

FCC TEST REPORT

For

VTIN TECHNOLOGY Co., Limited

Car Bluetooth FM Transmitter

Model No.: BH163A

Prepared For : VTIN TECHNOLOGY Co., Limited
Address : ROOM 603, 6/F, HANG PONT COMMERCIAL BUILDING, 31
TONKIN STREET, CHEUNG SHA WAN, KOWLOON

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
Address : 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan
District, Shenzhen, Guangdong, China
Tel: (86) 755-26066544 Fax: (86) 755-26014772

Report Number : R0217100032W2
Date of Test : Oct. 17~30, 2017
Date of Report : Oct. 30, 2017

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.....	7
1.7. Test Equipment List.....	8
1.8. Measurement Uncertainty.....	9
1.9. Description of Test Facility.....	9
2. Summary of Test Results.....	10
3. Conducted Emission Test.....	11
3.1. Test Standard and Limit.....	11
3.2. Test Setup.....	11
3.3. Test Procedure.....	11
3.4. Test Data.....	11
4. Radiation Spurious Emission and Band Edge.....	12
4.1. Test Standard and Limit.....	12
4.2. Test Setup.....	13
4.3. Test Procedure.....	14
4.4. Test Data.....	14
5. 20DB Occupy Bandwidth Test.....	22
5.1. Test Standard and Limit.....	22
5.2. Test Setup.....	22
5.3. Test Procedure.....	22
5.4. Test Data.....	22
6. Antenna Requirement.....	26
6.1. Test Standard and Requirement.....	26
6.2. Antenna Connected Construction.....	26
APPENDIX I -- TEST SETUP PHOTOGRAPH.....	27
APPENDIX II -- EXTERNAL PHOTOGRAPH.....	28
APPENDIX III -- INTERNAL PHOTOGRAPH.....	29

TEST REPORT

Applicant : VTIN TECHNOLOGY Co., Limited
Manufacturer : VTIN TECHNOLOGY Co., Limited
Product Name : Car Bluetooth FM Transmitter
Model No. : BH163A
Trade Mark : VTIN
Rating(s) : Input: DC 12V-24V, Output: DC 5V 2.1A

Test Standard(s) : FCC Part15 Subpart C 2016, Section 15.239

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 Test : Oct. 17~30, 2017

Prepared by :



Winkey Wang

(Tested Engineer / Winkey Wang)

Reviewer :

Tangcy. T.

(Project Manager / Tangcy. T)

Approved & Authorized Signer :

Tom Chen

(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	VTIN TECHNOLOGY Co., Limited
Address	:	ROOM 603, 6/F, HANG PONT COMMERCIAL BUILDING, 31 TONKIN STREET, CHEUNG SHA WAN, KOWLOON
Manufacturer	:	VTIN TECHNOLOGY Co., Limited
Address	:	ROOM 603, 6/F, HANG PONT COMMERCIAL BUILDING, 31 TONKIN STREET, CHEUNG SHA WAN, KOWLOON

1.2. Description of Device (EUT)

Product Name	:	Car Bluetooth FM Transmitter	
Model No.	:	BH163A	
Trade Mark	:	VTIN	
Test Power Supply	:	DC 12V / DC 24V	
Product Description	:	Operation Frequency:	88.1-107.9MHz
		Number of Channel:	199 Channels
		Modulation Type:	FM
		Antenna Type:	PCB antenna.
		Antenna Gain(Peak):	0.5 dbi
Remark: 1) For a more detailed features description, please refer to the manufacturer’s specifications or the User’s Manual. 2) This report is for FM module.			

1.3. Auxiliary Equipment Used During Test

N/A	
-----	--

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	88.1MHz
Mode 2	98.1MHz
Mode 3	107.9MHz

For Radiated Emission	
Final Test Mode	Description
Mode 1	88.1MHz
Mode 2	98.1MHz
Mode 3	107.9MHz

Note:

1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. EUT built-in battery-powered, fully-charged battery use of the test battery.

