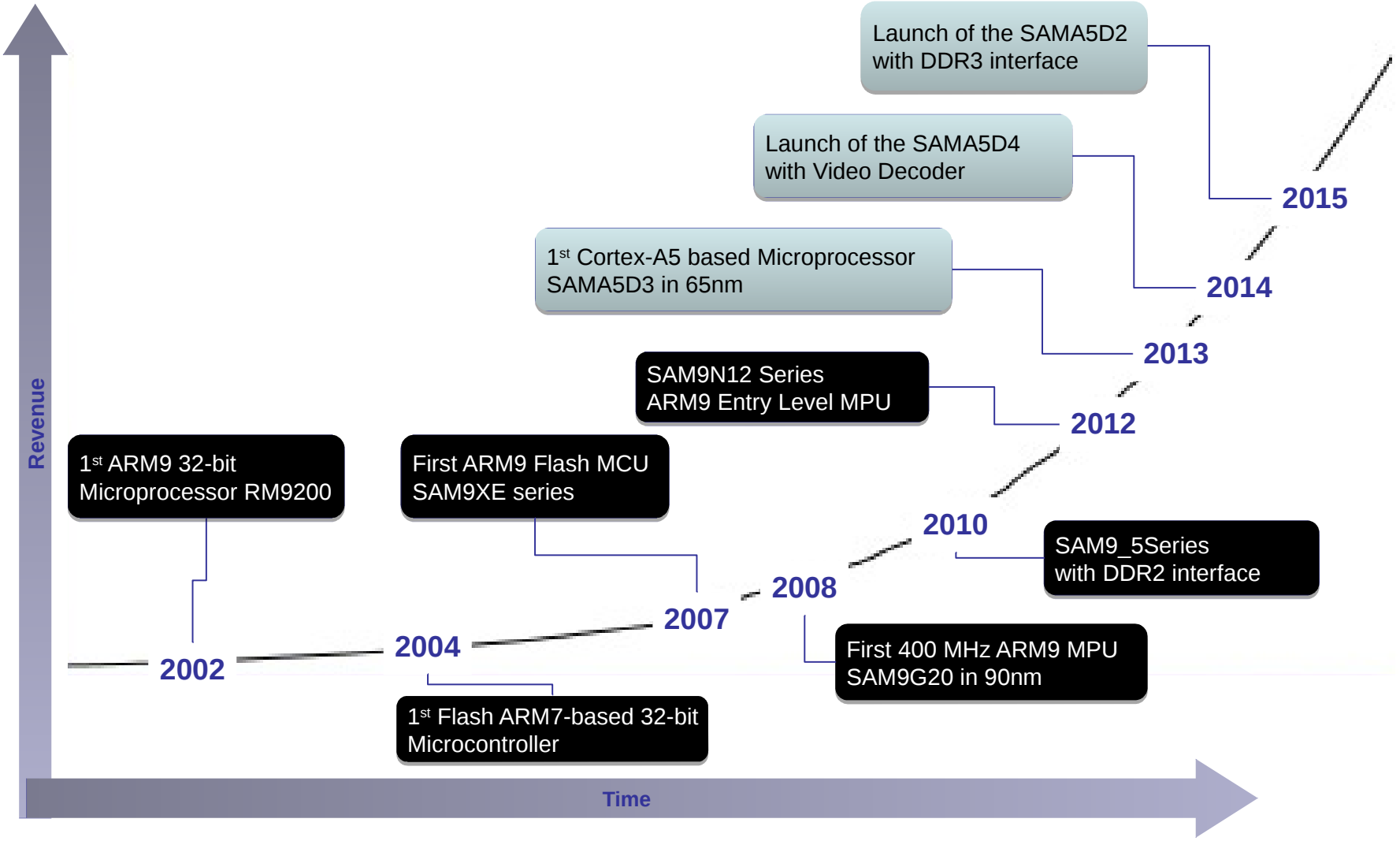
Agenda

- 32-bit MPU
- 32-bit MCU
- Development tools

MPU History


Launch of the SAMA5D2 with DDR3 interface
Launch of the SAMA5D4 with Video Decoder
1st Cortex-A5 based Microprocessor SAMA5D3 in 65nm
SAM9N12 Series ARM9 Entry Level MPU
1st ARM9 32-bit Microprocessor RM9200
First ARM9 Flash MCU SAM9XE series
SAM9_5Series with DDR2 interface
First 400 MHz ARM9 MPU SAM9G20 in 90nm
1st Flash ARM7-based 32-bit Microcontroller
2015
2014
2013
2012
2010
2008
2007
2004
2002
Revenue
Time

Value Proposition

- **Low Power**
  - Market leader with proven architectures

- **Ease of Use**
  - Low ball count, simple power scheme, maximum integration, available to the mass market

- **Small footprint**
  - Down to ultra small 8X8 packages size

- **Open source SW and HW**
  - Schematics, Linux, Bare Metal Softpack, Android, Qt, RTOS

Application Design-ins

Smartgrid Gateway

White Goods HMI

POS Terminal

2D Barcode Scanner

Surveillance system

Outdoor GPS

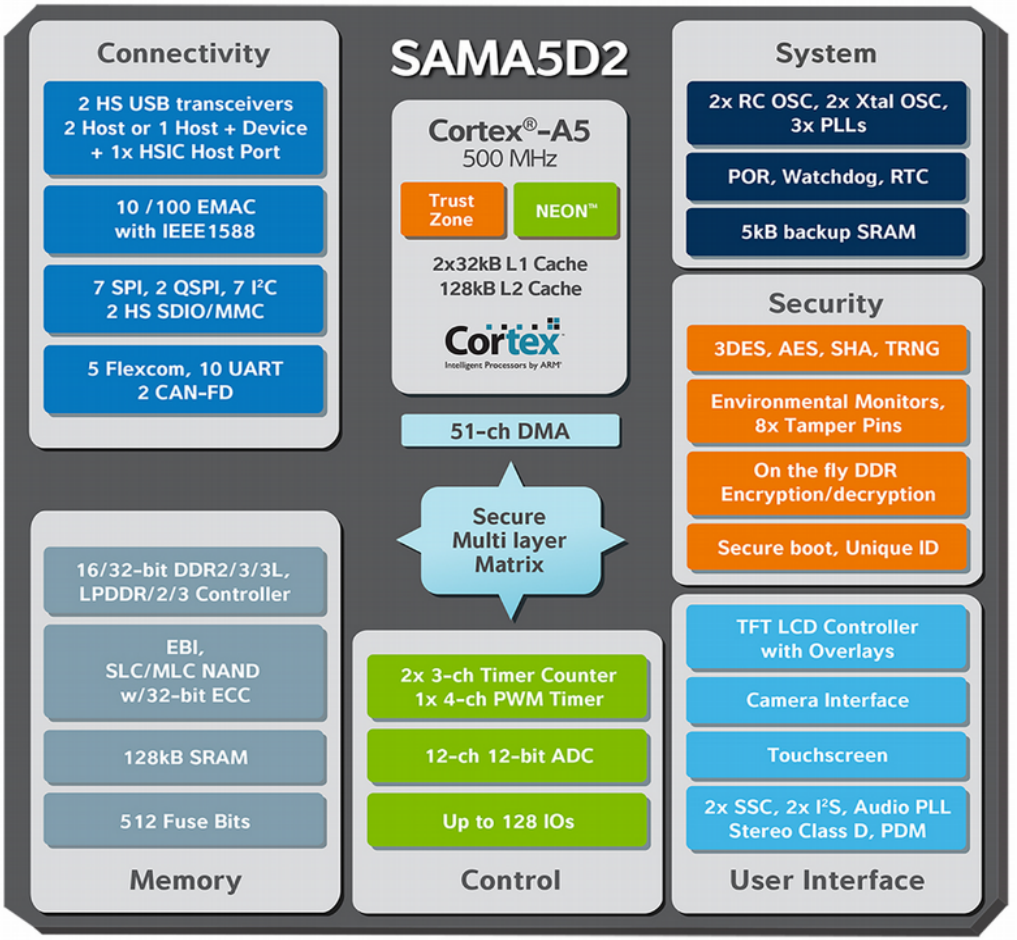
Biometrics

MPU Product Portfolio

	SAM9_5 Series / CN12	SAMA5D3	SAMA5D4	SAMA5D2
Max CPU / DDR speed (MHz)	400 / 133	536 / 166	600 / 200	500 / 166
VFPU / Neon / L2 Cache	No / No / No	Yes / No / No	Yes / Yes / 128kB	Yes / Yes / 128kB
SDRAM support	Yes	No	No	No
DDR3 support	No	No	No	Yes (DLL Off up to 166MHz)
Bus width	x32/x16	x32	x32/x16	x32/x16
Trace	No	No		Yes
Quad SPI	No	No		x2
UARTs	Up to 7	Up to 7	Up to 8	Up to 10
USB	X3 High Speed	x3 High Speed	x3 High Speed	x2 High Speed + x1 HSIC
EMAC CAN	Dual 10/100 x2 CAN	Gbit IEEE1588 + 10/100 x2 CAN	Dual 10/100 IEEE1588 No	10/100 w/ IEEE1588 + AVB x2 CAN-FD
LCD Interface	RGB - 4 Overlays	RGB - 5 Overlays	RGB - 4 Overlays	RGB - 4 Overlays
Audio sub-system / Video	No / No	No / No	No / Yes (720p)	ClassD, PDM / No
Capacitive Touch	No	No	No	Yes (BSW)
Camera Interface	RGB (G25 Series Only)	RGB	RGB	Enhanced RGB - Raw Bayer
Trustzone	No	No	Yes	Yes
Security	Crypto, TRNG , secure boot (only CN12 series)	Crypto, TRNG, secure boot	Crypto, TRNG, secure boot, tamper, On the fly DDR encryption, RSA/EEC	Crypto, TRNG, secure boot, , tamper, On the fly DDR/QSPI encryption, PCI certification, RSA/ECC (SW)
Static Power (typ)	< 8mW	< 0.5mW	<10mW	<0.3mW
Dynamic Power (typ)	< 110mW	< 150mW (536MHz)	<330mW (600Mhz)	< 150mW (500MHz)
Packages	BGA217, 247	BGA324	BGA289, 361	BGA196, 289, 256

