

EMC6069 Wi-Fi/BLE IoT Module

Datasheet

Built-in Wi-Fi 6 Combo SoC

2.4G Hz IEEE 802.11 b/g/n/ax, BLE 5.2, ultra-high integration, rich peripherals

Version: 1.1

Date: 2023-12-15

Number: DS0213EN

Abstract

- **Input: 3.0V~3.6V**
- **Operating temperature: -40°C to +85°C**
- **32-bit RISC-V MCU**
 - Main frequency up to 320MHz.
 - With double-precision floating point unit (FPU).
 - Provide memory protection unit (MPU).
 - UART supporting download and debugging.
- **Memory**
 - 512KB SRAM
 - 64KB ROM
 - 4MB XIP Flash
 - 32Byte eFuse
 - 8Kbit OTP
- **Wi-Fi**
 - IEEE 802.11 b/g/n/ax 1T1R .
 - Support 20/40MHz Channel bandwidth, 2.4GHz single frequency.
 - Transmitting power up to +18dBm, receiving sensitivity - 99dBm.
 - Support working mode : STA 、 AP 、 Direct , Concurrency AP+STA.
 - Support WPA/WPA2/WPA3.
 - Integrated BT/WLAN coexistence (PTA) .
- **Bluetooth**
 - Support BLE 5.2 Standard.
 - Support low power consumption (LE) 1 Mbps, 2 Mbps and long distance (125 kbps and 500 kbps)
 - Support Advertising Extension function.
 - Wi-Fi and BLE share the same PA and antenna, time-sharing multiplexing.
 - Support Bluetooth slave mode, which can be used for Bluetooth distribution network.

- **Rich Peripherals**

- 18 x GPIO
- 1 x SPI
- 10 x PWM
- 2 x UART



- **Interface and Size**

- Maintain pin compatibility with similar packaging modules.
- On-board PCB antenna or external antenna with IPEX connector.
- 18mm x 33mm, stamp hole

- **Rich supporting software**

- Support MXOS autonomous operating systems.
- Provide access SDK and AT instructions for major cloud platforms.
- Provide mass-produced firmware for various typical applications.

