



**Osmartlink
Technology**

— 零距离 · 智生活 —



OSL-ESP8266M4

Datasheet

2.4GHz Wi-Fi/IOT Module



1. Production Overview

The OSL-ESP8266M4 Wi-Fi Module is designed by Osmartlink Technology Co., Ltd. The module's MCU ESP8266 integrates the industry-leading Tensilica L106 32-bit MCU and ultra-low-power 16-bit RSIC in the smaller size package. The CPU clock speed is 80MHz. It can also reach a maximum value of 160MHz. Real Time Operation System (RTOS) is enabled. And it integrates Wi-Fi MAC/BB/RF/PA/LNA and On-board antenna.

The module supports standard IEEE802.11b/g/n protocol and integrated TCP/IP stack. The module can be used to add networking function, and it also can be used to build an independent network controller.

Application Area :

- Smart Socket
- Smart Lamp
- Infrared Partner
- Smart Home

Main Features

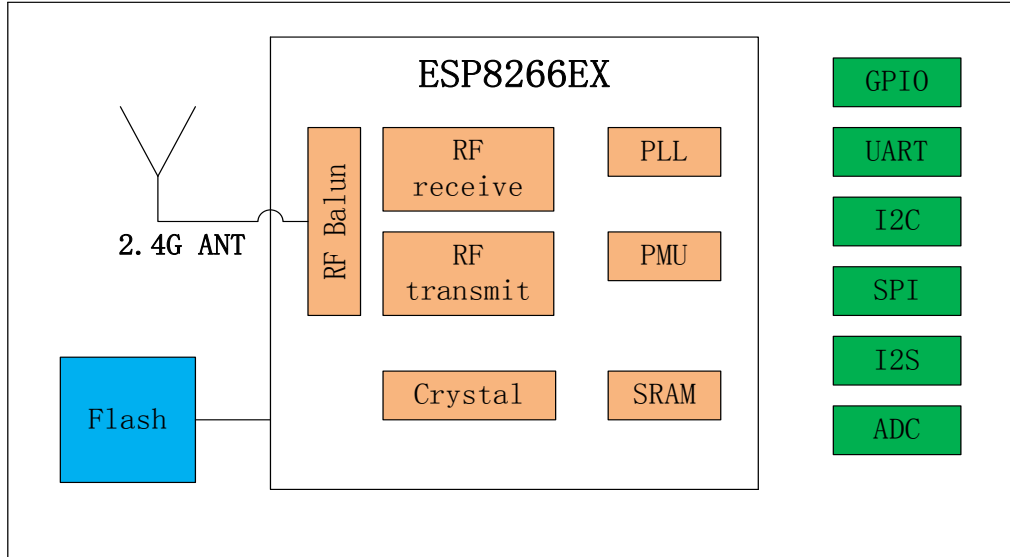
- Integrates Tensilica L106 32-bit micro controller (MCU) and ultra-low-power 16-bit RSIC. The CPU clock speed is 80MHz. It can also reach a maximum value of 160 MHz, Real Time Operation System (RTOS) is enabled
- 802.11 b/g/n support , integrates TCP/IP stack
- STA/AP/STA+AP support
- Integrates 10-bit ADC
- Integrates TR switch, balun, LNA, power amplifier and network
- Integrates PLL, voltage regulator and power management components , output power reach to +20 dBm in 802.11b mode
- WiFi @ 2.4 GHz , support WPA/WPA2 Security mode
- Support AT remote upgrade and cloud OTA upgrade
- Support Smart Config function (include Android and iOS)
- HSPI , UART, I2C, I2S, IR Remote Control, PWM, GPIO
- The current is 10uA in Deep sleep mode, and the current is less than 10uA in Off mode
- It can be waked up, connect and transmit packet in 2 ms
- The standby power consumption is less than 1.0 mW (DTIM3)
- Operation Temperature Range : -40°C- 125°C



