

HF-Z100A ZigBee Module Datasheet

V 1.1

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HISTORY

Ed.V1.0 05-29-2014 First Version.

Ed.V1.1 06-30-2014 Version 1.1.

1. PRODUCT OVERVIEW

1.1. General Description

The HF-Z100A is a fully self-contained, small form-factor, IEEE802.15.4 Zigbeemodulewith low complexity, self-organizing, lowpower, low costfeature.It is based on IEEE802.15.4 standard, can be coordinated to achieve communication between the thousands of tiny sensors that require very little energy to relay the data through radio waves from one sensor to another sensor, thus withhigh communication efficiency.

The HF-Z100A employs the world's lowest power consumption embedded architecture. It has been optimized for all kinds of Zigbee applications in the home automation, smart grid, smart lighting, handheld device, personal medical application and industrial control that have lower data rates, and transmit or receive data on an infrequent basis.

The HF-Z100A integrates all IEEE802.15.4 Zigbee functionality into a low-profile,15.6x12.2x2.0mmSMT module package that can be easily mounted on main PCB with application specific circuits. Also, module provides built-in antenna, external antenna option.

1.2. Device Features

- Size: 56 x 56 x 34mm size product.
- Input voltage: 100-240v~50/60Hz

1.3. Device Parameters

Table 1. HF-Z100A Module Technical Specifications

Class	Item	Parameters
Wireless Parameters	Certification	TBD
	Wireless Standard	802.15.4
	Radio Data Rate	250Kbps@2.4GHz
	Frequency Range	2.4~2.4835GHz
	Transmit Power	9 +/-1.5dBm
	ReceiverSensitivity	≤-101dBm
	Antenna Option	External: RF line out for external ANT Internal:On-boardChip ANT
Hardware Parameters	Data Interface	UART,ADC I2C,GPIO
	Operating Voltage	2.0~3.6V
	Operating Current	<60mA
	Deep Sleep Current	<10uA
	Communication	Indoor 30m,Outdoor 100m

	Distance	
	Operating Temp.	-40°C - 110°C
	StorageTemp.	-45°C - 125°C
	Dimensions and Size	15.6x12.2x2.0mm

1.4. Key Application

- Illumination control
- HVAC monitoring and control
- Building automation
- Access Control
- Security system
- Industrial automation
- Automated metering
- Smart energy

2. HARDWARE INTRODUCTION



Figure 1. HF-Z100A Overview

2.1. Pins Definition

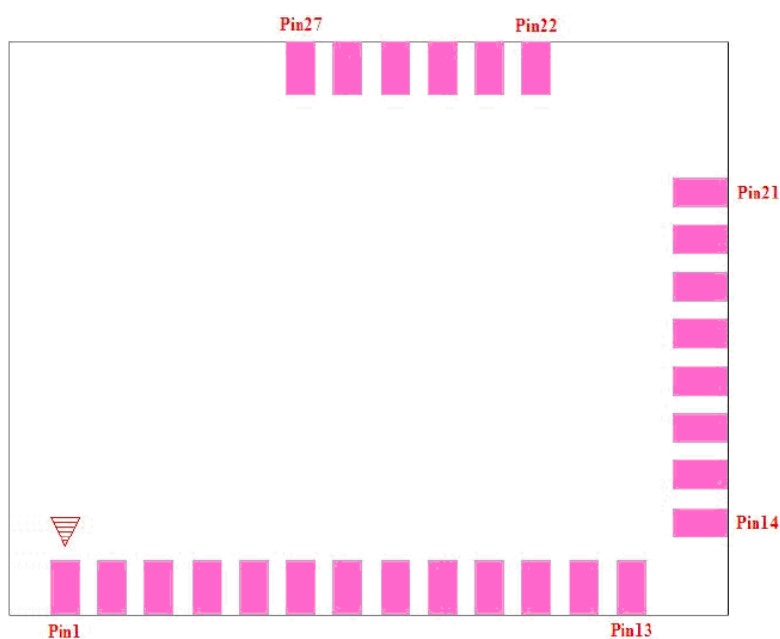


Figure 2. HF-Z100A Pins Map

Table 2. HF-Z100A Pins Definition

Pin	Net Name	Description
1	Ant_2.4G	2.4GHz antenna line out, Must 50 ohm control.
2	GND	Ground
3	GPIO12	PWM output-1 (Timer1)
4	GPIO13	PWM output-2 (Timer1)
5	GPIO14	SWD Clock

