



# AT32 | MICROCONTROLLER SELECTION GUIDE

2023

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About

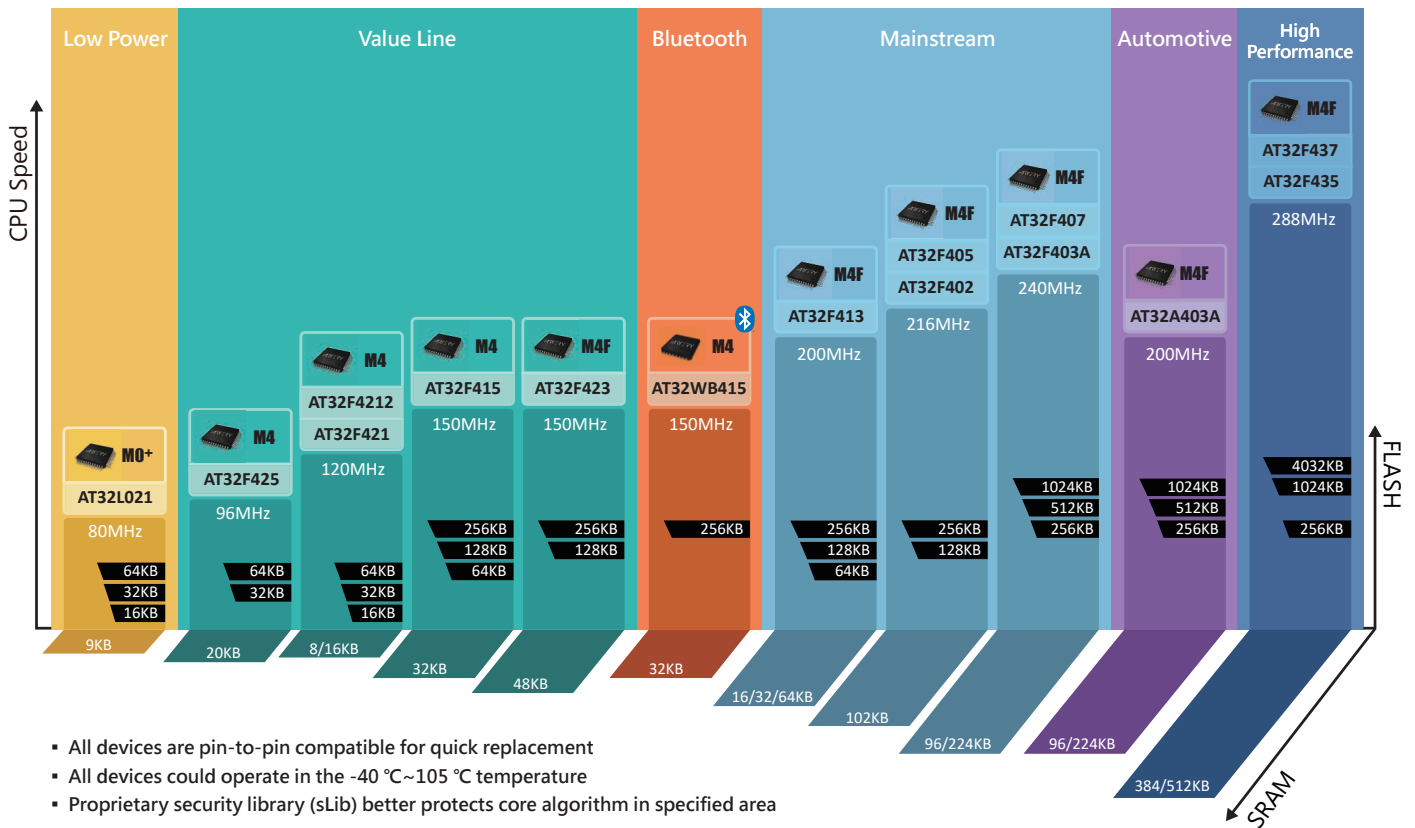


Founded in 2016, ARTERY Technology (雅特力科技) is a global MCU design company focusing on promoting innovative development of ARM® Cortex®-M4/M0+ 32-bit MCUs. It has set up R&D centers, sales service and tech support offices in Taiwan, Chongqing, Shenzhen, Suzhou, and Shanghai.

As of the year 2023, ARTERY has launched a total of 15 AT32 MCU product series including nearly 200 parts, all built based on 32-bit ARM® Cortex®-M4 (high performance) or M0+ (low power) core. AT32 MCUs are designed to shorten application development cycle and speed up time-to-market with its powerful features such as high-precision 12-bit ADC, rich communication interfaces, multiple Flash memory and SRAM options, as well as multiple-channel PWM. Today ARTERY has seen its total shipments exceed 100 million units and its products are being widely applied in various fields including 5G, IoT, consumer electronics, business services, motor and industrial control services. With the development over years, ARTERY AT32 MCUs have been gradually penetrating into our daily lives, as evidenced by Air Multiplier, intelligent lighting, sweeping robot, optical flow drone, laser radar, industrial sewing machine, servo-drive, gaming, circuit breakers, ADAS, T-BOX, digital power, electric tool, among others.

ARTERY core team brings together senior talent from the MCU industry. Their extensive experiences in R&D, coupled with powerful ARTERY-developed IP database, are behind the high-quality development of AT32 MCUs. Looking ahead, ARTERY will continue to expand cooperation with more partners worldwide that are interested in MCU-based applications, delivering broader product portfolio and optimal solutions appropriate to customer requirements.

# AT32 M4/M0+ MCU FAMILY



- All devices are pin-to-pin compatible for quick replacement
- All devices could operate in the -40 °C~105 °C temperature
- Proprietary security library (sLib) better protects core algorithm in specified area

## Low Power

**M0+ AT32L021**

- Cortex®-M0+ Core
- 80MHz CPU
- 64KB Flash, 8+1KB SRAM
- 4xUART, CAN, ADC

Sample available in 2023/Q4

## Bluetooth

**M4 AT32WB415**

- Cortex®-M4 Core
- 150MHz CPU
- 256KB Flash, 32KB SRAM
- OTG, CAN, 4xUART, 2xCMP
- BT 5.0 dual mode

## High Performance

**M4F AT32F435**

- Cortex®-M4F Core
- 288MHz CPU
- 4032KB Flash, 512KB SRAM
- 2xOTG, 2xCAN, 8xUART
- 3x5.33Msps ADC
- 2xQSPI, SDRAM

**M4F AT32F437**

- Cortex®-M4F Core
- 288MHz CPU
- 4032KB Flash, 512KB SRAM
- 2xOTG, 2xCAN, 8xUART
- 3x5.33Msps ADC, EMAC
- 2xQSPI, SDRAM

## Automotive

**M4F AT32A403A**

- Cortex®-M4F Core
- 200MHz CPU
- 1024KB Flash, 224KB SRAM
- 2xCAN, 8xUART, USB, XMC
- AEC-Q100 Grade 2

## Mainstream

**M4F AT32F413**

- Cortex®-M4F Core
- 200MHz CPU
- 256KB Flash, 64KB SRAM
- 2xADC, 2xCAN, USB

**M4F AT32F402**

- Cortex®-M4F Core
- 216MHz CPU
- 256KB Flash, 96+6KB SRAM
- OTG, QSPI, 8xUART

Sample available in 2023/Q4

**M4F AT32F405**

- Cortex®-M4F Core
- 216MHz CPU
- 256KB Flash, 96+6KB SRAM
- QSPI, 8xUART
- HS+FS OTG with PHY

Sample available in 2023/Q4

**M4F AT32F407**

- Cortex®-M4F Core
- 240MHz CPU
- 1024KB Flash, 224KB SRAM
- 2xCAN, 8xUART, USB, EMAC

**M4F AT32F403A**

- Cortex®-M4F Core
- 240MHz CPU
- 1024KB Flash, 224KB SRAM
- 2xCAN, 8xUART, USB, XMC

## Value Line

**M4 AT32F425**

- Cortex®-M4 Core
- 96MHz CPU
- 64KB Flash, 20KB SRAM
- OTG, CAN, 4xUART

**M4 AT32F421**

- Cortex®-M4 Core
- 120MHz CPU
- 64KB Flash, 16KB SRAM
- CMP, ADC, 2xUART

**M4 AT32F4212**

- Cortex®-M4 Core
- 120MHz CPU
- 64KB Flash, 16KB SRAM
- CMP, ADC, 2xUART, 2xOPA

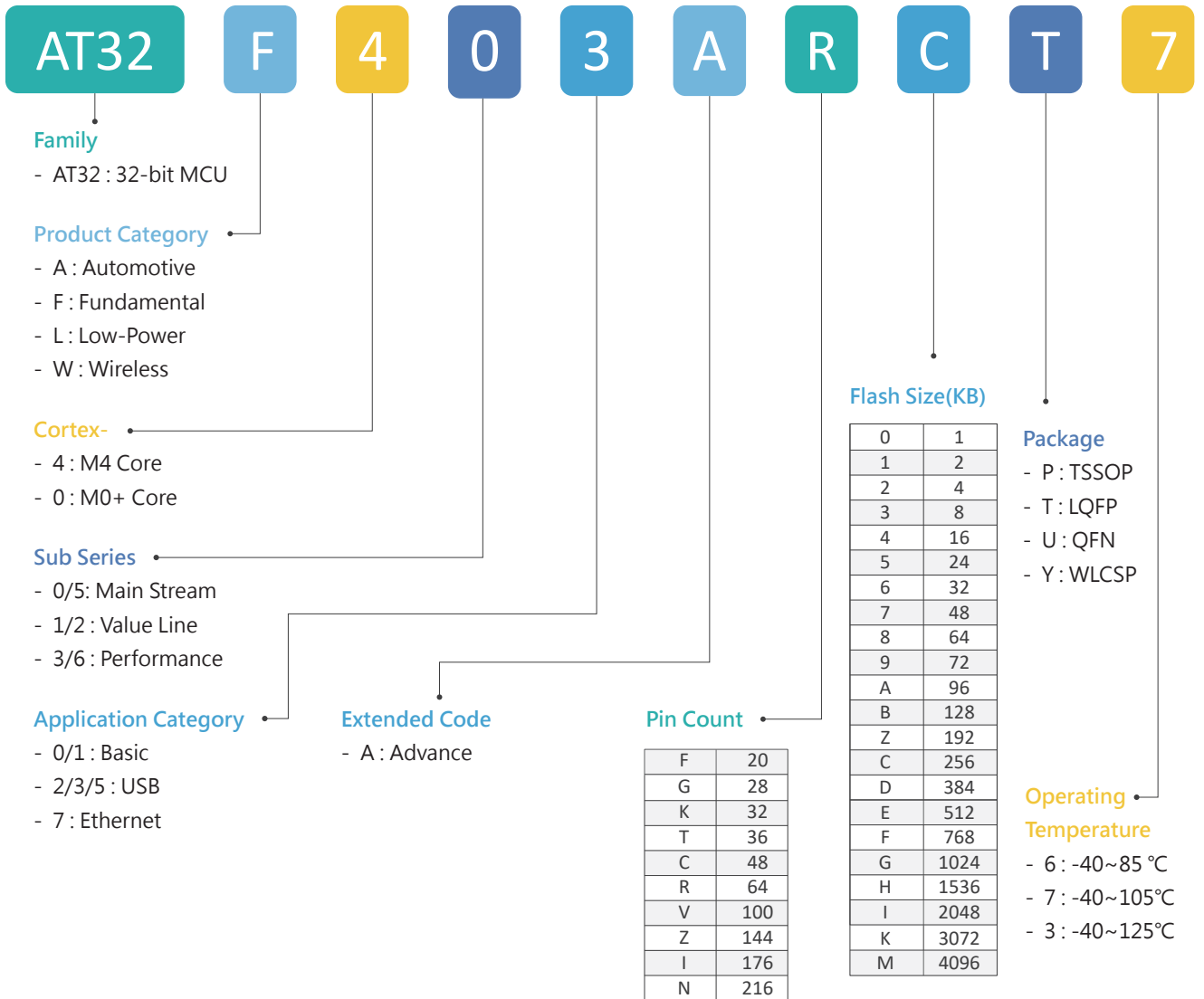
**M4 AT32F415**

- Cortex®-M4 Core
- 150MHz CPU
- 256KB Flash, 32KB SRAM
- OTG, 2xCMP, CAN

**M4F AT32F423**

- Cortex®-M4F Core
- 150MHz CPU
- 256KB Flash, 48KB SRAM
- OTG, 2xDAC, 2xCAN
- 24ch 5.33Msps ADC

