NO. Version 1.0

Antenna Specification

Model	**ITM-Gen3**
Model Number	**SLP-I211BZXXWW**

ITM specification

PRODUCT NAME	**ITM-Gen3**
MODEL CODE	**SLP-I211BZXXWW**
APPLIED MODEL	**JC Controller**
PRODUCT SPECIFICATION	**BLE, ZigBee**
MANUFACTURER	**RFtech**
MANUFACTURER ADRESS	**60, Jukyang-daero 1763beon-gil, Wonsam-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea**

[Information]

This is an IOT module that controls lighting using BLE+Zigbee.

I. Supports BLE+Zigbee
II. It consists of a built-in antenna(PCB)
III. It controls external LED instead of wall switch

ANTENNA Electrical characteristics

I. Operating frequency band
- BT ANTENNA

Band	Frequency [MHz]	
BLUETOOTH	2400	2485

II. Electrical specifications
- The antenna must meet the requirements specified in the electrical specifications.

Impedance	50 Ω
Partiality	Linear
Radiation pattern	Omni directional
Maximum output	100mWatte

Measurement method

I. VSWR and SMITH CHART

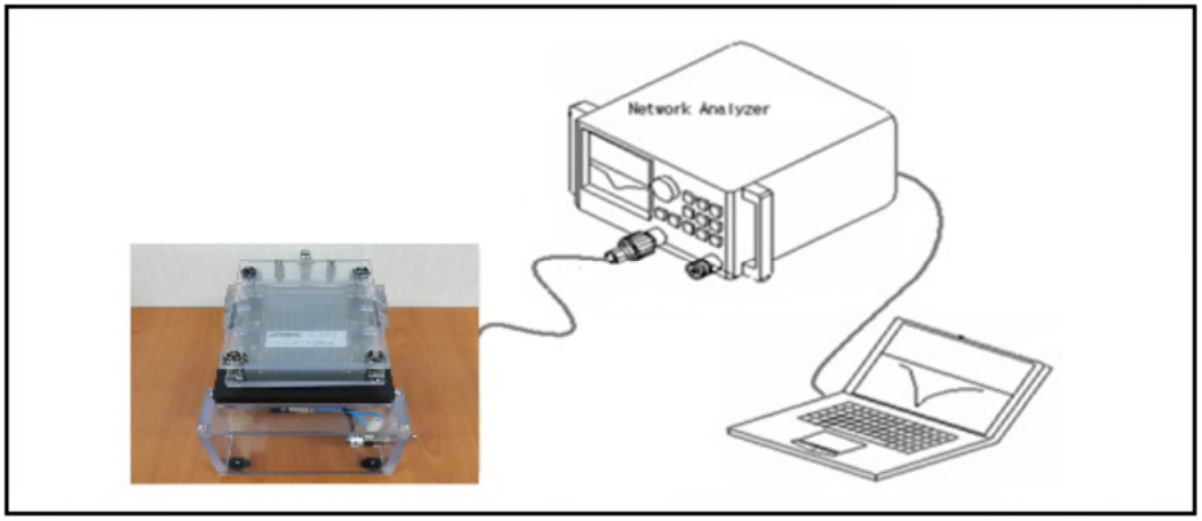
1-1. Power on Network Analyzer.

1-2. Set the start frequency and end frequency for optimal calibration.

1-3. Perform One port calibration in the order of open , short , load and check for abnormalities.

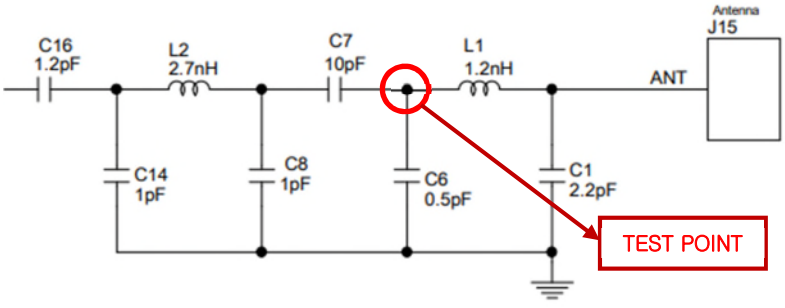
1-4. Since the characteristics of the antenna are greatly affected by surrounding metal objects,avoid from Network Analyzer.