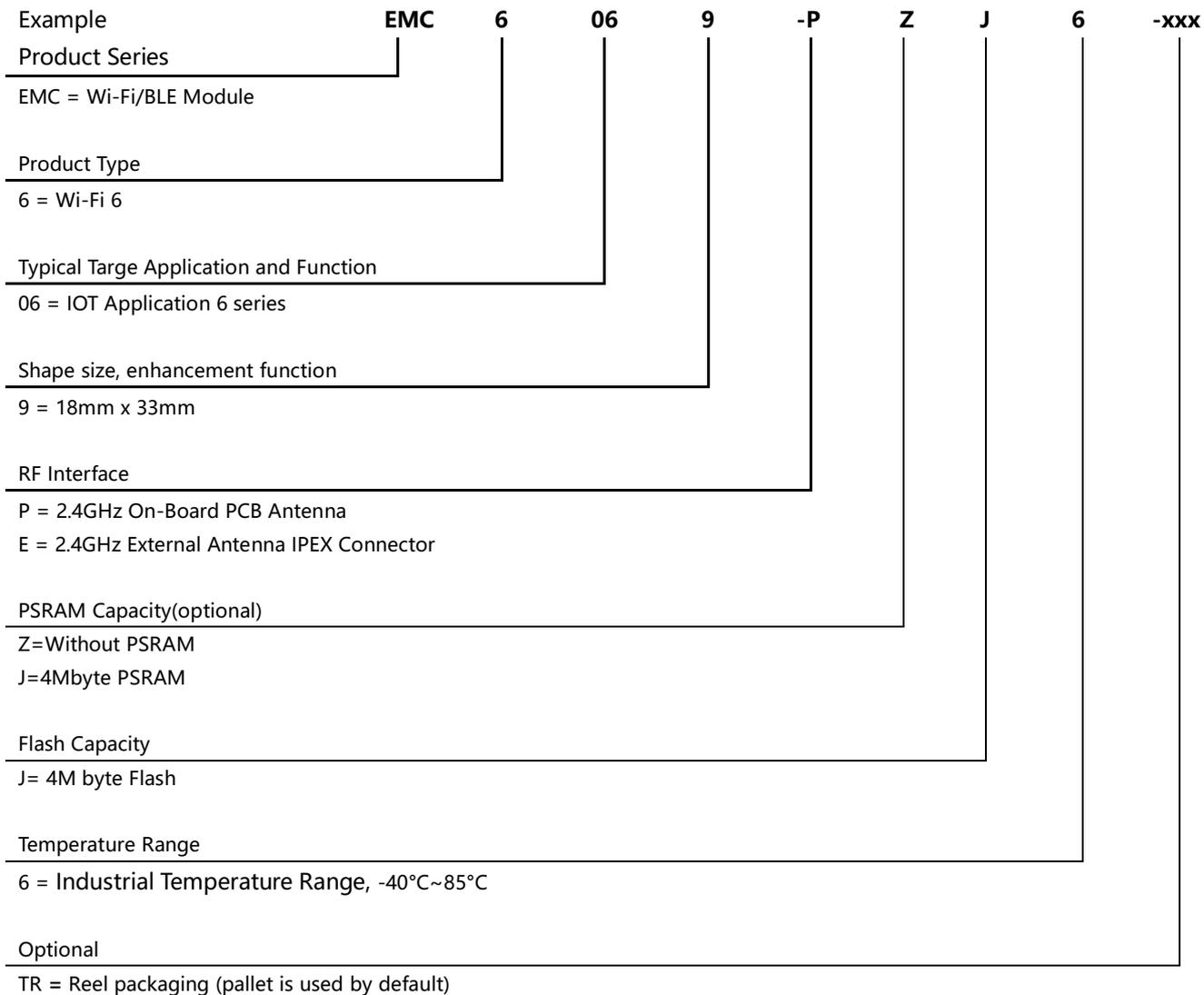
- **Typical Application**

- Smart appliances
- Intelligent electrician
- Industrial automation

- **Order code**

Code	Direction
EMC6069-PZJ6	On-Board PCB Antenna
EMC6069-EZJ6	External Antenna with IPEX connector
EMC6069-PZJ6-HF	On-Board PCB Antenna, no halogen

Order Code



For a list of all relevant features (such as packaging, minimum order quantity, etc.) and other information, please contact the nearest MXCHIP sales point and agent.

Parts

Order Code	Direction
MXKIT-Base	Development board motherboard, applicable to all EMC6069 modules.
MXKIT-Core-6069	The development board core board for EMC6069, including the EMC6069-P module. Used with MXKIT-Base.
FX-6069	EMC6069 production fixture, including accompanying plate: MXKIT-Base, MXKIT-Core-6069.

Version Update

Date	Version	Update
2023-01-28	0.1	Initial Version.
2023-04-12	0.2	Update pin definition. Update PCB antenna clearance diagram. Update typical application power. Update RF parameter.
2023-04-17	0.3	Update some descriptions.
2023-04-21	0.4	Update some electrical parameters.
2023-05-05	0.5	Update some power parameters.
2023-05-15	0.6	Add some power parameters and update some RF parameters.
2023-08-30	0.7	Add order code.
2023-10-20	0.8	Update module picture.
2023-10-31	0.9	Update label information and module picture.
2023-11-14	1.0	Update recommended packaging dimension diagram and label.
2023-12-15	1.1	Add warning comments. Delete block diagram.

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Datasheet lower than 1.0 are for reference only and may be modified before mass production.

Catalog

1. Introduction.....	3
2. Pin Definition.....	4
2.1. Pin Arrangement.....	4
2.2. Pin Definition	4
3. Electrical Parameters.....	6
3.1. Operation Voltage and Current.....	6
3.2. Typical Application Power.....	6
3.3. Temperature.....	7
3.4. Electrostatic discharge.....	7
3.5. RF Parameter.....	7
3.5.1. Wi-Fi RF Parameter	7
3.5.2. Bluetooth RF Parameter.....	9
4. Antenna Information	10
4.1. PCB Antenna Parameter and Usage	10
4.1.1. On-board PCB Antenna	10
4.1.2. PCB Antenna Clearance	10
4.2. External antenna parameters and use	10
5. General Assembly Size and PCB Package	12
5.1. General Assembly Size	12
5.2. Recommended Package Diagram.....	12
6. Radiation Exposure Statement	13
7. Production Guidelines.....	17
7.1. Precautions.....	18
7.2. Storage Condition	19
7.3. Secondary Reflux Temperature Curve	19
8. Warning.....	21
8.1. FCC Statement.....	21
8.2. ISED Statement.....	24
9. Label Information	26
10. Sales and Technical Support Information	27

Figure

Figure 1 Pin Arrangement	4
Figure 2 PCB Antenna Minimum Clearance (unit: mm)	10
Figure 3 Dimensions of copper tube antenna (unit: mm).....	11
Figure 4 Dimension Diagram of External Antenna Connector	11
Figure 5 General assembly dimension drawing (unit: mm, error ± 0.1 , external dimension error ± 0.2).....	12
Figure 6 Stamp hole package size (installation pad, unit: mm, error ± 0.1 , external dimension error ± 0.2)	12
Figure 7 Humidity Card	17
Figure 8 Storage Conditions Diagram.....	19
Figure 9 Reference Secondary Reflux Temperature Curve.....	20
Figure 10 Module Label Diagram	26

Table

Table 1 Pin Definition	4
Table 2 Operation Voltage and Current.....	6
Table 3 Typical Application Power	6
Table 4 Storage Temperature and operation temperature	7
Table 5 Electrostatic discharge.....	7
Table 6 RF Basic Parameter.....	7
Table 7 Output power	8
Table 8 Frequency error	8
Table 9 EVM	8
Table 10 Receiving sensitivity.	8
Table 11 Bluetooth TX/RX Characteristic.....	9
Table 12 PCB Antenna Parameter	10

1. Introduction

EMC6069 series modules are mainly used for data communication of the Internet of Things. The module realizes data acquisition and device control through rich peripheral interfaces. It can not only communicate directly with mobile devices through low-power Bluetooth, but also connect to the Internet of Things cloud service platform through Wi-Fi network connection to realize the interconnection of everything. This series of modules are applied to a wide range of Internet of Things applications through various external dimensions, interface forms, antenna interfaces and temperature ranges.