SAMA5D2

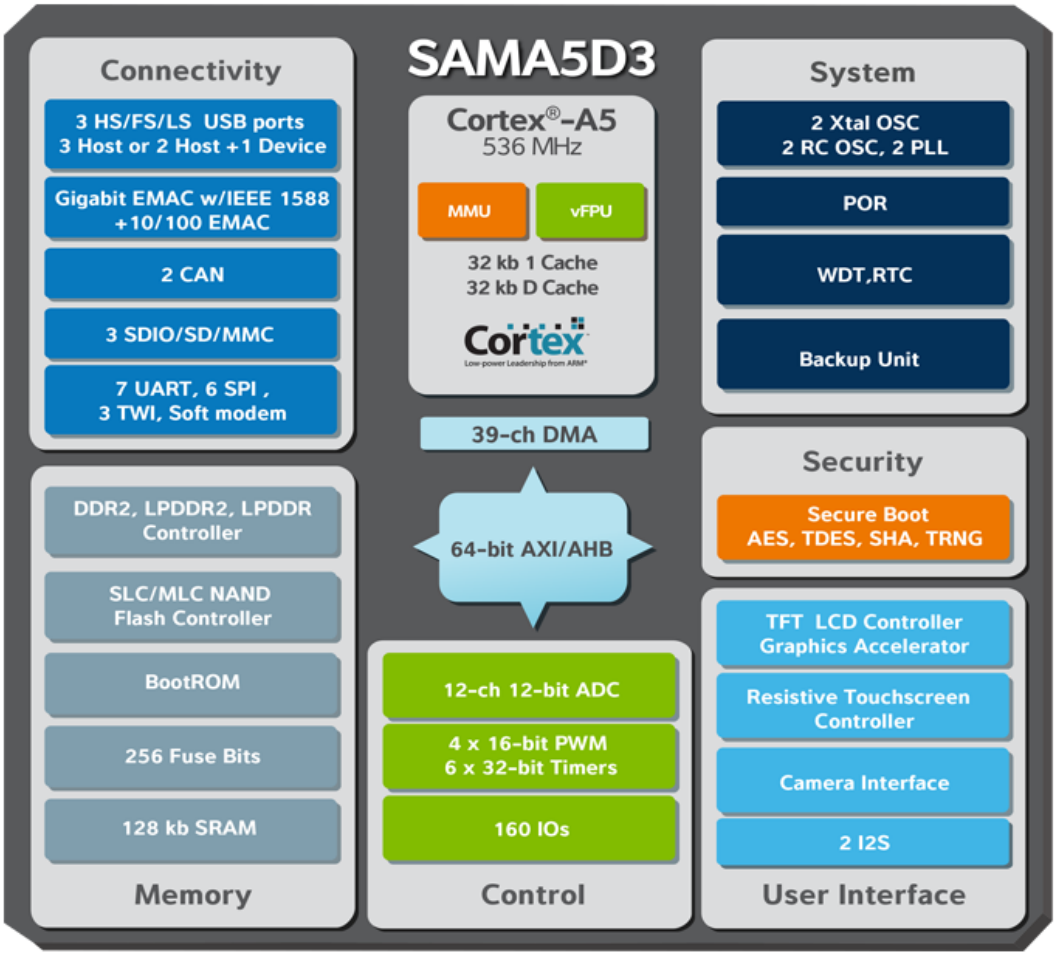
- **Cortex™ A5 Core**
  - Up to 500MHz
  - NEON + 128kB L2 Cache
- **Large memory type support**
  - DDR2, LPDDR/2/3
  - DDR3/DDR3L (DLL Off mode)
  - QSPI / SDCard / Managed NAND
- **Media embedded features**
  - Audio sub-system
  - 24-bit LCD
  - 12-bit Raw Bayer camera
  - Capacitive Touch
- **Advanced Security features**
  - PCI Payment certification
  - On-the-fly encryption/ decryption from DDR & QSPI
  - ARM TrustZone®
  - x8 tamper pins and Secure key storage
  - SW RSA and ECC



Kits: ATSAMA5D2-XULT

SAMA5D3

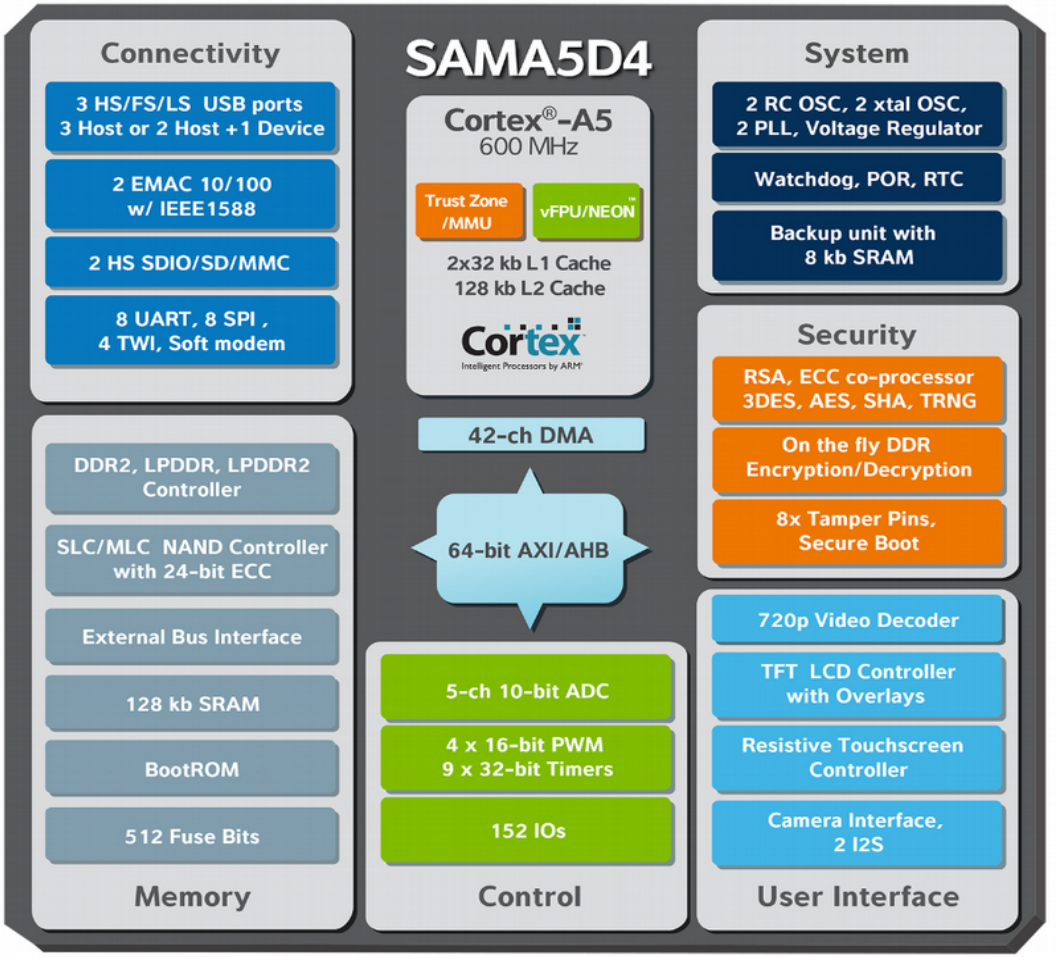
- **Cortex™A5 Core**
  - Up to 536MHz
  - ARM® VFPU v4
- **Low Power**
  - Run Mode < 150mW
  - Low-Power Mode < 0.5mW
  - Backup Mode < 2uW
- **Industrial Solution**
  - Dual CAN
  - Dual EMAC (GMAC w/ IEEE1588)
  - 7 UART, 6 SPI, 3 USB, …..
  - 105°C derivative
- **Safety and Security features**
- **Small Footprint and Die Business**
  - 15x15 or 12x12 packages