## Naming Rules



## Package List

20-pin TSSOP 6.5 x 4.4 mm	20-pin QFN 3 x 3 mm	28-pin QFN 4 x 4 mm	32-pin QFN 4 x 4 mm	32-pin QFN 5 x 5 mm	36-pin QFN 6 x 6 mm	48-pin QFN 6 x 6 mm	48-pin QFN 7 x 7 mm

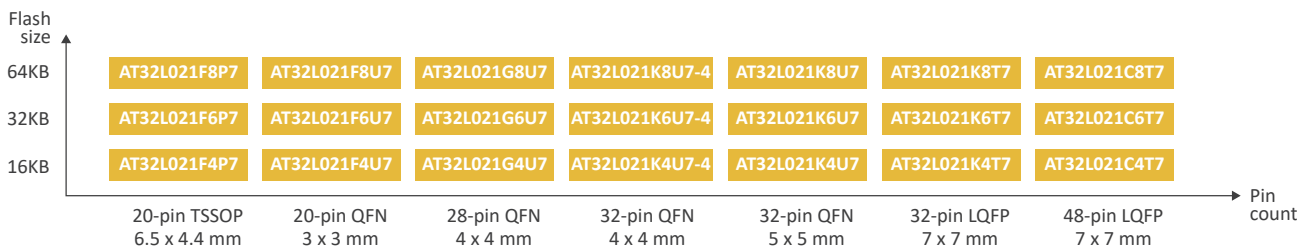
32-pin LQFP 7 x 7 mm	48-pin LQFP 7 x 7 mm	64-pin LQFP 7 x 7 mm	64-pin LQFP 10 x 10 mm	100-pin LQFP 14 x 14 mm	144-pin LQFP 20 x 20 mm

## AT32L021

AT32L021 (low power) series is based on ARM® Cortex®-M0+ 32-bit core operating at a frequency of up to 80 MHz. This device features 64 KB Flash memory and 8+1 KB SRAM (with parity check). It also embeds a 4 KB system memory that comes with two functions: one that serves as a Bootloader, and another one that is one-time configurable as user instruction and data memory for achieving a maximum of 64+4 KB. AT32L021 offers 1x CAN, 4x USARTs (with RS-485 mode), 2x SPIs/I<sup>2</sup>Ss, 2x I<sup>2</sup>Cs, 1x 16-bit advanced timer, 5x 16-bit general-purpose timers and 1x 16-bit basic timer. One of its highlights is a 12-bit high-speed 2 Msps ADC that is particularly suited for fast data acquisition, industrial control and motor applications. Furthermore, the device has the ability to enter/leave low-power mode at faster speed. Its ultra-low power consumption is also amazing - around 15uA current consumption and 20us wakeup time in Deepsleep mode, and even 1uA current in Standby mode, which could ensure longer battery life and thus makes it the perfect choice for entry-level low-power MCU applications.

The AT32L021 device operates in the temperature range of -40 °C to 105°C. It provides a variety of package types from larger to smaller ones to meet different memory demands. With powerful on-chip resources, higher integration and cost-effectiveness, the AT32L021 series is suitable for applications that require low-power consumption such as IoT, wireless communication, motor control and consumer electronics.

- Max Frequency : 80 MHz
- Operating Voltage : 1.71-3.6V
- Operating Temperature : -40-105°C
- Key Features : 64+4KB Flash, 8+1KB SRAM, CAN, 4x USARTs, 2x SPIs, 2x I<sup>2</sup>Cs, 12-bit ADC, Deepsleep~15uA ; Standby~1uA
- Main Applications : IoT, wireless communication, OBD, BMS, RF industrial control, small-sized meters, motor control, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer							Connectivity							Analog Interface		Package		
					Advanced TMR (16bit)	GP TMR (32bit)	GP TMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC (enhanced)	I <sup>2</sup> C	SPI	(1) I <sup>2</sup> S	USART/UART	OTG	CAN	IR TMR	ADC Engine		12-bit ADC ch.	
AT32L021F4P7	80	16	8+1	15	1	-	5	1	1	1	1	1	2	1	0/1	2/2	-	1	1	1	1	9	TSSOP20 6.5 x 4.4 mm
AT32L021F6P7	80	32	8+1	15	1	-	5	1	1	1	1	1	2	1	0/1	2/2	-	1	1	1	1	9	
AT32L021F8P7	80	64	8+1	15	1	-	5	1	1	1	1	1	2	1	0/1	2/2	-	1	1	1	1	9	
AT32L021F4U7	80	16	8+1	15	1	-	5	1	1	1	1	1	2	1	0/1	2/2	-	1	1	1	1	9	QFN20 3 x 3 mm
AT32L021F6U7	80	32	8+1	15	1	-	5	1	1	1	1	1	2	1	0/1	2/2	-	1	1	1	1	9	
AT32L021F8U7	80	64	8+1	15	1	-	5	1	1	1	1	1	2	1	0/1	2/2	-	1	1	1	1	9	
AT32L021G4U7	80	16	8+1	23	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	10	QFN28 4 x 4 mm
AT32L021G6U7	80	32	8+1	23	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	10	
AT32L021G8U7	80	64	8+1	23	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	10	
AT32L021K4U7-4	80	16	8+1	27	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	11	QFN32 4 x 4 mm
AT32L021K6U7-4	80	32	8+1	27	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	11	
AT32L021K8U7-4	80	64	8+1	27	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	11	
AT32L021K4U7	80	16	8+1	27	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	11	QFN32 5 x 5 mm
AT32L021K6U7	80	32	8+1	27	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	11	
AT32L021K8U7	80	64	8+1	27	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	11	
AT32L021K4T7	80	16	8+1	25	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	10	LQFP32 7 x 7 mm
AT32L021K6T7	80	32	8+1	25	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	10	
AT32L021K8T7	80	64	8+1	25	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	10	
AT32L021C4T7	80	16	8+1	39	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	15	LQFP48 7 x 7 mm
AT32L021C6T7	80	32	8+1	39	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	15	
AT32L021C8T7	80	64	8+1	39	1	-	5	1	1	1	1	1	2	2	0/2	4/0	-	1	1	1	1	15	

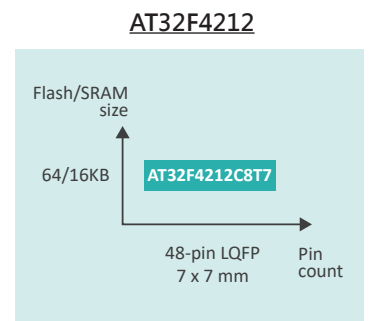
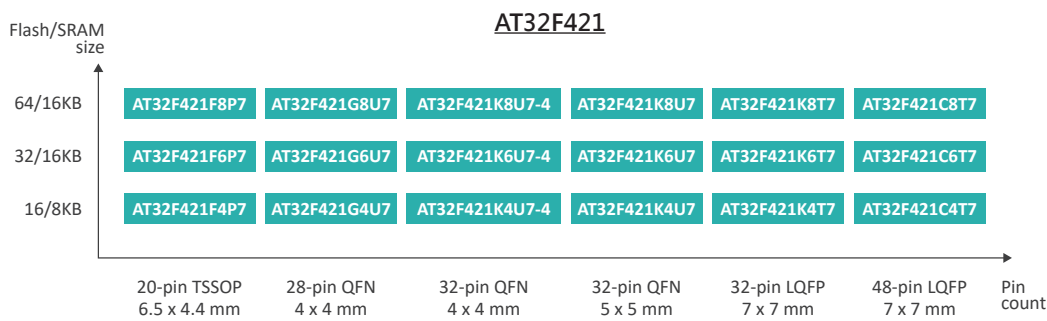
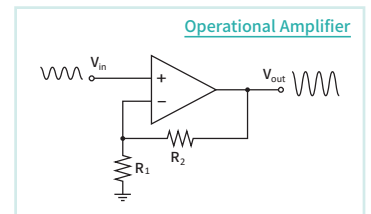
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S  
 (2) Sample available in 2023/Q4

## AT32F421 / AT32F4212

AT32F421 / AT32F4212 series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 120 MHz. This device features a digital signal processor (DSP), up to 64 KB Flash memory and 16 KB SRAM, 2x USARTs, 2x SPIs/I<sup>2</sup>Ss, 2x I<sup>2</sup>Cs, 1x 16-bit advanced timer, 5x 16-bit general-purpose timers, 1x high-speed rail to rail input/output analog voltage comparator and 1x 12-bit 15-channel high-speed 2 Msps ADC (as well as 2xOPAs of F4212) for fast data acquisition, mixed signal processing, industrial control and different motor applications. All I/Os have fast toggling capability and almost all of them are 5V tolerant. They can be used for a variety of purposes such as port remapping.

The device operates in the temperature range of -40 °C to 105 °C. It provides a rich choice of package types such as LQFP48, LQFP32, QFN32, QFN28 and mini TSSOP20 in response to diverse memory demands. The combination of powerful on-chip resources, higher integration and cost-effectiveness makes AT32F421 series stand out from fierce global market.

- **Max Frequency :** 120 MHz
- **Operating Voltage :** 2.4-3.6V
- **Operating Temperature :** -40-105°C
- **Key Features :** 16 KB SRAM, 1x CMP, 12-bit ADC, 2x OPA (F4212), hardware infrared (IR) timer
- **Main Applications :** IoT node, industrial automation, household electric appliances and medical equipment, electronic toy, high speed hair dryer, vacuum cleaner, electric cycles, self-balancing electric scooter, drone-specific electronic speed controller, washing machine, compressor, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer							Connectivity							Analog Interface				Package		
					Advanced TMR (16bit)	GP TMR (32bit)	GP TMR (16bit)	Basic TMR (16bit)	System (24bit)	WDT	WWDT	RTC (Enhanced)	I <sup>2</sup> C	SPI	(1)F/H) I <sup>2</sup> S	USART/UART	OTG	CAN	IR TMR	ADC Engine	12-bit ADC ch.	DAC Engine		COMP	OPA
AT32F421F4P7	120	16	8	15	1	-	5	1	1	1	1	1	2	1	0/1	1/1	-	-	1	1	9	-	1	-	TSSOP20 6.5 x 4.4 mm
AT32F421F6P7	120	32	16	15	1	-	5	1	1	1	1	1	2	1	0/1	1/1	-	-	1	1	9	-	1	-	
AT32F421F8P7	120	64	16	15	1	-	5	1	1	1	1	1	2	1	0/1	1/1	-	-	1	1	9	-	1	-	
AT32F421G4U7	120	16	8	23	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	10	-	1	-	QFN28 4 x 4 mm
AT32F421G6U7	120	32	16	23	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	10	-	1	-	
AT32F421G8U7	120	64	16	23	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	10	-	1	-	
AT32F421K4U7-4	120	16	8	27	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	11	-	1	-	QFN32 4 x 4 mm
AT32F421K6U7-4	120	32	16	27	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	11	-	1	-	
AT32F421K8U7-4	120	64	16	27	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	11	-	1	-	
AT32F421K4U7	120	16	8	27	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	11	-	1	-	QFN32 5 x 5 mm
AT32F421K6U7	120	32	16	27	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	11	-	1	-	
AT32F421K8U7	120	64	16	27	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	11	-	1	-	
AT32F421K4T7	120	16	8	25	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	10	-	1	-	LQFP32 7 x 7 mm
AT32F421K6T7	120	32	16	25	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	10	-	1	-	
AT32F421K8T7	120	64	16	25	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	10	-	1	-	
AT32F421C4T7	120	16	8	39	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	15	-	1	-	LQFP48 7 x 7 mm
AT32F421C6T7	120	32	16	39	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	15	-	1	-	
AT32F421C8T7	120	64	16	39	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	15	-	1	-	
AT32F4212C8T7	120	64	16	39	1	-	5	1	1	1	1	1	2	2	0/2	2/0	-	-	1	1	13	-	1	2	LQFP48 7 x 7 mm