The EMC6069 module is built with an ultra-high integration Wi-Fi/BLE Combo SOC chip, providing the necessary computing power and stable Wi-Fi/BLE connectivity of IOT data terminals. The chip integrates:

- RISC-V architecture processor with main frequency up to 320MHz.
- 512K Byte SRAM.
- 4M Byte XIP Flash.
- 2.4GHz Wi-Fi controller conforming to IEEE 802.11 b/g/n/ax standard.
- Low-power Bluetooth controller conforming to BLE5.2 BQB specification.

EMC6069 module is powered by 3.3V single power supply and supports the stamp hole SMT installation mode, which is applicable to various smart home appliance application scenarios.

MXCHIP provides the MXOS software platform to support the development of the EMC6069 series modules, and provides an efficient development environment, access protocol stacks for major Internet of Things cloud services, rich sample programs and various typical applications.

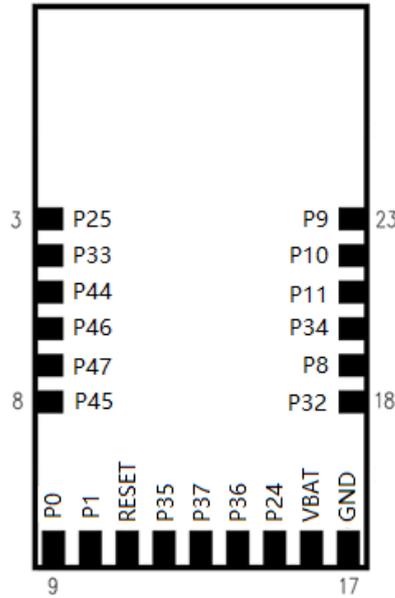
The following figure is the hardware block diagram of the EMC6069 module, mainly including:

- Wi-Fi microcontroller
- On-board or external antenna
- Power supply and communication interface
- Peripheral interface units

2. Pin Definition

2.1. Pin Arrangement

Figure 1 Pin Arrangement



2.2. Pin Definition

Table 1 Pin Definition

Pin No.	Name	I/O Type	Recommended Function
3	P25	I/O	PWM5
4	P33	I/O	PWM7
5	P44	I/O	SPI_SCK
6	P46	I/O	SPI_MOSI
7	P47	I/O	SPI_MISO
8	P45	I/O	SPI_CSN
9	P0	I/O	UART2_TXD, application UART
10	P1	I/O	UART2_RXD, application UART
11	RESET	I/O	RESET
12	P35	I/O	PWM9
13	P37	I/O	PWM11
14	P36	I/O	PWM10
15	P24	I/O	PWM4
16	VBAT	P	VBAT
17	GND	P	GND
18	P32	I/O	PWM6
19	P8	I/O	PWM2/ELINK
20	P34	I/O	PWM8
21	P11	I/O	LOG_TXD, debug and download UART
22	P10	I/O	LOG_RXD, debug and download UART
23	P9	I/O	PWM3/STATUS

Description:

1. P represents power supply pin; I/O represents input and output pins.

Attention:

- Pin21 and Pin22 are used for the UART serial port firmware downloading function. Please do not use them in the design and try to provide a convenient way to export to facilitate the download operation.
- RESET pin is an enable reset pin, which is effective at low level. If it is not used, it can remain suspended or be pulled up 3.3V.
- The processing of chip pins inside the module is as follows:
 - RESET: 100K pull-up resistance and 22nF capacitance to ground.

3. Electrical Parameters

3.1. Operation Voltage and Current

Table 2 Operation Voltage and Current

Parameter	Description	Min.	Typ.	Max	Unit
V _{DD}	Operating Voltage	3	3.3	3.6	V
V _{IL}	IO Low Voltage Input	-	-	0.8	V
V _{IH}	IO High Voltage Input	2	-	3.6	V
V _{OL}	IO Low Voltage output	-	-	0.4	V
V _{OH}	IO High Voltage output	2.4	-	-	V
I _{max}	IO Driver Current	-	-	16	mA

3.2. Typical Application Power

The module current test environment is based on VDD=3.3V and is tested in the ordinary office application environment (the values measured in different test environments will be different).

