

ZI-100AS

Zigbee Module Specification

Feb. 2007.

QuantumBase Inc.

101 Changubguan, KICET, 233-5, Gasandong, Geumchongu, Seoul, 153-203, R.O.Korea.

TEL: +82-2-3282-7739, FAX: +82-2-3282-7740

Website: www.quantumbase.com

Email: support@quantumbase.com

Copyright © 2007. by Quantumbase Inc., All rights reserved.

Contents

1. Overview
2. Specification
 - 2.1 General Specification
 - 2.2 Electrical Specification
3. Dimension & Pin Assignment
4. BLOCK DIAGRAM(ZIGBEE CHIP)
5. Test & Measurement results
6. PCB Layout
7. Antenna Installation notes
8. RF cable Ass'y of ZI-100AS module
9. Antenna

1. Overview

ZI-100AS is a wireless communication modem based on IEEE802.15.4, which can be widely used in home automation and security, automatic meter reading, factory automation, toys and so on.

2. SPECIFICATION

2.1 General Specification

- ✓ (1) UART baud rate : 19200 bps, 8bit data, None parity, 2stop
- ✓ (2) Modulation : O-QPSK Modulation
Compliance to IEEE802.15.4
- ✓ (3) Direct Sequence Spread Spectrum

2.2 Electrical Specification

- ✓ Current Consumption

Parameter	Min	TYP	Max	Unit
Active MCU & TX Mode(+5dBm)		60	70	mA
Active MCU & RX Mode		55	65	mA
Standby Current(Internal REGULATOR on)		50		uA

- ✓ RF Characteristic

Parameter	Min	TYP	Max	Unit
RF Frequency Range	2.400		2.4835	GHz
Transmit Data Rate		250		Kbps
Transmit Chip Rate		2000		Kchips/s
Maximum Output Power	0		+5	dBm
Receiver Sensitivity		-99		dBm
Spurious Emission(30 ~ 900MHz) , RBW=3MHz		-40		dBm
Spurious Emission(1.8 ~ 1.9GHz) , RBW=3MHz		-45		dBm
Spurious Emission(5.15 ~ 5.3GHz),RBW=1MHz		-45		dBm
2 nd Harmonics (RBW=300KHz)		-30		dBm
3 rd Harmonics (RBW=300KHz)		-50		dBm
Frequency Error Tolerance	±200			KHz

✓ Environment Characteristic

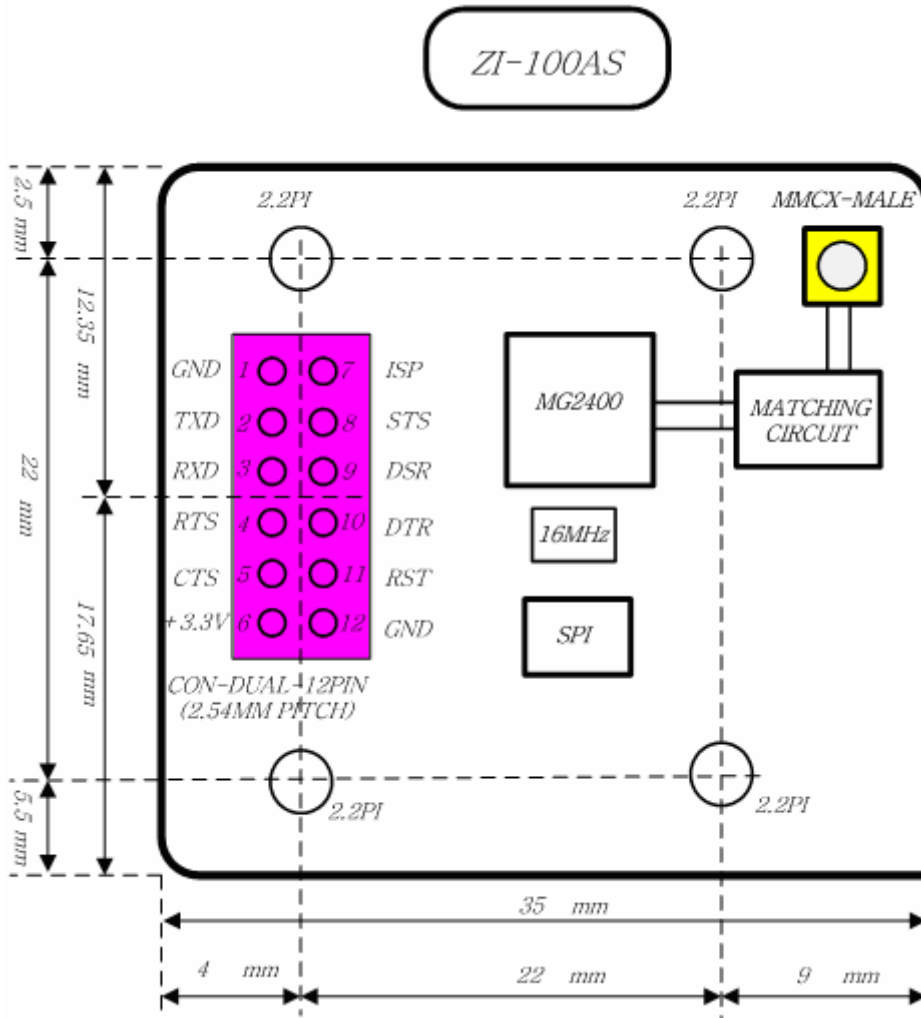
Parameter	Specification	Remark
Operating Temperature	-10 °C to +50 °C	
Storage Temperature	-40 °C to +85 °C	