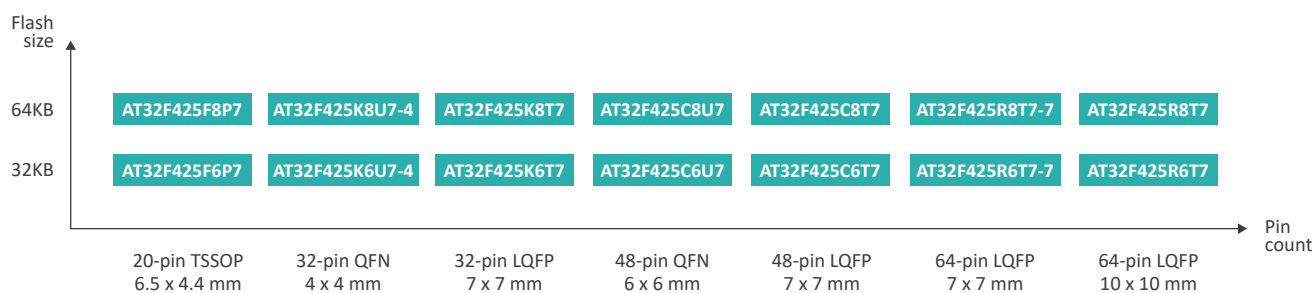
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

## AT32F425

AT32F425 (value line) series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 96 MHz. This device features a digital signal processor (DSP), up to 64 KB Flash memory and 20 KB SRAM. It also embeds a 4 KB system memory with two functions: one that serves as a Bootloader, and another one that is one-time configurable as user instruction and data memory for achieving a maximum of 64+4 KB. Meanwhile, it offers 1x OTG controller (support Xtal-less in device mode), 1x CAN, 4x USARTs, 3x SPIs/I<sup>2</sup>Ss (support full-duplex), 2x I<sup>2</sup>Cs, 1x 16-bit advanced timer, 6x 16-bit and 1x 32-bit general-purpose timers, 2x 16-bit basic timers, 1x 12-bit 16-channel high speed 2 Msps ADC. Furthermore, an independent 24-channel PWM output is made possible through the combination of these timers. Almost all I/Os are 5 V tolerant with port remapping feature, far beyond its counterparts in the field of USB OTG.

The AT32F425 device operates in the temperature range of -40 °C to 105 °C, with the provision of various package types including LQFP64, LQFP48, QFN48, LQFP32, QFN32, and mini TSSOP20 in response to diverse memory requirements. Thanks to its powerful on-chip resources, higher integration and cost-effectiveness, the device is considered as the best choice for application scenarios requiring high-speed computing power and USB functions such as gaming, industrial automation, motor control, IoT and consumer electronics.

- **Max Frequency** : 96 MHz
- **Operating Voltage** : 2.4-3.6V
- **Operating Temperature** : -40-105°C
- **Key Features** : 64+4 KB Flash, 20 KB SRAM, USB OTG, CAN, 4x USARTs, 12-bit ADC
- **Main Applications** : gaming keyboard, gaming mouse, USB accessories, micro printer, OBD, industrial control, motor control, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer								Connectivity						Analog Interface		Package	
					Advanced TMR (16bit)	GP TMR (32bit)	GP TMR (16bit)	Basic TMR (16bit)	System (24bit)	WDT	WWDT	RTC (Enhanced)	I <sup>2</sup> C	SPI	(SPI/I <sup>2</sup> S)	USART/UART	OTG	CAN	IRTIM	ADC Engine		12-bit ADC ch.
AT32F425F6P7	96	32	20	15	1	1	6	2	1	1	1	1	2	2	0/2	2/2	FS	1	1	1	9	TSSOP20
AT32F425F8P7	96	64	20	15	1	1	6	2	1	1	1	1	2	2	0/2	2/2	FS	1	1	1	9	6.5 x 4.4 mm
AT32F425K6U7-4	96	32	20	27	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	QFN32
AT32F425K8U7-4	96	64	20	27	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	4 x 4 mm
AT32F425K6T7	96	32	20	25	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	LQFP32
AT32F425K8T7	96	64	20	25	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	7 x 7 mm
AT32F425C6U7	96	32	20	39	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	QFN48
AT32F425C8U7	96	64	20	39	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	6 x 6 mm
AT32F425C6T7	96	32	20	39	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	LQFP48
AT32F425C8T7	96	64	20	39	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	10	7 x 7 mm
AT32F425R6T7-7	96	32	20	55	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	16	LQFP64
AT32F425R8T7-7	96	64	20	55	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	16	7 x 7 mm
AT32F425R6T7	96	32	20	55	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	16	LQFP64
AT32F425R8T7	96	64	20	55	1	1	6	2	1	1	1	1	2	3	0/3	4/0	FS	1	1	1	16	10 x 10 mm

(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

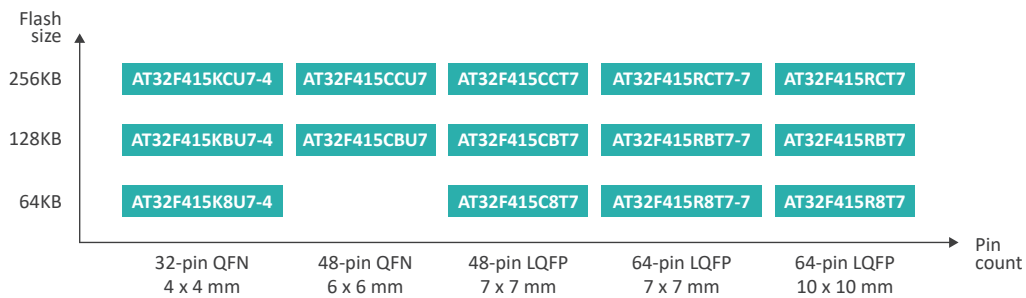
(2) Each 2 Half Duplex could be combined with 1 Full Duplex

## AT32F415

AT32F415 (value line) series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 150 MHz. This device features a digital signal processor (DSP), up to 256 KB Flash memory and 32 KB SRAM, 5x UARTs, 2x SPIs/I<sup>2</sup>Ss, 2x I<sup>2</sup>Cs, 1x SDIO, 1x CAN (active 2.0B), 1x 16-bit advanced timer, 5x 16-bit and 2x 32-bit general-purpose timers, 1x 14-channel DMA controller, 2x high-speed rail to rail input/output analog voltage comparators, 1x 12-bit 16-channel high-speed 2 Msps ADC. All I/Os have fast toggling capability and almost all of them are 5V tolerant, enhancing its competitiveness edge in the USB OTG MCU industry.

The device operates in the temperature range of -40 °C to 105 °C, with the provision of various package types including LQFP64, LQFP48, QFN48 and QFN32 in response to diverse memory requirements. With powerful on-chip resources, higher integration and cost-effectiveness, the AT32F415 series is particularly useful for applications that require fast computing power and USB feature such as gaming, industrial automation, motor control, IoT and consumer electronics.

- Max Frequency : 150 MHz
- Operating Voltage : 2.6-3.6V
- Operating Temperature : -40-105°C
- Key Features : 32 KB SRAM, USB OTG, 2x CMPs, CAN, sLib, ERTC
- Main Applications : micro printer, barcode scanner, electric scooter controller, gaming keyboard/mouse, gaming pad, PC accessories, industrial control, surveillance, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer							Connectivity						Analog Interface				SPIMI	Package		
					Advanced TMR (16bit)	GP1TMR (32bit)	GP1TMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDVT	RTC (enhanced)	I <sup>2</sup> C	SPI	(1) F/H I <sup>2</sup> S	USART/UART	SDIO	OTG	CAN	ADC Engine	12-bit ADC ch.			DAC Engine	CMP
AT32F415K8U7-4	150	64	32	27	1	2	5	-	1	1	1	1	2	2	0/2	2/0	1	FS	1	1	10	-	2	-	QFN32 4 x 4 mm
AT32F415KBU7-4	150	128	32	27	1	2	5	-	1	1	1	1	2	2	0/2	2/0	1	FS	1	1	10	-	2	-	
AT32F415KCU7-4	150	256	32	27	1	2	5	-	1	1	1	1	2	2	0/2	2/0	1	FS	1	1	10	-	2	-	
AT32F415CBU7	150	128	32	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	1	1	10	-	2	-	QFN48 6 x 6 mm
AT32F415CCU7	150	256	32	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	1	1	10	-	2	-	
AT32F415C8T7	150	64	32	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	1	1	10	-	2	-	LQFP48 7 x 7 mm
AT32F415CB7	150	128	32	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	1	1	10	-	2	-	
AT32F415CC7	150	256	32	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	1	1	10	-	2	-	
AT32F415R8T7-7	150	64	32	55	1	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	1	1	16	-	2	-	LQFP64 7 x 7 mm
AT32F415RBT7-7	150	128	32	55	1	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	1	1	16	-	2	-	
AT32F415RCT7-7	150	256	32	55	1	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	1	1	16	-	2	-	
AT32F415R8T7	150	64	32	55	1	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	1	1	16	-	2	-	LQFP64 10 x 10 mm
AT32F415RBT7	150	128	32	55	1	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	1	1	16	-	2	-	
AT32F415RCT7	150	256	32	55	1	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	1	1	16	-	2	-	

(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

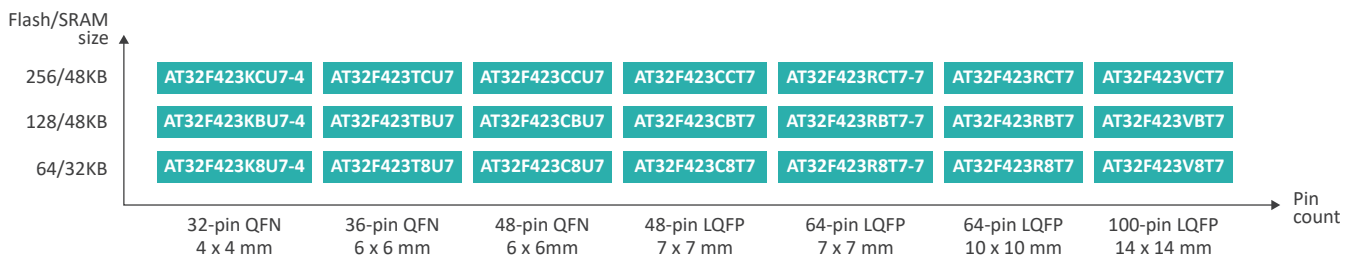


## AT32F423

AT32F423 series is based on ARM® Cortex® -M4 32-bit core operating at a frequency of up to 150 MHz. This device features a single-precision floating point unit (FPU), digital signal processor (DSP), up to 256 KB Flash memory and 48 KB SRAM. It also embeds a 20 KB system memory with two functions: one that serves as a Bootloader, and another one that is one-time configurable as user instruction and data memory for achieving a maximum of 256 + 20 KB. It incorporates XMC interface (for PSRAM and NOR extension, or 8080/6800 mode parallel LCD), 1x OTG controller (support Xtal-less in device mode), 2x CANs, 8x UARTs, 3x SPIs/I<sup>2</sup>Ss (full-duplex support), 3x I<sup>2</sup>Cs, 1x 16-bit advanced timer, 8x 16-bit general-purpose timers, 1x 32-bit general-purpose timer, 2x 16-bit basic timers, 1x 12-bit 24-channel high-speed 5.33 Msp/s ADC and 2x 12-bit DACs. All I/Os have fast toggling capability and almost all of them are 5V tolerant. They can be used for a variety of purposes such as port remapping.

AT32F423 operates in the temperature range of -40 °C to 105 °C, and provides a rich choice of package types to meet diverse memory demands. With powerful on-chip resources, higher integration and cost-effectiveness, the AT32F423 series offers robust solutions for a variety of applications such as industrial automation, motor control, IoT, consumer electronics, among many others.

