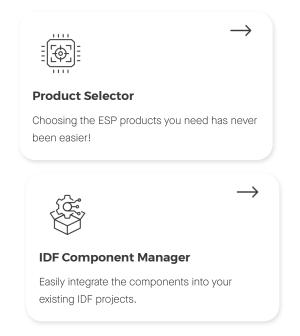


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ESP32-P4 Series

32-bit RISC-V MCU

- · High-performance MCU with RISC-V dual-core and single-core microprocessors
- · 128 KB HP ROM, 16 KB LP ROM, 768 KB HP L2MEM, 32 KB LP SRAM, 8 KB TCM
- · Powerful image and voice processing capability
- · 16 MB or 32 MB PSRAM in the chip's package





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ESP32-P Serie	S	ESP32-S	Series E	SP32-C Series	ESP32-H	l Series	ESP32 Series	ESF	P8266 Series	
Sc	οС	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module
ESPO	32-P4 32-P4		ESP32-P4NRW ESP32-P4NRW	Core/LP	QFN 10×10	104	128 KB HP ROM, 16 KB LP ROM, 768 KB HP L2MEM, 32 KB LP SRAM, 8 KB	N/A	16 32	N/A
ESPS	3Z-P4						TCM			.



ESP32-S Series

ESP32-S3 Series



32-bit MCU & 2.4 GHz Wi-Fi & Bluetooth 5 (LE)

- · Xtensa® 32-bit LX7 dual-core processor that operates at up to 240 MHz
- 512 KB of SRAM and 384 KB of ROM on the chip, and SPI, Dual SPI, Quad SPI, Octal SPI, QPI, and OPI interfaces that allow connection to flash and external RAM
- Additional support for vector instructions in the MCU, which provides acceleration for neural network computing and signal processing
 workloads
- · Peripherals include 45 programmable GPIOs, SPI, I2S, I2C, PWM, RMT, ADC and UART, SD/MMC host and TWAITM
- · Reliable security features ensured by RSA-based secure boot, AES-XTS-based flash encryption, the innovative digital signature and the HMAC peripheral, "World Controller"

SoC	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Developi
® ESP32-S3		ESP32-S3 ESP32-S3R2 ESP32-S3R8 ESP32-S3R8V ESP32-S3FN8 ESP32-S3FH4R2	Dual Core	QFN 7×7	56	384 KB ROM, 512 KB SRAM, 16 KB RTC SRAM	N/A N/A N/A N/A 8 4	N/A 2 8 8 N/A 2	ESP32-S3-WROOM-1 ESP32-S3-WROOM-1U ESP32-S3-WROOM-2 ESP32-S3-MINI-1 ESP32-S3-MINI-1U	ESP32-S ESP32-S; ESP32- ESP32- ESP32-S ESP32-S ESP32-S
ESP32-S3-PICO-1		ESP32-S3-PICO- 1-N8R2 ESP32-S3-PICO- 1-N8R8	Dual Core	LGA 7×7	56	384 KB ROM, 512 KB SRAM, 16 KB RTC SRAM	8 Quad	2 Quad 8 Octal	N/A	ı





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ESP32-P Series ESP32-S Series ESP32-C Series ESP32-H Series ESP32 Series ESP8266 Series

- High-performance 240 MHz single-core GPU
- · Ultra-low-power performance: fine-grained clock gating, dynamic voltage and frequency scaling
- · Security features: eFuse, flash encryption, secure boot, signature verification, integrated AES, SHA and RSA algorithms
- Peripherals include 43 GPIOs, 1 full-speed USB OTG interface, SPI, I2S, UART, I2C, LED PWM, LCD interface, camera interface, ADC, DAC, touch sensor, temperature sensor
- · Availability of common cloud connectivity agents and common product features shortens the time to market

SoC	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Developm
© ESP32-S2		ESP32-S2 ESP32-S2R2	Single Core	QFN 7×7	56	128 KB ROM, 320 KB SRAM, 16 KB RTC SRAM	N/A N/A	N/A 2	ESP32-S2-WROOM ESP32-S2-WROOM-I ESP32-S2-WROVER ESP32-S2-WROVER-I	ESP32-S2 ESP32-S1 ESP32-S2-I ESP32-S
© ESP32-S2F		ESP32-S2FH2 ESP32-S2FH4 ESP32-S2FN4R2	Single Core	QFN 7×7	56	128 KB ROM, 320 KB SRAM, 16 KB RTC SRAM	2 4 4	N/A N/A 2	ESP32-S2-MINI-1 ESP32-S2-MINI-1U	ESP32-S2 ESP32-S2-



