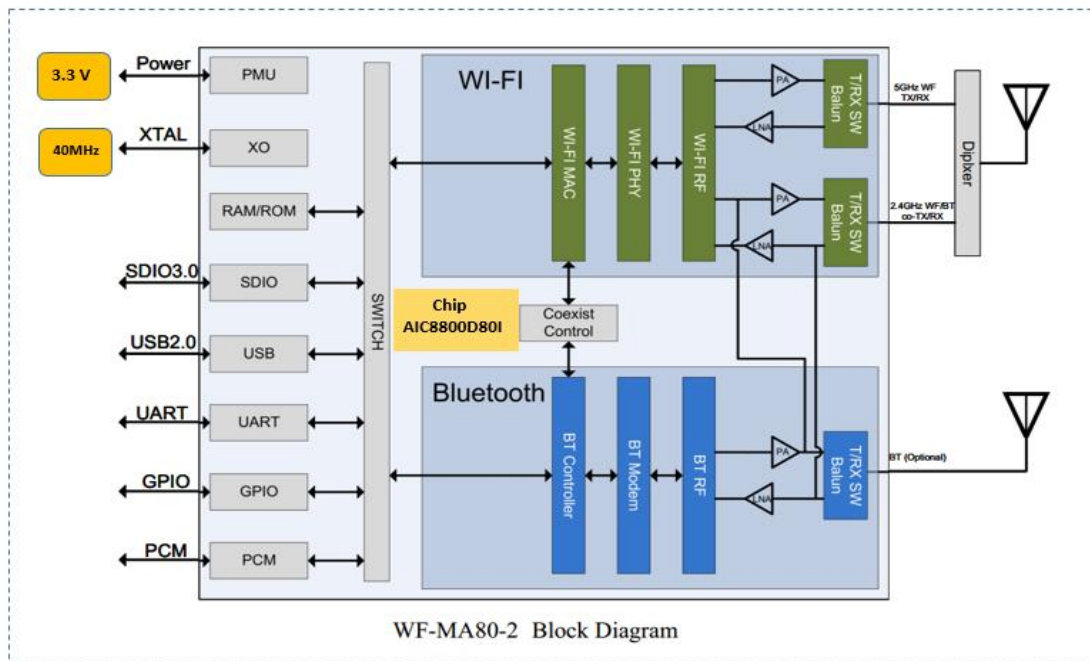


WF-MA80-FY3 Block Diagram



Operational Description:

Shinwa WF-MA80-FY3 module integrates the functions of WiFi6 and BT5.4. It uses a 56 pin 17mm * 17mm * 2.4mm QFN (P) package, the main chip adopts automotive grade (AEC-Q100) chips, designed specifically to meet customers' small size and low cost needs. This module can meet the requirements of wireless connectivity and entertainment devices. The WLAN/BT function supports USB 2.0/SDIO 3.0 interfaces, and the BT function supports UART interfaces, complying with the IEEE 802.11 a/b/g/n/ac/ax standard protocol requirements. This module can be used for other smart devices such as dash cams, smart speakers, set-top boxes, game consoles, printers, IP cameras, etc.

功能特征 (Function Character)

支持 SDIO/USB2.0/UART/PCM 接口

Supports SDIO/ USB2.0/UART/PCM interface

集成低功耗定时器和看门狗

Integrated low power timer and watchdog

WLAN 特点 (WLAN Features)

CMOS 单芯片完全集成 RF、Modem 和 MAC

CMOS single-chip fully-integrated RF, Modem and MAC

支持 2.4GHz/5GHz Wi-Fi6

Support 2.4GHz/5GHz Wi-Fi6

20/40/80MHz 带宽下的理论速率高达 600.4Mbps

Theoretical rates up to 600.4Mbps at 20/40/80 MHz bandwidth

支持 5MHz/10MHz 模式

Support 5MHz/10MHz mode

同时支持 STA、AP、Wi-Fi Direct 模式

Support STA, AP, Wi-Fi Direct mode concurrently

支持 STBC、波束赋形

Support STBC, beamforming

支持 Wi-Fi6 TWT

Support Wi-Fi6 TWT

支持两个 NAV、缓冲区报告、空间复用、多 BSSID、PPDU 内电源

Support two NAV, buffer report, space reuse, Multi-BSSID, intra-PPDU power

支持 LDPC

Support LDPC

支持 DCM、Mid-amble、UORA

Support DCM, Mid-amble, UORA

支持 WEP/WPA/WPA2/WPA3-SAE 个人、多功能一体机

Support WEP / WPA / WPA2 / WPA3-SAE Personal, MFP

BT 特点 (BT Features)

支持蓝牙 5.4 的所有强制和可选功能

Supports all the mandatory and optional features of Bluetooth5.4

支持先进的主从拓扑

Supports advanced master and slave topologies

FCC Statement

FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247 , FCC CFR Title 47 Part 15 Subpart E Section 15.407

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.

Any 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

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.

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: ZWYMA80X

When the module is installed inside another device, the user manual of the host 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.

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.

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.

Any company of the host device which install the modular with modular approval should perform the test of radiated & conducted emission and spurious emission, etc. according to FCC part 15C :

15.247 and 15.209 & 15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, then the host can be sold legally.

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

"To comply with FCC RF exposure compliance requirements, this grant is applicable to only Mobile Configurations. The antennas used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

The OEM must certify the final end product to comply with unintentional radiators (FCC Sections 15.107 and 15.109) before declaring compliance of the final product to Part 15 of the

FCC rules and regulations. Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change.