- **Max Frequency :** 150 MHz
- **Operating Voltage :** 2.4-3.6V
- **Operating Temperature :** -40-105°C
- **Key Features :** 24-channel 5.33 Msp/s ADC engine, 2x DACs, USB OTG, 8x UARTs, 2x CANs and XMC
- **Main Applications :** sweeping robot, LED control card, household electric appliances, IoT node, motor control, industrial automation, industrial control, surveillance, robot, 5G



Part No.	Frequency (MHz)	Flash (Kb)	SRAM (Kb)	I/O	Timer								Connectivity							Analog Interface			XMC	Package
					Advanced	GPWMR (32bit)	GPWMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC (Enhanced)	I <sup>2</sup> C	SPI	(1)(2) F/H I <sup>2</sup> S	USART/UART	CAN	OTG	IRTMR	(3) ADC Engine	12-bit ADC ch.	DAC Engine		
AT32F423K8U7-4	150	64	32	27	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	11	2	-	QFN32 4 x 4 mm
AT32F423KBU7-4	150	128	48	27	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	11	2	-	QFN36 6 x 6 mm
AT32F423KCU7-4	150	256	48	27	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	11	2	-	QFN48 6 x 6 mm
AT32F423T8U7	150	64	32	29	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	11	2	-	QFN36 6 x 6 mm
AT32F423TBU7	150	128	48	29	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	11	2	-	QFN36 6 x 6 mm
AT32F423TCU7	150	256	48	29	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	11	2	-	QFN48 6 x 6 mm
AT32F423C8U7	150	64	32	39	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	17	2	-	QFN48 6 x 6 mm
AT32F423CBU7	150	128	48	39	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	17	2	-	QFN48 6 x 6 mm
AT32F423CCU7	150	256	48	39	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	17	2	-	QFN48 6 x 6 mm
AT32F423C8T7	150	64	32	39	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	17	2	-	LQFP48 7 x 7 mm
AT32F423CBT7	150	128	48	39	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	17	2	-	LQFP48 7 x 7 mm
AT32F423CCT7	150	256	48	39	1	1	8	2	1	1	1	1	3	3	0/3	4/3	2	FS	1	1	17	2	-	LQFP48 7 x 7 mm
AT32F423R8T7-7	150	64	32	53	1	1	8	2	1	1	1	1	3	3	0/3	5/3	2	FS	1	1	23	2	1	LQFP64 7 x 7 mm
AT32F423RBT7-7	150	128	48	53	1	1	8	2	1	1	1	1	3	3	0/3	5/3	2	FS	1	1	23	2	1	LQFP64 7 x 7 mm
AT32F423RCT7-7	150	256	48	53	1	1	8	2	1	1	1	1	3	3	0/3	5/3	2	FS	1	1	23	2	1	LQFP64 7 x 7 mm
AT32F423R8T7	150	64	32	53	1	1	8	2	1	1	1	1	3	3	0/3	5/3	2	FS	1	1	23	2	1	LQFP64 10 x 10 mm
AT32F423RBT7	150	128	48	53	1	1	8	2	1	1	1	1	3	3	0/3	5/3	2	FS	1	1	23	2	1	LQFP64 10 x 10 mm
AT32F423RCT7	150	256	48	53	1	1	8	2	1	1	1	1	3	3	0/3	5/3	2	FS	1	1	23	2	1	LQFP64 10 x 10 mm
AT32F423V8T7	150	64	32	87	1	1	8	2	1	1	1	1	3	3	0/3	8/0	2	FS	1	1	24	2	1	LQFP100 14 x 14 mm
AT32F423VBT7	150	128	48	87	1	1	8	2	1	1	1	1	3	3	0/3	8/0	2	FS	1	1	24	2	1	LQFP100 14 x 14 mm
AT32F423VCT7	150	256	48	87	1	1	8	2	1	1	1	1	3	3	0/3	8/0	2	FS	1	1	24	2	1	LQFP100 14 x 14 mm

(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

(2) Each 2 Half Duplex could be combined with 1 Full Duplex

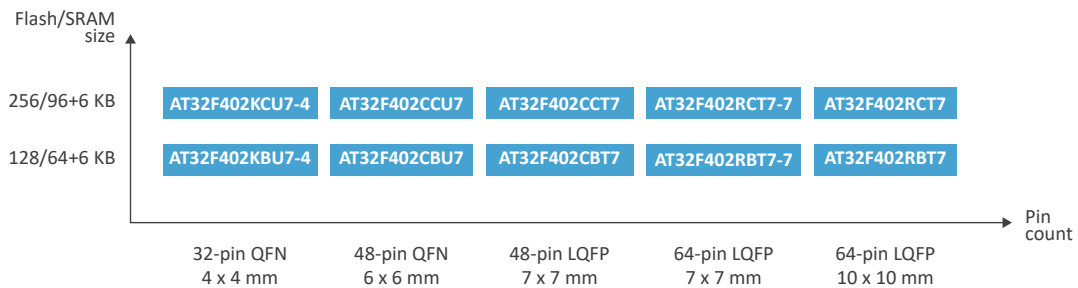
(3) 5.33 Msp/s ADC

## AT32F402

AT32F402 series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 216 MHz. This device features a single-precision floating point unit (FPU), digital signal processor (DSP), up to 256 KB Flash memory and 96+6 KB SRAM (with parity check). It also embeds a 20 KB system memory with two functions: one that serves as a Bootloader, and another one that is one-time configurable as user instruction and data memory for achieving a maximum of 256+20 KB. In addition, the device offers 1x USB OTG controller (internal PHY) (support Xtal-less in device mode), 1x QSPI, 1x CAN, 8x UARTs, 3x SPIs/I<sup>2</sup>Ss and 1x separate full-duplex I<sup>2</sup>S, 3x I<sup>2</sup>Cs, 1x 16-bit advanced timer, 7x 16-bit general-purpose timers, 1x 32-bit general-purpose timer, 2x 16-bit basic timers, 1x 12-bit 16-channel high-speed 2 Msps ADC. All I/Os have fast toggling capability and almost all of them are 5V tolerant. They can be used for a variety of purposes such as port remapping.

The device operates in the temperature range of -40 °C to 105 °C. It can be supplied in various packages, including LQFP64, LQFP48, QFN48 and QFN32 to meet diverse demands. AT32F402 series is suited for gaming, industrial automation, USB accessory, IoT and consumer electronics.

- **Max Frequency** : 216 MHz
- **Operating Voltage** : 2.4-3.6V
- **Operating Temperature** : -40-105°C
- **Key Features** : 96+6KB SRAM, USB OTG (embedded PHY), QSPI, full-duplex I<sup>2</sup>S, 8x UARTs, CAN
- **Main Applications** : gaming keyboard, gaming mouse, gaming pad, PC accessories, LED control card, audio device, micro printer, barcode scanner, industrial control, surveillance, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	QSPI	Timer							Connectivity						Analog Interface		Package		
						Advanced TMR (16bit)	GPTMR (32bit)	GPTMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC (Enhanced)	I <sup>2</sup> C	SPI	(1) F/H I <sup>2</sup> S	USART/UART	OTG	CAN	IRTRM		ADC Engine	12-bit ADC ch.
AT32F402KBU7-4	216	128	64+6	28	1	1	1	7	2	1	1	1	1	3	2	1/2	5/2	FS	1	1	1	10	QFN32 4 x 4 mm
AT32F402KCU7-4	216	256	96+6	28	1	1	1	7	2	1	1	1	1	3	2	1/2	5/2	FS	1	1	1	10	
AT32F402CBU7	216	128	64+6	40	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	FS	1	1	1	10	QFN48 6 x 6 mm
AT32F402CCU7	216	256	96+6	40	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	FS	1	1	1	10	
AT32F402CBT7	216	128	64+6	40	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	FS	1	1	1	10	LQFP48 7 x 7 mm
AT32F402CCT7	216	256	96+6	40	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	FS	1	1	1	10	
AT32F402RBT7-7	216	128	64+6	56	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	FS	1	1	1	16	LQFP64 7 x 7 mm
AT32F402RCT7-7	216	256	96+6	56	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	FS	1	1	1	16	
AT32F402RBT7	216	128	64+6	56	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	FS	1	1	1	16	LQFP64 10 x 10 mm
AT32F402RCT7	216	256	96+6	56	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	FS	1	1	1	16	

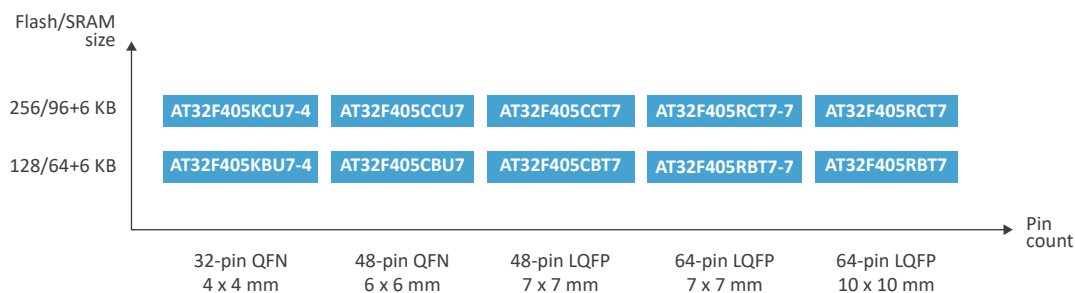
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S  
(2) Samples available in 2023/Q4

## AT32F405

AT32F405 series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 216 MHz. This device features a single-precision floating point unit (FPU), digital signal processor (DSP), up to 256 KB Flash memory and 96+6 KB SRAM (parity check support). It also embeds a 20 KB system memory with two functions: one that serves as a Bootloader, and another one that is one-time configurable as user instruction and data memory for achieving a maximum of 256 + 20 KB. It also incorporates independent HS USB OTG (internal PHY) and FS USB OTG (internal PHY) (support Xtal-less in device mode), 1x QSPI, 1x CAN, 8x UARTs, 3x SPIs/I<sup>2</sup>Ss and 1x separate full-duplex I<sup>2</sup>S, 3x I<sup>2</sup>Cs, 1x 16-bit advanced timer, 7x 16-bit general-purpose timers, 1x 32-bit general-purpose timer, 2x 16-bit basic timers, 1x 12-bit 16-channel high-speed 2 Msp/s ADC. All I/Os have fast toggling capability and almost all of them are 5V tolerant. They can be used for a variety of purposes such as port remapping.

The device operates in the temperature range of -40 °C to 105 °C. It can be supplied in various package types including LQFP64, LQFP48, QFN48 and QFN32 to meet diverse demands. Thanks to its built-in HS+FS OTG feature (each with independent PHY), the AT32F405 is particularly suitable for applications like gaming, industrial automation, USB accessories, IoT, consumer electronics, among others.

- **Max Frequency** : 216 MHz
- **Operating Voltage** : 2.4-3.6V
- **Operating Temperature** : -40 to 105 °C
- **Key Features** : 96+6KB SRAM, HS+FS USB OTG (each with embedded PHY), QSPI, full-duplex I<sup>2</sup>S, 8x UARTs, CAN
- **Main Applications** : gaming keyboard/mouse, gaming pad, PC accessories, LED control card, audio device, micro printer, barcode scanner, industrial control, surveillance, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	QSPI	Timer							Connectivity							Analog Interface		Package			
						Advanced TMR (16bit)	GPTMR (32bit)	GPTMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC (Enhanced)	I <sup>2</sup> C	SPI	<sup>(1)</sup> (F/H) I <sup>2</sup> S	USART/UART	OTGHS	OTGFS	CAN	IRTRM		ADC Engine	12-bit ADC ch.	
AT32F405KBU7-4	216	128	64+6	25	1	1	1	7	2	1	1	1	1	3	2	1/2	5/2	1	1	1	1	1	1	10	QFN32 4 x 4 mm
AT32F405KCU7-4	216	256	96+6	25	1	1	1	7	2	1	1	1	1	3	2	1/2	5/2	1	1	1	1	1	1	10	QFN32 4 x 4 mm
AT32F405CBU7	216	128	64+6	37	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	1	1	1	1	1	1	10	QFN48 6 x 6 mm
AT32F405CCU7	216	256	96+6	37	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	1	1	1	1	1	1	10	QFN48 6 x 6 mm
AT32F405CBT7	216	128	64+6	37	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	1	1	1	1	1	1	10	LQFP48 7 x 7 mm
AT32F405CCT7	216	256	96+6	37	1	1	1	7	2	1	1	1	1	3	3	1/3	5/2	1	1	1	1	1	1	10	LQFP48 7 x 7 mm
AT32F405RBT7-7	216	128	64+6	53	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	1	1	1	1	1	1	16	LQFP64 7 x 7 mm
AT32F405RCT7-7	216	256	96+6	53	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	1	1	1	1	1	1	16	LQFP64 7 x 7 mm
AT32F405RBT7	216	128	64+6	53	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	1	1	1	1	1	1	16	LQFP64 10 x 10 mm
AT32F405RCT7	216	256	96+6	53	1	1	1	7	2	1	1	1	1	3	3	1/3	6/2	1	1	1	1	1	1	16	LQFP64 10 x 10 mm

