User manual

Product description: IEEE 802.11b/g/n 1x1 USB module

Model name: WLM100A

Version: v1.0

1. Introduction

WLM100A is an USB embedded module compliant with IEEE802.11b/g/n. The core chipset is from Ralink, part number RT5370

2. Features

- CMOS Technology with PA, LNA, RF, Baseband and MAC integrated
- 1T1R Mode with 150Mbps PHY Rate for Both Transmit and Receiving
- Legacy and High Throughput Modes
- 20MHz/40MHz Bandwidth
- Reverse Direction Grant Data Flow and Frame Aggregation
- WEP64/128, WPA, WPA2, TKIP, AES, WAPI
- QoS-WMM, WMM-PS
- WPS, PIN, PBC
- Multiple BSSID support
- USB2.0
- Low Power with Advanced Power Management
- Operating Systems – Windows XP 32/64, 2000, Windows7, Vista32/64, Linux, Macintosh

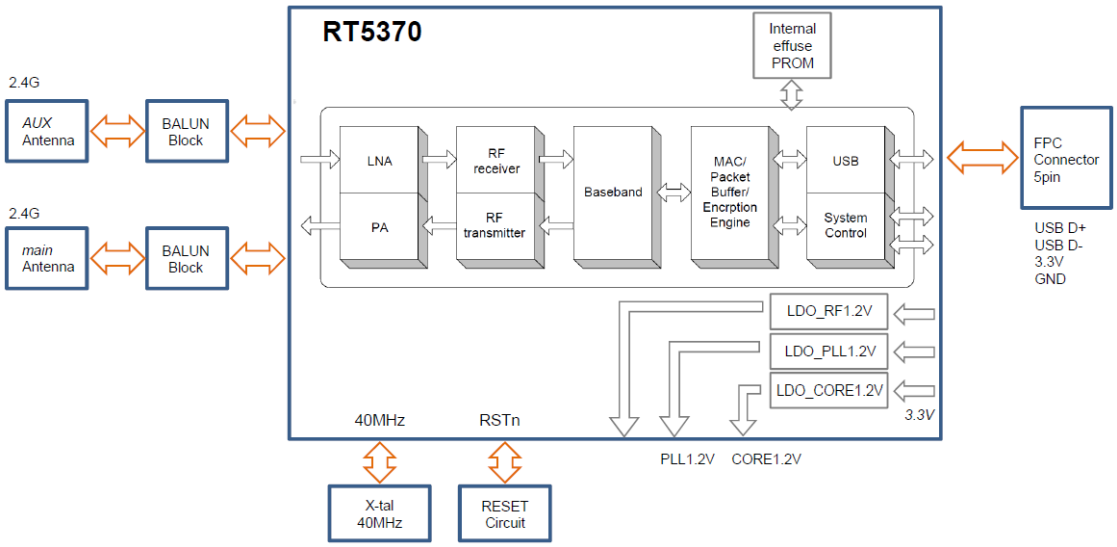
3. Hardware

3.1 Main Chipset Information

Item	Vender	Part number
MAC/BBP/Radio Transceiver/PA	Ralink	RT5370

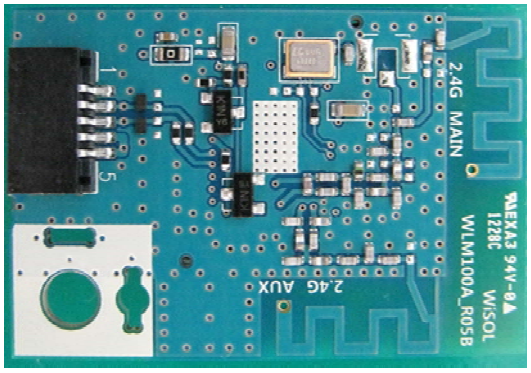
3.2 Circuit Block Diagram

The major internal components and external interfaces of WLM100A are illustrated in below Figure.