The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: "Contains transmitter module FCC ID: ZWYMA80X" Additionally, the following statement should be included on the label and in the final product's user manual:

"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 interferences, and (2) this device must accept any interference received, including interference that may cause undesired operation." The

module is limited to installation in applications. Separate approval is required for all other operating configurations, including portable configuration with respect to Part 2.1093

and different antenna configurations. A module or modules can only be used without additional authorizations if they have been tested and granted under the same intended end - use

operational conditions, including simultaneous transmission operations. When they have not been tested and granted in this manner, additional testing and/or FCC application filing

may be required. The most straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of at least one of the modules

submit a permissive change application. When having a module grantee file a permissive change is not practical or feasible, the following guidance provides some additional options

for host manufacturers. Integrations using modules where additional testing and/or FCC application filing(s) may be required are: (A) a module used in devices requiring additional RF

exposure compliance information (e.g., MPE evaluation or SAR testing), (B) limited and/or split modules not meeting all of the module requirements, and (C) simultaneous

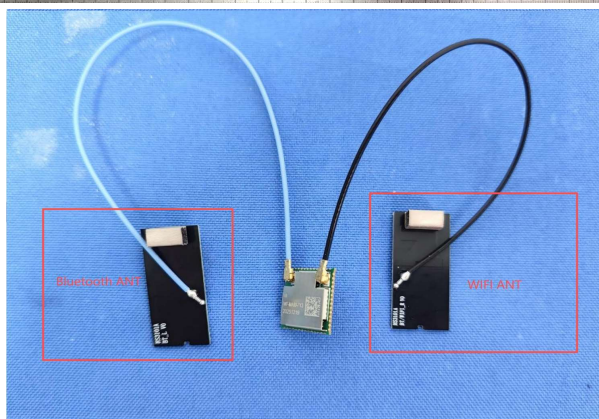
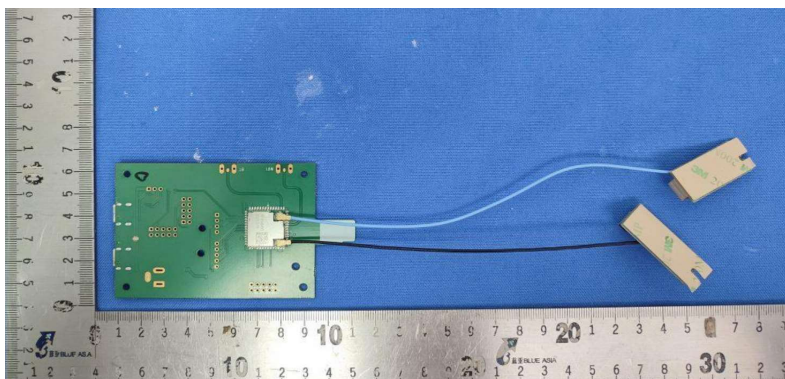
transmissions for independent collocated transmitters not previously granted together. This Module is full modular approval, it is limited to OEM installation ONLY. Integration into

devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change. (OEM) Integrator has to assure

compliance of the entire end product include the integrated Module. Additional measurements (15B) and/or equipment authorizations (e.g. Verification) may need to be addressed

depending on co-location or simultaneous transmission issues if applicable. (OEM) Integrator is reminded to assure that these installation instructions will not be made available to

the end user



BT antenna gain

Frequency (MHz)	BT-L(2.4G)		
	Efficiency (dB)	Efficiency (%)	MaxGain/dBi
2400	-5.64	27.29	-4.1
2410	-5.36	29.11	-3.54
2420	-4.55	35.08	-2.83
2430	-4.39	36.39	-2.36
2440	-3.64	43.25	-1.82
2450	-3.82	41.5	-1.19
2460	-3.58	43.85	-0.96
2470	-4.24	37.67	-0.4
2480	-4.61	34.59	0.07
2490	-5.42	28.71	0.36
2500	-6.04	24.89	0.32

WiFi antenna gain

Frequency (MHz)	BT/WIFI-R(2.4G)		
	Efficiency (dB)	Efficiency (%)	MaxGain/dBi
2400	-4.34	36.81	-1.4
2410	-3.82	41.5	-1.12
2420	-3.56	44.06	-0.29
2430	-3.33	46.4	0.03
2440	-3.23	47.52	0.45
2450	-3.13	48.61	0.99
2460	-3.03	49.83	0.36
2470	-3.17	48.23	0.8
2480	-3.21	47.75	0.21
2490	-3.56	44.06	0.39
2500	-4.39	36.39	-0.28

Frequency (MHz)	BT/WIFI-R(5G)		
	Efficiency (dB)	Efficiency (%)	MaxGain/dBi
5150	-3.37	45.98	4.53
5200	-4.11	38.81	3.62
5250	-4.33	36.91	2.72
5300	-3.67	42.95	3.77
5350	-3.04	49.66	4.34
5400	-3.35	46.2	4.12
5450	-3.74	42.23	4.12
5500	-3.78	41.89	3.28
5550	-3.13	48.64	3.66
5600	-3.48	44.87	3.71
5650	-3.66	43.05	3.06
5700	-3.4	45.7	2.61
5750	-3.34	46.39	3.31
5800	-3.28	46.95	4.02
5850	-3.59	43.76	3.52

天线厂家：佳邦科技股份有限公司

BT天线：248450012700-BT-L-天线， 天线Cable长193mm。

WiFi天线：1248450012800-BT/WIFI-R-天线， 天线Cable166mm。

Antenna manufacturer : Jibang Technology Co., Ltd .

BT antenna: 248450012700-BT-L-antenna, antenna Cable length 193mm.

WiFi antenna: 1248450012800-BT/WIFI-R-antenna, antenna Cable 166mm.