ESP-32S Wifi Bluetooth Combo Module

SKU 114990772

Xtensa® 32-bit LX6 Dua-core processor, up to 600 DMIPS

448 KByte ROM, 520 KByte SRAM

SDK Firmware for on-line programming

ESP32-S Wifi Bluetooth Combo Module has no difference with ESP3212 Wifi Bluetooth Combo Module, ESP3212 is replaced with ESP-32S.

ESP-32S Wifi Bluetooth combo module is ultra high performance and ultra low-power consumption Wi-Fi and Bluetooth combo wireless platform based on ESPRESSIF ESP32 chipset. ESP-32S integrates dual-core processor, 448 KByte ROM,520 KByte SRAM,16 KByte SRAM in RTC, 802.11 b/g/n/e/I Wi-Fi, Bluetooth v4.2 BR/EDR & BLE, clocks & Times, abundant peripheral Interfaces and sercurity mechanism.

ESP-32S Wifi Bluetooth combo module provides SDK Firmware for fast on-line programming and open source toolchains based on GCC for development support. It is designed for Generic low power IoT sensor hub, loggers, video steaming for camera, Wi-Fi & Bluetooth enabled devices, Home automation and mesh network applications, aimed at makers, hardware engineers, software engineers and solution provides.

Introduce ESP32

ESP32 is a single chip 2.4 GHz Wi-Fi and Bluetooth combo chip designed with TSMC ultra low power 40 nm technology. It is designed and optimized for the best power performance, RF performance, robustness, versatility, features and reliability, for a wide variety of applications, and different power profiles.

ESP32 is the most integrated solution for Wi-Fi + Bluetooth applications in the industry with less than 10 external components. ESP32 integrates the antenna switch, RF balun, power amplifier, low noise receive amplifier, filters, and power management modules. As such, the entire solution occupies minimal Printed Circuit Board (PCB) area.

ESP32 is designed for mobile, wearable electronics, and Internet of Things (IoT) applications. It has many features of the state-of-the-art low power chips, including fine resolution clock gating, power modes, and dynamic power scaling.
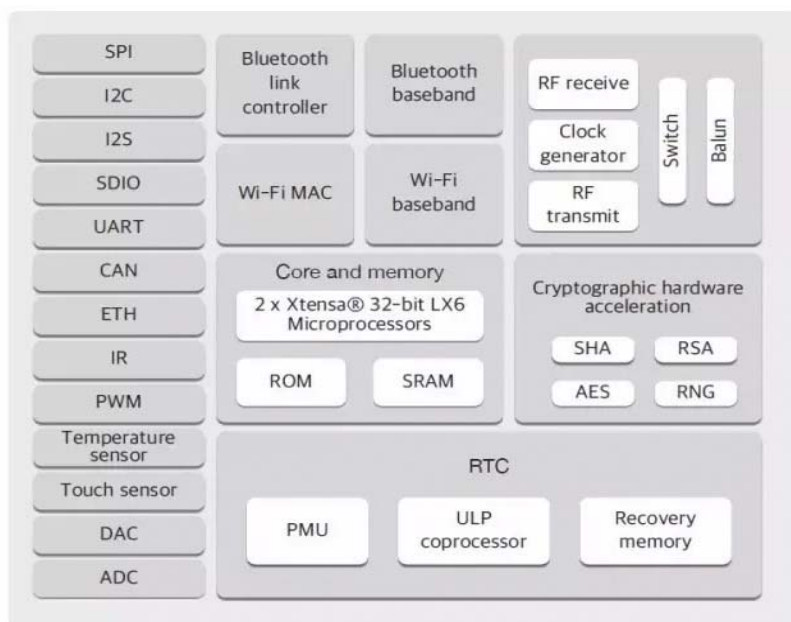
Key Features

CPU and Memory: Xtensa® 32-bit LX6 Dua-core processor, up to 600 DMIPS.

448 KByte ROM

520 KByte SRAM

16 KByte SRAM in RTC.

QSPI can connect up to 4* Flash/SRAM, each flash should be less than 16 Mbytes.

Supply Voltage: 2.2V~3.6V

Wifi:

802.11 b/g/n/e/i

802.11 n (2.4 GHz), up to 150 Mbps

802.11 e: QoS for wireless multimedia technology.