✓ RF Channel Table

Frequency(Center)	Channel Value	Remarks
2405MHz	0x00	
2410MHz	0x01	
2415MHz	0x02	
2420MHz	0x03	
2425MHz	0x04	
2430MHz	0x05	
2435MHz	0x06	
2440MHz	0x07	
2445MHz	0x08	
2450MHz	0x09	
2455MHz	0x0A	
2460MHz	0x0B	
2465MHz	0x0C	
2470MHz	0x0D	
2475MHz	0x0E	
2480MHz	0x0F	

3. Dimension & Pin Assignment

3.1 Dimension



Parameter	Value	Remarks
1	SIZE	35 x 30 x 0.8[mm] Length×Width×Height

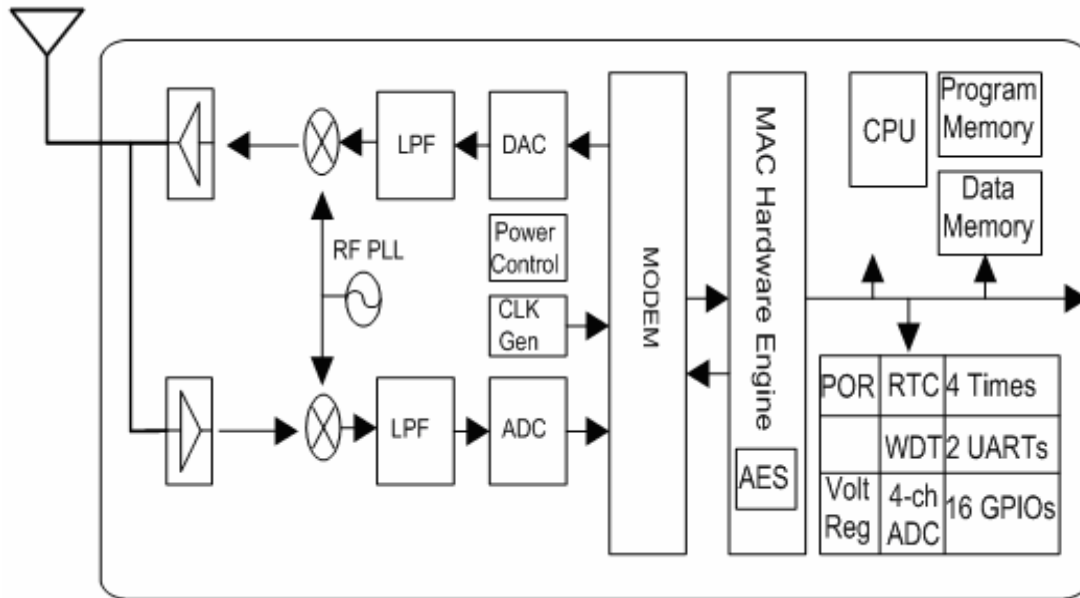
(Note : Only PCB thickness is taken to consideration)

3.2 PIN ASSIGNMENT

CONNECTOR- DUAL-CON-12(2.54mm Pitch)

Pin	Name	Description	Direction	Signal Level
1	GND	Power Ground	I	Ground
2	TXD	TX DATA OUT	O	CMOS Logic (3.3V)
3	RXD	RX DATA IN	I	CMOS Logic (3.3V)
4	RTS	Frame/Data mode	I	"High" /"Low"
5	CTS	ZI-100AS Busy		Active="Low"
6	+3.3V	DC input(+3.0 ~3.3V)	I	Power
7	ISP	Manufacturer Reserved	NC	
8	STATUS	Operation/Test mode	I	"High" /"Low"
9	DSR	Host Busy	I	Active="Low"
10	DTR	RF On/Off	I	"High" /"Low"
11	RST	Reset (internal pull up)	I	Active="Low"
12	GND	Power Ground	I	Ground