Table 3 Typical Application Power

Parameter	Condition	Min.	Typ.	Max	Unit
Active Mode					
RX Current	11b: 11 Mbps DSSS	-	63	-	mA
	11g: 54 Mbps OFDM	-	69	-	mA
	11n: MCS7, HT20	-	69	-	mA
	11n: MCS7, HT40	-	70	-	mA
	11ax: MCS7, HE20	-	71	-	mA
TX Current	11b: 11 Mbps DSSS @ 17 dBm	-	280	-	mA
	11g: 54 Mbps OFDM @ 15 dBm	-	250	-	mA
	11n: MCS7, HT20 @ 14 dBm	-	250	-	mA
	11n: MCS7, HT40 @ 14 dBm	-	248	-	mA
	11ax: MCS7, HE20 @ 14 dBm	-	247	-	mA
Standby Mode					
Normal Standby	-	-	3.0	-	mA
Low Voltage Standby	-	-	150	-	μA
Deep Sleep Mode					
Deep Sleep	-	-	15	-	μA
Shutdown Mode					
Shutdown	-	-	2.0	-	μA

3.3. Temperature

Table 4 Storage Temperature and operation temperature

Symbol	Ratings	Max	Unit
T _{STG}	Storage temperature	-55 to +125	°C
T _{work}	Ambient Operating Temperature	-40 to +85	°C
T _{Jun}	Junction Temperature	0 to +125	°C

3.4. Electrostatic discharge

Table 5 Electrostatic discharge

Symbo	Description	Name	Level	Max	Unit
V _{ESD} (HBM)	Electrostatic discharge voltage (manikin)	TA= +25 °C following JESD22-A114	2	2000	V
V _{ESD} (CDM)	Electrostatic discharge voltage (Discharge equipment model)	TA = +25 °C following JESD22-C101	II	500	

3.5. RF Parameter

3.5.1. Wi-Fi RF Parameter

Table 6 RF Basic Parameter

Item	Specification
Operating Frequency	2.412~2.484GHz
Channel BW	20M/40MHz
Antenna Interface	1T1R, Single stream
Wi-Fi Standard	IEEE 802.11b/g/n/ax
Modulation Type	11b: DBPSK, DQPSK, CCK for DSSS 11g: BPSK, QPSK, 16QAM, 64QAM for OFDM 11n: MCS0~7, OFDM 802.11ax: MCS0~7, OFDM
Data Rates	802.11b: 1, 2, 5.5 and 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48 and 54 Mbps 802.11n: MCS0~7, up to 72.2Mbps
Antenna type	One U.F.L connector for external antenna PCB printed ANT (Reserve)

Note: The following typical values of Tx test data are recorded for about 20s under normal temperature.

Transmitting performance

Table 7 Output power

TX Characteristics	Min.	Typical	Max.	Unit
Power@11Mbps, 802.11b	14	16.5	18	dBm
Power@54Mbps, 802.11g	13	14.5	16	dBm
Power@HT20, MCS7,802.11n	11	12.5	14	dBm
Power@HT40, MCS7,802.11n	10	11.5	14	dBm
Power@HE20, MCS7,802.11ax	11	12.5	14	dBm

Table 8 Frequency error

TX Characteristics	Min.	Typical	Max.	Unit
Frequency Error	-15	-5	+15	ppm

Table 9 EVM

TX Characteristics	Min.	Typical	Max.	Unit
EVM@11Mbps, 802.11b	-	-18	-10	dB
EVM@54Mbps, 802.11g	-	-28	-25	dB
EVM@HT20, MCS7,802.11n	-	-29	-27	dB
EVM@HT40, MCS7,802.11n	-	-28	-27	dB
EVM@HE20, MCS7,802.11ax	-	-28	-27	dB

Receiving performance

Table 10 Receiving sensitivity.

RX Characteristics	Min.	Typical	Max.	Unit
Minimum Input Level Sensitivity				
PER _≤ 8%@11Mbps,802.11b	-	-87	-	dBm
PER _≤ 10%@54Mbps,802.11g	-	-73	-	dBm
PER _≤ 10%@HT20, MCS7, 802.11n	-	-71	-	dBm
PER _≤ 10%@HT40, MCS7, 802.11n	-	-68	-	dBm
PER _≤ 10%@HE20, MCS7, 802.11ax	-	-68	-	dBm

3.5.2. Bluetooth RF Parameter

Table 11 Bluetooth TX/RX Characteristic

Item	Data Rate	Min	Typical	Max	Unit
POWER_AVERAGE	LE_1M	4	6	10	dBm
Frequency Drift Error	LE_1M	-50	10	50	KHz
Carrier frequency offset and drift at NOC:					
ΔF_n max	LE_1M	-150	15	150	KHz
$ F_0 - F_n $	LE_1M	0	10	50	KHz
$ F_1 - F_0 $	LE_1M	0	10	20	KHz
$ F_n - F_{n5} $	LE_1M	0	10	20	KHz
Modulation characteristics:					
ΔF_1 avg	LE_1M	225	250	275	KHz
ΔF_2 avg	LE_1M	185	235	275	KHz
ΔF_2 avg/ ΔF_1 avg	LE_1M	0.8	1	2	KHz
ΔF_2 max	LE_1M	185	225	275	KHz
RX Characteristics					
Minimum Sensitivity PER \leq 30.8%	LE_1M	-	-94	-	dBm

4. Antenna Information

EMC6069 has two specifications: PCB antenna and external antenna. Please order according to the order code. IPX antenna connector is not welded on the module using PCB antenna. Better RF performance can be obtained by connecting external antenna through IPX connector.