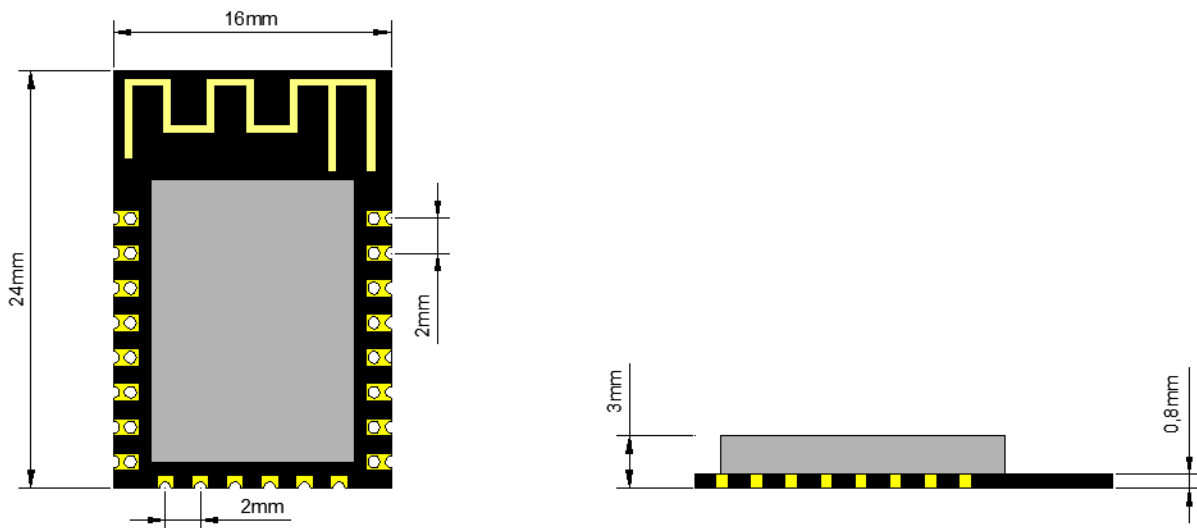
| Item | Parameters | Description |
|----------|-----------------------|---|
| Wi-Fi | Wireless Standards | IEEE 802.11 b/g/n |
| | Frequency Range | 2.4GHz-2.5GHz (2400M-2483.5M) |
| | Tx Power | 802.11b : +20dBm 802.11g : +19dBm 802.11n : +17dBm |
| | Receive Sensitivity | 802.11b : -91dBm (11Mbps) 802.11g : -75dBm (54Mbps) 802.11n : -72dBm (MCS7) |
| | Antenna | PCB On-board antenna |
| HardWare | CPU | Tensilica L106 32 bit MicroController |
| | Flash | 4Mbyte SPI |
| | Peripheral Interface | UART/HSPI/I2C/I2S/Ir Remote Control/ GPIO/PWM |
| | Operating Voltage | 3.0~3.6V (Typical Value3.3V) |
| | Operating Current | Average Value : 80mA |
| | Operating Temperature | -40°C~85°C |
| | Package | 24*16*3mm |
| SoftWare | Wi-Fi Mode | Station/SoftAP/SoftAP+Station |
| | Security | WPA/WPA2 |
| | Encryption Type | WEP/TKIP/AES |
| | Update Firmware | Local Serial / OTA |
| | Software Development | Provide SDK for secondary development |
| | Networking Protocol | IPv4, TCP/UDP/HTTP/FTP/MQTT |
| | User Configuration | AT+ Instruction, Cloud Corne, Android/iOS APP |



2. Functional Diagram



3. Package



Front View

Side View



4. Power Dissipation

| Item | Min | Typical | MAx |
|--|-----|---------|-----|
| TX : 802.11b , CCK 11Mbps , +17dBm | - | 170 mA | - |
| TX : 802.11g , OFDM 54Mbps , +15dBm | - | 140 mA | - |
| TX : 802.11n , MCS7 , +13dBm | - | 120 mA | - |
| RX : 802.11b , Packet Size 1024Byte , -80dBm | - | 50 mA | - |
| RX : 802.11g , Packet Size 1024Byte , -70dBm | - | 56 mA | - |
| RX : 802.11n , Packet Size 1024Byte , -65dBm | - | 56 mA | - |
| Modem-Sleep | - | 15 mA | - |
| Light-Sleep | - | 0.9 mA | - |
| Deep-Sleep | | 20 uA | |
| Power Off | - | 0.5 uA | - |

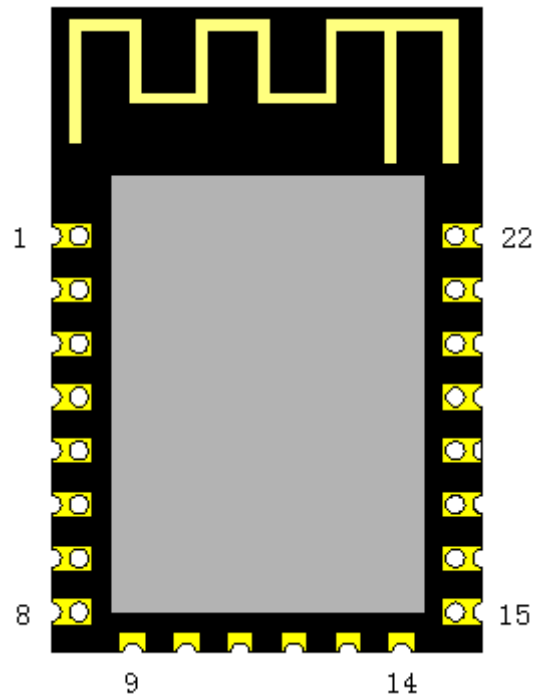
Modem-Sleep : Used for scenarios where the CPU has been working, such as the application of PWM or I2S applications. When maintaining a Wi-Fi connection, if there is no data transfer, the Wi-Fi Modem circuit can be turned off to save electricity based on 802.11 standards (such as u-apsd). For example, at DTIM3, keep the sleep 300ms, wake up 3ms and wake up to receive the AP's Beacon package, the current is about 15mA.

