SYNIC®
Intelligent Wireless

# Data Sheet

Module name：IA9QH5 SY5-A24 Module

Project Code：SMMSBRQHC58RH2

Product name:RF 5G Wireless Module (FPC type)

OEM/Integrators Installation Manual

Version 0.1

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## INDEX

# 1. Features

- 5.2GHz/5.8GHz ISM Band
- GFSK modulation
- Low BOM cost
- Long distance > 30m (Line of sight)
- Support 1-1 duplex mode or 1-N broadcasting mode
- Digital I2S audio interface
- Support no audio detection function
- Support compression/un-compression mode
- Antenna diversity
- Short delay time variation
- Audio format 16/24bit , 32/44.1/48K/96KHz sampling rate
- Robust Packet error correction
- Low power consumption
- No RF induced audio noise
- Audio latency time < 20ms
  (Programmable according customized spec.)

# 2. Application

- Wireless HTiB Rear Speaker
- Wireless Outdoor Speaker
- Wireless TV theater
- Wireless Audio Sender
- Wireless Headphone
- Wireless Stereo Ear Microphone

# 3. RF Specification

| Item | Min | Typ | Max | Unit | Note |
|---|---|---|---|---|---|
| Channel Range | 5160 | — | 5240 | MHz | |
| -20dB bandwidth | — | 2.7 | — | MHz | 2M Mode |
| RF Output Power | | 11 | | dBm | Peak power at Antenna port |
| Sensitivity | — | -91 | — | dBm | The smaller, the better |

Table 1 5.2GHz RF Specification

| Item | Min | Typ | Max | Unit | Note |
|---|---|---|---|---|---|
| Channel Range | 5735 | — | 5840 | MHz | |
| -20dB bandwidth | — | 3 | — | MHz | 2M Mode |
| RF Output Power | | 11 | | dBm | Peak power at Antenna port |
| Sensitivity | — | -89 | —- | dBm | The smaller, the better |

Table 2 5.8GHz RF Specification

# 4. Electrical Specification

| Item | Min | Typ | Max | Unit | Note |
|---|---|---|---|---|---|
| Power Supply Voltage | 3.0 | 3.3 | 3.6 | V | |
| Consumption Current (TX_MODE) | | 132 | | mA | No GPIO driving , 0.1CH Mode |
| Consumption Current (RX_MODE) | | 91 | | mA | No GPIO driving , 0.1CH Mode |
| Operating Temperature | 0 | 25 | 55 | ℃ | |

Table 5

| **Item** | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Parameter** | **Min** | **Typ** | **Max** | **Unit** | **Conditions** |
| $V_{IH}$ | Input High Threshold | 2.0 | — | 3.33 | V | LDO_OUT=3V |
| $V_{IL}$ | Input Low Threshold | -0.3 | — | 0.8 | V | LDO_OUT=3V |
| $V_{OH}$ | Output High Threshold | 2.4 | — | — | V | LDO_OUT=3V |
| $V_{OL}$ | Output Low Threshold | — | — | 0.4 | V | LDO_OUT=3V |