4.1. PCB Antenna Parameter and Usage

4.1.1. On-board PCB Antenna

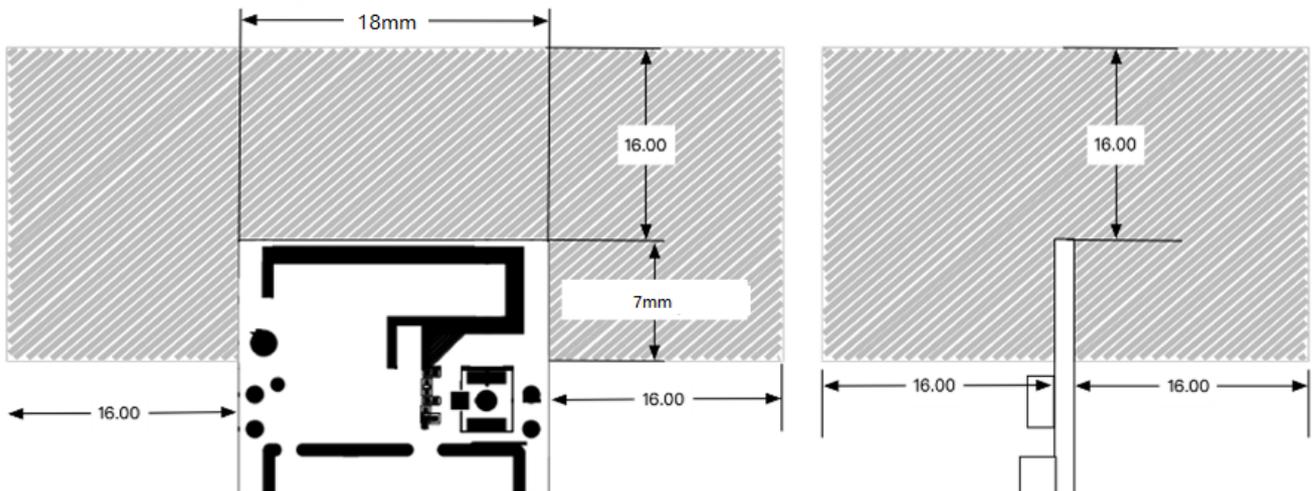
Table 12 PCB Antenna Parameter

Item	Min.	Typical	Max.	Unit
Frequency	2400		2500	MHz
Impedance		50		Ω
VSWR			2	
Gain	$\leq 2\text{dBi}$			
Efficiency	$>70\%$ or $>-1.54\text{dB}$			

4.1.2. PCB Antenna Clearance

When using PCB antenna in WIFI module, it is necessary to ensure that PCB and other metal devices are at least 16 mm away from the motherboard. The shaded areas in the figure below need to be far away from metal devices, sensors, interference sources and other materials that may cause signal interference.

Figure 2 PCB Antenna Minimum Clearance (unit: mm)

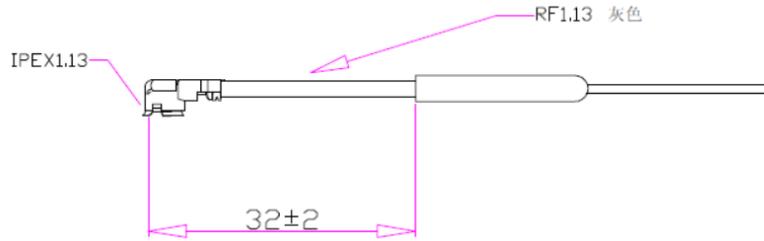


4.2. External antenna parameters and use

Users can select 2.4G antennas with different dimensions and gain no more than 2dBi according to the application environment.

The following is a copper tube antenna with IPEX connector commonly used by MXCHIP.

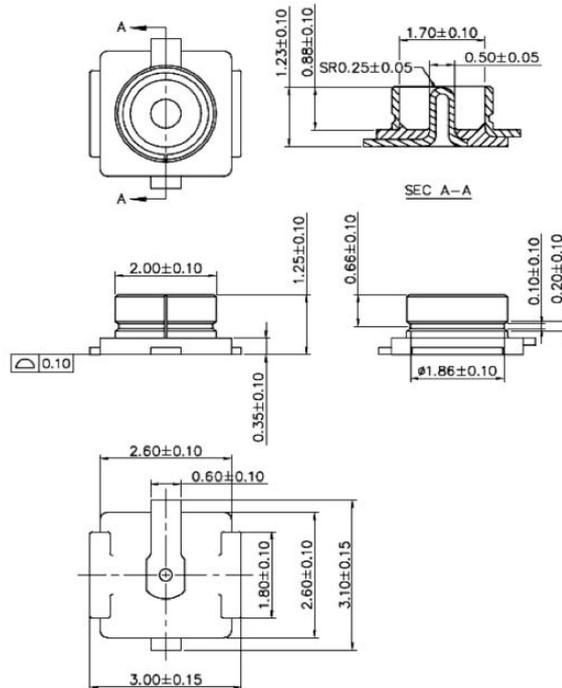
Figure 3 Dimensions of copper tube antenna (unit: mm)



- Frequency range: 2400-2500 MHz
- Input impedance: 50 Ohm
- SWR: <2.0
- Gain: 2.0dBi
- Polarization: vertical
- Directionality: omnidirectional
- Copper pipe: 4.4 * 23mm
- Wire: 1.13 gray line L-82mm

Dimension Diagram of External Antenna Connector.

