



[WM-Z1110] 2.4GHz TRANSCEIVER MODULE

Operating Manual



Figure 1. WM-Z1110

Features

- WM-Z1110 is a 2.4 GHz IEEE 802.15.4, transceiver module designed for wireless sensor measurement system.
- 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 2405.0-2483.5MHz 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.

TRANSCEIVER MODULE (type : WM-Z1110) for Wireless Sensor Network system

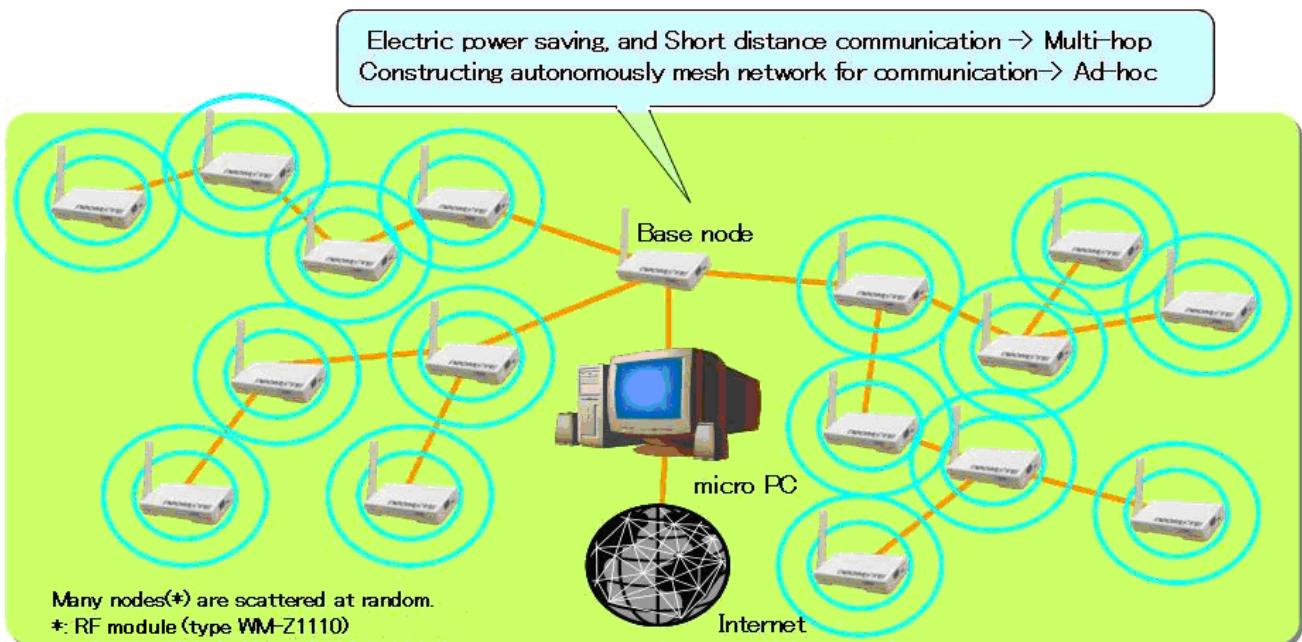


Figure.2 Wireless Sensor Network system
with RF module (type WM-Z1110)

Description

The transceiver module (WM-Z1110) 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*.

* Xmesh technology by Crossbow 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.

General Specifications

No.	Item	Spec	Notes
1	Frequency	2405 to 2480 MHz, 5 MHz channel spacing. 16 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	1/2 λ sleeve dipole	
7	Receiver type	Super heterodyne	
8	RX Intermediate Frequency	2MHz	
9	Operating Temperature	-10 to 45 degreeC	
10	Dimensions	75.5mm x 37.2mm x 14.8mm	
11	Power Voltage	+3.6Vdc +/- 5%	

