



## 2.4GHz/10mW TRANSCEIVER MODULE

### WM-Z2200 Hardware User's Manual



Figure 1. WM-Z2200

#### Features

- WM-Z2200 is a 2.4 GHz/10mW IEEE 802.15.4, transceiver module designed for wireless sensor measurement system and data link device.
- The transceiver module includes the direct digital sequence spectrum diffusion baseband modem that offers an effective data rate of 250Kbps.
- The frequency synthesizer operates for operation frequency range of 2405-2475MHz with 5MHz channel spacing.
- Frequency stability of 50ppm is determined by a single crystal oscillator (16.000MHz).

#### Benefits

- Highly reliable even if the RF environment changes.
- Provides simpler, faster, and easier installation of wireless sensor network system.
- By the addition of the front end, long-distance communication was enabled.

## **TRANSCEIVER MODULE (type:WM-Z2200) for Wireless Sensor Network system**

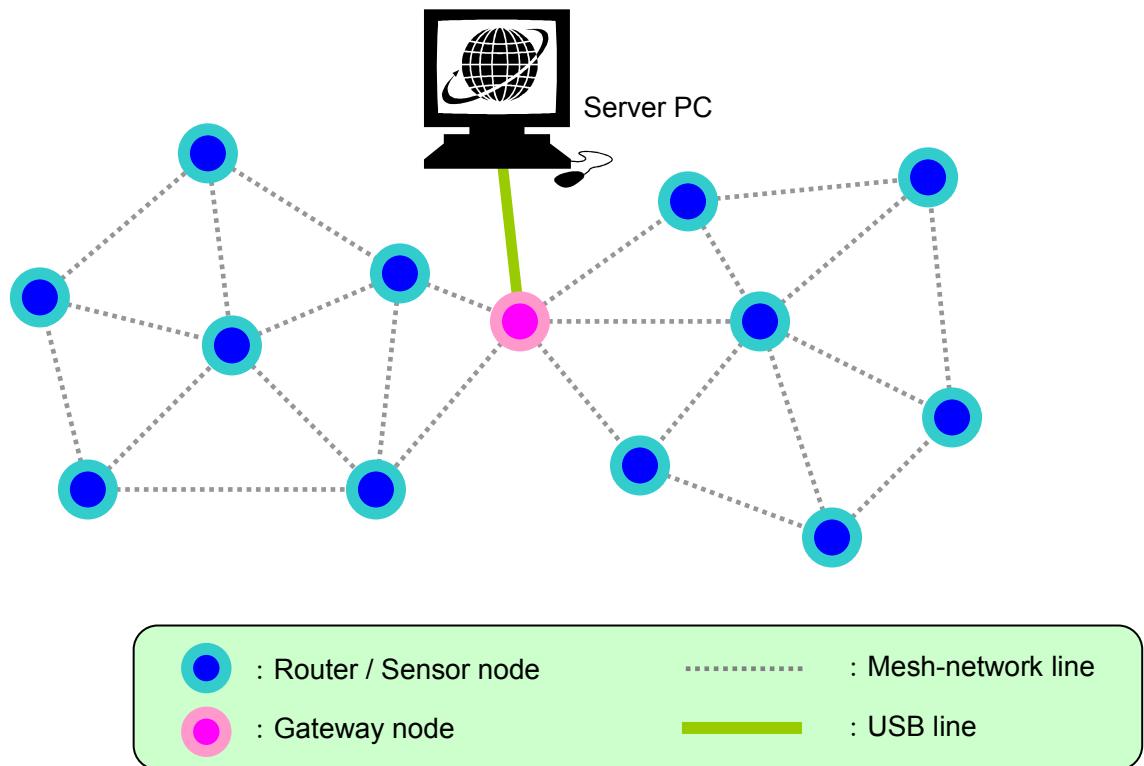


Figure 2. Wireless sensor network system concept

### **Description**

The transceiver module (WM-Z2200) forms a Wireless Sensor Network system (WSN) with the sensor unit and the equipment control unit, as shown in Fig.2 .  
WSN utilizes wireless mesh technology.

