

FCC Test Report

Applicant : Beijing Silion Technology Corp.,LTD.

Address : 5 Floor, Building A, No.3 Longyu North St.,
Changping District, Beijing, China

Product Name : RFID module

Report Date : Oct. 08, 2024

Shenzhen Anbotek Compliance Laboratory Limited



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TEST REPORT

Applicant : Beijing Sillion Technology Corp.,LTD.

Manufacturer : Beijing Sillion Technology Corp.,LTD.

Product Name : RFID module

Model No. : SIM7200, SIM5200, SIM3200

Trade Mark : N.A

Rating(s) : Input: DC 5V $\Rightarrow$ 2A

Test Standard(s) : FCC Part15 Subpart C, Section 15.247

Test Method(s) : ANSI C63.10: 2020

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the 47 CFR Part 15.247 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt

Sept. 04, 2024

Date of Test

Sept. 04, 2024 to Sept. 27, 2024

Prepared By

Ella Liang

(Ella Liang)

Approved & Authorized Signer

Kingkong Jin

(Kingkong Jin)



Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Oct. 08, 2024

Note 1:
This is a Class II application which was based on the original report 18220WC30002601. The difference between the original device and current one described as following:

- 1. Update the Antenna.
- 2. Update the Photograph.

The changes are not related with the other RF parameters, only Radiation Spurious Emission were retested.



1. General Information

1.1. Client Information

Applicant	:	Beijing Sillion Technology Corp.,LTD.
Address	:	5 Floor, Building A, No.3 Longyu North St., Changping District, Beijing, China
Manufacturer	:	Beijing Sillion Technology Corp.,LTD.
Address	:	5 Floor, Building A, No.3 Longyu North St., Changping District, Beijing, China
Factory	:	Beijing Sillion Technology Corp.,LTD.
Address	:	5 Floor, Building A, No.3 Longyu North St., Changping District, Beijing, China

1.2. Description of Device (EUT)

Product Name	:	RFID module
Model No.	:	SIM7200, SIM5200, SIM3200 (Note: All samples are the same except the model number, appearance and size, so we prepare "SIM7200"for test only.)
Trade Mark	:	N.A
Test Power Supply	:	AC 120V, 60Hz for adapter
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N.A.

RF Specification

Support Technology	:	☒ RD ID
Operation Mode	:	☐ DSSS ☒ FHSS
Operation Frequency	:	902.750~927.25MHz
Number of Channel	:	50 Channels
Modulation Type	:	ASK
Antenna Type	:	Ceramic antenna
Antenna Gain(Peak)	:	6 dBi(Provide by customer)

Remark: 1) All of the RF specification are provided by customer. 2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



1.3. Auxiliary Equipment Used During Test

Description	Rating(s)
Adapter	Model: PA-1650-58 Input: AC100-240~50/60Hz, 1.6A CMIIT KP06503020
Computer	Model: N19W3 Input: 19V/3.42A;20V/3.25A CMIIT ID:2020AJ3862

