Product Specification

Revision	V1.0		
Date	2016-07-16		
Model Name	BL-LW084-B		
Product Name	IEEE 802.11b/g/n (1T1R) MINI PCI-E Module		
Bilian Approve Field			
Engineer	**QC**	**Sales**	
Customer Approve Field			
Engineer	**QC**	**Manufactory**	**Purchasing**

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Revision History

Date	Document Revision	Product Revision	Description
2017/07/21	0.1	V0.1	Preliminary release
2017/08/19	1.0	V1.0	batch production

1. Introduction

1.1 General Description

BL-LW084-B product accord with FCC CE is a highly integrated Wi-Fi single chip which support 150Mbps PHY rate. It fully complies with IEEE802.11n and IEEE802.11b/g standard, offering feature-rich wireless connectivity at high standard, and delivering reliable, cost-effective throughput from an extended distance.

Optimized RF architecture and baseband algorithms provide superb performance and lower power consumption. Intelligent MAC design deploys a high efficient DMA engine and hardware data processing accelerators which offloads the host processor.

Figure 1 Top View

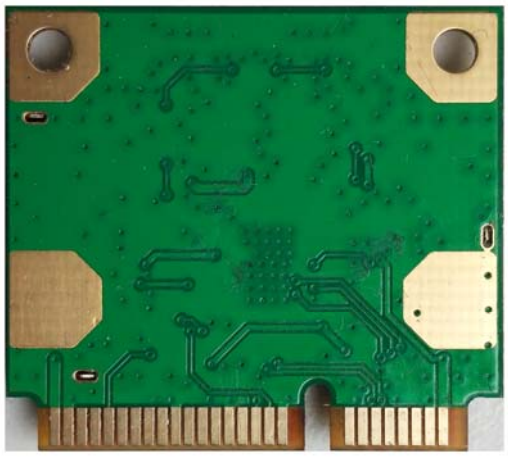


Figure 2 Bottom View

1.2 Features

- Operating Frequencies : 2.4~2.4835GHz
- Host Interface is MINI PCI EXPRESS
- IEEE Standards : IEEE 802.11b/g/n
- Wireless data rate can reach up to 150Mbps
- Connect to the external antenna through the IPEX connector
- Power Supply:3.3V±0.2V