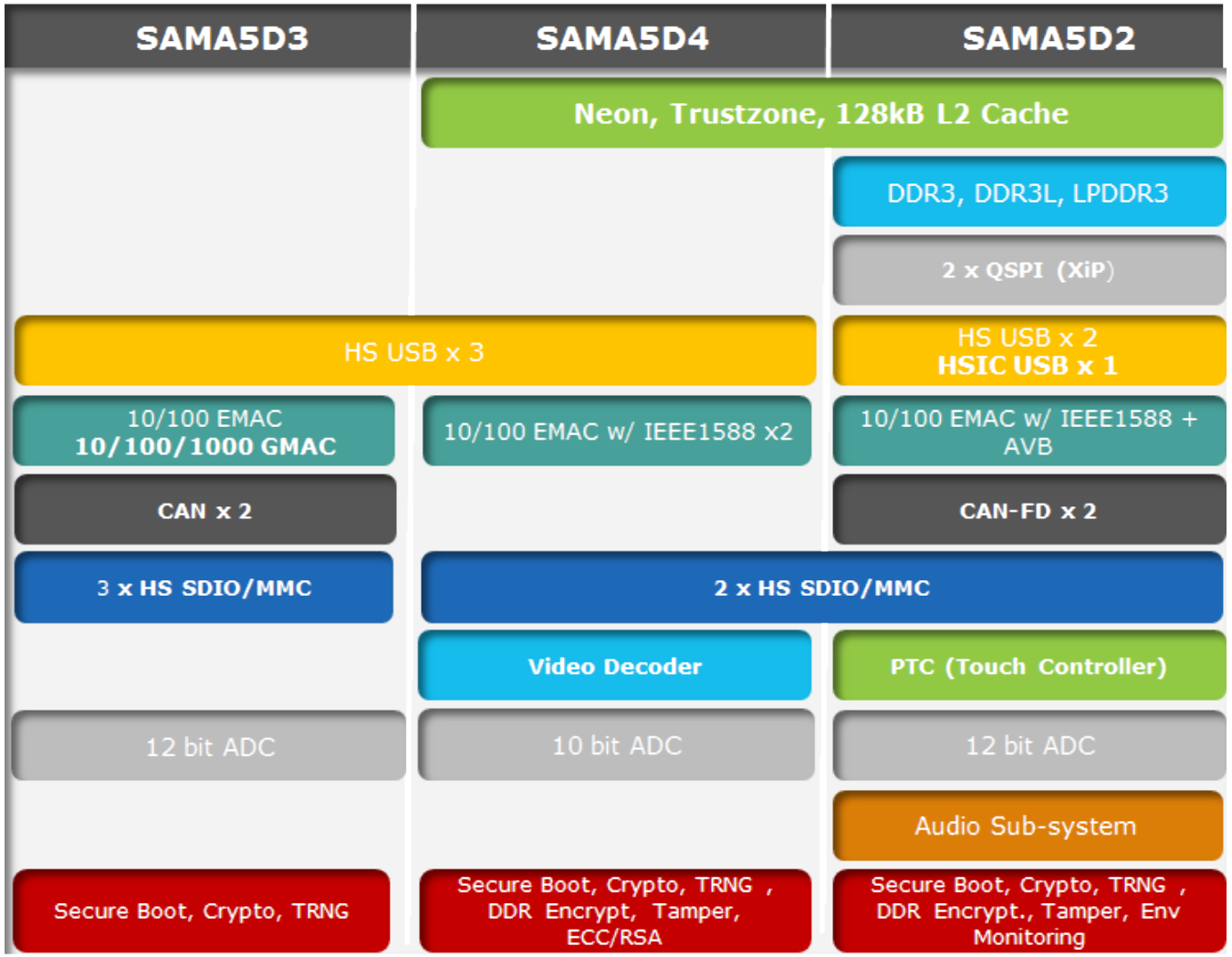
Kits: ATSAMA5D3-XPLD, SAMA5D35-EK or SAMA5D36-EK

SAMA5D4

- **Cortex™ A5 Core**
  - Up to 600MHz
  - NEON + 128kB L2 Cache
- **HW Video Playback**
  - Decode videos up to 720p @ 30fps
  - Support H.264, H.263, VP8, MPEG4 Codecs
- **Advanced Security features**
  - On-the-fly encryption/ decryption from DDR
  - ARM TrustZone®
  - RSA and ECC cryptography
  - x8 tamper pins and Secure key storage



SAMA5 Features



Shared Features

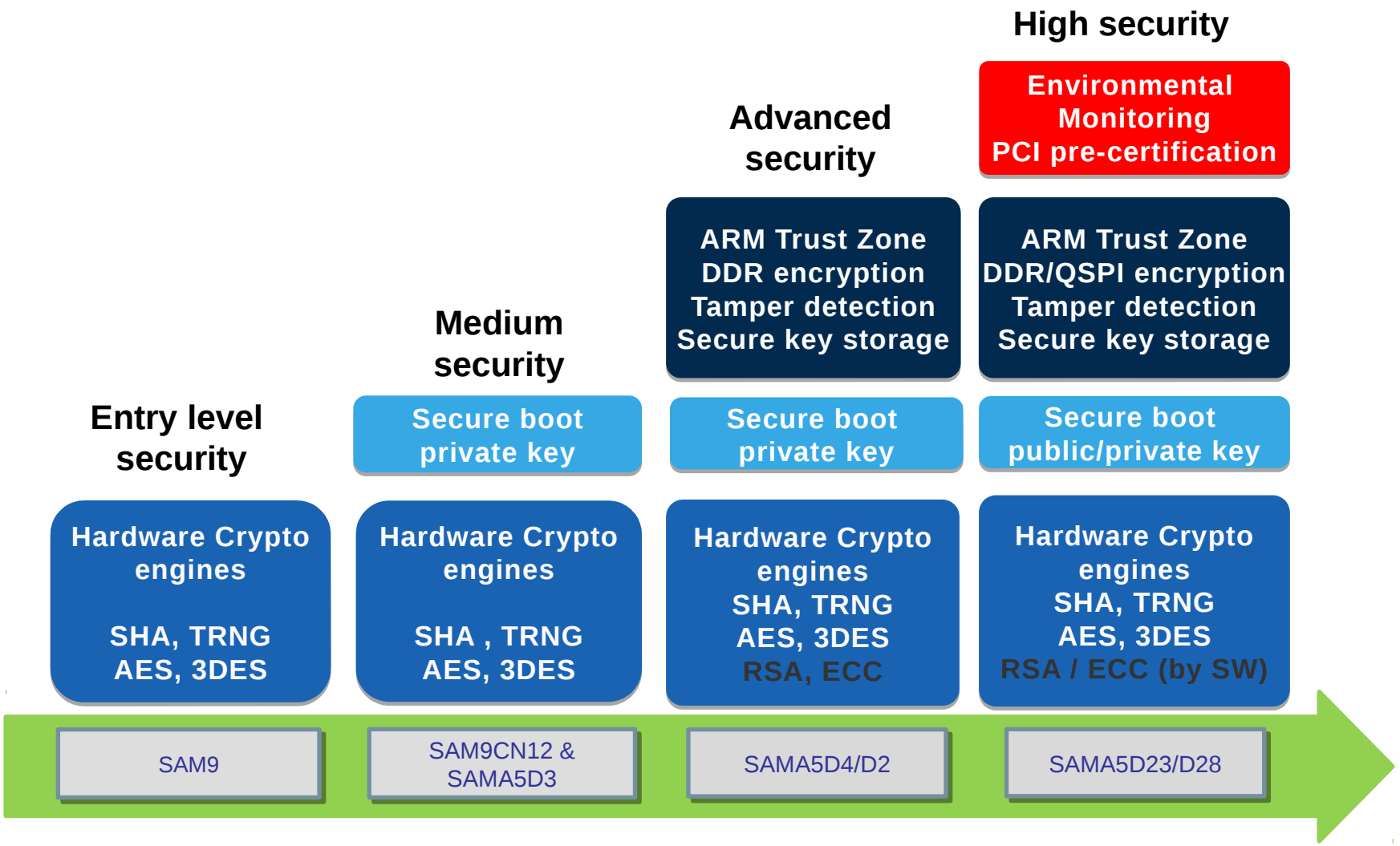
- **Cortex A5 with vFPU 500-600MHz**
- **L1 Cache (2 x 32kB) 128kB SRAM**
- **DDR2, LPDDR, LPDDR2**
- **24-Bit LCD**
- **Camera Interface**
- **USART, SPI, I2C, I2S**
- **Linux BSP**

SAMA5 Power Consumption

	SAMA5D2	SAMA5D3	SAMA5D4
Backup	4.2uA	1.2uA	7uA
Backup – DDR Self Refresh	44uA	N/A	N/A
Ultra Low Power ULP0 750kHz (typ) / Wake-up time	1.8mW / 205 us	0.6mW / 60us	8.8mW / 150us
Ultra Low Power ULP1 (typ) / Wake-up time	0.3mW / 15us	N/A	N/A
Idle (typ)	33mW (MCK @ 166MHz)	29mW (MCK @ 132MHz)	48mW (MCK @ 132MHz) 66mW (MCK @ 200MHz)
Dynamic Power (typ) - Dhrystone	285mW (500MHz) MRL A 140mW (500MHz) MRL B	140mW (528MHz)	328mW (600 MHz)

External Loads on PIOs are not taken into account

Security Features



DRAM Memory

		64Mb 8MB	128Mb 16MB	256Mb 32MB	512Mb 64MB	1Gb 128MB	2Gb 256MB	4Gb 512MB
SAMA5D4 SAMA5D3 SAMA5D2	LPDDR3[1]							
	LPDDR2							
	LPDDR1		Lowest cost for this density					
	DDR3L[1]					Lowest cost for this density	Lowest cost for this density	
	DDR3[1]					Lowest cost for this density	Lowest cost for this density	Lowest cost for this density
	DDR2		Lowest cost for this density	Lowest cost for this density	Lowest cost for this density	Lowest cost for this density		
SAM9-5s SAM9N12	DDR2		Lowest cost for this density	Lowest cost for this density	Lowest cost for this density	Lowest cost for this density		
	SDRAM	Lowest cost for this density	Lowest cost for this density					

Memory footprint needed for….