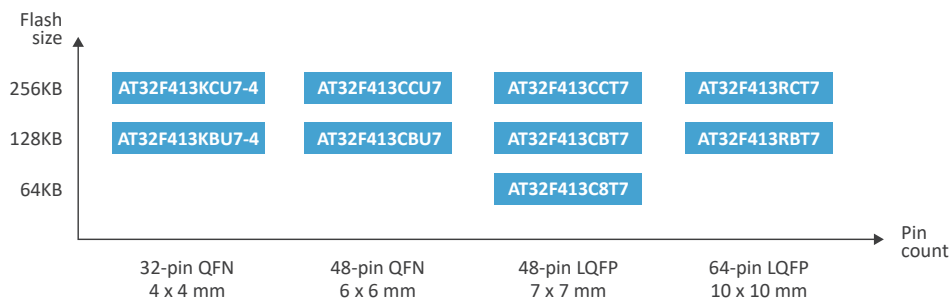
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S  
(2) Sample available in 2023/Q4

## AT32F413

AT32F413 series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 200 MHz. This device features a single-precision floating point unit (FPU), digital signal processor (DSP), rich peripherals and flexible clock control mechanism. It embeds up to 256 KB Flash memory and 64 KB SRAM, and up to 16 MB SPIM extended memory. One of its highlights is its zero-wait Flash memory access, allowing for its operation performance better than counterparts. Besides, AT32F413 has an extensive range of peripherals for enhanced connectivity. This includes 1x USB interface, 2x CANs, 1x SDIO, 5x UARTs, 2x SPIs/I<sup>2</sup>Ss, 2x I<sup>2</sup>Cs, 2x 16-bit advanced timers, 5x 16-bit general-purpose timers, 2x 32-bit general-purpose timers, 2x 12-bit 16-channel high-speed 2 Msps ADCs, and independent VBAT battery-powered domain. All I/Os have fast toggling capability and almost all of them are 5V tolerant. They can be used for a variety of purposes such as port remapping.

AT32F413 operates in the temperature range of -40 °C to 105 °C. It can be supplied in various package types including LQFP64, LQFP48, QFN48 and QFN32 to meet diverse demands. The product series is particularly suitable for those applications that require high-speed computation at affordable prices, including consumer electronics, industrial automation, motor control, IoT, among others.

- **Max Frequency :** 200 MHz
- **Operating Voltage :** 2.6-3.6V
- **Operating Temperature :** -40 to 105 °C
- **Key Features :** 64 KB SRAM, USB Xtal-less, sLib, 2x CANs, SPIM extend memory (program execution and data encryption)
- **Main Applications :** micro printer, stage lighting, electric scooter controller, three-axis stabilizer, flight controller, industrial control, surveillance, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer								Connectivity						Analog Interface			SPIM	Package		
					Advanced TMR (16bit)	GP TMR (32bit)	GP TMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC	I <sup>2</sup> C	SPI	(1)F/H I <sup>2</sup> S	USART/UART	SDIO	USB Device	CAN	ADC Engine	12-bit ADC ch.			DAC Engine	XMC
AT32F413KBU7-4	200	128	32/16/64	27	1	2	5	-	1	1	1	1	2	2	0/2	2/0	1	FS	2	2	10	-	-	1	QFN32 4 x 4 mm
AT32F413KCU7-4	200	256	32/16/64	27	1	2	5	-	1	1	1	1	2	2	0/2	2/0	1	FS	2	2	10	-	-	1	
AT32F413CBU7	200	128	32/16/64	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	2	2	10	-	-	1	QFN48 6 x 6 mm
AT32F413CCU7	200	256	32/16/64	39	2	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	2	2	10	-	-	1	
AT32F413C8T7	200	64	32	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	2	2	10	-	-	1	LQFP48 7 x 7 mm
AT32F413CBT7	200	128	32/16/64	39	1	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	2	2	10	-	-	1	
AT32F413CCT7	200	256	32/16/64	39	2	2	5	-	1	1	1	1	2	2	0/2	3/0	1	FS	2	2	10	-	-	1	
AT32F413RBT7	200	128	32/16/64	55	1	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	2	2	16	-	-	1	LQFP64 10 x 10 mm
AT32F413RCT7	200	256	32/16/64	55	2	2	5	-	1	1	1	1	2	2	0/2	3/2	1	FS	2	2	16	-	-	1	

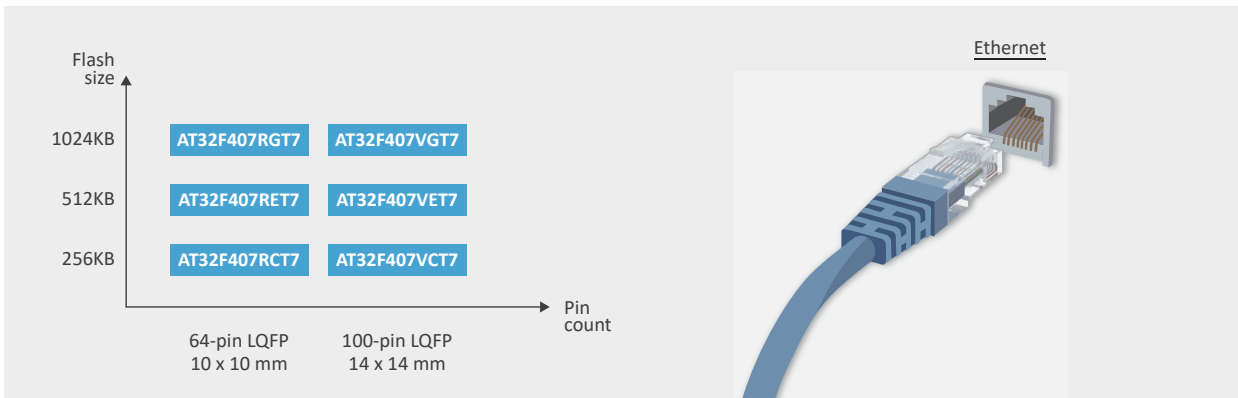
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

## AT32F407

AT32F407 series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 240 MHz. This device features a single-precision floating point unit (FPU), digital signal processor (DSP). It is also provided with rich peripherals and flexible clock control mechanism for a wide range of applications. It incorporates embedded memories (up to 1 MB Flash and 224 KB SRAM), with its zero-wait Flash access outperforming its counterparts in terms of performance.

AT32F407 series also offers 8x UARTs, 2x CANs, and IEEE-802.3 10/100 Mbps Ethernet port controller suitable for IoT and USB applications (no external crystal oscillator is required), leading to higher reliability and lower cost in terminal products. The AT32F407 device operates in the temperature range of -40 °C to 105 °C, with a rich choice of package types available for diverse demands. With its powerful on-chip resources, higher integration and cost-effectiveness, the AT32F407 series is considered to be especially suited for applications including industrial automation, motor control, IoT and consumer electronics.

- **Max Frequency** : 240 MHz
- **Operating Voltage** : 2.6-3.6V
- **Operating Temperature** : -40-105°C
- **Key Features** : 1 MB Flash, 224 KB SRAM, 10/100 Mbps Ethernet, 3x ADC engines, 8x UARTs, 2x CANs, XMC, USB Xtal-less, SPI-M extend memory (execution program and data encryption)
- **Main Applications** : IoT gateway, serial server, micro printer, stage lighting, industrial control, surveillance, LED display, industrial robot, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer							Connectivity							Analog Interface			XMC	SPI-M	Package		
					Advanced TMR (16bit)	GPTMR (32bit)	GPTMR (16bit)	Basic TMR (16bit)	System (24bit)	WDT	WWDT	RTC	I <sup>2</sup> C	SPI	(1) F/H I <sup>2</sup> S	USART/UART	SDIO	USB Device	CAN	Ethernet MAC	ADC Engine				12-bit ADC ch.	DAC Engine
AT32F407RCT7	240	256	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	1	3	16	2	1	1	LQFP64 10 x 10 mm
AT32F407RET7	240	512	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	1	3	16	2	1	1	
AT32F407RGT7	240	1024	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	1	3	16	2	1	1	
AT32F407VCT7	240	256	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	1	3	16	2	1	1	LQFP100 14 x 14 mm
AT32F407VET7	240	512	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	1	3	16	2	1	1	
AT32F407VGT7	240	1024	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	1	3	16	2	1	1	

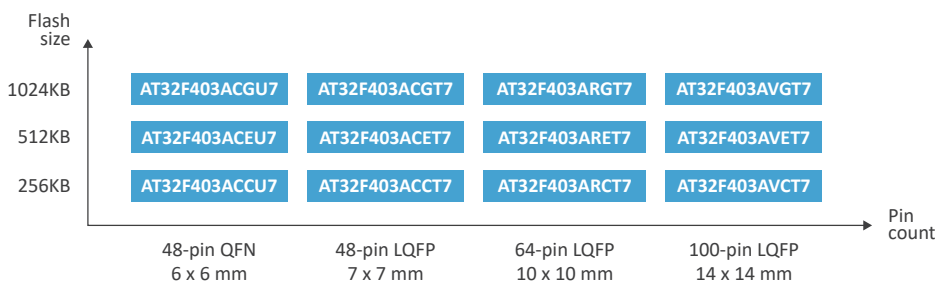
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

## AT32F403A

AT32F403A series is based on ARM® Cortex®-M4 32-bit core and advanced process, operating at a frequency of up to 240 MHz. With the internal single precision floating-point unit (FPU) and digital signal processor (DSP), it is also provided with rich peripherals and flexible clock control mechanism for a wide range of applications. More than that, it boasts excellent memory design supporting up to 1 MB Flash memory and 224 KB SRAM, in particularly its zero-wait Flash access far beyond its counterparts in terms of performance.

AT32F403A series imports the Security Library (sLib) to support the use of password to protect the specified program area, in which IDH programs the core algorithm and provides to downstream customers for secondary development. Apart from higher computing performance, AT32F403A series features 8x UARTs and 2x CANs for IoT applications. The USB device applications, without the need of external crystal oscillators, can not only enhance the reliability of terminal products but reduce costs as well. AT32F403A devices can perform well in the temperature range of -40 to 105 °C . It also provides a variety of chips for selection in response to diverse memory requirements, with powerful on-chip resource allocation, higher integration and cost-effectiveness. With this, the AT32F403A series is undoubtedly the top choice for applications that seek for higher performance but lower price, including industrial automation, motor control, IoT and consumer electronics.

