



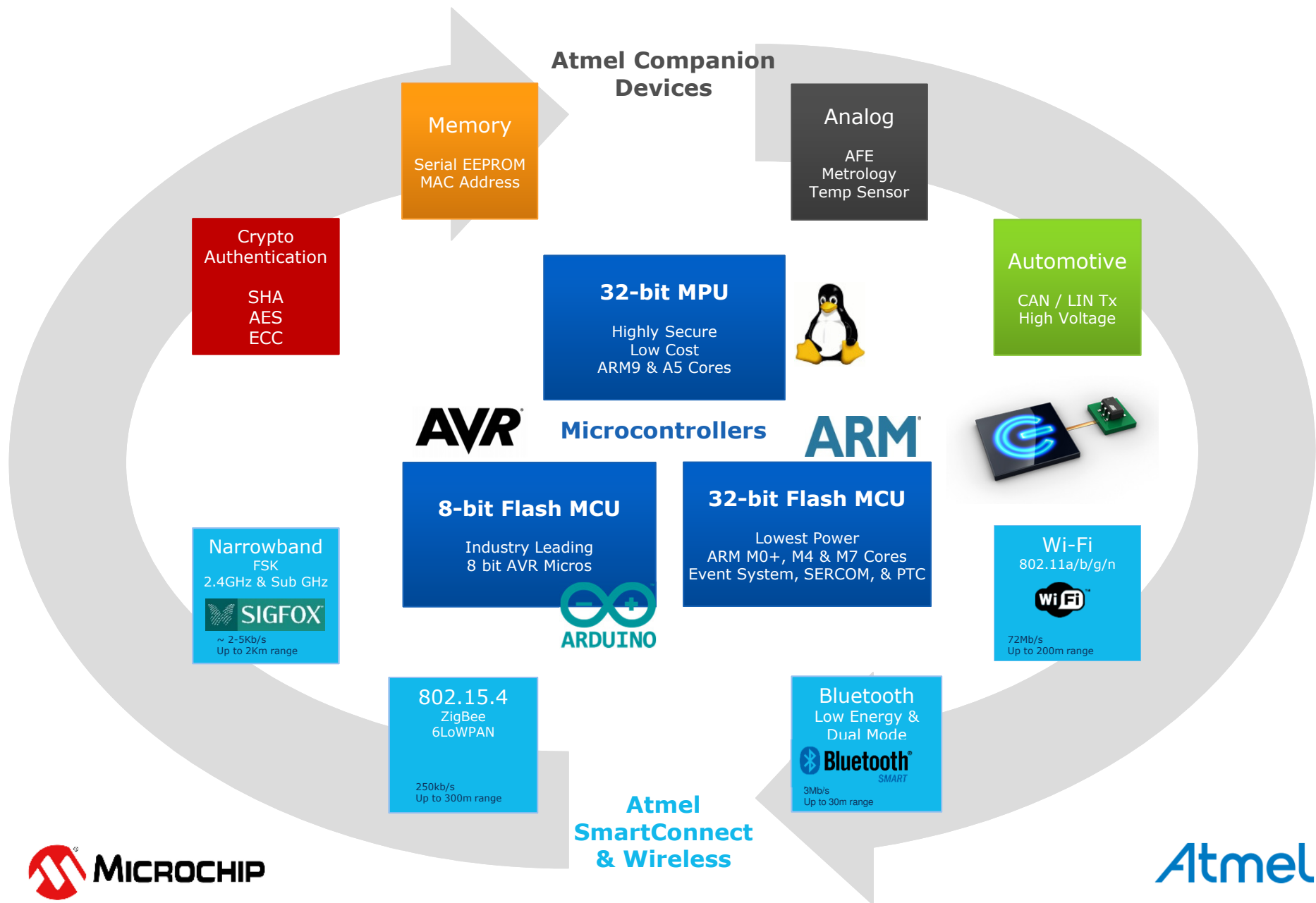
Portfolio overview & attach within MCHP

@ Rutronik Solution Day

June 2016

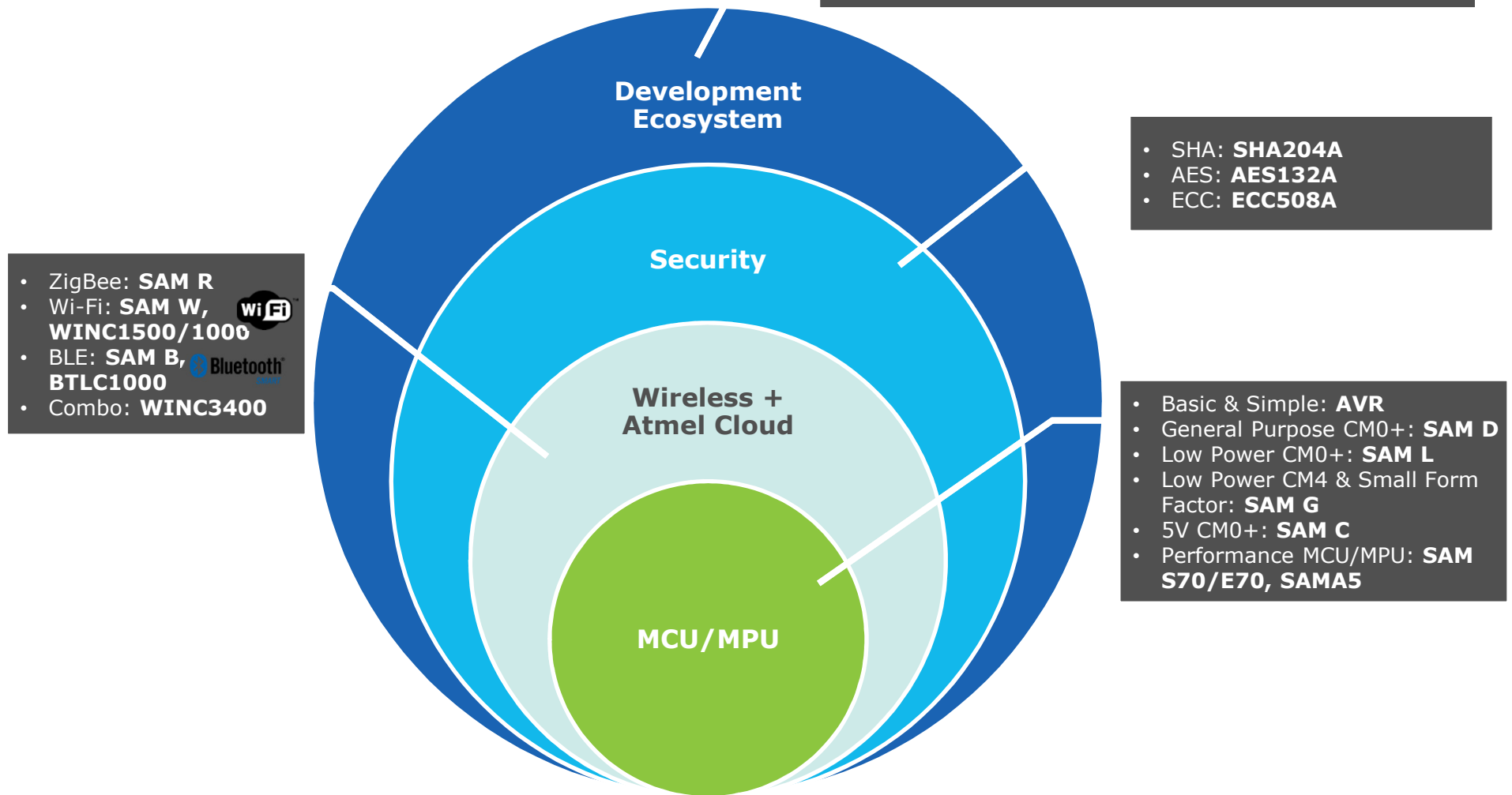
Jens Kahrweg

Atmel MCU @ the Heart of the Connected World

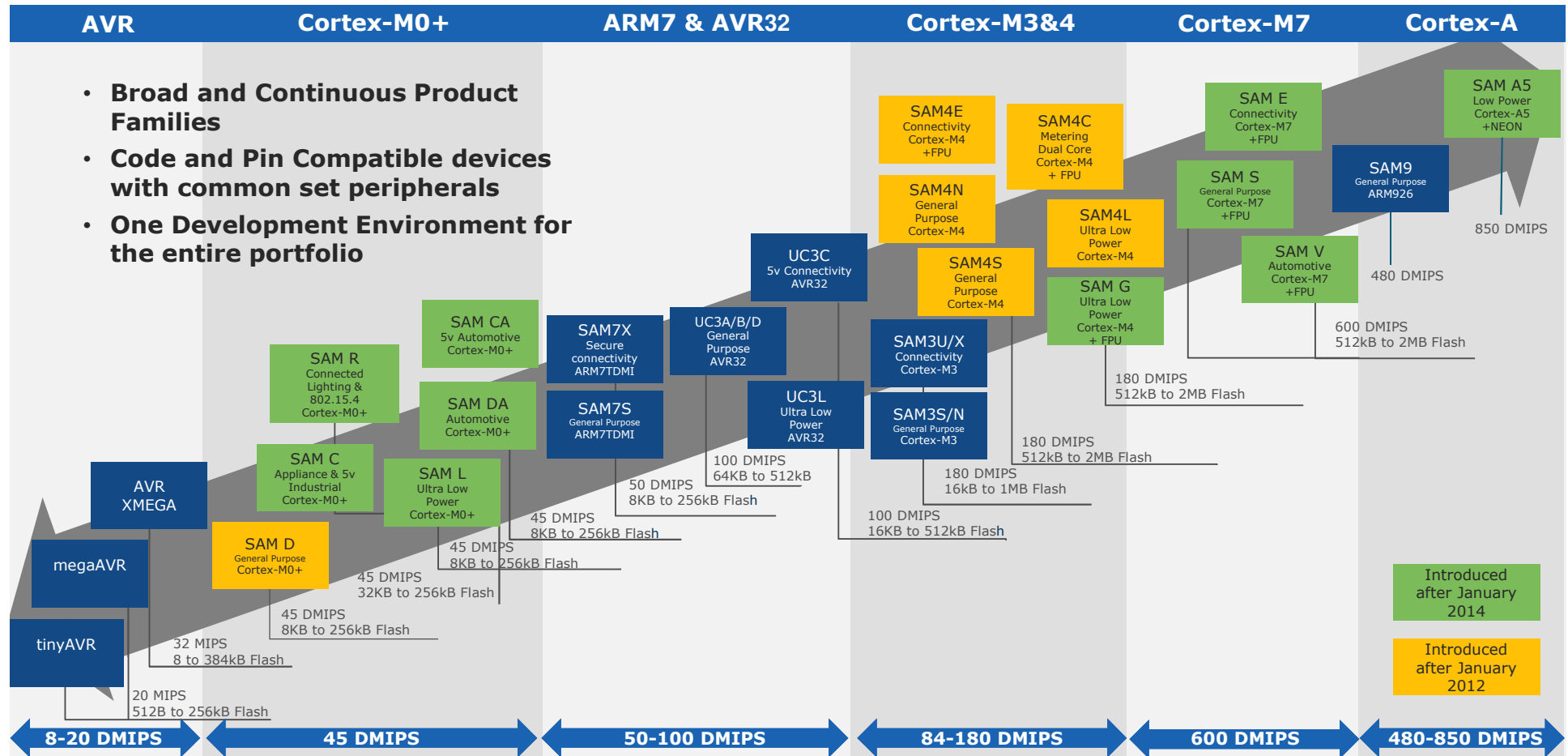


Atmel Whole Product for a Connected World

Atmel Studio 7, Atmel Software Framework, and Atmel Start, all make it easier to develop with Atmel's MCU and shorten the time to prototype and market