Table 6

# 5. Mechanical Specification

## 6.1 No Shielding Case

- Dimension： 35 * 35 * 1 mm
- PCB 4 Layers

Mechanical Drawing：

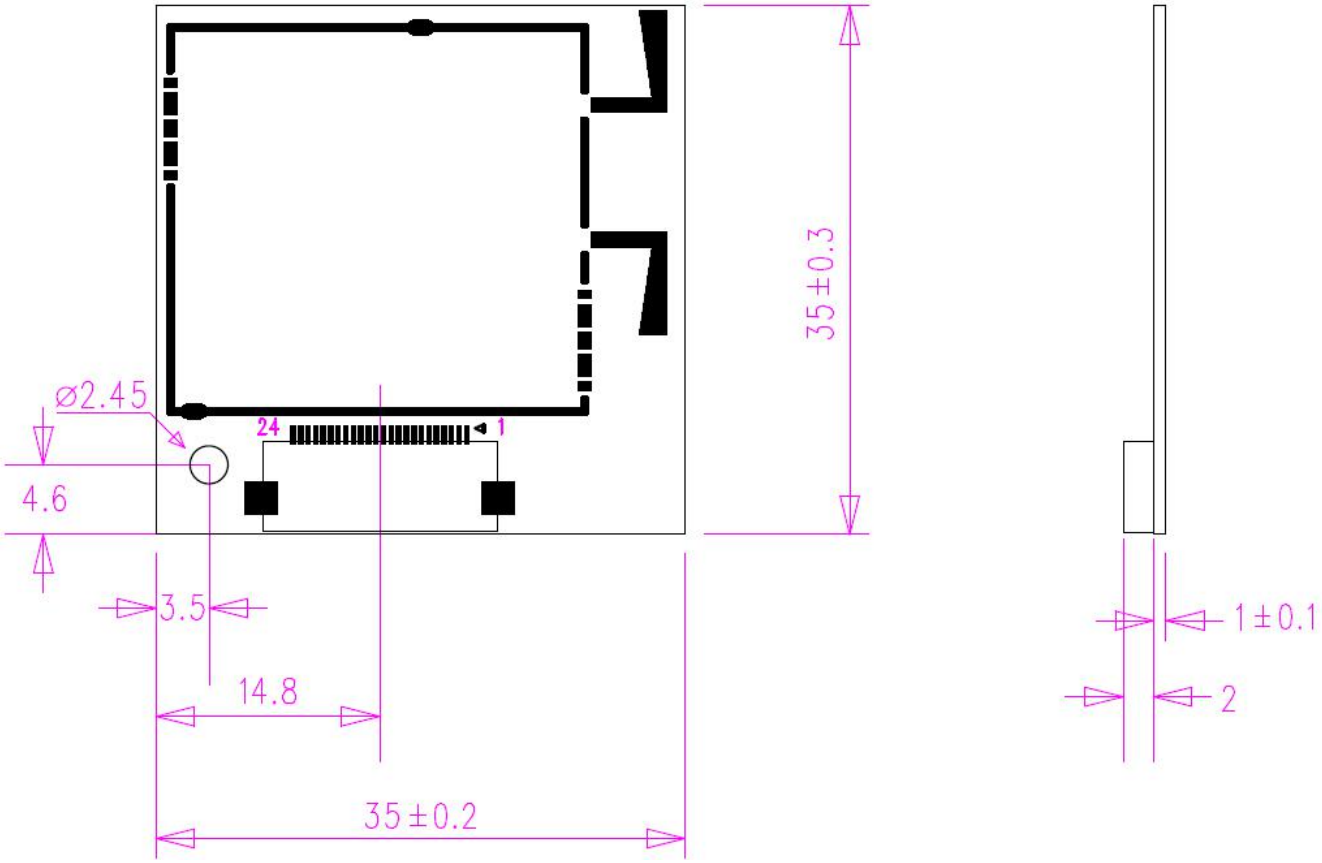


Fig 6.1 Mechanical Drawing of SY5-A24 Module

# Interface

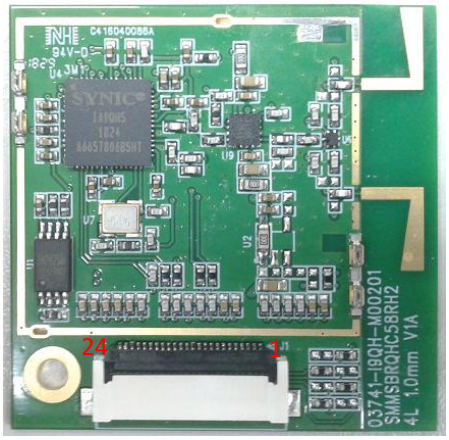


Fig 8.1 Pin sequence of SY5-A24 Module

| Pin | Name | I/O | TX Function Define | RX Function Define |
|---|---|---|---|---|
| 1 | GPIO11 | I/O | GPIO | GPIO |
| 2 | GPIO15 | I/O | GPIO | GPIO |
| 3 | I2C_DATA_S | I/O | I2C Master/Slave data signal | GPIO |
| 4 | I2C_CLK_S | I/O | I2C Master/Slave clock signal | GPIO |
| 5 | I2C_DATA_M | I/O | GPIO | I2C Master/Slave data signal |
| 6 | I2C_CLK_M | I/O | GPIO | I2C Master/Slave clock signal |
| 7 | GPIO 31 | I/O | GPIO | GPIO |
| 8 | GPIO 13 | I/O | GPIO | GPIO |
| 9 | SPB_I2S_BCK | I/O | SPB I2S audio BCK | SPB I2S audio BCK |
| 10 | SPB_I2S_LRCK | I/O | SPB I2S audio LRCK | SPB I2S audio LRCK |
| 11 | SPB_I2S_MCLK | I/O | SPB I2S audio MCLK | SPB I2S audio MCLK |
| 12 | DGND | P | Digital GND | Digital GND |
| 13 | SPA_I2S_BCK | I/O | SPA I2S audio BCK | SPA I2S audio BCK |
| 14 | SPA_I2S_LRCK | I/O | SPA I2S audio LRCK | SPA I2S audio LRCK |
| 15 | SPA_I2S_DATA | I/O | I2S DATA 0 | SYNC LED |
| 16 | SPB_I2S_DATA | I/O | SPB I2S audio Data | SPB I2S audio Data |
| 17 | GPIO 21 | I/O | GPIO | GPIO |
| 18 | GPIO 34 | I/O | GPIO | GPIO |
| 19 | GPIO 16 | I/O | GPIO | GPIO |
| 20 | GPIO 17 | I/O | GPIO | AMP RESET(L Act) |
| 21 | GPIO 36 | I/O | I2C_BUSY，Need 10K Pull High Resistor | I2C_BUSY，Need 10K Pull High Resistor |
| 22 | DGND | P | Digital GND | Digital GND |
| 23 | VCCIO | P | DC 3.0 ~ 3.6V IN | DC 3.0 ~ 3.6V IN |
| 24 | VCCIO | P | DC 3.0 ~ 3.6V IN | DC 3.0 ~ 3.6V IN |

Table 8 IO Function Define

## FCC Statement

**15.19**

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.

**15.21**

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

**15.105(b)**

**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

## RF Exposure Statement

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

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENTS

The RF 5G Wireless