- **Max Frequency :** 240 MHz
- **Operating Voltage :** 2.6-3.6 V
- **Operating Temperature :** -40 to 105 °C
- **Key Features :** 1 MB Flash, 224 KB SRAM, 3x 12-bit ADC engine, 8x UARTs, 2x CANs, XMC, USB Xtal-less, SPIM extend memory (program execution and data can be encrypted)
- **Main Applications :** sweeping robot, micro printer, stage lighting, HMI, LED display, QR code scanner, electric scooter controller, flight controller, industrial control, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer								Connectivity						Analog Interface			Package			
					Advanced TMR (16bit)	GPTMR (32bit)	GPTMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC	I <sup>2</sup> C	SPI	(1) F/H I <sup>2</sup> S	USART/UART	SDIO	USB Device	CAN	ADC Engine	12-bit ADC ch.		DAC Engine	XMC	SPIM
AT32F403ACCU7	240	256	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	QFN48 6 x 6 mm
AT32F403ACEU7	240	512	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	
AT32F403ACGU7	240	1024	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	
AT32F403ACCT7	240	256	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	LQFP48 7 x 7 mm
AT32F403ACET7	240	512	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	
AT32F403ARCT7	240	256	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	LQFP64 10 x 10 mm
AT32F403ARET7	240	512	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	
AT32F403ARGT7	240	1024	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	LQFP100 14 x 14 mm
AT32F403AVCT7	240	256	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	
AT32F403AVET7	240	512	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	LQFP100 14 x 14 mm
AT32F403AVGT7	240	1024	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	

(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

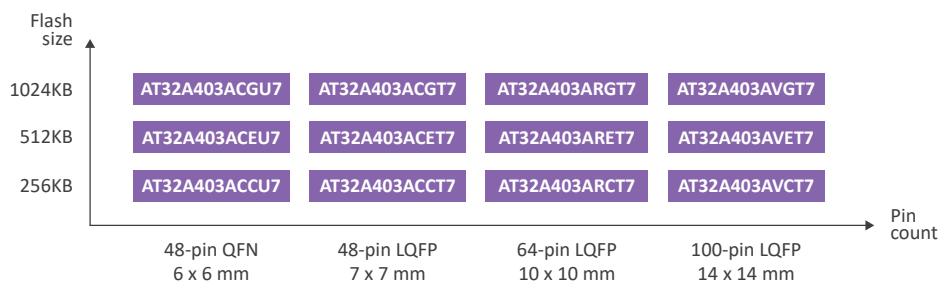
## AT32A403A (Automotive)

AT32A403A series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 200 MHz. This device features a single-precision floating point unit (FPU), digital signal processor (DSP), rich peripherals and flexible clock control mechanism. It embeds up to 1 MB Flash memory and 224 KB SRAM, in particularly its zero-wait Flash access overtaking its counterparts in terms of performance.

The device operates in the temperature range of -40 °C to 105 °C. It offers 8x UARTs and 2x CANs suitable for IoT and USB applications (no external crystal oscillator is required), leading to higher reliability and lower cost in terminal products. With powerful on-chip resources, higher integration and cost-effectiveness, the AT32A403A series is considered the preferred choice for applications such as automotive, industrial automation, motor control, IoT and consumer electronics.

Reliability and safety is one of the most important parts of automotive microcontrollers when it comes to ensuring users security in driving vehicles in harsh environments. As ARTERY's first automotive MCU, AT32A403A (A denotes Automotive) certified with AEC-Q100 Grade2 standard is designed to address a wide variety of applications with demanding safety requirements such as automotive body control, ADAS, car video system and BMS for new energy vehicles. Under AEC-Q100 standard, AT32A403A has successfully passed Accelerated Environment Stress Tests, Accelerated Lifetime Simulation Tests, Package Assembly Integrity Tests, Electrical Verification Tests, among others.

- **Max Frequency** : 200 MHz
- **Operating Voltage** : 2.6-3.6V
- **Operating Temperature** : -40-105°C
- **Key Features** : 1 MB Flash, 224 KB SRAM, 3x ADC engines, 8x UARTs, 2x CANs, XMC, USB Xtal-less, SPIM extend memory (program execution and data encryption)
- **Main Applications** : automotive applications control, sweeping robot, micro printer, stage lighting, HMI, LED display, QR code scanner, electric scooter controller, flight controller, industrial control, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer								Connectivity							Analog Interface			Package		
					Advanced TMR (16bit)	GPTMR (32bit)	GPTMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC	F <sup>2</sup> C	SPI	(1) F/H I <sup>2</sup> S	USART/UART	SDIO	USB Device	CAN	ADC Engine	12-bit ADC ch.	DAC Engine		XMC	SPIM
<sup>(2)</sup> AT32A403ACCU7	200	256	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	QFN48 6 x 6 mm
<sup>(2)</sup> AT32A403ACEU7	200	512	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	
<sup>(2)</sup> AT32A403ACGU7	200	1024	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	
<sup>(2)</sup> AT32A403ACCT7	200	256	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	LQFP48 7 x 7 mm
<sup>(2)</sup> AT32A403ACET7	200	512	96/224	37	2	2	8	2	1	1	1	1	3	4	2/2	3/4	1	FS	2	3	10	2	-	1	
<sup>(2)</sup> AT32A403ARCT7	200	256	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	LQFP64 10 x 10 mm
<sup>(2)</sup> AT32A403ARET7	200	512	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	
<sup>(2)</sup> AT32A403ARGT7	200	1024	96/224	51	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	LQFP100 14 x 14 mm
<sup>(2)</sup> AT32A403AVCT7	200	256	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	
<sup>(2)</sup> AT32A403AVET7	200	512	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	
<sup>(2)</sup> AT32A403AVGT7	200	1024	96/224	80	2	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FS	2	3	16	2	1	1	

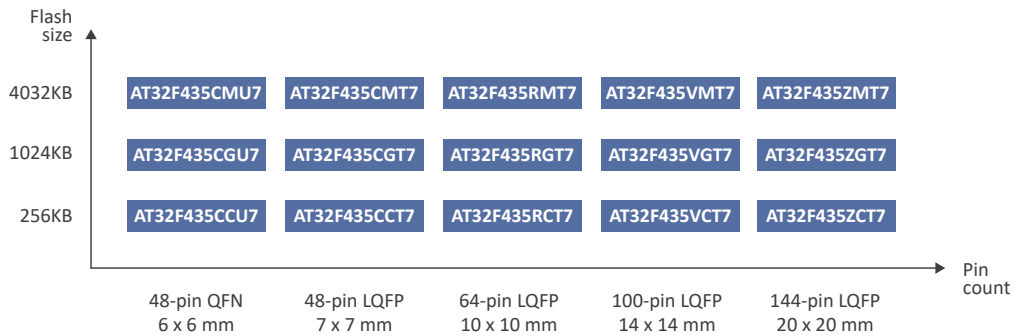
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S  
 (2) AEC-Q100 Grade 2

## AT32F435

As a high performance microcontroller, AT32F435 series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 288 MHz. This device features a single precision floating-point unit (FPU) and digital signal processor (DSP) and it is provided with rich peripherals and flexible clock control mechanism for a wide range of applications. It incorporates embedded memories of up to 4032 KB Flash memory and 512 KB SRAM.

AT32F435 series offers 2x OTG controllers (Xtal-less in device mode), 2x QSPIs (for external SPI Flash memory or SPI RAM extension), 8x UARTs, 2x CANs, 4x SPIs/I<sup>2</sup>Ss (2x full-duplex), 3x high-speed ADC engines (5.33 Msps), 8~14 bit digital video parallel interface(DVP) and XMC interface (for SDRAM, SRAM and PSRAM). The device operates in the temperature range of -40 °C to 105 °C, with a rich choice of package types available for diverse demands. With powerful on-chip resources, higher integration and cost-effectiveness, the AT32F435 series is particularly suited for applications including industrial automation, motor control, IoT and consumer electronics.

- **Max Frequency** : 288 MHz
- **Operating Voltage** : 2.6-3.6V
- **Operating Temperature** : -40-105°C
- **Key Features** : 4032 KB Flash, 512 KB SRAM, SDRAM, 2x QSPIs, 2x OTGs, DVP, 3x 5.33 Msps ADC engines
- **Main Applications** : sweeping robot, micro printer, stage lighting, HMI, LED display, QR code scanner, surveillance, industrial control, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	QSPI	Timer							Connectivity							Analog Interface			Package					
						Advanced TMR (16bit)	GP TMR (32bit)	GP TMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC(Enhanced)	I <sup>2</sup> C	SPI	<sup>(1)</sup> (F/H)I <sup>2</sup> S	USART/UART	SDIO	OTG	CAN	IRTRM	Ethernet MAC		<sup>(2)</sup> ADC Engine	12-bit ADC ch.	DAC Engine	XMC	DVP
AT32F435CCU7	288	256	384/512	39	2	3	2	8	2	1	1	1	1	3	4	2/2	3/4	2	FSx2	2	1	-	3	10	2	-	1	QFN48 6 x 6 mm
AT32F435CGU7	288	1024	384/512	39	2	3	2	8	2	1	1	1	1	3	4	2/2	3/4	2	FSx2	2	1	-	3	10	2	-	1	
AT32F435CMU7	288	4032	384/512	39	2	3	2	8	2	1	1	1	1	3	4	2/2	3/4	2	FSx2	2	1	-	3	10	2	-	1	
AT32F435CCT7	288	256	384/512	39	2	3	2	8	2	1	1	1	1	3	4	2/2	3/4	2	FSx2	2	1	-	3	10	2	-	1	LQFP48 7 x 7 mm
AT32F435CGT7	288	1024	384/512	39	2	3	2	8	2	1	1	1	1	3	4	2/2	3/4	2	FSx2	2	1	-	3	10	2	-	1	
AT32F435CMT7	288	4032	384/512	39	2	3	2	8	2	1	1	1	1	3	4	2/2	3/4	2	FSx2	2	1	-	3	10	2	-	1	
AT32F435RCT7	288	256	384/512	53	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	16	2	1	1	LQFP64 10 x 10 mm
AT32F435RGT7	288	1024	384/512	53	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	16	2	1	1	
AT32F435RMT7	288	4032	384/512	53	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	16	2	1	1	
AT32F435VCT7	288	256	384/512	84	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	16	2	1	1	LQFP100 14 x 14 mm
AT32F435VGT7	288	1024	384/512	84	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	16	2	1	1	
AT32F435VMT7	288	4032	384/512	84	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	16	2	1	1	
AT32F435ZCT7	288	256	384/512	116	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	24	2	1	1	LQFP144 20 x 20 mm
AT32F435ZGT7	288	1024	384/512	116	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	24	2	1	1	
AT32F435ZMT7	288	4032	384/512	116	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	-	3	24	2	1	1	

(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S  
(2) 5.33 Msps ADC

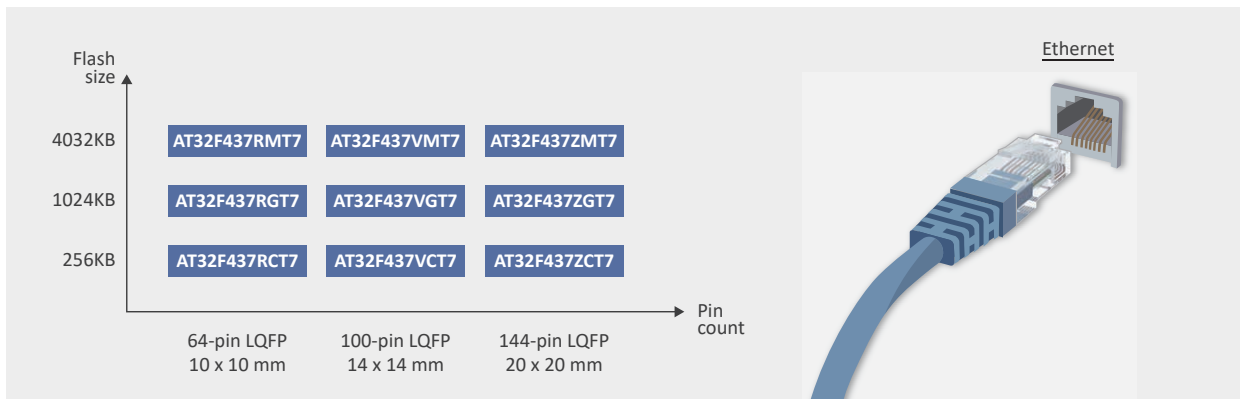


## AT32F437

As a high performance microcontroller, AT32F437 series is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 288 MHz. This device features a single precision floating-point unit (FPU) and digital signal processor (DSP) and it is provided with rich peripherals and flexible clock control mechanism for a wide range of applications. It incorporates embedded memories of up to 4032 KB Flash memory and 512 KB SRAM.

AT32F437 series offers 2x OTG controllers (Xtal-less in device mode), 2x QSPIs (for external SPI Flash memory or SPI RAM extension), 8x UARTs, 2x CANs, 4x SPIs/I<sup>2</sup>Ss (2x full-duplex), 3x high-speed ADC engines (5.33 Msps), 8~14 bit digital video parallel interface (DVP) and XMC interface (for SDRAM, SRAM and PSRAM), as well as IEEE-802.3 10/100 Mbps Ethernet port controller suitable for IoT applications. The AT32F437 series operates in the temperature range of -40 °C to 105 °C, with a rich choice of package types available for diverse demands. With powerful on-chip resources, higher integration and cost-effectiveness, the product series is particularly suitable for applications including industrial automation, motor control, IoT and consumer electronics.