1.3 Applications

- IP Camera
- STB
- Smart TV

2. Functional Block Diagram

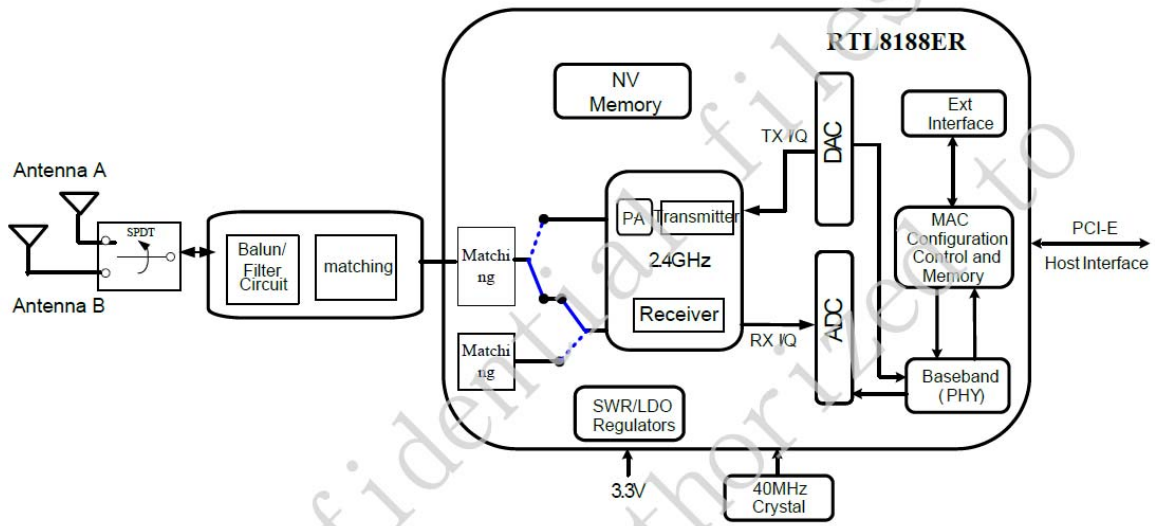


Figure 2.Single-Band 11n (1x1) dual antenna diversity Solution

Figure 3 RTL8188EE block diagram

3. Product Technical Specifications

3.1 General Specifications

Item	Description
Product Name	BL-LW084-B
Main Chip	RTL8188EE
Host Interface	MINI PCI EXPRESS
IEEE Standards	IEEE 802.11b, IEEE 802.11g,IEEE 802.11n
Operating Frequencies	2.4GHz~2.4835GHz
Modulation	802.11b: CCK, DQPSK, DBPSK 802.11g: 64-QAM,16-QAM, QPSK, BPSK 802.11n: 64-QAM,16-QAM, QPSK, BPSK
Working Mode	Infrastructure, Ad-Hoc
Wireless Data Rate	802.11b: 1, 2 ,5.5,11 Mbps 802.11g: 6,9,12,18,24,36,48,54 Mbps

	802.11n: MCS0~7，HT20 reach up to72.2Mbps, HT40 reach up to150Mbps
Rx Sensitivity	-93dBm (Min)
TX Power	18dBm (Max)
Antenna Type	Connect to the external antenna through the IPEX connector
Dimension(L*W*H)	30.0x 26.7x3.2mm (LxWxH)，Tolerance: ±0.2mm
Power Supply	3.3V±0.2V
Power Consumption	standby mode 40mA@3.3V (Max), TX mode 180mA@3.3V (Max)
Clock Source	40MHz
Working Temperature	-10° C to +50° C
Storage Temperature	-40° C to +70° C

ESD CAUTION: Although this module is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this module. It must be protected from ESD at all times and handled under the protection of ESD.

3.2 DC Power Consumption

Vcc=3.3V，Ta = 25 °C，unit: mA				
Supply current	Typ.		Max	
Standby (RF disabled)	35		40	
802.11b	1Mbps		11Mbps	
Supply current	Typ.	Max.	Typ.	Max.
TX mode	170	180	160	170
RX mode	30	35	35	40
802.11g	6Mbps		54Mbps	
Supply current	Typ.	Max.	Typ.	Max.
TX mode	120	130	110	120
RX mode	30	35	35	40
802.11n HT20	MCS0		MCS7	
Supply current	Typ.	Max.	Typ.	Max.
TX mode	100	110	90	100
RX mode	30	35	35	40
802.11n HT40	MCS0		MCS7	
Supply current	Typ.	Max.	Typ.	Max.
TX mode	95	105	90	100
RX mode	30	35	35	40

3.3 RF Specifications

TX Power	802.11b: 17±1.5dBm 802.11g/11n-HT20: 14±1.5dBm 802.11n -HT40: 14±1.5dBm
TX Constellation Error(EVM)	802.11b: < -22dB@11Mbps 802.11g/11n-HT20: < -28dB@54/72.2Mbps 802.11n-HT40: < -28dB@135Mbps
Receiver Minimum Input Sensitivity@PER	802.11b: < -90dBm@PER<8%@1Mbps 802.11b: < -84dBm@PER<8%@11Mbps 802.11g: < -72dBm@PER<10%@54Mbps 802.11n: < -66dBm@PER<10%@135Mbps

RF Test Report

Mode	Rate(Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH1	CH7	CH13	CH1	CH7	CH13	CH1	CH7	CH13
11b	1	17.27	17.45	17.64	-34.43	-34.02	-33.67	-93	-93	-93
	11	17.55	17.57	17.55	-25.33	-25.84	-27.23	-86	-85	-85
11g	6	15.25	15.69	15.63	-32.62	-33.59	-31.35	-90	-90	-90
	54	14.87	14.66	14.82	-32.49	-34.23	-33.61	-74	-74	-74
11n HT20	MCS0	14.92	14.61	14.33	-32.38	-34.32	-34.66	-90	-89	-90
	MCS7	14.32	14.27	14.19	-32.29	-33.96	-35.14	-70	-70	-70
Mode	Rate(Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH3	CH7	CH11	CH3	CH7	CH11	CH3	CH7	CH11
11n HT40	MCS0	14.86	14.51	14.63	-31.37	-32.08	-32.42	-88	-88	-88
	MCS7	14.35	14.05	14.27	-31.67	-31.95	-34.00	-67	-67	-67