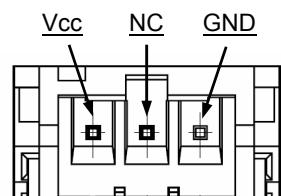
Transmission Specifications

No.	Item	Spec	Notes
1	RF Power	-12.2dBm to -4.44dBm	
2	Frequency error tolerance	+/- 50ppm	
3	Harmonics	2nd:Less than -40dBm 3rd:Less than -60dBm	CW
4	Adjacent ch leakage	Less than -25dBm	
5	Occupied bandwidth	Less than 5MHz(99% OBW)	
6	Spurious emission	Less than -16dBm(238MHz to 2400MHz), Less than -26dBm(Less than 2387MHz and More than 2496.5MHz)	CW
7	Current dissipation	Less than 40mA	

Receiver Specifications

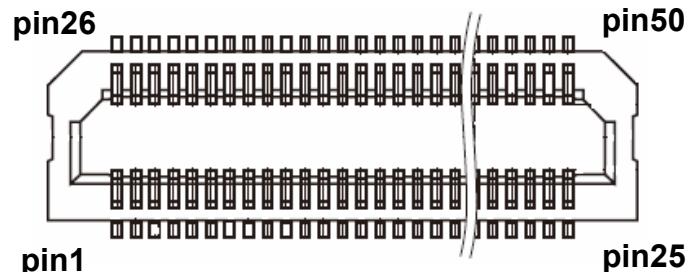
No.	Item	Spec	Notes
1	Sensitivity (PER=1%)	-80dBm +/- 6dB	
2	Spurious emission	Less than -47dBm @1GHz and more	
3	Spurious Response	More than 25dB	
4	Adjacent channel rejection	More than 25dB (+/- 5MHz)	
5	Selectivity	Less than -6dB	
6	Inter-modulation	More than 25dB	
7	Carrier Sense	Level:-77dBm +/- 5dB Dynamic Range:More than 90dB	
8	Current dissipation	Less than 40mA	

Interface Connector Description



pin1

J1 : Power supply connector
[S3B-PH-SM4-TB]

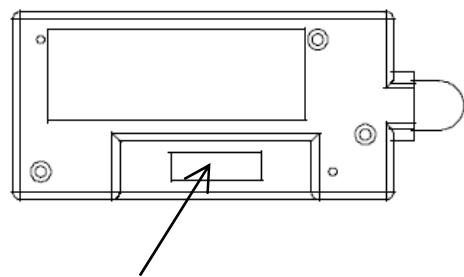
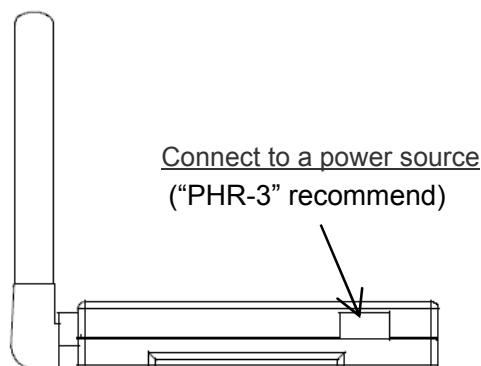