-. Condition



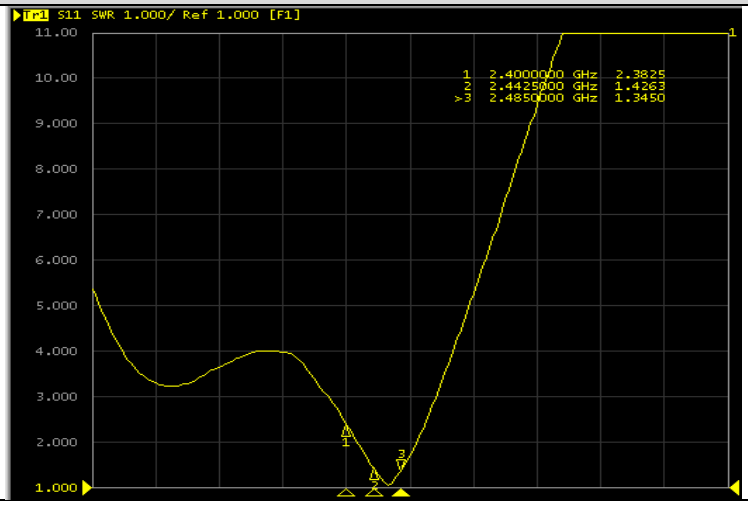
Electrical Characteristics DATA

I. Matching Values

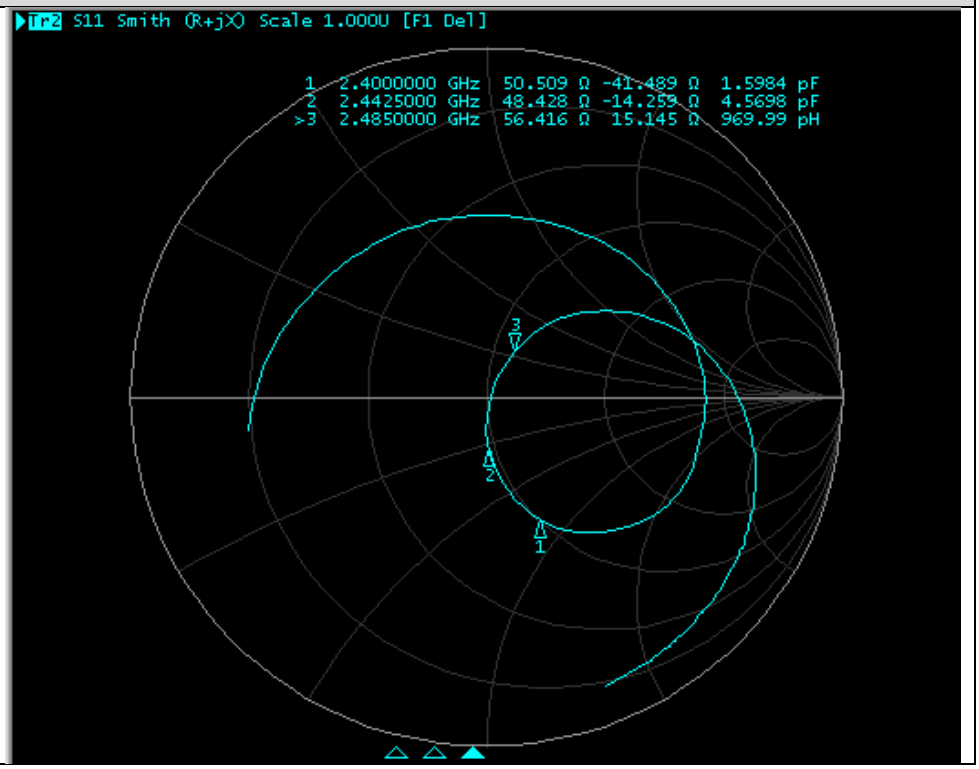
ANTENNA	Matching Value
B/T	

II. VSWR

Band	Bluetooth		
	2400MHz	2442.5MHz	2485MHz
VSWR	2.4 : 1 less	1.4 : 1 less	1.4 : 1 less

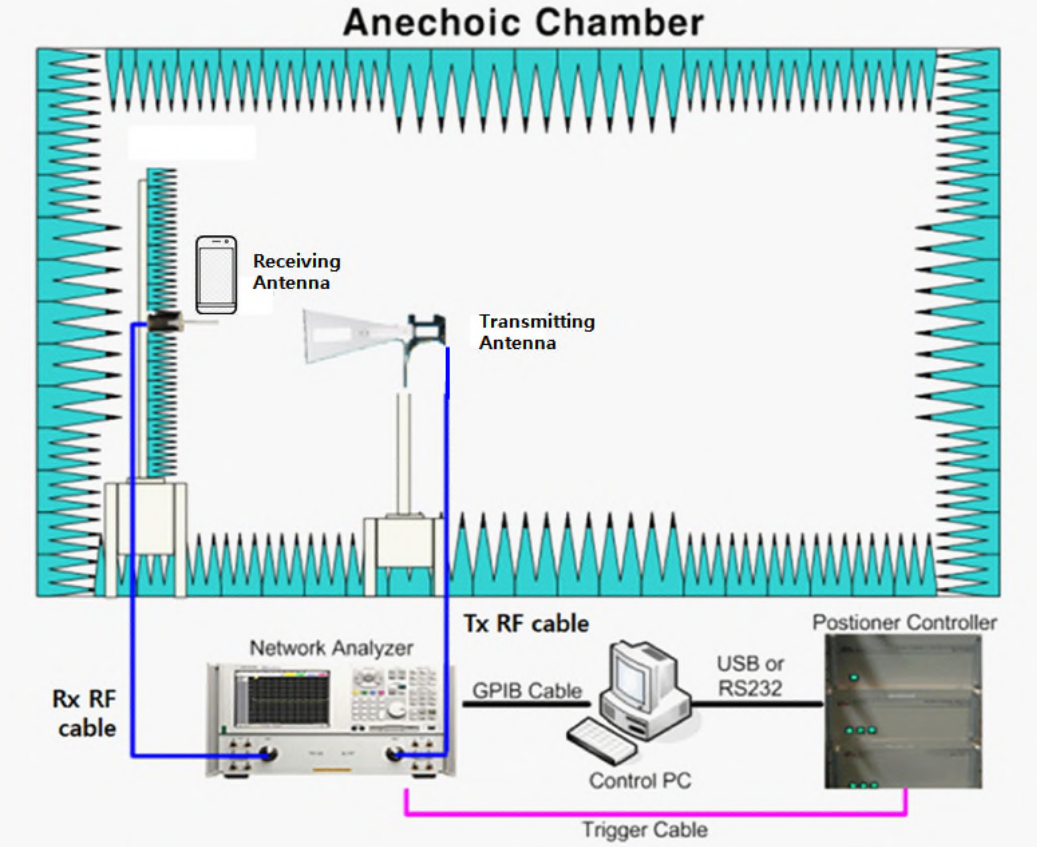
ANTENNA	VSWR
B/T	

I. Smith chart

ANTENNA	SMITH CHART
B/T	

GAIN DATA / RADIATION PATTERN

I. 3D Gain/Radiation pattern measurement mathod



II. Chamber setup and calibration

. Install the standard gain horn antenna suitable for the frequency to be measured toward the reflector.