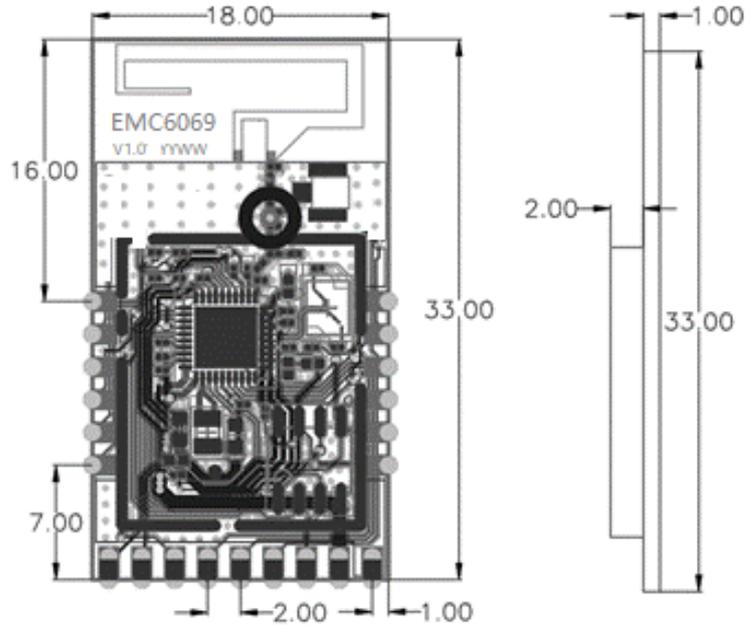
Figure 4 Dimension Diagram of External Antenna Connector



5. General Assembly Size and PCB Package

5.1. General Assembly Size

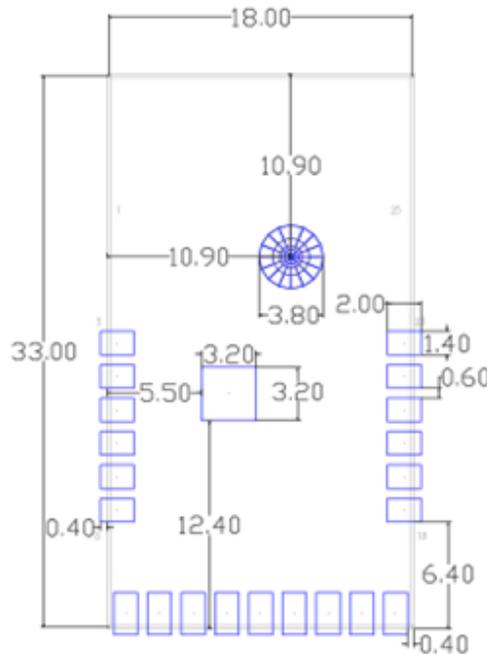
Figure 5 General assembly dimension drawing (unit: mm, error ± 0.1, external dimension error ± 0.2)



5.2. Recommended Package Diagram

The size of resistance welding window and pad is the same. SMT recommends that the thickness of steel mesh be 0.12mm-0.14mm.

Figure 6 Stamp hole package size (installation pad, unit: mm, error ± 0.1, external dimension error ± 0.2)



6. 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.

The module is limited to OEM installation only The OEM integrator is responsible for ensuring that the end-user has no manual instructions to remove or install module 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:P53-EMC6069 Or Contains FCC ID: P53-EMC6069.

When the module is installed inside another device, the user manual of the host must contain below warning statements.

1.1 List of applicable FCC rules

FCC Part 15 Subpart C 15.247 & 15.209

1.2 Specific operational use conditions

The module is a 2.4GHz Wi-Fi /BLE Module

2.4GHz Wi-Fi/BLE Module	Operation Frequency		Number of Channel		Modulation		Antenna Spec.	
	2.4G Wi-Fi	BLE	2.4G Wi-Fi	BLE	2.4G Wi-Fi	BLE	2.4G Wi-Fi	BLE
EMC6069-P	2412-2462MHz	2402-2480MHz	11	40	DSSS, OFDM	GFSK	Single PCB antenna, 2dBi Max.	

The module can be used for mobile or portable applications with a maximum 2dBi antenna. The host manufacturer installing this module into their product must ensure that the final composit product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

1.3 Limited module procedures Not applicable. The module is a Single module and complies with the

requirement of FCC Part 15.212.

1.4 Trace antenna designs

Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.

1.5 RF exposure considerations

The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and users' body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

1.6 Antennas

Antenna Specification are as follows:

Type: Single PCB antenna Gain: 2dBi.

