

HF-LPB105

Low Power Wi-Fi Module User Manual

V 1.0



Overview of Characteristic

- ✧ Support IEEE802.11b/g/n Wireless Standards
- ✧ Based on Self-developed High Cost Effective MCU
- ✧ Ultra-Low-Power for Battery Applications with Excellent Power Save Scheme
- ✧ Support UART/PWM/GPIO Data Communication Interface
- ✧ Support Work As STA/AP/AP+STA Mode
- ✧ Support Smart Link Function (APP program provide)
- ✧ Support Wireless and Remote Firmware Upgrade Function
- ✧ Support Multi-TCP Link (5 Channel) Application
- ✧ Support Internal/External(I-PEX) Antenna Option
- ✧ Single +5V Power Supply, +5V UART Voltage.
- ✧ Smallest Size: 45.7mm x 30.5mm x 6mm
- ✧ FCC/CE/TELEC Certificated

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HISTORY

Ed. V1.0 07-12-2015 First Version.

1. PRODUCT OVERVIEW

1.1. General Description

The HF-LPB105 is a fully self-contained small form-factor, single stream, 802.11b/g/n Wi-Fi module, which provide a wireless interface to any equipment with a Serial/SPI interface for data transfer. HF-LPB105 integrate MAC, baseband processor, RF transceiver with power amplifier in hardware and all Wi-Fi protocol and configuration functionality and networking stack, in embedded firmware to make a fully self-contained 802.11b/g/n Wi-Fi solution for a variety of applications.

The HF-LPB105 employs the world's lowest power consumption embedded architecture. It has been optimized for all kinds of client applications in the home automation, smart grid, handheld device, personal medical application and industrial control that have lower data rates, and transmit or receive data on an infrequent basis.

The HF-LPB105 integrates all Wi-Fi functionality into a low-profile, 23.1x32.8x 2.7mm SMT module package that can be easily mounted on main PCB with application specific circuits. Also, module provides built-in antenna, external antenna option.

1.1.1 Device Features

- Single stream Wi-Fi @ 2.4 GHz with support for WEP security mode as well as WPA/WPA2
- Based on Self-developed High Cost Performance MCU
- Ultra-low-power operation with all kinds of power-save modes.
- Includes all the protocol and configuration functions for Wi-Fi connectivity.
- Support STA/AP/AP+STA Mode
- Support Smart Link Function
- Support Wireless and Remote Firmware Upgrade Function
- Support Max 2 Channel GPIO Output
- Integrated chip antenna, antenna connector options.
- Compact surface mount module 45.7mm x 30.5mm x 6mm.
- Full IPv4 stack.
- Low power RTOS and drivers.
- CE/FCC/TELEC Certified.
- RoHS compliant.
- Single supply – 5V operation.

1.1.2 Device Parameters

Table 1 HF-LPB105 Module Technical Specifications

Class	Item	Parameters
Wireless Parameters	Certification	FCC/CE
	Wireless standard	802.11 b/g/n
	Frequency range	2.412GHz-2.484GHz
	Transmit Power	802.11b: +16 +/-2dBm (@11Mbps)
		802.11g: +14 +/-2dBm (@54Mbps)
		802.11n: +13 +/-2dBm (@HT20, MCS7)
	Receiver Sensitivity	802.11b: -93 dBm (@11Mbps ,CCK)
802.11g: -85 dBm (@54Mbps, OFDM)		
802.11n: -82 dBm (@HT20, MCS7)		
Antenna Option	External:I-PEX Connector	
	Internal:On-board PCB antenna	
Hardware Parameters	Data Interface	UART
		PWM, GPIO
	Operating Voltage	4.75~6V
	Operating Current	Peak [Continuous TX]: ~300mA Normal [WiFi ON/OFF, DTIM=100ms]: Average. ~12mA, Peak: 300mA
	Operating Temp.	-40°C - 85°C
	Storage Temp.	-45°C - 125°C
	Dimensions and Size	45.7mm x 30.5mm x 6mm
External Interface	1x8 pin 2.54mm PIN or 4pin 2.5mm header	
Software Parameters	Network Type	STA /AP/STA+AP
	Security Mechanisms	WEP/WPA-PSK/WPA2-PSK
	Encryption	WEP64/WEP128/TKIP/AES
	Update Firmware	Local Wireless, Remote
	Customization	Web Page Upgrade Support SDK for application develop
	Network Protocol	IPv4, TCP/UDP/HTTP
	User Configuration	AT+instruction set. Android/ iOS Smart Link APP tools