1.4. Description of Test Modes

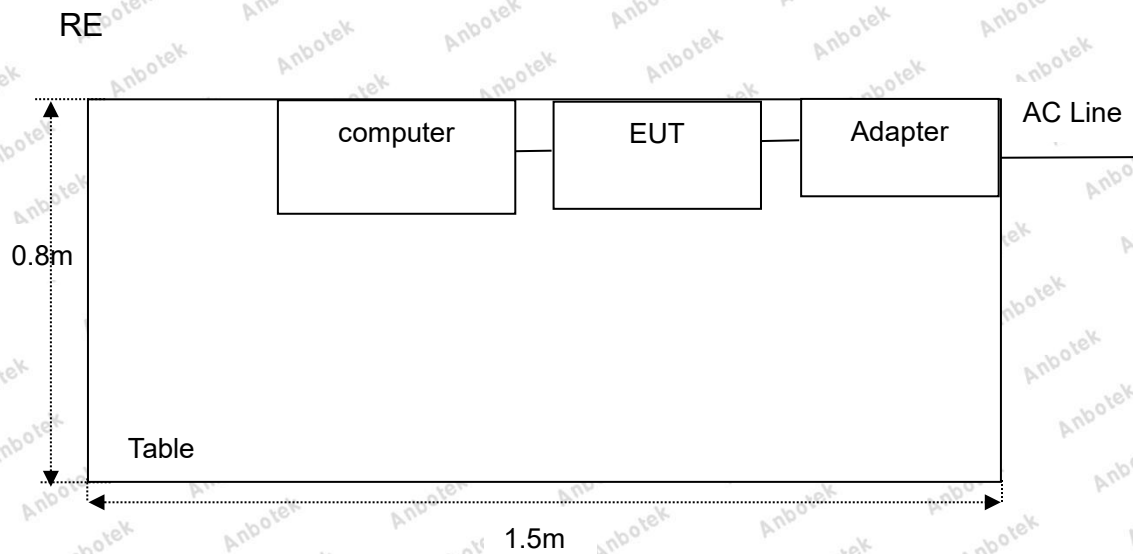
Chann el	Frequen cy (MHz)	Chann el	Frequen cy (MHz)	Chann el	Frequen cy (MHz)	Chann el	Frequen cy (MHz)	Chann el	Frequen cy (MHz)
01	902.75	02	903.25	03	903.75	04	904.25	05	904.75
06	905.25	07	905.75	08	906.25	09	906.75	10	907.25
11	907.75	12	908.25	13	908.75	14	909.25	15	909.75
16	910.25	17	910.75	18	911.25	19	911.75	20	912.25
21	912.75	22	913.25	23	913.75	24	914.25	25	914.75
26	915.25	27	915.75	28	916.25	29	916.75	30	917.25
31	917.75	32	918.25	33	918.75	34	919.25	35	919.75
36	920.25	37	920.75	38	921.25	39	921.75	40	922.25
41	922.75	42	923.25	43	923.75	44	924.25	45	924.75
46	925.25	47	925.75	48	926.25	49	926.75	50	927.25

Note:

1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. EUT was tested with Channel 1, 25 and 50.



1.5. Description Of Test Setup



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Jan. 18, 2024	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jan. 18, 2024	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 12, 2023	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Jan. 23, 2024	1 Year
5.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 12, 2023	1 Year
6.	EMI Preamplifier	SKET Electronic	LNPA-0118G -45	SKET-PA-002	Jan. 17, 2024	1 Year
7.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	Oct. 23, 2022	3 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 12, 2023	1 Year
10.	Horn Antenna	A-INFO	LB-180400- KF	J211060628	Oct. 12, 2023	1 Year
11.	Pre-amplifier	SONOMA	310N	186860	Jan. 17, 2024	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 12, 2023	1 Year
14.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 12, 2023	1 Year
15.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 12, 2023	1 Year
16.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 20, 2023	1 Year
17.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	N/A	Oct. 16, 2023	1 Year
18.	Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102150	May. 06, 2024	1 Year



1.7. Measurement Uncertainty

Parameter	Uncertainty
Occupied Bandwidth	925Hz
Conducted Output Power	0.76dB
Conducted Spurious Emission	1.24dB
Radiated spurious emissions (Below 30MHz)	3.53dB
Radiated spurious emissions (30MHz~1GHz)	Horizontal: 3.92dB; Vertical: 4.52dB
Radiated spurious emissions (above 1GHz)	1G-6GHz: 4.78dB; 6G-18GHz: 4.88dB 18G-40GHz: 5.68dB
The measurement uncertainty and decision risk evaluated according to AB/WI-RF-F-032. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 434132

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 434132.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

Sogood Industrial Zone Laboratory & 1/F. of Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Subdistrict, Bao'an District, Shenzhen, Guangdong, China.



1.9.Disclaimer

1. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
2. The test report is invalid if there is any evidence and/or falsification.
3. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
4. This document may not be altered or revised in any way unless done so by Anbotek and all revisions are duly noted in the revisions section.
5. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
6. The authenticity of the information provided by the customer is the responsibility of the customer and the laboratory is not responsible for its authenticity.