Pin	Net Name	Description
6	GPIO15	SWD Data
7	GPIO16	IIC SDA
8	VIO	IO Power (2.0~3.6V)
9	GPIO17	IIC CLK
10	GPIO18	PWM output-3 (Timer1)
11~13	GND	Ground
14	GPIO21	UART2_TXD
15	GPIO22	PWM output-4 (Timer1) UART2_RXD
16	GPIO23	PWM output-5 (Timer1)
17	GND	Ground
18	VBAT	Main Power (2.0~3.6V)
19	GND	Ground
20	GPIO29	Reserve
21	GPIO28	Enable
22	GND	Ground
23	RESET_N	The reset signal
24	GPIO4	ADCx3 or ADCx1 And Wakeup INTx2
25	GPIO5	
26	GPIO6	
27	GND	Ground

2.2. Electrical Characteristics

Table 3. Operation Parameters

Parameter	Condition	Min.	Typ.	Max.	Unit
Operating Supply voltage		2.0	3.3	3.6	V
RX Current	Active CPU 32MHz		21		mA
TX Current	Active CPU 32MHz, +9dBm		34		mA
Deep Sleep Current			10		uA

Table 4. RF Parameters

Parameter	Ratings	Unit
Operating Frequency	2.4~2.4835	GHz
IF Frequency	4	MHz
Quantity of Channel	16	
Number of Channels	11~26	
Max TX Power	9	dBm
RX Sensitivity	~104	dBm
Data Rate	250	KBS

2.3. Mechanical Size

HF-Z100A modules detailed mechanical data is referred to as following Figure(Unit is Mil).
 The pad size:25mil X 45mil, pin pitch is 40mil.

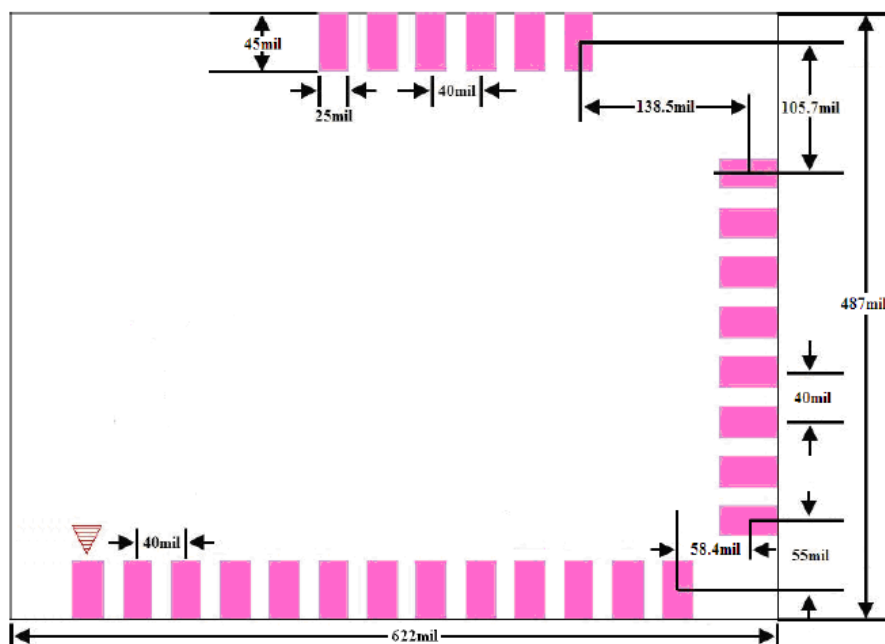


Figure 3. HF-Z100A Mechanical Dimension

2.4. Antenna

HF-Z100A module support internal on-board chip antenna and RF line outoption.