ESP32-C Series

ESP32-C6 Series



32-bit RISC-V MCU & 2.4 GHz Wi-Fi 6 & Bluetooth 5 (LE) & IEEE 802.15.4

- · 32-bit RISC-V single-core processor that operates at up to 160 MHz
- · State-of-the-art power and RF performance
- · 320 KB ROM, 512 KB SRAM, 16 KB Low-power SRAM on the chip, and works with external flash
- · 30 (QFN40) or 22 (QFN32) programmable GPIOs, with support for SPI, UART, I2C, I2S, RMT, TWAI and PWM

SoC	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Developm
ESP32-C6		ESP32-C6 ESP32-C6FH4	Single Core	QFN 5×5 /	40 32	512 KB SRAM, 320 KB ROM	O 4	N/A	ESP32-C6-WROOM-1 ESP32-C6-MINI-1	ESP32-06 ESP32-06



ESP32-P Series



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SDKs

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ESP32 Series

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ESP8266 Series

ESP32-C Series 32-bit kiSC-v single-core processor with a lour-stage pipeline that operates at up to 160 IVIHz

· State-of-the-art power and RF performance

ESP32-S Series

· 400 KB of SRAM and 384 KB of ROM on the chip, and SPI, Dual SPI, Quad SPI, and QPI interfaces that allow connection to flash

ESP32-H Series

- · Reliable security features ensured by RSA-3072-based secure boot, AES-128-XTS-based flash encryption, the innovative digital signature and the HMAC peripheral, hardware acceleration support for cryptographic algorithms
- · Rich set of peripheral interfaces and GPIOs, ideal for various scenarios and complex applications

SoC	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Develop
® ESP32-C3		ESP32-C3 ESP32-C3FH4 ESP32-C3FH4X ESP32-C3FN4 (EOL)	Single Core	QFN 5×5	32	400 KB RAM, 384 KB ROM, 8 KB RTC SRAM	N/A 4	N/A	ESP32-C3-WROOM-02 ESP32-C3-WROOM-02U ESP32-C3-MINI-1 ESP32-C3-MINI-1U	ESP32-C3 ESP32-C3- ESP32-C3-AV DO ESP32
SPROBS ESP8685		ESP8685H4	Single Core	QFN 4×4	28	400 KB RAM, 384 KB ROM, 8 KB RTC SRAM	2, 4	N/A	ESP8685-WROOM-01 ESP8685-WROOM-03 ESP8685-WROOM-04 ESP8685-WROOM-05 ESP8685-WROOM-06 ESP8685-WROOM-07	

ESP32-C2 Series



32-bit RISC-V MCU & 2.4 GHz Wi-Fi & Bluetooth 5 (LE)

- · 32-bit RISC-V single-core processor that operates at up to 120 MHz
- · State-of-the-art power and RF performance
- · 576 KB ROM, 272 KB SRAM (16 KB for cache) on the chip
- · 14 programmable GPIOs: SPI, UART, I2C, LED PWM controller, General DMA controller (GDMA), SAR ADC, Temperature sensor

SoC	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Developm
ESP8684		ESP8684H2 ESP8684H4	Single Core	QFN 4×4	24	272 KB SRAM, 576 KB ROM	2 4	N/A	ESP8684-MINI-1 ESP8684-WROOM-01C ESP8684-WROOM-02C ESP8684-WROOM-02UC ESP8684-WROOM-03 ESP8684-WROOM-04C ESP8684-WROOM-05 ESP8684-WROOM-06C ESP8684-WROOM-07	ESP8684

ESP32-P Series



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ESP32-S Series ESP32-C Series ESP32-H Series

ESP32 Series

ESP8266 Series

32-bit RISC-V MCU & Bluetooth 5 (LE) & IEEE 802.15.4

- · 32-bit RISC-V single-core processor that operates at up to 96 MHz
- · 320 KB SRAM, 128 KB ROM, 4 KB LP Memory, and works with external flash
- 19 programmable GPIOs, with support for UART, SPI, I2C, I2S, Remote Control Peripheral, LED PWM, Full-speed USB Serial/JTAG Controller, GDMA, MCPWM
- · Can be used for building Thread end devices, as well as Thread border router and Matter bridge by combining it and ESP Wi-Fi SoC

SoC	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Developn
ESP32-H2		ESP32-H2FH2 ESP32-H2FH4	Single Core	QFN 4×4	32	320 KB SRAM, 128 KB ROM, 4 KB LP Memory	2	N/A	ESP32-H2-MINI-1 ESP32-H2-MINI-1U ESP32-H2-WROOM-02C	ESP32-H2



