

# FCC TEST REPORT

Client Name : Beijing ManThink Technology Co., Ltd.  
Address : Room 904, JingKai Building B DiSheng North Road No.1,  
BDA, Beijing, China  
Product Name : GDO802  
Date : Jun. 28, 2019

**Shenzhen Anbotek Compliance Laboratory Limited**



# Contents

1. General Information.....	4
1.1. Client Information.....	4
1.2. Description of Device (EUT).....	4
1.3. Auxiliary Equipment Used During Test.....	4
1.4. Description of Test Modes.....	5
1.5. List of channels.....	5
1.6. Description of Test Setup.....	6
1.7. Test Equipment List.....	7
1.8. Measurement Uncertainty.....	8
1.9. Description of Test Facility.....	8
2. Summary of Test Results.....	9
3. Conducted Emission Test.....	10
3.1. Test Standard and Limit.....	10
3.2. Test Setup.....	10
3.3. Test Procedure.....	10
3.4. Test Data.....	10
4. Radiation Spurious Emission and Band Edge.....	15
4.1. Test Standard and Limit.....	15
4.2. Test Setup.....	16
4.3. Test Procedure.....	17
4.4. Test Data.....	18
5. 20dB Bandwidth Test.....	36
5.1. Test Standard and Limit.....	36
5.2. Test Setup.....	36
5.3. Test Procedure.....	36
5.4. Test Data.....	36
6. Antenna Requirement.....	39
6.1. Test Standard and Requirement.....	39
6.2. Antenna Connected Construction.....	39
APPENDIX I -- TEST SETUP PHOTOGRAPH.....	40
APPENDIX II -- EXTERNAL PHOTOGRAPH.....	42
APPENDIX III -- INTERNAL PHOTOGRAPH.....	47

# TEST REPORT

Applicant : Beijing ManThink Technology Co., Ltd.  
Manufacturer : Beijing ManThink Technology Co., Ltd.  
Product Name : GDO802  
Model No. : GDO802  
Trade Mark : ManThink  
Rating(s) : Input: DC 55.5V, 40W for POE Power Supply  
**Test Standard(s) : FCC Part15 Subpart C, Paragraph 15.249**  
**Test Method(s) : ANSI C63.10: 2013**

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 FCC Part 15 Subpart C 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

May 10, 2019

Date of Test

May 10~Jun. 05, 2019

Prepared by



*Oliay Yang*

(Engineer / Oliay Yang)

Reviewer

*Snowy Meng*

(Supervisor / Snowy Meng)

Approved & Authorized Signer

*Sally Zhang*

(Manager / Sally Zhang)

## 1. General Information

### 1.1. Client Information

Applicant	:	Beijing ManThink Technology Co., Ltd.
Address	:	Room 904, JingKai Building B DiSheng North Road No.1, BDA, Beijing, China
Manufacturer	:	Beijing ManThink Technology Co., Ltd.
Address	:	Room 904, JingKai Building B DiSheng North Road No.1, BDA, Beijing, China
Factory	:	Beijing ManThink Technology Co., Ltd.
Address	:	Room 904, JingKai Building B DiSheng North Road No.1, BDA, Beijing, China

### 1.2. Description of Device (EUT)

Product Name	:	GDO802
Model No.	:	GDO802
Trade Mark	:	ManThink
Test Power Supply	:	AC 240V, 60Hz for adapter/ AC 120V, 60Hz for adapter
Test Sample No.	:	S1(Normal Sample), S2(Engineering Sample)
Product Description	Operation Frequency:	923.2MHz~924.6MHz
	Modulation Type:	LoRa
	Antenna Type:	fibre-glass epoxy Antenna
	Antenna Gain(Peak):□	5 dBi
<b>Remark:</b> 1)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

POE Power Supply	:	MODEL: UM-PSE40SL-B INPUT: AC 100-264V 50/60HZ OUTPUT: DC 55.5V, 40W
------------------	---	--

### 1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH01
Mode 2	CH05
Mode 3	CH08
Mode 4	Keeping TX+ Charging Mode

For Conducted Emission	
Final Test Mode	Description
Mode 4	Keeping TX+ Charging Mode

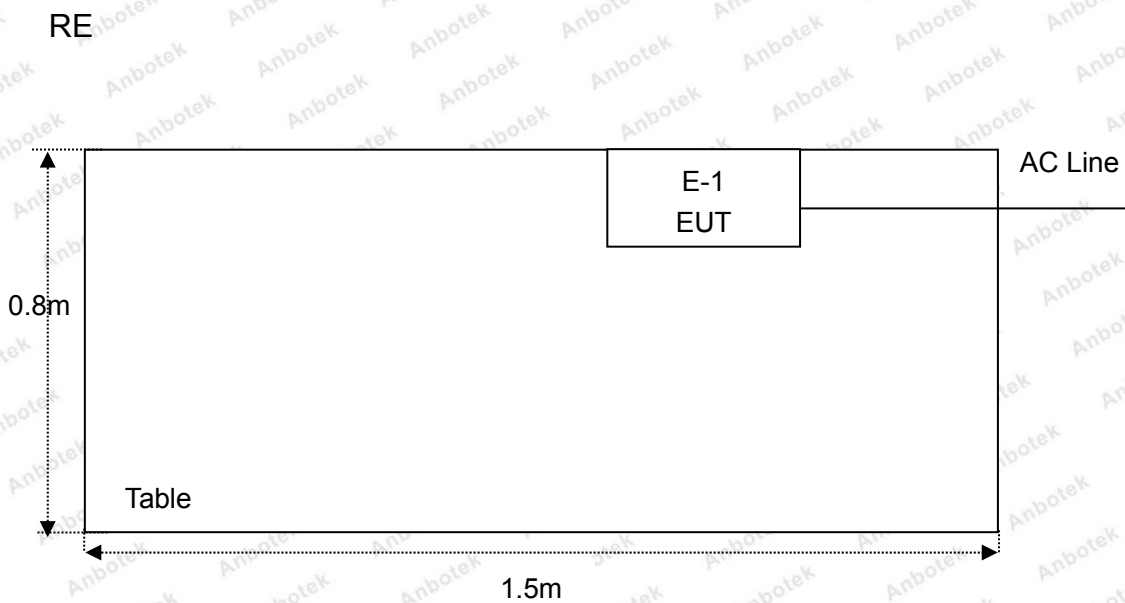
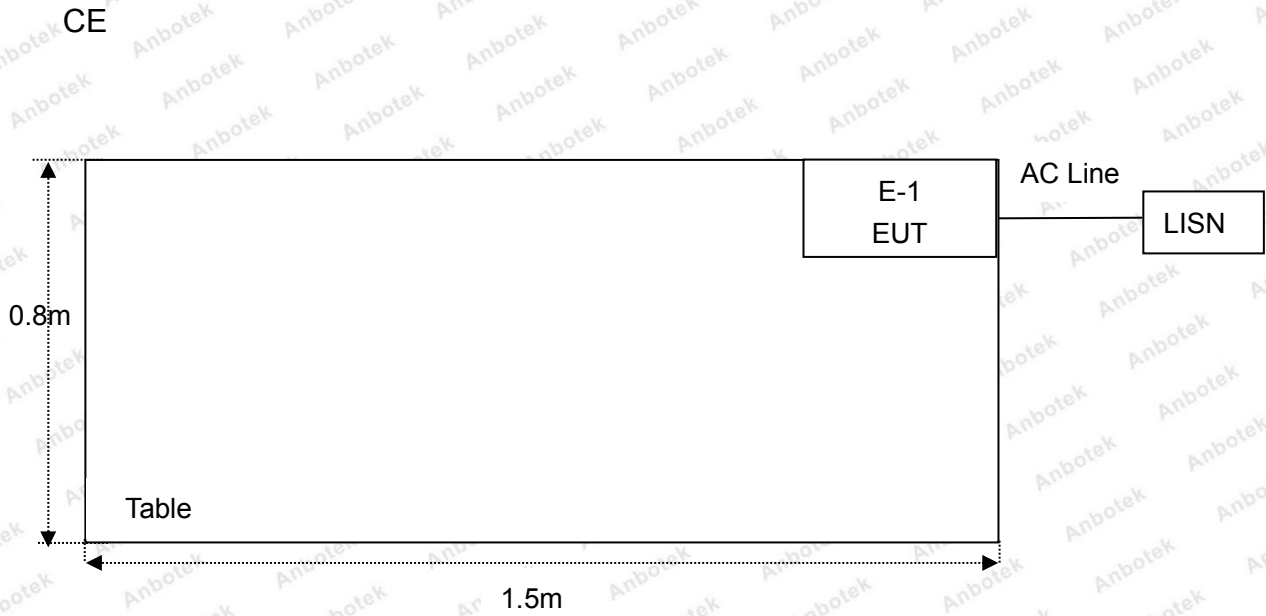
For Radiated Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH05
Mode 3	CH08
Mode 4	Keeping TX+ Charging Mode

### 1.5. List of channels

Channel	Freq. (MHz)
01	923.2
02	923.4
03	923.6
04	923.8
05	924.0
06	924.2
07	924.4
08	924.6

Note: The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.

### 1.6. Description of Test Setup



**1.7. 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	Nov. 26, 2018	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESPI3	101604	Nov. 05, 2018	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 05, 2018	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	Nov. 05, 2018	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 05, 2018	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Nov. 05, 2018	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 20, 2018	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 19, 2018	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 20, 2018	1 Year
10.	Horn Antenna	A-INFO	LB-180400- KF	J211060628	Nov. 20, 2018	1 Year
11.	Pre-amplifier	SONOMA	310N	186860	Nov. 05, 2018	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Nov. 05, 2018	1 Year
14.	Power Sensor	DAER	RPR3006W	15100041SN045	Nov. 05, 2018	1 Year
15.	Power Sensor	DAER	RPR3006W	15100041SN046	Nov. 05, 2018	1 Year
16.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 05, 2018	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 05, 2018	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 05, 2018	1 Year
19.	DC Power Supply	LW	TPR-6420D	374470	Oct. 31, 2018	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	N/A	Nov. 01, 2018	1 Year

### 1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

### 1.9. Description of Test Facility

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

#### FCC-Registration No.: 184111

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. 184111, July 31, 2017.

#### ISED-Registration No.: 8058A-1

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-1, June 13, 2016.

#### Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102



## 2. Summary of Test Results

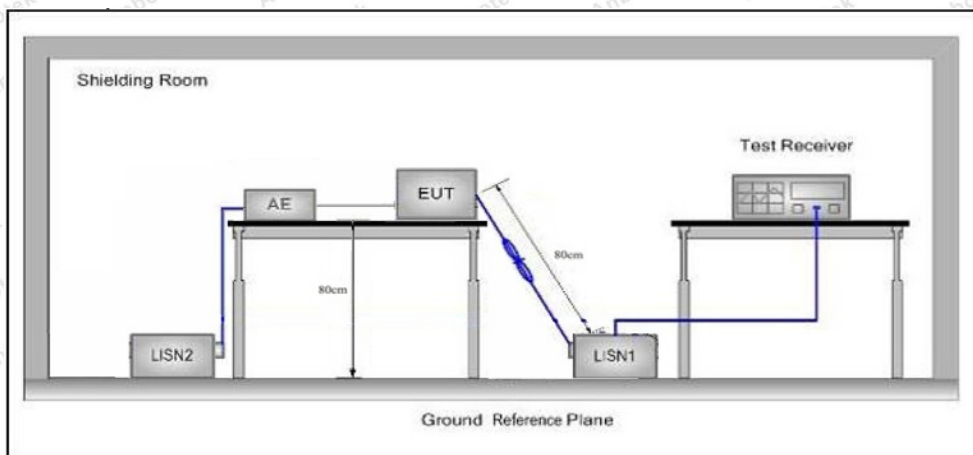
Standard Section	Test Item	Result
15.203	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.249	Spurious Emission	PASS
15.215(c)	20dB Bandwidth	PASS
15.249(c)	Band Edge	PASS
<b>Remark: "N/A" is an abbreviation for Not Applicable.</b>		

### 3. Conducted Emission Test

#### 3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
<b>Remark:</b> (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

#### 3.2. Test Setup



#### 3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

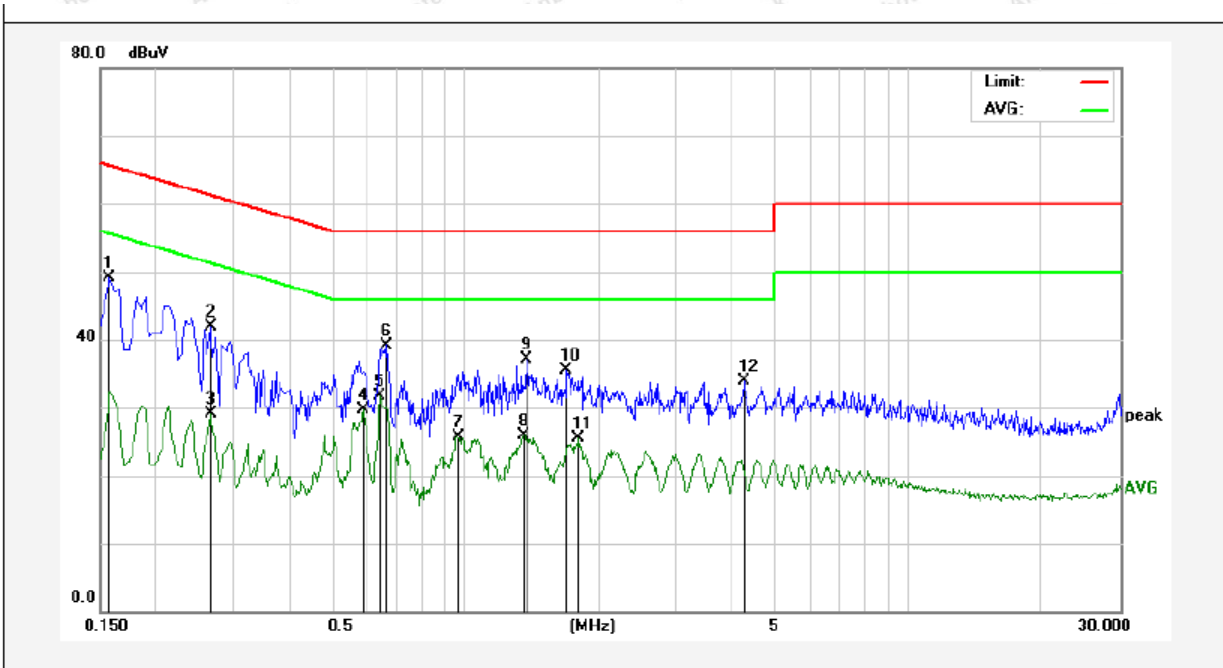
#### 3.4. Test Data

During the test, pre-scan all modes, and found the CH01 which is the worst case, only the worst case is recorded in the report.

Please to see the following pages.

