SYNIC®
Intelligent Wireless

Data Sheet

Module name：IA9QH5 S83D-F

Version 0.1

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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		12		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		12		dBm	Peak power at Antenna port
Sensitivity	—	-90	—-	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	
Operating Temperature	0	25	55	℃	
Consumption Current (TX_MODE)		130		mA	RF Power :11dBm ,0.1CH No GPIO driving
Consumption Current (RX_MODE)		86		mA	

Table 3

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 4

◆ Power On Reset Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
Trst			10		mS	

Table 5

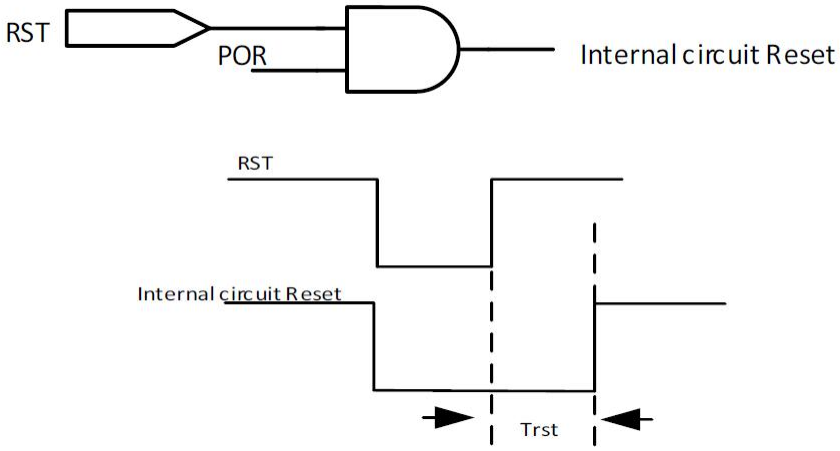

Fig 4.1 Reset Timing Chart

5. Mechanical Specification

5.1 No Shielding Case

- Dimension：20 * 40 * 6.7 mm
- PCB 4 Layers

Mechanical Drawing：

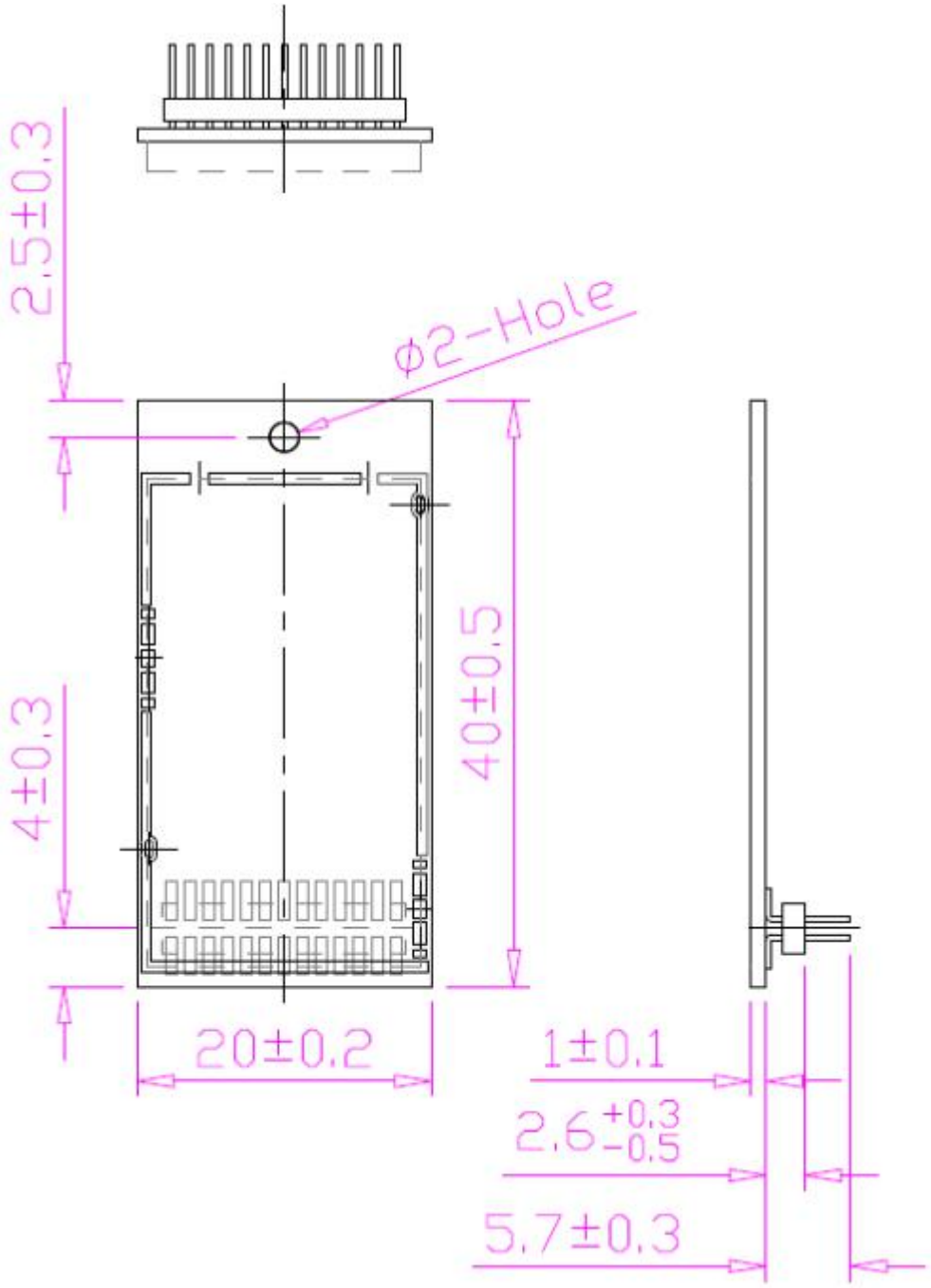

Fig 5.1 Mechanical Drawing of S83D-F Module

◆ Propose 1.27mm Female Header size：H:4.3±0.15mm W:3.0±0.15mm

5.2 With Shielding Case

- Dimension：20 * 40 * 8.7 mm
- PCB 4 Layers

Mechanical Drawing：

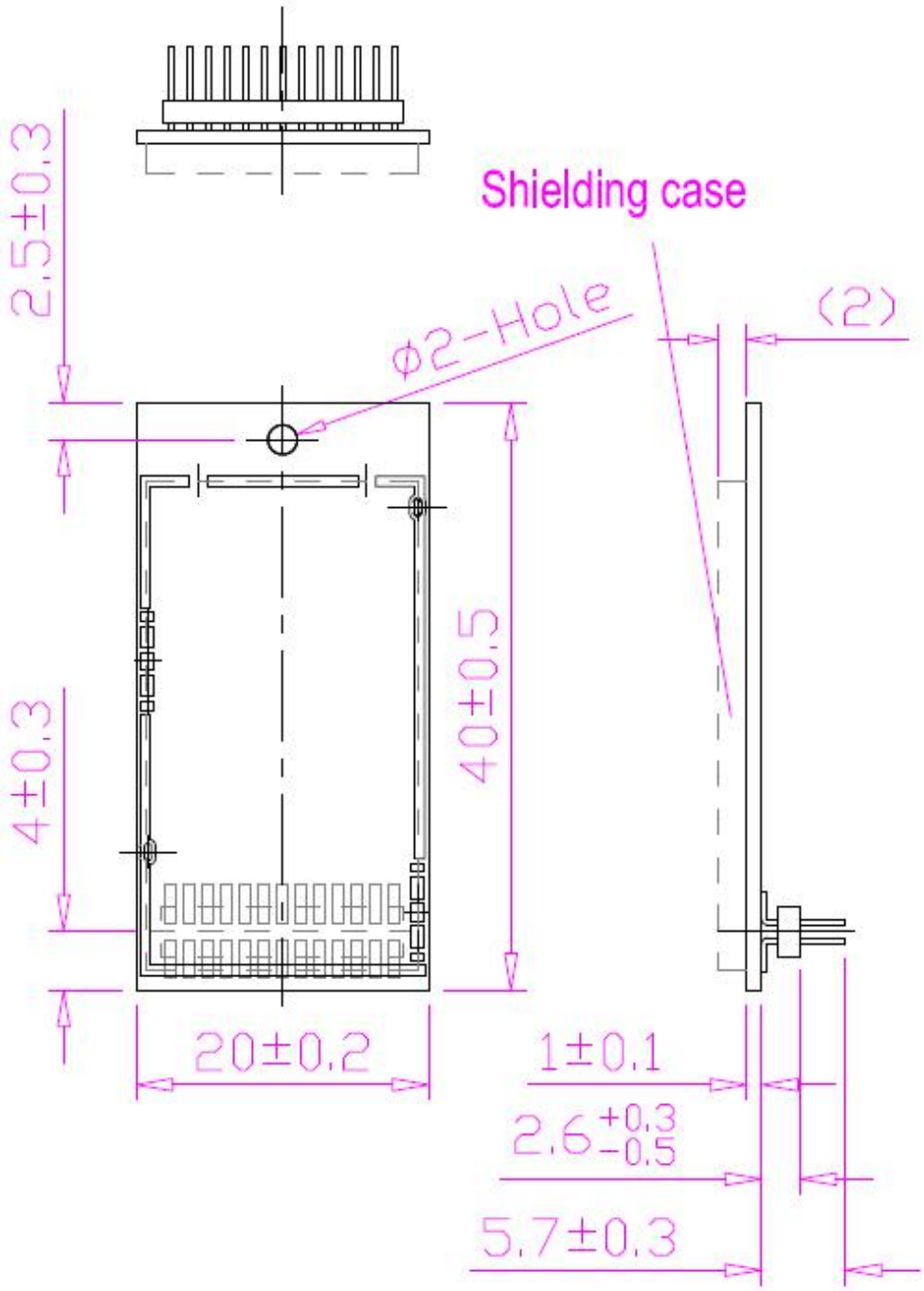