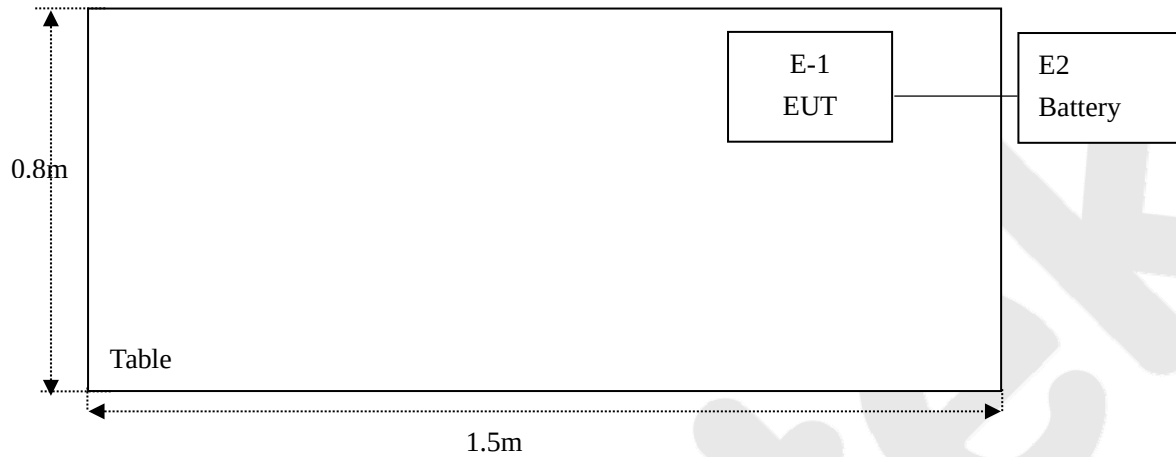
1.5. List of channels

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	88.10	51	93.10	101	98.10	151	103.10
2	88.20	52	93.20	102	98.20	152	103.20
3	88.30	53	93.30	103	98.30	153	103.30
4	88.40	54	93.40	104	98.40	154	103.40
5	88.50	55	93.50	105	98.50	155	103.50
6	88.60	56	93.60	106	98.60	156	103.60
7	88.70	57	93.70	107	98.70	157	103.70
8	88.80	58	93.80	108	98.80	158	103.80
9	88.90	59	93.90	109	98.90	159	103.90
10	89.00	60	94.00	110	99.00	160	104.00
11	89.10	61	94.10	111	99.10	161	104.10
12	89.20	62	94.20	112	99.20	162	104.20
13	89.30	63	94.30	113	99.30	163	104.30

14	89.40	64	94.40	114	99.40	164	104.40
15	89.50	65	94.50	115	99.50	165	104.50
16	89.60	66	94.60	116	99.60	166	104.60
17	89.70	67	94.70	117	99.70	167	104.70
18	89.80	68	94.80	118	99.80	168	104.80
19	89.90	69	94.90	119	99.90	169	104.90
20	90.00	70	95.00	120	100.00	170	105.00
21	90.10	71	95.10	121	100.10	171	105.10
22	90.20	72	95.20	122	100.20	172	105.20
23	90.30	73	95.30	123	100.30	173	105.30
24	90.40	74	95.40	124	100.40	174	105.40
25	90.50	75	95.50	125	100.50	175	105.50
26	90.60	76	95.60	126	100.60	176	105.60
27	90.70	77	95.70	127	100.70	177	105.70
28	90.80	78	95.80	128	100.80	178	105.80
29	90.90	79	95.90	129	100.90	179	105.90
30	91.00	80	96.00	130	101.00	180	106.00
31	91.10	81	96.10	131	101.10	181	106.10
32	91.20	82	96.20	132	101.20	182	106.20
33	91.30	83	96.30	133	101.30	183	106.30
34	91.40	84	96.40	134	101.40	184	106.40
35	91.50	85	96.50	135	101.50	185	106.50
36	91.60	86	96.60	136	101.60	186	106.60
37	91.70	87	96.70	137	101.70	187	106.70
38	91.80	88	96.80	138	101.80	188	106.80
39	91.90	89	96.90	139	101.90	189	106.90
40	92.00	90	97.00	140	102.00	190	107.00
41	92.10	91	97.10	141	102.10	191	107.10
42	92.20	92	97.20	142	102.20	192	107.20
43	92.30	93	97.30	143	102.30	193	107.30
44	92.40	94	97.40	144	102.40	194	107.40
45	92.50	95	97.50	145	102.50	195	107.50
46	92.60	96	97.60	146	102.60	196	107.60
47	92.70	97	97.70	147	102.70	197	107.70
48	92.80	98	97.80	148	102.80	198	107.80
49	92.90	99	97.90	149	102.90	199	107.90
50	93.00	100	98.00	150	103.00		

1.6. Description Of Test Setup

RE



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	May 27, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	May 27, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 27, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	May 27, 2017	1 Year
5.	Spectrum Analysis	Agilent	N9038A	MY53227295	May 27, 2017	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	May 27, 2017	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	May 27, 2017	1 Year
8.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	May 31, 2017	1 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 31, 2017	1 Year
10.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Apr. 03, 2017	1 Year
11.	Horn Antenna	Schwarzbeck	BBHA9170	9170-375	May 27, 2017	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	May 27, 2017	1 Year
13.	Pre-amplifier	SKET Electronic	BK1G40G50 A	KD25352	May 27, 2017	1 Year
14.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
15.	Power Sensor	DAER	RPR3006W	15I00041SN045	May 27, 2017	1 Year
16.	Power Sensor	DAER	RPR3006W	15I00041SN046	May 27, 2017	1 Year
17.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	May 27, 2017	1 Year
18.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	May 27, 2017	1 Year
19.	Signal Generator	Agilent	E4421B	MY41000743	May 27, 2017	1 Year
20.	DC Power supply	IVYTECH	IV6003	1601D6030007	May 26, 2017	1 Year
21.	TEMP&HUMI PROGRAMMABLE CHAMBER	Sertep	ZJ-HWHS80 B	ZJ-17042804	Mar. 03, 2017	1 Year

1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal)
		Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB

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

All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

2. Summary of Test Results

Standard Section	Test Item	Result
15.203	Antenna Requirement	PASS
15.207	Conducted Emission	N/A
15.205/15.209/15.239	Spurious Emission	PASS
15.205	Band Edge Emission	PASS
15.215(c)	Occupied Bandwidth	PASS
Remark: “N/A” is an abbreviation for Not Applicable.		