When customer select internal antenna, you shall comply with following antenna design rules and module location suggestions:

- For user PCB, RED color region (6x5mm) can't put componet or paste GND net;
- For user PCB, GREEN color regin (> 2 x 4mm) suggest paste GND net (better add via) to improve antenna reflection plane;
- Antenna must away from metal or high components at least 10mm;
- Antenna can't be shielded by any meal enclosure. All cover, include plastic, shall away from antenna at least 10mm;

High-Flying suggest HF-Z100A module better locate in following region at customer board as Figure 5, which to reduce the effect to antenna and wireless signal, and better consult High-Flying technical people when you structure your module placement and PCB layout.

HF-Z100A on-board chip antenna parameters as following:

Table 5. HF-Z100A Chip Antenna Parameters

Frequency Range (MHz)	Peak Gain (X-Z total)	Average Gain (X-Z total)	VSMR	Impedance
2400~2500	1.5 dBi typ.	-1.0 dBi typ.	3.0 MAx	50 ohm

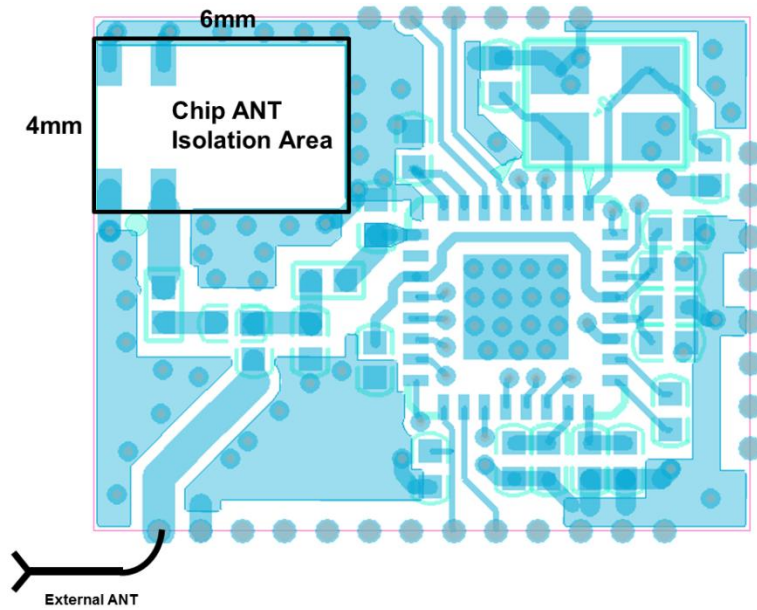


Figure 4. HF-Z100A Antenna Position

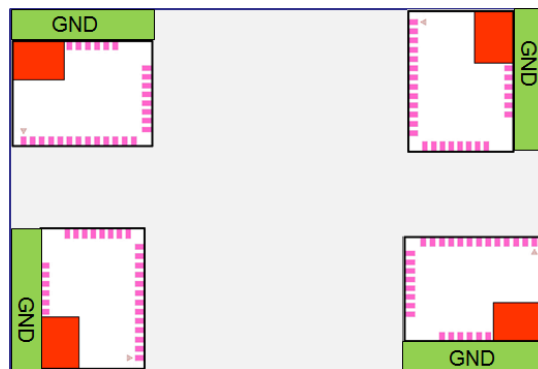


Figure 5. HF-Z100A with Chip Antenna Suggested Placement

2.5. Evaluation Kit

High-Flying provides the evaluation kit to promote user to familiar the product and develop the detailed application. The evaluation kit shown as below, user can connect to HF-Z100A module with the UART (USB), or SWD Debugger port to configure the parameters, manage the module or do the some functional tests.