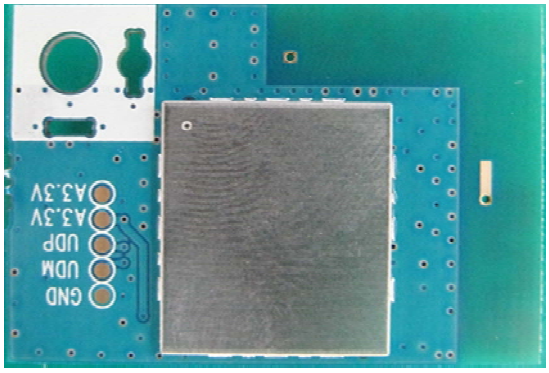


3.3 Outlook Diagram

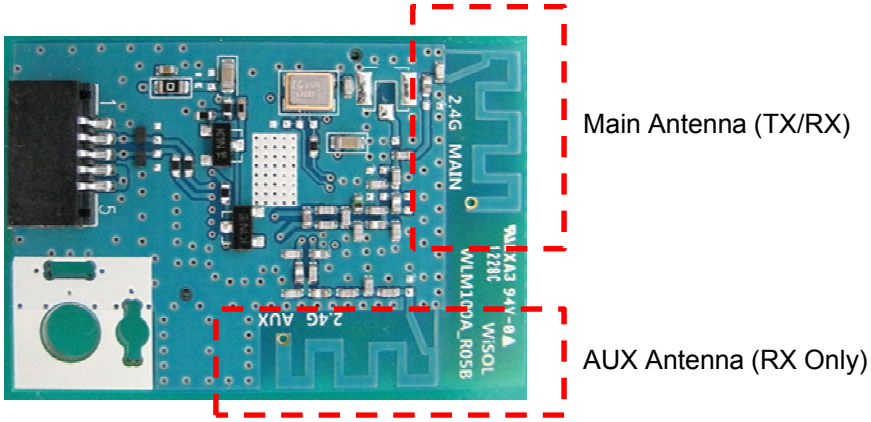
Top view



Bottom view



3.4 Antenna Information

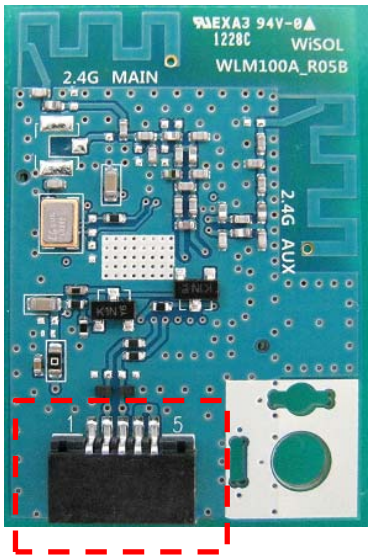


3.4.1 Gain and Efficiency

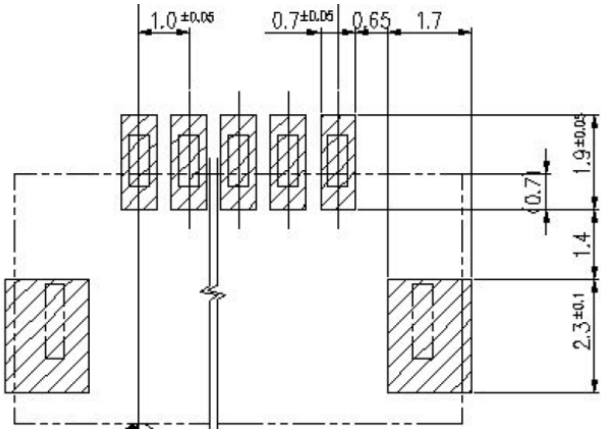
	Frequency	MHz	2400	2442	2485
Main	Efficiency	%	55.1	65.5	63.2
	Avg. Gain	dBi	-2.6	-1.8	-2.0
	Peak Gain	dBi	0.6	2.2	2.6
AUX	Efficiency	%	38.3	45.5	35.4
	Avg. Gain	dBi	-4.2	-3.4	-4.5
	Peak Gain	dBi	-0.1	1.3	0.6

