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Puya Semiconductor (Shanghai) Co., LTD



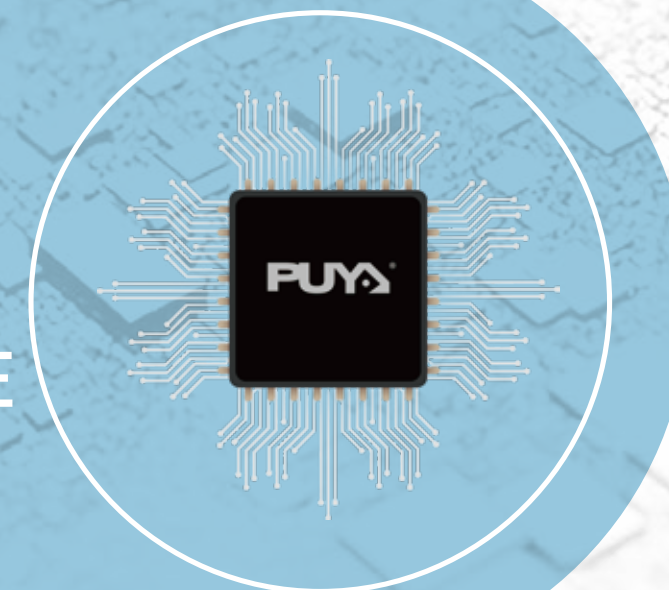
PUYA SEMICONDUCTOR (SHANGHAI) CO., LTD

MCU

2025 Rev

PRODUCT SELECTION GUIDE

PY32 Series • PY32 Development Environment



Stock Name: Puraan Gufen
Stock Code: 688766

COMPANY OVERVIEW



Puya is a leading provider of non-volatile memory and microcontrollers in the industry and a key national integrated circuit design enterprise. Founded in 2016, its headquarters is located in Zhangjiang Hi-Tech Park, Shanghai. It has a subsidiary in Chengdu, as well as sales and field application service and support centers in Shenzhen, Wuxi, and South Korea. Additionally, it has a research and development center in Suzhou. Moreover, it conducts business in Beijing, the UK, Germany, India, etc. As an innovative integrated circuit design company, Puya was listed on the STAR Market of the Shanghai Stock Exchange in August 2021, with the stock code 688766.

As a pioneer in the semiconductor industry, Puya has combined with the leading fabs, integrated advanced design and technological advantages, and has committed to the research and development of memory product based on NOR Flash and EEPROM, which have the advantages of ultra-low power consumption, high reliability, wide voltage and high cost performance. Among them, the NOR serial Flash memory process is the industry-leading 40nm~55nm, with the characteristics of ultra-low power consumption and high reliability. EEPROM series products which support IIC and SPI interface and maximum 4M capacity, can reach 4 million erasable life and 200-years data storage time, and have very low static power consumption and operating current, and 6KV electrostatic protection ability.

After years of technological accumulation and integration, we layout general purpose MCU product line with characteristic technology, based on our leading memory advantages of ultra-low power consumption and high cost performance. Our 32-bit ARM Cortex M0+ MCU extend our memory advantage, which can be widely used in smart home, small household applications, BMS, security and drive motors, industrial control and other application fields. Currently, our MCU product matrix includes ARM®Cortex®-M0+ and ARM®Cortex®-M4 MCU families, and is equipped with a complete on-site solution support team to continuously promote our MCU ecological environment construction.