4. Block Diagram



5. Test & Measurement Results

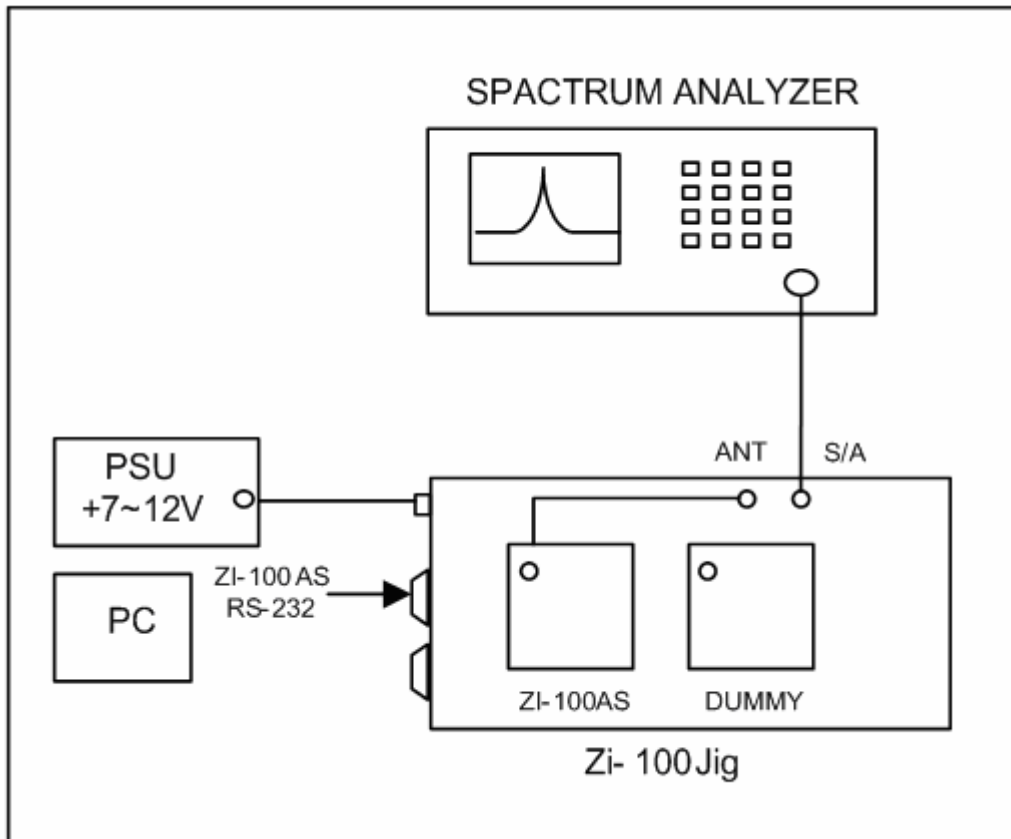
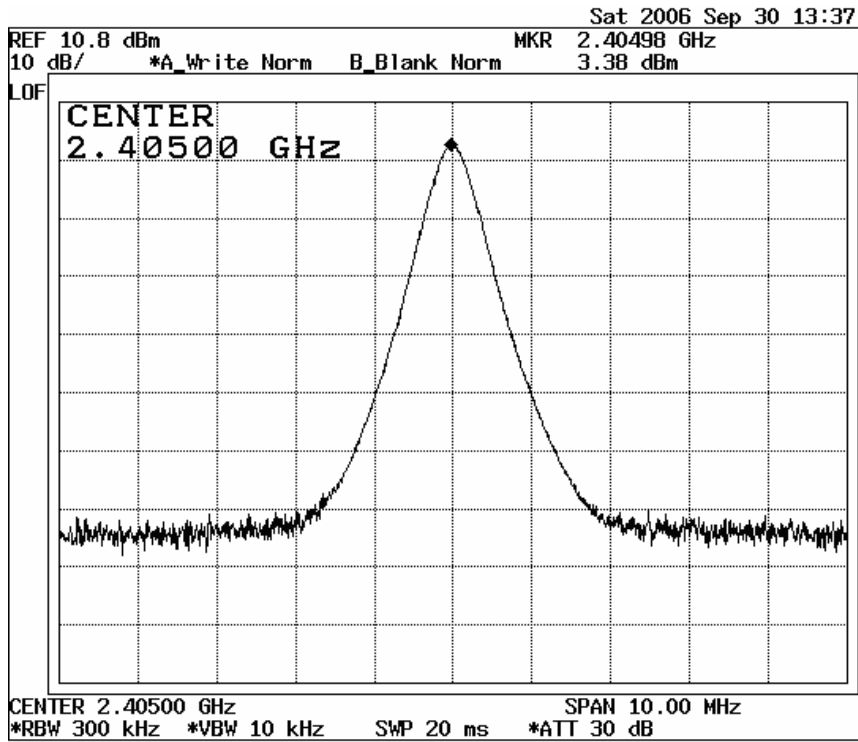