ESP32 Series

ESP32 SoCs

32-bit MCU & 2.4 GHz Wi-Fi & Bluetooth/Bluetooth LE



- Two or one CPU core(s) with adjustable clock frequency, ranging from 80 MHz to 240 MHz
- · +19.5 dBm output power ensures a good physical range
- · Classic Bluetooth for legacy connections, also supporting L2CAP, SDP, GAP, SMP, AVDTP, AVCTP, A2DP (SNK) and AVRCP (CT)
- · Support for Bluetooth Low Energy (Bluetooth LE) profiles including L2CAP, GAP, GATT, SMP, and GATT-based profiles like BluFi, SPP-like, etc
- · Bluetooth Low Energy (Bluetooth LE) connects to smart phones, broadcasting low-energy beacons for easy detection
- · Sleep current is less than 5 µA, making it suitable for battery-powered and wearable-electronics applications
- · Peripherals include capacitive touch sensors, Hall sensor, SD card interface, Ethernet, high-speed SPI, UART, I2S and I2C

SoC	Buy	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Development Board	Fo
ESP32-DOWD-V3		Dual Core	QFN 5×5	48	520 KB SRAM 448 KB ROM 16 KB RTC SRAM	N/A	N/A	ESP32-WROOM-32E ESP32-WROOM-32UE ESP32-WROOM-DA ESP32-WROVER-E ESP32-WROVER-IE ESP32-DU1906 ESP32-DU1906-U	ESP32-DevKitC ESP-WROVER-KIT ESP32-LyraT ESP32-LyraT-Mini ESP32-LyraTD-MSC ESP32-LyraTD-SYNA ESP32-Vaquita-DSPG ESP32-Korvo ESP32-Ethernet-Kit ESP32-Korvo-DU1906	(↑



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Hardware > Product Overview > SoCsupport Ecosystem Company Contact ESP32-H Series ESP32-P Series ESP32-S Series ESP32-C Series ESP32 Series ESP8266 Series 520 KB SRAM **Dual Core** ESP32-MINI-1 448 KB ROM (PCN-2021-021) QFN 5×5 48 4 N/A ESP32-DevKitM-1 16 KB RTC ESP32-MINI-1U (PCN-2021-021) ESP32-U4WDH SRAM 448 KB ROM 520 KB SRAM Dual core LGA 7×7 48 N/A ESP32-PICO-V3-ZERO ESP32-PICO-V3-ZERO-DevKit 16 KB RTC ESP32-PICO-V3 SRAM 448 KB ROM 520 KB SRAM ESP32-PICO-MINI-02 Dual Core LGA 7×7 48 ESP32-PICO-DevKitM-2 16 KB RTC ESP32-PICO-MINI-02U ESP32-PICO-V3-02 SRAM 448 KB ROM 520 KB SRAM Dual Core LGA 7×7 48 4 N/A N/A ESP32-PICO-KIT 16 KB RTC ESP32-PICO-D4 SRAM ESP32-WROOM-32D 520 KB SRAM ESP32-WROOM-32U ESP32-DevKitC 448 KB ROM ESP32-WROOM-32SE Dual core QFN 5×5 48 N/A N/A **FSP-WROVFR-KIT** ESP32-DOWD 16 KB RTC ESP32-WROVER-B ESP32-LyraTD-DSPG Not recommended for SRAM new designs → ESP32-WROVER-IB ESP32-DOWD-V3 / ESP32-U4WDH 520 KB SRAM 448 KB ROM Dual Core QFN 6×6 48 N/A N/A N/A N/A ESP32-DOWDQ6-V3 16 KB RTC Not recommended for SRAM new designs → ESP32-DOWD-V3 / ESP32-U4WDH 520 KB SRAM 448 KB ROM QEN 6×6 48 Ν/Δ N/A ESP32-WROOM-32 ESP32-DevKitC Dual core ESP32-DOWDQ6 16 KB RTC Not recommended for SRAM new designs ∃ ESP32-DOWD-V3 / ESP32-U4WDH 520 KB SRAM 448 KB ROM Single core QFN 5×5 48 N/A N/A ESP32-SOLO-1 ESP32-DevKitC ESP32-SOWD 16 KB RTC Not recommended for SRAM new designs →
ESP32-DOWD-V3 /
ESP32-U4WDH



ESP8266 Series





ESP32 Series

ESP8266 Series



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ESP32-P Series ESP32-S Series ESP32-C Series

- · +19.5 dBm output power ensures a good physical range
- · Sleep current is less than 20 μA, making it suitable for battery-powered and wearable-electronics applications
- · Peripherals include UART, GPIO, I2C, I2S, SDIO, PWM, ADC and SPI

SoC	Buy	Variants	Core	Dimensions (mm)	Pins	RAM/ROM (KB)	Flash (MB)	PSRAM (MB)	Module	Develop
ESP8266EX Recommended upgrade → ESP8684		N/A	Single core	QFN 5×5	32	160 KB RAM	N/A	N/A	ESP-WROOM-02D ESP-WROOM-02U ESP-WROOM-02 ESP-WROOM-S2	ESP82 ESP
SP8285 ESP8285 Recommended upgrade → ESP8684		ESP8285N08 ESP8285H16	Single core	QFN 5×5	32	160 KB RAM	1 2	N/A	N/A	



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