This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna; The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a 'unique' antenna coupler. As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

1.7 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID: P53-EMC6069" with their finished product.

1.8 Information on test modes and additional testing requirements

Operation Frequency: 2412-2462MHz / 2402-2480MHz

Number of Channel: 11 / 40

Modulation: DSSS, OFDM / GFSK

Host manufacturer must perform test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

1.9 Additional testing, Part 15 Subpart B disclaimer The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

S

7. Production Guidelines

MXCHIP stamp port packaging module must be SMT machine patches, module humidity sensitivity grade MSL3, after unpacking more than a fixed time patches to bake module.

- SMT patches require instruments.
 - Reflow bonding machine.
 - AOI detector
 - 6-8mm suction nozzle
- Baking requires equipment:
 - Cabinet oven
 - Anti-static, high temperature tray
 - Antistatic and heat resistant gloves.

The storage conditions of MXCHIP module are as follows:

- Moisture-proof bags must be stored in an environment with temperature < 30 degree C and humidity < 85% RH.
- A humidity indicator card is installed in the sealed package.

Figure 7 Humidity Card



After the module is split, if the humidity card shows pink, it needs to be baked.

The baking parameters are as follows:

- The baking temperature is $120^{\circ}\text{C}\pm 5^{\circ}\text{C}$ and the baking time is 4 hours.
- The alarm temperature is set to 130°C .
- SMT patches can be made after cooling < 36°C under natural conditions.
- Drying times: 1 time.
- If there is no welding after baking for more than 12 hours, please bake again.

If the disassembly time exceeds 3 months, SMT process is forbidden to weld this batch of modules,

because PCB gold deposition process, over 3 months, pad oxidation is serious, SMT patch is likely to lead to virtual welding, leak welding, resulting in various problems, our company does not assume the corresponding responsibility;

Before SMT patch, ESD (Electrostatic Discharge, Electrostatic Release) protection should be applied to the module.

SMT patches should be made according to the reflow curve. The peak temperature is 250 C. The reflow temperature curve is shown in Chapter 9, Figure 9.

In order to ensure the qualified rate of reflow soldering, 10% of the first patches should be taken for visual inspection and AOI testing to ensure the rationality of furnace temperature control, device adsorption mode and placement mode, and 5-10 patches per hour are recommended for visual inspection and AOI testing in subsequent batch production.

7.1. Precautions

- Operators of each station must wear static gloves during the entire production process;
- Do not exceed the baking time when baking;
- It is strictly forbidden to add explosive, flammable or corrosive substances during baking;
- When baking, the module uses a high temperature tray to be placed in the oven to keep the air circulation between each module while avoiding direct contact between the module and the inner wall of the oven;
- When baking, please close the oven door to ensure that the oven is closed to prevent temperature leakage and affect the baking effect.
- Try not to open the door when the oven is running. If it must be opened, try to shorten the time for opening the door;
- After baking, the module should be naturally cooled to <math><36^{\circ}\text{C}</math> before wearing the static gloves to avoid burns;
- When operating, strictly guard against water or dirt on the bottom of the module;

The temperature and humidity control level of MXCHIP factory module is Level3, and the storage and baking conditions are based on IPC/JEDEC J-STD-020.

7.2. Storage Condition

Figure 8 Storage Conditions Diagram



CAUTION
This bag contains
MOISTURE-SENSITIVE DEVICES

LEVEL
3

If Blank, see adjacent bar code label

1. Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)
2. Peak package body temperature: 260 °C
If Blank, see adjacent bar code label
3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must
 - a) Mounted within: 168 hrs. of factory conditions
If Blank, see adjacent bar code label
≤30°C/60%RH, OR
 - b) Stored at <10% RH
4. Devices require bake, before mounting, if:
 - a) Humidity Indicator Card is > 10% when read at 23 ± 5°C
 - b) 3a or 3b not met.
5. If baking is required, devices may be baked for 48 hrs. at 125±5°C