**Conducted Emission Test Data**

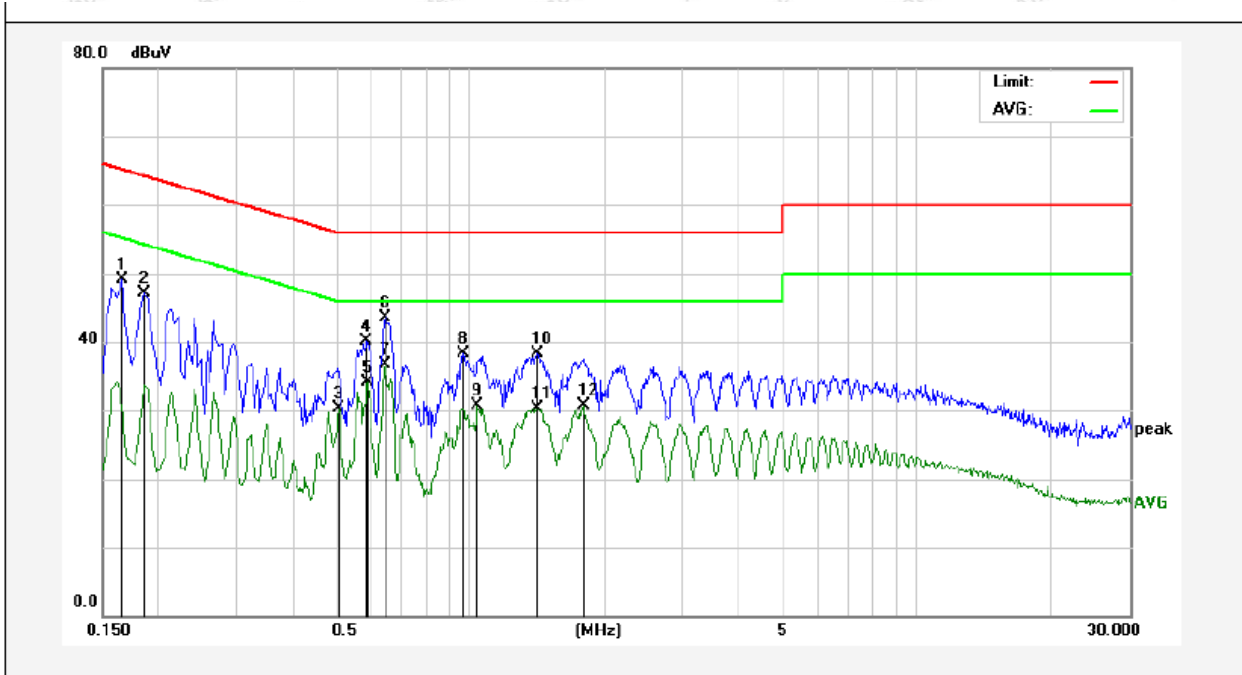
Test Site: 1# Shielded Room  
 Operating Condition: Keeping TX+ Charging Mode(CH01)  
 Test Specification: AC 240V, 60Hz for adapter  
 Comment: Live Line  
 Tem.: 21.8°C Hum.: 53%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1580	29.15	19.90	49.05	65.56	-16.51	QP	
2	0.2660	21.92	19.89	41.81	61.24	-19.43	QP	
3	0.2660	9.13	19.89	29.02	51.24	-22.22	AVG	
4	0.5899	9.63	20.01	29.64	46.00	-16.36	AVG	
5	0.6419	11.69	20.02	31.71	46.00	-14.29	AVG	
6	0.6660	19.17	20.03	39.20	56.00	-16.80	QP	
7	0.9620	5.55	20.11	25.66	46.00	-20.34	AVG	
8	1.3540	5.85	20.13	25.98	46.00	-20.02	AVG	
9	1.3740	17.02	20.13	37.15	56.00	-18.85	QP	
10	1.6940	15.34	20.13	35.47	56.00	-20.53	QP	
11	1.8020	5.31	20.14	25.45	46.00	-20.55	AVG	
12	4.2660	13.66	20.19	33.85	56.00	-22.15	QP	

**Conducted Emission Test Data**

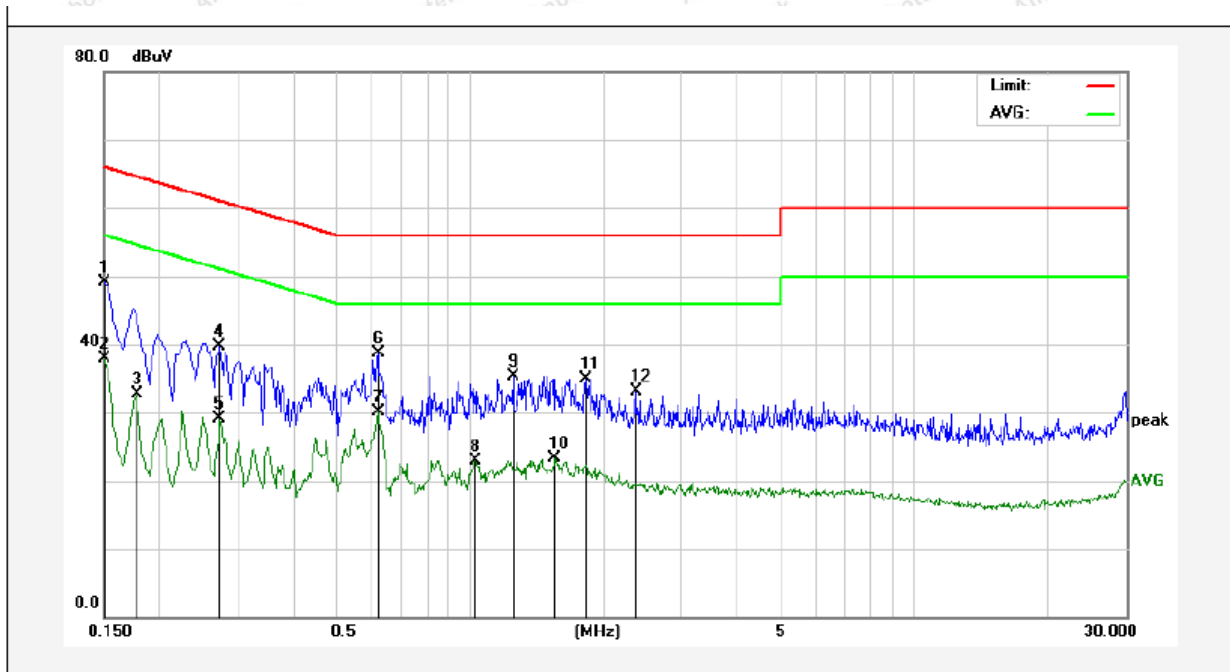
Test Site: 1# Shielded Room  
 Operating Condition: Keeping TX+ Charging Mode(CH01)  
 Test Specification: AC 240V, 60Hz for adapter  
 Comment: Neutral Line  
 Tem.: 21.8°C Hum.: 53%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1660	29.16	19.90	49.06	65.15	-16.09	QP	
2	0.1860	27.20	19.90	47.10	64.21	-17.11	QP	
3	0.5100	10.23	19.98	30.21	46.00	-15.79	AVG	
4	0.5860	20.09	20.01	40.10	56.00	-15.90	QP	
5	0.5899	14.07	20.01	34.08	46.00	-11.92	AVG	
6	0.6460	23.58	20.02	43.60	56.00	-12.40	QP	
7	0.6460	16.63	20.02	36.65	46.00	-9.35	AVG	
8	0.9660	18.22	20.11	38.33	56.00	-17.67	QP	
9	1.0420	10.65	20.12	30.77	46.00	-15.23	AVG	
10	1.4140	18.20	20.13	38.33	56.00	-17.67	QP	
11	1.4140	10.27	20.13	30.40	46.00	-15.60	AVG	
12	1.7940	10.51	20.14	30.65	46.00	-15.35	AVG	

**Conducted Emission Test Data**

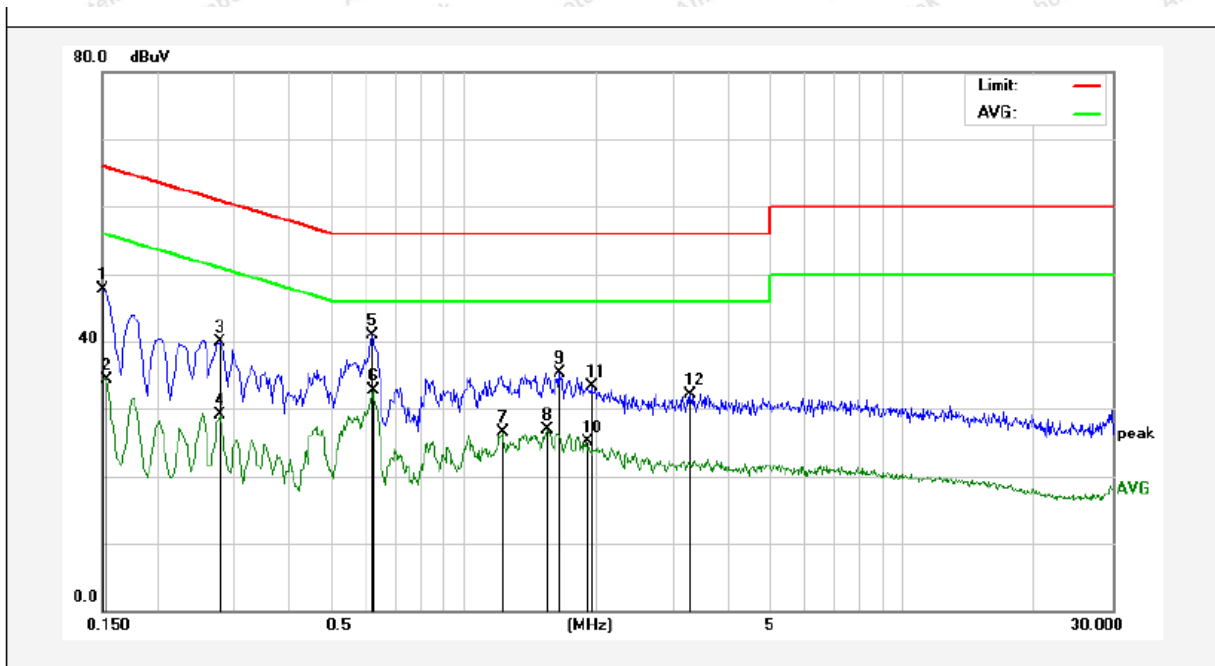
Test Site: 1# Shielded Room  
 Operating Condition: Keeping TX+ Charging Mode(CH01)  
 Test Specification: AC 120V, 60Hz for adapter  
 Comment: Live Line  
 Tem.: 21.8°C Hum.: 53%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1500	29.19	19.90	49.09	65.99	-16.90	QP	
2	0.1500	18.02	19.90	37.92	55.99	-18.07	AVG	
3	0.1780	12.72	19.90	32.62	54.57	-21.95	AVG	
4	0.2740	19.81	19.89	39.70	60.99	-21.29	QP	
5	0.2740	9.26	19.89	29.15	50.99	-21.84	AVG	
6	0.6220	18.68	20.02	38.70	56.00	-17.30	QP	
7	0.6220	10.11	20.02	30.13	46.00	-15.87	AVG	
8	1.0300	2.87	20.12	22.99	46.00	-23.01	AVG	
9	1.2540	15.21	20.13	35.34	56.00	-20.66	QP	
10	1.5580	3.10	20.13	23.23	46.00	-22.77	AVG	
11	1.8220	14.84	20.14	34.98	56.00	-21.02	QP	
12	2.3620	12.93	20.15	33.08	56.00	-22.92	QP	

### Conducted Emission Test Data

Test Site: 1# Shielded Room  
 Operating Condition: Keeping TX+ Charging Mode(CH01)  
 Test Specification: AC 120V, 60Hz for adapter  
 Comment: Neutral Line  
 Tem.: 21.8°C Hum.: 53%



No.	Freq. (MHz)	Reading (dBUV)	Factor (dB)	Result (dBUV)	Limit dBUV	Over Limit (dB)	Detector	Remark
1	0.1500	27.75	19.90	47.65	65.99	-18.34	QP	
2	0.1539	14.49	19.90	34.39	55.78	-21.39	AVG	
3	0.2779	20.01	19.89	39.90	60.88	-20.98	QP	
4	0.2779	9.16	19.89	29.05	50.88	-21.83	AVG	
5	0.6180	20.81	20.02	40.83	56.00	-15.17	QP	
6	0.6220	12.65	20.02	32.67	46.00	-13.33	AVG	
7	1.2260	6.31	20.12	26.43	46.00	-19.57	AVG	
8	1.5580	6.79	20.13	26.92	46.00	-19.08	AVG	
9	1.6460	15.25	20.13	35.38	56.00	-20.62	QP	
10	1.9060	5.03	20.14	25.17	46.00	-20.83	AVG	
11	1.9500	13.24	20.14	33.38	56.00	-22.62	QP	
12	3.2860	11.93	20.17	32.10	56.00	-23.90	QP	

## 4. Radiation Spurious Emission and Band Edge

### 4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
Test Limit	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
			54.0	Average	3
Above 1000MHz	-	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.

Test Standard	FCC Part15 C Section 15.249					
	Fundamental frequency (MHz)	Field Strength	Limit (microvolts/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
Test Limit	923.2~924.6	Fundamental	50	94.0	Quasi-peak	3
		Harmonics	500	74.0	Average	3
			-	94.0	Peak	3

**Remark:**

- (1) 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.