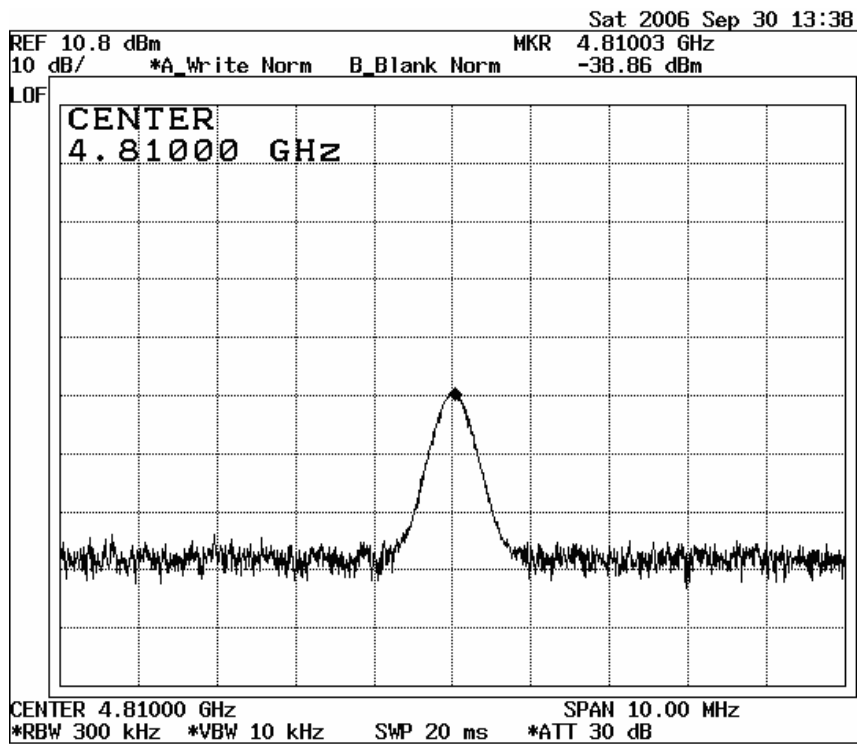
Figure 5.1 Test system configurations

In order to measure RF transmission characteristic, a spectrum analyzer, PSU (Power supply unit), Personal computer, and an evaluation Board for ZI-100AS are needed as shown in Figure 5.1.

