

HF-Z100C ZigBeeModule Datasheet

V 1.2

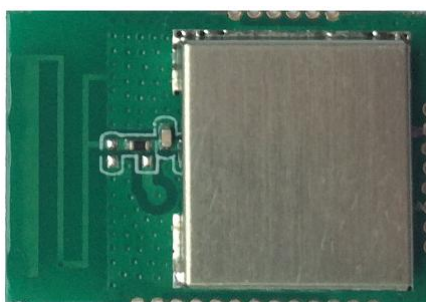


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HISTORY

Ed.V1.0	08-14-2014	First Version.
Ed.V1.1	08-26-2014	Change pin definition and mechanical size picture.
Ed.V1.2	09-25-2014	Correct the module size.

1. PRODUCT OVERVIEW

1.1. General Description

The HF-Z100C is a fully self-contained, small form-factor, IEEE802.15.4 Zigbee module with low complexity, self-organizing, low power and low cost feature. 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 with high communication efficiency.

The HF-Z100C 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-Z100C integrates all IEEE802.15.4 Zigbee functionality into a low-profile, 21.8x15.1x2.5mm SMT module package that can be easily mounted on main PCB with application specific circuits. Also, module provides built-in PCB antenna.

1.2. Device Features

- Size: 22.2 x 15.5 x 3.0mm size module;
- High RX sensitivity: ≤ -101 dBm;
- Excellent link budget: > 110 dB;
- Max output power: 9dBm +/- 1.5dBm;
- Extend Operation Temperature: $-40^{\circ}\text{C} - 110^{\circ}\text{C}$ for smart lighting application;
- Low power consumption:
 - Operating Current: < 60 mA
 - Deep Sleep Current: < 10 uA
- 512KB Internal Flash, 160KB SRAM resource for customized application;
- Full Zigbee ZHA/ZLL profile supported;
- Various peripherals interface:
 - 15 x GPIO ports
 - 3 x 16-bit ADC input channel
 - 2 x UART with hardware flow control
 - 5 x PWM interface
 - 1 x I2C interface
 - SWD debug interface
- Power Supply Range from 2V to 3.6V, support battery supply application;
- High performance on-board PCB antenna;
- FCC/IC/TELEC certification;

1.3. Device Parameters

Table 1. HF-Z100C Module Technical Specifications

Class	Item	Parameters
Wireless Parameters	Certification	FCC/IC/TELEC
	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: None Internal:On-boardPCB ANT
Hardware Parameters	Data Interface	UART,ADC I2C,GPIO
	Operating Voltage	2.0~3.6V
	Operating Current	<60mA
	Deep Sleep Current	<10uA
	CommunicationDistance	Indoor 30m,Outdoor 100m
	Operating Temp.	-40℃- 110℃
	StorageTemp.	-45℃- 125℃
	Dimensions and Size	22.2 x 15.5 x 3.0mm