RTOS	LINUX	LINUX + QT	ANDROID

Eco-system

IDE	**Segger** - Embedded Studio	**IAR** - EWARM	**ARM/Keil**–MDK (planning to add CA5 support)	**GNU**

RTOS	Segger	Express Logic	ARM/Keil	FreeRTOS
Kernel	embOS	ThreadX	RTX	FreeRTOS
TCP/IP (IPv4 & 6)	embOS/IP	NetX Duo CycloneTCP	TCPnet V7 CycloneTCP	LwIP CycloneTCP FreeRTOS+TCP
SSL / TLS	emSSL	WolfSSL CycloneSSL	emSSL CycloneSSL	WolfSSL CycloneSSL
USB	embUSB Host embUSB Device	USBX Host USBX Device	USB Host USB Device	
File System	emFile	FileX	Flash File System	FreeRTOS+FAT
Bluetooth	Clarinox?	Clarinox		Clarinox
Graphics	emWIN	GUIX	emWIN	

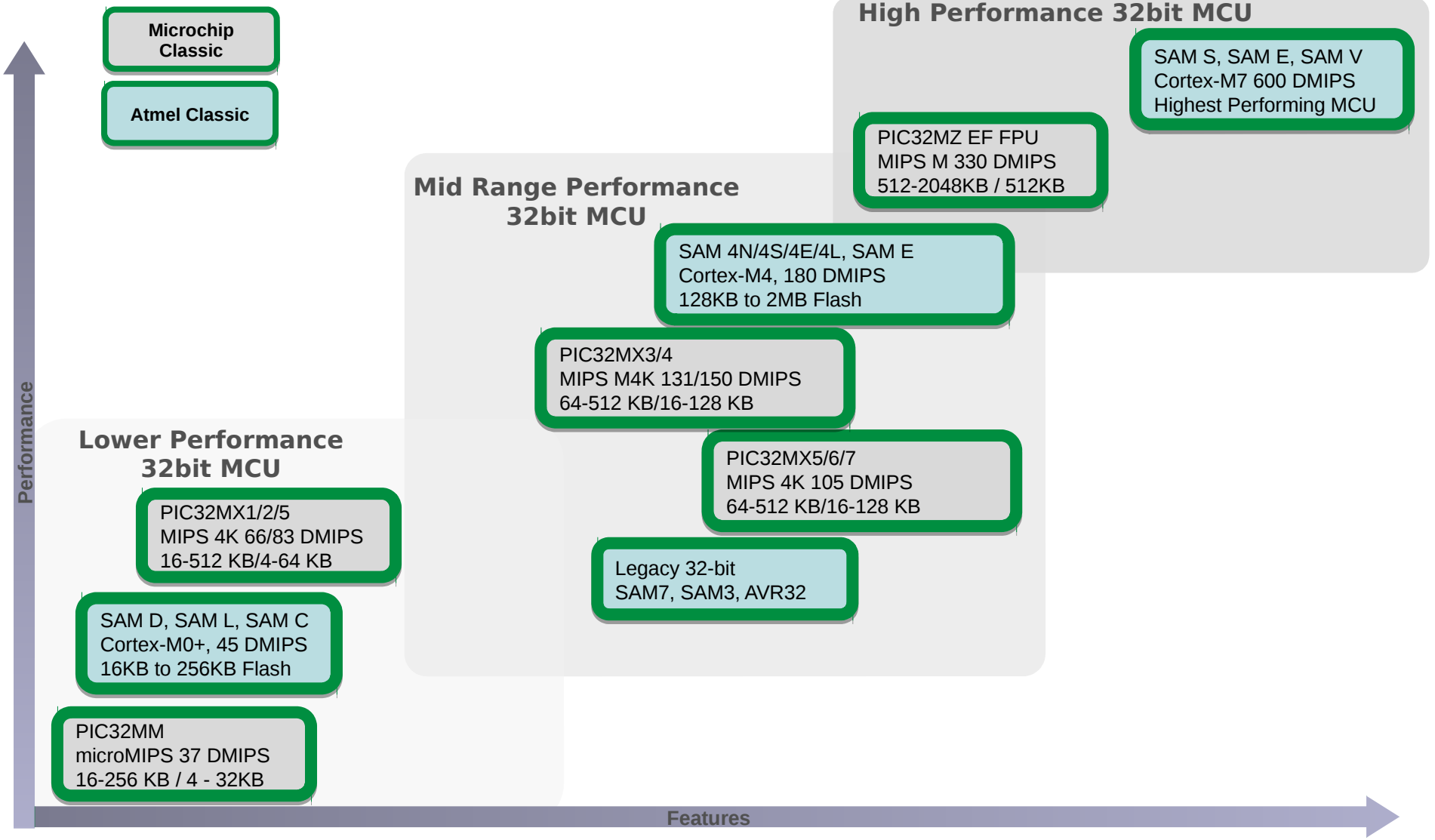
SAMA5 OS Support

	SAMA5D3x	SAMA5D4x	SAMA5D2x
Linux LTS Kernel 4.1	✓	✓	✓
Windows c. 2016	–	–	✓
Android KitKat 4.4.2	✓	✓	On-going
Windows Compact 7	✓	✓	–
NuttX	✓	✓	✓
QNX	✓	–	–
uC-OS III	✓	–	–
EmbOS	✓	✓	Planned
ThreadX®	✓	–	✓
uITRON4.0	✓	–	–
eT-Kernel	✓	–	–
FreeRTOS	✓	✓	✓
QuadrOS	–	–	–
eCOS	–	–	–

Agenda

- 32-bit MPU
- 32-bit MCU
- Development tools

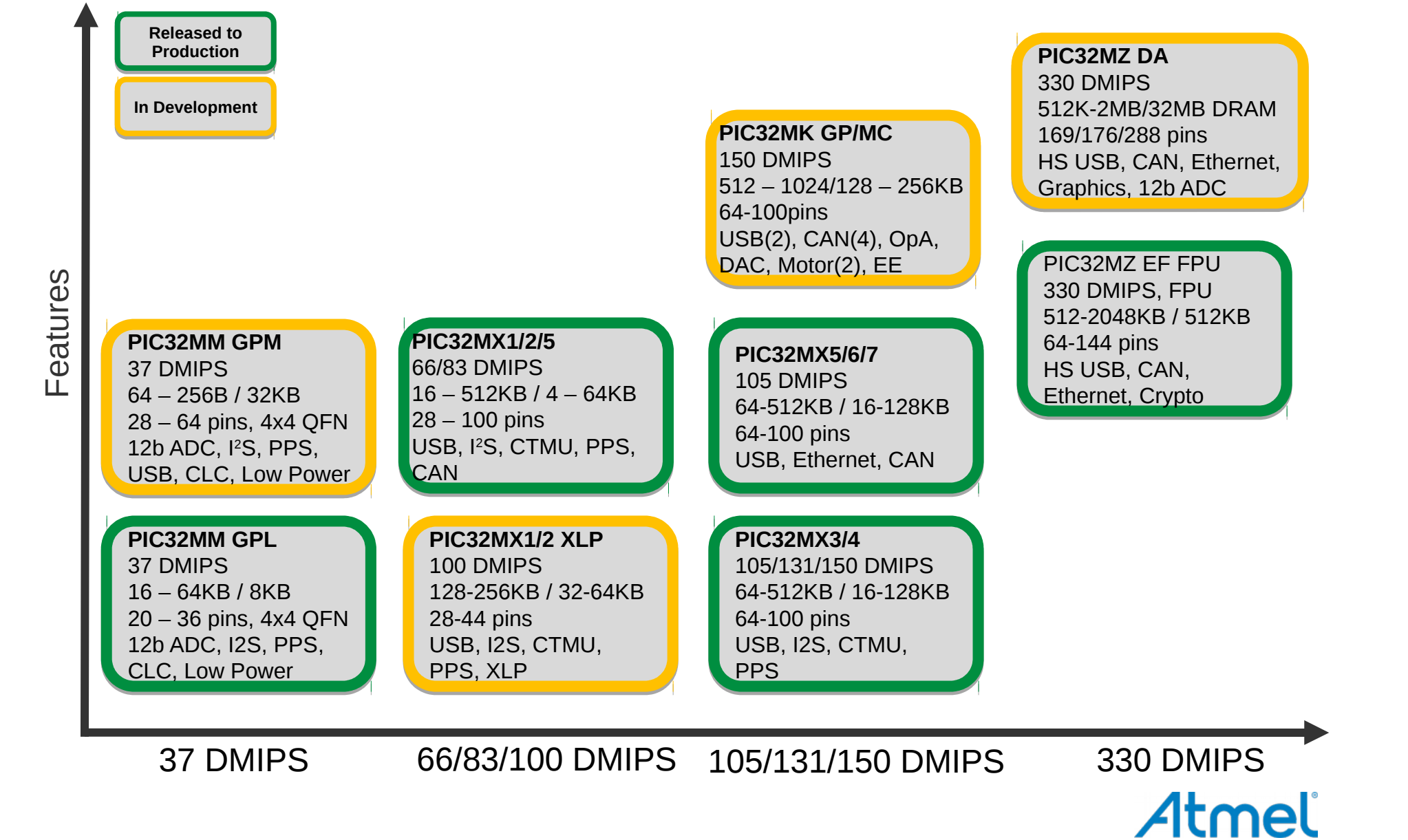
32-bit MCU


Microchip Classic
Atmel Classic
High Performance 32bit MCU
SAM S, SAM E, SAM V
Cortex-M7 600 DMIPS
Highest Performing MCU
PIC32MZ EF FPU
MIPS M 330 DMIPS
512-2048KB / 512KB
Mid Range Performance 32bit MCU
SAM 4N/4S/4E/4L, SAM E
Cortex-M4, 180 DMIPS
128KB to 2MB Flash
PIC32MX3/4
MIPS M4K 131/150 DMIPS
64-512 KB/16-128 KB
PIC32MX5/6/7
MIPS 4K 105 DMIPS
64-512 KB/16-128 KB
Legacy 32-bit
SAM7, SAM3, AVR32
Lower Performance 32bit MCU
PIC32MX1/2/5
MIPS 4K 66/83 DMIPS
16-512 KB/4-64 KB
SAM D, SAM L, SAM C
Cortex-M0+, 45 DMIPS
16KB to 256KB Flash
PIC32MM
microMIPS 37 DMIPS
16-256 KB / 4 - 32KB
Performance
Features