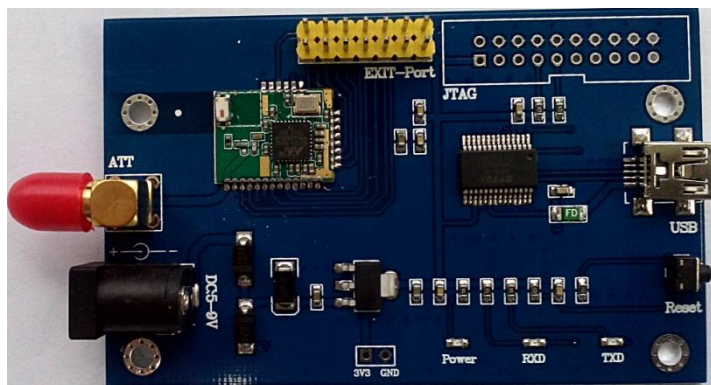


Figure 6. HF-Z100A Evaluation Kit

Notes: User need consult high-flying for software SDK support or more detailed debug support. The external interface description for evaluation kit as follows:

Table 6HF-Z100A Evaluation Kit Interface Description

Function	Name	Description
External Interface	JTAG	JTAG data debug interface (Not for user use)
	USB	UART to USB debug interface. (For PC without RS232, need load driver). Can be Power input.
	ATT	2.4GHz ZigBee Antenna Connector
	DC5-9V	DC jack for power in, 5~9V input.
	EXT PORT	HF-Z100A GPIO function extend interface connector
LED	Power	3.3V Power Indicator
	TXD	UART TXD Indicator
	RXD	UART TXD Indicator
Button	nReset	Used to reset the module.

2.6. Order Information

Base on customer detailed requirement, HF-Z100A series modules provide different variants and physical type for detailed application.

