

HF-LPT120G

Low Power Wi-Fi Module User Manual

V 1.4



Overview of Characteristic

- ✧ Support IEEE802.11b/g/n Wireless Standards
- ✧ Based on Self-developed High Cost SOC
- ✧ Ultra-Low-Power for Battery Applications with Excellent Power Save Scheme
- ✧ Support UART/GPIO Data Communication Interface
- ✧ Support Work As STA/APMode
- ✧ Support Smart Link Function (APP program provide)
- ✧ Support Wireless and Remote Firmware Upgrade Function
- ✧ Support Internal Antenna Option
- ✧ Smallest Size: 24mm x 19.5mm x 3mm
- ✧ FCC/CE Certificated

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HISTORY

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|-----------------|------------|-------------------------------|
| Ed. V1.3 | 10-14-2016 | First Version. |
| Ed. V1.4 | 10-25-2016 | Update boot GPIO requirement. |

1. PRODUCT OVERVIEW

1.1. General Description

The HF-LPT120G 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-LPT120G 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-LPT120G 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-LPT120G integrates all Wi-Fi functionality into a low-profile, 24mm x 19.5mm x 3mm module package that can be easily mounted on main PCB with application specific circuits. Also, module provides built-in antenna.

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 Mode
- Support Smart Link Function
- Support Wireless and Remote Firmware Upgrade Function
- Integrated PCB antenna.
- Compact surface mount module 24mm x 19.5mm x 3mm mm.
- Full IPv4 stack.
- Low power RTOS and drivers.
- CE/FCC Certified.
- RoHS compliant.
- Single supply – 3.3V operation.

1.1.2 Device Parameters

Table 1 HF-LPT120G 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)		
Internal:On-board PCB antenna		
Hardware Parameters	Data Interface	UART GPIO
	Operating Voltage	2.95~3.6V
	Operating Current	Normal [WiFi ON/OFF, DTIM=100ms]: Average. ~20mA, Peak: 280mA
	Operating Temp.	-20°C - 85°C
	Storage Temp.	-40°C - 125°C
	Dimensions and Size	24mm x 19.5mm x 3mm
	External Interface	2x9 pad
Software Parameters	Network Type	STA /AP
	Security Mechanisms	WEP/WPA-PSK/WPA2-PSK
	Encryption	WEP64/WEP128/TKIP/AES
	Update Firmware	Local Wireless, Remote
	Customization	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