A wireless mesh network consists of a collection of nodes that communicate with each other by ad-hoc routing.

A grid-like topology enables the signal to hop among different paths in order to circumvent obstructions as it seeks and ultimately finds its target device.

These redundant communication paths enable a very high reliability.  
Because multiple signal paths exist, the network can adjust to potential communication link disruptions due to changes in the physical environment.

Once installed and powered, the transceivers automatically form a mesh network, and the Xmesh's communication is virtually transparent to the system and end user.

## Specifications

No.	Item	Spec	Notes
1	Frequency	2405 to 2475 MHz, 5 MHz channel spacing. 15 selectable channels of operation in the 2.4 GHz ISM band.	
2	Modulation	O-QPSK Direct Sequence Spread Spectrum radio in accordance with the IEEE 802.15.4 specification	
3	Oscillator	Frequency Synthesizer	
4	Transmit bit rate	250Kbps	
5	Antenna Impedance	50ohm unbalanced	
6	Antenna type	Coaxial connector	I-PEX type
7	Receiver type	Super heterodyne	
8	Operating Temperature	-10 to +70° C	
9	Dimensions	50mm x 25mm x 7.5mm	
10	Power Voltage	+2.7 ~ +3.3Vdc	

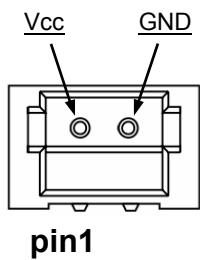
## Transmission Specifications

No.	Item	Spec	Notes
	Frequency error tolerance	+ /- 50ppm	
	Harmonics	20 dB down from the highest emission level	Conducted
	Adjacent ch leakage	< -25dBm	
	Occupied bandwidth	< 5MHz(99% OBW)	
5	Spurious emission		
	30-88MHz	< 100 uV/m	
	88-216MHz	< 150 uV/m	
	216-960MHz	< 200 uV/m	
	Above 960MHz	< 500 uV/m	
6	Current dissipation	< 100mA	

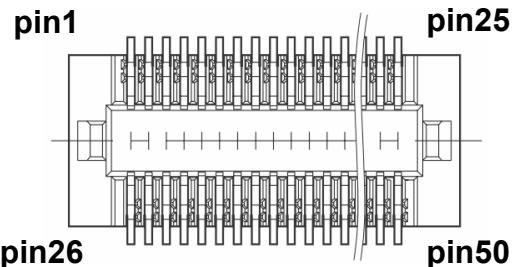
## Receiver Specifications

No.	Item	Spec	Notes
1	Sensitivity (PER=1%)	< -95dBm	
2	Spurious emission	< -47dBm @1GHz and more	
3	Spurious Response	> 25dB	
4	Adjacent channel rejection	> 25dB (+ /- 5MHz)	
5	Selectivity	< -6dB	
6	Inter-modulation	> 25dB	
7	Carrier Sense	Level:-77dBm + /- 5dBm Dynamic Range:> 90dB	
8	Current dissipation	< 80mA	