4. Pin Assignments

Figure 4 Pin Assignments (Top view)

Pin No	Pin Name	Description	Pin No	Pin Name	Description
1	WAKE	Wake / sleep control	2	VD33	DC 3.3V Power input
3	Reserved	Reserved	4	GND	Ground
5	Reserved	Reserved	6	Reserved	Reserved
7	CLKREQ#	Reference clock request signal	8	Reserved	Reserved
9	GND	Ground	10	Reserved	Reserved
11	REFCLK-	PCI Express Differential reference clock signal 100MHz ± 300ppm	12	Reserved	Reserved
13	REFCLK+		14	Reserved	Reserved
15	GND	Ground	16	Reserved	Reserved
17	Reserved	Reserved	18	GND	Ground
19	Reserved	Reserved	20	W_DISABLE	Radio signal control
21	GND	Ground	22	PERST	Reset signal (low level)
23	HSON	PCI Express Differential transmission signal	24	Reserved	Reserved
25	HSOP		26	GND	Ground
27	GND	Ground	28	Reserved	Reserved
29	GND	Ground	30	Reserved	Reserved
31	HSIN	PCI Express Differential transmission signal	32	Reserved	Reserved
33	HSIP		34	GND	Ground
35	GND	Ground	36	Reserved	Reserved
37	GND	Ground	38	Reserved	Reserved

39	Reserved	Reserved	40	Reserved	Reserved
41	Reserved	Reserved	42	Reserved	Reserved
43	GND	Ground	44	LED_WLAN	LED pin (active low)
45	Reserved	Reserved	46	Reserved	Reserved
47	Reserved	Reserved	48	Reserved	Reserved
49	Reserved	Reserved	50	GND	Ground
51	Reserved	Reserved	52	VD33	DC 3.3V Power input

5. Application Information

5.1 Supported Platform

Operating System	CPU Framework	Driver
WIN2000/XP/VISTA/WIN7	X86 Platform	Enable
LINUX2.4/2.6	ARM, MIPSII	Enable
WINCE5.0/6.0	ARM ,MIPSII	Enable