## 4.2. Test Setup

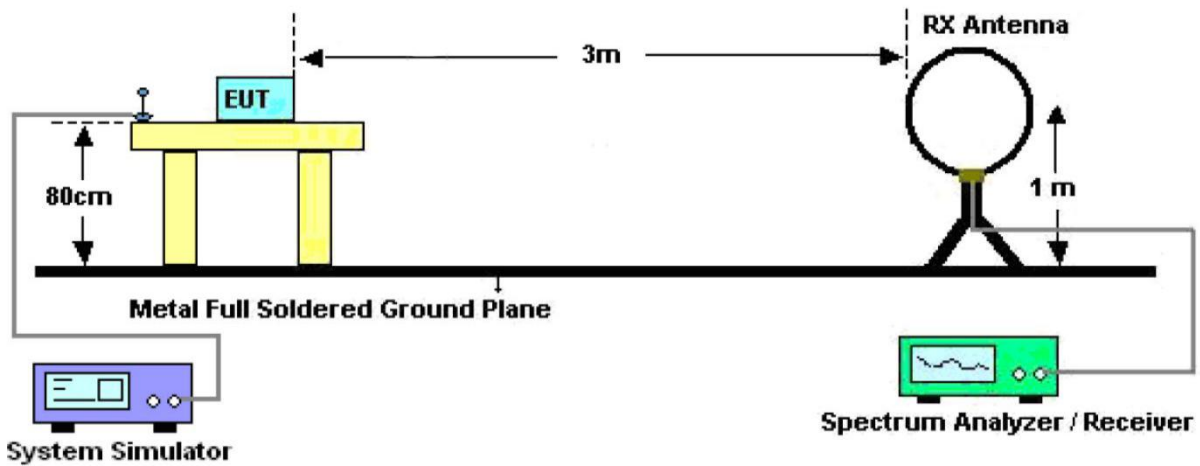


Figure 1. Below 30MHz

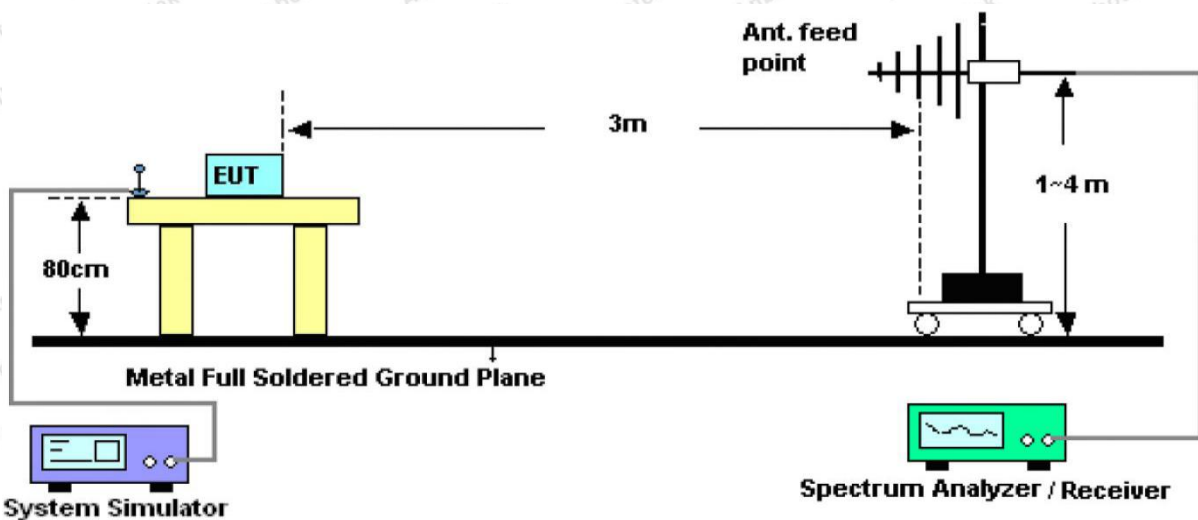


Figure 2. 30MHz to 1GHz



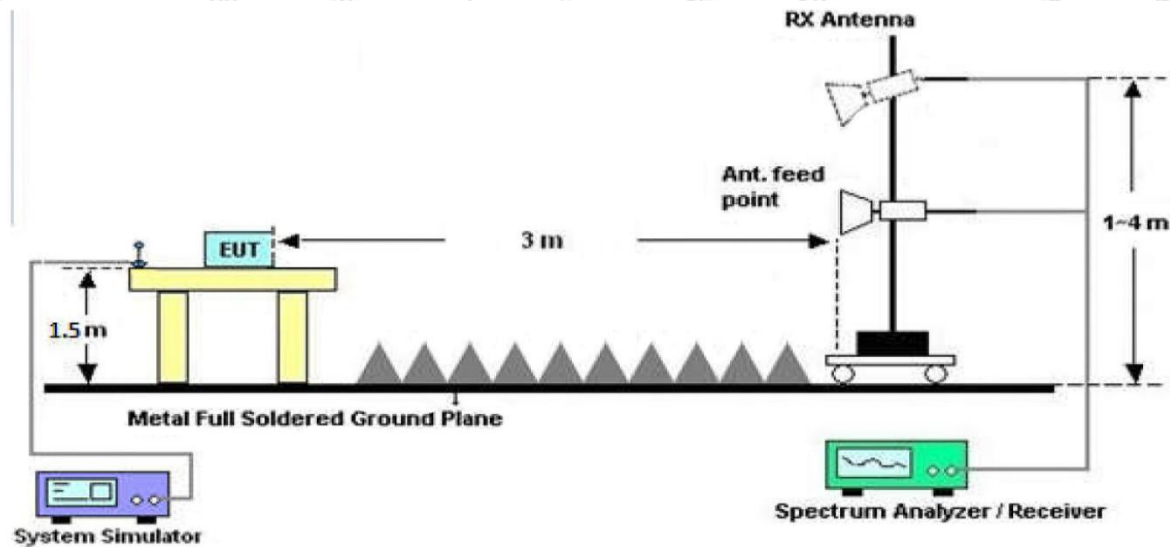


Figure 3. Above 1 GHz

### 4.3. 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 = 120KHz, 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.

#### 4.4. 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.

**Test Results (30~1000MHz)**

Job No.: SZAWW190510004-01

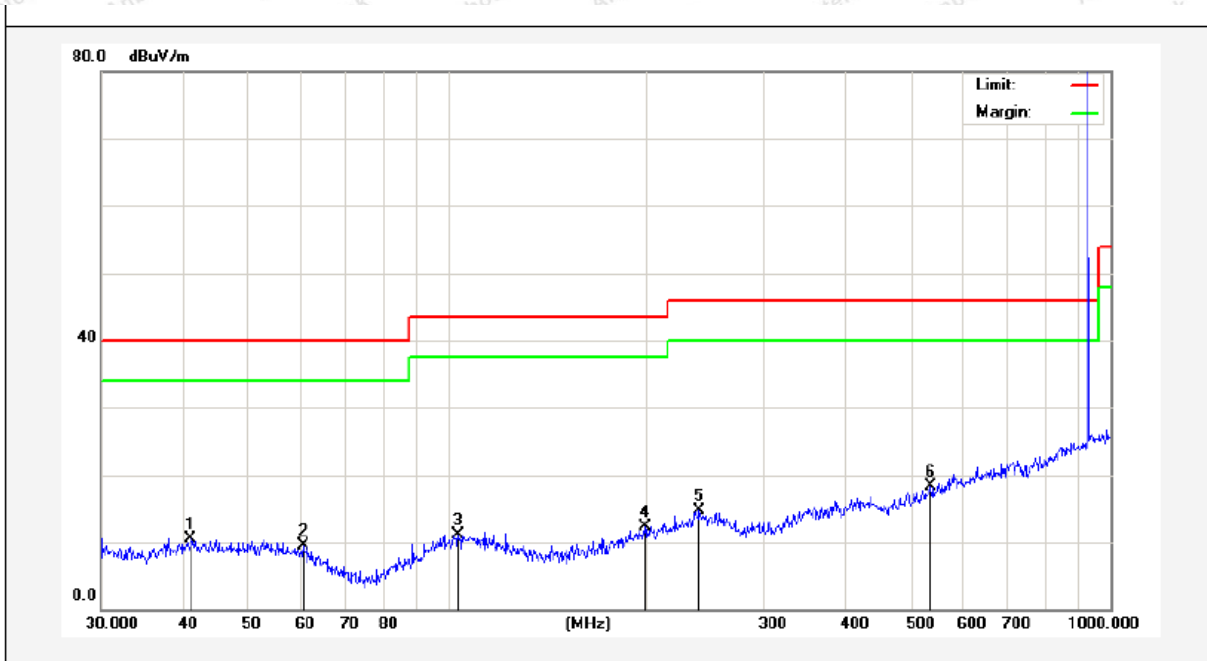
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 240V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH01)

Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	40.9881	28.16	-17.57	10.59	40.00	-29.41	QP	300	54	
2	60.4919	28.10	-18.61	9.49	40.00	-30.51	QP	300	163	
3	103.8055	33.97	-22.82	11.15	43.50	-32.35	QP	300	243	
4	198.5880	33.09	-20.88	12.21	43.50	-31.29	QP	300	231	
5	239.9874	33.71	-18.95	14.76	46.00	-31.24	QP	300	26	
6	535.7073	30.51	-12.28	18.23	46.00	-27.77	QP	300	37	

Job No.: SZAWW190510004-01

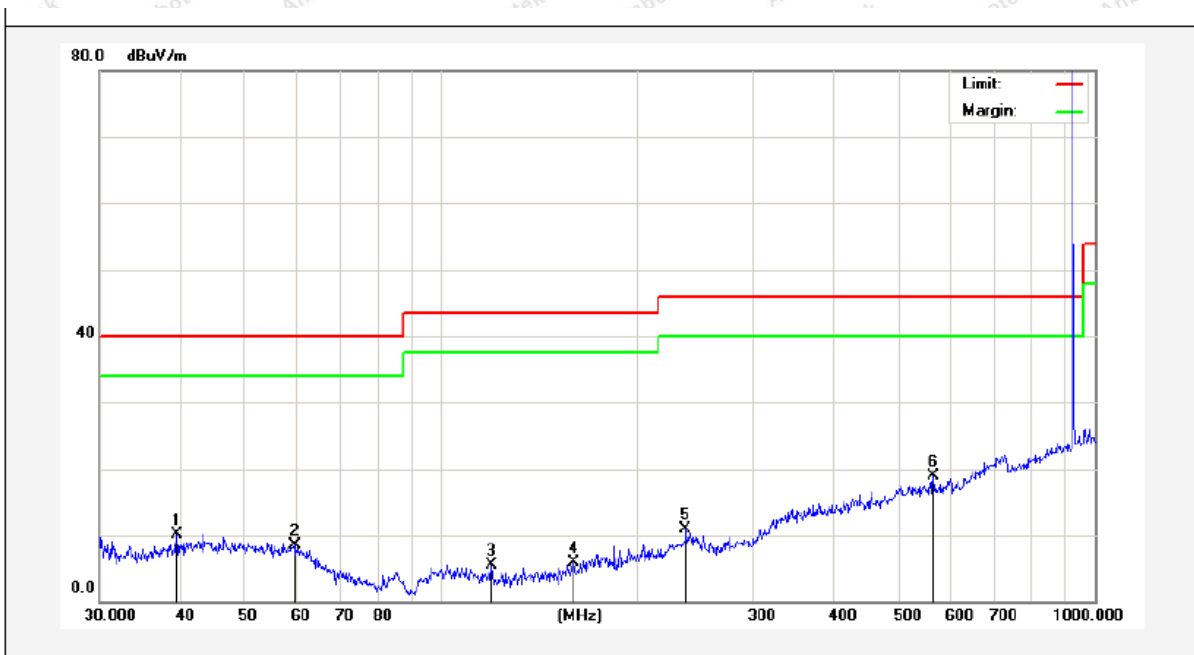
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 240V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH01)

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	39.4371	26.79	-16.71	10.08	40.00	-29.92	QP	300	0	
2	59.6492	25.90	-17.39	8.51	40.00	-31.49	QP	300	57	
3	119.4360	22.95	-17.36	5.59	43.50	-37.91	QP	300	214	
4	159.7844	24.75	-18.84	5.91	43.50	-37.59	QP	300	266	
5	236.6447	26.01	-15.12	10.89	46.00	-35.11	QP	300	29	
6	566.6221	29.85	-10.86	18.99	46.00	-27.01	QP	300	360	

Job No.: SZAWW190510004-01

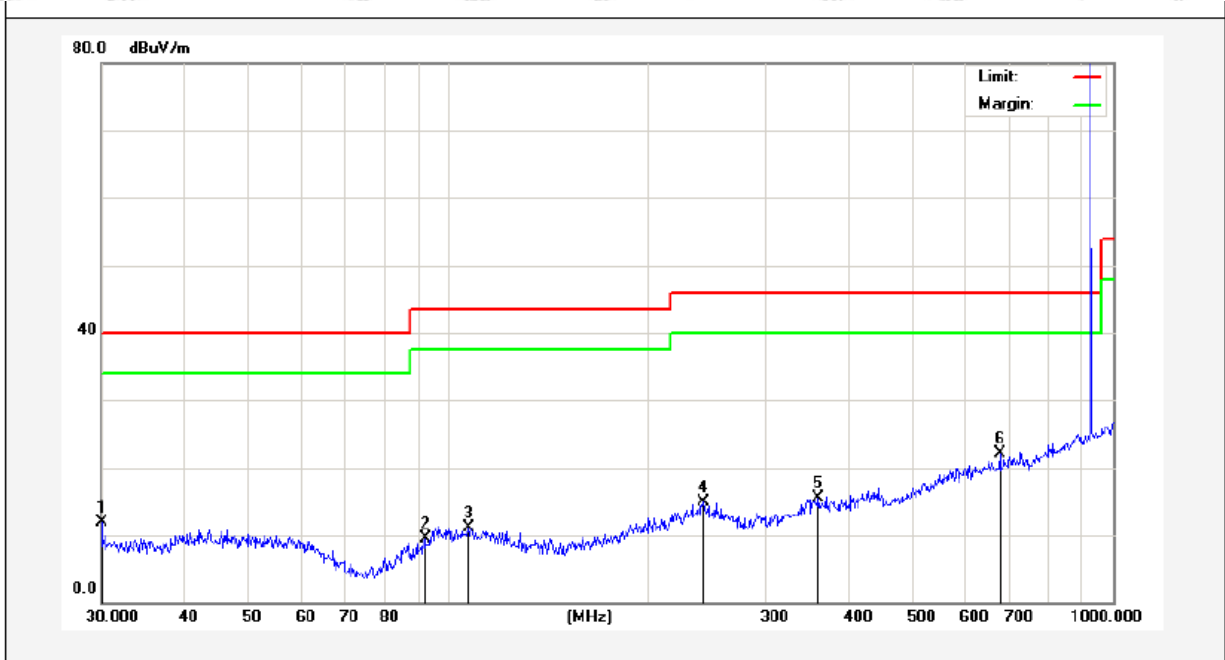
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 120V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH01)

Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	30.0000	30.87	-18.95	11.92	40.00	-28.08	QP	300	35	
2	92.1388	33.82	-24.41	9.41	43.50	-34.09	QP	300	222	
3	107.1337	33.95	-22.77	11.18	43.50	-32.32	QP	300	300	
4	241.6763	33.94	-19.03	14.91	46.00	-31.09	QP	300	146	
5	360.4476	30.34	-14.76	15.58	46.00	-30.42	QP	300	126	
6	675.2080	32.01	-9.99	22.02	46.00	-23.98	QP	300	300	

Job No.: SZAWW190510004-01

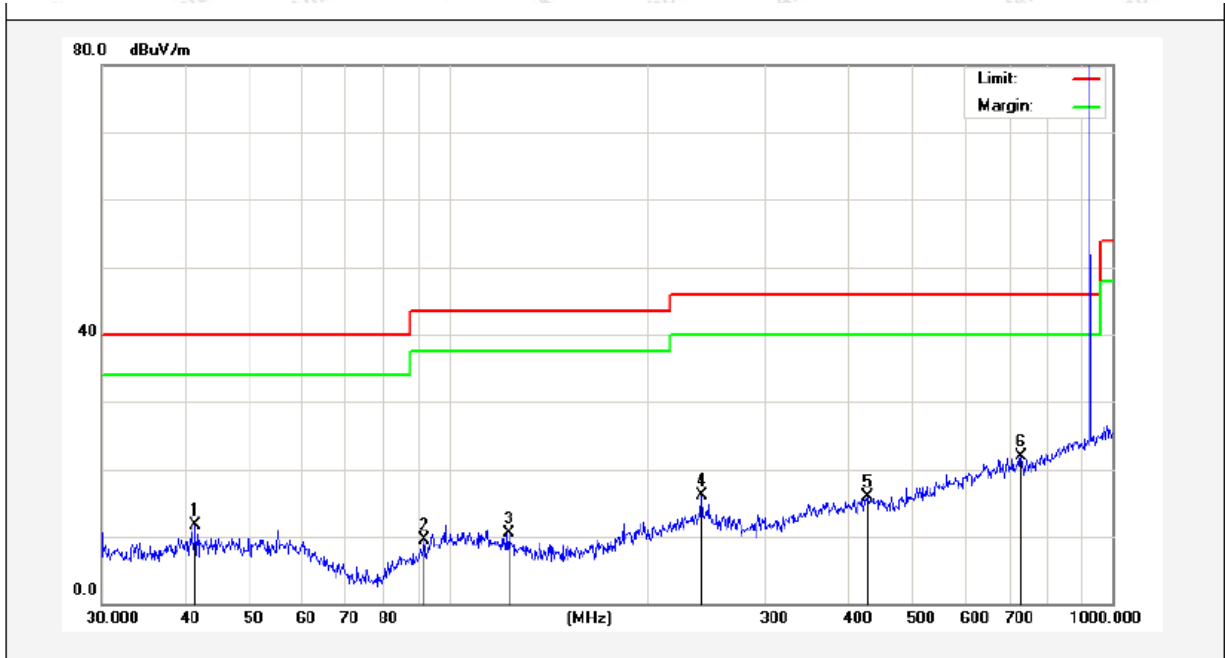
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 120V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH01)

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	41.5670	28.17	-16.56	11.61	40.00	-28.39	QP	300	127	
2	91.8162	27.96	-18.55	9.41	43.50	-34.09	QP	300	162	
3	123.2655	28.35	-17.88	10.47	43.50	-33.03	QP	300	135	
4	240.8303	31.10	-14.95	16.15	46.00	-29.85	QP	300	122	
5	428.0192	28.41	-12.56	15.85	46.00	-30.15	QP	300	55	
6	729.3582	30.49	-8.51	21.98	46.00	-24.02	QP	300	79	

