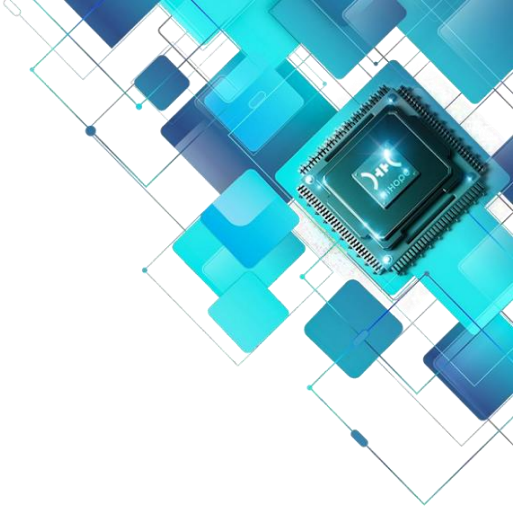
HOPERUN Information Technology 潤和軟件



HH-M01 NearLink Module

Product manual

Document version: 02

Release date: 2024/12/12

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1 Overview

Figure 1-1 HH-M01 NearLink Module

HopeRun HH-M01 module is based on HiSilicon NearLink WS63 solution. It is a highly integrated 2.4GHz Wi-Fi, BLE and SLE SoC module that supports 802.11b/g/n/ax protocol and BLE5.3 protocol, BLE Mesh and BLE gateway functions, supports SLE1.0 protocol, and supports SLE gateway function. Supports Oniro lightweight system and is widely used in IoT smart terminal fields such as smart home appliances.

2 Product Highlights

● **Flexible networking capabilities, supporting three networking methods: Wi-Fi/BLE/SLE**

✧ Wi-Fi: Supports various data rates of the IEEE 802.11b/g/n protocol, supports MCSO~MCS9 rates of the IEEE802.11ax protocol

✧ BLE: supports BLE1MHz/2MHz bandwidth, supports BLE4.0/4.1/4.2/5.0/5.1/5.2/5.3 protocol, supports BLE Mesh and BLE gateway functions, maximum air interface rate 2Mbps

✧ SLE: supports SLE1MHz/2MHz/4MHz bandwidth, supports SLE1.0 protocol, supports SLE gateway function, maximum air interface rate 4Mbps

● **Rich digital interface**

✧ Built-in SPI, QSPI, IC, I2S, UART, GPIO, etc.

● **Powerful security engine**

✧ Hardware implementation of AES128/256 encryption and decryption algorithm

✧ Hardware implementation of HASH-SHA256 and HMAC_SHA256 algorithms

✧ Hardware implementation of RSA and ECC signature verification algorithms

✧ Hardware implements true random number generation, meeting FIPS140-2 random testing standards

✧ Hardware supports TLS/DTLS acceleration

✧ Hardware supports national secret algorithms SM2, SM3, SM4

✧ Internally integrated EFUSE, supporting secure storage, secure boot, and hardware ID

✧ Internally integrated MPU features support memory isolation features

- **Open operating system**

✧ Open operating system Oniro provides an open, efficient and secure system development and operating environment

✧ Rich low power consumption, small memory, high stability, high real-time mechanism

✧ Flexible protocol support and expansion capabilities

✧ Secondary development interface

✧ Multi-level development interface: operating system adaptation interface and system diagnostic interface, link layer interface, network layer interface

3 Technical parameters

Table 3-1 HH-M01 NearLink module technical parameters

Module	Technical parameters
Wi-Fi	● 1×1 2.4GHz frequency band (ch1～ch14) ● PHY supports IEEE 802.11b/g/n/ax MAC supports IEEE 802.11d/e/i/k/v/w ● Support 802.11n 20MHz/40MHz bandwidth, support 802.11ax 20MHz bandwidth ● Supported maximum rate: 150Mbps@HT40 MCS7, 114.7Mbps@HE20 MCS9 ● Built-in PA and LNA, integrated TX/RX Switch, Balun, etc. ● Supports STA and AP forms. When used as an AP, it supports up to 6 STAs. ● Support A-MPDU, A-MSDU ● Support Block-ACK ● Support QoS to meet different business service quality requirements ● Support WPA/WPA2/WPA3 personal, WPS2.0 ● Supports RF self-calibration scheme ● Supports STBC and LDPC
Bluetooth	● Bluetooth Low Energy (BLE) ● Support BLE 4.0/4.1/4.2/5.0/5.1/5.2 ● Supports 125Kbps, 500Kbps, 1Mbps, 2Mbps rates ● Support multicast ● Support Class 1 ● Support high power 20dBm ● Support BLE Mesh, support BLE gateway
NearLink	● Sparklink Low Energy (SLE) ● Support SLE 1.0

	● Support SLE 1MHz/2MHz/4MHz, maximum air interface rate 12Mbps ● Supports Polar channel coding ● Support SLE gateway
CPU subsystem	● High-performance 32bit microprocessor, maximum operating frequency 240MHz ● Embedded SRAM 606KB, ROM 300KB ● Embedded 4MB Flash
Peripheral interface	● 1 SPI interface, 1 QSPI interface, 2 I2C interfaces, 1 I2S interface, 3 UART interfaces, 19 GPIO interfaces, 6 ADC inputs, 8 PWM (Note: the above interfaces are implemented through multiplexing) ● External crystal clock frequency 24MHz, 40MHz
Other information	● Power supply voltage input: typical 3.3V/5V ● The IO power supply voltage supports 3.3V, and supports 5V when connected to an external MCU and debugged UART. ● Package: QFN-40, 12mmx12mmx3mm ● Working temperature:: 40°C~+85°C

4 Packing list

Table 4-1 Packing list

serial number	content	quantity
1	HH-M01 NearLink Module	1