pin1

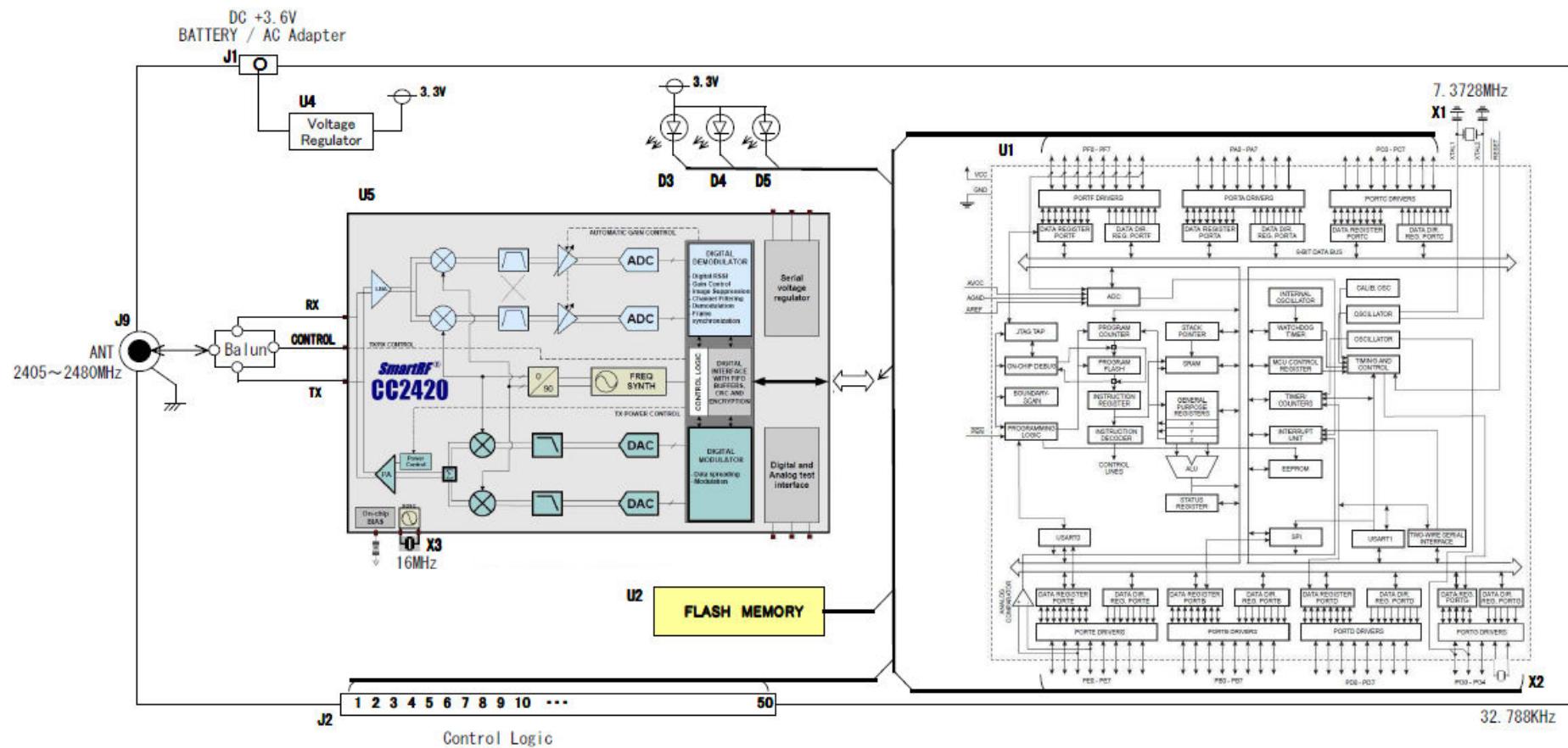
J2 : Stacking I/O connector
[AXK5S50237YG]