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

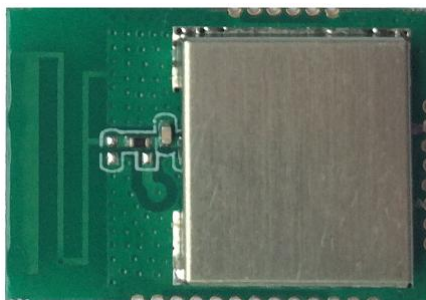


Figure 1. HF-Z100C Overview

2.1. Pins Definition

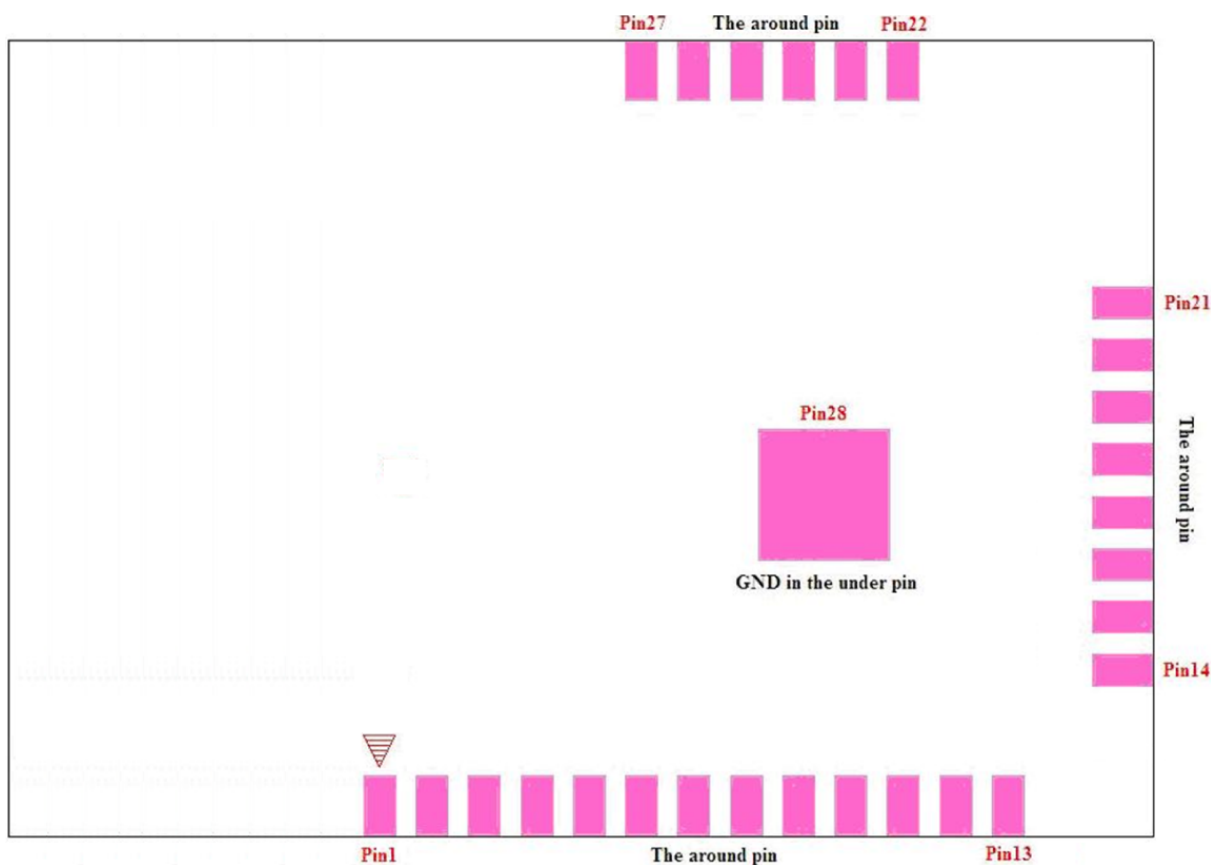


Figure 2. HF-Z100C Pins Map

Table 2. HF-Z100C Pins Definition

Pin	Net Name	Description
1~2	GND	Ground
3	GPIO12	PWM output-1 (Timer1)
4	GPIO13	PWM output-2 (Timer1)

Pin	Net Name	Description
5	GPIO14	SWD Clock
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-5 (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	Reserve
22	GND	Ground
23	RESET_N	The reset signal
24	GPIO4	ADCx3 or ADCx1 And Wakeup INTx2
25	GPIO5	
26	GPIO6	
27	GND	Ground
28	The under 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 Channeels	11~26	
Max TX Power	9	dBm
RX Seneitivity	~104	dBm
Data Rate	250	KBS

2.3. Mechanical Size

HF-Z100C modules detailed mechanical data is referred to as following Figure(Unit is Mil).

There are two kinds of pad: One is 25mil X 45mil, their pin pitch is 40mil and the other one is 100mil X 100mil.