Atmel: Broad Scalable MCU Platform



Atmel 8-bit AVR Microcontrollers

More than 7 Billion AVR's shipped - One for every person on Earth!

- **tinyAVR**

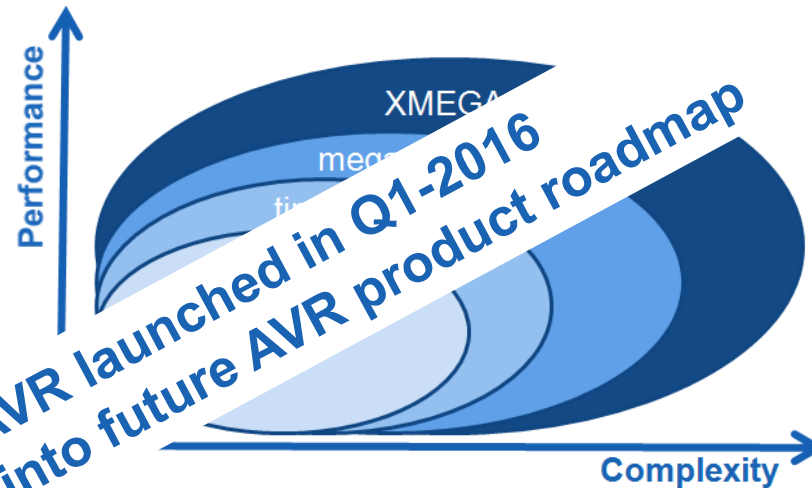
- 512B – 16kB, 6 – 32 pins
- Small, but powerful
- ~600 product variants

- **megaAVR**

- 4kB – 256kB, 28 – 100 pins
- Robust and flexible
- ~1100 product variants

- **AVR XMEGA**

- 8kB – 384kB, 32 – 128 pins
- Extraordinary performance
- Superb analog peripherals
- ~300 product variants