6. Mechanical Specifications

Module dimension: Typical (L*W * H): 30.0mm*26.7mm*3.2mm Tolerance : +/-0.2mm

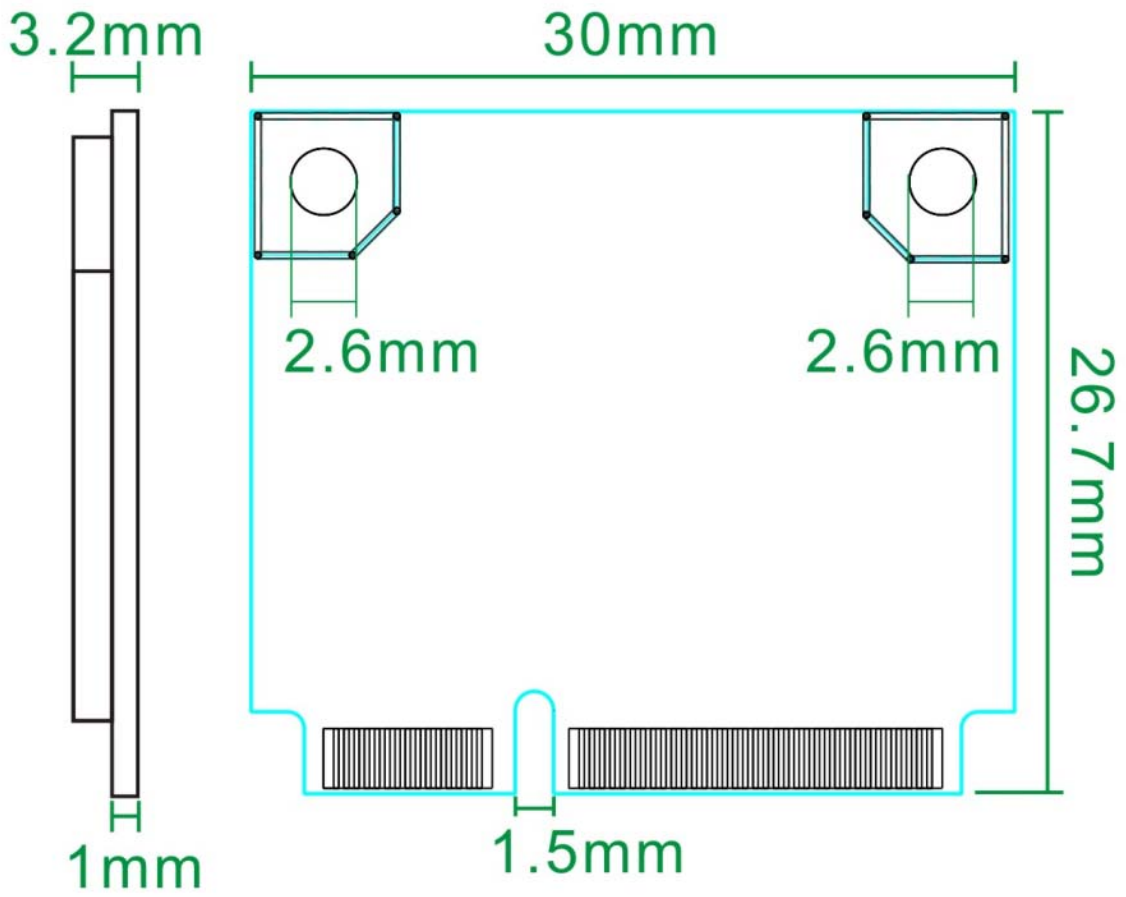


Figure 5 Top View

7. Others

7.1 Package Information

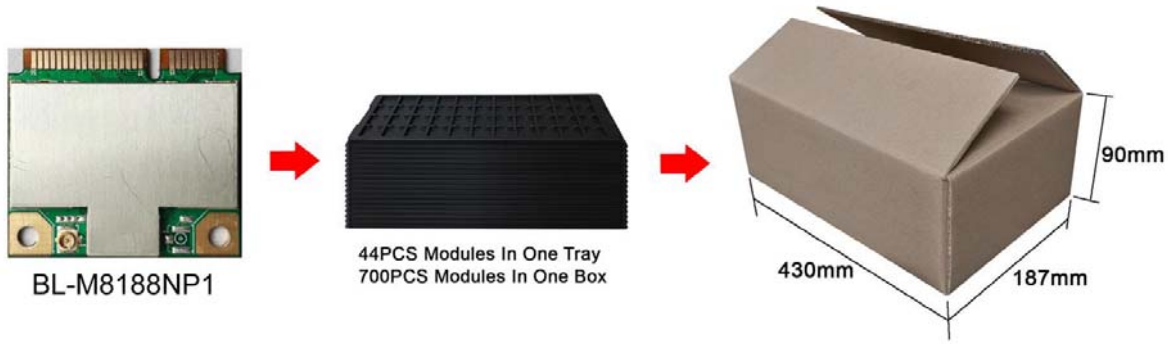
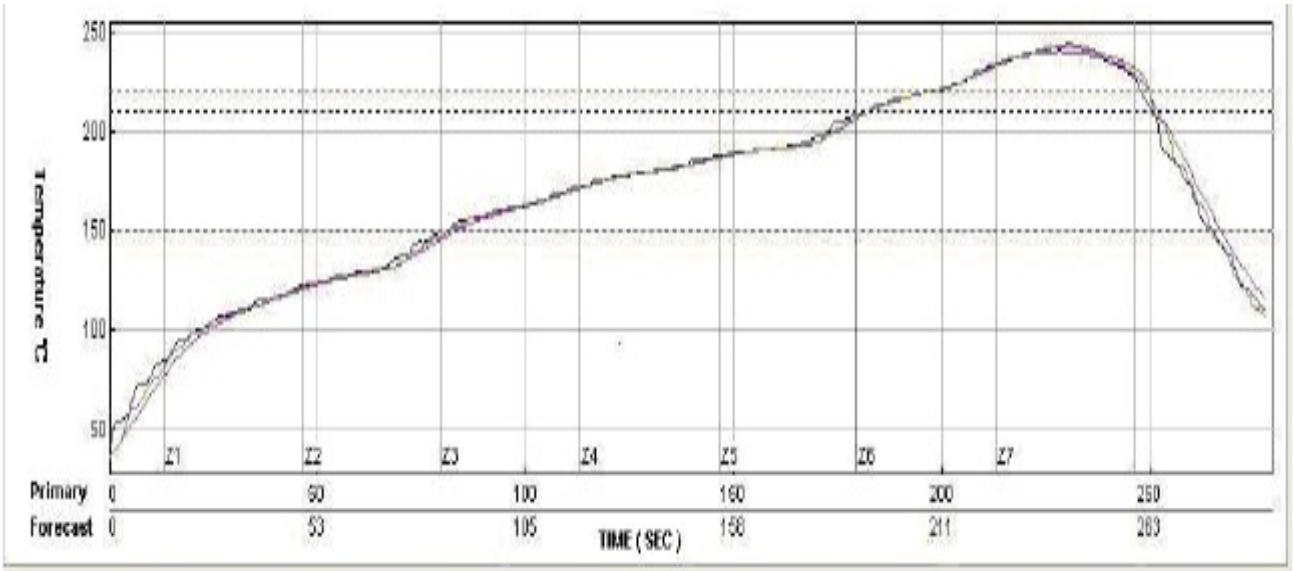