Fig 5.2 Mechanical Drawing of S83D-F Module with shielding case

◆ Propose 1.27mm Female Header size：H:4.3±0.15mm W:3.0±0.15mm

6. Interface

Fig 7.1 Pin sequence of S83D-F Module (Bottom View)

Pin	Name	I/O	TX Function Define	RX Function Define
1	VCCIO	P	DC 3.0 ~ 3.6V IN	DC 3.0 ~ 3.6V IN
2	DGND	P	Digital GND	Digital GND
3	SPB_I2S_MCLK	I/O	SPB I2S audio MCLK system clock output	SPB I2S audio MCLK system clock output
4	GPIO 32	I/O	GPIO	AMP MUTE
5	GPIO 14	I/O	GPIO	GPIO
6	GPIO 13	I/O	GPIO	GPIO
7	GPIO 17	I/O	GPIO	GPIO
8	GPIO 26	I/O	I2C_BUSY，Need 10K Pull High Resistor	I2C_BUSY，Need 10K Pull High Resistor
9	I2C_CLK	I/O	I2C Master/Slave clock signal	I2C Master/Slave clock signal
10	I2C_DATA	I/O	I2C Master/Slave data signal	I2C Master/Slave data signal
11	DGND	P	Digital GND	Digital GND
12	DGND	P	Digital GND	Digital GND
13	GPIO 27	I/O	GPIO	Pairing
14	GPIO 21	I/O	GPIO	GPIO
15	GPIO 16	I/O	GPIO	ON/OFF 12V
16	GPIO 0	I/O	GPIO / SAP I2S audio MCLK	GPIO / SAP I2S audio MCLK
17	M_RESET(PORN)	I/O	Internal power on reset (1)	Internal power on reset (1)
18	I2C_CLK	I/O	I2C Master/Slave clock signal	I2C Master/Slave clock signal
19	I2C_DATA	I/O	I2C Master/Slave data signal	I2C Master/Slave data signal
20	GPIO 30	I/O	GPIO	AMP RESET(L Act)
21	SPA_I2S_DATA	I/O	I2S DATA 0	SYNC LED
22	SPB_I2S_LRCK	I/O	SPB I2S audio LRCK	SPB I2S audio LRCK
23	DGND	P	Digital GND	Digital GND
24	SPB_I2S_BCK	I/O	SPB I2S audio BCK	SPB I2S audio BCK
25	GPIO 15	I/O	GPIO	ON/OFF 3.3V
26	SPB_I2S_DATA	I/O	SPB I2S audio Data	SPB I2S audio Data

Table 6 IO Function Define

Note : (1) *.Not need external RC circuit to do RC reset
*.Power On Reset Characteristics can reference section 5 Electrical Specification (page 6)
*.External controller can direct control M_RESET but should assign the control IO as input for normal operation and output low to Reset S83D-E Module

7. Revision History

Date	Revision	Descriptions
2019/02/27	0.1	First release

Table 7

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.

Regulatory Module Integration Instructions

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-IA9QH5S83D-F".
  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.

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-IA9QH5S83DF” 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