CONTENT

● PY32 Series Products

- 02 PY32 Series Products Introduction
- 03 PY32 Series MCU Introduction
- 04 PY32 Series RoadMap
- 05 M0+ High Cost-efficient Products
- 06 M0+ General Products Selection Guide
- 07 M0+ General Products Selection Guide
- 08 M0+ Ultra Low Power Products Selection Guide
- 08 M0+ Motor Specific Products Selection Guide
- 09 M0+ Touch Control Products Selection Guide
- 08 M4 High Cost-efficient Products
- 11 M4 Product Selection Guide
- 12 PY32 MCU Product Naming Rules

● PY32 Development Environment

- 12 PY32 MCU Development Environment
- 12 PY32 MCU Operating System
- 13 Development kit, programmer, burner
- 14 Appendix

PY32 Series Products Introduction

High cost-effectiveness PY32F002B / PY32F003 / PY32F030 / PY32F031 / PY32F040 / PY32F072 series MCU , based on 32-bit ARM® Cortex® - M0+ , operating frequency from 24MHz to 72MHz, maximum 128K Flash, wide voltage, built-in LCD, USB 2.0, CAN2.0, MC-PWM, OP, CMP, DAC and other peripherals.

Ultra low power PY32L020 series MCU, based on 32-bit ARM ® Cortex ® - M0+ , Current in Deepstop mode is 0.7uA, operating frequency is 48MHz, 24K Flash, built-in CMP, ADC, Vref, USART, IIC, SPI and other peripherals.

PY32F403 series MCU, based on 32-bit ARM ® Cortex ® - M4 , The working frequency can reach up to 144 MHz, the maximum capacity of Flash is 384 KB, and it has built-in SDIO, USB 2.0, CAN-FD, ESMC, DAC and other peripherals.

Touch PY32T020 series MCU, based on 32-bit ARM ® Cortex ® - M0+, It can support up to 26 channels of touch buttons and related functions, with a working frequency of 48MHz and 32K Flash. The chip integrates IIC, SPI, UART, ADC, CMP, LCD and other peripherals.

High performance PY32E407 series MCU based on 32-bit ARM ® Cortex ® - M4 , The working frequency can reach up to 170MHz, the maximum capacity of Flash is 512 KB, and it has built-in SDIO, USB-OTG, CAN-FD, ESMC, DAC, Cordic, digital encryption module AES, RNG, 10/100 ETH and other peripherals.

PY32E407	170MHz Cortex-M4		
PY32F403	144MHz Cortex-M4		
PY32F072	PY32F040	PY32F031	72MHz Cortex-M0+
PY32F030	PY32L020	PY32T020	48MHz Cortex-M0+
PY32F003	32MHz Cortex-M0+		
PY32F002B	24MHz Cortex-M0+		

PY32系列MCU

Rich product portfolio to meet customers' diverse application needs: consumer electronics, home appliances, IoT products, medical electronics, industrial control, general civilian products, etc.



Ultra low power

- 32-bit ARM ® Cortex ® - M0+
- In DeepStop mode: 0.7uA
- The operating frequency can reach up to 48MHz
- The maximum capacity of Flash/SRAM is 24/3KB
- Working temperature: -40~105 °C
- Supports up to 18 I/Os



Universal (M0+/M4)

- 2-bit ARM ® Cortex ® - M0+/M4
- The operating frequency can reach up to 144MHz
- The maximum capacity of Flash/SRAM is 384/64KB
- Working temperature: -40~105 °C
- Supports up to 80 I/Os
- Built in operational amplifier, comparator, DAC, supporting USB and CAN 2.0/CAN-FD communication interfaces



Motor specific

- 32-bit ARM ® Cortex ® - M0+
- The operating frequency can reach up to 72MHz
- The maximum capacity of Flash/SRAM is 128/16KB
- Working temperature: -40~105 °C
- Supports up to 42 I/Os
- Built in multiplier/divider
- Supports 3-channel complementary PWM, suitable for various types of motor control algorithms



Touch

- 32-bit ARM ® Cortex ® - M0+
- The operating frequency can reach up to 48MHz
- The maximum capacity of Flash/SRAM is 32/4KB
- Working temperature: -40~105 °C
- Supports up to 26 I/Os
- High reliability mode anti-interference can pass the 10 V dynamic CS test
- High sensitivity design enables remote key touch control



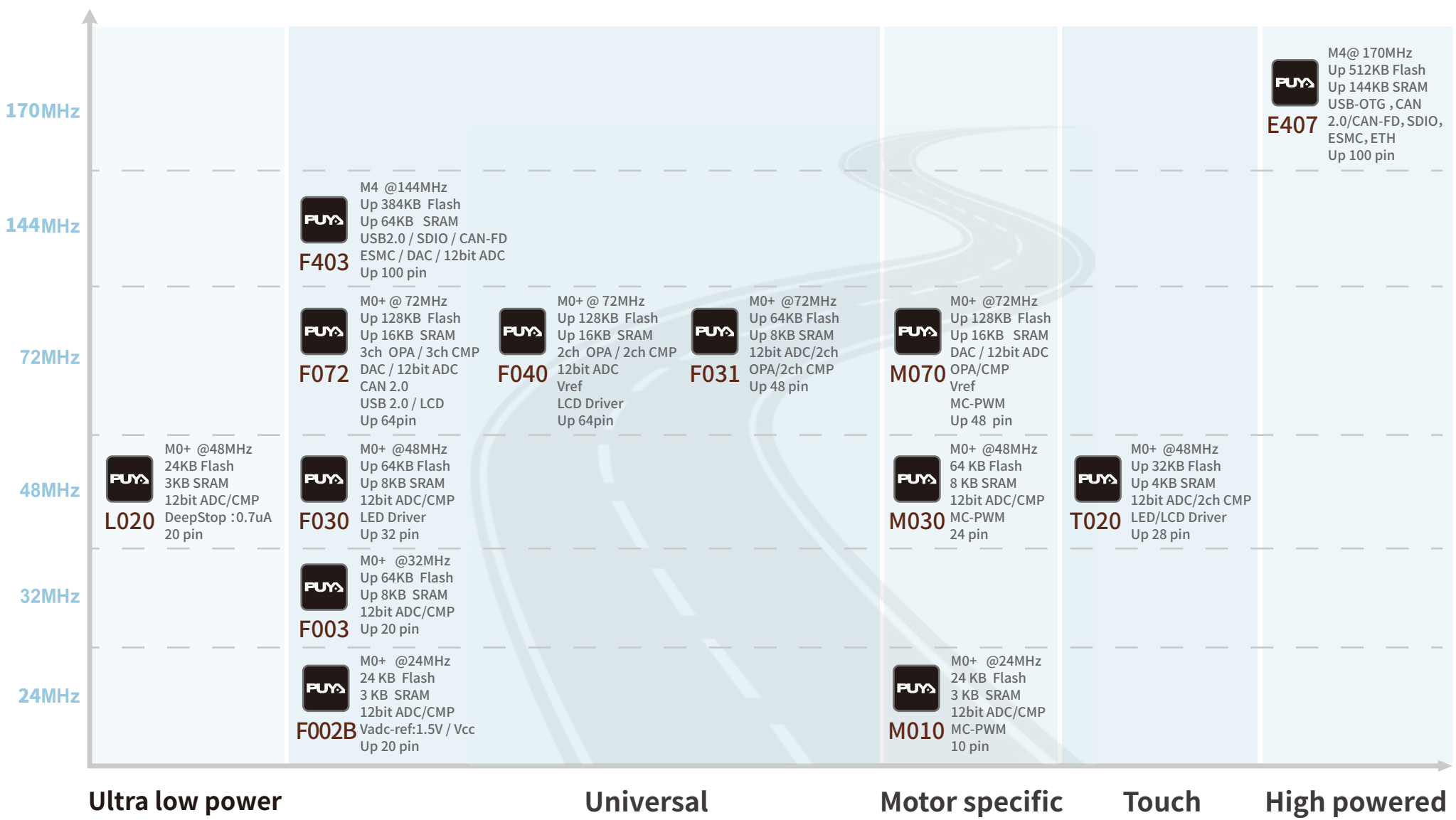
High-powered

- 32-bit ARM ® Cortex ® - M4
- The operating frequency can reach up to 170MHz
- The maximum capacity of Flash/SRAM is 512/144KB
- Working temperature: -40~105 °C
- Supports up to 86 I/Os
- Built in USB-OTG, CAN 2.0/CAN-FD, SDIO, ESMC, Cordic, digital encryption module AES, RNG, 10/100 ETH and other advanced peripherals



PY32 Series RoadMap

The PY32 series MCU products cover various fields and have a wide range of application scenarios.



Cost-effective products based on the M0+ core



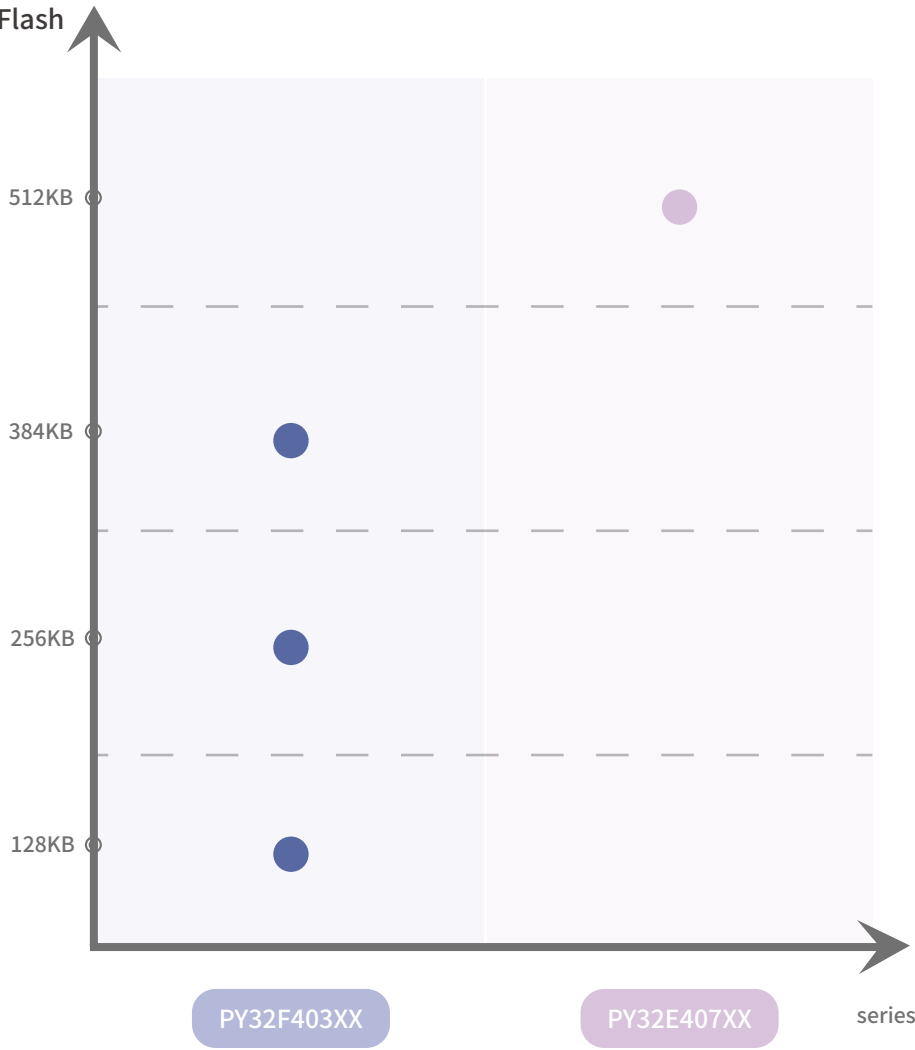
High powered products for the M4 kernel

M4 Product Performance Description:

- PY32F403/E407: Based on 32-bit ARM®Cortex®-M4 High performance MCU with kernel
- Enhanced computational capability, supports floating-point operations, comes with a single cycle multiplier and hardware divider
- Efficient digital processing capabilities, low power consumption, low cost, and easy to use
- Flexible solutions for high-end consumer, power management, embedded audio, and industrial automation markets

Key Features:

- Flash: 128KB – 512KB
- The maximum frequency can reach 170MHz
- Equipped with I2S, Advanced peripherals such as USB-OTG, CAN 2.0/CAN-FD, SDIO, ESMC, Cordic, digital encryption modules AES, RNG, 10/100 ETH, etc
- Complete range of packaging options, including QFN36, LQFP48, LQFP64, LQFP100, and more

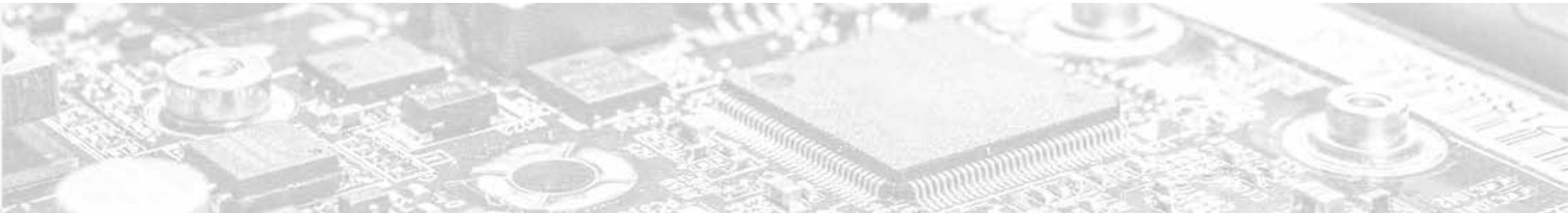


Universal Product Selection Guide(M4)

系列	Part No.	Max CLK (MHz)	Memory(Bytes)		IO	DMA	Timer							Communication							Analog Interface					Package Information		Operation Temp. (°C)				
			Flash	SRAM			GTIM	ADTM	Basic TM	Systic	LPTIMER	PWM	WDG	RTC	USART	IC	SPI	DS	USB 2.0	CAN FD	SDIO	ESMC	12bit ADC Units(Chs)	12bit DAC Units	LED	LCD	Temp Sensor		CMP	OPA	Package Type	Package Size(mm)
PY32F403 1.7~3.6V	PY32F403V1DT6	144	384	64	80	2/12	10	2	2	1	-	31	2	1	5	2	3	3	1	CAN FD	1	1	3 (16+3)	-	-	-	1	-	-	LQFP100	14*14*1.4	-40~85
	PY32F403R1DT6	144	384	64	51	2/12	10	2	2	1	-	27	2	1	5	2	3	2	1	CAN FD	1	1	3 (16+3)	-	-	-	1	-	-	LQFP64	10*10*1.4	-40~85
	PY32F403R1CT6	144	256	64	51	2/12	10	2	2	1	-	27	2	1	5	2	3	2	1	CAN FD	1	1	3 (16+3)	-	-	-	1	-	-	LQFP64	10*10*1.4	-40~85
	PY32F403R2DT6	144	384	64	49	2/12	10	2	2	1	-	29	2	1	5	2	2	3	1	CAN FD	1	1	3 (16+3)	-	-	-	1	-	-	LQFP64	10*10*1.4	-40~85
	PY32F403C1DT6	144	384	64	37	2/12	10	2	2	1	-	24	2	1	3	2	3	1	1	CAN FD	1	1	3 (10+3)	-	-	-	1	-	-	LQFP48	9*9*1.4	-40~85
	PY32F403C2DT6	144	384	64	37	2/12	10	2	2	1	-	28	2	1	3	2	3	3	1	CAN FD	1	1	3 (10+3)	-	-	-	1	-	-	LQFP48	9*9*1.4	-40~85
	PY32F403C1CT6	144	256	64	37	2/12	10	2	2	1	-	24	2	1	3	2	3	1	1	CAN FD	1	1	3 (10+3)	-	-	-	1	-	-	LQFP48	9*9*1.4	-40~85
	PY32F403C1BT6	144	128	64	37	2/12	10	2	2	1	-	24	2	1	3	2	3	1	1	CAN FD	1	1	3 (10+3)	-	-	-	1	-	-	LQFP48	9*9*1.4	-40~85
	PY32F403C1CU6	144	256	64	41	2/12	10	2	2	1	-		2	1	2	1	3	1	1	CAN FD	1	1	3 (11+3)	-	-	-	1	-	-	QFN48	6*6*0.75	-40~85
	PY32F403K1BU6	144	128	32	26	2/12	10	2	2	1	-	18	2	1	2	1	2	1	1	-	-	1	3 (10+3)	-	-	-	1	-	-	QFN32(4*4)	4*4*0.75	-40~85