Job No.: SZAWW190510004-01

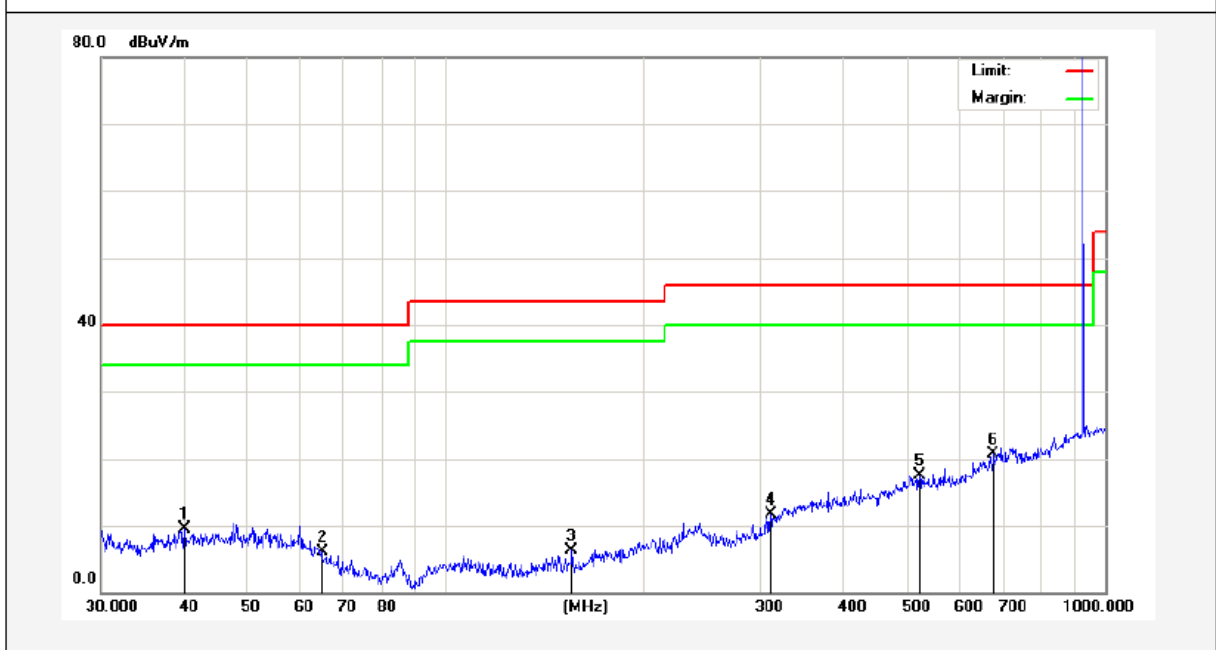
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 240V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH05)

Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBUV)	Factor (dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	40.1347	26.15	-16.57	9.58	40.00	-30.42	QP	300	254	
2	64.8865	25.48	-19.36	6.12	40.00	-33.88	QP	300	231	
3	155.3644	25.43	-19.07	6.36	43.50	-37.14	QP	300	300	
4	311.0867	27.07	-15.36	11.71	46.00	-34.29	QP	300	134	
5	522.7180	29.31	-11.86	17.45	46.00	-28.55	QP	300	142	
6	677.5798	30.21	-9.47	20.74	46.00	-25.26	QP	300	167	

Job No.: SZAWW190510004-01

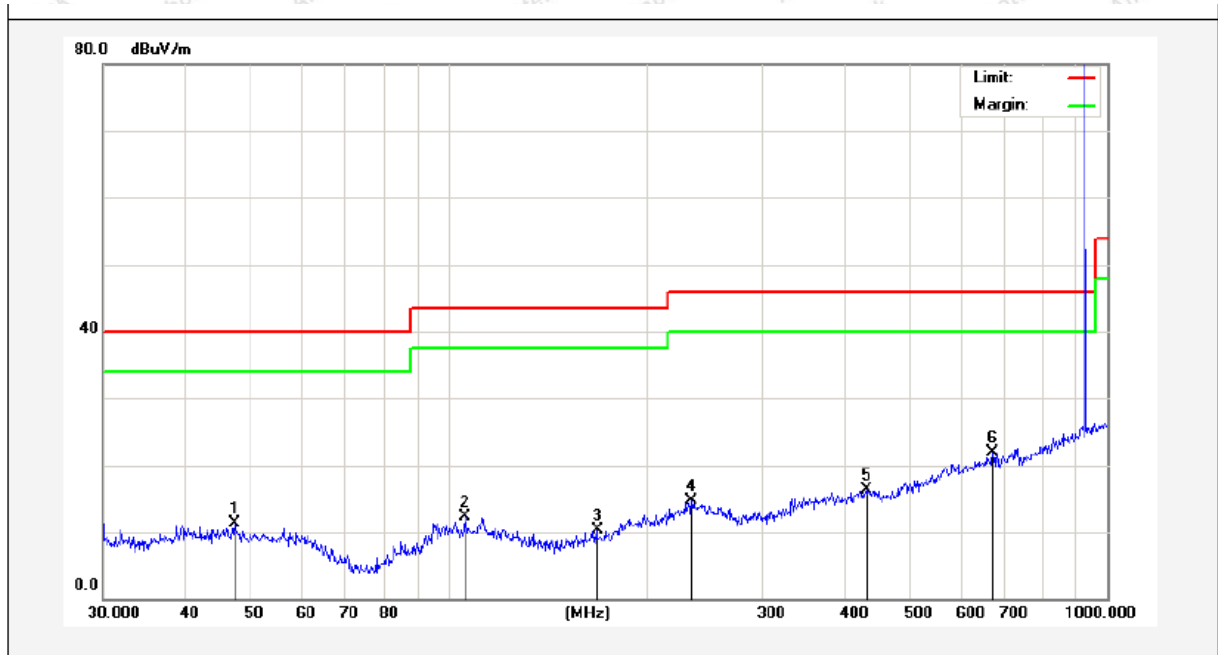
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 240V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH05)

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	47.4918	28.99	-17.65	11.34	40.00	-28.66	QP	300	300	
2	106.0126	35.09	-22.79	12.30	43.50	-31.20	QP	300	146	
3	168.4138	32.10	-21.72	10.38	43.50	-33.12	QP	300	360	
4	234.1684	34.29	-19.54	14.75	46.00	-31.25	QP	300	130	
5	432.5457	29.83	-13.59	16.24	46.00	-29.76	QP	300	99	
6	670.4893	31.99	-10.12	21.87	46.00	-24.13	QP	300	143	



Job No.: SZAWW190510004-01

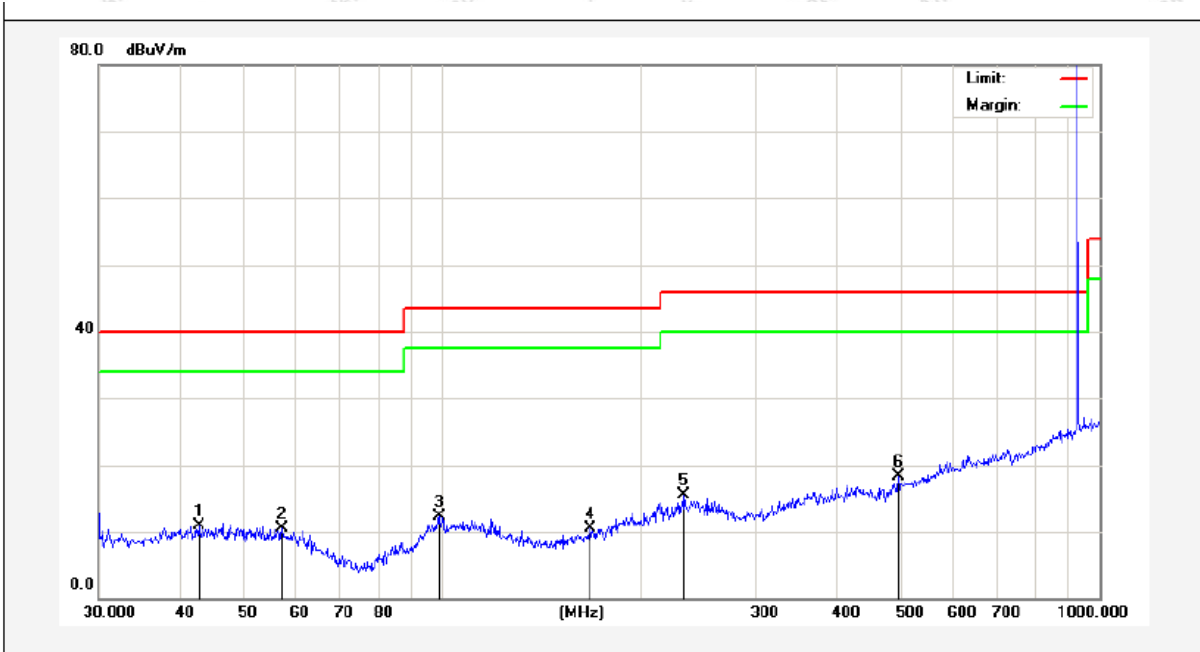
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 120V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH05)

Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	42.6000	28.55	-17.55	11.00	40.00	-29.00	QP	300	300	
2	56.9912	28.61	-18.18	10.43	40.00	-29.57	QP	300	360	
3	98.8326	35.21	-22.97	12.24	43.50	-31.26	QP	300	341	
4	167.8243	32.30	-21.79	10.51	43.50	-32.99	QP	300	143	
5	233.3487	35.09	-19.62	15.47	46.00	-30.53	QP	300	213	
6	494.1984	30.85	-12.54	18.31	46.00	-27.69	QP	300	126	

Job No.: SZAWW190510004-01

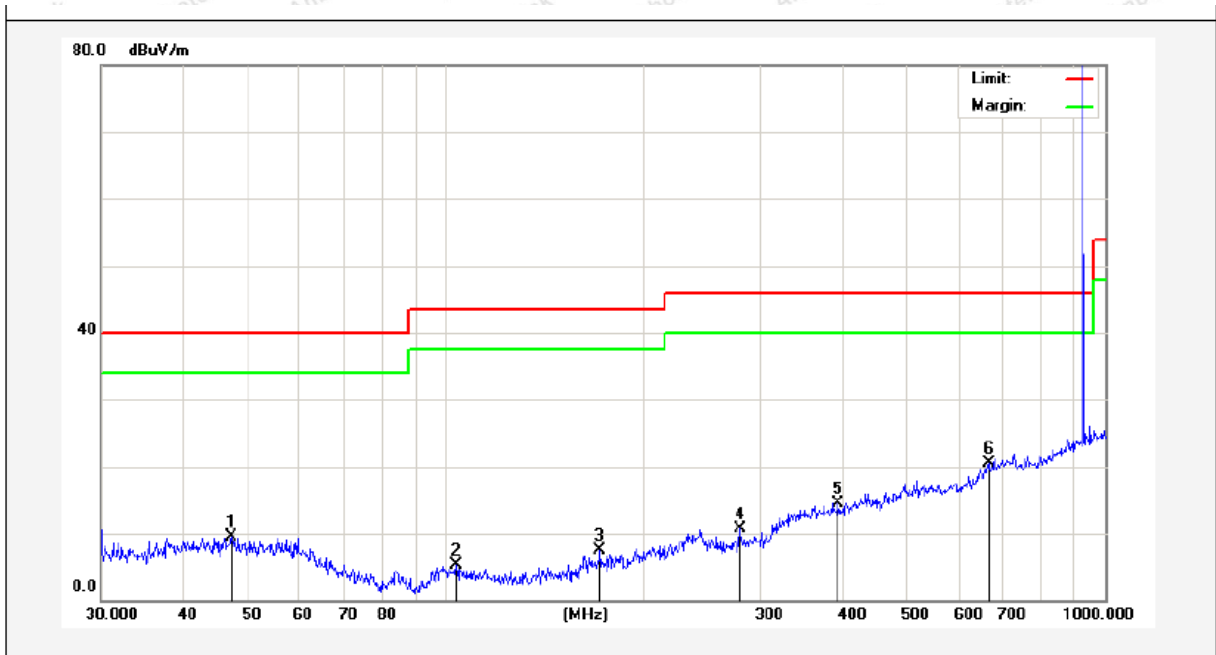
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 120V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH05)

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	47.3255	26.08	-16.64	9.44	40.00	-30.56	QP	300	165	
2	103.8055	22.16	-16.82	5.34	43.50	-38.16	QP	300	142	
3	171.3926	25.85	-18.39	7.46	43.50	-36.04	QP	300	130	
4	279.0436	26.80	-16.02	10.78	46.00	-35.22	QP	300	223	
5	393.4723	27.74	-13.25	14.49	46.00	-31.51	QP	300	237	
6	665.8035	30.10	-9.56	20.54	46.00	-25.46	QP	300	300	

Job No.: SZAWW190510004-01

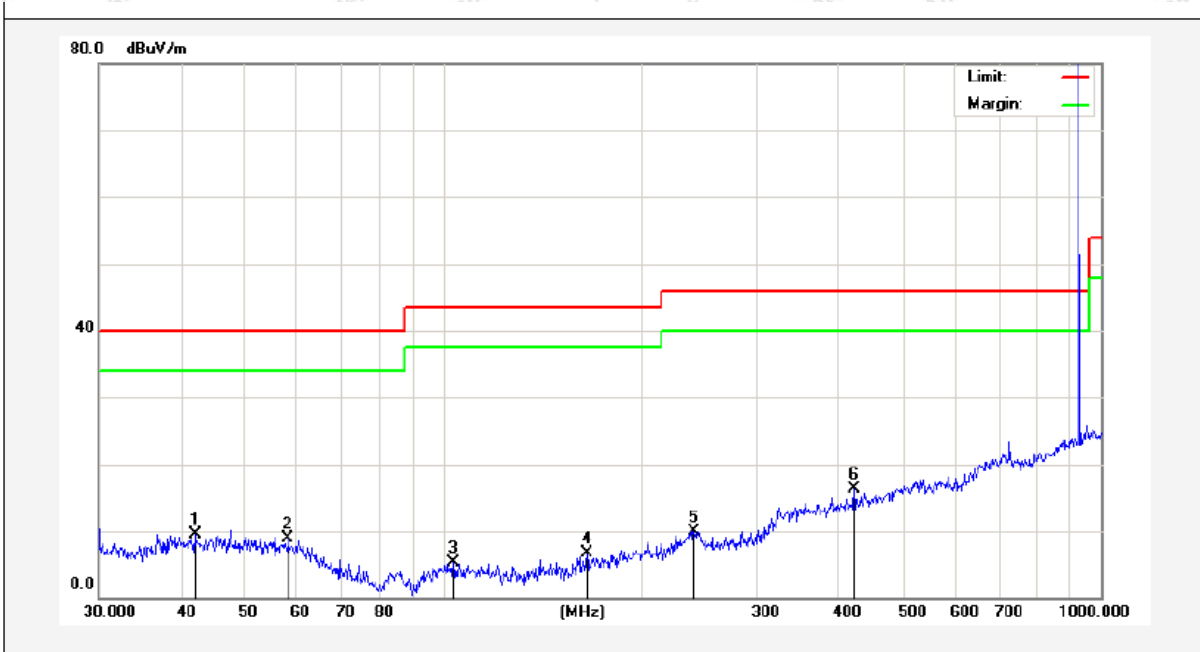
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 240V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH08)

Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	42.0066	26.14	-16.55	9.59	40.00	-30.41	QP	300	123	
2	58.2030	26.18	-17.28	8.90	40.00	-31.10	QP	300	133	
3	103.8055	22.22	-16.82	5.40	43.50	-38.10	QP	300	142	
4	165.4866	25.26	-18.65	6.61	43.50	-36.89	QP	300	196	
5	240.8304	24.89	-14.95	9.94	46.00	-36.06	QP	300	200	
6	422.0577	28.78	-12.57	16.21	46.00	-29.79	QP	300	360	

Job No.: SZAWW190510004-01

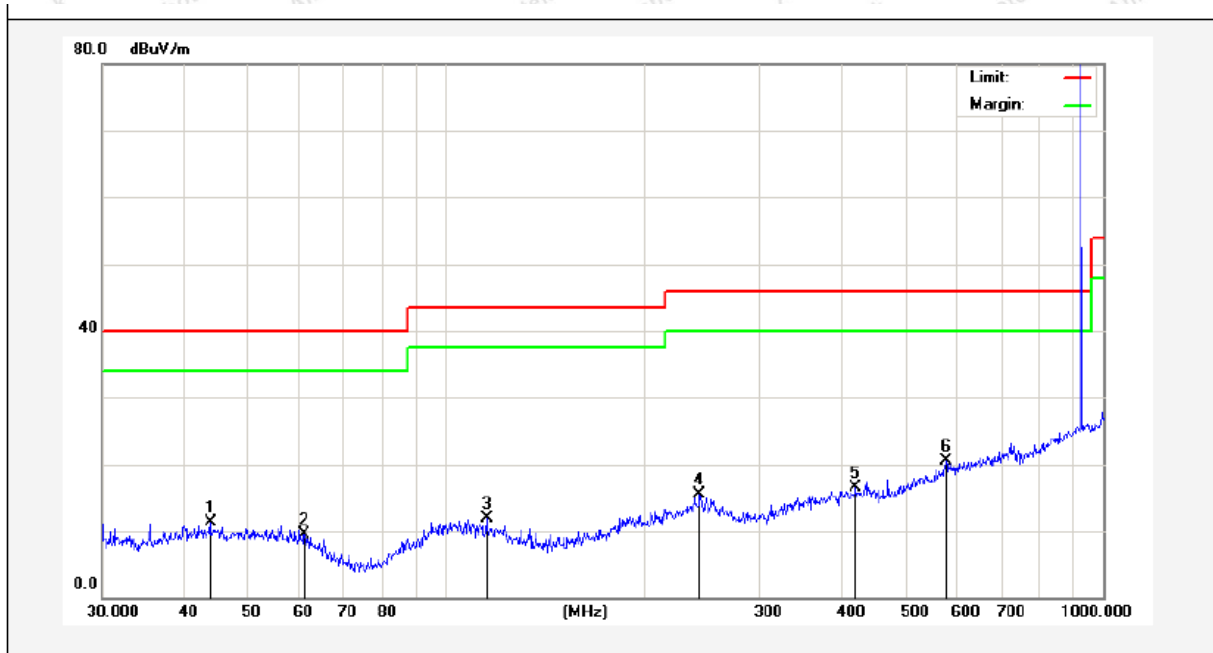
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 240V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH08)

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	43.8119	28.81	-17.54	11.27	40.00	-28.73	QP	300	243	
2	60.9176	28.28	-18.78	9.50	40.00	-30.50	QP	300	360	
3	115.3205	34.91	-23.08	11.83	43.50	-31.67	QP	300	320	
4	243.3772	34.58	-19.10	15.48	46.00	-30.52	QP	300	243	
5	420.5803	30.28	-13.68	16.60	46.00	-29.40	QP	300	293	
6	576.6443	32.73	-12.16	20.57	46.00	-25.43	QP	300	117	

Job No.: SZAWW190510004-01

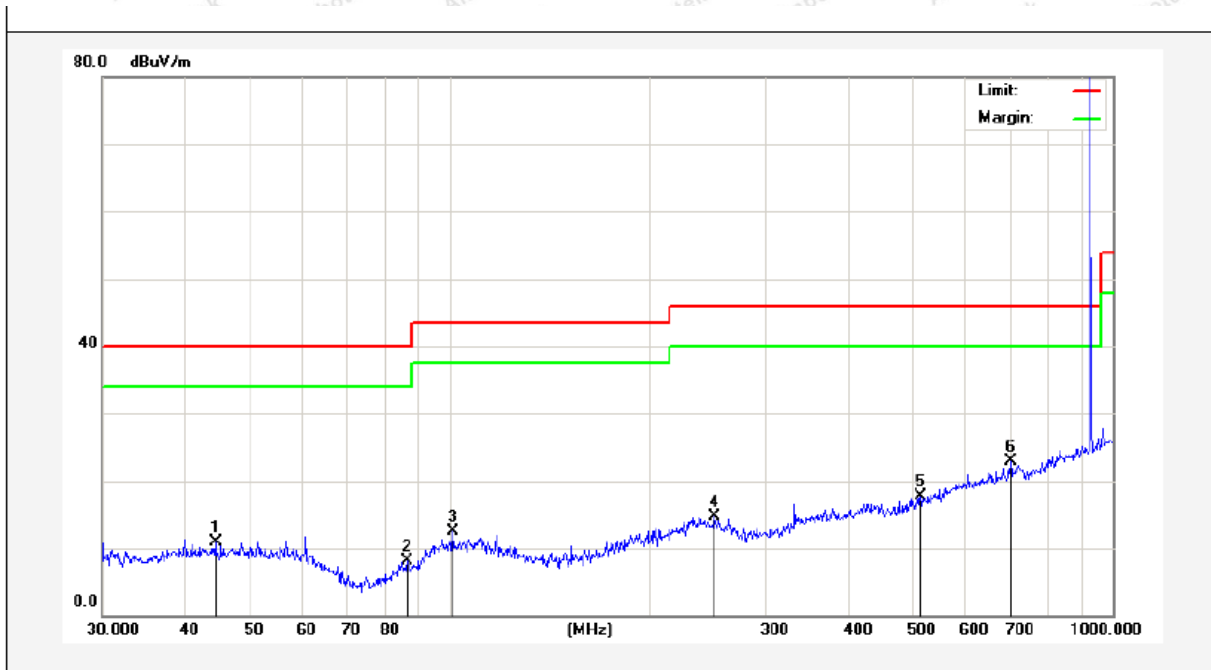
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 120V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH08)

Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	44.4308	28.43	-17.54	10.89	40.00	-29.11	QP	300	246	
2	86.5029	31.77	-23.58	8.19	40.00	-31.81	QP	300	346	
3	101.2885	35.31	-22.87	12.44	43.50	-31.06	QP	300	136	
4	251.1804	34.24	-19.45	14.79	46.00	-31.21	QP	300	242	
5	513.6331	30.12	-12.34	17.78	46.00	-28.22	QP	300	222	
6	701.7610	32.22	-9.26	22.96	46.00	-23.04	QP	300	300	

Job No.: SZAWW190510004-01

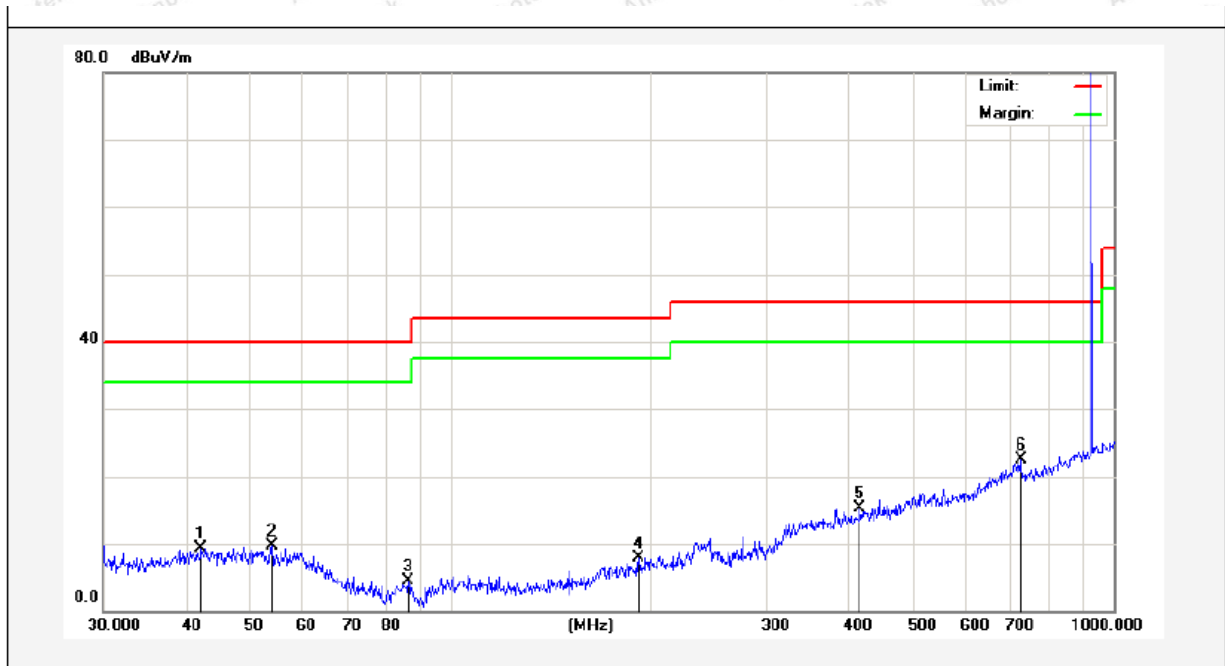
Temp.(°C)/Hum.(%RH): 23.7°C/51%RH

Standard: FCC PART 15C

Power Source: AC 120V, 60Hz for adapter

Test Mode: Keeping TX Mode(CH08)

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	42.1542	25.92	-16.55	9.37	40.00	-30.63	QP	300	356	
2	53.8818	26.75	-16.98	9.77	40.00	-30.23	QP	300	300	
3	86.5029	24.19	-19.68	4.51	40.00	-35.49	QP	300	230	
4	192.4186	24.73	-16.79	7.94	43.50	-35.56	QP	300	222	
5	414.7223	28.11	-12.73	15.38	46.00	-30.62	QP	300	163	
6	724.2611	31.09	-8.65	22.44	46.00	-23.56	QP	300	179	

**Fundamental**

**CH01**

Frequency	Antenna	Reading	Factor	Results	Limits	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	Mode
923.2	H	95.32	-3.71	91.61	94	QP
923.2	V	96.65	-3.71	92.94	94	QP

**CH05**

Frequency	Antenna	Reading	Factor	Results	Limits	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	Mode
924.0	H	94.31	-3.71	90.60	94	QP
924.0	V	95.56	-3.71	91.85	94	QP

**CH08**

Frequency	Antenna	Reading	Factor	Results	Limits	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	Mode
924.6	H	95.76	-3.71	92.05	94	QP
924.6	V	95.93	-3.71	92.22	94	QP

**Harmonics Emissions**

CH01

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Level	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
1846.4000	H	49.59	7.39	28.73	26.31	59.40	74	-14.60	PK
1846.4000	H	39.91	7.39	28.73	26.31	49.72	54	-4.28	AV
2769.6000	H	48.77	8.10	29.71	27.01	59.57	74	-14.43	PK
2769.6000	H	38.29	8.10	29.71	27.01	49.09	54	-4.91	AV
3692.8000	H	--	--	--	--	--	--	--	PK
3692.8000	H	--	--	--	--	--	--	--	AV
1846.4000	V	45.75	7.39	28.73	26.31	55.56	74	-18.44	PK
1846.4000	V	39.20	7.39	28.73	26.31	49.01	54	-4.99	AV
2769.6000	V	45.57	8.10	29.71	27.01	56.37	74	-17.63	PK
2769.6000	V	37.57	8.10	29.71	27.01	48.37	54	-5.63	AV
3692.8000	V	--	--	--	--	--	--	--	PK
3692.8000	V	--	--	--	--	--	--	--	AV

CH05

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Level	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
1849.2000	H	50.26	7.39	28.73	26.31	60.07	74	-13.93	PK
1849.2000	H	40.41	7.39	28.73	26.31	50.22	54	-3.78	AV
2773.8000	H	47.88	8.10	29.71	27.01	58.68	74	-15.32	PK
2773.8000	H	37.91	8.10	29.71	27.01	48.71	54	-5.29	AV
3698.4000	H	--	--	--	--	--	--	--	PK
3698.4000	H	--	--	--	--	--	--	--	AV
1849.2000	V	45.18	7.39	28.73	26.31	54.99	74	-19.01	PK
1849.2000	V	38.42	7.39	28.73	26.31	48.23	54	-5.77	AV
2773.8000	V	46.35	8.10	29.71	27.01	57.15	74	-16.85	PK
2773.8000	V	38.32	8.10	29.71	27.01	49.12	54	-4.88	AV
3698.4000	V	--	--	--	--	--	--	--	PK
3698.4000	V	--	--	--	--	--	--	--	AV