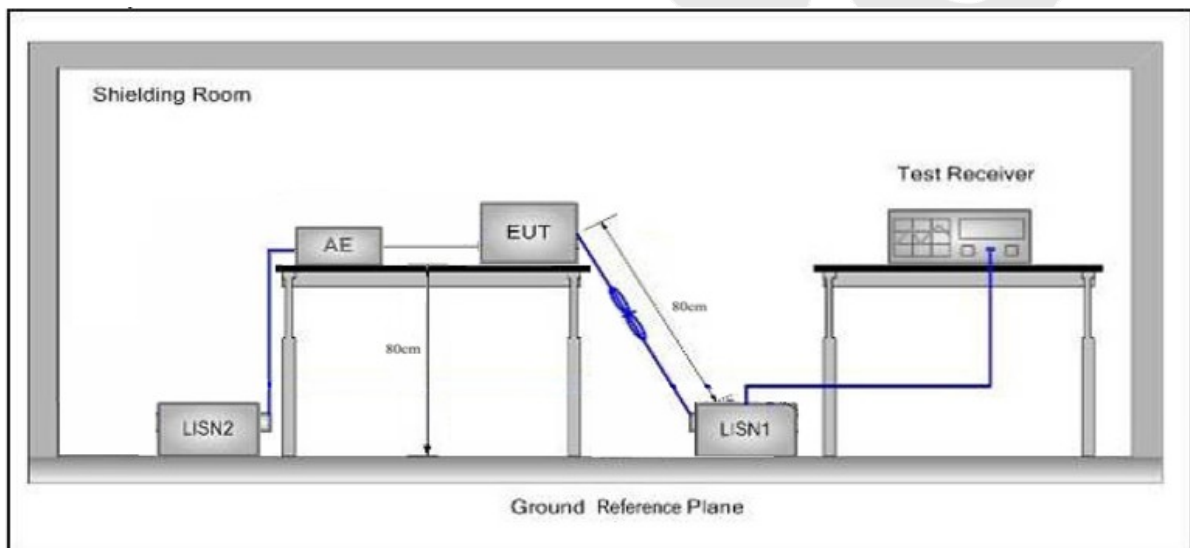
3. Conducted Emission Test

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

Remark: (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

N/A

The EUT is powered by car's power DC 12V / DC 24V, So not applicable.

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209, 15.205 and 15.239(a)				
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.					

According to §15.239(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

$$\text{Emission Level (dBuV/m)} = 20 \log \text{Emission Level (uV/m)}$$

The field strength of emission limits have been calculated in below table:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m)@3m
88.1-107.9	48 (AVG)
	68 (Peak)

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. FCC part15.239(b) The field strength of any emissions within the permitted 200 KHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

4.2. Test Setup

Figure 1. Below 30MHz

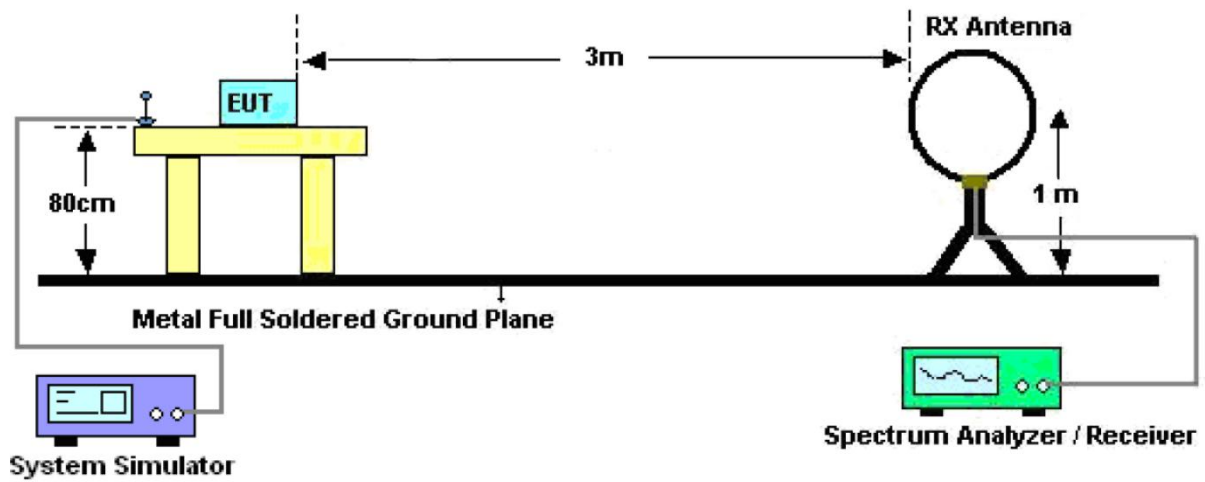


Figure 2. 30MHz to 1GHz

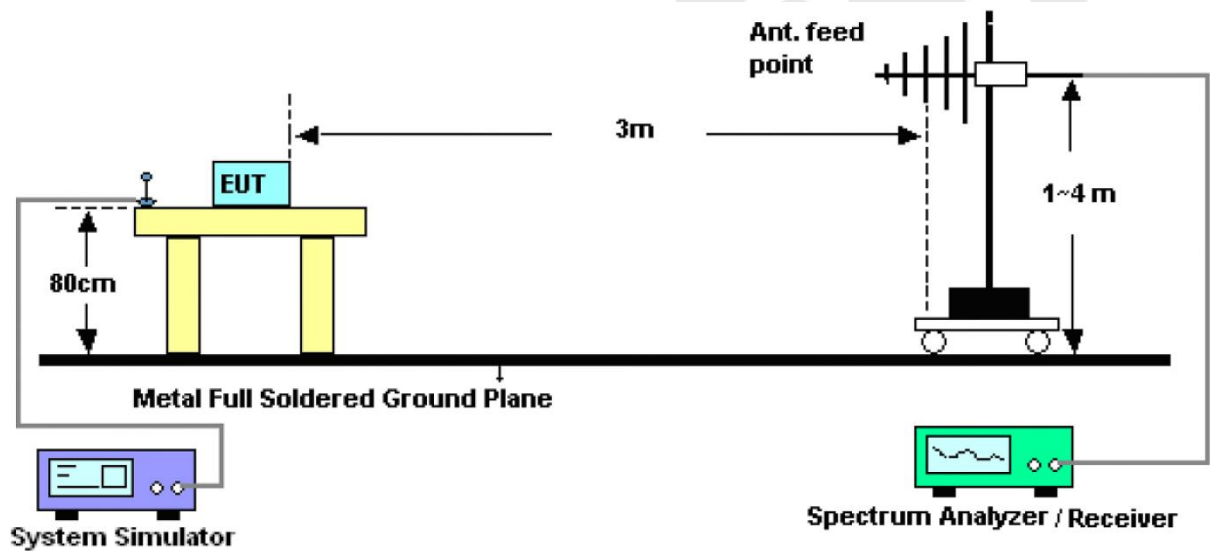
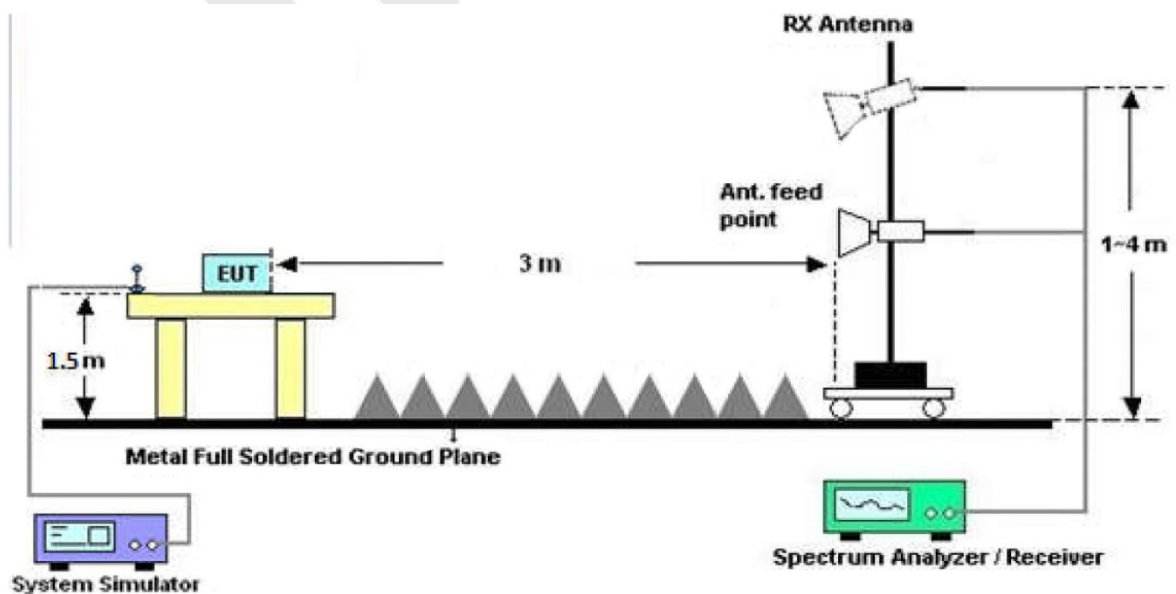


Figure 3. Above 1 GHz



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 = 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.

4.4. Test Data

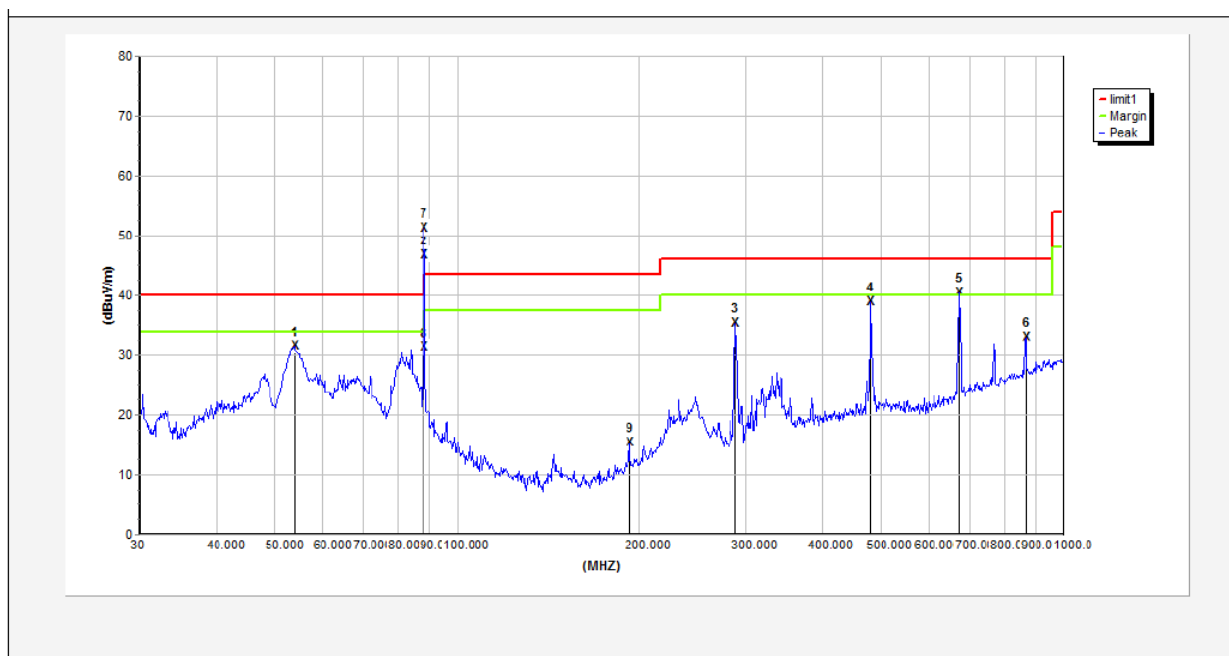
PASS

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)

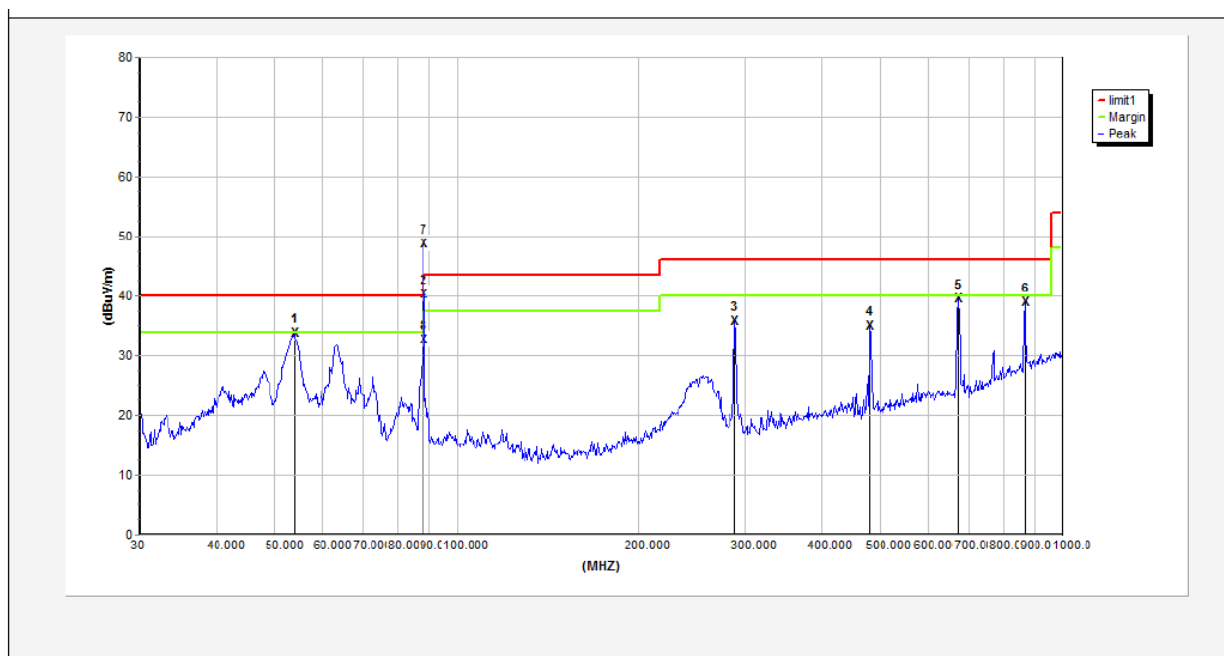
Job No.: 0217100032W Temp.(°C)/Hum.(%RH): 24.3°C/55%RH
Standard: FCC PART 15C Power Source: DC 12V
Test Mode: Mode 1 Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	53.8818	46.30	-14.85	31.45	40.00	-8.55	QP	300	24	
2	88.0329	68.63	-21.88	40.75	43.50	-3.25	QP	300	95	
3	287.9904	53.36	-18.01	35.35	46.00	-10.65	QP	300	141	
4	480.5276	50.31	-11.53	38.78	46.00	-7.22	QP	300	169	
5	672.8444	49.67	-9.22	40.45	46.00	-5.55	QP	300	201	
6	866.0879	38.29	-5.34	32.95	46.00	-13.05	QP	300	241	
7	88.1000	68.94	-21.88	46.75	68.00	-21.25	PK	300	180	
8	88.1000	48.96	-21.88	27.94	48.00	-20.06	AV	300	180	

Test Results (30~1000MHz)

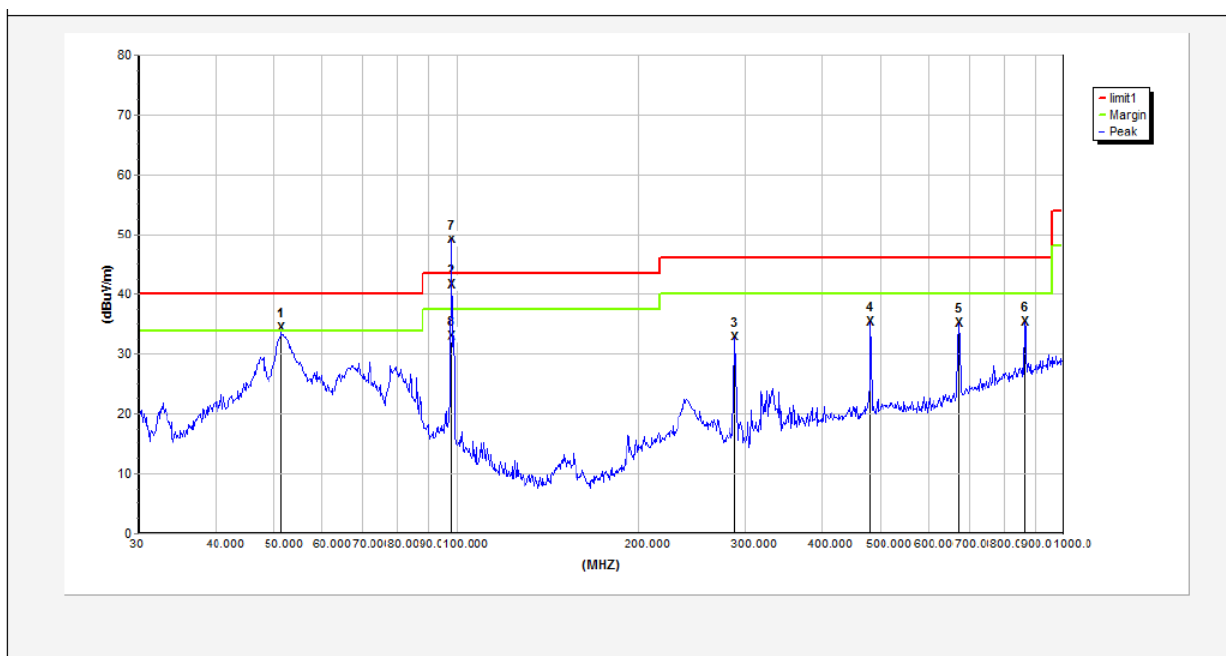
Job No.: 0217100032W Temp.(°C)/Hum.(%RH): 24.3°C/55%RH
Standard: FCC PART 15C Power Source: DC 12V
Test Mode: Mode 1 Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	53.8817	48.61	-14.85	33.76	40.00	-6.24	QP	300	41	
2	88.1029	58.24	-18.05	40.19	43.50	-3.31	QP	300	62	
3	287.9904	50.74	-15.01	35.73	46.00	-10.27	QP	300	112	
4	480.5276	46.41	-11.53	34.88	46.00	-11.12	QP	300	174	
5	672.8444	48.10	-8.68	39.42	46.00	-6.58	QP	300	196	
6	866.0879	43.12	-4.34	38.78	46.00	-7.22	QP	300	231	
7	88.1000	69.44	-18.05	47.55	68.00	-20.45	PK	300	180	
8	88.1000	47.96	-18.05	27.84	48.00	-20.16	AV	300	180	

Test Results (30~1000MHz)

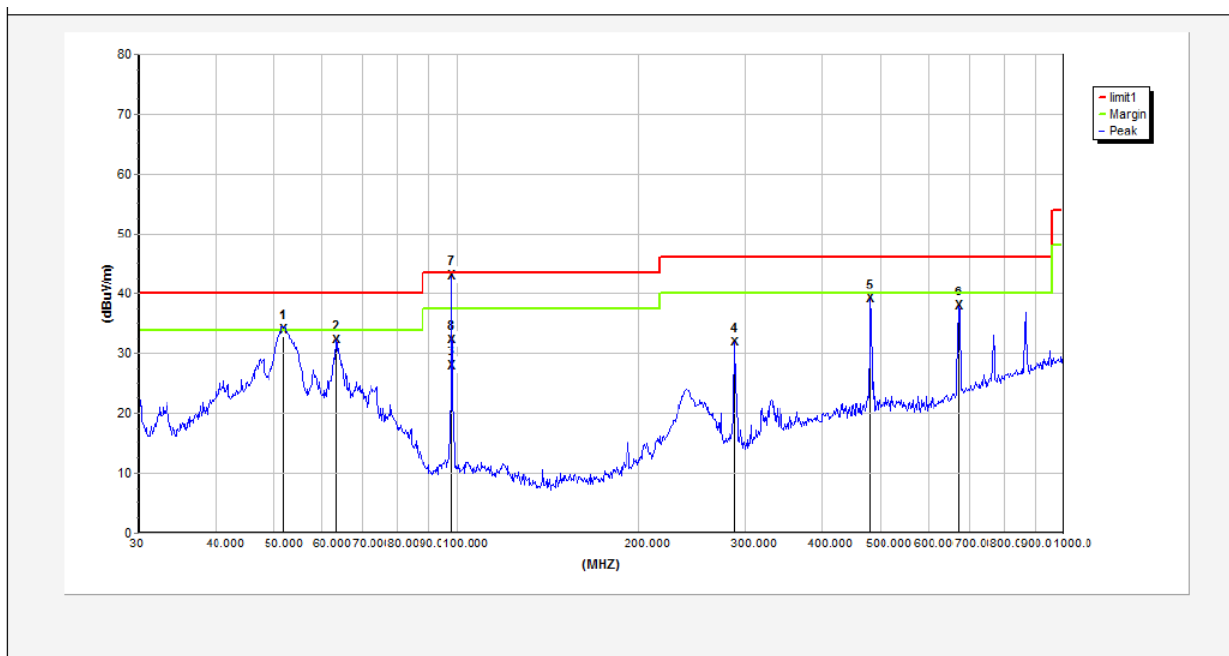
Job No.: 0217100032W Temp.(°C)/Hum.(%RH): 24.3°C/55%RH
Standard: FCC PART 15C Power Source: DC 12V
Test Mode: Mode 2 Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	51.4807	49.05	-14.68	34.37	40.00	-5.63	QP	300	24	
2	97.7983	62.48	-20.88	41.60	43.50	-1.90	QP	300	95	
3	287.9904	50.82	-18.01	32.81	46.00	-13.19	QP	300	141	
4	480.5276	46.84	-11.53	35.31	46.00	-10.69	QP	300	169	
5	672.8440	44.35	-9.22	35.14	46.00	-10.86	QP	300	201	
6	863.0562	40.70	-5.39	35.31	46.00	-10.69	QP	300	241	
7	98.1000	67.94	-20.88	47.06	68.00	-20.94	PK	300	180	
8	98.1000	47.66	-20.88	26.78	48.00	-21.22	AV	300	180	

Test Results (30~1000MHz)

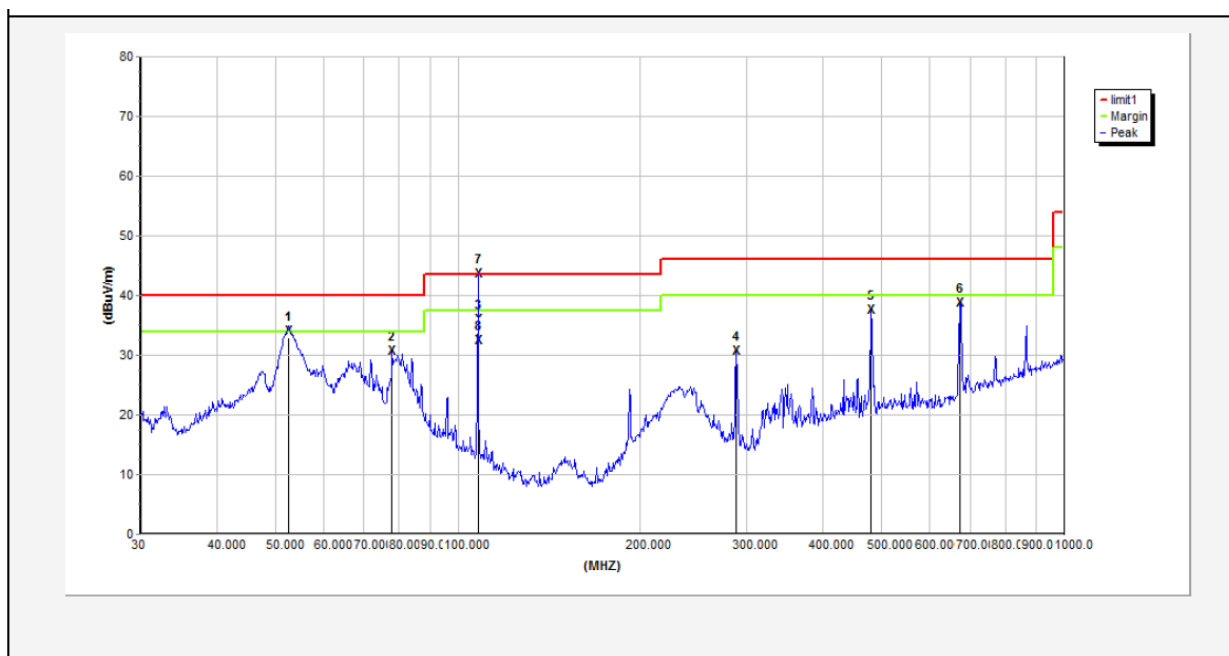
Job No.: 0217100032W Temp.(°C)/Hum.(%RH): 24.3°C/55%RH
Standard: FCC PART 15C Power Source: DC 12V
Test Mode: Mode 2 Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	51.9530	48.72	-14.71	34.01	40.00	-5.99	QP	300	24	
2	63.3132	48.98	-16.77	32.21	40.00	-7.79	QP	300	95	
3	97.7943	56.71	-15.88	40.83	43.50	-2.67	QP	300	141	
4	287.9904	46.76	-15.01	31.75	46.00	-14.25	QP	300	169	
5	480.5276	50.53	-11.53	39.00	46.00	-7.00	QP	300	201	
6	672.8444	46.46	-8.68	37.78	46.00	-14.25	QP	300	241	
7	98.1000	58.94	-15.88	43.06	68.00	-24.94	PK	300	180	
8	98.1000	38.46	-15.88	20.58	48.00	-27.42	AV	300	180	

Test Results (30~1000MHz)