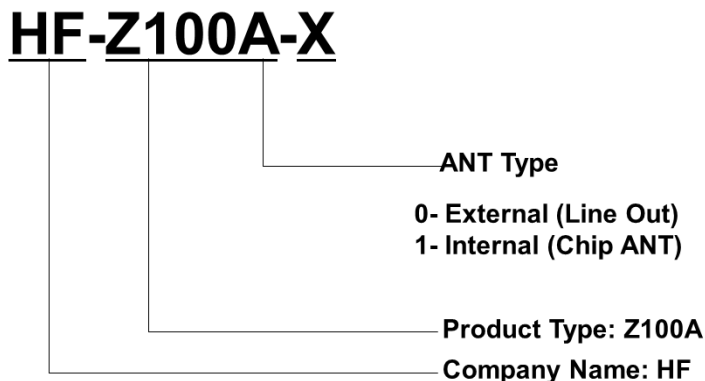


Figure 7. HF-Z100A Order Information

2.7. Typical Application

The module basic reference schematic is referred to following,

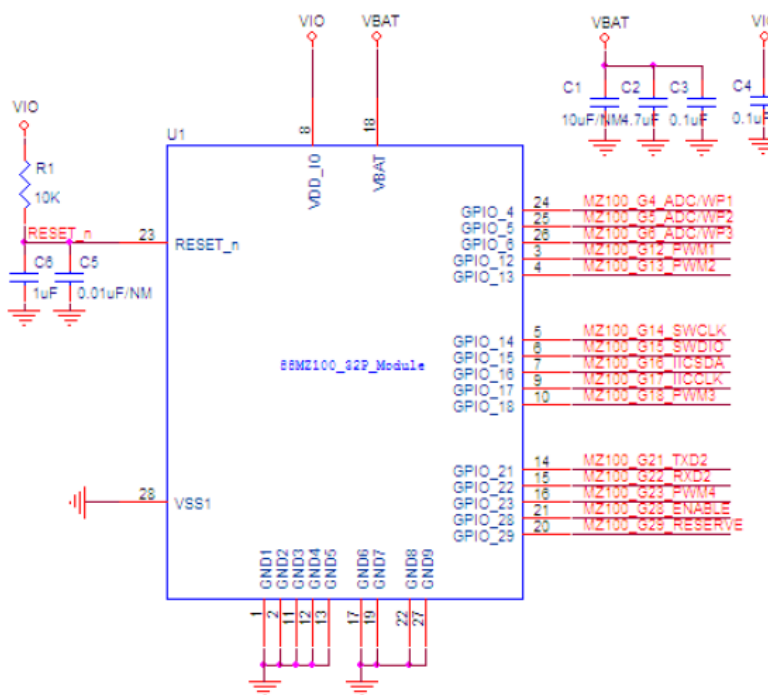


Figure 8. HF-Z100AHardware Typical Application

Notes: If HF-Z100A GPIO6 (RXD) and GPIO4 (TXD) are not used for ADC and Wakeup function, suggesting them as the default UART download port.

3. PACKAGE INFORMATION

3.1. Recommended Reflow Profile

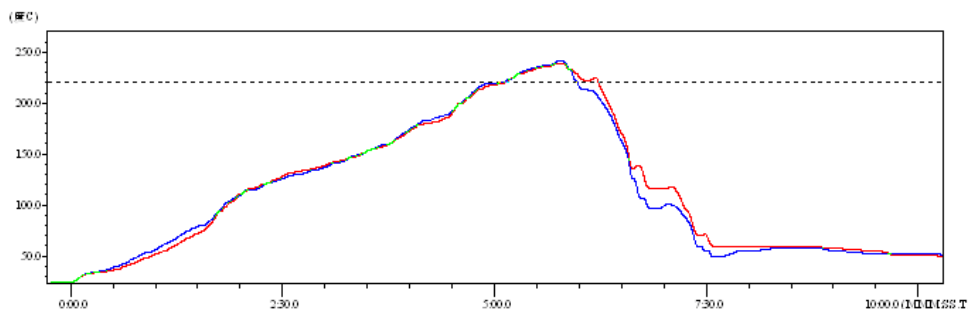


Figure 9. Reflow Soldering Profile

Table 7. Reflow Soldering Parameter

NO.	Item	Temperature (Degree)	Time(Sec)
1	Reflow Time	Time of above 220	35~55 sec
2	Peak-Temp	260 max	

- Note:** 1. Recommend to supply N2 for reflow oven.
 2. N2 atmosphere during reflow (O2<300ppm)

3.2. Device Handling Instruction (Module IC SMT Preparation)

- Shelf life in sealed bag: 12 months, at <30°C and <60% relative humidity (RH)
- After bag is opened, devices that will be re-baked required after last baked with window time 168 hours.
- Recommend to oven bake with N2 supplied
- Recommend end to reflow oven with N2 supplied
- Baked required with 24 hours at 125±5°C before rework process for two modules, one is new module and two is board with module
- Recommend to store at ≦10% RH with vacuum packing
- If SMT process needs twice reflow:
 - (1) Top side SMT and reflow □ □ (2) Bottom side SMT and reflow

Case 1: Zigbee module mounted on top side. Need to bake when bottom side process over 168 hours window time, no need to bake within 168 hours

Case 2: Zigbee module mounted on bottom side, follow normal bake rule before process

Note: Window time means from last bake end to next reflow start that has 168 hours space.

3.3. Shipping Information

TAPE

Size: TBD



BOX

Size: TBD



Figure 10. Shipping Information

To Be Discussed

APPENDIX B: CONTACT INFORMATION

Address: Room.511/510, Building 7, No.365, ChuanhongRoad,Pudong New Area,
Shanghai, China, 201202

Web: www.hi-flying.com

Service Online: 400-189-3108

Sales Contact: sales@hi-flying.com

For more information about High-Flying modules, applications, and solutions, please visit our web site
<http://www.hi-flying.com/en/>

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