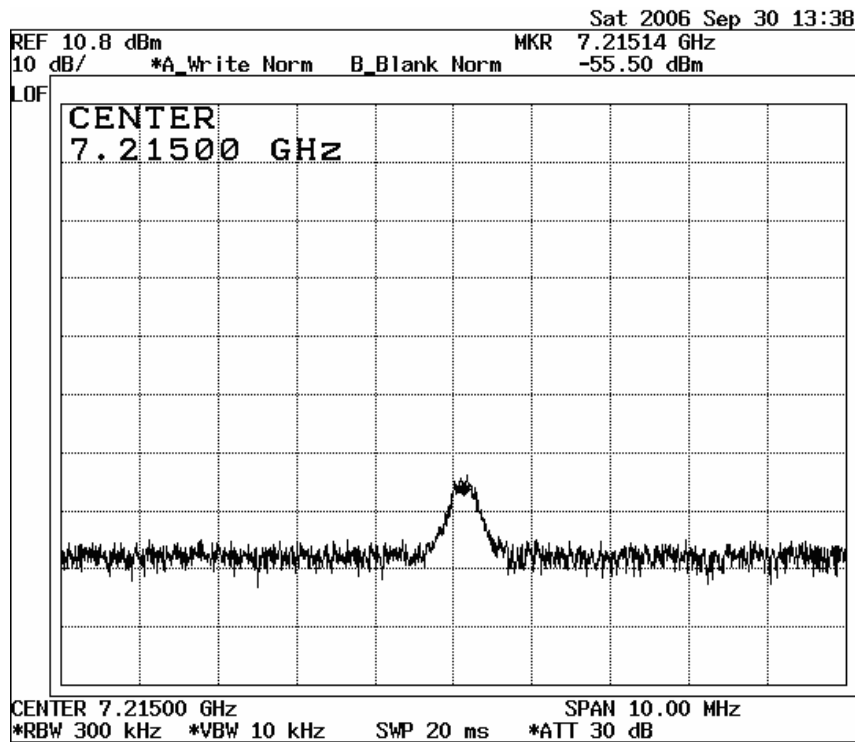
RF Output Power



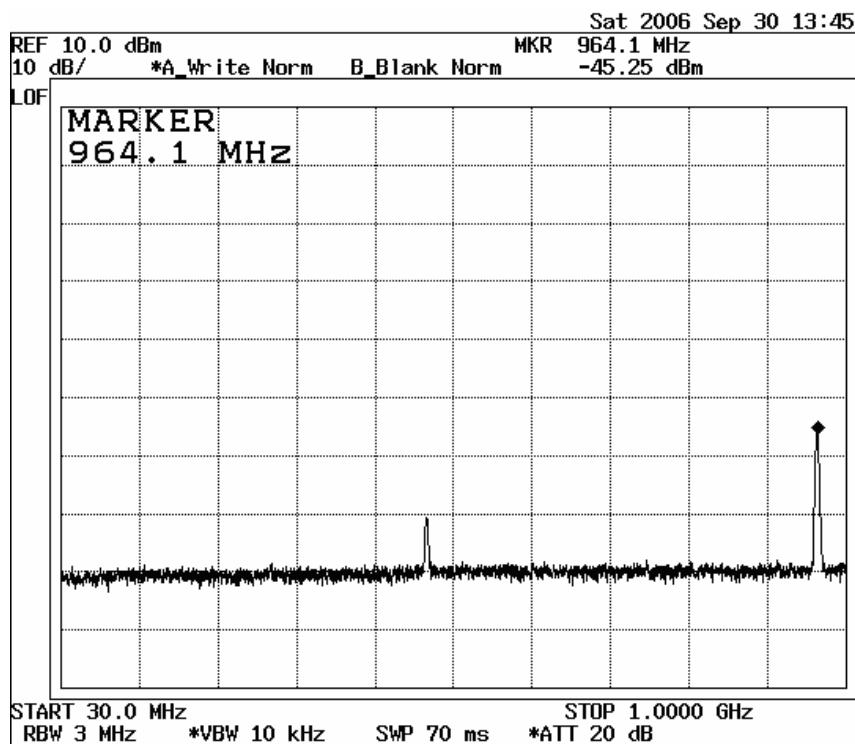
2nd Harmonic



3rd Harmonic

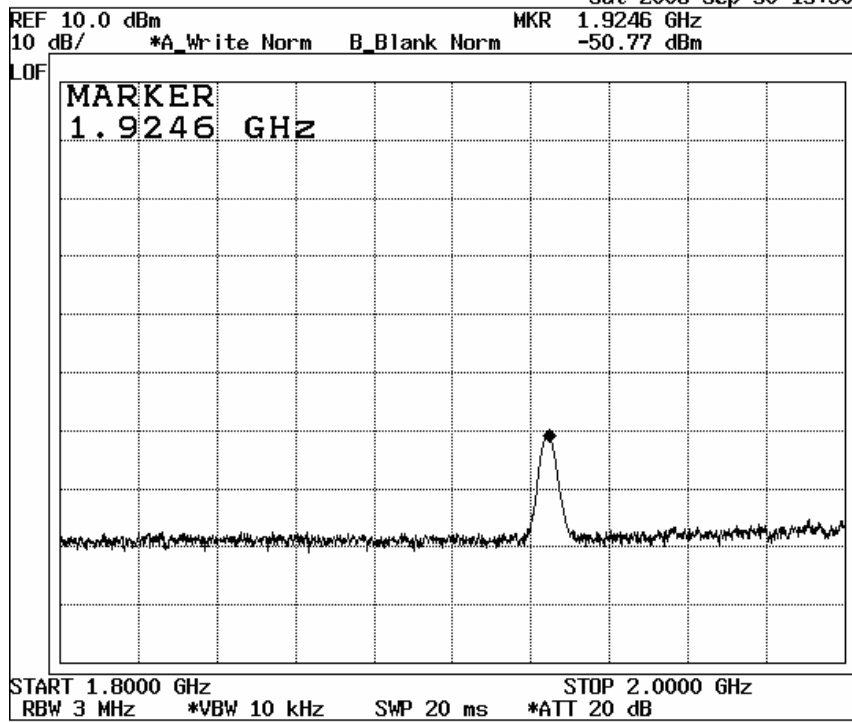


SPURIOUS EMISSION (30MHz ~ 900MHz)