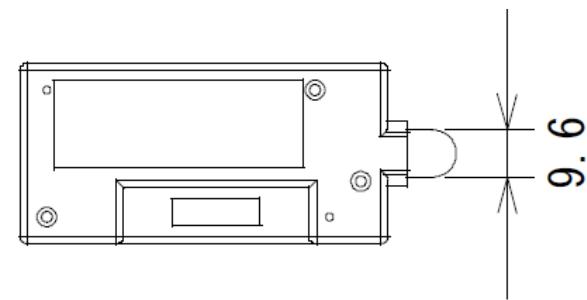
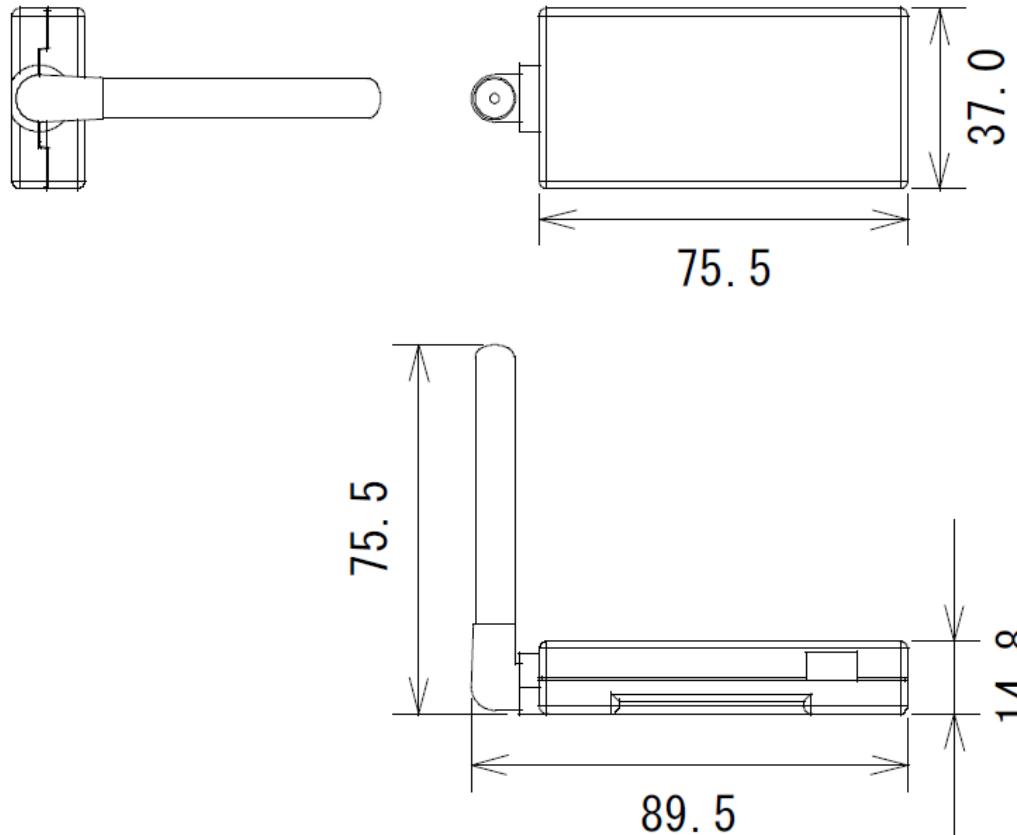
J2 : Pin definitions

Pin No.	Name	I/O	Description	Pin No.	Name	I/O	Description
1	GND	-	Ground	26	AC-	I/O	Sensor Data
2	VCC	-	Vcc	27	USART0_RXD	O	USART0 RX Data
3	INT3	I/O	Sensor Data	28	USART0_TXD	O	USART0 TX Data
4	INT2	I/O	Sensor Data	29	PW0	O	Sensor Power SW
5	INT1	I/O	Sensor Data	30	PW1	O	Sensor Power SW
6	INT0	I/O	Sensor Data	31	PW2	O	Sensor Power SW
7	CC_CCA	O	RF Detect Status	32	PW3	O	Sensor Power SW
8	LED3	O	LED3 Status	33	PW4	O	Sensor Power SW
9	LED2	O	LED2 Status	34	PW5	O	Sensor Power SW
10	LED1	O	LED1 Status	35	PW6	O	Sensor Power SW
11	RD	I/O	Sensor Data	36	ADC7	I	Analog Input (Voltage)
12	WR	I/O	Sensor Data	37	ADC6	I	Analog Input (Voltage)
13	ALE	I/O	Sensor Data	38	ADC5	I	Analog Input (Voltage)
14	PW7	O	Sensor Power SW	39	ADC4	I	Analog Input (Voltage)
15	USART1_CLK	O	USART1 Clock	40	ADC3	I	Analog Input (Voltage)
16	PROG_MOSI	I	Channel SW	41	ADC2	I	Analog Input (Voltage)
17	PROG_MOSO	O	Channel SW	42	ADC1	I	Analog Input (Voltage)
18	SPI_SCK	O	SPI Serial Clock	43	ADC0	I	Analog Input (Voltage)
19	USART1_RXD	I	USART1 RX data	44	THERM_PWR	O	Temp Sensor Power SW
20	USART1_TXD	O	USART1 TX data	45			Do Not Connect
21	I2C_CLK	O	I2C Bus Clock	46			Do Not Connect
22	I2C_DATA	O	I2C Bus Data	47	RSTN	I	Reset
23	PWM0	I/O	Sensor Data	48	PWM1B	I/O	Sensor Data
24	PWM1A	I/O	Sensor Data	49	VCC	-	Vcc
25	AC+	I/O	Sensor Data	50	GND	-	Ground



Block Diagram

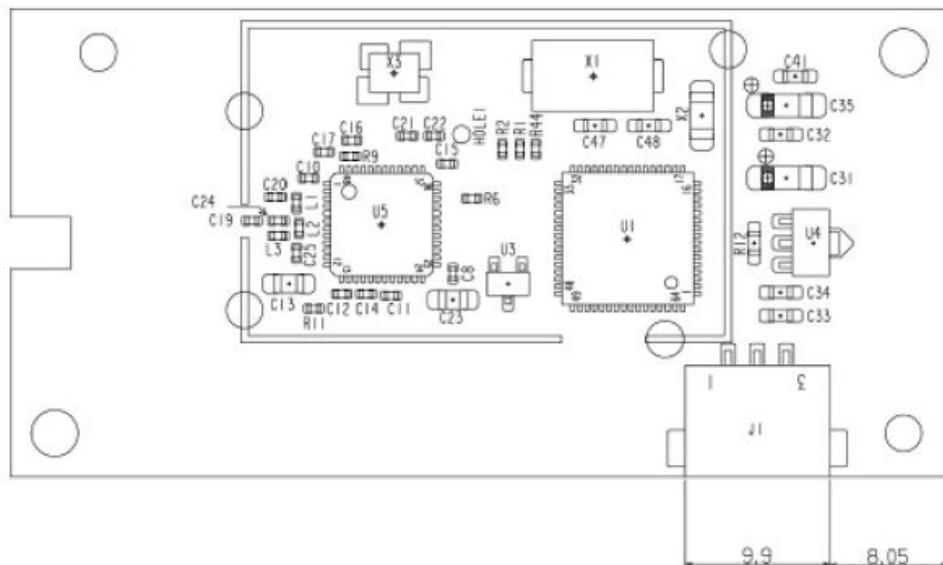


Dimensional drawing

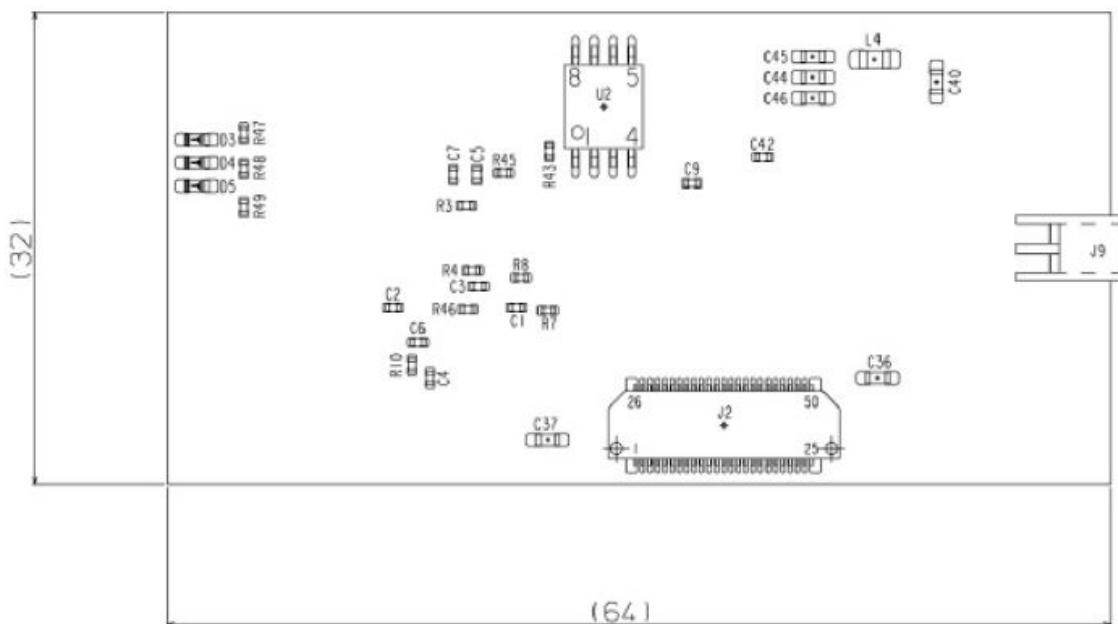
unit : mm

Board drawing

—Component Side—



—Solder Side—



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 : WWGZ1110

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.

Manufactured by : Sumitomo Precision Products

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