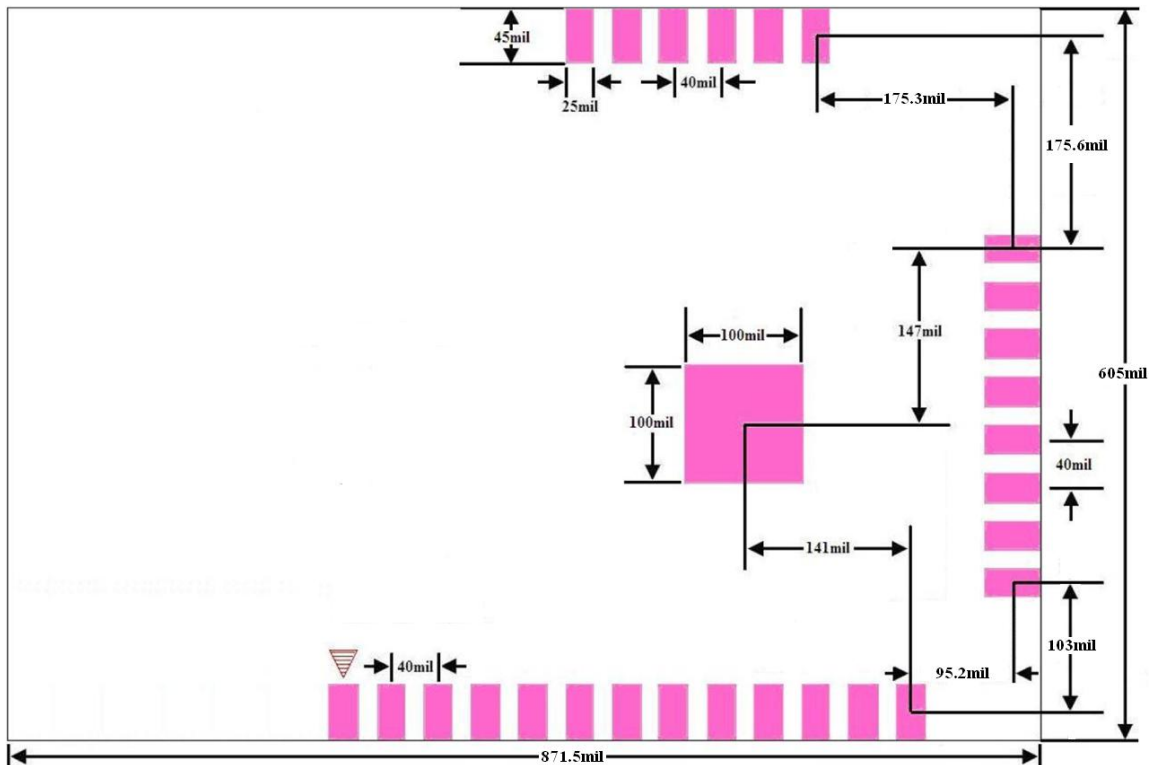


Figure 3. HF-Z100C Mechanical Dimension

2.4. Antenna

HF-Z100C module support internal on-board chip antenna. The position of PCB antenna on board refer to Figure 4, you shall comply with following antenna design rules and module location suggestions:

- For user PCB, antenna region (605x215mil) can't put componet or paste GND net;
- 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-Z100C 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.

