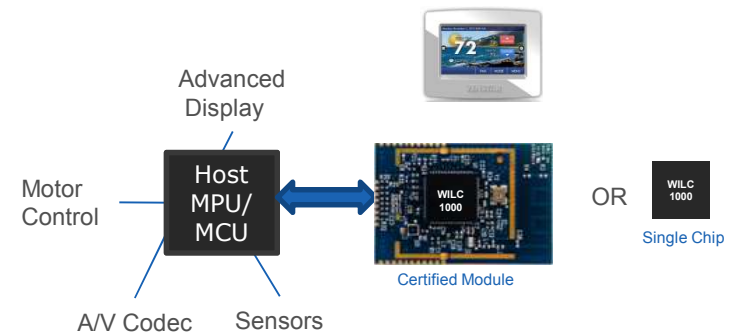
- MCU / Wireless SoC Chipsets
- Ready to MP Certified Modules
- MP ready integrated SW stacks
- System-In-Package Integration
- Lowest Power Consumption
- Shortest Time to Market

Wi-Fi Solutions



SmartConnect Wi-Fi Go To Market

- **Link Controller – MPU/MCU Add-On Mode**
 - Bring **WiFi only** to existing Linux/Android-running MPU through SDIO-to-WiFi interface or existing MCU running a TCP/IP stack, as:
 - Certified module (Broad Market)
 - Single Chip
- **Network Controller – Low-End MCU Add-On Mode**
 - Bring **WiFi and Network capabilities** to existing MCU through UART or SPI-to-WiFi interface, as:
 - Certified module (Broad Market)
 - Single Chip
- **Wireless MCU – Standalone Mode**
 - Phase 1: MCU + Network Controller on Certified Module
 - Phase 2: SiP (MCU + WiFi)



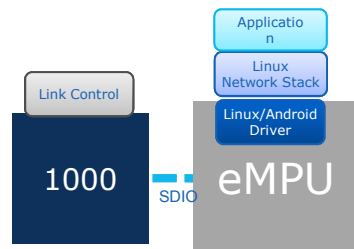
WILC Link Controller Series

WILC is a State of The Art single-chip Link Controller

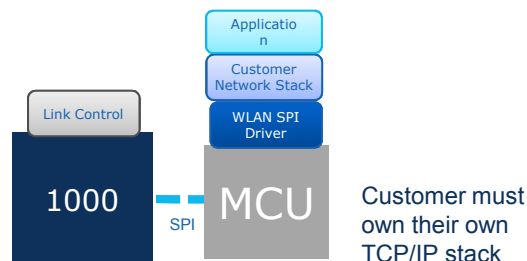
- Targeting **high data rate** and **extended range** IoT use cases
- Interfaced with MPU using **SDIO interface**.
- Interfaced with MCUs using **SPI interface**.

SW Deliverables

- **eMPU** WLAN Linux Driver (net_device, cfg802.11 interfaces)
 - Full Distribution for Atmel eMPU
 - Kernel Module source + Customization manual for 3rd-party eMPU



- **MCU** C-based Network stack and Driver (Custom WLAN Driver)
 - Project Example in Atmel Studio for (SAM4S, SAMD21)
 - Driver Source + Customization manual for network stack binding.
 - Software Guides and demo project manual



Link Controller	WILC1000
Standards	802.11 b/g/n 1x1
Max PHY rate	72Mbps
Frequency	2.4GHz
Stacks	WEP, WPS, WPA2 Wi-Fi STA/AP/Direct
Crypto. Acceleration	-
Applications	IoT, Audio/Video
Interfaces	SPI, UART, I2C
Tx/Rx (dBm)	+20dBm/-91dBm (g)
Tx/Rx peak (mA)	263mA/70mA
Package	5x5mm QFN
Temp Range	-20 to +85°C
Availability	Q4'14