## Interface Connector Description



**J1** : Power supply connector  
[S2B-ZR-SM4A-TF]

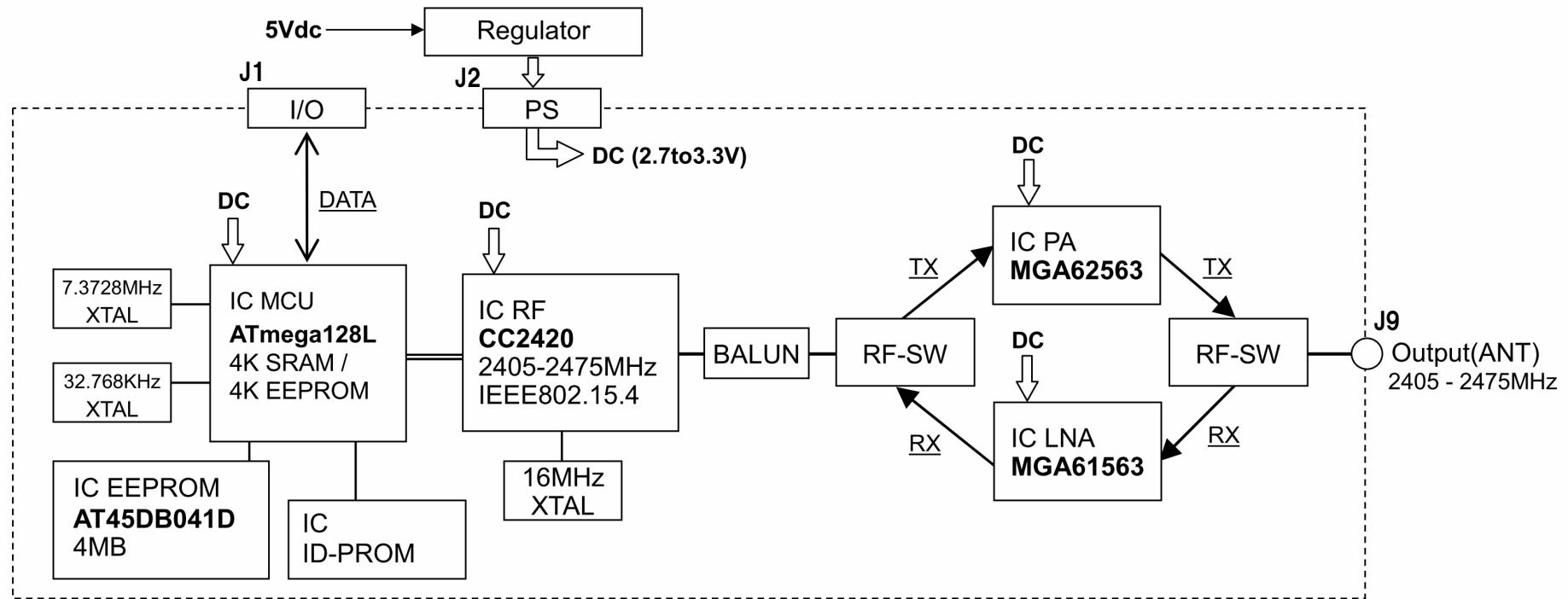


**J2** : I/O connector  
[AXK5F50547YG]

### J2 : Pin definitions

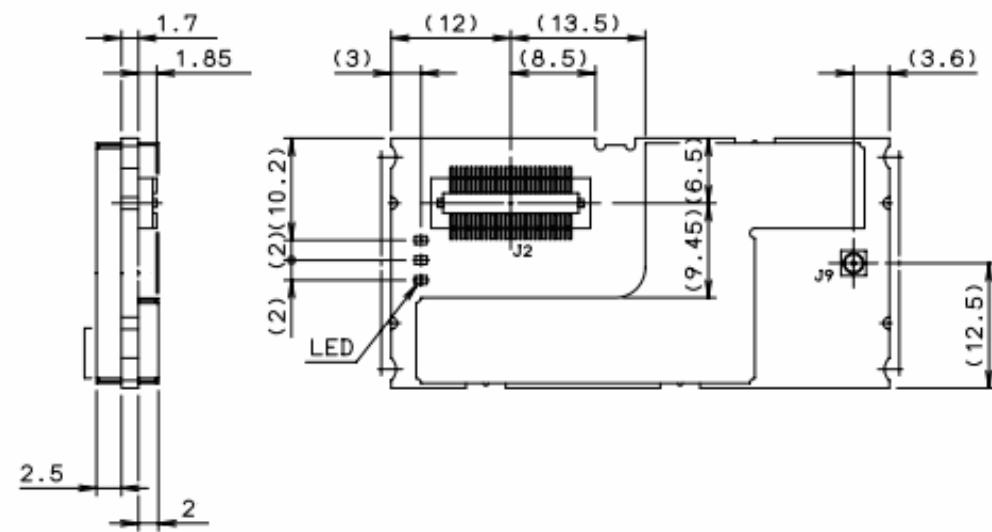
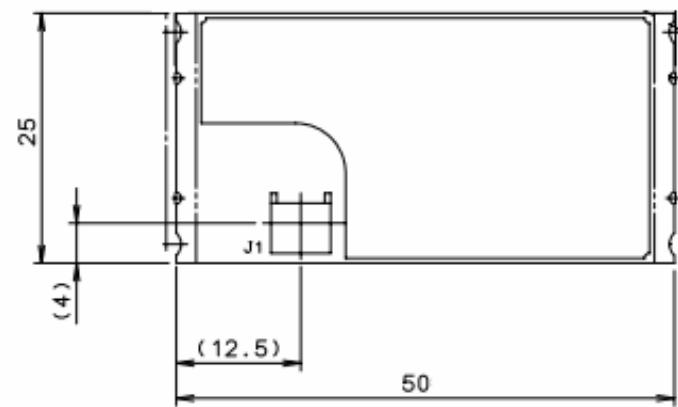
Pin.	Name	I/O	Description	Pin	Name	I/O	Description
1	GND	/\	Ground	26	PE3	I/O	GPIO
2	DVDD	/\	Power Supply	27	USART0_RXD	I	USART0 Receive
3	INT7	I/O	GPIO	28	USART0_TXD	O	USART0 Transmit
4	NC	/\	Not Connected	29	PC0	I/O	GPIO
5	INT5	I/O	GPIO	30	PC1	I/O	GPIO
6	INT4	I/O	GPIO	31	PC2	I/O	GPIO
7	NC	/\	Not Connected	32	PC3	I/O	GPIO
8	LED3	O	LED (Yellow)	33	PC4	I/O	GPIO
9	LED2	O	LED (Green)	34	PC5	I/O	GPIO
10	LED1	O	LED (Red)	35	PC6	I/O	GPIO
11	PQ1	I/O	GPIO	36	NC	/\	Not Connected
12	PQ0	I/O	GPIO	37	ADC6	I	ADC Channel 6
13	PQ2	I/O	GPIO	38	ADC5	I	ADC Channel 5
14	PC7	I/O	GPIO	39	ADC4	I	ADC Channel 4
15	NC	/\	Not Connected	40	ADC3	I	ADC Channel 3
16	PDI	I	Programming Data Input	41	ADC2	I	ADC Channel 2
17	PDO	O	Programming Data Out	42	ADC1	I	ADC Channel 1
18	SCK	I	SPI Serial Clock	43	ADC0	I	ADC Channel 0
19	NC	/\	Not Connected	44	NC	/\	Not Connected
20	NC	/\	Not Connected	45	NC	/\	Not Connected
21	I2C_CLK	O	I2C Bus clock	46	NC	/\	Not Connected
22	I2C_DATA	O	I2C Bus data	47	/RSTN	I	Reset
23	PB4	I/O	GPIO	48	PB6	I/O	GPIO
24	PB5	I/O	GPIO	49	DVDD	/\	Power Supply
25	PE2	I/O	GPIO	50	GND	/\	Ground

## Block diagram



※ The modular transmitter don't have its power supply regulation. In installing the module, please be sure to configure the voltage regulator.

## Dimensional drawing



unit : mm

## Compliance Statement

### FCC WARNING :

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

### FCC ID : WWGZ2200

### 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. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

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.

Products equipped with this device, must indicate the following contents on the label or the Chassis :

- Contains Transmitter Module FCC ID: WWGZ2200 or
- Contains FCC ID: WWGZ2200

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