Module complies with Part 15 of the United States of America FCC rules and regulations. The Orig inal Equipment Manufacturer (OEM) must comply with the FCC certification requirements.

15.21 Any changes or modifications made to the module without the manufacturer's approval could void the user's authority to operate the module.

# Instructions to the OEM/Integrator:

This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC/ISED (Innovation, Science and Economic Development Canada) certification if they meet the following conditions. Otherwise, Additional FCC/IC approvals must be obtained.

- 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: PJH-IA9QH5SY5A24". 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 user's manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC / IC RF exposure guidelines.
- The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.
- This Module is full modular approval, it is limited to OEM installation ONLY.
- The module is limited to installation in mobile application.
- A separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and difference antenna configurations.
- The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
- The Grantee will provide guidance to the Host Manufacturer for compliance with the Part 15B requirements if requested.

## IC Statement

This device complies with Industry Canada licence-exempt RSS standard(s). 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.

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.

## IC 20cm RF

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

Cet équipement est conforme aux limites d’exposition aux rayonnements de la IC établies pour un environnement non contrôé. Cet équipement doit être installé et fonctionner à au moins 20 cm de distance d’un radiateur ou de votre corps.

IC labeling requirement for the final end product: The final end product must be labeled in a visible area with the following “Contains IC: 24253-9QH5SY5A24” The Host Marketing Name (HMN) must be indicated at any location on the exterior of the host product or product packaging or product literature, which shall be available with the host product or online.

The device for operation in the band 5150 – 5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems