2.4GHz/10mW TRANSCEIVER MODULE

WM-Z2210 Hardware User's Manual

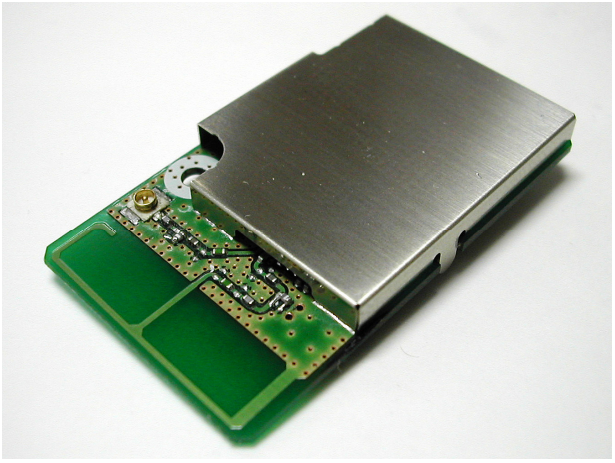


Figure 1.　WM-Z2210

Features

- WM-Z2210 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.

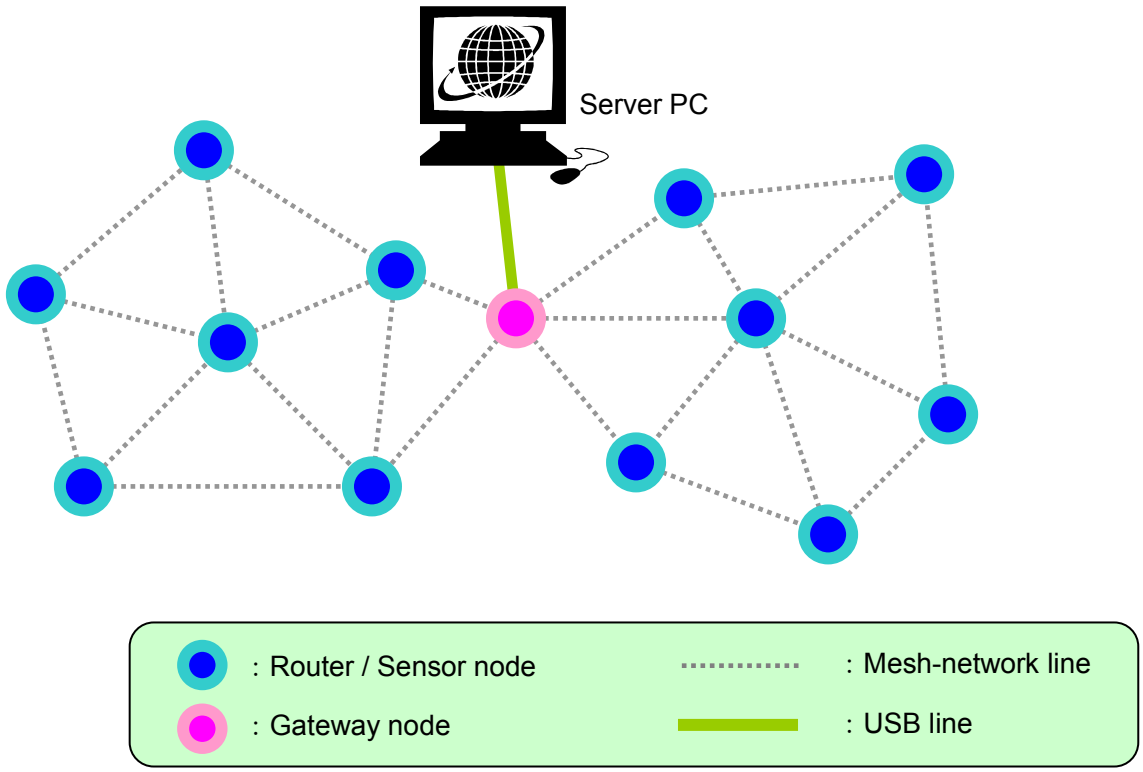


Figure 2.　Wireless sensor network system concept

Description

The transceiver module (WM-Z2210) 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	-30 to +75° C	
9	Dimensions	25mm x 43mm x 4.5mm	
10	Power Voltage	+2.7 ~ +3.6Vdc	