WMM-PS, UAPSD

MPDU and A-MSDU aggregation

Block ACK

Fragmentation and defragmentation

Automatic Beacon monitoring/scanning

802.11 i security features: pre-authentication and TSN

Wi-Fi Protected Access (WPA)/WPA2/WPA2-Enterprise/Wi-Fi Protected Setup (WPS)

Infrastructure BSS Station mode/SoftAP mode

Wi-Fi Direct (P2P), P2P Discovery, P2P Group Owner mode and P2P Power Management

UMA compliant and certified

Antenna diversity and selection

Bluetooth:

Compliant with Bluetooth v4.2 BR/EDR and BLE specification

Class-1, class-2 and class-3 transmitter without external power amplifier

Enhanced power control

+10 dBm transmitting power

NZIF receiver with -98 dBm sensitivity

Adaptive Frequency Hopping (AFH)

Standard HCI based on SDIO/SPI/UART ? High speed UART HCI, up to 4 Mbps

BT 4.2 controller and host stack
Service Discover Protocol (SDP)
General Access Profile (GAP)
Security Manage Protocol (SMP)
Bluetooth Low Energy (BLE)
ATT/GATT
HID
All GATT-based profile supported
SPP-Like GATT-based profile
BLE Beacon
A2DP/AVRCP/SPP, HSP/HFP, RFCOMM
CVSD and SBC for audio codec
Bluetooth Piconet and Scatternet

Clocks and Timers

Internal 8 MHz oscillator with calibration
Internal RC oscillator with calibration
External 2 MHz to 40 MHz crystal oscillator
External 32 kHz crystal oscillator for RTC with calibration
Two timer groups, including 2 x 64-bit timers and 1 x main watchdog in each group
RTC watchdog

Peripheral Interface:

12-bit SAR ADC up to 18 channels
2 × 8-bit D/A converters
10 × touch sensors
Temperature sensor
4 × SPI, 2 × I2S, 2 × I2C, 3 × UART
1 host (SD/eMMC/SDIO), 1 slave (SDIO/SPI)
Ethernet MAC interface with dedicated DMA and IEEE 1588 suppor
CAN 2.0
IR (TX/RX)
Motor PWM, LED PWM up to 16 channels
Hall sensor
Ultra low power analog pre-amplifier

Security

IEEE 802.11 standard security features all supported, including WFA, WPA/WPA2 and WAPI

Secure boot

Flash encryption

1024-bit OTP, up to 768-bit for customers

Cryptographic hardware acceleration: -AES-HASH(SHA-2) library-RSA-ECC-Random Number Generator (RNG)