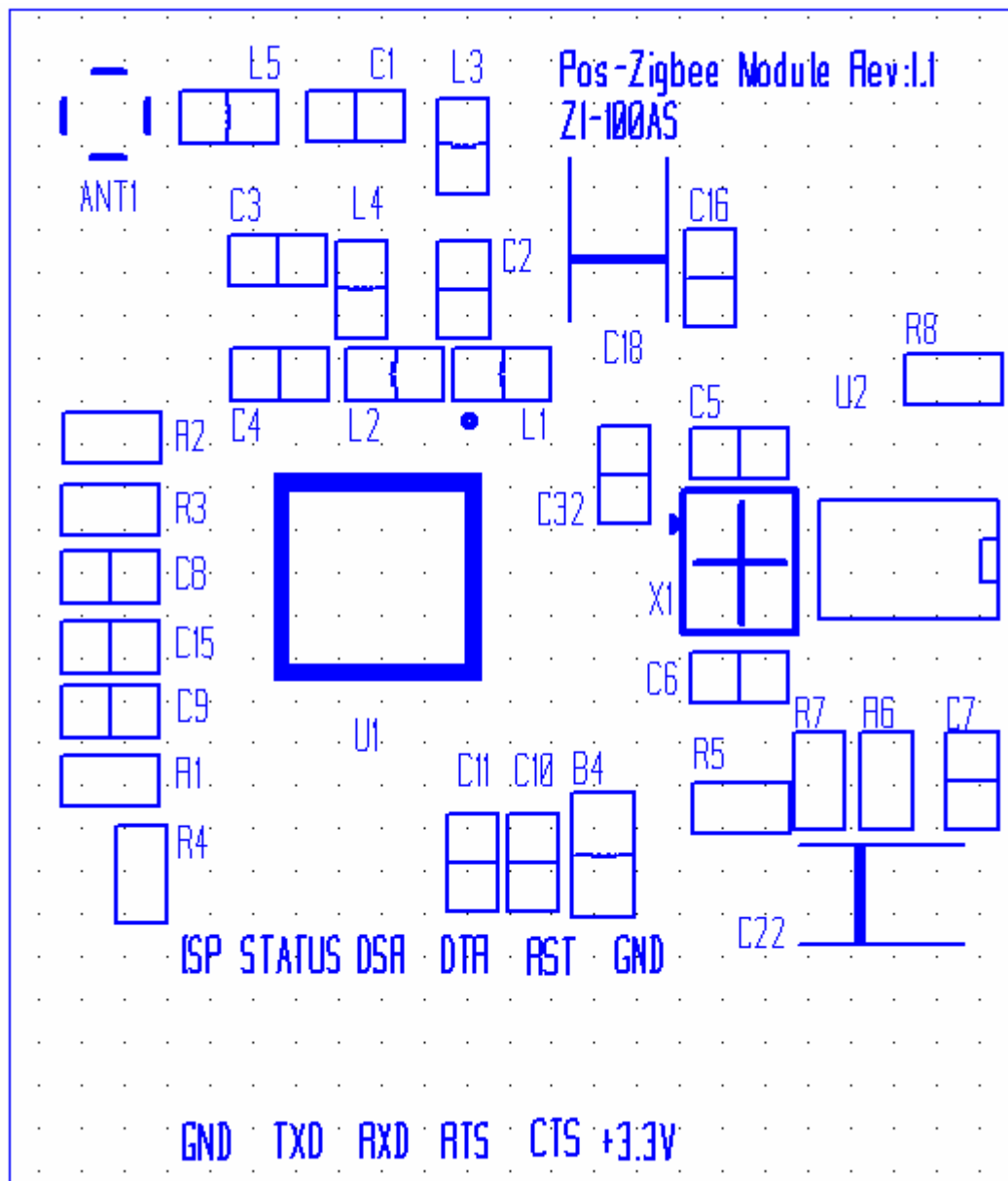
SPURIOUS EMISSION (1.8GHz ~ 1.9GHz)