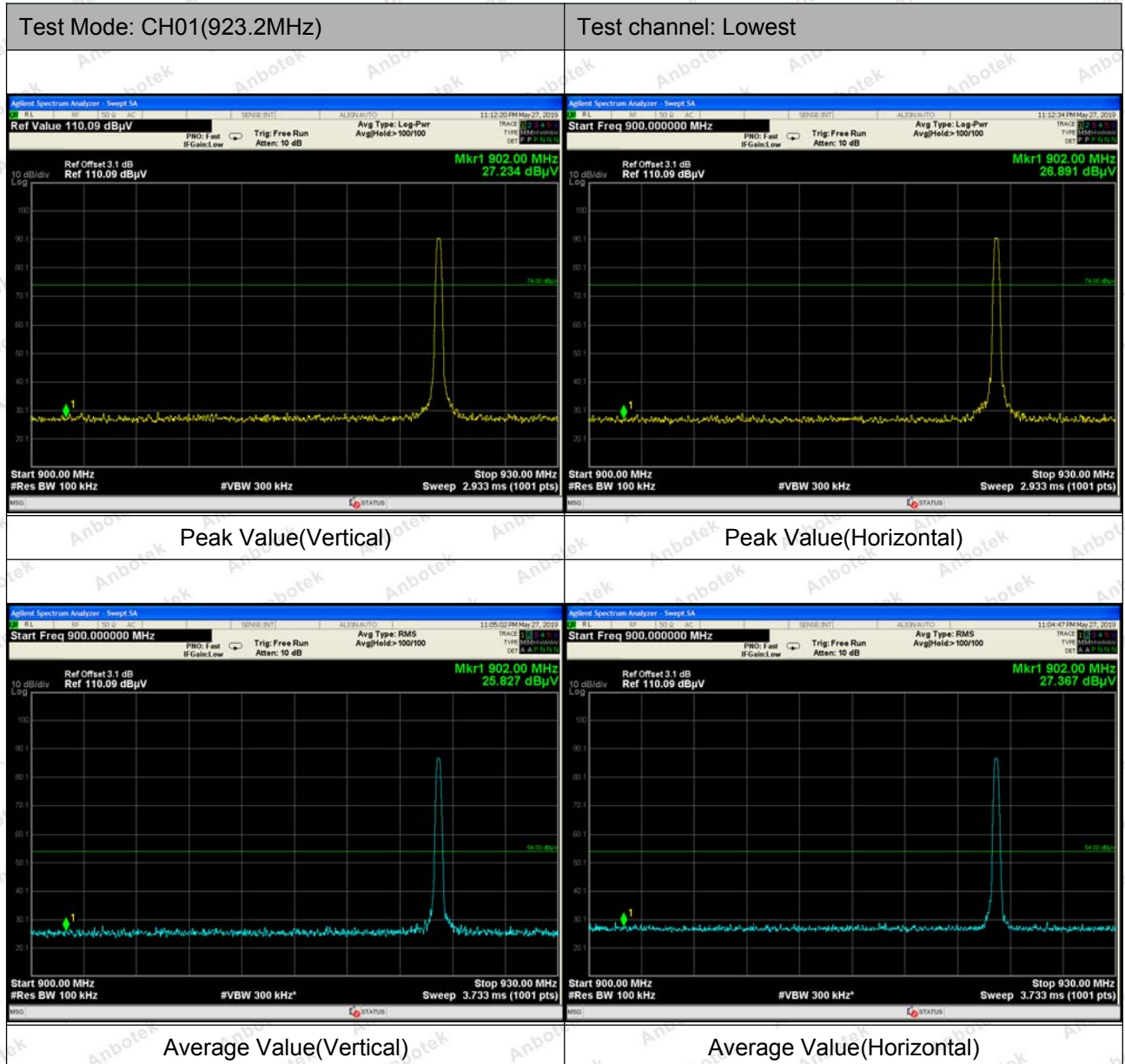
CH08

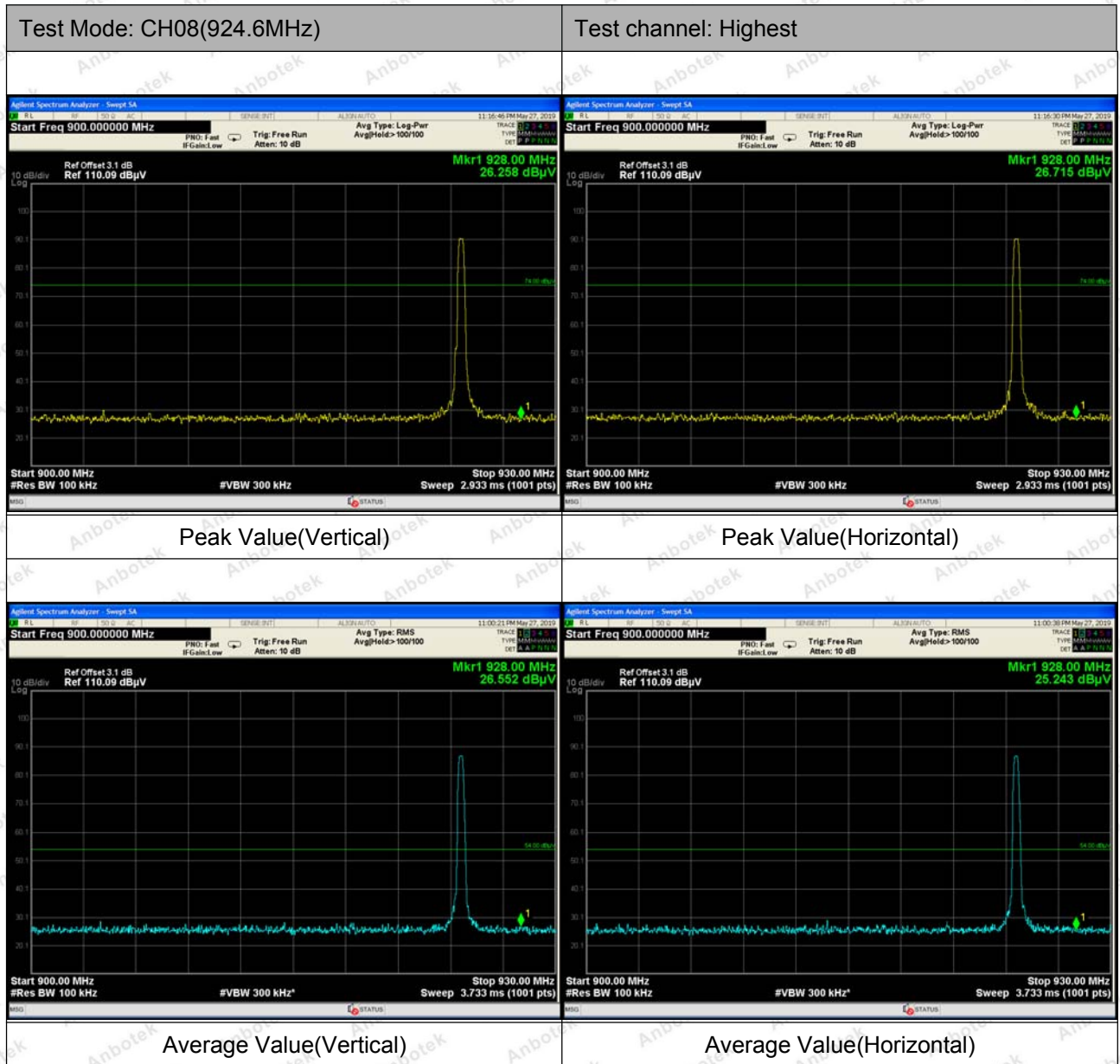
Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Level	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
1848.0000	H	50.55	7.39	28.73	26.31	60.36	74	-13.64	PK
1848.0000	H	39.20	7.39	28.73	26.31	49.01	54	-4.99	AV
2772.0000	H	48.61	8.10	29.71	27.01	59.41	74	-14.59	PK
2772.0000	H	38.39	8.10	29.71	27.01	49.19	54	-4.81	AV
3696.0000	H	--	--	--	--	--	--	--	PK
3696.0000	H	--	--	--	--	--	--	--	AV
1848.0000	V	46.10	7.39	28.73	26.31	55.91	74	-18.09	PK
1848.0000	V	39.21	7.39	28.73	26.31	49.02	54	-4.98	AV
2772.0000	V	45.78	8.10	29.71	27.01	56.58	74	-17.42	PK
2772.0000	V	37.99	8.10	29.71	27.01	48.79	54	-5.21	AV
3696.0000	V	--	--	--	--	--	--	--	PK
3696.0000	V	--	--	--	--	--	--	--	AV

Remark:

1. Level = Reading + Cable Loss+Ant Factor-Amplifier
2. "--" Mark indicated Background Noise Level

**Radiated Band Edge:**



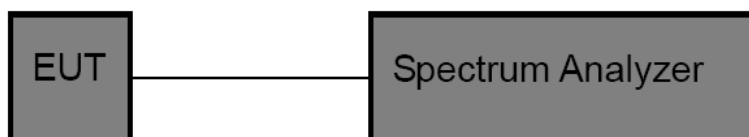


## 5. 20dB Bandwidth Test

### 5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.249
---------------	-----------------------------

### 5.2. Test Setup



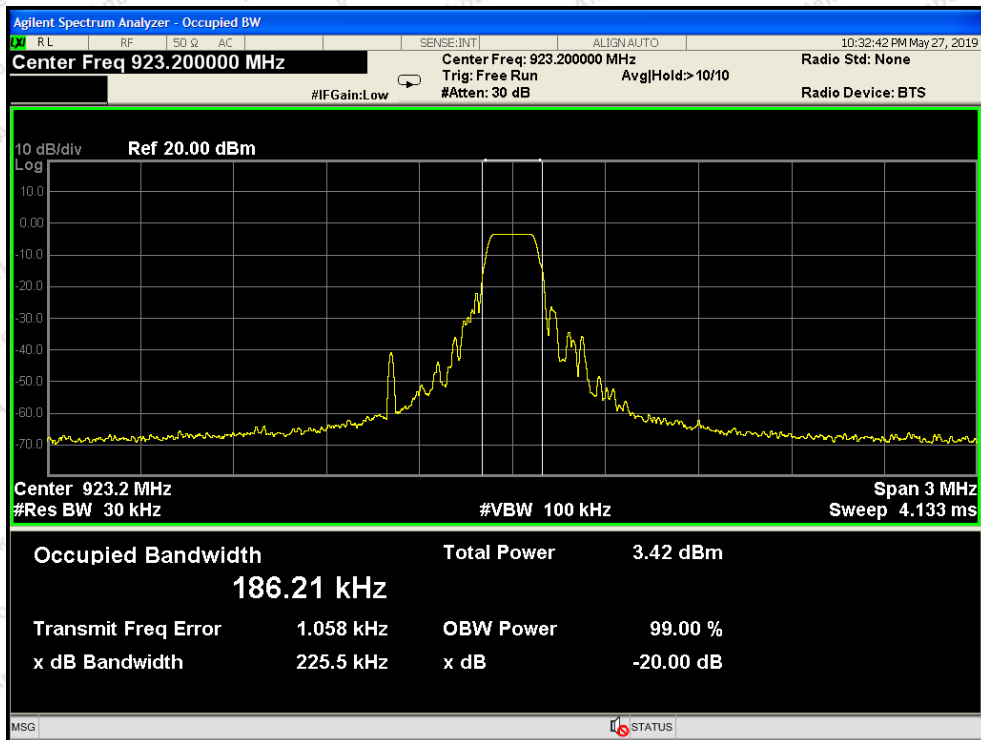
### 5.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:  
 RBW = 30kHz, VBW ≥ 3 \* RBW = 100kHz,  
 Detector = peak  
 Trace mode = Max hold.  
 Sweep = auto couple.
4. Mark the peak frequency and -20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

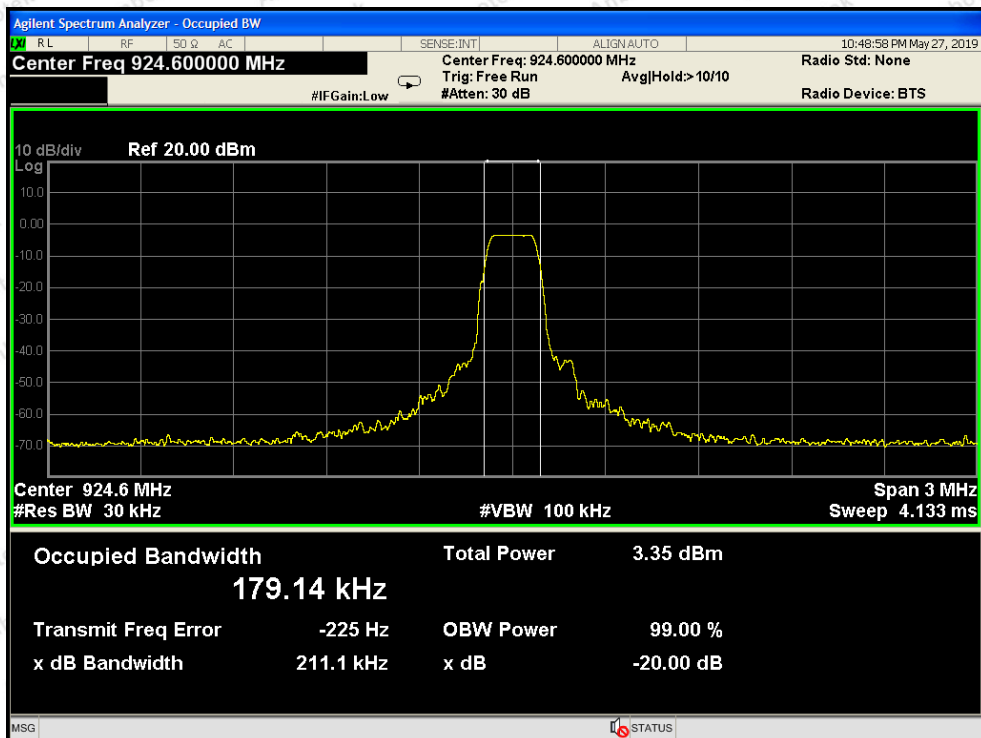
### 5.4. Test Data

Test Item	: 20dB Bandwidth	Test Mode	: TX Mode
Test Voltage	: AC 120V, 60Hz for adapter	Temperature	: 24°C
Test Result	: PASS	Humidity	: 55%RH

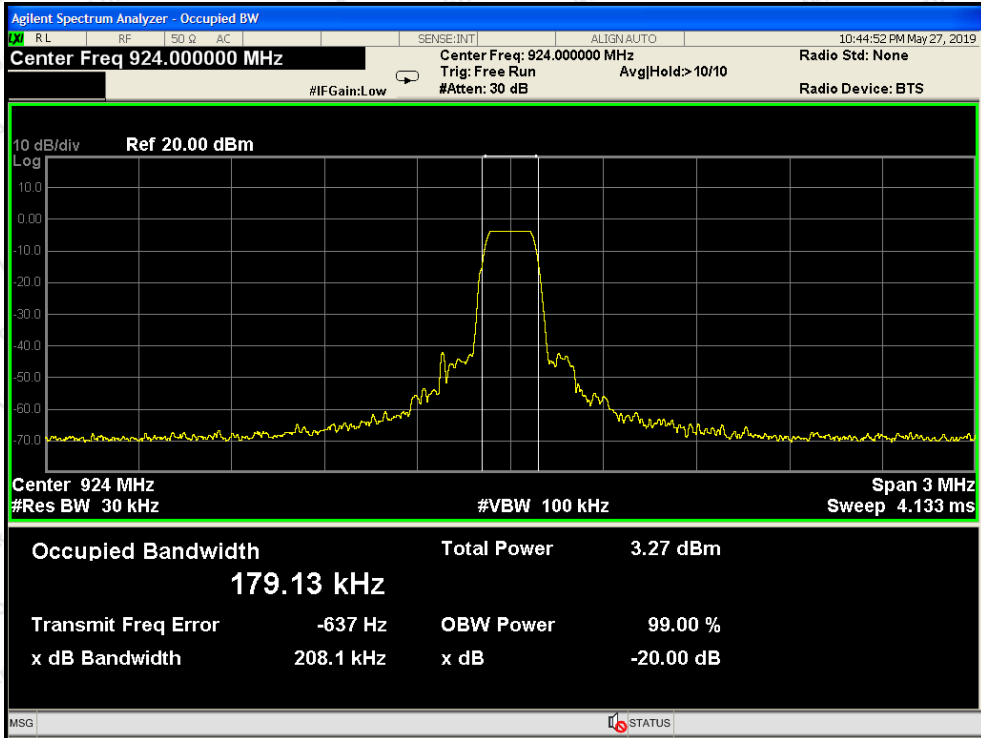
Frequency (MHz)	Bandwidth (kHz)	Result
923.2	225.5	PASS
924.0	211.1	PASS
924.6	208.1	PASS



Test Mode: CH01



Test Mode: CH05



Test Mode: CH08

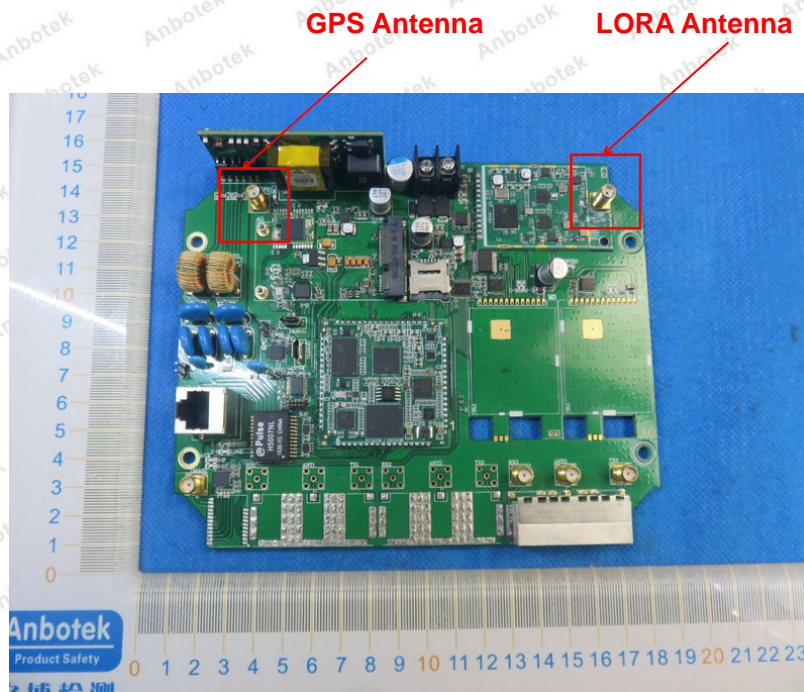
## 6. Antenna Requirement

### 6.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
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.

### 6.2. Antenna Connected Construction

The antenna is a fibre-glass epoxy Antenna which permanently attached, and the best case gain of the antenna is 1 dBi. It complies with the standard requirement.