Development Support

SDK Firmware for fast on-line programming

Open source toolchains based on GCC

Application

Generic low power IoT sensor hub

Generic low power IoT loggers

Video streaming from camera

Over The Top (OTT) devices

Music players - Internet music players - Audio streaming devices

Wi-Fi enabled toys - Loggers - Proximity sensing toys

Wi-Fi enabled speech recognition devices

Audio headsets

Smart power plugs
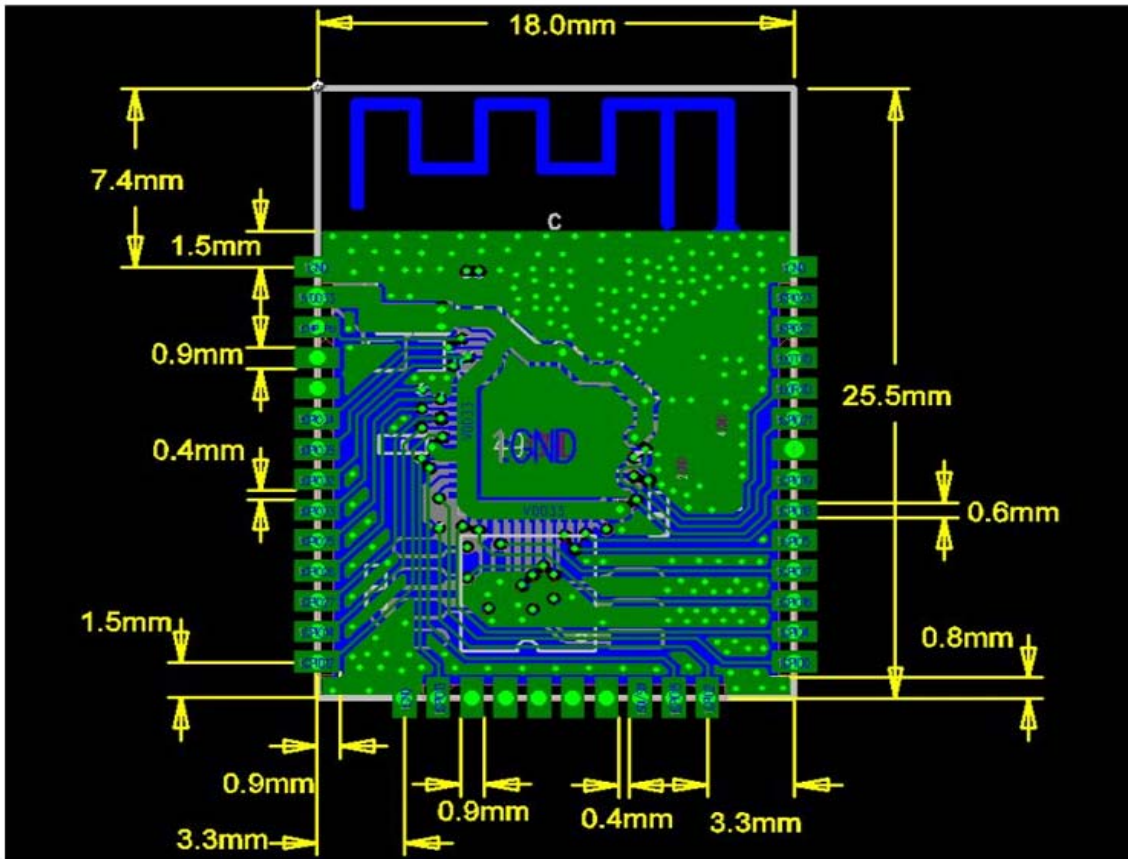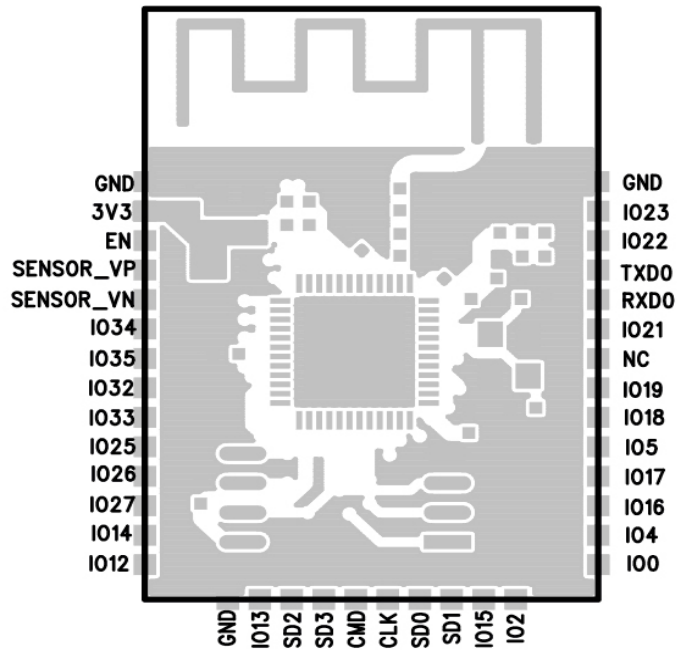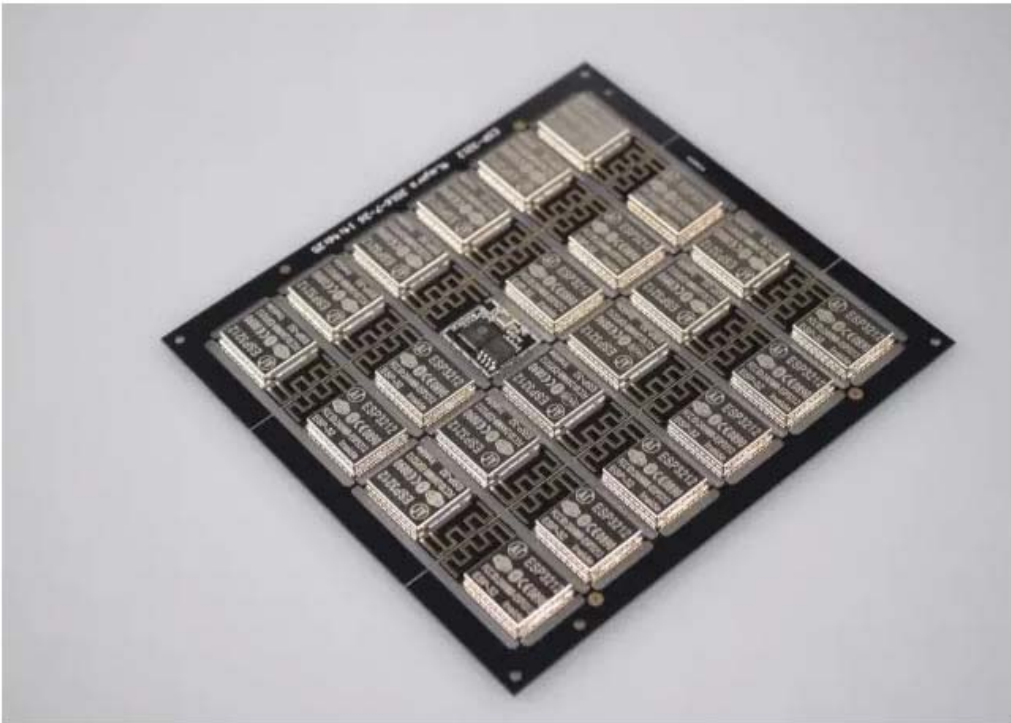
Home automation