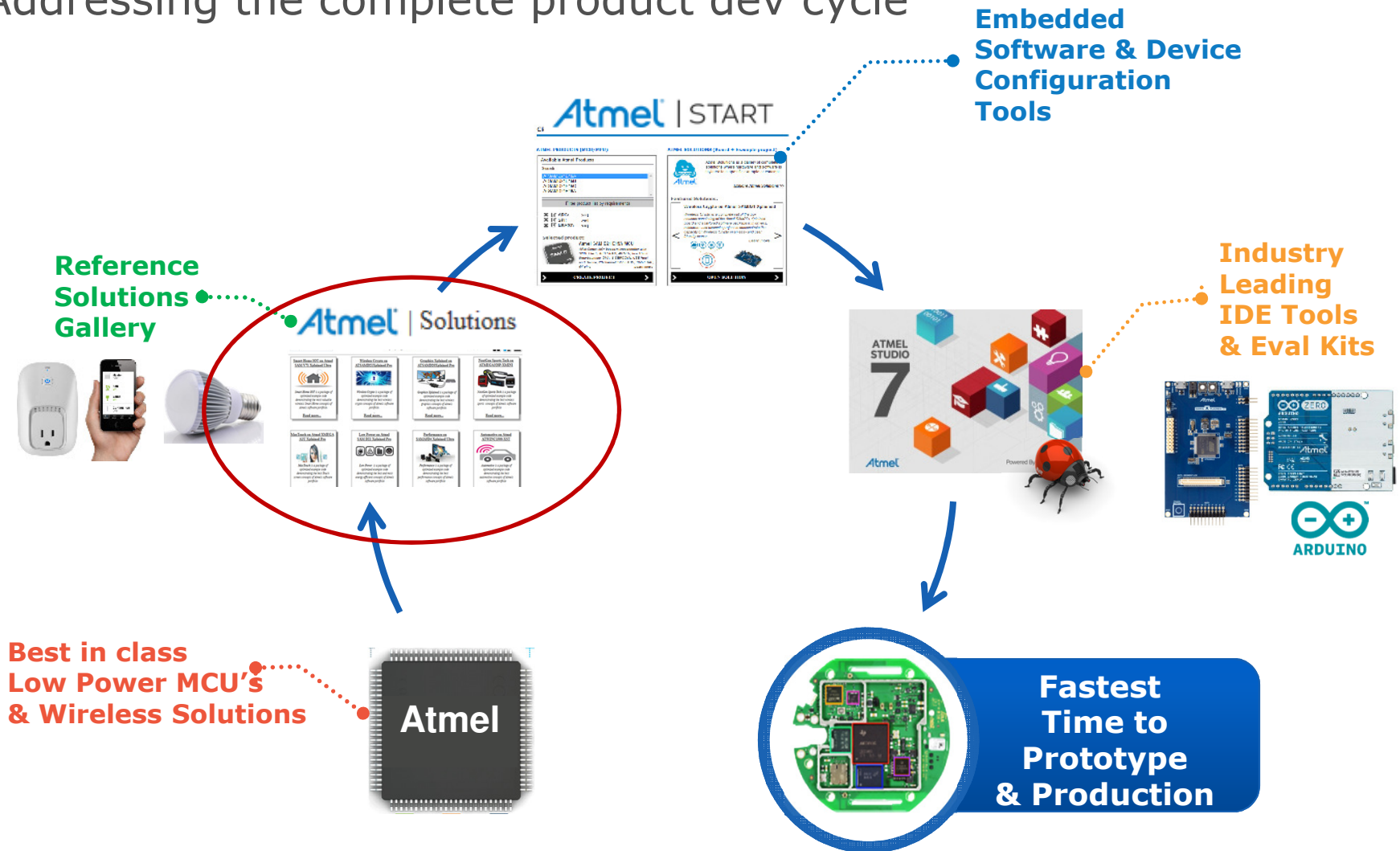


Broad Cortex M0+ Offering

	General Purpose					Low Power		5V		
Family Features	SAM D09	SAM D10	SAM D11	SAM D20	SAM D21	SAM L21	SAM L22	SAM C20	SAM C21	
Cortex M0+	8-16KB Flash			16-256KB Flash		32-256KB Flash				
Event System										
SERCOM	14 and 24 pins	14, 20 and 24 pins		32, 48 and 64 pins						
PTC										
10-bit 350 ksps DAC	6-ch DMA					12-ch DMA	16-ch DMA	6-ch DMA	12-ch DMA	
2xAnalog Comparator	1x T/C for Control			3x T/C for Control						
32-bit RTC	12-bit 350Ksps ADC					12-bit 1Msps ADC		12-bit 1Msps and 16-bit SD ADC		
Serial Wire Debug										
BOR and POR	FS USB Device			FS USB H&D				2x CAN		
Internal RCs										
Watchdog						I ² S	SLCD	HW Div		
High GPIO Count							Ultra Low Power		5V Operation	

Atmel Differentiation with SW & Tools...

Addressing the complete product dev cycle



From Product Selection, to SW Development,
to Prototype & Production – Atmel has you covered



Atmel's Holistic Approach to IoT Connectivity

Intelligent Components

MCU/
MPU

Widest selection of Low Power MCU / MPU including 8-bit, Cortex ARM M0+, M3, M4, M7 and A5

Wireless

Integrated wireless connectivity solutions with BLE, 802.11, ZigBee, 6LowPan and more

Crypto
Device

Atmel crypto security solutions provide industry-leading performance, cost effectiveness and integration

Sensor

Partnered with market-leading manufacturers and SW providers to provide complete Atmel-based system solutions

Development Environment

Algorithmic IPs: Security, Touch, Network/Communication Stacks

Enabling Solutions

Wireless
MCU
Crypto

Light bulb,
Key FOB

Sensor

Wireless
MCU
Crypto

Fitness band,
Activity Tracker,
Temp Sensor

MCU/
MPU

Sensor

Cap
Touch

Wireless
Module

Watches,
Thermostat,
Door Lock,
Appliances

MCU /
MPU

Energy
Source

Sensor

Wireless
Module

Smart City
Infrastructures,
Smart Metering



Gateways



Cloud Connectivity



100% Portfolio Coverage:
"Out of the Box" Cloud connectivity for ALL MCUs, MPUs and Wireless Solutions

Atmel Cloud-Sandbox:
Cloud visualization of IoT edge-node while prototyping

Broad Cloud Ecosystem:
Portal for Third Party Cloud Services



Scalable Family of Atmel | SmartConnect



Crypto Authentication

Ensures things and code are real, untampered, & confidential

Secure Identity

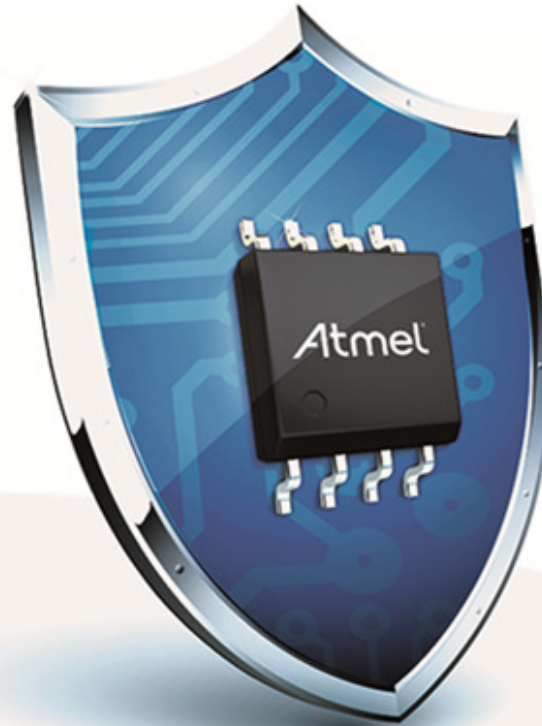
Easiest way to provide
Credentials to a system

Secure Download & Boot

Authenticate & protect
code in-transit

Anti-Cloning

Prevent building with
identical BOM or
stolen code



Node Authentication

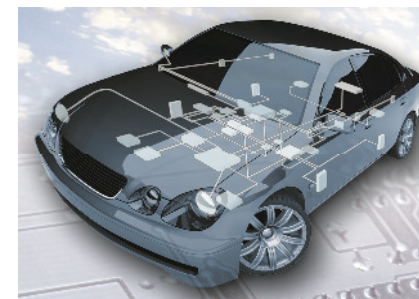
Ensure only
OEM/licensed nodes
& accessories work

Message Security

Authentication,
message integrity,
and confidentiality
of network nodes
(IoT)

Atmel Automotive Product Lines

- **Microcontrollers:** Embedded Flash MCUs: Proprietary AVR 8-bit Controllers and Highly Integrated 32-bit ARM MCUs
- **Touch:** Dedicated Touch Controllers for Buttons, Sliders, Wheels and Touchscreens
- **Car Access:** Secure Automotive LF/ RF Solutions (Remote Keyless Entry, Passive Go, Passive Entry)
- **In-Vehicle Networking:** Complete Portfolio of Stand-alone and Integrated LIN Solutions, Best-in-class EMC Performance, More to Come
- **Electric Motor Drivers:** DC, BLDC, High-temperature
- **Memory:** Automotive Serial EEPROM Memories