## APPENDIX I -- TEST SETUP PHOTOGRAPH

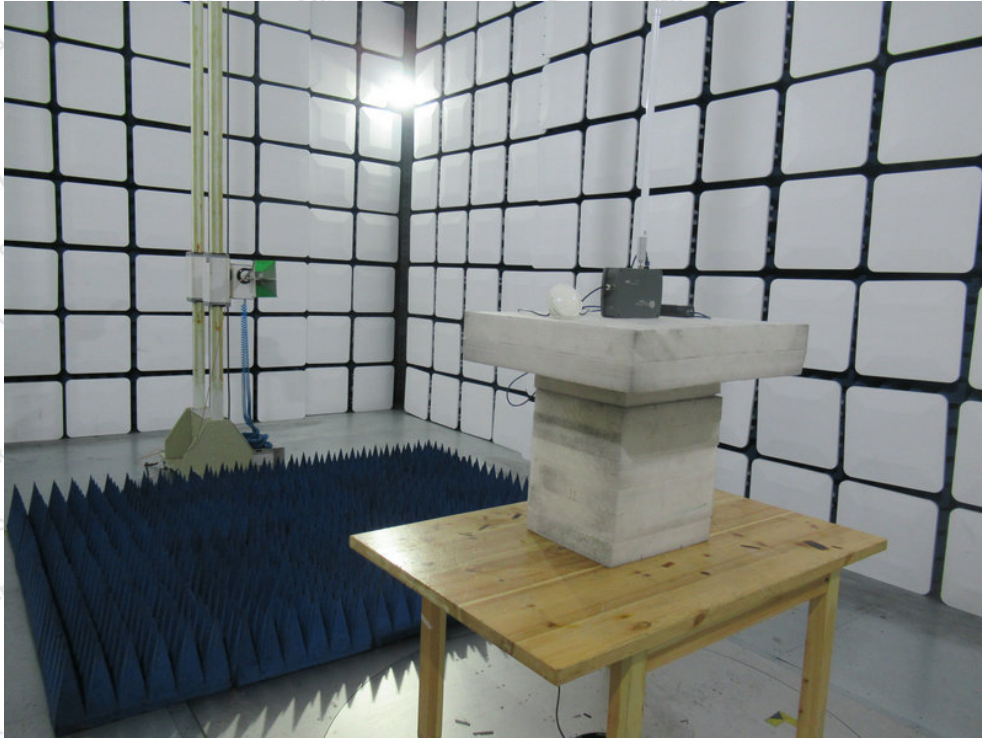
Photo of Power Line Conducted Emission Test



Photo of Radiation Emission Test



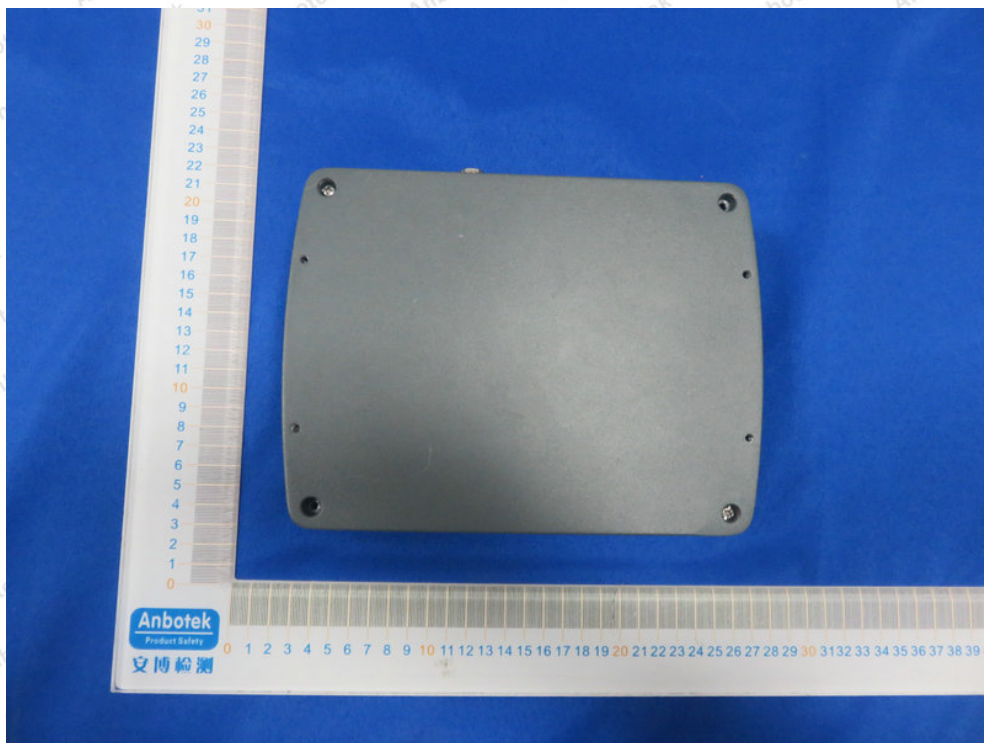
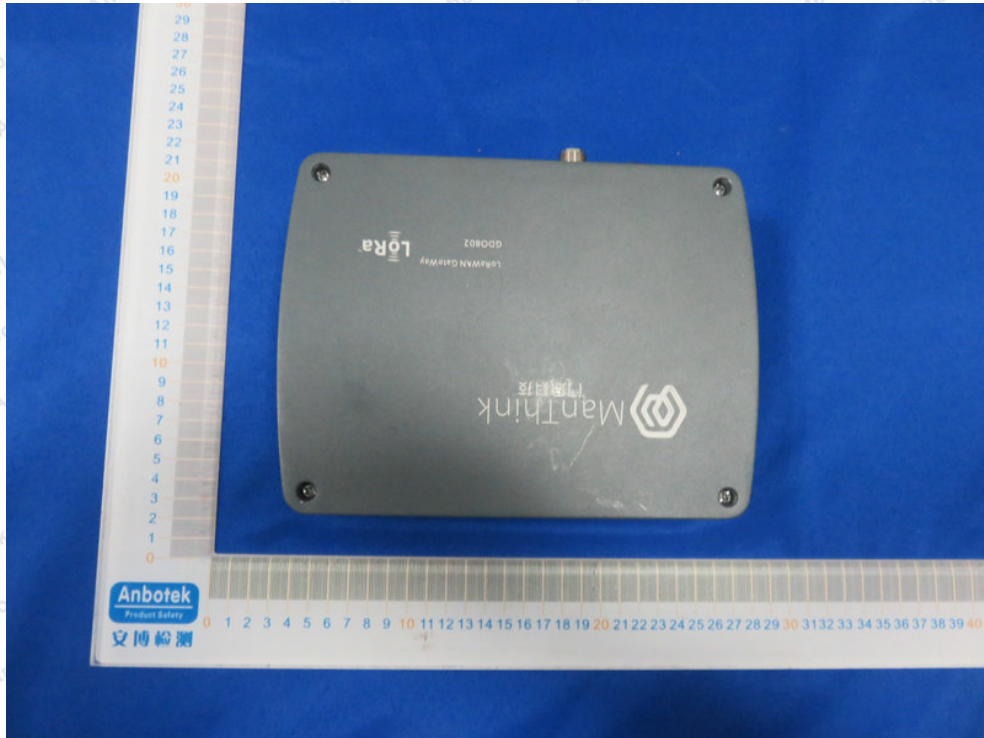


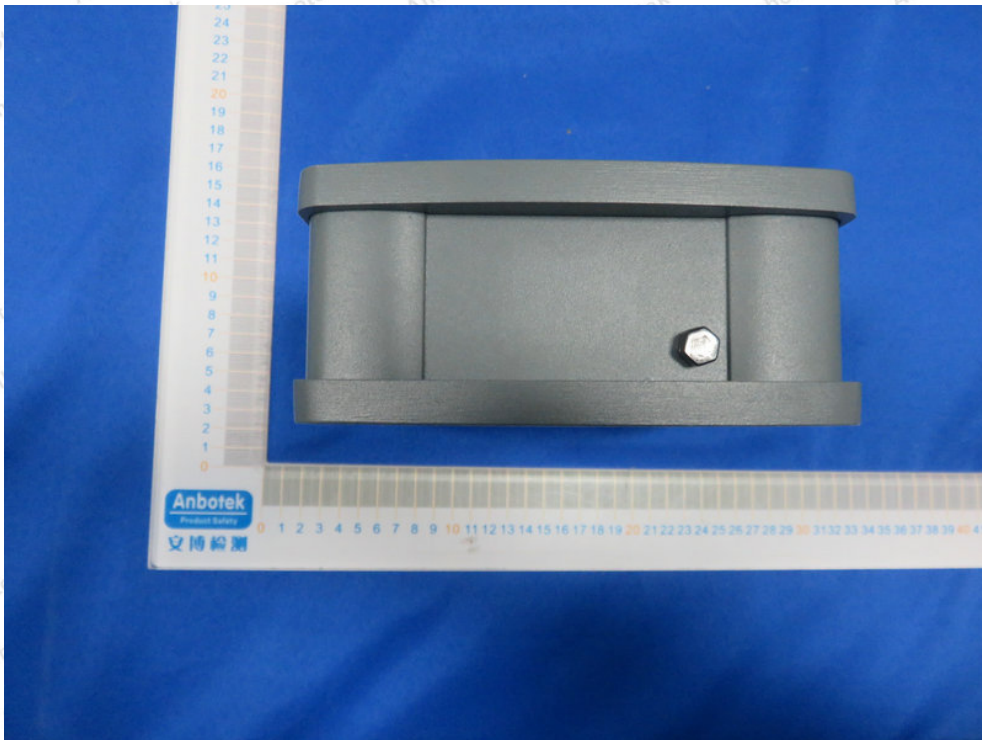
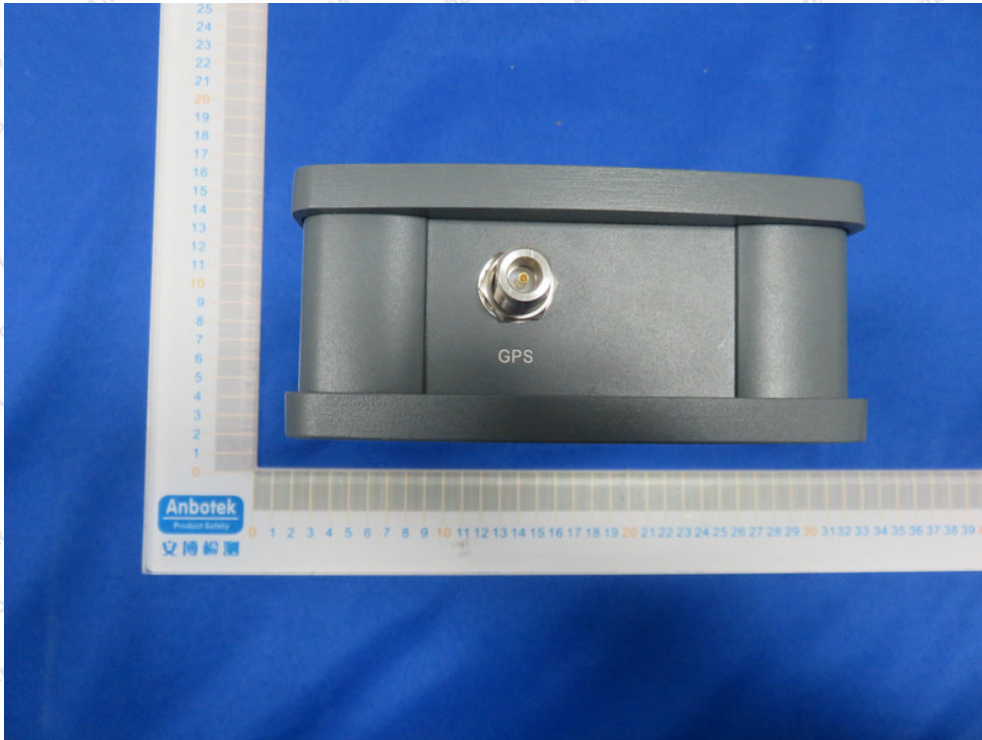


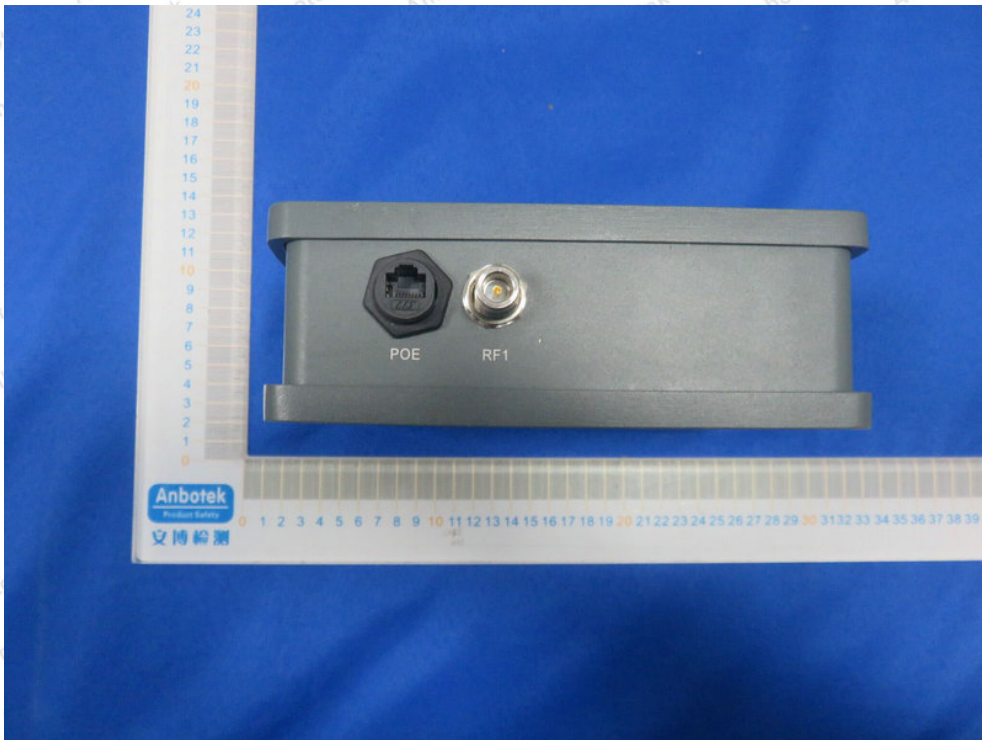
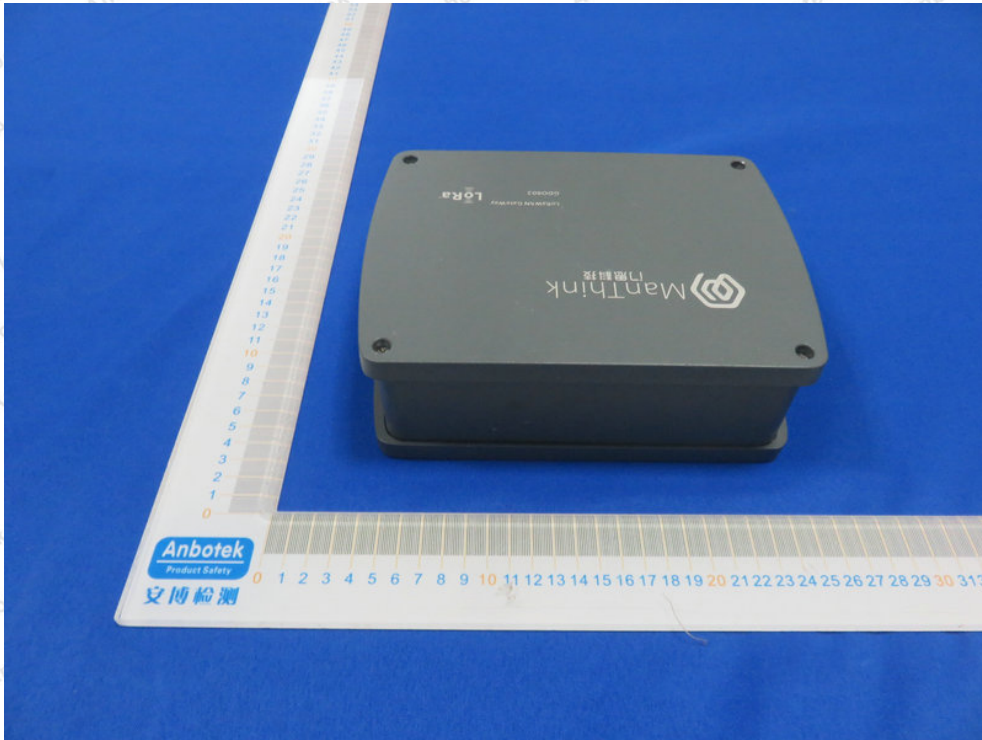
## APPENDIX II -- EXTERNAL PHOTOGRAPH