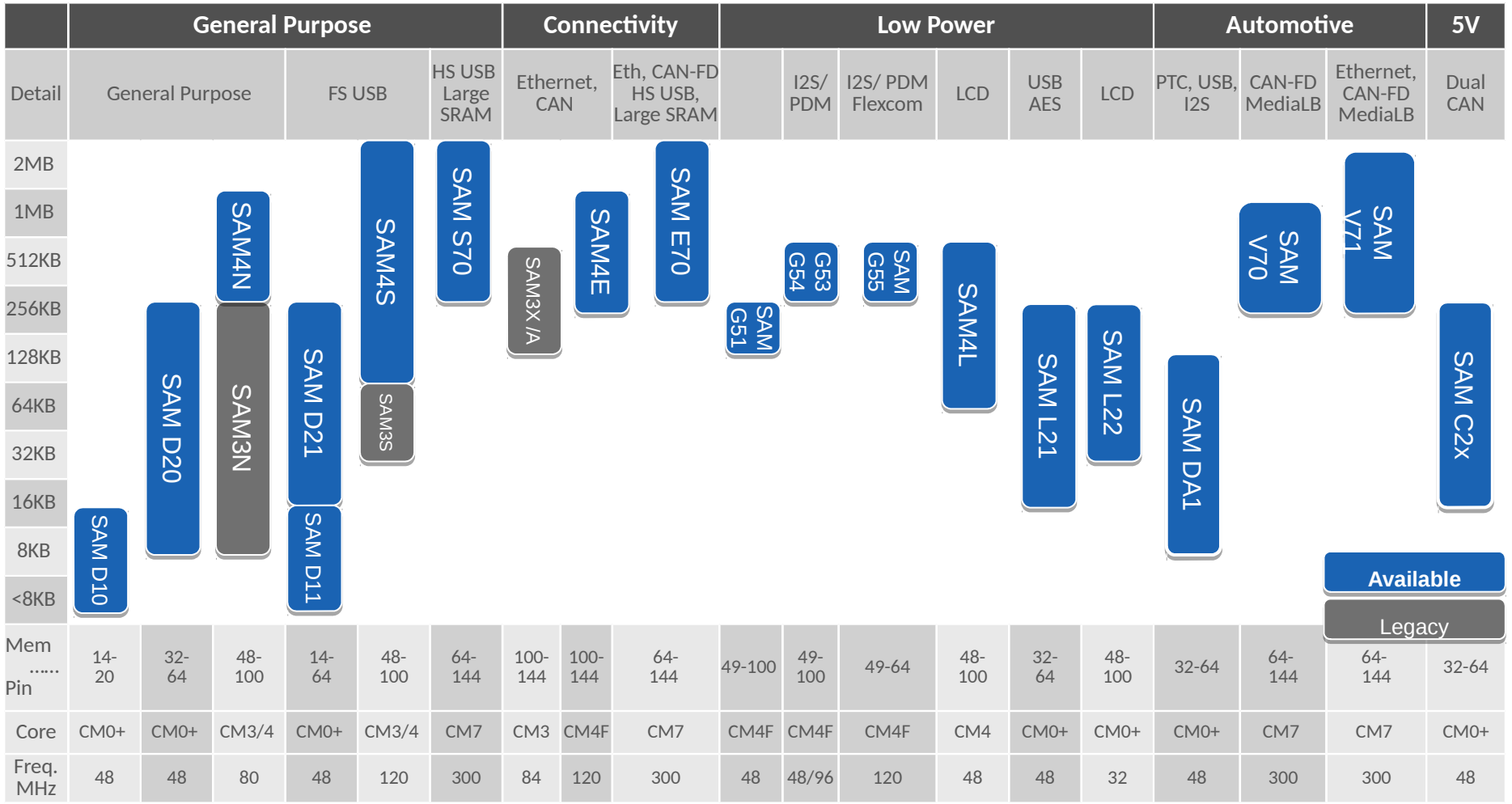
PIC32 Portfolio

	General Purpose + Audio				Connectivity			Advanced Connectivity + Performance		
Detail	FS USB	FS USB, XLP Low Power	FS USB + CAN	FS USB + Touch	FS USB, CAN	FS USB, Ethernet	FS USB, 2 CAN, Ethernet	HS USB, 2 CAN, Ethernet, Crypto	HS USB, 2 CAN, Ethernet, Crypto, Performance+	HS USB, 2 CAN, Ethernet, Graphics, Crypto
2MB								PIC32MZ EF	PIC32MZ EF-250	PIC32MZ DA
1MB										
512KB										
256KB	PIC32MX 1/2	PIC32MX 1/2 XLP	PIC32MX 1/2/5	PIC32MX 3/4 Advanced	PIC32MX 5	PIC32MX 6	PIC32MX 7			
128KB										
64KB										
32KB										
16KB	PIC32MX 3/4									
8KB										
<8KB										
Mem ..... Pin	28/36/44	64/100/121	28/36/44	64/100	64/100/124	64/100	64/100	64/100	64/100/124/144	64/100/144	169/176/288
Core	MIPS32 M4K	MIPS32 M4K	MIPS32 M4K	MIPS32 M4K	MIPS32 M4K	MIPS32 M4K	MIPS32 M4K	MIPS32 M4K	MIPS32 M-Class	MIPS32 M-Class	MIPS32 M-Class
Freq. MHz	40/50	80	76	40/50	120	80	80	80	200	252	200

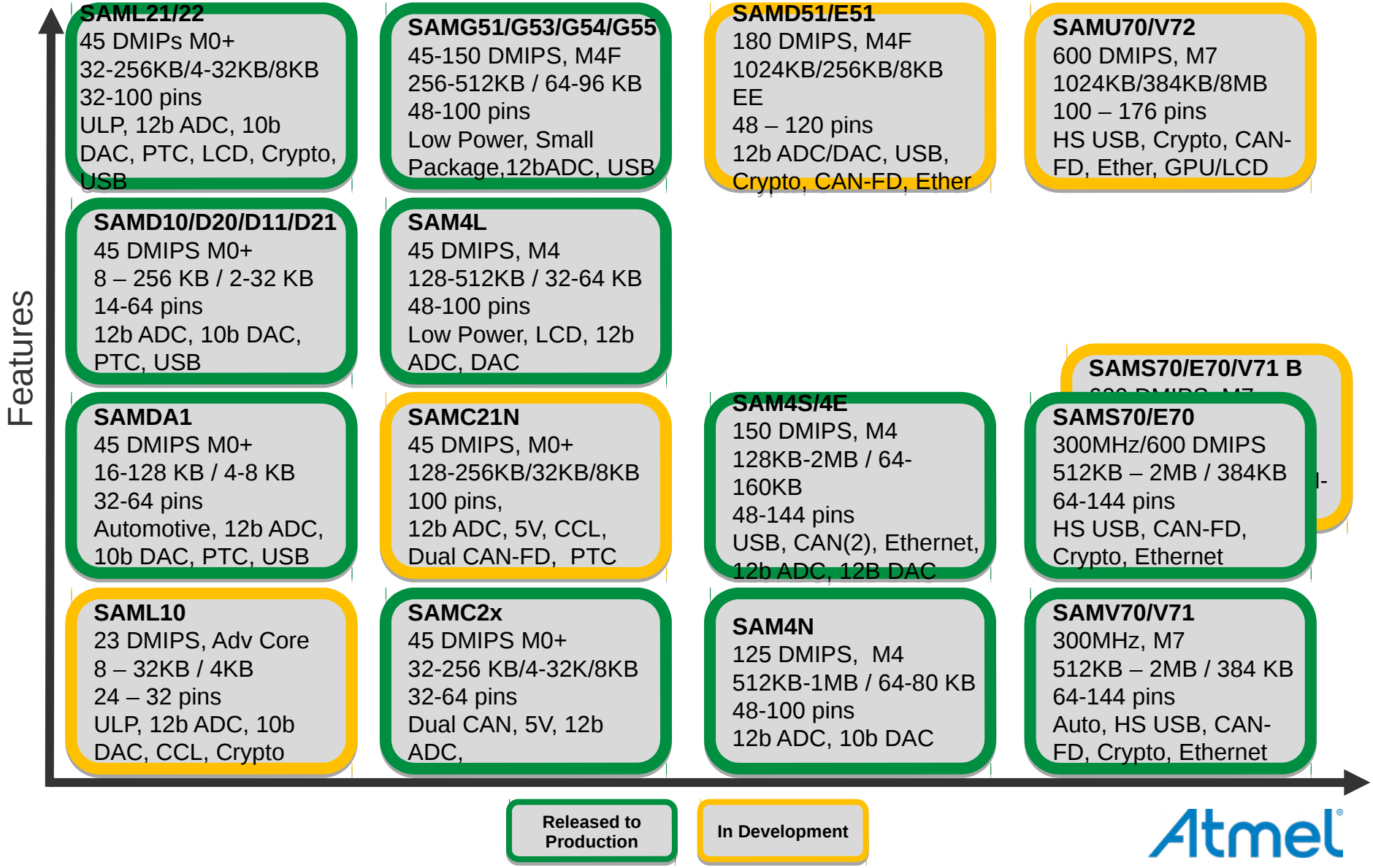
PIC32 Roadmap



SAM Portfolio



SAM MCU Roadmap



PIC32MZ EF

- **Performance 252 MHz / 415 DMIPs and 3.28 CoreMark/MHz**
- **Micromips - High code density (30% better) while maintaining top performance**
- **DSP, FPU (single and double precision)**
- **Up to 2MB Flash and 512KB RAM**
  - Dual-Panel Flash with Live Update
- **Up to 48 Ch. 12-bit ADC @ 18Msps**
  6 S&H, 6 D. filters, 6 D. comparators
- **High Integration**
  - High Speed USB; 10/100 EMAC; 2x CAN 2.0B module; 6x UART, 6x SPI / I2S, 5x I2C; and SQI
  - Full-featured hardware crypto engine with RNG
- **Starter Kit:**
  - PIC32MZ Embedded Connectivity with FPU (EF) Starter Kit: DM32007
  - PIC32MZ Embedded Connectivity with FPU (EF) Starter Kit (Crypto): DM320007-C