- **Max Frequency** : 288 MHz
- **Operating Voltage** : 2.6-3.6V
- **Operating Temperature** : -40-105°C
- **Key Features** : 4032 KB Flash, 512 KB SRAM, 10/100 Mbps Ethernet, SDRAM, 2 x QSPIs, 2x OTGs, DVP, 3x 5.33 Msps ADC engines
- **Main Applications** : IoT gateway, serial server, micro printer, stage lighting, HMI, LED display, QR code scanner, surveillance, industrial control, 5G



Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	QSPI	Timer							Connectivity							Analog Interface			DVP	Package				
						Advanced TMR (16bit)	GPTMR (32bit)	GPTMR (16bit)	Basic TMR (16bit)	System (24bit)	WDT	WWDT	RTC (Enhanced)	I <sup>2</sup> C	SPI	(1) F/H <sup>2</sup> S	USART/UART	SDIO	OTG	CAN	IRTMR	Ethernet MAC			(2) ADC Engine	12-bit ADC ch.	DAC Engine	XMC
AT32F437RCT7	288	256	384/512	53	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	16	2	1	1	LQFP64 10 x 10 mm
AT32F437RGT7	288	1024	384/512	53	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	16	2	1	1	LQFP100 14 x 14 mm
AT32F437RMT7	288	4032	384/512	53	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	16	2	1	1	LQFP100 14 x 14 mm
AT32F437VCT7	288	256	384/512	84	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	16	2	1	1	LQFP144 20 x 20 mm
AT32F437VGT7	288	1024	384/512	84	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	16	2	1	1	LQFP144 20 x 20 mm
AT32F437VMT7	288	4032	384/512	84	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	16	2	1	1	LQFP144 20 x 20 mm
AT32F437ZCT7	288	256	384/512	116	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	24	2	1	1	LQFP144 20 x 20 mm
AT32F437ZGT7	288	1024	384/512	116	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	24	2	1	1	LQFP144 20 x 20 mm
AT32F437ZMT7	288	4032	384/512	116	2	3	2	8	2	1	1	1	1	3	4	2/2	4/4	2	FSx2	2	1	1	3	24	2	1	1	LQFP144 20 x 20 mm

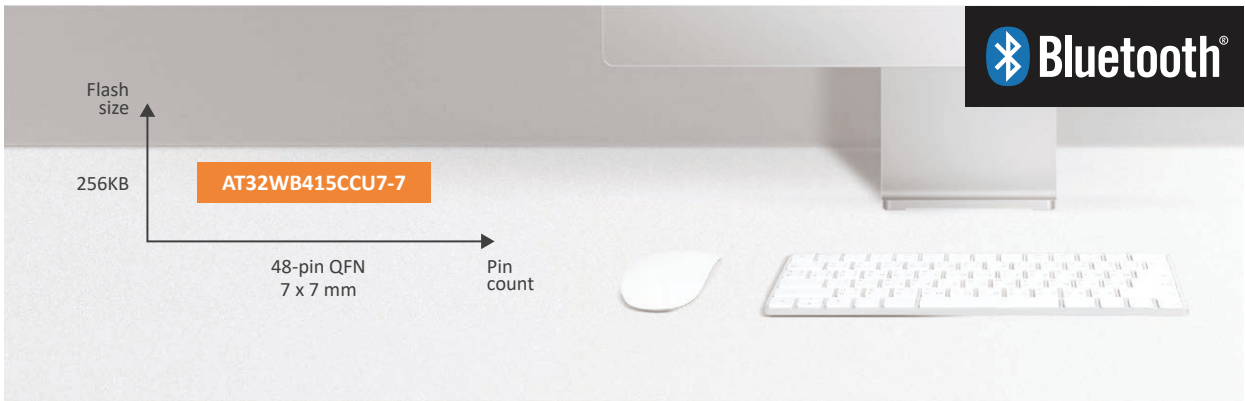
(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S  
(2) 5.33 Msps ADC

## AT32WB415

AT32WB415 embeds a low-power radio that is compliant with Bluetooth Low Energy SIG specification 5.0. It contains rich communication interfaces, Bluetooth radio frequency (RF) transceiver and baseband features, delivering robust wireless data signal processing capability, with up to -97 dBm sensitivity in Bluetooth RX, and -20 dBm ~ +4 dBm in Bluetooth TX. The antenna embedded in the device can cover as far as 30m, up to 2Mbps, for powerful connectivity.

The device is based on ARM® Cortex®-M4 32-bit core operating at a frequency of up to 150 MHz. It integrates a digital signal processor (DSP) and memory protection unit (MPU), up to 256 KB Flash memory and 32 KB SRAM. The device features a comprehensive range of peripherals, namely 1x 12-bit 8-channel ADC, 2x CMPs, 4x UARTs, 1x SPI, 1x I<sup>2</sup>C, 1x CAN, 1x advanced timer and 7x general purpose timers. The AT32WB415 series operates in the temperature range of -40°C to 105°C. Compared to legacy MCUs, in which functions are relatively scattered, AT32WB415 provides an all-in-one solution for the development of Bluetooth technology products. Besides, its reduced PCB size and the optimized RF layout will bring more excellent solutions for various applications such as consumer electronics, smart home, Internet of Things (IoT), among others.

- **Max Frequency :** 150 MHz
- **Operating Voltage :** 2.6-3.6V
- **Operating Temperature :** -40-105°C
- **Key Features :** Bluetooth 5.0, 256KB Flash, 32KB SRAM, 4x UARTs, USB OTG, CAN, 12-bit ADC, 2x CMPs
- **Main Applications :** IoT, wearables, PC accessories, household electric appliance, smart home, printer, electronic toy, robot



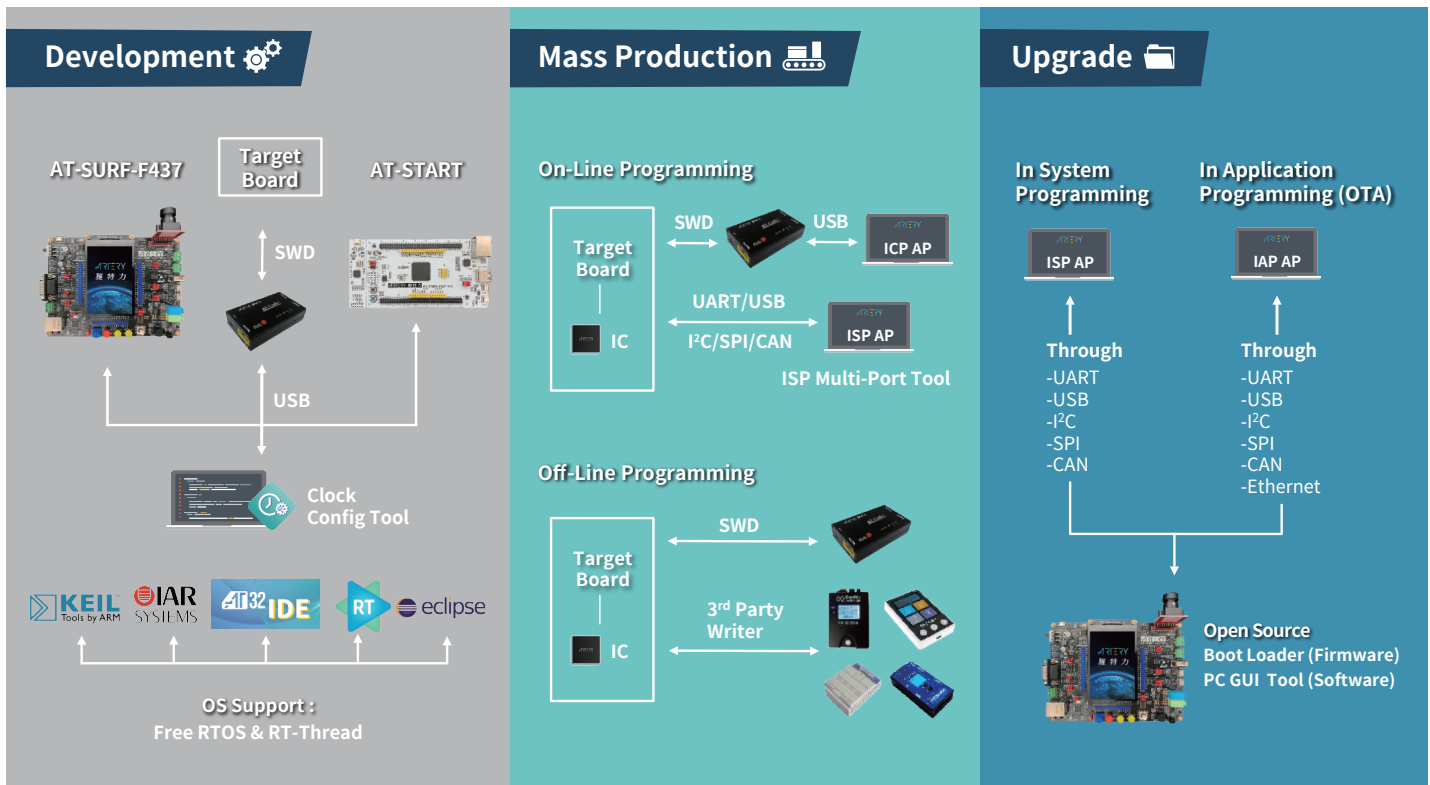
Part No.	Frequency (MHz)	Flash (KB)	SRAM (KB)	I/O	Timer							Connectivity					Analog Interface			Package					
					Advanced TM R(16bit)	GPTMR (32bit)	GPTMR (16bit)	Basic TMR (16bit)	Systick (24bit)	WDT	WWDT	RTC (Enhanced)	I <sup>2</sup> C	SPI	( <sub>1</sub> )F/(H) <sup>1/2</sup> S	USART/UART	CAN	OTG	ADC Engine		12-bit ADC ch.	DAC Engine	CMP		
AT32WB415CCU7-7	150	256	32	30	1	2	5	-	1	1	1	1	1	1	1	1	0/1	3/1	1	FS	1	8	-	2	QFN48 7x7 mm

(1) F/H: Full Duplex I<sup>2</sup>S / Half Duplex I<sup>2</sup>S

## Development Tools

Systematically, ARTERY provides a complete set of software (BSP, ICP/ISP/IAP) and hardware (AT-START board, SURF board and AT-Link Family) for engineers with the aim of making it easier the product development, programming and firmware upgrade.