1.1.3 Key Application

- Remote equipment monitoring
- Asset tracking and telemetry
- Security
- Industrial sensors and controls
- Home automation
- Medical devices

1.2. Hardware Introduction

1.2.1. Pins Definition

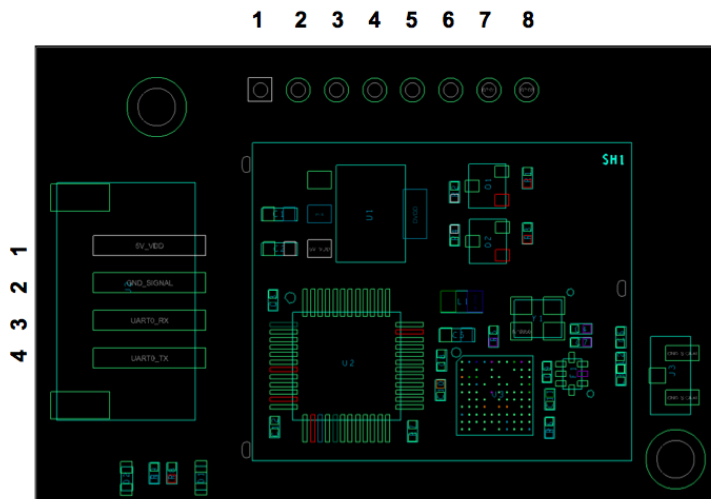


Figure 1. HF-LPB105 Pins Map

Table 2 HF-LPB105 Pins Definition

Pin	Description	Net Name	Signal Type	Comments
1	+5V Power	DVDD	Power	5V@250mA
2	Ground	GND	Power	
3	UART0	UART0_RX	I	5V, No connect if not use.
4	UART0	UART0_TX	O	5V, No connect if not use.
5	Multi-Function	nReload	I,PU	5V, Detailed functions see <Notes>
6	Module Reset	EXT_RESETn	I,PU	5V, “Low” effective reset input.
7	PWM_1	PWM_1	I/O	3.3V I/O, GPIO12 No connect if not use.
8	PWM_2	PWM_2	I/O	3.3V I/O, GPIO13 No connect if not use.

<Notes>

nReload Pin (Button) function:

1. When this pin is set to “low” during module boot up, the module will enter wireless firmware and config upgrade mode. This mode is used for customer manufacture. (See Appendix D to download software tools for customer batch configuration and upgrade firmware during mass production)
2. After module is powered up, short press this button (“Low” <= 2s) to make the module go into “Smart Link “ config mode, waiting for APP to set password and other information. (See Appendix D to download SmartLink APP)

3. After module is powered up, long press this button (“Low” $\geq 4s$) to make the module recover to factory setting.

High-Flying strongly suggest customer fan out this pin to connector or button for “Manufacture” and “ Smart Link” application.

1.2.2. Electrical Characteristics

Absolute Maximum Ratings:

Parameter	Condition	Min.	Typ.	Max.	Unit
Storage temperature range		-45		125	°C
Maximum soldering temperature	IPC/JEDEC J-STD-020			260	°C
Supply voltage		0		5	V
Voltage on any I/O pin		0		5	V
ESD (Human Body Model HBM)	TAMB=25°C			2	KV
ESD (Charged Device Model, CDM)	TAMB=25°C			1	KV

Power Supply & Power Consumption:

Parameter	Condition	Min.	Typ.	Max.	Unit
Operating Supply voltage		4.75	5	6	V
Supply current, peak	Continuous Tx		300		mA
Supply current, IEEE PS	DTIM=100ms		12		mA
Output high voltage	Sourcing 6mA	2.8			V
Output low voltage	Sinking 6mA			0.2	V
Input high voltage		2.2			V
Input low voltage				0.8	V
GPIO Input pull-up resistor			200		kΩ
GPIO Input pull-down resistor			200		kΩ

1.2.3. Mechanical Size

HF-LPB105 modules physical size (Unit: mm) as follows:

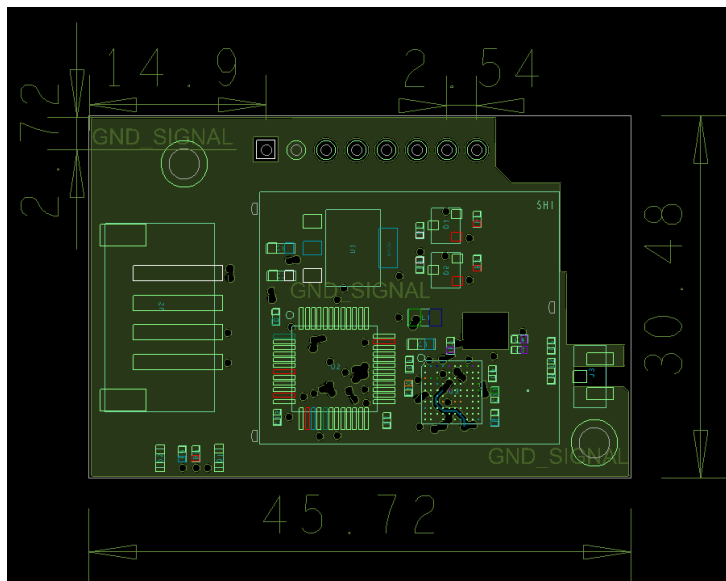


Figure 2. HF-LPB105 Mechanical Dimension

1.2.4. External Antenna

HF-LPB105 module supports internal antenna and external antenna(I-PEX) option for user dedicated application.

If user select external antenna, HF-LPB105 modules must be connected to the 2.4G antenna according to IEEE 802.11b/g/n standards.



Figure 3. HF-LPB105 External Antenna Example

The antenna parameters required as follows:

Table 3 HF-LPB105 External Antenna Parameters

Item	Parameters
Frequency range	2.4~2.5GHz
Impedance	50 Ohm
VSWR	2 (Max)
Return Loss	-10dB (Max)
Connector Type	I-PEX or populate directly

1.2.5. Order Information

Base on customer detailed requirement, HF-LPB105 series modules provide different variants and physical type for detailed application.

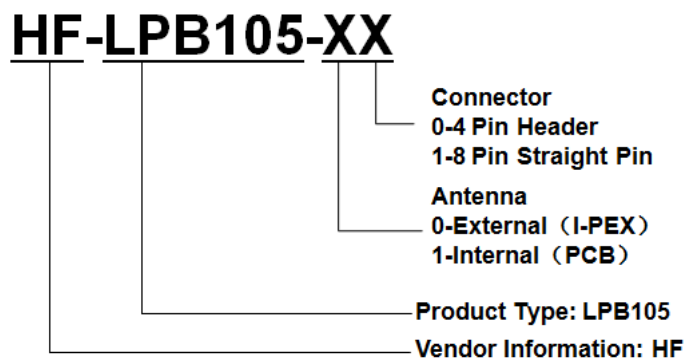


Figure 4. HF-LPB105 Order Information

1.3. Typical Application

Refer to HF-LPB100 user manual for detailed application and module usage.

2. PACKAGE INFORMATION

2.1. Recommended Reflow Profile

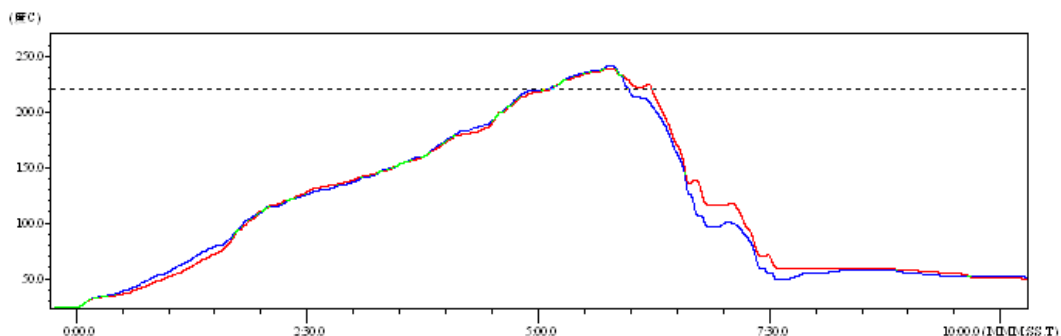


Figure 5. Reflow Soldering Profile

Table 11 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)

2.2. 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:
 - Top side SMT and reflow □ □
 - Bottom side SMT and reflow

Case 1: Wifi 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: Wifi 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.

2.3. Shipping Information(TBD)

TAPE

Size: 340*340*70 mm



BOX

Size: 340*340*350 mm (inside)



Figure 6. Shipping Information

Note:

1 tape = 500pcs

1 box = 5 tapes = 5 * 500 pcs = 2500pcs

APPENDIX E: CONTACT INFORMATION

Address: [Room 1002,Building 1,No.3000,Longdong Avenue,Pudong New Area,Shanghai,China,201203](#)

Web: www.hi-flying.com

Service Online: [400-189-3108/18616078755](tel:400-189-3108/18616078755)

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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