PIC32 Family	PIC32MZ EF	PIC32MZ EF-250
Program Memory (KB)	512 – 2048	
RAM (KB)	128 – 512	
Boot Flash Memory (KB)	160	
Pin Count	64/100/124/144	
Performance MHz	200	**252**
Performance DMIPS	330	**415**
Internal Oscillators	32kHz, 8 MHz	
ADC	Up to 48 ch., 12-bit, 18 Msps	
Comparators	2	
Timers/Capture/Compare	9/9/9	
Cap. Touch (CTMU)	No	
Internal Regulator	Yes	
I2C,UART, SPI/I2S	**5, 6, 6**	
CAN	**2**	
10/100 EMAC	**Yes**	
USB	**High Speed USB2.0 Device/Host/OTG**	
DMA(Prog./ Ded.)	**8/18**	
Memory Interface	**EBI, SQI**	
Security Features	**Crypto Engine with RNG and authentication (AES, 3DES, SHA, MD5 and HMAC)**	
Other Peripherals	PMP, RTCC, PPS	
Package	QFN, TQFP, TFBGA, VTLA, LQFP, XFBGA	

NEW

PIC32MZ DA

- **Integrated graphics control and acceleration**
  - 3-layer graphics controller driving 24-bit color SVGA
  - High-performance 2D Graphics Processing Unit (GPU)
- **High Performance DDR2 DRAM**
  - 32MB internal DDR2 DRAM or 128MB externally addressable
- **Expanded on-chip memory**
  - Up to 2MB Flash and 640KB RAM
  - Dual-panel Flash with Live Update
- **High Integration & Performance**
  - 12-bit ADC throughput at 18Msps
  - Expansive peripheral set
  - Full-featured hardware crypto engine with RNG

- **Starter Kit:**
  - PIC32MZ Embedded Graphics (DA) External DDR2 Starter Kit (crypto/non-crypto)
  - PIC32MZ Embedded Graphics (DA) Stack DDR2 Starter Kit (crypto/non-crypto)

PIC32 Family	PIC32MZ DA
Program Memory (KB)	1024 – 2048
RAM (KB)	256 – 640
Boot Flash Memory (KB)	64
Pin Count	169/176/288
Performance MHz	200
Performance DMIPS	330
Internal Oscillators	32KHz, 8 MHz
ADC	Up to 45 ch., 12-bit, 18 Msps
Comparators	2
Timers/Capture/Compare	9/9/9
Cap. Touch (CTMU)	Yes
Internal Regulator	Yes
I2C,UART, SPI/I2S	5, 6, 6
CAN 2.0B	**2**
10/100 EMAC	**Yes**
USB	**High Speed USB2.0 Device/Host/OTG**
DMA(Prog./ Ded.)	**8/26**
Memory Interface	**EBI, SQI, DDR2, SDHC**
Security Features	**Crypto Engine with RNG and authentication (AES, 3DES, SHA, MD5 and HMAC)**
Other Peripherals	PMP, RTCC, PPS
Package	LQFP, LFBGA

RTP
CQ1'17

PIC32MM GPL

- **Performance 25 MHz / 37 DMIPs and 3.14 CoreMark/MHz**
- **Micromips - High code density (30% better) while maintaining top performance**
- **Two sets of 32 core register files**
- **Up to 64KB Flash and 8KB RAM**
- **Up to 14 Ch. 12/10-bit ADC @ 200/300 Ksps 2 D. comparators**
- **Low Cost**
- **Development Kit:**

Explorer 16/32 Development Board (DM240001-2)
PIC32MM0064GPL036 Plug-In Module (MA320020)

PIC32 Family	PIC32MM GPL
Program Memory (KB)	16 – 64
RAM (KB)	4 – 8
Boot Flash Memory (KB)	-
Pin Count	**20/28/36/40**
Performance MHz	25
Performance DMIPS	37
Internal Oscillators	32KHz, 8 MHz
ADC	Up to14 ch., 12-bit, 300 ksps
Comparators	2
Timers/MCCP/SCCP	7/1/2
Cap. Touch (CTMU)	No
Internal Regulator	Yes
I2C,UART, SPI/I2S	0, 2, 2
CAN 2.0B	0
10/100 EMAC	No
USB	No
DMA(Prog./ Ded.)	0/0
Memory Interface	No
Security Features	No
Other Peripherals	**CRC, CLC,** RTCC, PPS
Package	SSOP/QFN/SOIC/UQFN/**SPDIP**

NEW

SAM C20/C21

- **2.7V – 5.5V Operating Voltage**
  - Ensures best possible signal-to-noise ratio and robustness
- **Targeted for industrial, white goods and other 5V applications**
- **Advanced peripherals for target markets**
  - RS485 and LIN master support added to SERCOM module
  - Hardware Divide Accelerator
  - Dual CAN ports supporting both CAN 2.0 and CAN-FD 1.0 (SAM C21 only)
  - High Accuracy Analog Integration
  - Configurable Custom Logic
  - Memory Protection Unit
  - Class B/IEC60730 library support
- **Pin and Code compatible to existing SAM D families**

- **MP: Now**
- **Kits: SAMC21-XPRO, SAMC20-QTRDEMO**

NEW

	SAM C20	SAM C21
CPU	48MHz CM0+ with MTB and MPU	48MHz CM0+ with MTB and MPU
Memory	32-256KB Flash 4- 32KB SRAM 8KB EEPROM emulation block	
Pin Range	32 – 64 26 – 52 GPIO	32 – 64 26 – 52 GPIO
Operating Range	**2.7 – 5.5V**	**2.7 – 5.5V**
Event System	6-ch	12-ch
DMA	6-ch	12-ch
CRC	32-bit for memory 32-bit for peripherals 16-bit for peripherals	
Analog	1Msps, 12-bit ADC 2x AC <50nS	2x 1Msps, 12-bit ADC 350ksps , 10-bit DAC 4x AC, <50ns 3 ch 16-bit S/D ADC
Timer/ Counters	5x TC 1x TCC 1x RTC	5x TC 3x TCC 1x RTC
Communication	4x SERCOM with LIN and RS485 support	6x SERCOM with LIN and RS485 support **2x CAN**
PTC	Yes (enhanced)	Yes (enhanced)
CCL	Yes	Yes
Package	QFP, QFN	QFP, QFN

SAM D51

- **Highest Throughput**
  - Cortex-M4 with FPU
  - 4kByte Instruction Cache or TCM
- **Ultra Low Power**
  - 75µA/MHz in Active Mode
  - Hiberate 25°C (Core domain/NVM Off, Buck reg)
    - With 32kB SRAM = 3.2µA
    - With 256kB SRAM = 10µA
  - Backup RTC at 25°C
    - 3.4µA with 4k SRAM
    - 2.6µA without SRAM Retention
  - From 1.71V up to 3.6V
  - Event System, Sleep Walking
  - Position decoder and Freq Meter
- **Security**
  - Crypto/Tamper as opposite
  - Memory lock/debug disable
  - ECC on Flash and SRAM, CRC

- **Kit: ATSAMD51-XPRO**

SAM Family	SAM D51
Frequency	**120 MHz**
Flash (Dual Bank with RWW)	256kBytes to 1MByte
SRAM / EEPROM	Up to 256KB / 8KB
SERCOM (USART, SPI, I2C, ISO7816, LIN, RS485)	8 (SPI 16MHz, I2C slave up to 3.4MHz)
Dual Voltage GPIO	**1.8V and 3.3V**
QSPI XIP	1 (up to 60MHz DDR, 75MHz SDR)
SDXC/SDIO V3/eMMC	2
USB (with PHY)	FS Device and Host
Peripheral Touch Controller	**Self, Mutual, 16 x 16 ch**
Custom Configurable Logic	Yes, 4 LUTs
I²S	2
Comparator	2 with windowing
ADC (12 bit, 1Msps)	2 x 16 Ch
DAC (12 bit, 1Msps)	2
16/32bit Timers/PWMs	8/5
Crypto	TRNG, AES256, SHA1/244/256, ECC 1k, RSA, DSA, 5 Tamper Detects
Pin count	48, 64, 100 and 120 pin
Package	QFN, TQFP, BGA, WLCSP

RTP
CQ2'17

SAM S70/E70/V7x

- **High Performance**
  - Cortex-M7 – 300MHz, 1500 CoreMarks
  - 16kB+16kB of I&D Cache with ECC
  - Execution in place from on-chip Flash, NVM connected to QSPI and EBI
  - Multi-port SRAM minimizing latency
- **Features**
  - HS USB Host/Device with integrated PHY
  - Memory Integrity Check Monitor
  - CMOS Camera Interface
  - Ethernet and Dual CAN on SAM E70
  - Sleepwalking on UART and I^2C
  - Event System
- **Advanced Analog Frontend (AFE)**
  - Dual S&H, 12-bit ADC, 16-bit HW averaging
  - Differential input, Programmable gain
  - Automatic Gain and Offset error correction
  - DMA support, HW & SW trigger
- **Extended Industrial temp range -40 to 105°C**