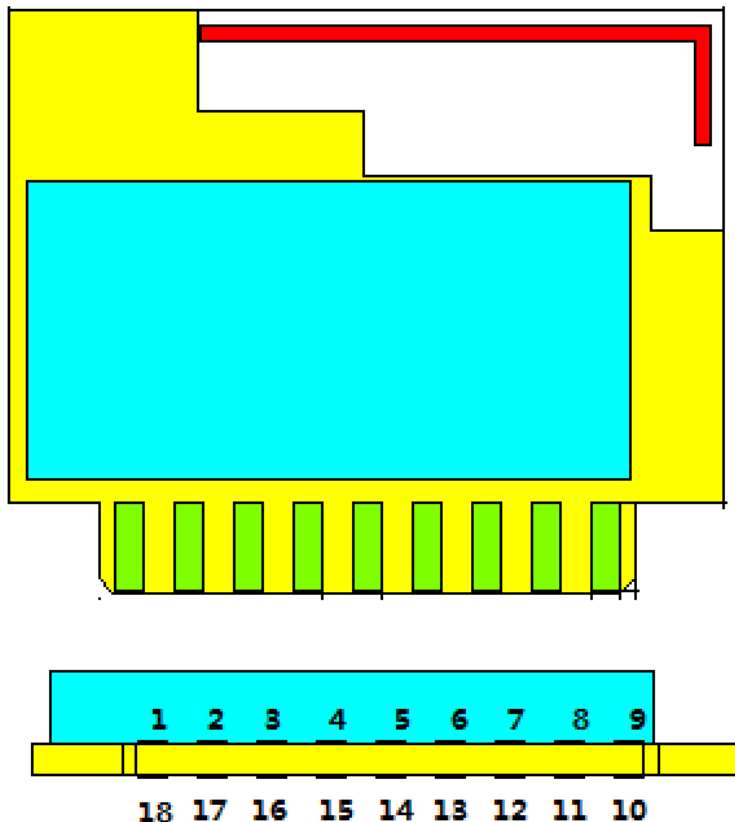


Figure 1. HF-LPT120G Pins Map

Table 2 HF-LPT120G Pins Definition

Pin	Description	Net Name	Signal Type	Comments
1,10,11,12,14,16,18	Ground	GND	Power	
2,17	+3.3V	VDDIO	Power	
3	UART0	UART0_TX	O,PU	GPIO20
4	UART0	UART0_RX	I	GPIO19
5	GPIO_18	GPIO_18	I/O	GPIO18
6	GPIO_3	nReady	I/O	“0” – Boot-up OK; “1” – Boot-up No OK; No connect if not use.;
7	UART1_RXD	UART1_RXD	I/O	GPIO6/UART1_RXD UART1 Debug Information Input
8	UART1_TXD	UART1_TXD	I/O,PU	GPIO5/UART1_TXD UART1 Debug Information Output

9	GPIO_15	nLink	I/O	Detailed functions see <Notes>
13	Module Reset	EXT_RESETn	I,PU	“Low” effective reset input.
15	Restore Configuration	nReload	I/O,PU	Can be configured as GPIO_2 Detailed functions see <Notes>

<Notes> **PIN3/PIN9 must be high when bootup, otherwise the module will fail to work.**

I — Input; O — Output

PU—Internal Resistor Pull Up; I/O: Digital I/O; Power—Power Supply

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” >= 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.

nLink Pin (LED) function:

1. At wireless firmware and config upgrade mode , this LED used to indicate configure and upgrade status.
2. At “Smart Link “ config mode, this LED used to indicate APP to finish setting.
3. At normal mode, it’s Wi-Fi link status indicator

High-Flying strongly suggest customer fan out this pin to LED.

1.2.2. Electrical Characteristics

Absolute Maximum Ratings:

Parameter	Condition	Min.	Typ.	Max.	Unit
Storage temperature range		-40		125	°C
Maximum soldering temperature	IPC/JEDEC J-STD-020			260	°C
Supply voltage		0		3.6	V
Voltage on any I/O pin		0		3.6	V
ESD (Human Body Model HBM)	TAMB=25°C			2.5	KV
ESD (MM)	TAMB=25°C			0.25	KV

Power Supply & Power Consumption:

Parameter	Condition	Min.	Typ.	Max.	Unit
Operating Supply voltage		2.95	3.3	3.6	V
Supply current, peak	Continuous Tx		280		mA
Supply current, IEEE PS	DTIM=100ms		20		mA

1.2.3. Mechanical Size

HF-LPT120G modules physical size (Unit: mm) as follows:

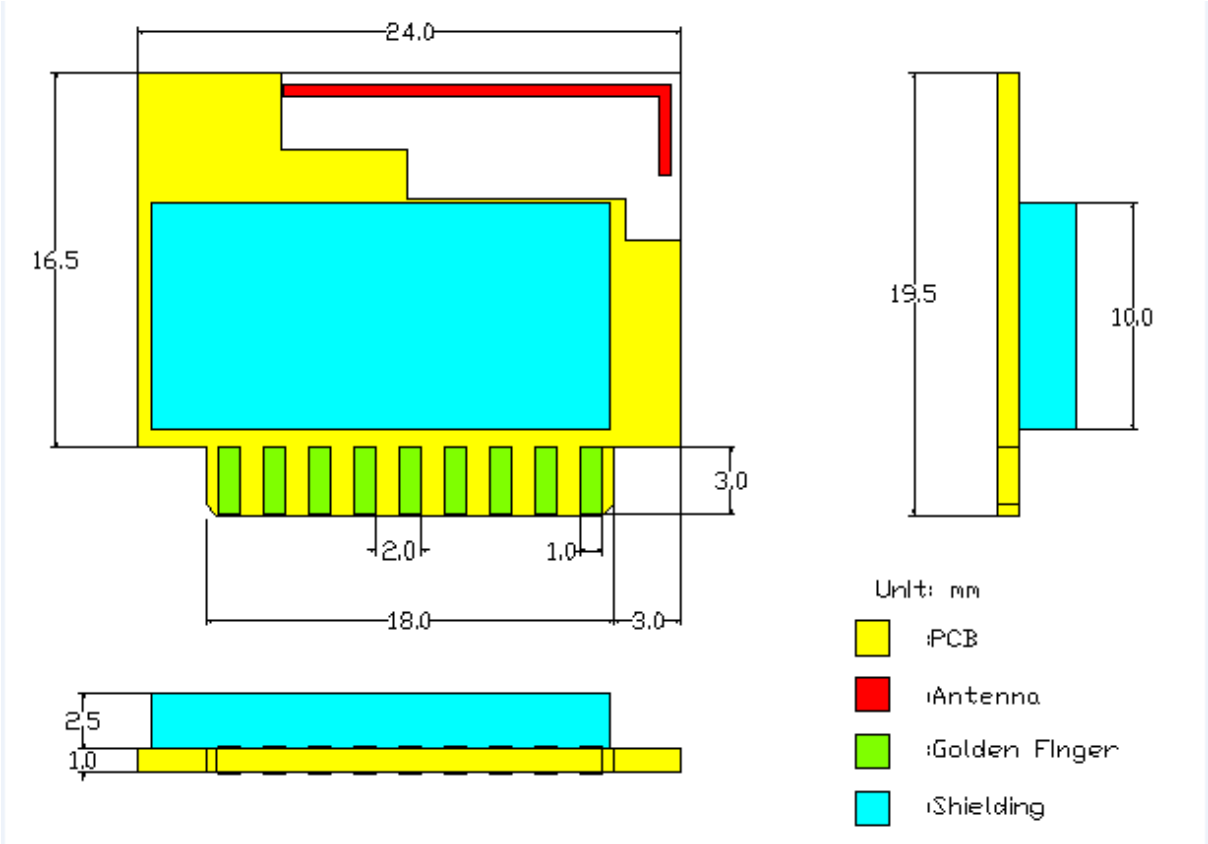
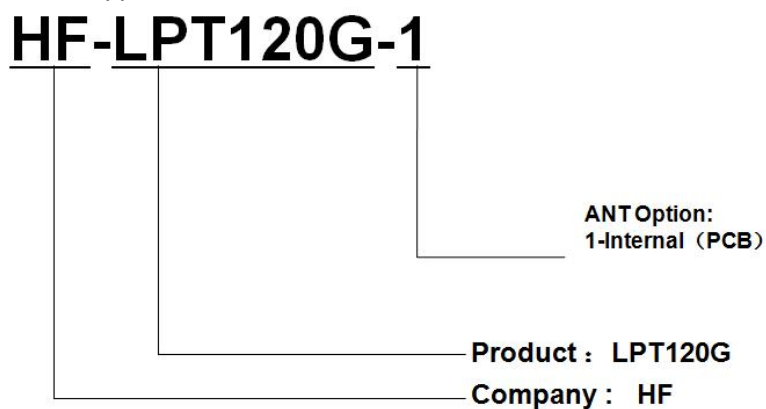


Figure 2. HF-LPT120G Mechanical Dimension

1.2.4. Order Information

Base on customer detailed requirement, HF-LPT120G series modules provide different variants and physical type for detailed application.



HF-LPT120G-1 Front



HF-LPT120G-1 Back



Figure 3. HF-LPT120G Order Information

1.3. Typical Application

Refer to HF-LPB120 user manual for detailed application and module usage.

2. PACKAGE INFORMATION

2.1. Recommended Reflow Profile

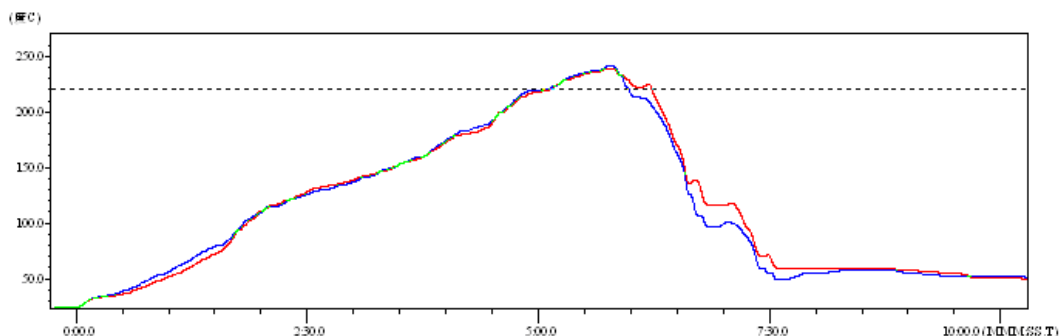


Figure 4. Reflow Soldering Profile

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)

1. Shelf life in sealed bag: 12 months, at <30°C and <60% relative humidity (RH)
2. After bag is opened, devices that will be re-baked required after last baked with window time 168 hours.
3. Recommend to oven bake with N2 supplied
4. Recommend end to reflow oven with N2 supplied
5. 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
6. Recommend to store at ≦ 10% RH with vacuum packing
7. If SMT process needs twice reflow:
 - (1) Top side SMT and reflow
 - (2) 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.

APPENDIX E: CONTACT INFORMATION

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

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