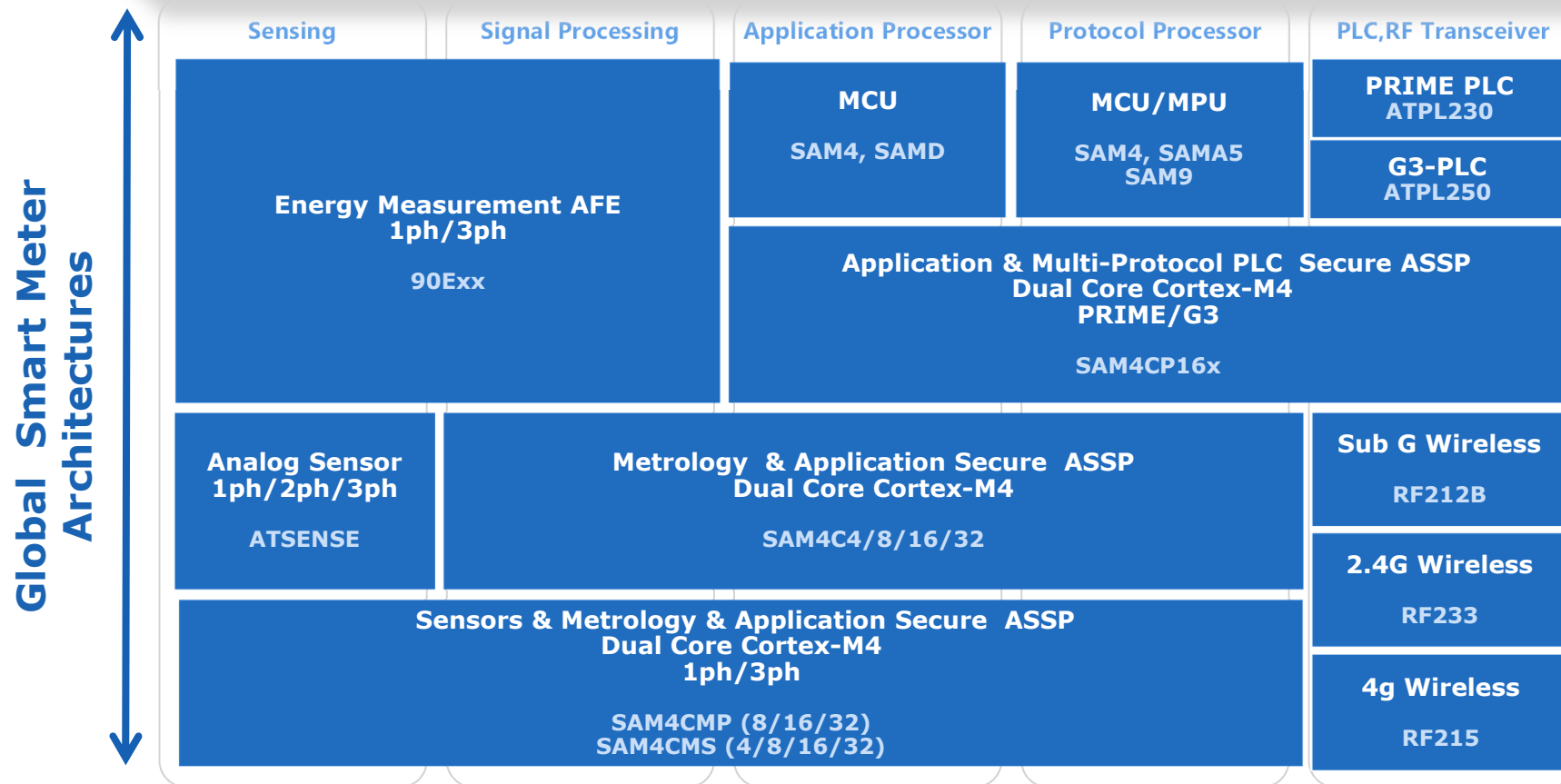
Atmel Smart Meter Platform Roadmap



Best-in-class Metrology

Highest Integration and Flexibility

Leading-Edge Connectivity





**Atmel portfolio for
attach to MCHP products**

Where & why to sell Atmel products based on which technology ?

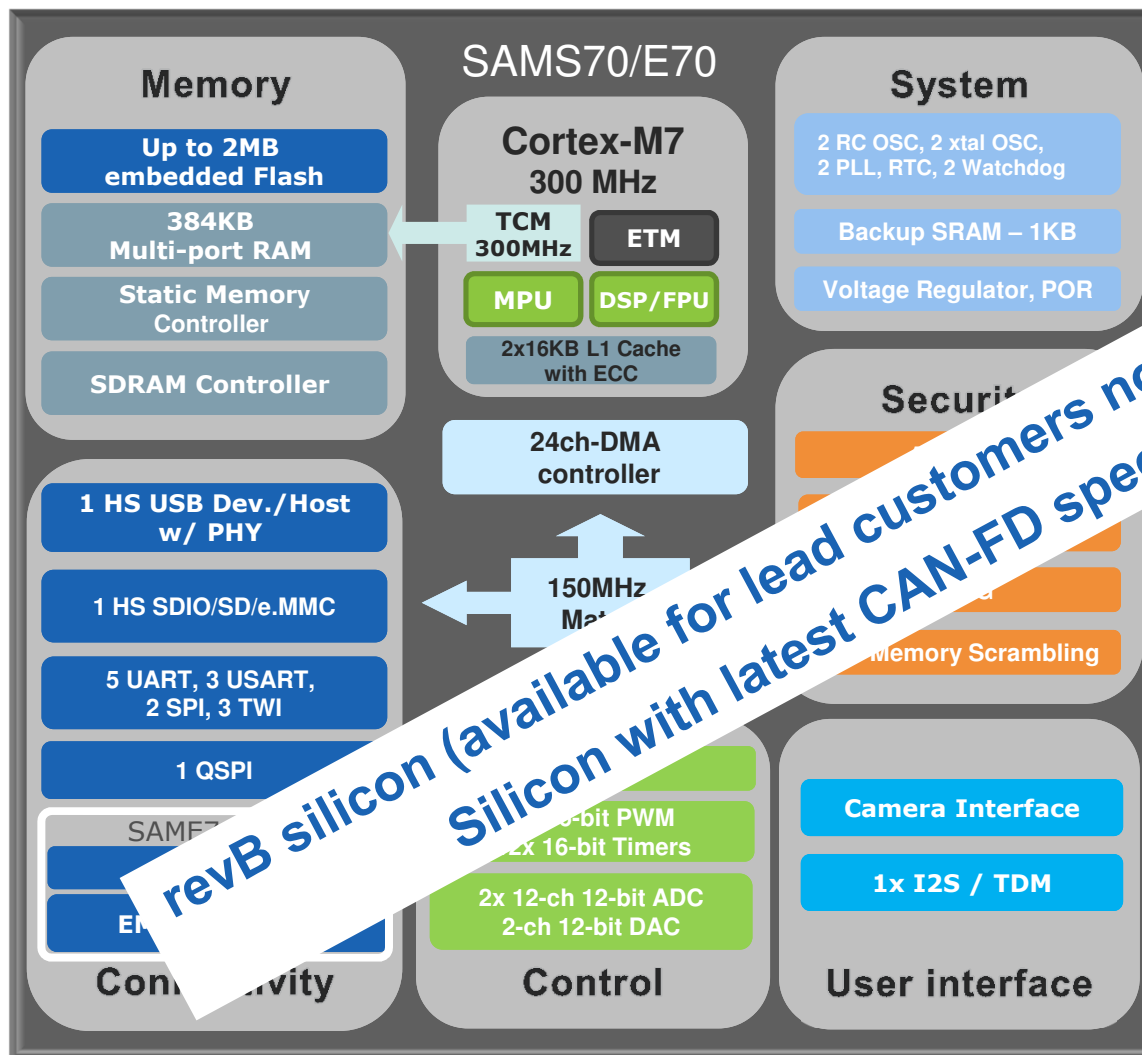
	Embedded Control	Wireless / IoT	HMI / Touch	Security	Automotive
Focus Technology	8-Bit AVR 32-Bit ARM Cortex-M 32-Bit ARM Cortex-A	Zigbee (sub GHz, 2.4GHz) Wi-Fi (2.4GHz) BT Classic & BLE SigFox	32-Bit ARM9 32-Bit ARM Cortex-A PTC @ 32-Bit ARM devices & AVR	Crypto Authentication (symmetric / asymmetric) TPM	IVN (LIN, CAN) Car access & industrial RF 8-Bit AVR 32-Bit Cortex-M
Why Atmel ?	• Most efficient single-cycle 8-Bit CPU • Ease-of-use with IDP (Atmel Studio 7, Atmel Start & Atmel Gallery) for AVR&ARM • Large & scalable 8/32-Bit product portfolio • Pico Power to enable – Lowest static power 8-Bit (100nA@25°C) – World's most efficient Cortex M0+ device (highest EEEMBC score) with 35µA/MHz & <1µA with 40K SRAM retention • Smart low power peripherals: Event system, SERCOM Sleepwalking, low-cost USB from internal RTC	Broadest offering for IoT Zigbee • Best RF performance & Ultra low power (sleep, TX off, RX listen) • Highest data rate (2MBit/s), Best ESD & supports T=125°C Wi-Fi & BT/BLE • MP certified (FCC, ETSI etc.) modules incl. stach • Best RF performance • Lowest Power (deep sleep < 3µA) • Cloud-ready platform • Industry's best security • Supporting standards: OIC, Thread, home kit SigFox • Single chip, 1st SigFox certified device	HMI: • Low Power: Run mode <150mW @536MHz) • Small footprint (10x10) • Open Source SW support on Linux, Android, freeRTOS • Linux QT widget library for HMI Touch: • HW for capacitive touch sensing (CPU utilization < 5%) • Class B Safety Lib • Low power • Robustness (EMI, moisture) for home appliance touch	• Strong multi-level HW security e.g. active shield, memories protected) @ low cost • Portfolio from low-cost symmetric AES encryption (SHA204) to sophisticated asymmetric ECC • Easy-to-use tools (Xplained wings) and demo SW (ACES) available	• Industry's largest LIN portfolio (Tx & SBC) • HV port for switches, relay & LED • CAN: low power standby mode and CAN FD support • Industrial RF – low current consumption TX/RX • PTC for robust buttons & proximity • 32-Bit MCU w Ethernet AVB stack for infotainment gateway

