

WiSe 1230 Hardware and Technical Specification

Version (Rev 1.5)

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Revision History

Rev No	Date	Notes
Rev 1.0	05/01/2017	Draft Release
Rev 1.1	07/02/2017	BLE chip partnumber corrected
Rev1.2	14/02/2017	Block diagram and External antenna guide included.
Rev1.3	23/02/2017	Land Pattern Dimension added.
Rev1.4	17/04/2017	PCB Antenna description removed.
Rev1.5	14/06/17	Module Host details added.

General Information

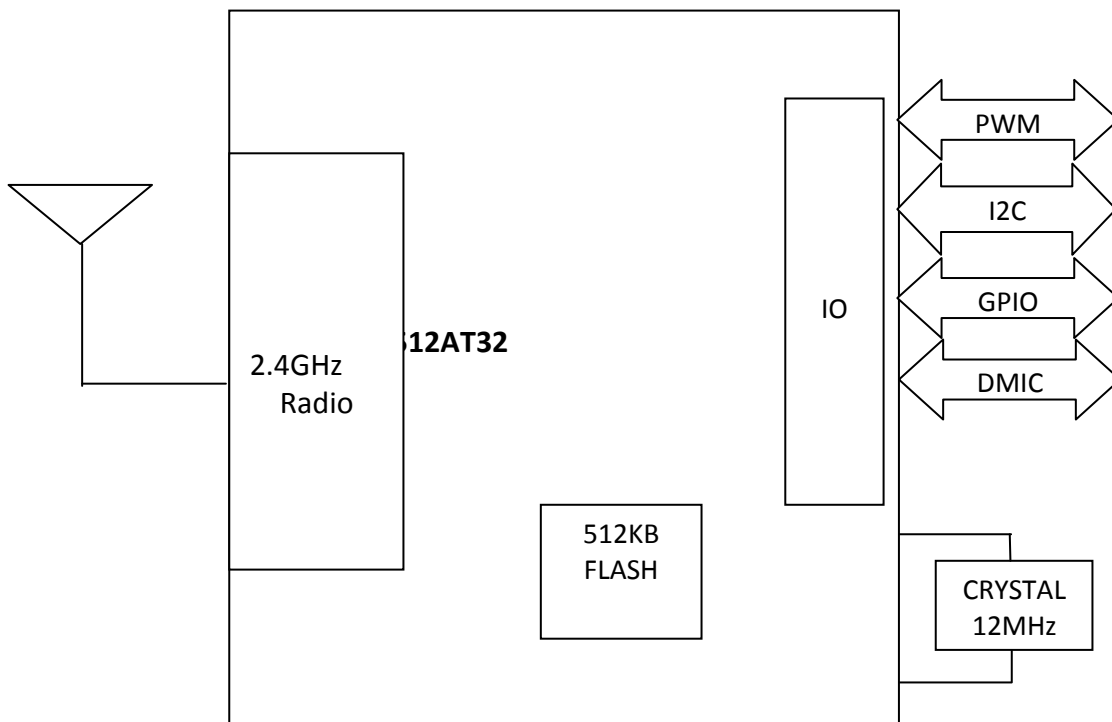
Features

- Bluetooth v4.0 specification complaint
- Support for Bluetooth 4.1 specification host stack
- 512KB of Flash memory
- 12 MHz and 32MHz clock system
- PWM/SPI/GPIO/UART/I2C interface
- TX output power upto +5dbm
- -92dbm BT4.0 RX sensitivity
- RSSI Monitoring
- 5 programmable GPIO's/ 5 PWM channels
- 2 AIO channels

General Description

WiSe 1230 module enables ultra-low-power connectivity and basic data transfer for applications previously limited by the power consumption, size constraints and complexity of other wireless standards. WiSe 1230 is intended to provide considerably reduced power consumption and cost.

Block Diagram:



Application:

WiSe 1230 enables connectivity and data transfer to leading smartphone, tablet and personal computing devices including Apple iPhone, iPad, iPod and Mac products and leading Android devices.