. Frequency setting and calibration

III. Antenna measurement procedure

. Connect the cable to the port on the antenna and measure the radiation pattern using a measurement program

. Setting the measurement frequency and measuring horizontal and vertical radiation pattern.

. Save the raw data after checking the measurement result.

IV. Equipment

Classfication	Description	Specificatons	Remark
Test site	No reflection Passive Chamber	3m x 2.5m x 3m	-
Equipment	Network Analyzer	Keysight E5071B	-
	PC(Desktop)	I3-3220 / 8GB	-

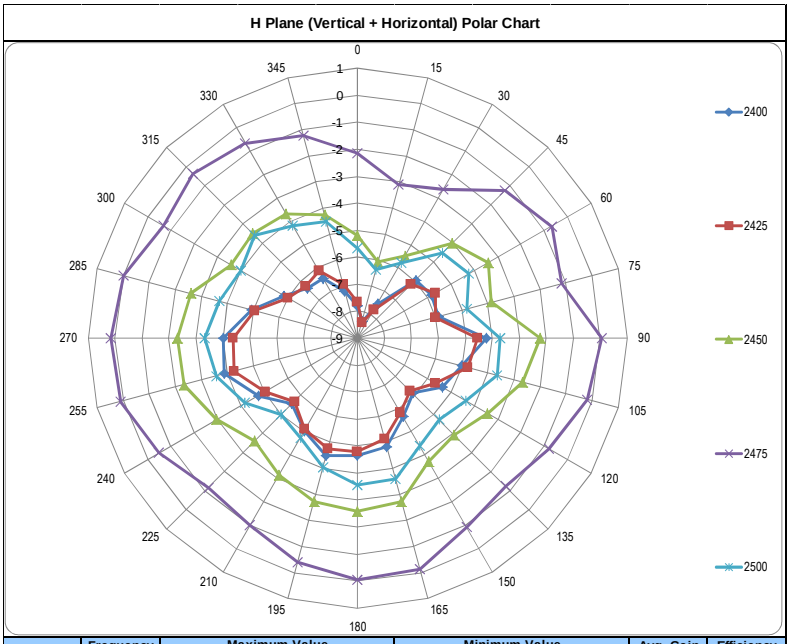
V. Peak Gain

. The gain of the antenna is displayed in [dBi] by setting the horn antenna to the standard antenna

Frequency Range		Bluetooth		
		2400MHz	2450MHz	2500MHz
Peak. Gain	H	-3.90	-2.23	-3.32
	E1	-4.01	-1.98	-2.68
	E2	-4.36	-2.06	-2.40