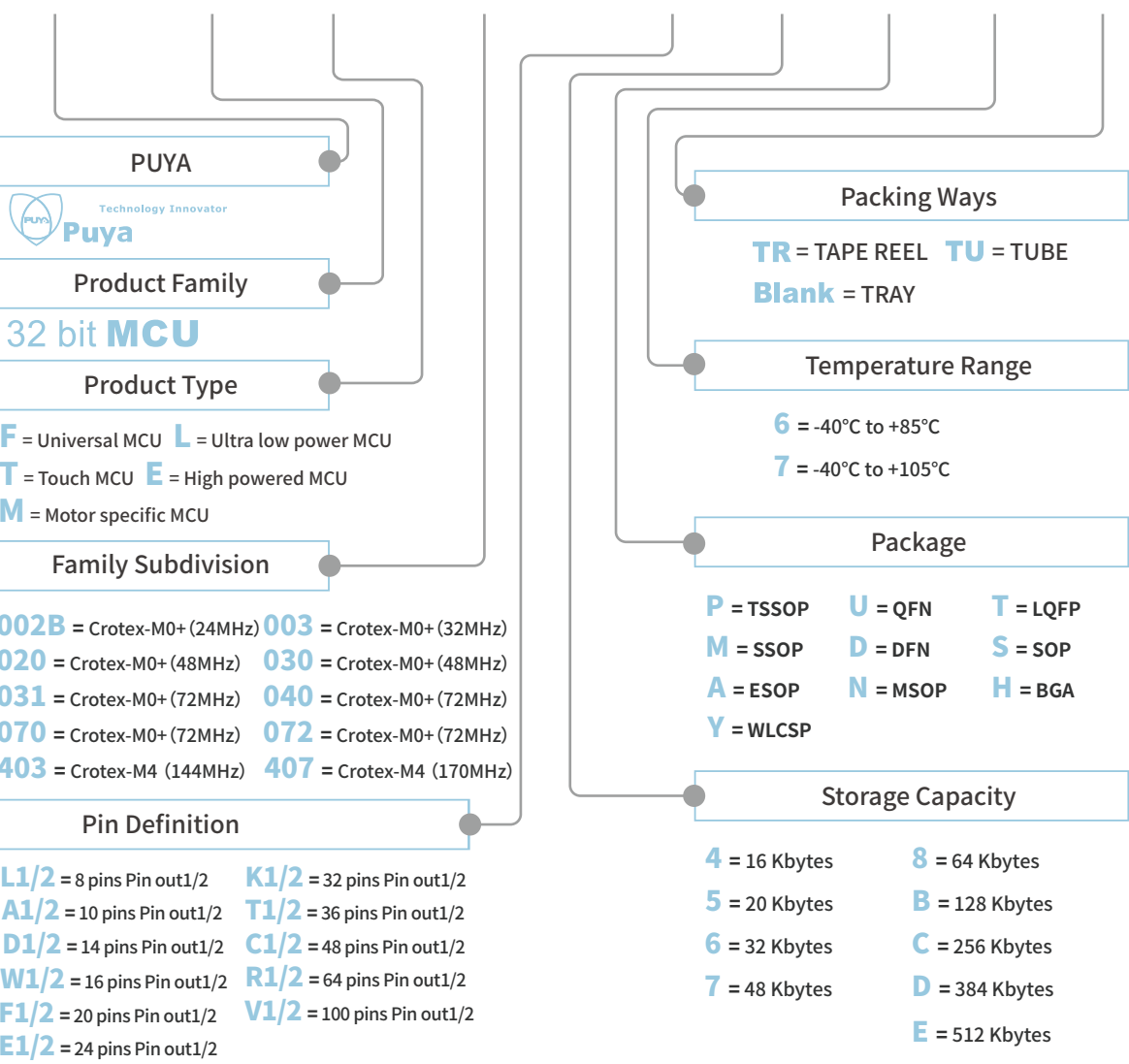
High powered Product Selection Guide(M4)