Mesh network

Specs:

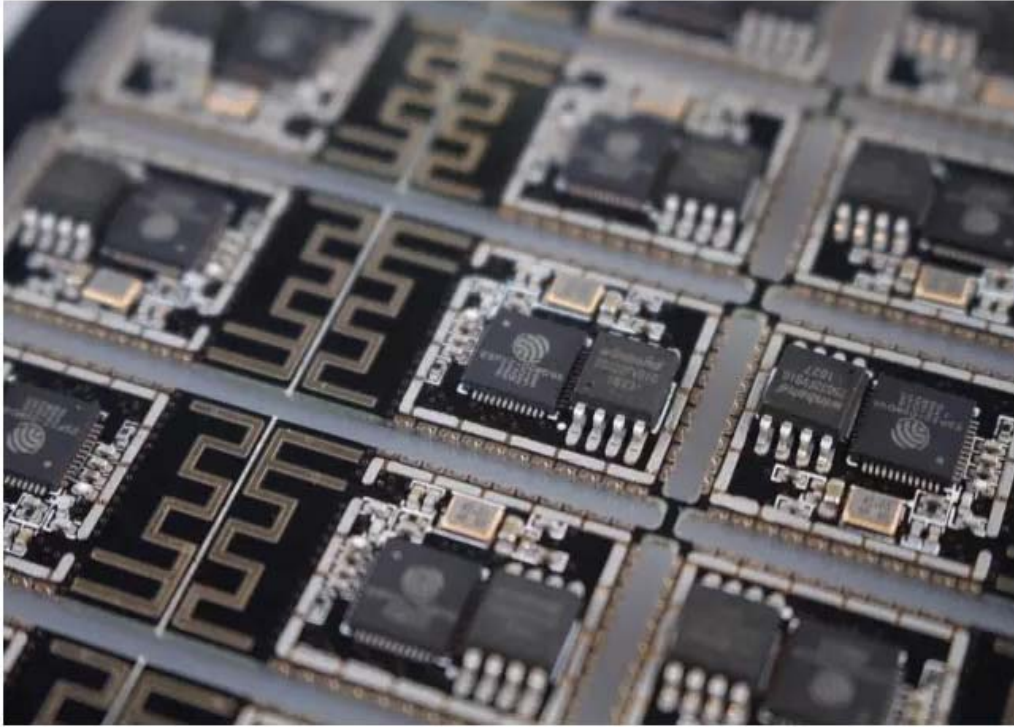| Category	Feature	Spec
Wireless Parameters	Certifications	FCC/CE coming soon
	Wireless Standard	802.11 b/g/n/e/i Bluetooth 4.2（BR/EDR/BLE）
	Frequency	2.4GHz-2.5GHz （2400M-2483.5M）
Hardware Parameters	Data Interface	UART/SPI/I2C/I2S/IR/CAN GPIO/PWM
	Working Voltage	3.0~3.6V
	Working Current	Average：90mA
	Working Temperature	-40°~125°
	Storage Temperature	normal temperature
	Size	16mm * 24mm * 3mm
Software Parameter	Wireless Network Model	Station/SoftAP/SoftAP+station
	Security	WFA、WPA/WPA2,WAPI
	Encryption Type	WEP/TKIP/AES
	Update Firmware	Local Serial Download / OTA / Host Download Burn
	Software Development	Support customized servers Provide SDK for secondary development
	Network Protocol	IPv4，TCP/UDP/HTTP/FTP
	User Configuration	AT+ instructions, cloud server, Android/iOS APP

Size:

The size of ESP-32S Wifi module is 18mm x 25mm x 3mm.

The ESP-32S deploys 4MB SPI Flash with WSOP－8 package. It also uses 3DBi PCB antenna on board.

GND   GND
3V3   IO23
EN   IO22
SENSOR_VP   TXD0
SENSOR_VN   RXD0
IO34   IO21
IO35   NC
IO32   IO19
IO33   IO18
IO25   IO5
IO26   IO17
IO27   IO16
IO14   IO4
IO12   IO0

GND IO13 SD2 SD3 CMD CLK SD0 SD1 IO15 IO2

PART LIST

- 1x ESP-32S Wifi Bluetooth Combo Module