- Smart mesh light application
- Smart home heating and lighting control
- Health sensors like blood pressure, thermometer and glucose meter
- Beacons
- Security
- Sensors
- Wearable devices.

Form factor:

- Dimension: 23.45x15mm

Hardware Specification:

COMPONENTS	DESCRIPTION
BLE CHIP	TLSR8269F512AT32
CRYSTAL	12MHz

External antenna.

Antenna

WiSe1230 Modules has external antenna with UFL connector. The WiSe1230 has been certified with the external antenna only.

The external antenna’s directivity determines the required position and orientation of the antenna with respect to the ground plane. We need to make sure the external antenna impedance is close to 50 Ohm to have optimal matching. External antenna’s centreband frequency should be in the range of 2.4 to 2.483 GHz. The nearby materials and nature of the application determine whether you need a directional or omnidirectional antenna.

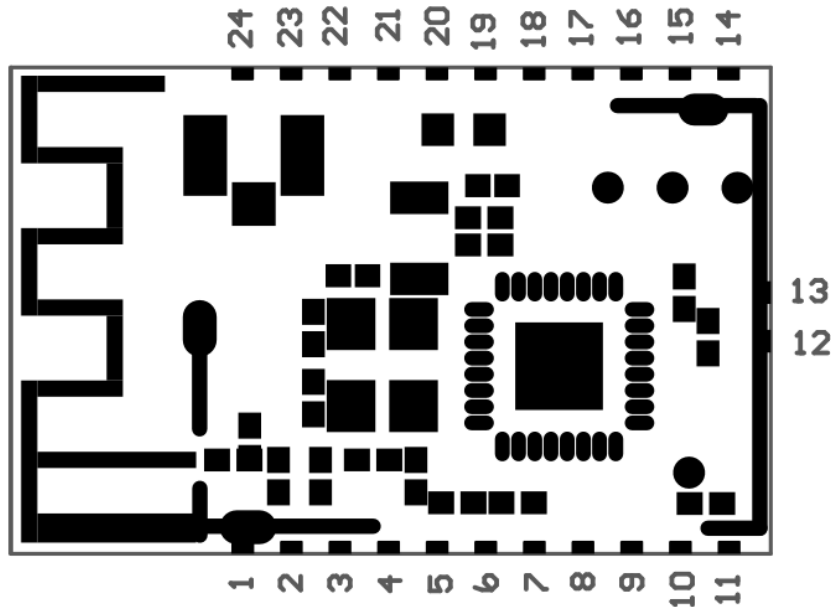
The following are some design guidelines to help ensure antenna performance:

- Never place the ground plane or route copper traces directly underneath the antenna portion of the module.
- Never place the antenna close to metallic objects.
- In the overall design, ensure that wiring and other components are not placed near the antenna.
- Do not place the antenna in a metallic or metalized plastic enclosure.

- Keep plastic enclosures 1cm or more away from the antenna in any direction. Description

Pinout and Pin Description

Pinout Diagram



PINS	NAME	FUNCTION	COMMENTS
1	GND	Ground	Ground(Vss)
2	ANA_B1	I/O	Programmable I/O or AIO
3	ANA_B0/SWS	I/O or AIO	Programmable I/O or AIO
4	GP5	I/O or AIO	Programmable I/O or AIO
5	TX	I/O	Programmable I/O
6	RX	I/O	Programmable I/O
7	PWM1	I/O or AIO	Programmable I/O or AIO
8	SPI_CLK	I	SPI Clock or Programmable I/O
9	DP/IO	I/O	Programmable I/O
10	DMIC_DI/A0	I/O	DMIC data I/P or Programmable I/O
11	DMIC_CLK/A1	I/O	DMIC Clk or Programmable I/O
12	GND	Ground	Ground(Vss)
13	GND	Ground	Ground(Vss)
14	SWM/A7	I/O	Single Wire Master or I/O
15	I2C_SDA	I/O	I2C Data or Programmable I/O
16	I2C_SCL	I/O	I2C Clk or Programmable I/O
17	PWM5	I/O	Programmable I/O
18	PWM4	I/O	Programmable I/O
19	PWM0	I/O	Programmable I/O
20	VDD33	Power	Power Input(Vdd)
21	GP4/D2	I/O	Programmable I/O
22	CSB	O	SPI select or Programmable I/O