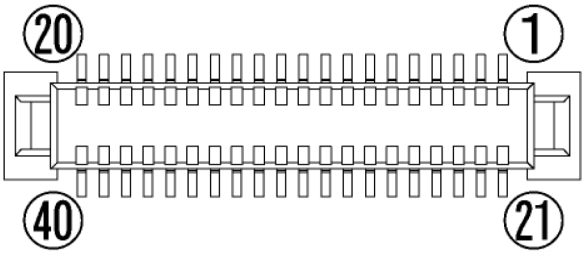
Transmission Specifications

No.	Item	Spec	Notes
1	RF Power	10 mW	
2	Frequency error tolerance	+ /- 50ppm	
3	Harmonics	20 dB down from the highest emission level	Conducted
4	Adjacent ch leakage	< -25dBm	
5	Occupied bandwidth	< 5MHz(99% OBW)	
6	Spurious emission		
	30-88MHz	< 100 uV/m	
	88-216MHz	< 150 uV/m	Radiated
	216-960MHz	< 200 uV/m	
	Above 960MHz	< 500 uV/m	
7	Current dissipation	< 70mA	

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	Current dissipation	< 50mA	

Interface Connector Description

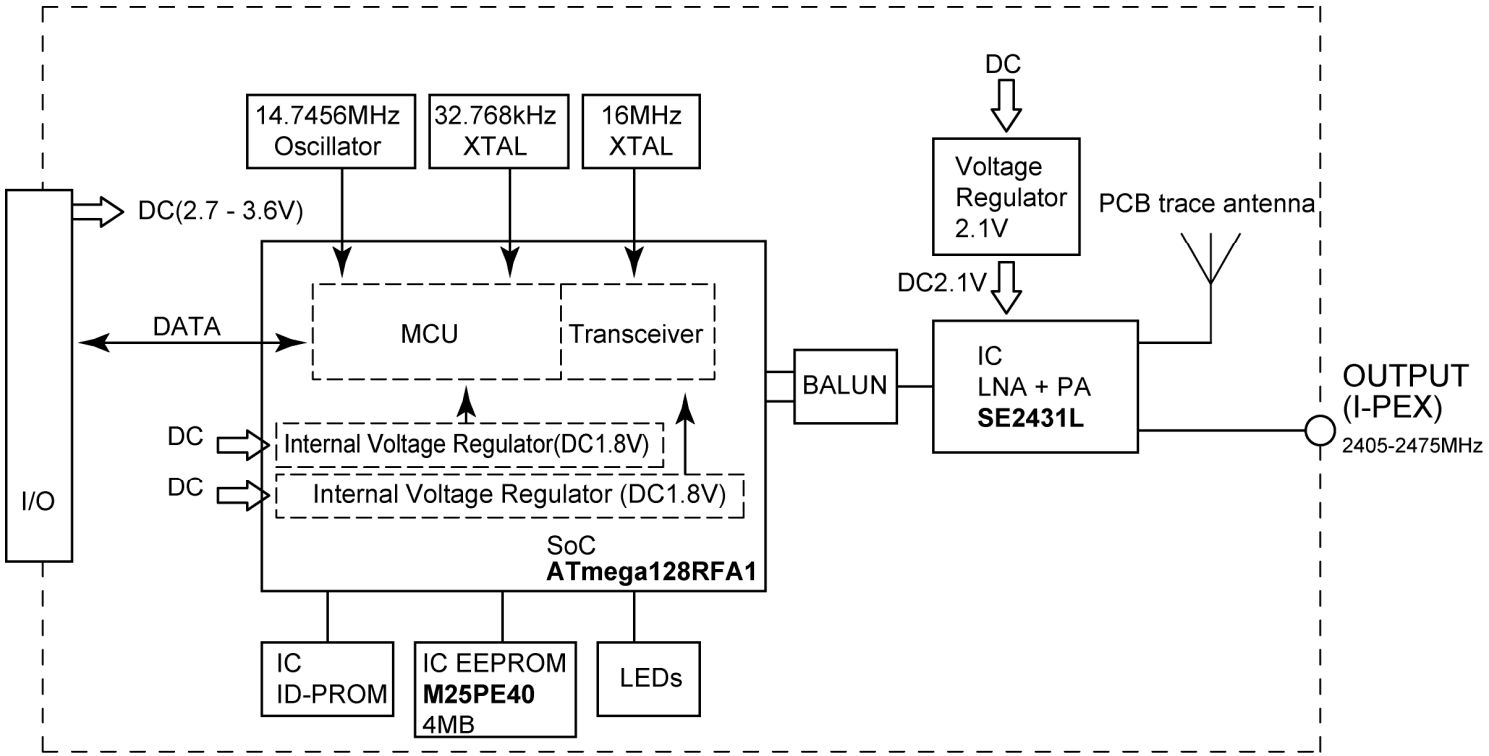


J2 : I/O connector
[AXK6F40547YG]

Pin definitions "J2"