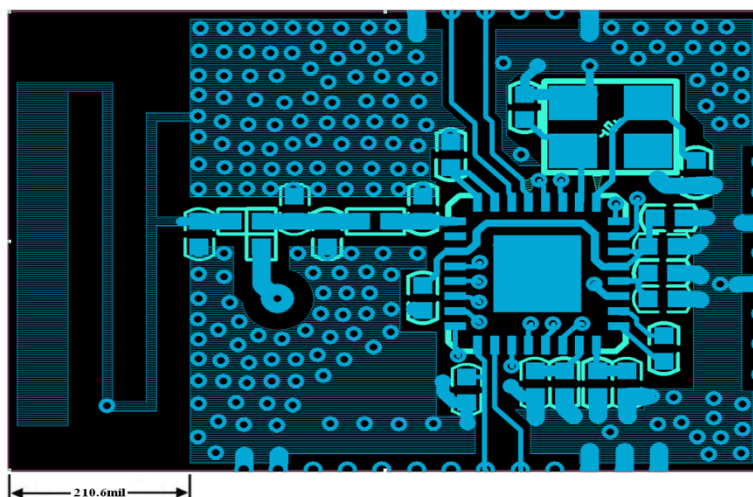


Figure 4. HF-Z100C PCB Antenna Position

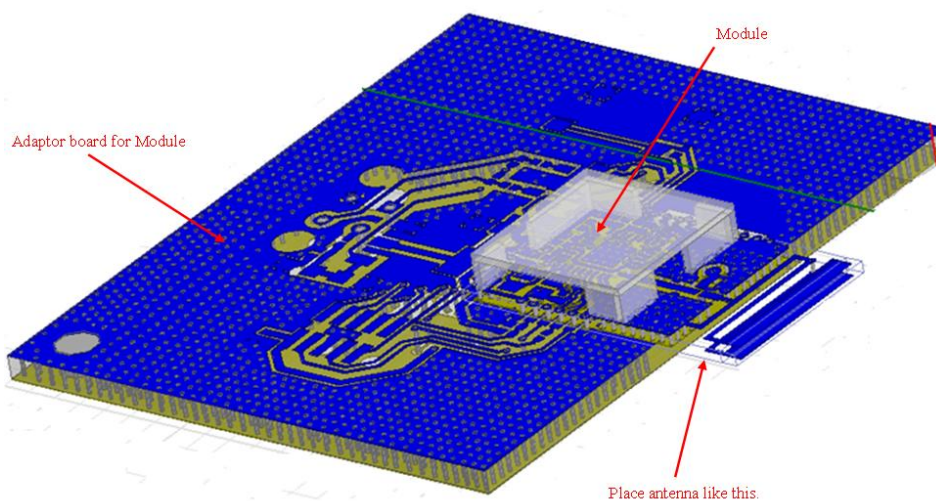


Figure 5. HF-Z100C Module Reference Placement

2.5. Order Information

HF-Z100C modules provide only provide one variant and physical type for detailed application.

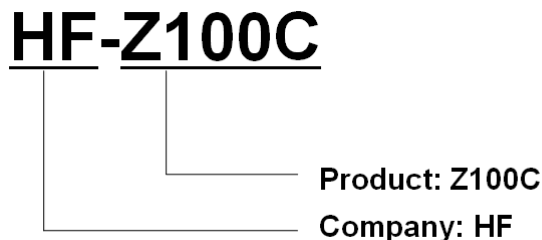


Figure 6. HF-Z100C Order Information

2.6. Typical Application

The module basic reference schematic is referred to following,

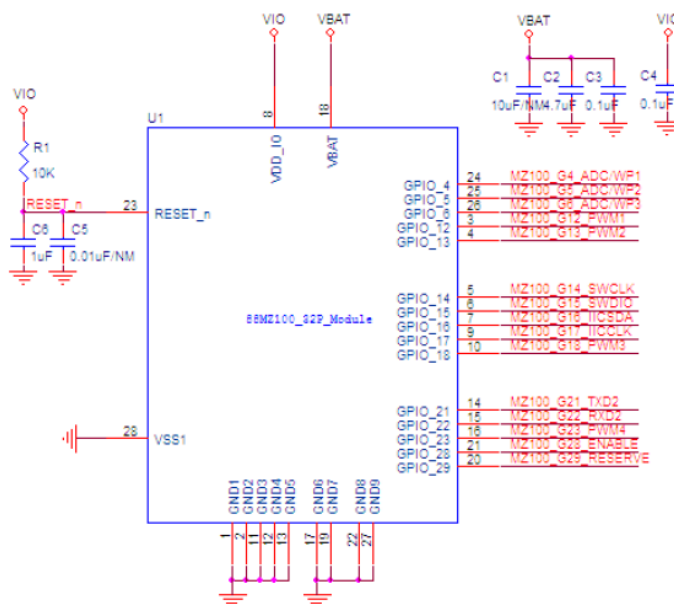


Figure 7. HF-Z100CHardware Typical Application

Notes 1: If HF-Z100C GPIO6 (RXD) and GPIO4 (TXD) are not used for ADC and Wakeup function, suggesting using them as the default UART download port.

Note2: VIO power and VBAT power of module can be supplied by the same power source or by the separate power sources according to the application.

3. PACKAGE INFORMATION

3.1. Recommended Reflow Profile

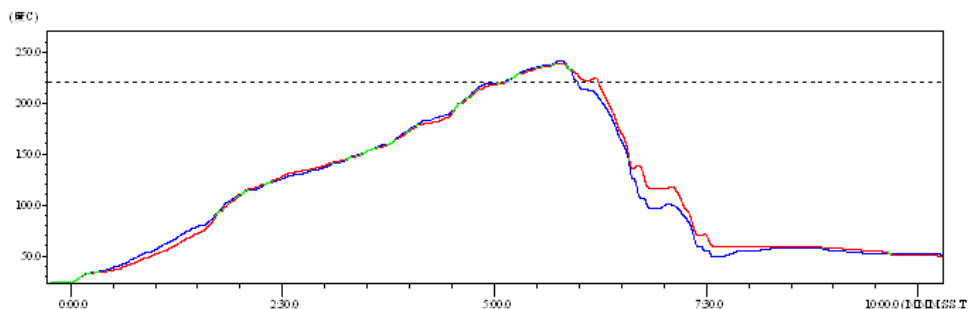


Figure 8. Reflow Soldering Profile

Table 5. 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** mm



BOX

Size: **TBD** mm (inside)



Figure 9. Shipping Information

APPENDIX A: CONTACT INFORMATION

Address: Room 1002, #1 Building, No.3000 Longdong Avenue, Pudong, 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
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