Figure 6 Package Information

8. Typical Solder Reflow Profile



TCs	RAMP		SOAP Between 150 to 240 ℃		Reflow 220℃		Peak Temperature ℃	
2	1.4	-7%	99.4	31%	53.8	38%	243.1	82%
3	1.4	-4%	100.5	35%	51.5	15%	241.0	20%
4	1.4	-5%	101.4	38%	54.4	44%	244.7	93%
Different in Temp	0.04		1.99		2.92		3.65	
P.2	1.4	-7%	99.4	31%	53.8	38%	243.1	82%
P.3	1.4	-4%	100.5	35%	51.5	15%	241.0	20%
P.4	1.4	-5%	101.4	38%	54.4	44%	244.7	93%
Different in Temp	0.04		1.99		2.92		3.65	

1. Pls handle the module under ESD protection.
2. Reflow soldering shall be done according to the solder reflow profile. Peak temperature 245℃.
3. Products require baking before mounting if humidity indicator cards reads >30% temp <30 degree C, humidity < 70% RH, over 96 hours.
   Baking condition: 125 degree C, 12 hours
   Baking times: 1 time
4. Storage Condition: Moisture barrier bag must be stored under 30 degree C, humidity under 85% RH. The calculated shelf life for the dry packed product shall be a 12 months from the bag seal date. Humidity indicator cards must be blue, <30%.

9. installation

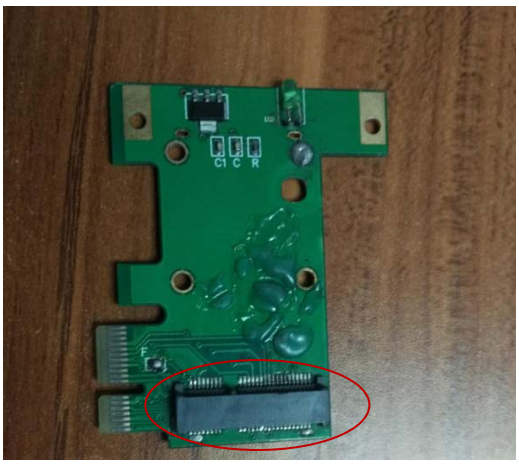
1. product should not collocate with other radio
2. host label should content modular FCC ID:2AL6K-LW084-B
3. If you buy this module, you use should be satisfied for the antenna:

(a)the antenna type:connect to the external antenna through the IPEX connector

(b)the antenna gain:≤2dBi

4.installation

(a)find the client mainboard's router interface:as shown on the following picture.



(b)the module insert the mainboard according to the requirements of customers,pay attention to the position

(c)finished

FCC Statement

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.

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.