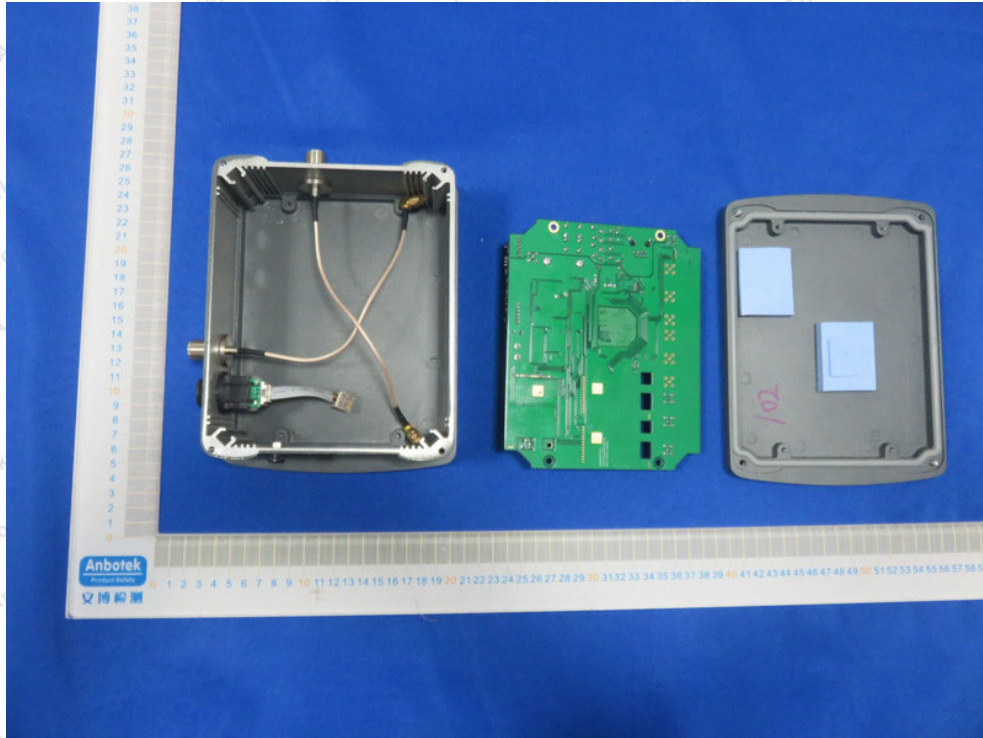


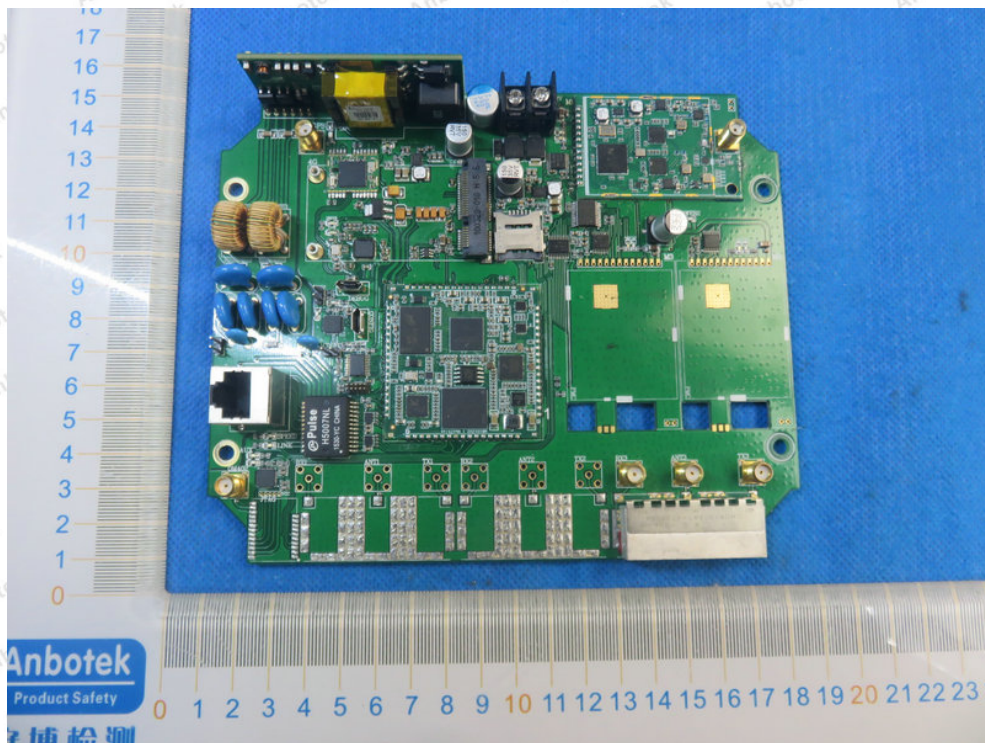
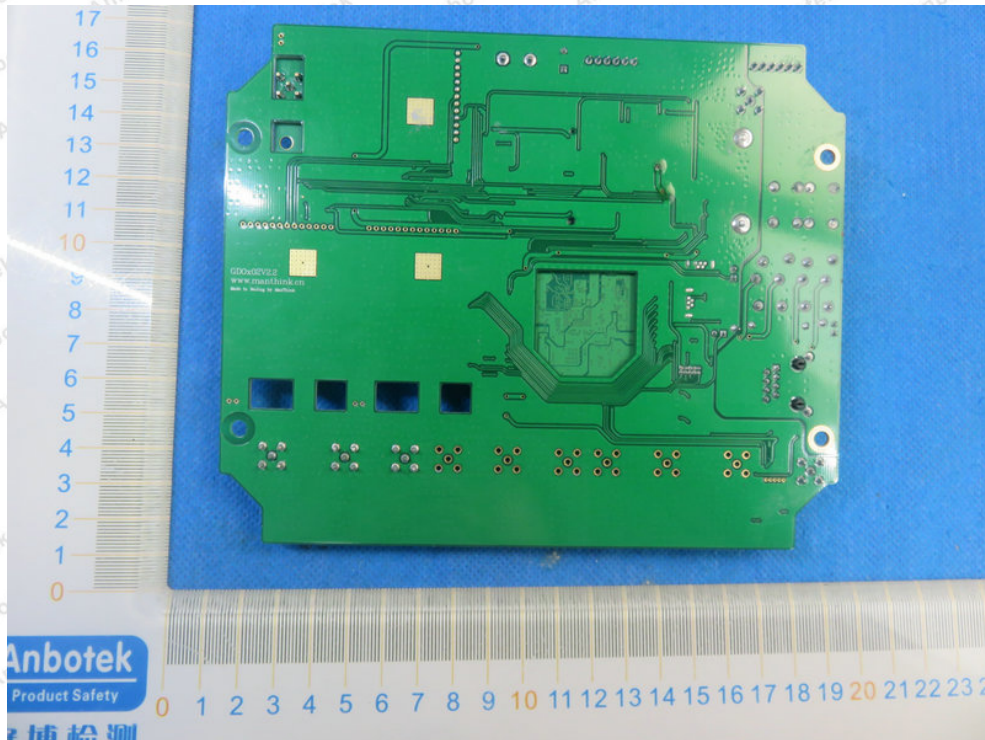




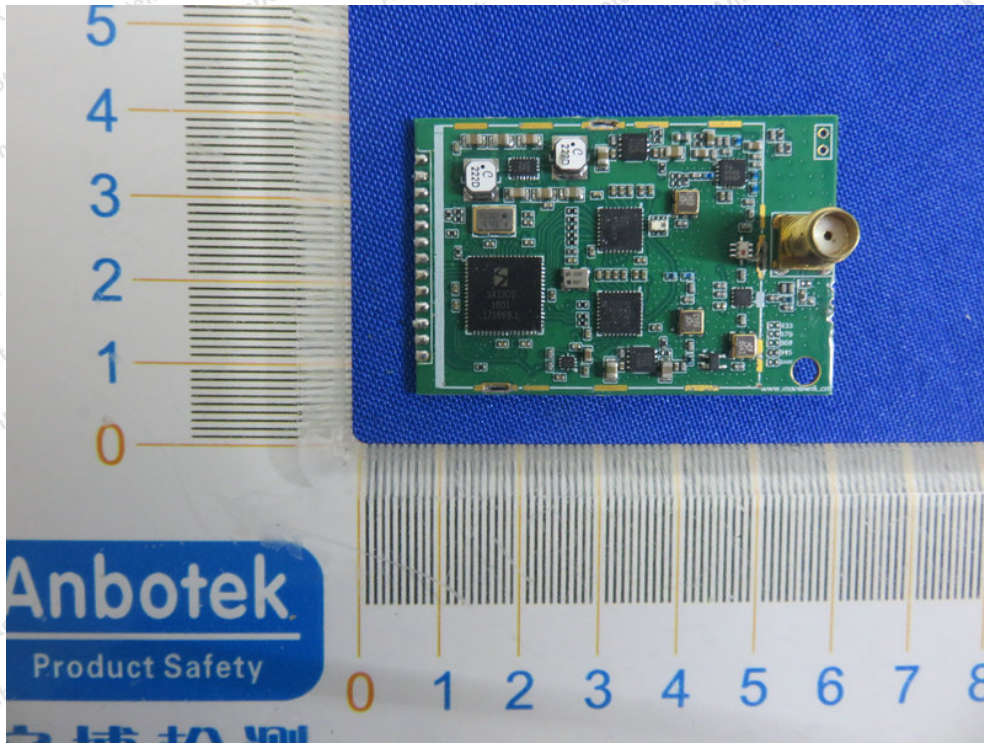
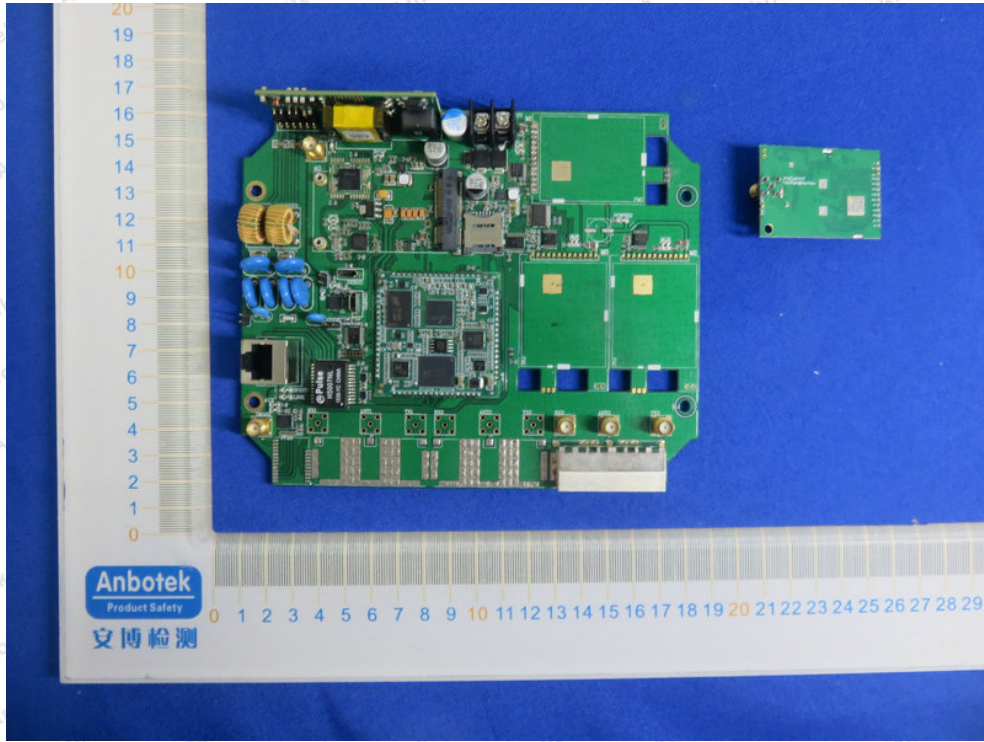


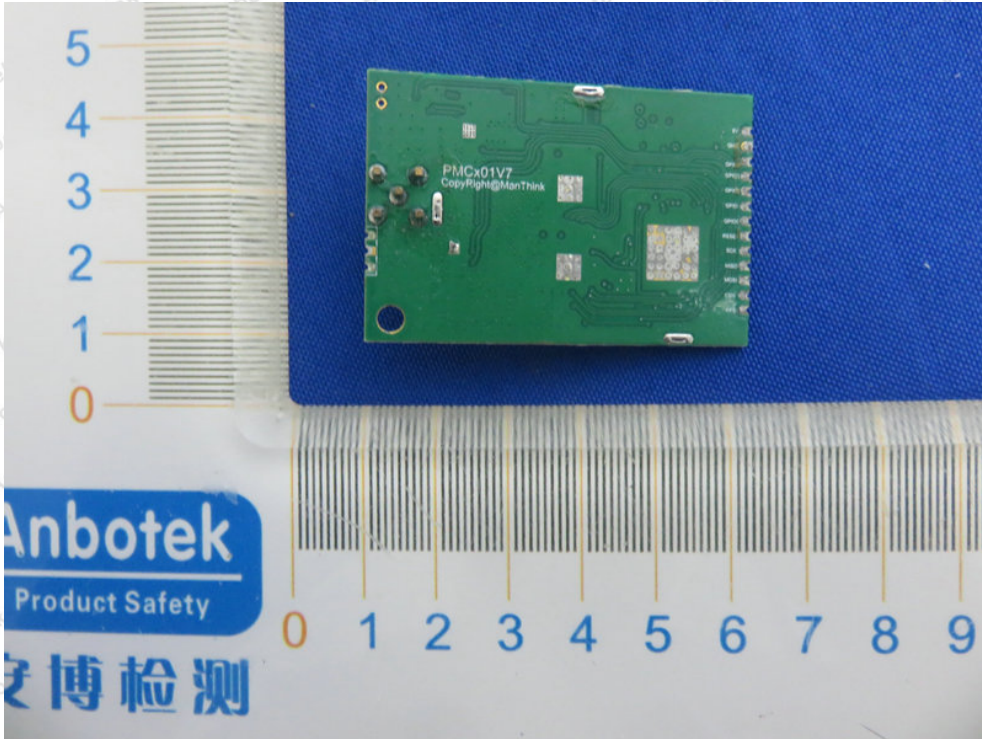
### APPENDIX III -- INTERNAL PHOTOGRAPH











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