23	SPI_MISO	O	SPI data output or Programmable I/O
24	SPI_MOSI	I	SPI data input or Programmable I/O

Electrical characteristics

Absolute Maximum Ratings

Ratings	Min	Max
Storage Temperature	-65°C	125°C
Supply voltage	2.2V	3.6V

Recommended operating condition

Item	Min	Typical	Max
Operating Temperature	-40	-	125°C
Supply voltage	2.2V	3.3V	3.6V
IO Supply Voltage	V	-	3.6V

AIO

Ratings	Min	Max
Input Voltage	0.7	3.3V
Output voltage	V	3.3V

PWM

Totally there are 5 PWM channels.

PWM Frequency:	Target frequency TBD kHz.
Maximum voltage for logic low:	VIL = 0 V
Absolute maximum current sourced:	IMAX = mA
Absolute maximum voltage level:	VMax =3.6V

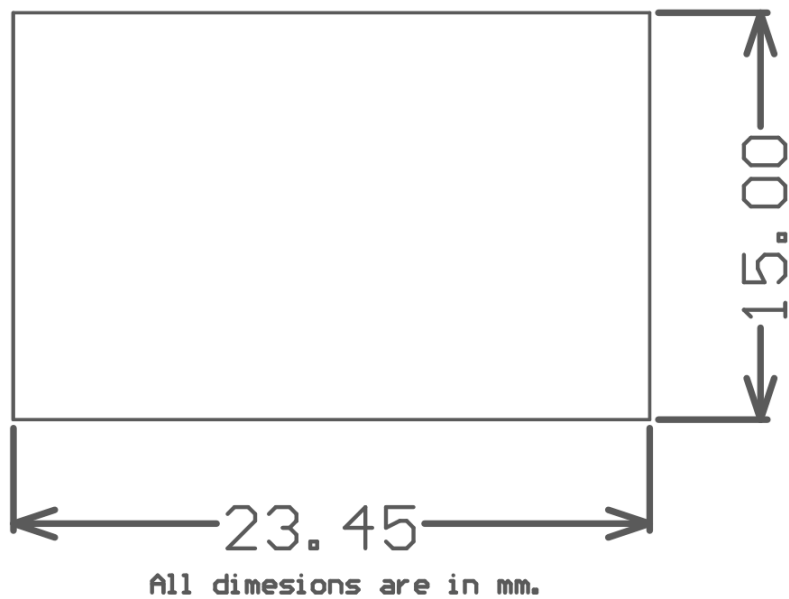
Current Consumption:

Mode	Total Typical Current at 3V
Sleep Mode	15µA
RX/TX active	~15mA @ 3V peak current

RF Characteristics:

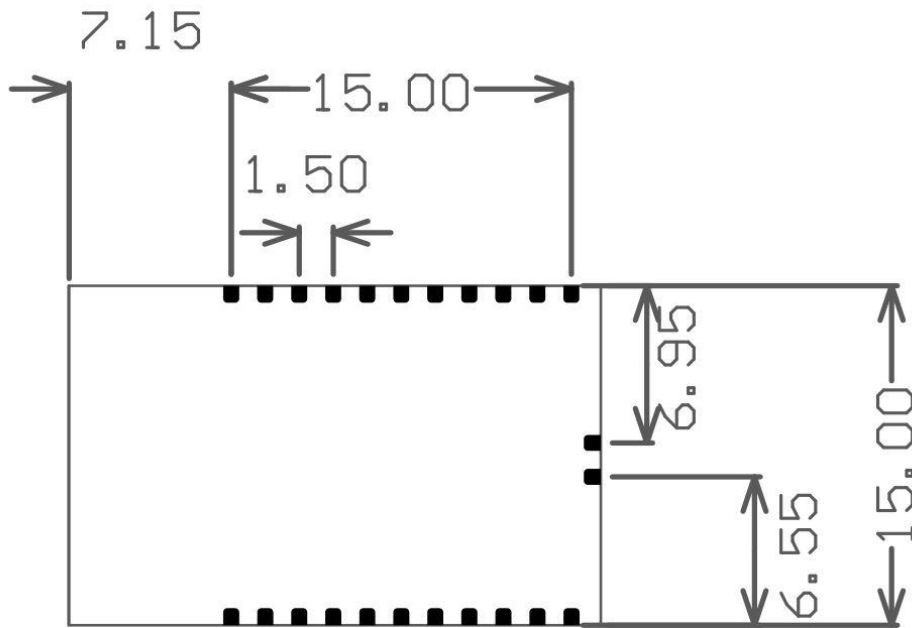
Path	Description	Conditions	Min	Typ	Max	Unit
	Operating Frequency		2402		2480	MHz
	Maximum output power			7		dBm
	2 nd harmonic				54	dBuV
	3 rd harmonic				54	dBuV
TX	Modulation delta F1 average		225	255	275	kHz
	Modulation delta F1 / F2		0.8			
	Modulation delta F2 max			100		%
	Frequency accuracy		-100	25	100	kHz
	Frequency offset		-100	25	100	kHz
RX	Receiver Sensitivity			-92		dBm
	Receiver Sensitivity (with dirty transmitter)			-93		dBm
	Maximum received signal at 30.8% PER			-10		dBm

Module Dimension



Recommended Land Pattern Dimension:

- Dimension: 23.45x15mm
- Pitch: 1.5mm
- Pad dimension: 0.96x0.96mm
- Height:3.4mm(includes shield)



All dimensions are in mm

Host details:

The WiSe1230 module is going to be embedded with Multisensor

Multisensor

Multisensor is the one which contains PIR (ALS312), LDR (TEMT6000)RTC (HYM8563) and WiSe1230 module. It is intended to be a general purpose remote control that contains PIR, Ambient light sensor, Real time clock. Eventually we can make this an extremely flexible device by combining the PIR and ambient light sensor functions into one, and use the real-time clock to send out time sync packets for the low-power mesh. Also it can be used as a scheduler. Also this device is the 2 x AAA battery powered.

Note: The module can be integrated only in the host platform where it has been tested. Any additional hosts having different function, shape and electrical characteristics should be added with a class 2 permissive change. This implies additional testing of the radiated emissions within the new host.

Best practices

When designing with WiSe1230 modules, please pay attention to the following recommendations

- While integrating module make sure all the module pads are soldered properly.
- The module's voltage requirement is 2.5 to 3.6V, if the power supply is over 3.3V, please use a voltage regulator.
- If the communicating host uses a different voltage then the BLE module, please make sure that the voltage matches on the communication ports.
- The external antenna needs to be connected to the module.
- For best wireless signals, please avoid packing the antenna close to metal parts or case.

(OEM) Integrator has to assure compliance of the entire end-product incl. the integrated RF Module. For 15 B (§15.107 and if applicable §15.107) compliance, the host manufacturer is required to show compliance with 15 while the module is installed and operating.

Furthermore the module should be transmitting and the evaluation should confirm that the module's intentional emissions (15C) are compliant (fundamental / out-of-band). Finally the integrator has to apply the appropriate equipment authorization (e.g. Verification) for the new host device per definition in §15.101.

Integrator is reminded to assure that these installation instructions will not be made available to the end user of the final host device.

The final host device, into which this RF Module is integrated" has to be labelled with an auxiliary label stating the FCC ID of the RF Module, such as "Contains FCC ID: 2AG4NWISE1230"

"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."

NOTE: 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.

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