Where & why to sell Atmel products based on which technology ? - Attach products

	Embedded Control	Wireless / IoT	HMI / Touch	Security	Automotive
Key Product	Tiny AVR, (X)Mega AVR SAMD/L SAMC (5V) SAM4S/N/L/G/E SAME70/S70 SAMA5	RF233,ATmegaRFR2 SAMR21 WINC1500 WINC3400 SAMW25 BTLC1000, SAMB11 ATA8510/15/20	SAM9 G/CN SAMA5D3/4 SAMA5D2 w PTC SAMD1x/2x PTC SAML21 PTC SAMC20 PTC	SHA204 ECC108/508 TPM2.0 SAMA5D4/D2	ATA6632/3/4 (LIN) ATA656x (CAN-FD) SAMDA/CA SAMV70/1 ATA583x
Target Applications	• Battery-powered general purpose • Small appliance • Board controller • Sensor interfaces • Lighting • Industrial automation & M2M (process transmitter & Asset tracking) • GPS watches • Sensors, actuators • Room control unit • Networking & gateways	<u>Zigbee:</u> • Connected Lighting & Smart Meter <u>Wi-Fi, BLE&SigFox</u> • Wearables, • Appliance • Healthcare • Smart meter • Thermostats • Connected Lighting • Industrial control • Building automation • HMI panels	• Wearables, • Control panels • Imaging & terminals • Industrial automation • Audio streaming • Robotics • Home Appliance • Room control unit • Battery-powered automation panels, • Automotive interior	• Consumables e.g. external batteries, cables • Secure IoT application e.g. building automation, smart meter etc. • Industrial automation networking • Power tools • 3D Printer • Smart Meter & secure gateways,	• Networking: Body module, door /seat control, window lifter • RKE / PKE • Interior HMI e.g. center stack, roof module, • Battery-operated car access, door opener / passive entry, remote connections • Industrial & construction