系列	Part No.	Max CLK (MHz)	Memory(Bytes)		IO	DMA	Timer							Communication							Digital Interface				Analog Interface							Package Information		Operation Temp. (°C)				
			Flash	SRAM			GTIM	ADTM	Basic TM	Systic	LPTIMER	PWM	WDG	RTC	USART	UART	LPART	IC	SPI	DS	USB-DT-G	CAN	10/100 ETH	SDIO	ESMC	EXTI	Cordic	AES RNG	12bit ADC Units(Chs)	12bit DAC Units	LED	LOD	Temp Sensor		CMP	OPA	Package Type	Package Size(mm)
PY32E407 1.7~3.6V	PY32E407V1ET7	170	512	144	86	2(6)	15	2	2	1	1		2	1	3	3	1	4	3	3	2	CANFD/CAN 2.0	1	1	1	16	1	1	1 (14+5),1 (16+3),1 (15+4)	-	-	1	1	4	3	LQFP100	14*14*1.4	-40~105
	PY32E407R1ET7	170	512	144	52	2(6)	15	2	2	1	1		2	1	3	3	1	4	3	3	2	CANFD/CAN 2.0	1	1	1	16	1	1	1 (14+5),1 (16+3),1 (3+4)	-	-	1	1	4	3	LQFP64	12*12*1.4	-40~105
	PY32E407K1ET7	170	512	144	28	2(6)	15	2	2	1	1		2	1	2	1	1	3	3	2	1	CANFD/CAN 2.0	-	-	-	16	1	1	1 (6+5),1 (7+3),1 (1+4)	-	-	1	1	3	2	QFN32(4*4)	4*4*0.75	-40~105



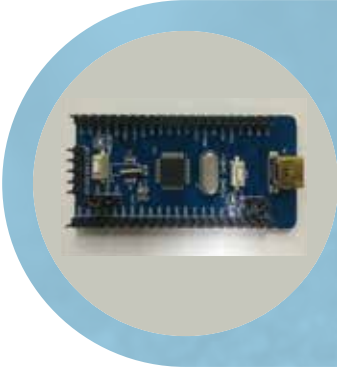
PY32 MCU Product Naming Rules

PY 32 F ABC F1 6 T 6 X



Operating System

Development Environment



- Support Keil uVision v5.28 or higher version development environment
- Support PY32F full range of HAL/LL library development
- 3.3V/5V power supply
- Offer USB interface power for emulator or target MCU
- Abundant I/O port resources

Development Kits

PY-Compiler

- Support Windows operating systems. No driver is required in Win10
- Support Keil uVision v5.28 or higher version development environment
- Support PY32F programming environment
- Support for UART with asynchronous serial communication
- USB cable connected to computer to offer 3.3V/5V power supply
- Target chip adaptive, support PY32 programming via SWD debug port



- Support self-start, stop and offline burning
- Support various erasing methods, auto empty chip skip, no need to wait
- Support 3.3 V and 5 V voltage output
- Support touch screen and multiple languages
- Thousands of programming storage capacity
- HID+ WinUSB-level dual-mode driverless architecture
- Millisecond chip response

PY-Burner

NOTE

NOTE

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