The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.



2. Summary of Test Results

Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.205/15.209	Spurious Emission	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		



3. Radiation Spurious Emission and Band Edge

3.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz~1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz~30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:

(1) The lower limit shall apply at the transition frequency.

(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

3.2. Test Setup

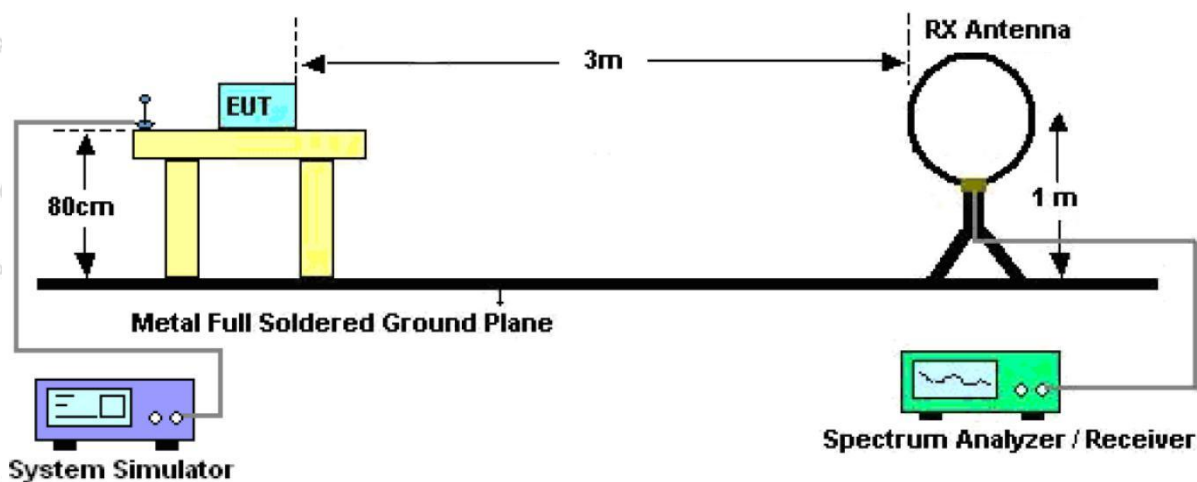


Figure 1. Below 30MHz



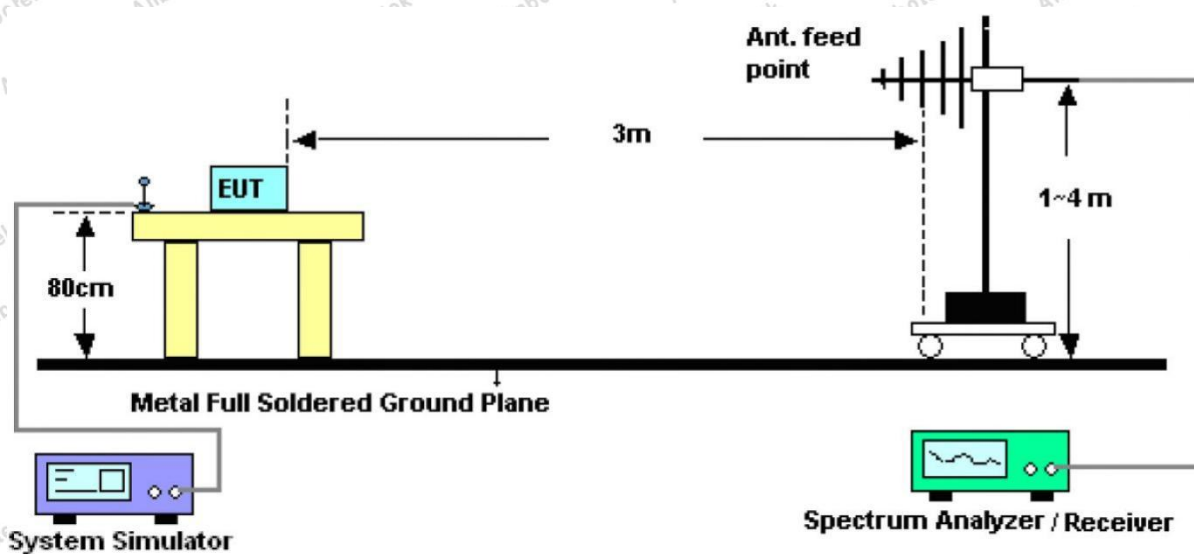


Figure 2. 30MHz to 1GHz

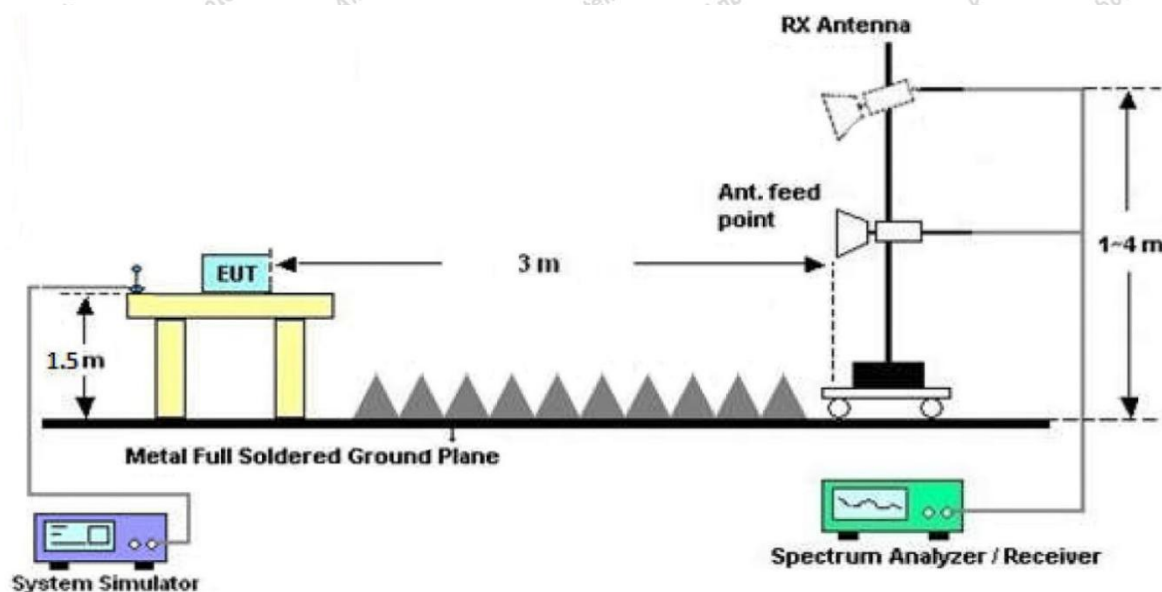


Figure 3. Above 1 GHz

3.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of



emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW = 1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9kHz, VBW = 30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW = 300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz, Set the spectrum analyzer as:

RBW = 1MHz, VBW = 1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.