HOT

	S70	E70	V70	V71
Frequency	**CM7 - 300 MHz**			
Flash	512KB / 1MB / 2MB			
SRAM	256KB / 384KB / 384KB			
Backup SRAM	1KB			
Ext Bus Interface	16-bit (SDRAM, SRAM)			
Ethernet 1588 (MAC)	-	10/100	-	10/100
CAN-FD	-	**2**	**2**	**2**
Media LB	-		Yes	
Automotive qualified	-		Yes	
Camera interface	1			
QSPI	1			
HSMCI/SDIO/eMMC	1			
USB	1x HS (Host/Device)			
USART or SPI / UART	5/3			
SPI / I2C / SSC	2 / 3 / 1			
12-bit ADC	2x 12-ch 2Mbps			
12-bit DAC	2-ch 2Mbps			
Timers/PWM	12/8			
Crypto	TRNG, AES256, SHA1/256			
Pin count	64 – 100 – 144			
Package	QFP, BGA			

- **Kit: ATSAME70-XPLD & ATSAMV71-XULT**

SAM U70

- **High Performance**
  - 300 MHz Cortex-M7 with FPU
  - 16kB I&D Cache
- **Memory**
  - 384KB SRAM at 0 Wait State
  - Multi-port SRAM
  - Optional Stacked SDRAM up to 8MB
- **Power Consumption**
  - <300µA/MHz
  - <450µA in wait mode (full SRAM)
  - 3µA in backup with RTC and 1KB SRAM
- **UI Features**
  - LCD interface (RGB)
  - Display controller with
    - 2 Overlay/scaling/rotating/alpha blending
    - LUT of color for the background
  - 2D Graphics acceleration
  - Capacitive button, slider, wheel
  - Camera interface (//)

- **Kit: ATSAMU70-XULT**

SAM Family	SAM U70
Frequency	**300 MHz**
Flash / SRAM	Up to 1MB / 384 KB
Ext Bus Interface	**8/16b SRAM, SDRAM**
QSPI	1x, SDR/DDR, 75MHz
Flexcom (USART, SPI, I2C)	**10**
Ethernet AVB	10/100Mbps
LCD-TFT interface	RGB 24bpp, 2D graphics
HSMCI/SDIO/eMMC	2
USB	1 x HS Host/Dev. 1 x FS Dev., HSIC
Peripheral Touch Controller	16x self / 64x mutual (BSW)
CMOS Camera interface	12-bit
CAN-FD	**4**
I²S / SSC	2 / 1
Other Audio	Audio PLL / 2 PDM / Class D
RTC	Yes
12b ADC / 12b DAC	10-ch / 2-ch
Timers / PWM	12 / 8
Crypto	TRNG, AES256, SHA256
Pin count	100 – 144 – 176
Package	QFP, BGA

RTP
CQ2'17

Agenda

- 32-bit MPU
- 32-bit MCU
- Development tools

Development tools

- **Atmel Studio 7 and MPLAB X are a vital part of their respective ecosystems, each having unique benefits for their respective clients.**
  - Atmel Studio will continue
  - MPLAB X will continue
- **MPLAB XC and Atmel GCC compilers remain a staple of client development. Professionals, students and makers depend on them for their daily operations.**
  - MPLAB XC Compilers will continue
  - Atmel-GCC Compilers will continue
  - IAR and Keil partnerships will continue
- **Having reliable device debuggers and programmers is a critical part of the design process. Atmel-ICE, and the MPLAB family of debuggers provide that capability for our clients.**
  - Atmel-ICE & SAM-ICE will continue
  - PICkit, MPLAB ICD and MPLAB REAL ICE will continue

IDE and Compiler

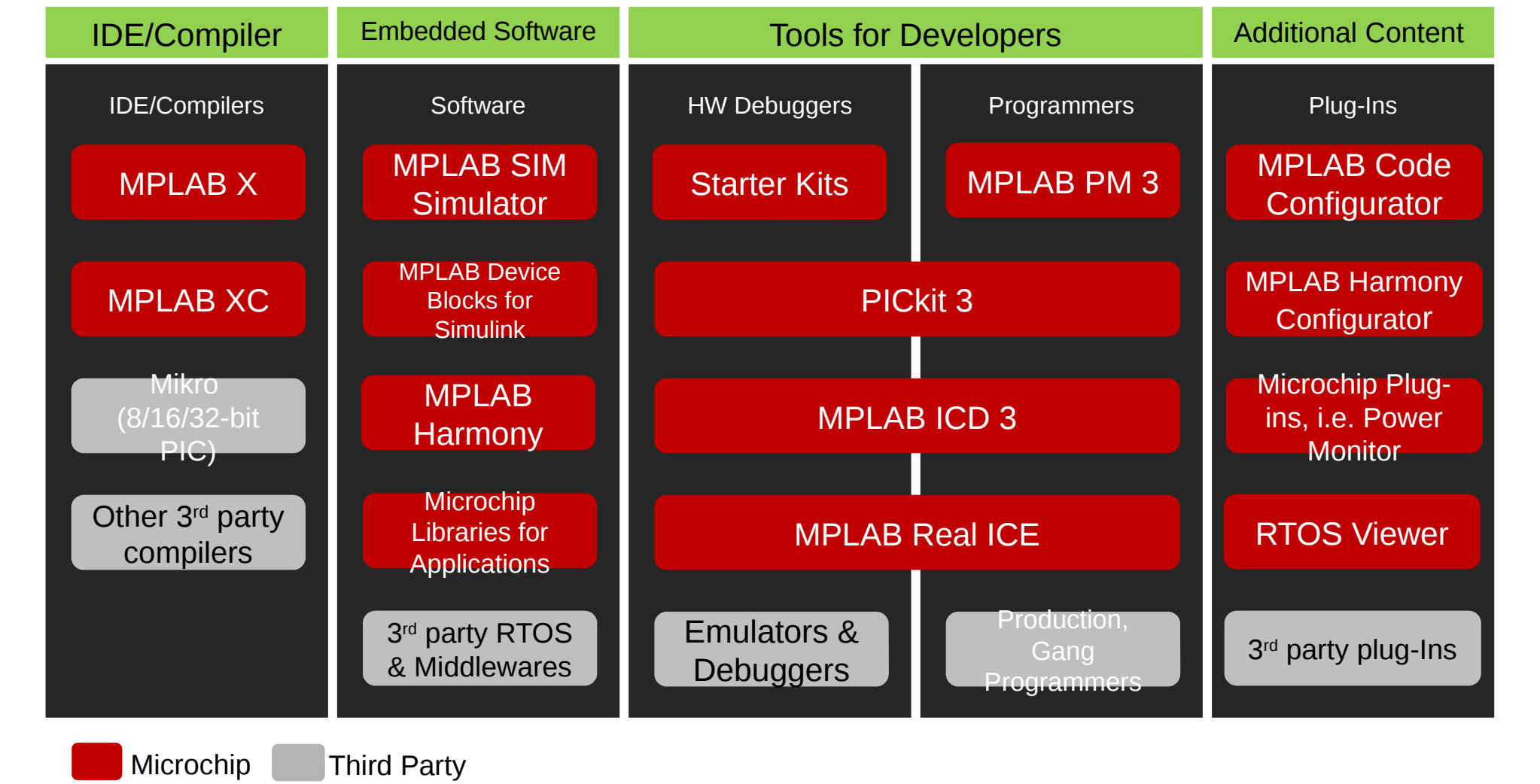
	PIC MCU and DSC	AVR	SAM and ARM
FREE	FREE MPLAB X MPLAB XC	FREE Atmel Studio AVR-GCC	FREE Atmel Studio ARM-GCC
FREE	Good Performance Optimizing Open Source and Proprietary	Good Performance Optimizing Open Source	Good Performance Optimizing Open Source
Purchase	MPLAB XC PRO MPLAB X **$29/mo** or $1K	IAR Workbench $5K	IAR Workbench $5K Keil uVision $700 - $5K
Purchase	Best PIC Performance 20% smaller, faster Proprietary License	Best AVR Performance 20% smaller, faster Proprietary License	Best ARM Performance 20% smaller, faster Proprietary License