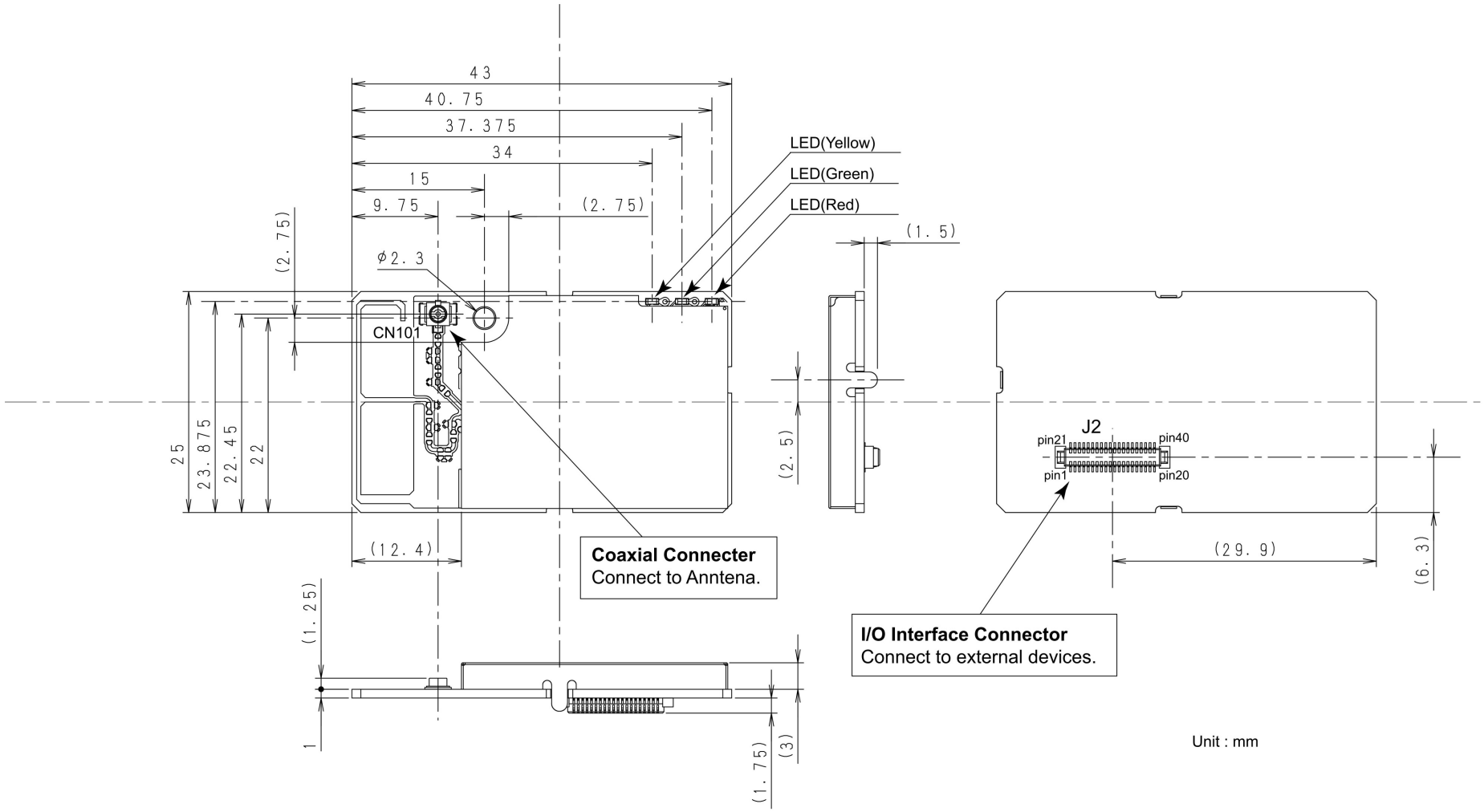
Pin	Name	I/O	Description	Pin	Name	I/O	Description
1	VDD	—	Power Supply	21	GND	—	Ground
2	VDD	—	Power Supply	22	GND	—	Ground
3	NC	—	Not Connected	23	NC	—	Not Connected
4	NC	—	Not Connected	24	PB0	I/O	GPIO
5	NC	—	Not Connected	25	PB1	I/O	GPIO
6	PD7	I/O	GPIO	26	PB2	I/O	GPIO
7	PD6	I/O	GPIO	27	PB3	I/O	GPIO
8	PD5	I/O	GPIO	28	PB4	I/O	GPIO
9	PD4	I/O	GPIO	29	PB5	I/O	GPIO
10	PD3	O	USART1 Transmit	30	PB6	I/O	GPIO
11	PD2	I	USART1 Receive	31	PB7	I/O	GPIO
12	PD1	I/O	GPIO	32	PE0	I	reserved
13	PD0	I/O	GPIO	33	PE1	O	reserved
14	NC	—	Not Connected	34	PE2	O	reserved
15	RSTN	I	Reset	35	PE3	O	LED3（Green）
16	PG2	O	GPIO	36	PE4	O	LED4（Yellow）
17	PF7	O	GPIO	37	PE5	O	LED5（RED）
18	PF6	O	GPIO	38	PE6	O	U7 contorol
19	PF5	O	GPIO	39	PE7	I/O	GPIO
20	PF4	O	GPIO	40	NC	—	Not Connected

Block diagram



Parameter	Value	Notes
Type	MCU/802.15.4 Radio	
Modulation	DSSS	IEEE802.15.4
RF Frequency	2405 - 2475 MHz	
RF Channels	15ch	
RF Antenna	External Unbalanced	
PCB trace Antenna	Inverted-F PCB trace Antenna	
Internal Clocks	32.768KHz / 14.7456MHz / 16MHz	
PA+LNA	PA, Tx Harmonic Filtering, LNA, SPDT and a DPDT Switch	
SoC-Flash/SRAM/EEPROM	128 Kbytes / 16 Kbytes / 4096 Byte	
Power Supply	2.7 - 3.6V	

Dimensional drawing



Unit : mm

Compliance Statement

FCC CAUTION :

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 : WWGZ2210

CAUTION: Radio Frequency Radiation Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation (MPE). But it is desirable that it should be installed and operated keeping the radiator at least 20cm or more away from person's body (excluding extremities: hands, wrists, feet and ankles).

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

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

- "Contains Transmitter Module FCC ID: WWGZ2210" or
- "Contains FCC ID: WWGZ2210"

Manufactured by : Sumitomo Precision Products

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