SAM S70 & E70 High Performance MCU

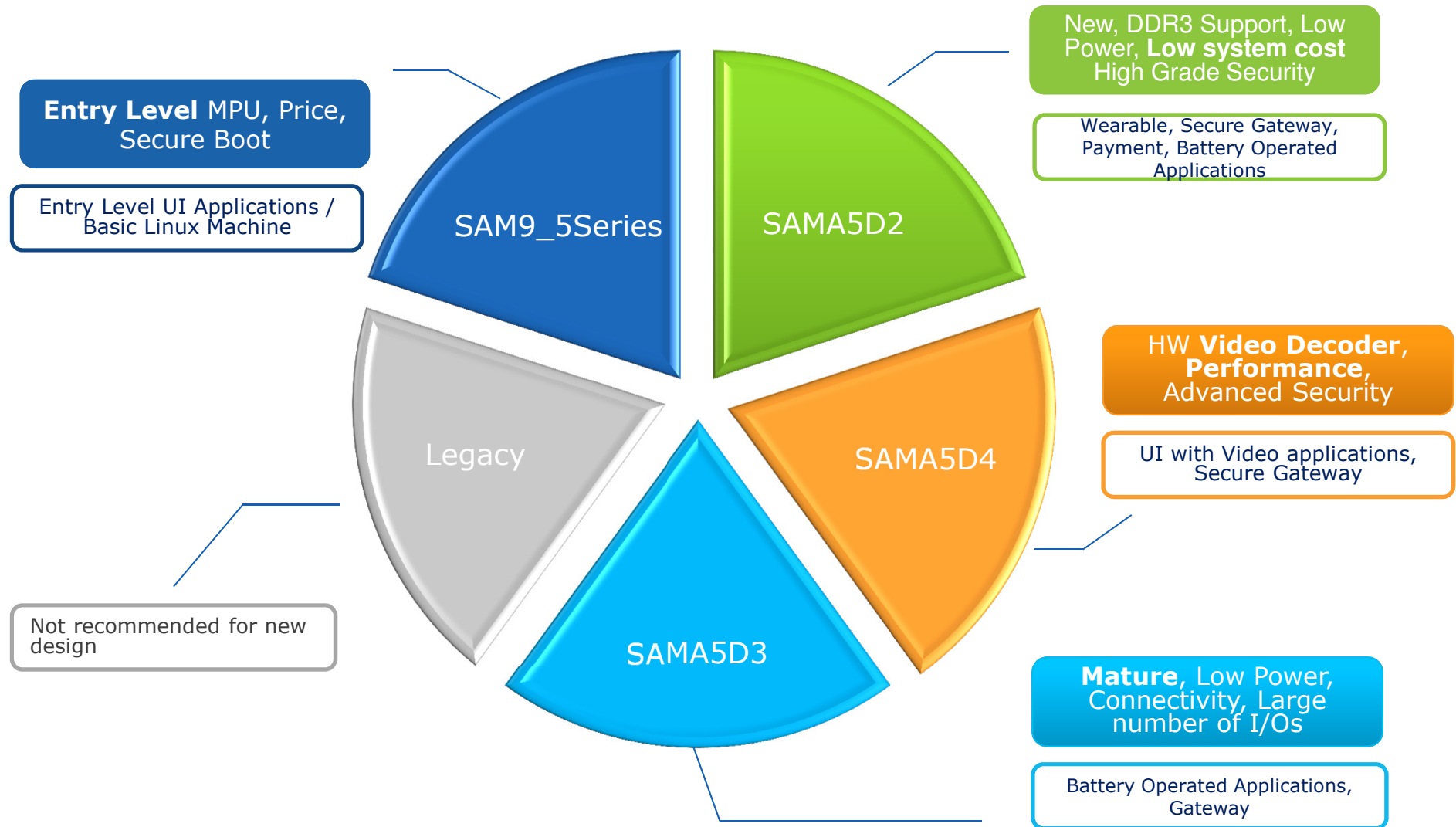


- **Cortex™ M7 Core**
 - Up to 300MHz
 - DSP/FPU Ext
 - Embedded
- 512KB Embedded Flash
- 384KB Multi-port RAM
- SDRAM interface
- Full Speed USB + Phy
- Advanced Analog and PWM
- **Ethernet AVB and Dual CAN-FD on SAM E70**
- SleepWalking™
- Packages:
 - BGA: 100, 144
 - QFP: 64, 100, 144
 - QFN: 64
- Temp range -40/105°C
- 12 Years Lifetime Commitment

revB silicon (available for lead customers now) is 1st & ONLY MCU Silicon with latest CAN-FD spec from Bosch

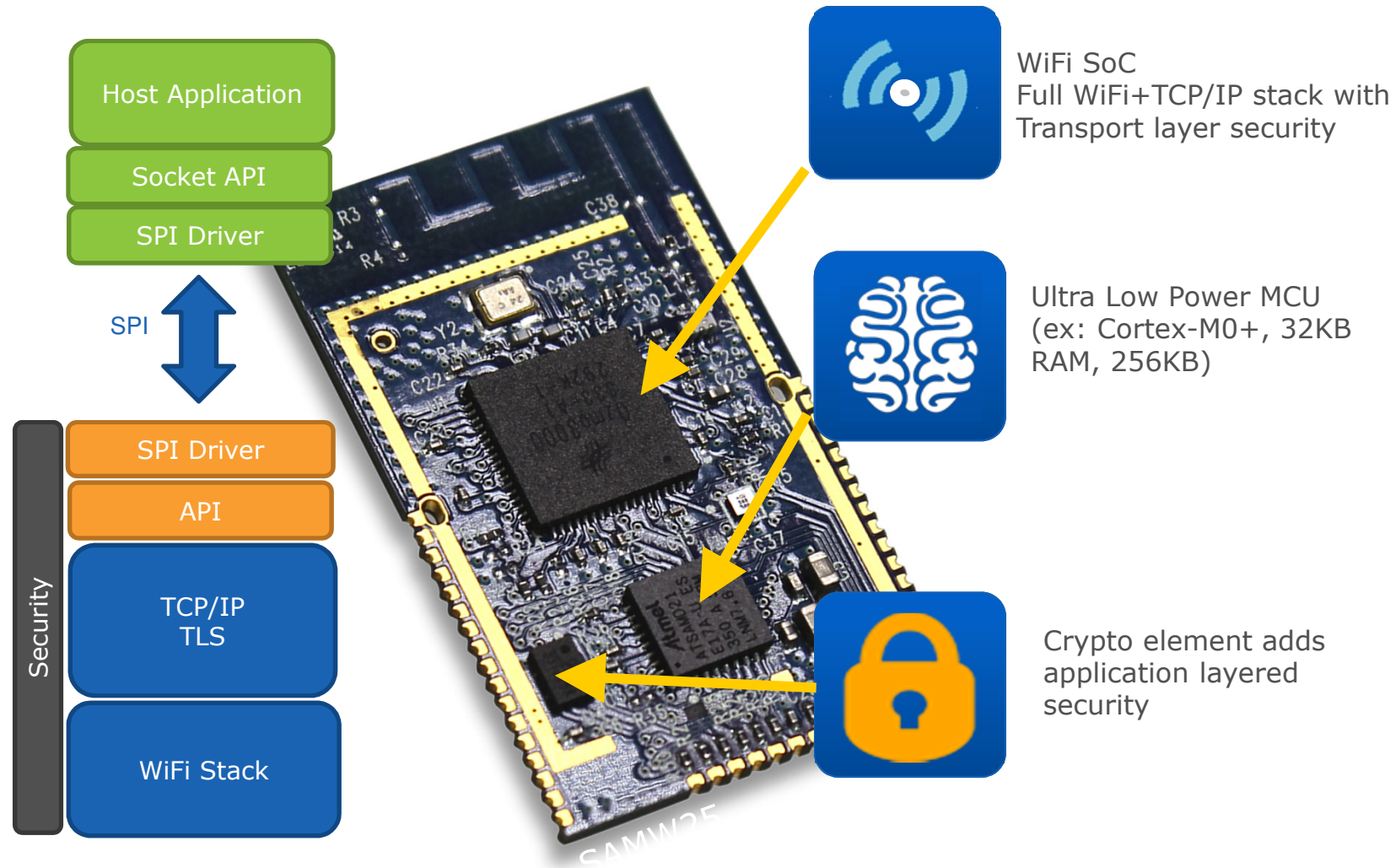
Atmel eMPU Product Portfolio

Major Strengths and Target Applications



Example of an Edge Sensing Node Solution

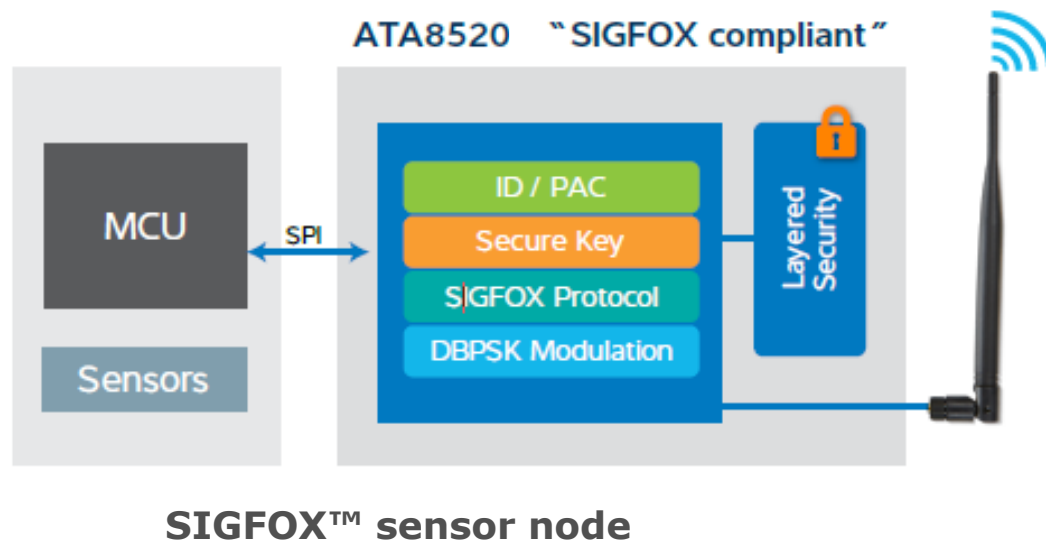
Certified Module approach for quick time to market (SAMW25)