RBW = 1MHz, VBW = 10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

3.4. Test Data

PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

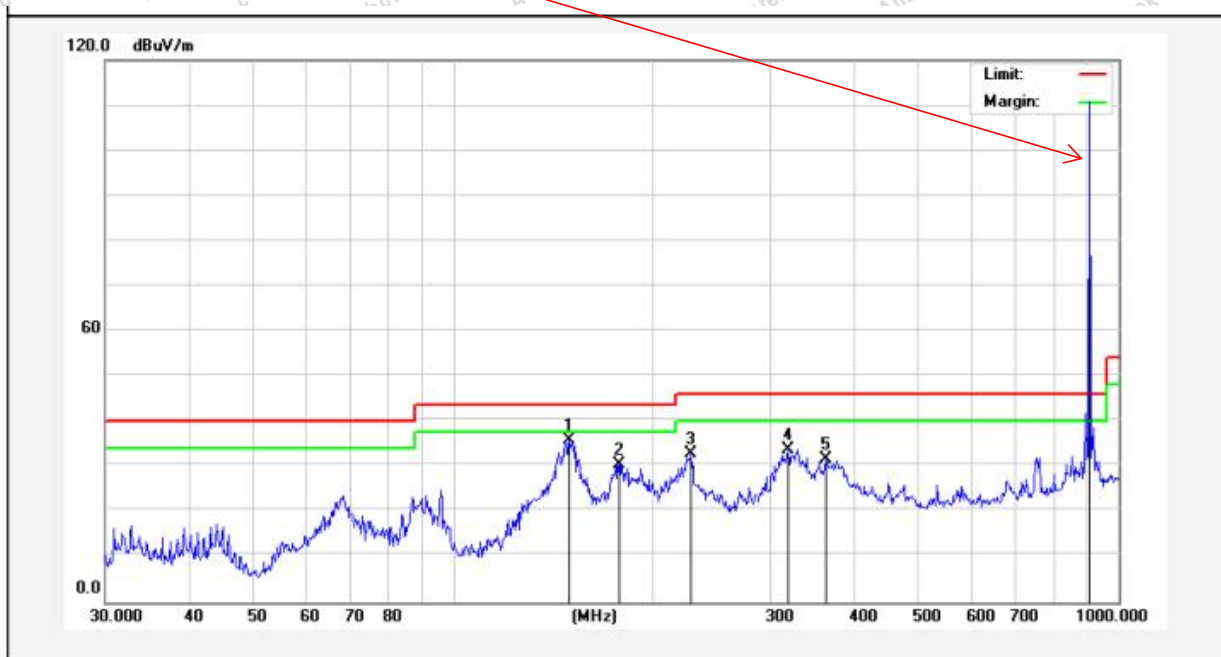
The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all modes, only the worst case is recorded in the report.



Test Results (30~1000MHz)

Test Mode: Low CH (902.75MHz)
Power Source: AC 120V, 60Hz for adapter
Polarization: Horizontal
Temp.(°C)/Hum.(%RH): 22.6°C/56%RH
Fundamental



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector			
1	149.4857	59.88	-24.05	35.83	43.50	-7.67	QP			
2	177.5092	53.26	-22.74	30.52	43.50	-12.98	QP			
3	227.6906	52.85	-20.14	32.71	46.00	-13.29	QP			
4	318.8170	49.68	-15.78	33.90	46.00	-12.10	QP			
5	362.9844	46.53	-14.85	31.68	46.00	-14.32	QP			
6	903.3094	116.96	-6.19	110.77	46.00	64.77	peak			



Test Results (30~1000MHz)

Test Mode: Low CH (902.75MHz)
Power Source: AC 120V, 60Hz for adapter
Polarization: Vertical
Temp.(°C)/Hum.(%RH): 22.6°C/56%RH
Fundamental



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector			
1	44.1202	43.64	-14.97	28.67	40.00	-11.33	QP			
2	83.8156	51.90	-20.07	31.83	40.00	-8.17	QP			
3	88.9639	54.59	-19.34	35.25	43.50	-8.25	QP			
4	148.4410	58.88	-24.10	34.78	43.50	-8.72	QP			
5	225.3080	54.68	-20.29	34.39	46.00	-11.61	QP			
6	903.3094	113.88	-6.19	107.69	46.00	61.69	peak			



Test Results (1GHz-25GHz)

Test channel: Lowest

Peak value:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1805.50	34.82	17.67	52.49	74.00	-21.51	Vertical
2708.25	33.79	20.94	54.73	74.00	-19.27	Vertical
3611.00	36.82	22.51	59.33	74.00	-14.67	Vertical
4513.75	*			74.00		Vertical
5416.50	*			74.00		Vertical
1805.50	33.94	17.67	51.61	74.00	-22.39	Horizontal
2708.25	36.68	20.94	57.62	74.00	-16.38	Horizontal
3611.00	30.84	22.51	53.35	74.00	-20.65	Horizontal
4513.75	*			74.00		Horizontal
5416.50	*			74.00		Horizontal