Light-Sleep : Applications for cpus, such as Wi-Fi switches. When maintaining a Wi-Fi connection, if there is no data transfer, you can turn off the Wi-Fi Modem circuit and stop the CPU to save power according to the 802.11 standard (such as U-APSD). For example, at DTIM3, a sleep 300ms is maintained, and a Beacon packet that wakes up to receive an AP from every 3ms is about 0.9 mA.

Deep-Sleep : Applied to does not need to always keep a Wi-Fi connection scenario, the application of a long time to send a packet (e.g., every 100 seconds measure time temperature sensor), per 300s we wake up to 0.1s-1s connected to the AP, the overall average current can be far less than 1mA.



5. Pin Function Definition

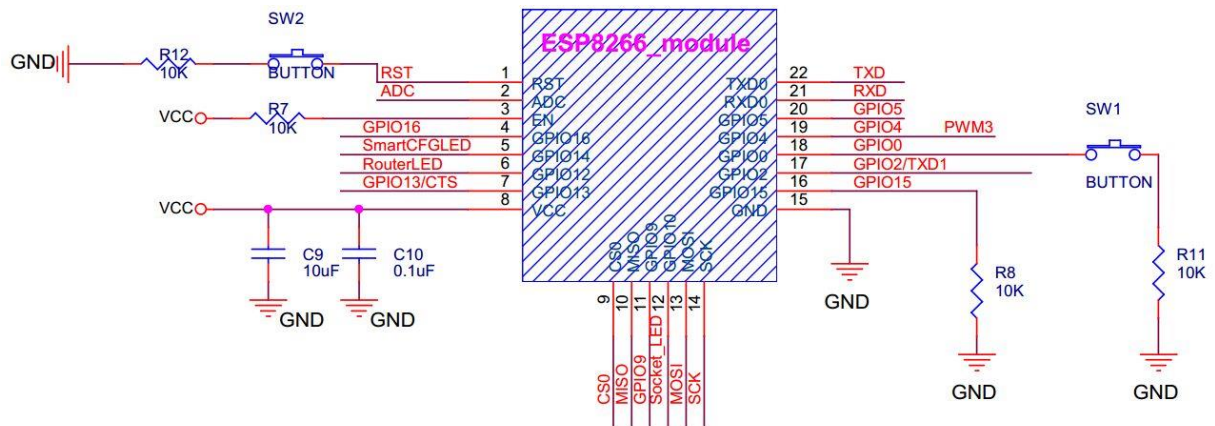


| NO | PIN | Function Description |
|----|------|---|
| 1 | RST | Reset |
| 2 | ADC | A/D Converting Results.Input Voltage Range :0 ~ 1V ,Data Range : 0 ~ 1024 |
| 3 | EN | Chip Enables, The high level is effective |
| 4 | IO16 | GPIO16; Deep sleep can be awakened when receiving RST pipe feet |
| 5 | IO14 | GPIO14; HSPI_CLK |
| 6 | IO12 | GPIO12; HSPI_MISO |
| 7 | IO13 | GPIO13; HSPI_MOSI; UART0_CTS |
| 8 | VCC | 3.3V Power Supply |
| 9 | CS0 | Chip select |
| 10 | MISO | Slave Output/Master Input |
| 11 | IO9 | GPIO9 |
| 12 | IO10 | GPIO10 |
| 13 | MOSI | Slave Input/Master Output |



| | | |
|----|------|---------------------------------|
| 14 | SCLK | Clock |
| 15 | GND | GND |
| 16 | IO15 | GPIO15; MTDO; HSPIC5; UART0_RTS |
| 17 | IO2 | GPIO2; UART1_TXD |
| 18 | IO0 | GPIO0 |
| 19 | IO4 | GPIO4 |
| 20 | IO5 | GPIO5 |
| 21 | RXD | UART0_RXD; GPIO3 |
| 22 | TXD | UART0_TXD; GPIO1 |

6. Typical Application Diagram



FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following

measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:

"Contains Transmitter Module FCC ID: 2AMPSOSL-ESP8266M4Or ContainsFCC ID: 2AMPSOSL-ESP8266M4"

when the module is installed inside another device, the user manual of this device must contain below warning statements;

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product