Note: If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure

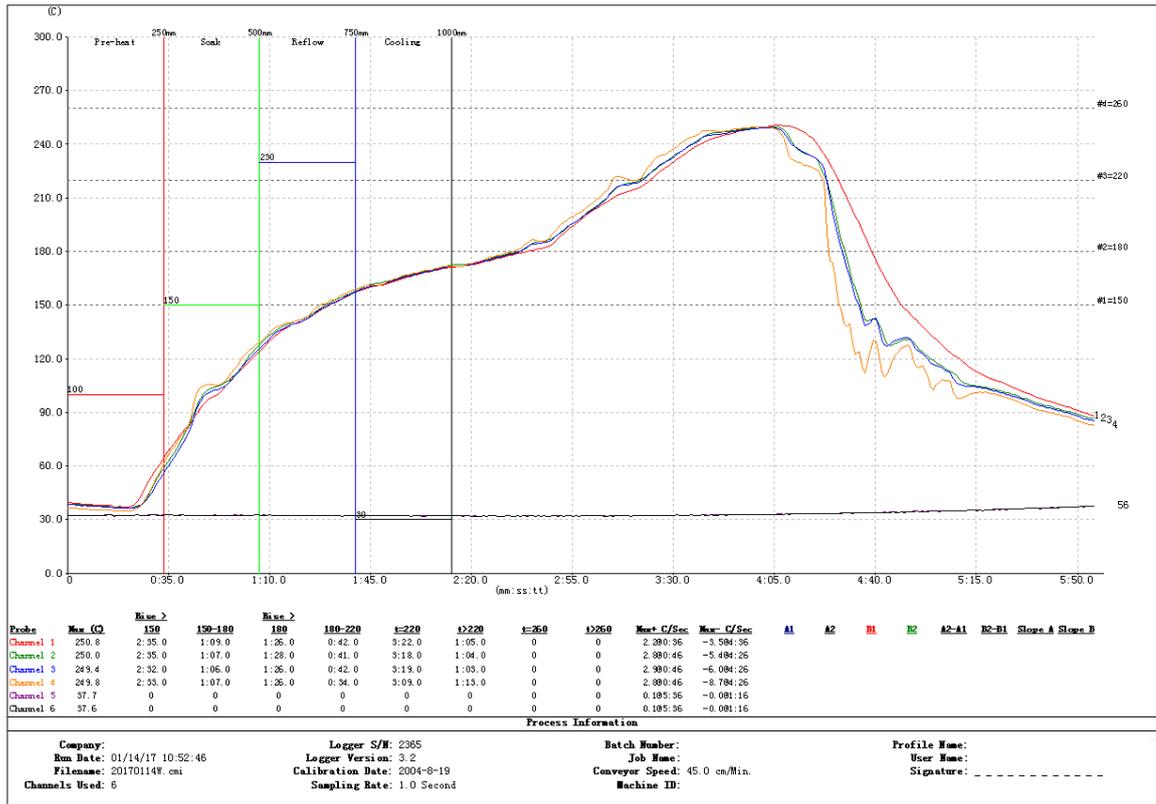
Bag Seal Date: _____
If Blank, see adjacent bar code label

Note: Level and body temperature defined by IPC/JEDEC J-STD-020

7.3. Secondary Reflux Temperature Curve

We recommend solder paste model: SAC305, lead-free. No more than 2 reflux times.

Figure 9 Reference Secondary Reflux Temperature Curve



8. Warning

8.1. 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 important announcement

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.

The module is limited to OEM installation only The OEM integrator is responsible for

ensuring that the end-user has no manual instructions to remove or install module 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:P53-EMC6069 Or Contains FCC ID: P53-EMC6069

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

1.1 List of applicable FCC rules

FCC Part 15 Subpart C 15.247 & 15.209

1.2 Specific operational use conditions

The module is a 2.4GHz Wi-Fi/BLE Module

Operation Frequency: 2412-2462MHz

Number of Channel: 11

Modulation: DSSS, OFDM

Type: PCB Antenna

Gain: 2dBi Max.

The module can be used for mobile or portable applications with a maximum 2dBi antenna. The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

1.3 Limited module procedures Not applicable. The module is a Single module and complies with the requirement of FCC Part 15.212.

1.4 Trace antenna designs

Not applicable. The module has its own antenna, and doesn't need a host's printed board micro strip trace antenna etc.

1.5 RF exposure considerations

The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and users' body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

1.6 Antennas

Antenna Specification are as follows:

Type: PCB Antenna

Gain: 2dBi

This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna; The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a 'unique' antenna coupler. As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

1.7 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID: P53-EMC6069" with their finished product.

1.8 Information on test modes and additional testing requirements

Operation Frequency: 2412-2462MHz

Number of Channel: 11

Modulation: DSSS, OFDM

Host manufacturer must perform test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

1.9 Additional testing, Part 15 Subpart B disclaimer The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter

installed.

8.2. ISED Statement

- English: This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device. The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).

- French: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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Radiation Exposure Statement

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

9. Label Information

Figure 10 Module Label Diagram



1. MXCHIP: Company Logo.
2. EMC6069-P: Product Main Type.
3. HF: PVC free version.
4. CE: EU certification mark
5. CMIIT ID: SRRC ID.
6. FCC ID: FCC Certification Authorization ID.
7. IC: IC Certification Authorization ID.
8. ZJ6: Product Sub model.
9. X2301: Production Serial Number.
10. MAC: Module MAC Address.
11. 0000.0000.A245: Software version.
12. QR code: MAC Address.

Note: Due to the production batch and version, the above label schematic diagram is for reference only, please refer to the real object.

10. Sales and Technical Support Information

If you need to consult or purchase this product, please call Shanghai MXCHIP Information Technology Co., Ltd. during office hours.

Office hours: Monday to Friday morning: 9:00-12:00, afternoon: 13:00-18:00

Contact Tel: +86-21-52655026

Address: 9th Floor, Lane 5, 2145 Jinshajiang Road, Putuo District, Shanghai

Zip code: 200333

Email: sales@mxchip.com