SIGFOX - Atmel SoC Solution ATA8520x

Concept & USP:

- Highest integration level with embedded SIGFOX functionalities: DBPSK modulation, protocol stack, secure key, ID & PAC code
- Flexible solution – can be combined with any MCU selected as optimal for the user application
- Easy system integration: using a standard SPI communication with SPI command interface



SIGFOX™ base station



Security Portfolio Overview

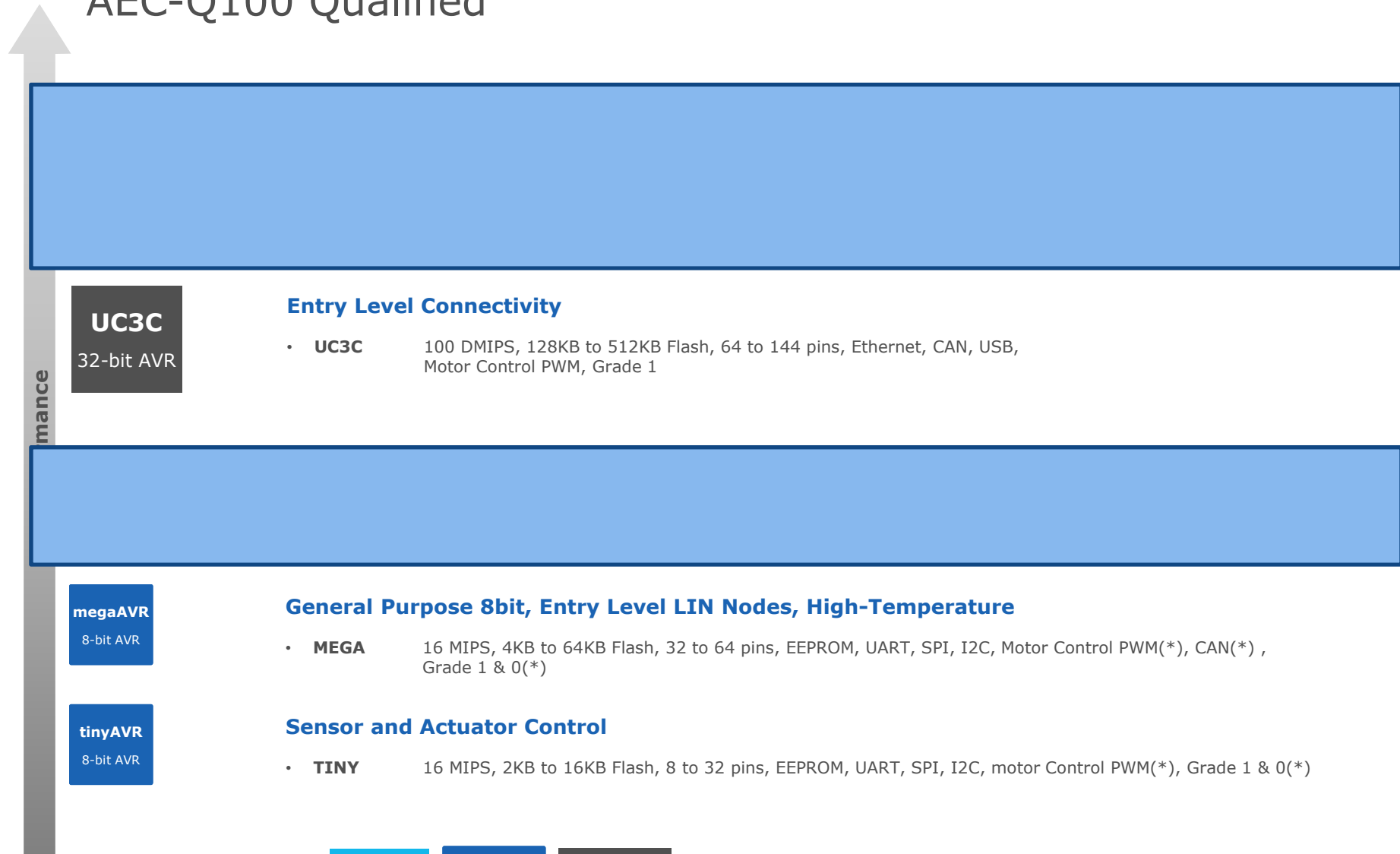
	SHA204A	ECC508A	TPM 2.0
Key Features & Use Cases	Accessory Authentication	Node / Accessory Authentication Network Security (TLS/DTLS support) Node to Cloud Authentication and On-Boarding	TPM 2.0 Protocol Node Authentication IP Network Security Node to Cloud Authentication and On-boarding Remote Attestation On the fly encryption/decryption Cryptographic Agility
Crypto Algorithms	NIST SHA256	NIST SHA256; ECC P256	NIST SHA256, ECC P256, RSA 2048
Non Volatile Memory	4.5Kbits	8.5Kbits	64kB
I/O Interface	I2C, Single Wire	I2C, Single Wire	I2C, SPI
Migration	Package, Pinout and Software compatibility across the board for UDFN-8 / I2C variants		TCG compliant
Packages	UDFN8, SOIC8, SOT23-3, 3-Contact (RBH)	UDFN8, SOIC8, SOT23-3	UDFN8, TSSOP
Availability	Production	Production	Samples Q3 2016