WILC1000 Link Controller

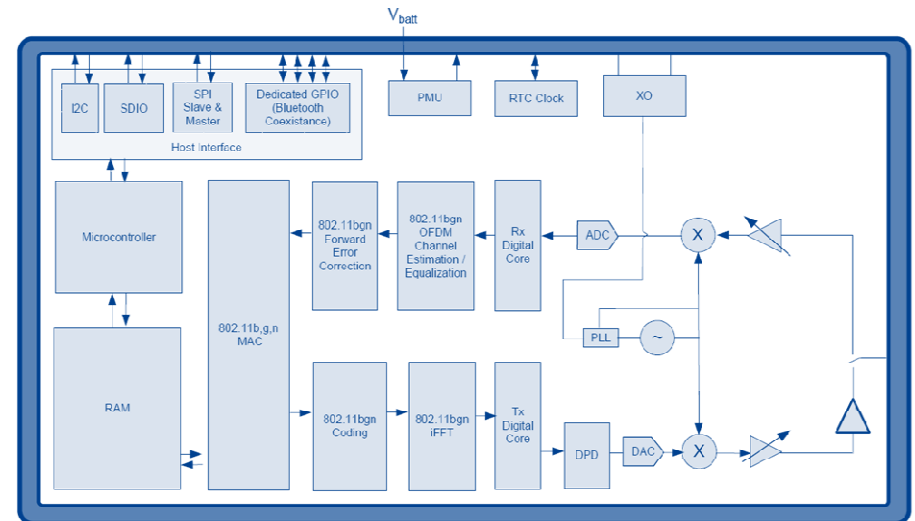
WILC is a State of The Art single-chip Wi-Fi Link Controller

- **IEEE 802.11 b/g/n Single Chip SOC**

- Integrated RF Transceiver, PA, TR Switch, PMU, Modem, and MAC

- **Key Features**

- IEEE 802.11 b/g/n (1x1) for up to 72 Mbps
- Single spatial stream in 2.4GHz RF band
- Integrated PA with digital linearization, TR Switch, and PMU
- Superior Sensitivity/Range via adv. PHY signal processing
 - Advanced Equalization and Channel Estimation
 - Advanced Carrier and Timing Synchronization
- TDLS, Wi-Fi Direct and Soft-AP support for Android
- Supports IEEE 802.11 WEP, WPA, WPA2 Security
- Supports China WAPI security
- Superior MAC throughput via hardware accelerated two-level A-MSDU/A-MPDU frame aggregation and block acknowledgement
- On-chip memory management engine to reduce host load
- SPI, SDIO, UART, TSIF host interfaces
- Integrated 40Mhz Cortus APS3.



Available Sept 22nd
5x5 mm QFN (0.5mm pitch)
3.1x3.1mm WLCSP56



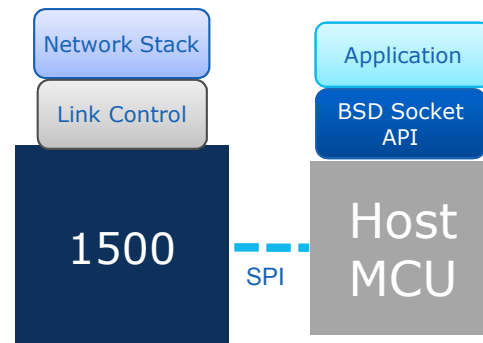
WINC Network Controller Series

WINC is a State of The Art Wi-Fi single-chip Network Controller

- Targeting **high data rate** and **extended range** IoT use cases
- **True Single Chip** Internet Network Controller solution
- System in Package with **4Mb stacked flash**.

Deliverables

- BSD-style Socket Interface MCU software (9K Flash, 1K RAM)
 - Board Support Package Example (I2C/SPI port on ref MCUs)
 - ASIC Driver (data encapsulation, Wi-Fi management),... etc.
 - SW Distribution package via Gallery (SAM4S, SAMD21)
- Programmer's Guide (Driver API document).
- Software Guides and demo project manual
- Demo project example source code
- PC tools (flashing, efuse ... etc).