Average value:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
1805.50	23.09	17.67	40.76	54.00	-13.24	Vertical
2708.25	22.84	20.94	43.78	54.00	-10.22	Vertical
3611.00	26.29	22.51	48.80	54.00	-5.20	Vertical
4513.75	*			54.00		Vertical
5416.50	*			54.00		Vertical
1805.50	22.27	17.67	39.94	54.00	-14.06	Horizontal
2708.25	25.71	20.94	46.65	54.00	-7.35	Horizontal
3611.00	20.35	22.51	42.86	54.00	-11.14	Horizontal
4513.75	*			54.00		Horizontal
5416.50	*			54.00		Horizontal



Test Results (1GHz-25GHz)

Test channel: Middle

Peak value:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1829.50	34.37	17.70	52.07	74.00	-21.93	Vertical
2744.25	33.76	20.97	54.73	74.00	-19.27	Vertical
3659.00	36.32	22.51	58.83	74.00	-15.17	Vertical
4573.75	*			74.00		Vertical
5488.50	*			74.00		Vertical
1829.50	33.75	17.70	51.45	74.00	-22.55	Horizontal
2744.25	36.55	20.97	57.52	74.00	-16.48	Horizontal
3659.00	30.56	22.51	53.07	74.00	-20.93	Horizontal
4573.75	*			74.00		Horizontal
5488.50	*			74.00		Horizontal

Average value:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	
1829.50	23.18	17.70	40.88	54.00	-13.12	polarization
2744.25	22.70	20.97	43.67	54.00	-10.33	Vertical
3659.00	26.14	22.51	48.65	54.00	-5.35	Vertical
4573.75	*			54.00		Vertical
5488.50	*			54.00		Vertical
1829.50	22.38	17.70	40.08	54.00	-13.92	Vertical
2744.25	26.06	20.97	47.03	54.00	-6.97	Horizontal
3659.00	20.65	22.51	43.16	54.00	-10.84	Horizontal
4573.75	*			54.00		Horizontal
5488.50	*			54.00		Horizontal



Test Results (1GHz-25GHz)

Test channel: Highest						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1854.50	34.50	17.74	52.24	74.00	-21.76	Vertical
2781.75	33.92	20.99	54.91	74.00	-19.09	Vertical
3709.00	37.02	22.51	59.53	74.00	-14.47	Vertical
4636.25	*			74.00		Vertical
5563.50	*			74.00		Vertical
1854.50	33.89	17.74	51.63	74.00	-22.37	Horizontal
2781.75	36.76	20.99	57.75	74.00	-16.25	Horizontal
3709.00	30.94	22.51	53.45	74.00	-20.55	Horizontal
4636.25	*			74.00		Horizontal
5563.50	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
1854.50	24.30	17.74	42.04	54.00	-11.96	Vertical
2781.75	23.97	20.99	44.96	54.00	-9.04	Vertical
3709.00	26.79	22.51	49.30	54.00	-4.70	Vertical
4636.25				54.00		Vertical
5563.50				54.00		Vertical
1854.50	23.56	17.74	41.30	54.00	-12.70	Horizontal
2781.75	26.86	20.99	47.85	54.00	-6.15	Horizontal
3709.00	20.80	22.51	43.31	54.00	-10.69	Horizontal
4636.25	*			54.00		Horizontal
5563.50	*			54.00		Horizontal

Remark:

1.Result =Reading + Factor

2. Test frequency are from 1GHz to 25GHz, "*"means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.



4. Antenna Requirement

4.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

4.2. Antenna Connected Construction

The antenna is ceramic antenna which permanently attached, and the best case gain of the antenna is 6 dBi. It complies with the standard requirement.



APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph_RF

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

----- End of Report -----