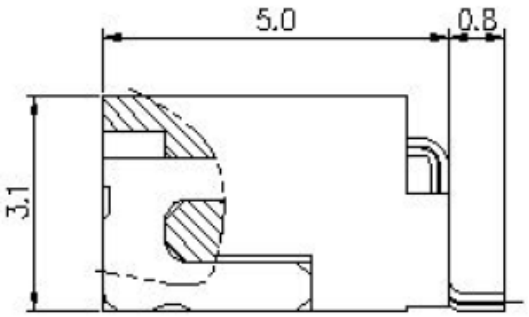
4. Interface

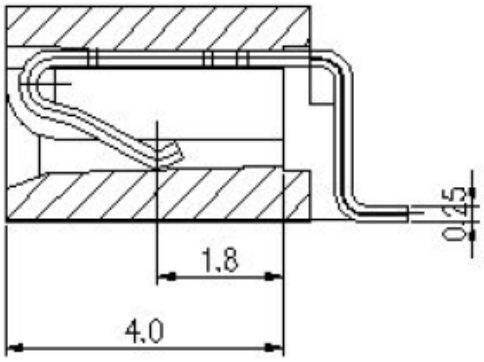
1.00mm pitch 5Pin FPC/FFC Connector
SMT, TOP Contact, Non-ZIF Type



Terminal	Name	Interface	I/O	Description
1	GND	Analog	I	Ground
2	USB D-	Digital	I/O	USB Interface negative
3	USB D+	Digital	I/O	USB Interface positive
4	VCC	Analog	I	3.3V Power supply input
5	VCC	Digital	I	3.3V Power supply input







5. Specifications

5.1 Supply Voltage

3.3V +/- 5% DC

5.2 Current Consumption

Symbol	Parameter	Min	Typ.	Max	Unit
ICC_RX	Receiving Current Consumption	-	250	-	mA
ICC_TX	Transmission Current Consumption	-	410	-	mA

5.3 RF Sensitivity

Typical sensitivity level, 2RX with +/-3dB Tolerance. Unit : dBm

20MHz	Frequency (MHz)		
	2412	2436	2462
1Mbps	-90	-90	-90
2Mbps	-90	-90	-90
5.5Mbps	-89	-89	-89
11Mbps	-86	-86	-86
6Mbps	-88	-88	-88
9Mbps	-88	-88	-88
12Mbps	-85	-85	-85
18Mbps	-83	-83	-83
24Mbps	-80	-80	-80
36Mbps	-77	-77	-77
48Mbps	-73	-73	-73
54Mbps	-72	-72	-72
MCS0	-87	-87	-87
MCS1	-85	-85	-85
MCS2	-83	-83	-83
MCS3	-80	-80	-80
MCS4	-77	-77	-77
MCS5	-73	-73	-73
MCS6	-71	-71	-71
MCS7	-70	-70	-70

5.4 Environmental Spec.

Symbol	Parameter	Rating	Unit
Temp	Operating	-20 to 70	℃
TSTG	Storage Temperature	-40 to 85	℃

Federal Communication Commission Interference 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 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.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user′s authority to operate this equipment.

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.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

FCC Radiation Exposure Statement:

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. This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains **FCC ID: A3LWLM100A** ". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

IC Statement

This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la classe B est conforme á la norme NMB-003 du Canada.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 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.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator is still responsible for the IC compliance requirement of the end product, which integrates this module.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the IC RSS-102 radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

LABEL OF THE END PRODUCT: The final end product must be labeled in a visible area with the following " Contains **IC : 649E-WLM100A** ".