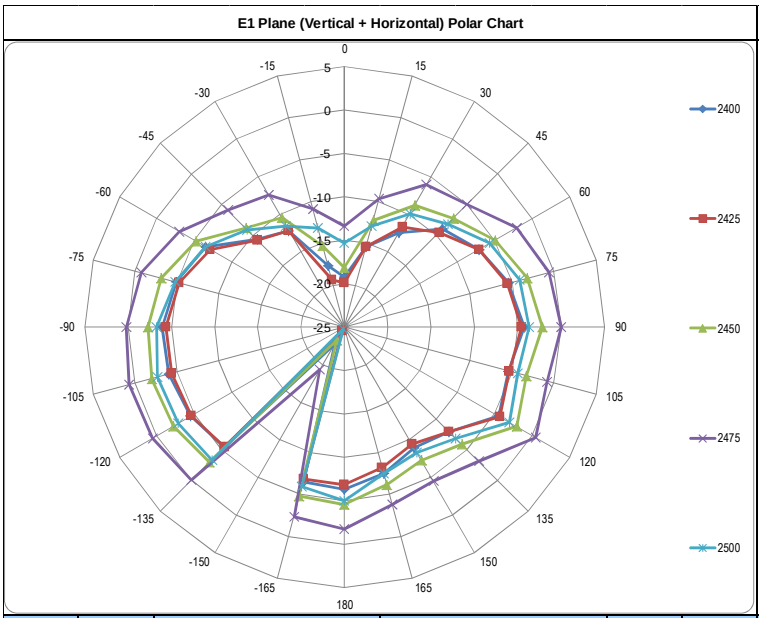
I.1.1 ANTENNA

(1) H Plane



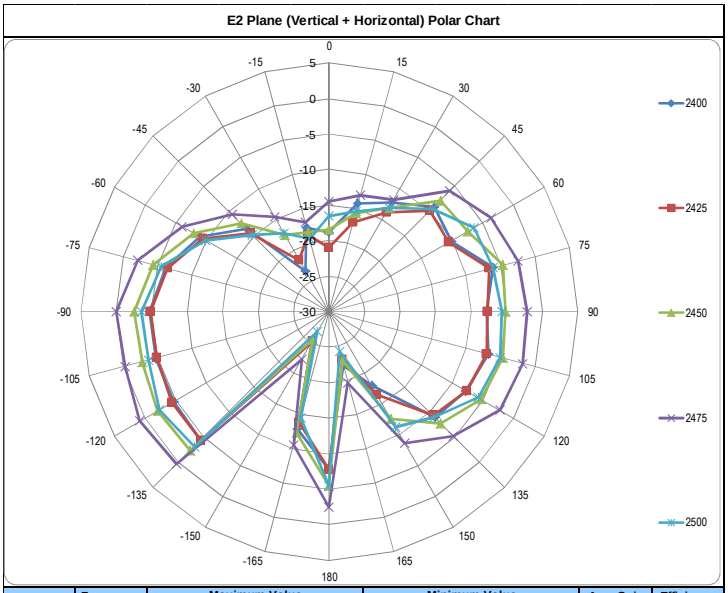
No	Frequency	Maximum Value			Minimum Value			Avg. Gain	Efficiency
	[MHz]	Θ [Deg]	Φ [Deg]	Value[dBi]	Θ [Deg]	Φ [Deg]	Value[dBi]	[dBi]	[%]
1	2400	90	255	-3.90	90	15	-8.34	-5.51	28.13
2	2425	90	255	-4.27	90	15	-8.41	-5.64	27.32
3	2450	90	90	-2.23	90	15	-6.07	-3.40	45.68
4	2475	90	270	0.15	90	15	-3.12	-0.76	83.92
5	2500	90	270	-3.32	90	15	-6.37	-4.28	37.31

(2) E1 Plane



No	Frequency	Maximum Value			Minimum Value			Avg. Gain	Efficiency
	[MHz]	Θ [Deg]	Φ [Deg]	Value[dBi]	Θ [Deg]	Φ [Deg]	Value[dBi]	[dBi]	[%]
1	2400	90	-90	-4.01	90	-150	-22.70	-6.99	19.98
2	2425	90	120	-4.30	90	-150	-24.55	-7.20	19.06
3	2450	90	-105	-1.98	90	-150	-23.21	-4.98	31.75
4	2475	90	-105	0.72	90	-150	-19.30	-2.36	58.06
5	2500	90	-105	-2.68	90	-150	-24.78	-5.90	25.71

(3) E2 Plane



No	Frequency	Maximum Value			Minimum Value			Avg. Gain	Efficiency
	[MHz]	Θ [Deg]	Φ[Deg]	Value[dBi]	Θ [Deg]	Φ[Deg]	Value[dBi]	[dBi]	[%]
1	2400	90	-135	-4.36	90	-150	-25.10	-8.59	13.82
2	2425	90	-135	-4.36	90	-150	-25.22	-8.81	13.15
3	2450	90	-120	-2.06	90	-150	-25.43	-6.64	21.66
4	2475	90	-120	0.81	90	-150	-22.20	-3.96	40.21
5	2500	90	-120	-2.40	90	-150	-26.72	-7.34	18.43