Sat 2006 Sep 30 13:50

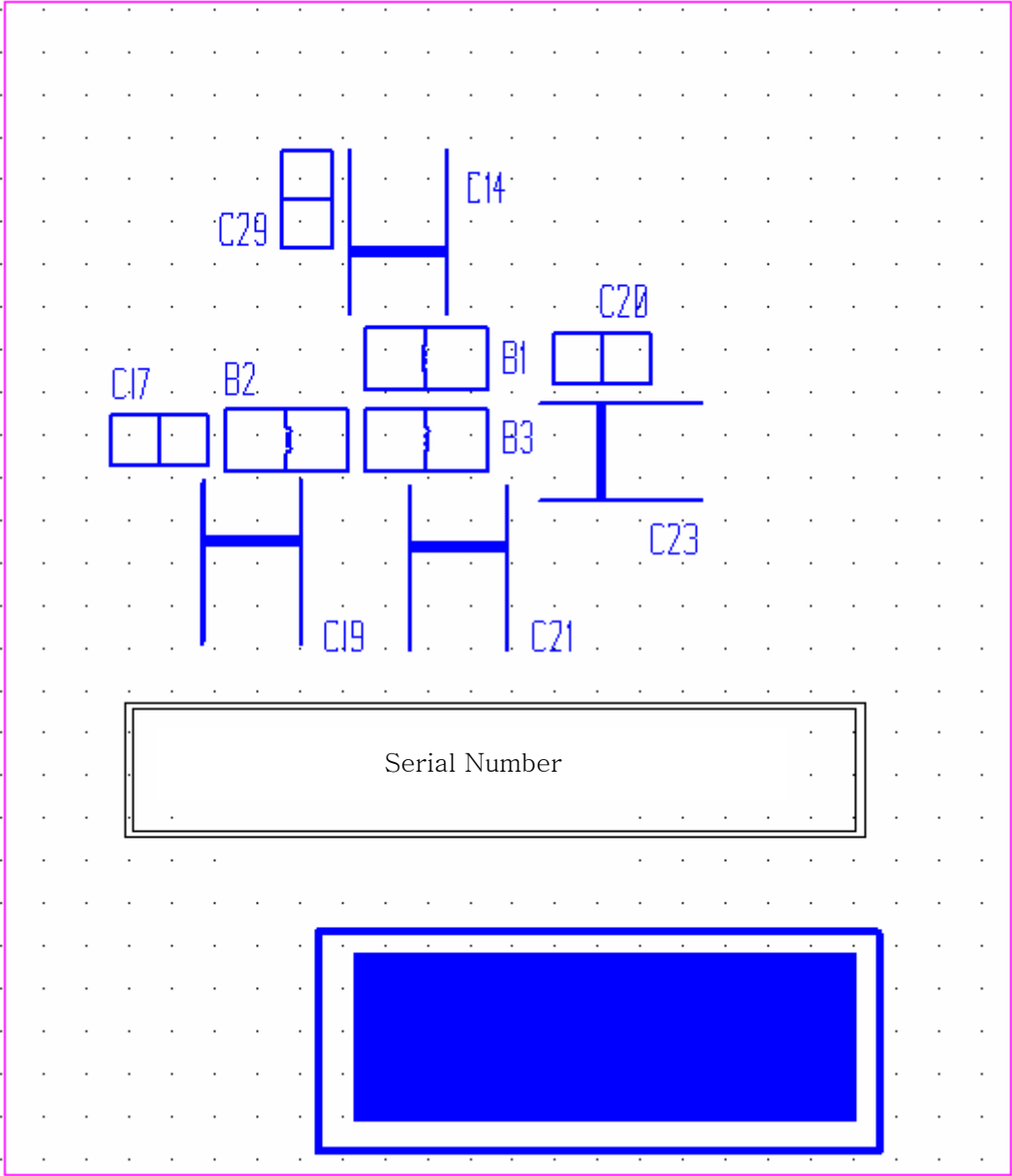


6. PCB LAYOUT

[TOP SILK]



[BOTTOM SILK]



You can find a serial number on the bottom side of the MODULE

7. Installation

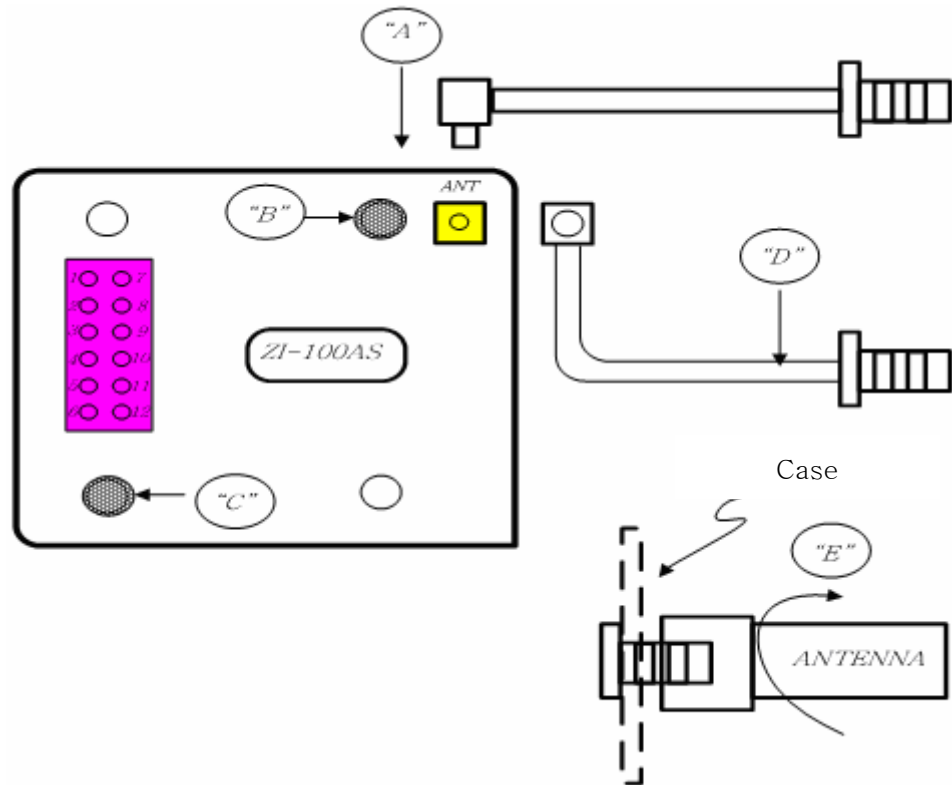


Figure 7.1 How to install antenna on ZI-100AS module

[Installation Sequence]