Network Controller	WINC1500
Standards	802.11 b/g/n 1x1
Max PHY rate	72Mbps
Frequency	2.4GHz
Stacks	TCP/IP, TLS WEP, WPS, WPA2 Wi-Fi STA/AP/Direct
Crypto. Acceleration	-
Applications	IoT, Audio/Video
Interfaces	SPI, UART, I2C
Tx/Rx (dBm)	+20dBm/-91dBm (g)
Tx/Rx peak (mA)	263mA/70mA
Sleep	3uA
Package	5x5mm QFN
Temp Range	-20 to +85°C
Availability	Q4'14

WINC1500 Network Controller

WINC is a State of The Art single-chip Wi-Fi Network Controller

- **MCU Interfaces**

- SPI, UART, and I2C

- **BOM optimized**

- Integrated LNA, PA, and T/R Switch
- Integrated e-Fuses to store MAC address and calibration data
- Industry smallest die size

- **Power Save Modes**

- 1uA Deep Sleep mode
- 300uA Standby mode (State is preserved)
- On-chip low power sleep oscillator
- Fast host wake-up by chip pin or clock-less transaction

- **Fast Boot Options**

- On-Chip Boot ROM (Firmware instant boot)
- SPI flash boot (firmware patches and state variables)
- Low-leakage on-chip memory for state variables (next chip revision)
- No SPI flash is needed if firmware patches and state variables can be loaded from MCU at boot time
- Fast AP Re-Association

- **On-Chip Network Stack to offload MCU**

- Integrated Network IP stack to minimize host CPU requirements
- Network features TCP, UDP, DHCP, ARP, HTTP, SSL, and DNS
- Wi-Fi security WEP, WPA, WPA2 and WPS
- No OS small footprint host driver (4KB flash – less than 1KB RAM)



Selector Guide – WILC/WINC Add-On PCB Modules

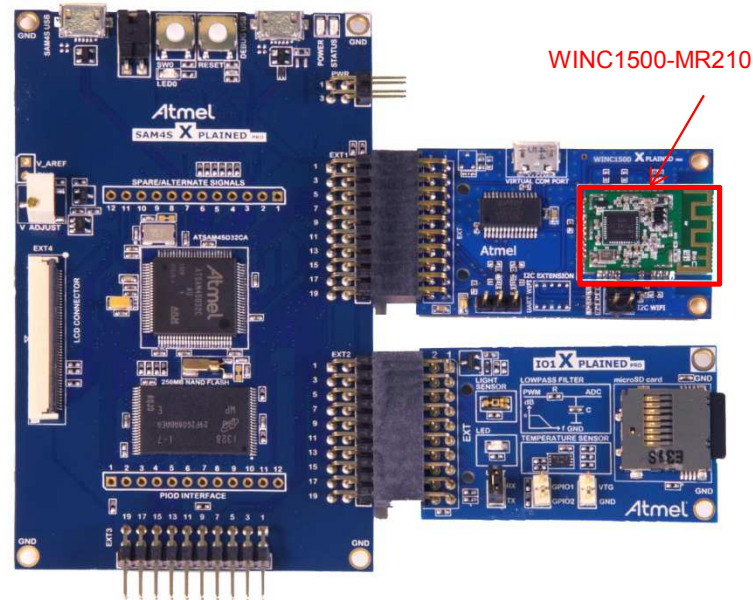
	WILC1000 -MR1100A	WILC1001 -MR1100A	WILC1000 -MR110PA	WINC1500 -MR210PA	WINC1500 -MR510CA
Wi-Fi SoC	WILC1000A	WILC1001A	WILC1000A	WINC1500A	WINC1500A
External Host Type	MPU/MCU	MPU/MCU	MPU/MCU	MCU	MCU
External Host Interface	SDIO/SPI	SDIO/SPI	SDIO/SPI	UART, SPI	UART, SPI
Single Band 802.11n	✓	✓	✓	✓	✓
WPS, WPA/WPA2 Supplicant	Ext.	Ext.	Ext.	✓	✓
TCP/UDP, DNS, HTTP/HTTPS, TLS	Ext.	Ext.	Ext.	✓	✓
Crypto memory (ECC108)	–	–	–	–	✓
Antenna Design	–	–	PCB	PCB	Chip/u.FL
OTA Upgrade	–	–	–	✓	✓
Dimensions	15 x 14 mm	15 x 14 mm	22 x 15 mm	22 x 15 mm	22 x 15 mm
Pin out	31 (LGA)	31 (LGA)	28x castellations (Pin-to-Pin Compatible)		
Availability (MP)	09/22/14				01/06/15