The most comprehensive and flexible offering in the industry

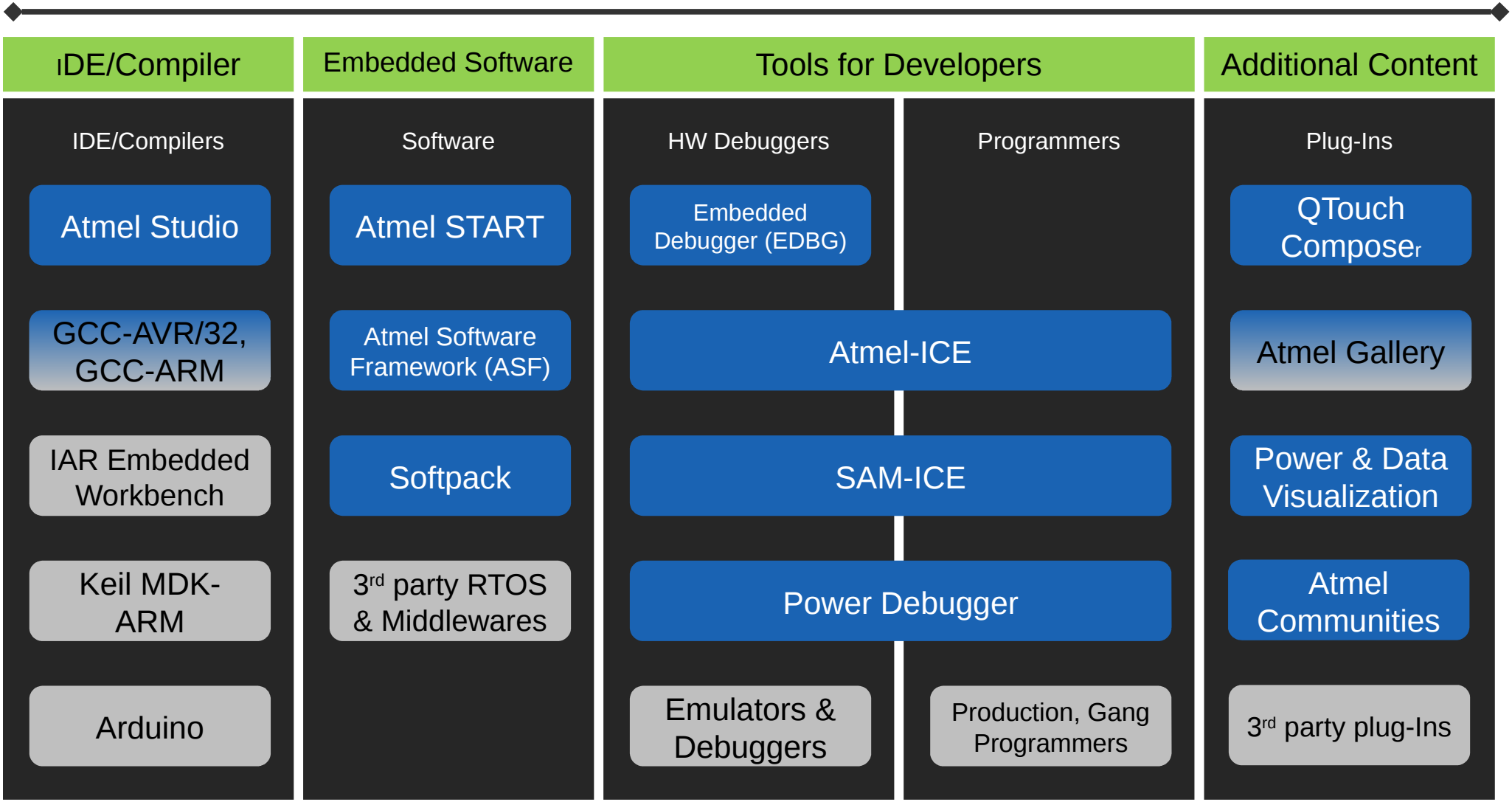
Debugger and Programmer

The most comprehensive and flexible offering in the industry

PIC Ecosystem IDE

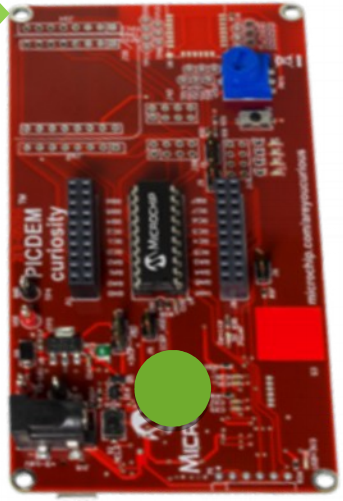


Atmel Ecosystem IDE



Curiosity

NEW

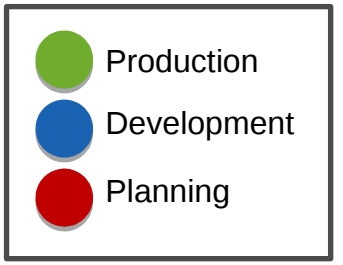


MCU8
ASP $19.95
PIC16F

MCU16
ASP $XXX
PIC24

MCU32
ASP $22.99
PIC32MX

MCU32
ASP $28.99
PIC32MZ



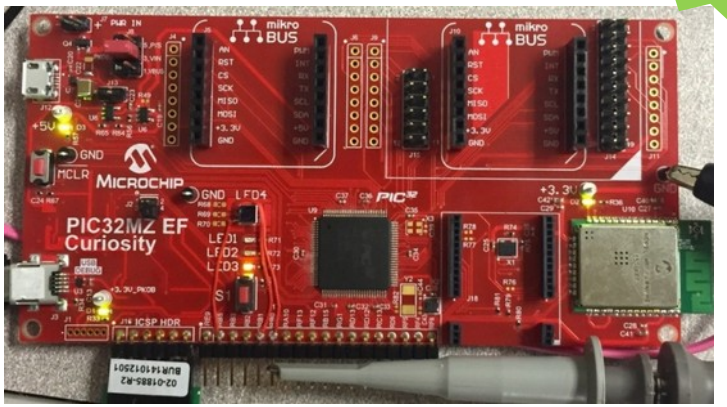
- **Boards will include PKOB (PICkit On Board)**
- **Ecosystem in development. Primary focus on Ease of Use.**
- **Up to 2 mikroBUS connectors on MCU32 for expansion**
- **Low touch, community based forum driven support**
- **Collaterals to foster new discovery opportunity creation**

PIC32 Curiosity

NEW

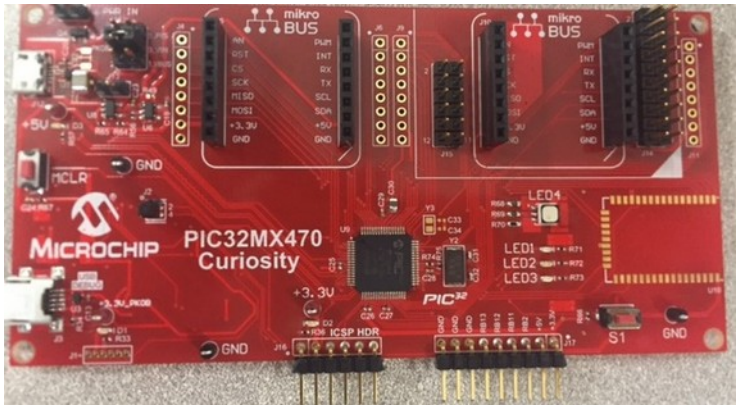
- Enable Application Rapid Prototyping to PIC32 Potential/Existing Customers.
- Provide a platform for PIC32 Ecosystem partners to develop solution kits for Customer base.

EXOSITE PubNub



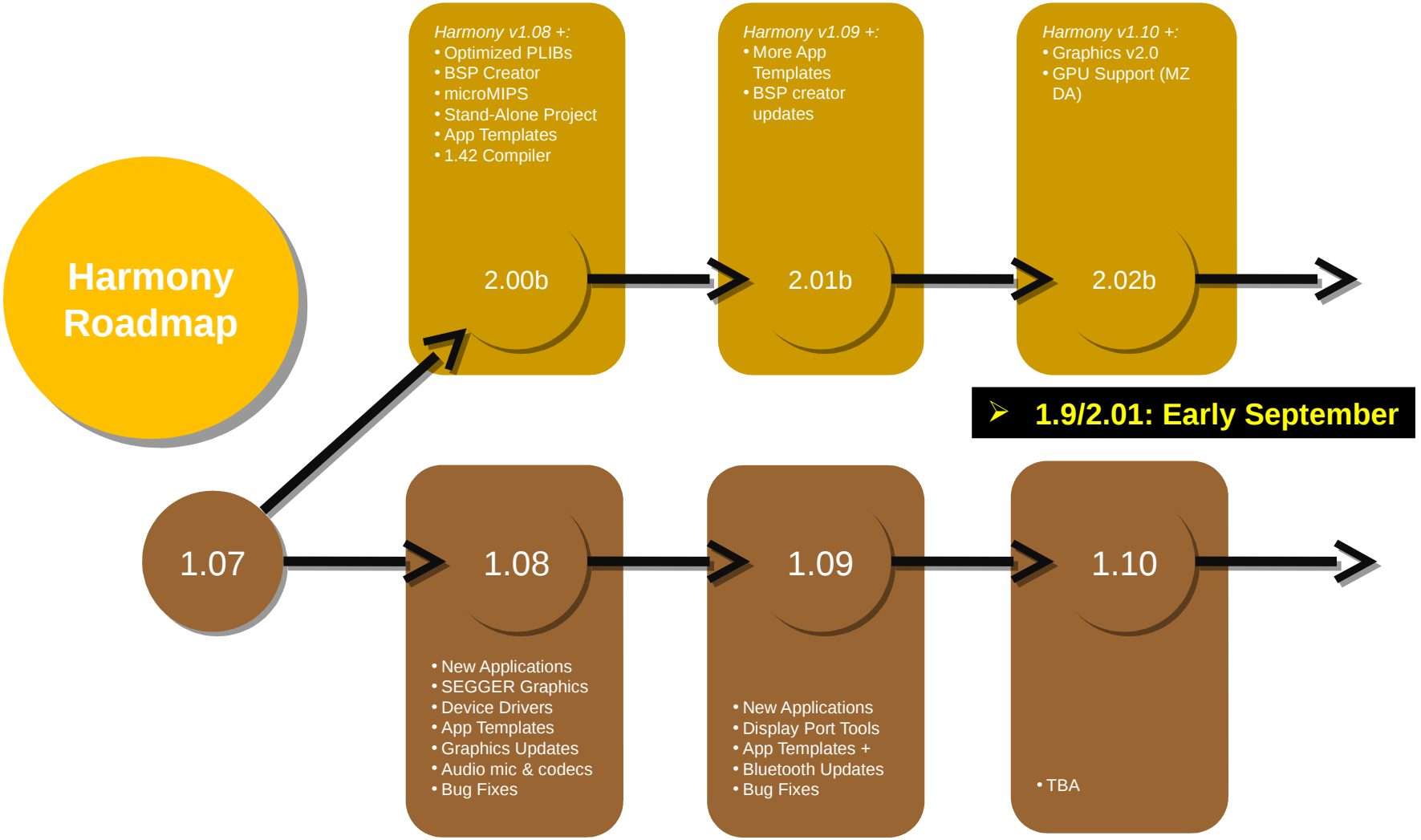
- Add to the Microchip's Curiosity development platform with highly differentiated PIC32 boards.
- Leverage the "Low Touch" Market Segment to generate new discovery customers with low cost & cost effective solutions that are viewed as low obstacles to engagement.

Curiosity PIC32MX470 Development Board



- Available NOW

Harmony Roadmap



Konec

Děkuji za vaši pozornost

Miroslav Mácha