1. Connect RF cable Ass'y(D) to Ant connector mounted on ZI-100AS module
(Pressing the connector at the one end of the RF cable ass'y **vertically down** will complete the connection)
(Note: If you don't press it vertically down in proper manner, the pin at the RF cable connector can be broken.)
2. Screw ZI-100AS on your application board through the mounting holes named "B" and "C".
- 3 Finally, connect the antenna Ass'y to an external antenna through a case of your application.

8. RF Cable Ass'y for ZI-100AS

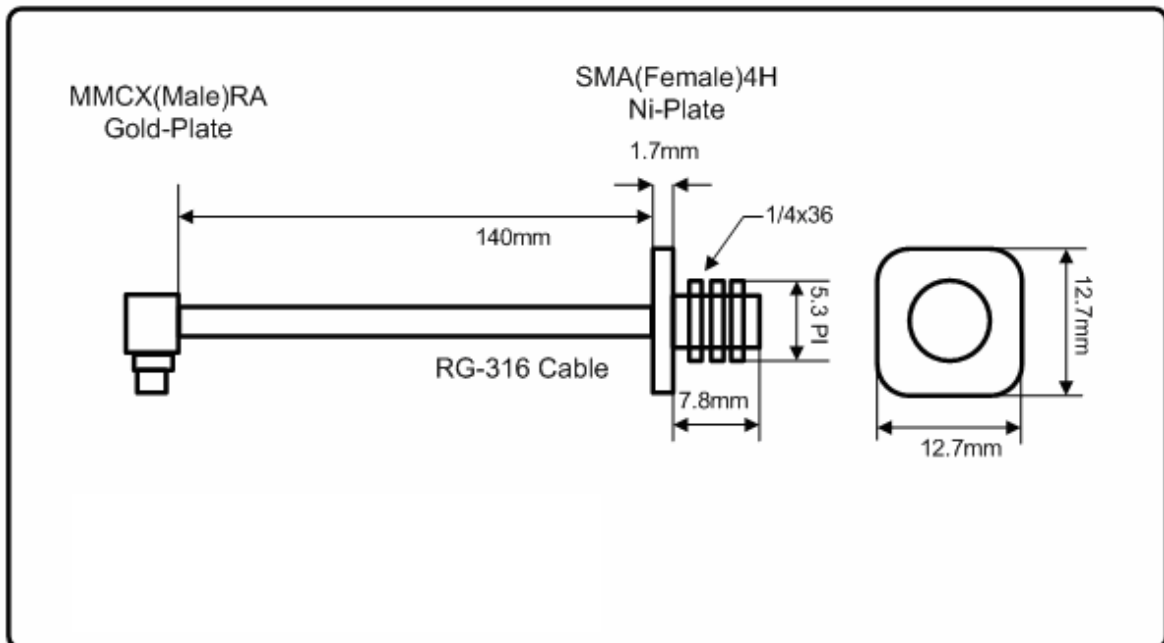
Electrical Specification

Parameter	Specification
RF Frequency Range	DC ~ 3GHz
Insertion Loss	0.6dB Max
RF Leakage	-55dBm Min(Between 2 to 3GHz)
Insulation Resistance	1 G ohm, Min
Impedance	50 ohm

Connector material & surface treatment

ITEM	Material	Surface Treatment	Note
BODY	Brass	Gold,NI Plated	MBsBD
CONTACT	Brass	Gold,NI Plated	MBsBD
INSULATOR	PTFE		Teflon

RF Cable Ass'y structure



9. Antenna

Electrical Specification

Parameter	Specification
RF Frequency Range	2400 ~ 2483MHz
V.S.W.R	Less than 1:2.0
POLARIZATION	VERTICAL
RADIATION	OMNI DIRECTION
Nominal Impedance	50 ohm
Gain	2 dBi

Structural Specification

ITEM	Spec.	Note
RADIATOR	RG-316 CABLE	
SLEEVE	URETHANE	BLACK
BASE	NYLON66	BLACK
CONNECTOR	SMA-FEMALE	NI-PLATE
TOTAL LENGTH		

Antenna Structure