WINC1500-XSTK Starter Kit

WiFi MCU add-On

Generic WIFI XPRO Carrier Wing:

- WINC1500-MRx XPRO (Channel and Direct
- WILC1000-MRx XPRO (Direct and ODM Only)



SmartConnect MPU Eval Kits

WiFi Link Controller (MPU add-On)

HW Tools:

Generic SD Carrier Wing populated with
WILC1000-MR1 module or WILC3000-MR1 module

- WILC1000-MR1x SDPRO

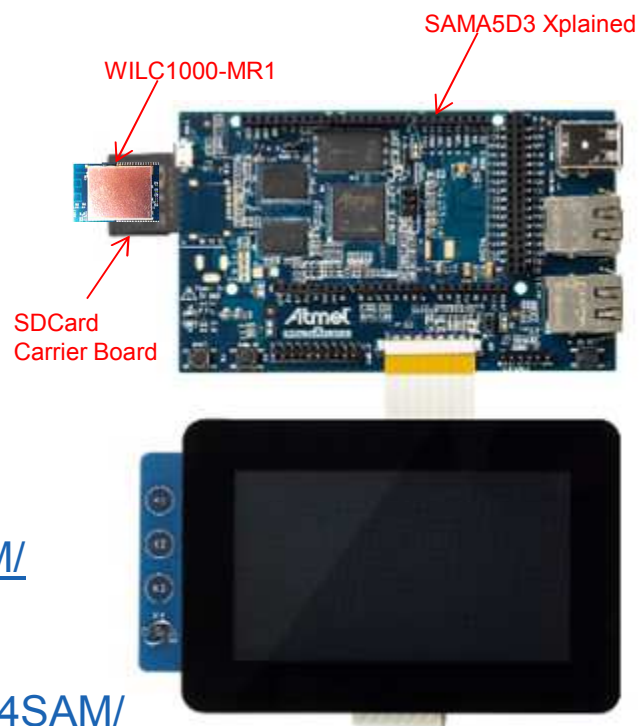
SDIO Drivers:

- Linux drivers available on linux4sam

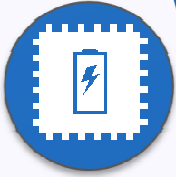
<http://www.at91.com/linux4sam/bin/view/Linux4SAM/>

- Android drivers available on android4sam.com

<http://www.at91.com/android4sam/bin/view/Android4SAM/>



SmartConnect Value Proposition



World's leading MCU Portfolio & Ecosystem

- Atmel | SMART MCU/MPUs, Atmel AVR MCUs
- Industry leading PicoPower innovation
- Atmel Studio, Arduino Platform

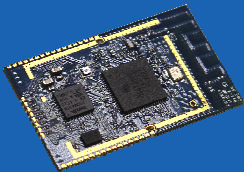


State of the Art Low Power Wireless SoCs

- ZigBee/6LoWPAN 802.15.4 Transceivers
- Low Power Wi-Fi 802.11 a/b/g/n + BT 4.0 Combo SoCs
- Bluetooth 4.1 Low Energy SoC



SmartConnect IoT Solutions



- Ready to MP Certified Modules with integrated IoT SW stack
- MCU-like integration in Atmel Development Ecosystem
- Years of battery life on batteries