### AT32 MCU Production Trilogy



## AT32 Std BSP (Standard Library)

- **Project**
  - Applicable to AT32 MCU family
  - Support Keil MDK, IAR EWARM
  - Abundant example codes
- **Utilities**
  - sLib Demo / IAP Demo
  - Random Number Generator Demo
- **Middleware**
  - AT32 USB application cases
  - Support RT-Thread Studio / OS
  - Support FreeRTOS
  - Support LittlevGL graphic library
  - Support LwIP and FatFs
- **IEC 60730 CLASS B software library**
  - **Start-up detection**
    - CPU
    - Watchdog
    - Flash integrity
    - RAM function
    - System clock
    - Control flow
  - **Runtime detection**
    - Partial CPU core registers
    - Stack overflow
    - System clock running
    - Flash CRC segmented detection
    - Watchdog
    - Partial RAM self-check (through interrupt service routine)



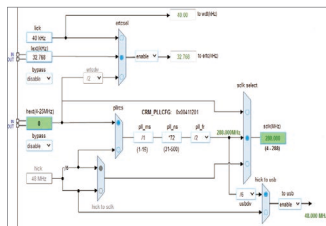
IEC 60730 CLASS B software library ▲

## AT32 Tooling System

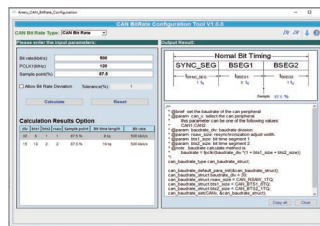
- **ICP Tool (In-Circuit Programming)**
  - Program AT32 MCU using AT-Link / J-Link
  - Program both Flash memory and SPIM Flash (Bank 3)
  - Program Option Byte (load from file or device)
  - Support sLib for secondary development and programming
  - Auto detection of SWD speed through AT-Link
  - AT-Link offline programming settings
- **ISP Tool (In-System Programming)**
  - Update AT32 MCU via UART or USB DFU
  - Program both Flash memory and SPIM Flash (Bank3)
  - Support .hex/.bin file format
  - Connect to multiple devices simultaneously (Multi-Port tool)
- **AT32\_IDE Tool (Eclipse)**
  - Applicable to AT32 MCU family
  - Compatible with Windows® and Linux®
  - Contain a series of Eclipse programs and tools
  - Use GNU ARM toolchain to create projects
  - Use GDB for project debugging
  - Support internal memory and Flash memory access
  - Support setting of hardware interrupt and detection point
- **AT32\_New\_Clock\_Configuration**
  - Configure clock path and parameters for AT32 MCUs
  - Make the clock path and frequency settings clearer
- **I<sup>2</sup>C\_Timing\_Configuration**
  - Input I<sup>2</sup>C parameters through UI software
  - Quickly calculate the corresponding result of I<sup>2</sup>C and generate standard code for relevant configuration
- **CAN\_BitRate\_Configuration**
  - Input CAN Bus parameters through UI software
  - Quickly calculate the corresponding result of CAN Bus and generate standard code for relevant configuration



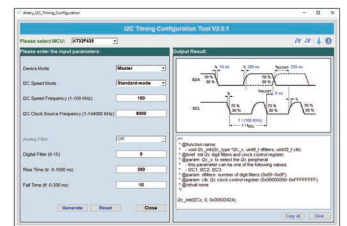
AT32\_IDE Tool (Eclipse) ▲



AT32\_New\_Clock\_Configuration ▲



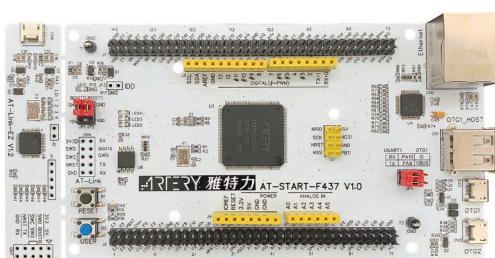
CAN\_BitRate\_Configuration ▲



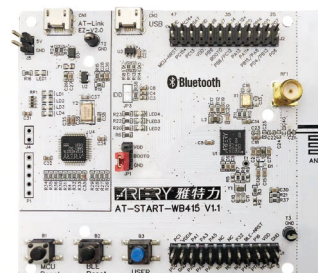
I<sup>2</sup>C\_Timing\_Configuration ▲

## AT32 MCU Evaluation Board

- **AT-START**
  - A simple and easy-to-use evaluation/development kit with rich interfaces, compatible with Arduino™ interface, and Keil MDK and IAR EWARM environment
    - Connect to main MCU using AT-Link/J-Link
    - Compatible with Arduino™ Uno R3 hardware interface
    - Update code using UART/USB DFU
- **AT32WB415 Wireless Bluetooth Evaluation Board**
  - Compliant with Bluetooth® 5.0 specification
  - 2.4 GHz low-power transceiver
  - Operate at a frequency of up to 150 MHz / 256KB Flash
  - Sensitivity in Bluetooth TX: -20 dBm to +4 dBm
  - Powerful connectivity: 30 m, up to 2 Mbps
  - Rich peripherals (USB OTG, 2xCMPs, CAN) / 12-bit ADC



AT-START ▲

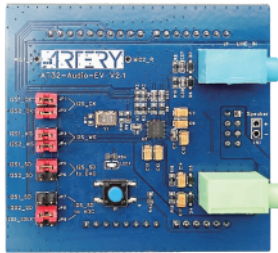


AT32WB415 ▲

## AT32 MCU Evaluation Board

### AT32 Audio Evaluation Board

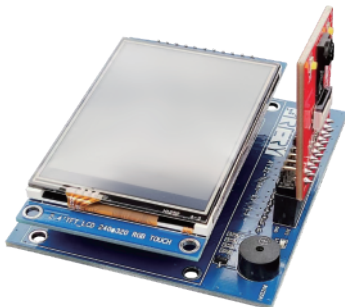
- Support multi-media playback through audio signal processing
- Standard Arduino™ Uno R3 extension interface
- Support 2 MIC input / LINE IN / LINEOUT



AT32-Audio-EV ▲

### AT32 Video Evaluation Board

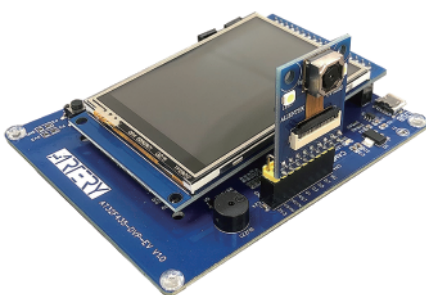
- Support multiple image data processing applications
- Standard Arduino™ Uno R3 extension interface
- SPI interface QVGA CMOS Sensor
- 2.4-inch TFT LCD screen



AT32-Video-EV ▲

### AT32F435 DVP Evaluation Board

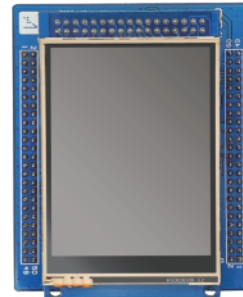
- Built-in AT32F435VMT7 high-performance MCU
- 256 MB SDRAM on board
- 64 MB QSPI SRAM on board
- 8080 TFT-LCD screen
- Digital video parallel interface (DVP)



AT32F435-DVP-EV ▲

### AT32 LCD Evaluation Board

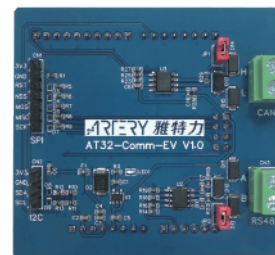
- 2.8-inch 240x320 TFT-LCD resistance touch screen



AT32-LCD-EV ▲

### AT32 Communication Evaluation Board

- Fast implementation of communication applications
- Standard communication interfaces (RS-485 / CAN / I<sup>2</sup>C / SPI of receiver / transmitter)
- Standard Arduino™ Uno R3 extension interface
- Compatible with AT-START board



AT32-Comm-EV ▲

### AT-SURF-F437

- 288 MHz ultra-high speed / Extend 256 MB SDRAM onboard
- Digital camera / 3.5-inch 480x320 TFT-LCD screen
- Standard communication interface (RS-232, RS-485 and dual CANs of receiver / transmitter)
- Dual OTGs and 10/100M Ethernet
- MIC / LINEIN / LINEOUT



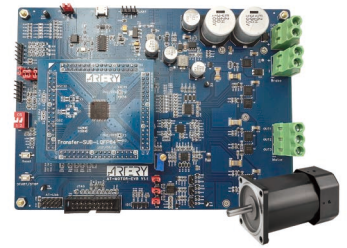
AT-SURF-F437 ▲



## AT32 Motor Control

- **AT32 Motor Evaluation Board**

- General-purpose low voltage three-phase motor driver with brake resistor connector
- Permanent magnet synchronous motor (PMSM) / brushless DC (BLDC) motor control
- Support sensored square wave commutation mode / sensorless FOC control mode
- Provide rotor position feedback by incremental encoder / Hall sensor
- Various communication interfaces including USB / 2xCANs / USART / SPI / I<sup>2</sup>C
- Input voltage: 12V ~ 60V, maximum output current: 30 A<sub>PEAK</sub>



- **BSP: AT32 Motor Control Library**

- Motor control library algorithm, which contains encoder / Hall sensor and sensorless FOC control related functions (applicable to 3-shunt / 2-shunt / 1-shunt current sensing) and Hall sensor and sensorless 6-step BLDC control related functions



AT32-Motor-EV ▲

- **UI: AT32 Motor Monitor Program**

- Motor monitor program, which can monitor real-time motor parameters / status, dynamically display response waveforms and tune control parameters online

## AT-Link Family (Debugging / Programming Tool)

There are four kinds of tools available for debugging and programming (also called AT-Link Family). They are AT-Link-Pro, AT-Link+, AT-Link-ISO+ and AT-Link-EZ. With various functions, the AT-Link Family, being small, portable, easy to operate, and stable, is particularly useful for AT32 MCU debugging and online/offline programming.

- **AT-Link-Pro**

- IDE online debugging, online/offline programming, output voltage regulating, offline parameter settings and USB-to-serial interface
- Support LCD display and touch operation

- **AT-Link+**

- Support programming of AT32WB415 series MCUs
- Designed with SPI, peripheral interfaces (I<sup>2</sup>C / CAN) and multifunctional interface (MULTI FUNC)
- Support online/offline programming

- **AT-Link-ISO+**

- Support programming of AT32WB415 series MCUs
- Enhanced isolation protection over AT-Link+

- **AT-Link-EZ (online programming is marked in yellow line)**



AT-Link-Pro ▲

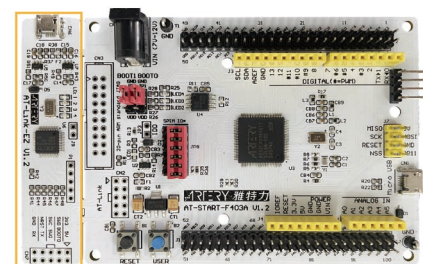


AT-Link+ ▲



Isolation Protection

AT-Link-ISO+ ▲



AT-Link-EZ ▲

## Development Tools

▪ Third-party programmer (in alphabetical order)

In addition to ICP/ISP tools, the following programmers, are also supported for programming.

- Armfly ([www.armfly.com](http://www.armfly.com))
- Acroview ([www.acroview.com](http://www.acroview.com))
- Amo ([www.amomcu.cn](http://www.amomcu.cn))
- Alientek ([www.alientek.com](http://www.alientek.com))
- DediProg ([www.dediprogram.com](http://www.dediprogram.com))
- Forcreat ([www.forcreat.com](http://www.forcreat.com))
- Galecomm ([www.galecomm.com](http://www.galecomm.com))
- Hi-Lo Systems ([hilosystems.com](http://hilosystems.com))
- ICWORKSHOP ([www.icworkshop.com](http://www.icworkshop.com))
- MaxWiz ([www.maxwiz.com.cn](http://www.maxwiz.com.cn))
- Prosystems ([www.prosystems.com.cn](http://www.prosystems.com.cn))
- Rx-prog ([www.rx-prog.com](http://www.rx-prog.com))
- System General ([www.sg.com.tw](http://www.sg.com.tw))
- Sinaen ([sinaen.diytrade.com](http://sinaen.diytrade.com))
- XELTEK ([www.xeltek-cn.com](http://www.xeltek-cn.com))
- XWOPEN ([www.xwopen.com](http://www.xwopen.com))
- Zhifeng ([bbzfkj.world.taobao.com](http://bbzfkj.world.taobao.com))
- ZLG ([www.zlg.cn](http://www.zlg.cn))



\* To find out more, please contact ARTERY sales team.

## AT32 Extensive Ecosystems

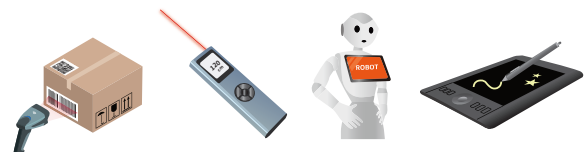


## AT32 Application Scenarios

▪ Industrial Control



▪ Commerce



▪ Automotive



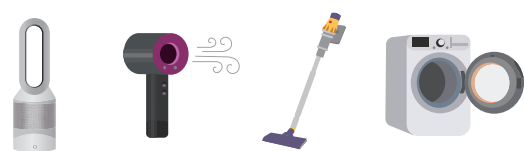
▪ Consumer Electronics



▪ Communication & Power Management



▪ Smart Home





Official Website



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## Artery Technology

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- **Chongqing Office** 10F., Kangtianxiinhui Bldg. 1, No.60, Kecheng Rd., Jiulongpo Dist., Chongqing, China  
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- **Suzhou Office** D302-3, No.1355 JinJiHu Avenue, International Science & Technology Park, Suzhou Industrial Park, China  
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- **Shanghai Office** Rm.512, Bldg. B, No. 317, Xianxia Road, Changning District, Shanghai, China  
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- **Others** [info@arterytek.com](mailto:info@arterytek.com)