**Low-cost, high-level secure element, easy to design-in
in order to make your customer's system security-proof**



Automotive Microcontrollers Overview

AEC-Q100 Qualified



Sampling

Production

Legacy 32/bit

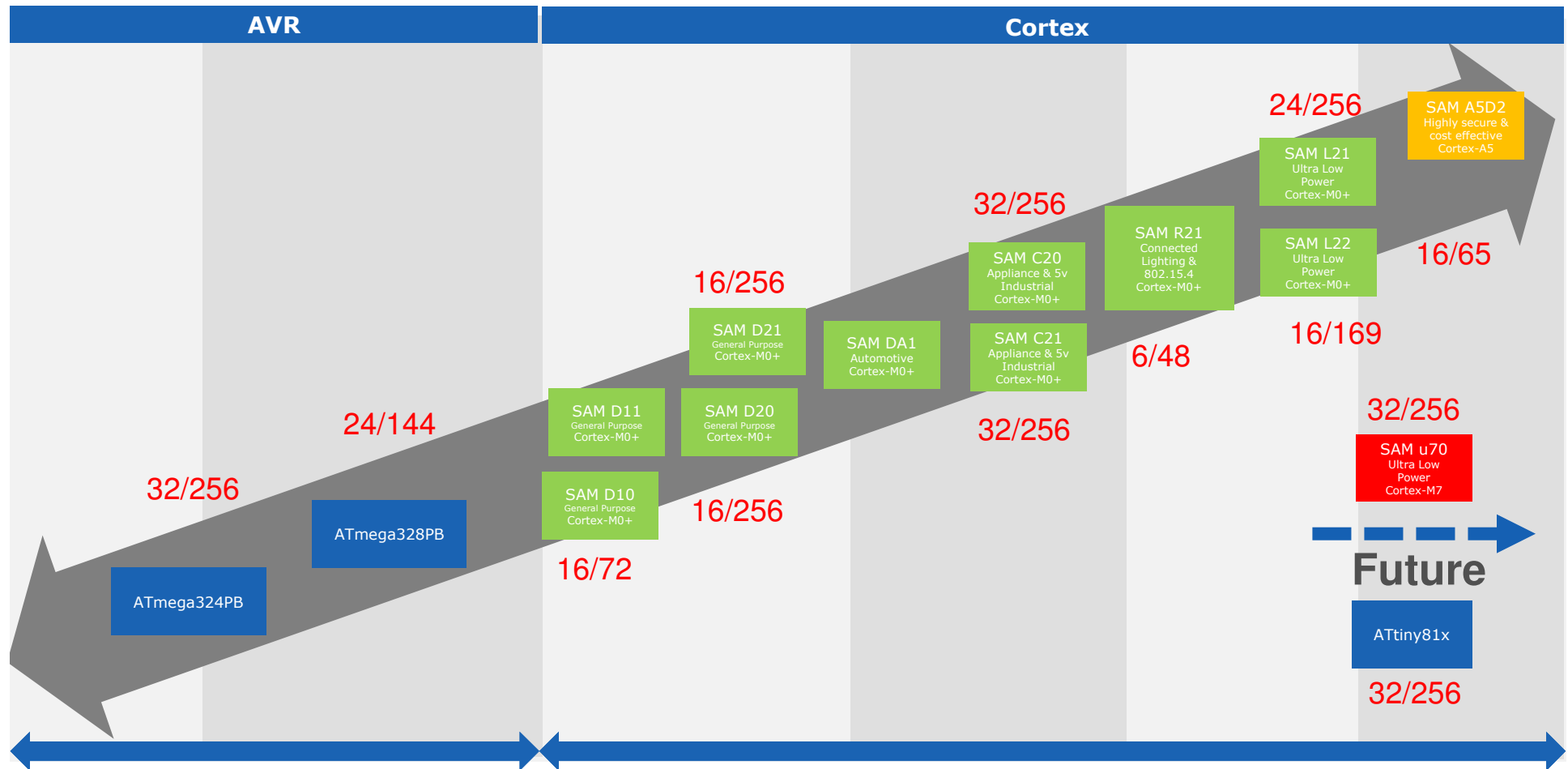
(*) Features available only on a subset of the family



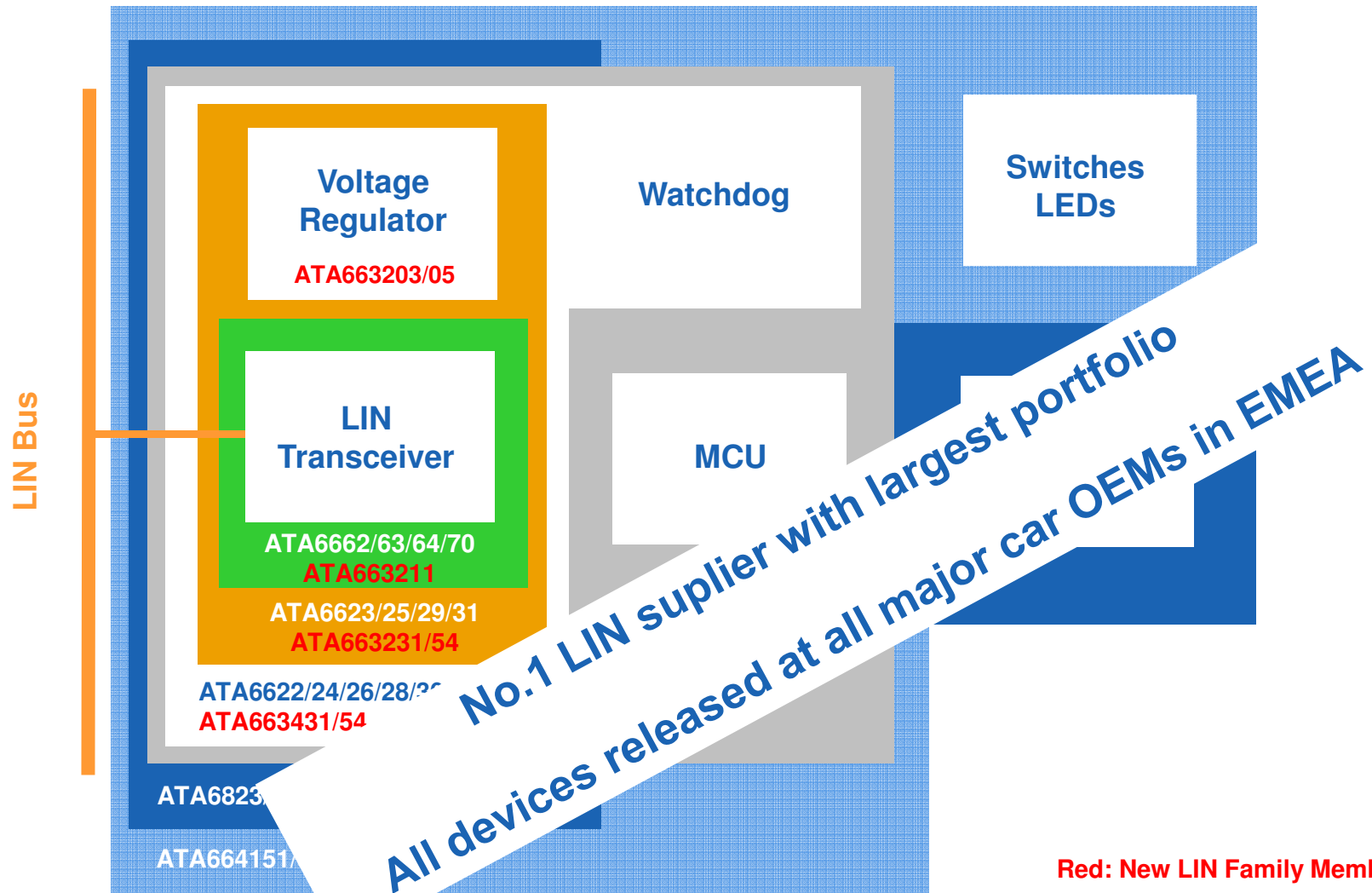
The PTC is a Default Peripheral for Atmel MCUs

Atmel devices with integrated Peripheral Touch Controller

Number of self/mutual Channels in red



Atmel LIN ICs – Largest LIN Portfolio



New CAN Transceiver Family – Choice Matrix

		Part Numbers						
Feature		ATA6560	ATA6561/ 66 	ATA6564	ATA6565 Dual CAN	ATA6570	ATA6571	ATA6572
Standby Mode		✓	✓	–	2x ✓	✓	✓	✓
Silent Mode		✓	–	✓	–	✓	✓	✓
I/O pins from 3V to 5V		–	✓	✓	–	✓	✓	✓
SPI		–	–	–	–	✓	–	–
HV- WAKE input		–	–	–	–	–	–	–
Watchdog	default ON	–	–	–	–	–	–	✓
	default OFF	–	–	–	–	–	–	–
INH- output		–	–	–	–	✓	✓	✓
Watchdog Reset output		–	–	–	–	–	–	✓
CAN FD (5Mbit)		✓	–	–	2x ✓	✓	✓	✓
CAN PN		–	–	–	–	✓	–	✓
ISO Norm		ISO11898-2,5	ISO11898-2,5	ISO11898-2	ISO11898-2,5	ISO11898-2,5,6	ISO11898-2,5	ISO11898-2,5,6
Technology		150nm BCD on SOI Technology						
Package		DFN8/SO8	DFN8/SO8	DFN8/SO8	DFN14/SO14	DFN14/SO14	DFN14/SO14	DFN14/SO14
Compatible socket		pin/socket compatible				pin/socket compatible		

Supporting CAN-PN & CAN-FD
All devices released at all major car OEMs in EMEA



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