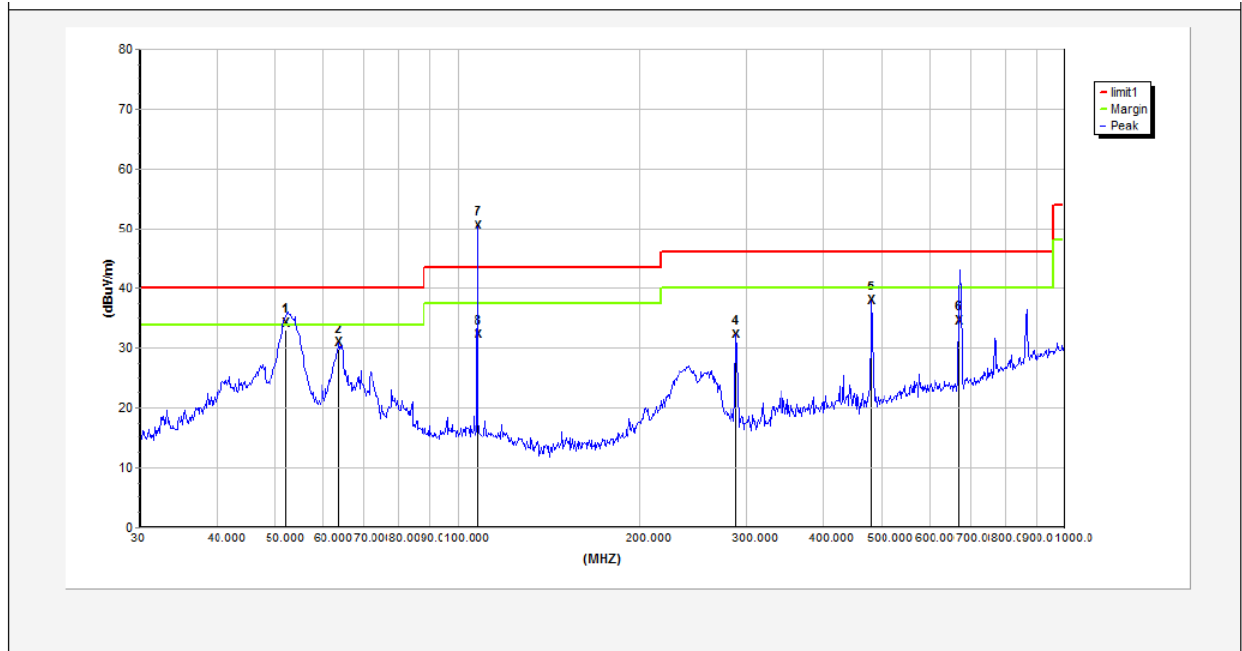
Job No.: 0217100032W Temp.(°C)/Hum.(%RH): 24.3°C/55%RH
Standard: FCC PART 15C Power Source: DC 12V
Test Mode: Mode 3 Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	52.4953	48.72	-14.75	33.97	40.00	-6.03	QP	300	24	
2	77.8654	51.90	-21.38	30.52	40.00	-9.48	QP	300	95	
3	107.8877	56.62	-21.66	34.96	43.50	-6.54	QP	300	141	
4	287.9904	48.60	-18.01	30.59	46.00	-15.41	QP	300	169	
5	480.5276	49.07	-11.53	37.54	46.00	-8.46	QP	300	201	
6	672.8444	47.82	-9.22	38.60	46.00	-7.40	QP	300	241	
7	107.9000	65.89	-21.66	44.23	68.00	-23.77	PK	300	180	
8	107.9000	45.26	-21.66	23.60	48.00	-24.40	AV	300	180	

Test Results (30~1000MHz)

Job No.: 0217100032W Temp.(°C)/Hum.(%RH): 24.3°C/55%RH
Standard: FCC PART 15C Power Source: DC 12V
Test Mode: Mode 3 Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	52.0253	48.90	-14.71	34.19	40.00	-5.81	QP	300	24	
2	63.7588	47.66	-16.95	30.71	40.00	-9.29	QP	300	95	
3	107.8877	54.49	-15.66	38.83	43.50	-4.67	QP	300	141	
4	287.9904	47.18	-15.01	32.17	46.00	-13.83	QP	300	169	
5	480.5276	49.43	-11.53	37.90	46.00	-8.10	QP	300	201	
6	671.0645	43.16	-8.69	34.47	46.00	-11.53	QP	300	241	
7	107.9000	66.94	-15.66	51.28	68.00	-16.72	PK	300	180	
8	107.9000	44.56	-15.66	28.90	48.00	-19.10	AV	300	180	

Test Results (1GHz-25GHz)

107.9MHz										
Frequency (MHz)	Meter Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type	Comment
1012.52	57.00	46.30	3.70	24.20	-18.24	38.80	74.00	-35.20	PK	V
1012.52	46.09	46.30	3.70	24.20	-18.24	27.79	54.00	-26.21	AV	V
1033.64	55.07	46.30	3.70	24.20	-18.24	36.77	74.00	-37.23	PK	H
1033.64	46.10	46.30	3.70	24.20	-18.24	27.80	54.00	-26.20	AV	H
1045.27	57.85	44.90	3.70	24.20	-18.24	40.95	74.00	-33.05	PK	V
1045.27	48.86	44.90	3.70	24.20	-18.24	31.96	54.00	-22.04	AV	V
1055.36	56.90	44.90	3.70	24.20	-18.24	40.00	74.00	-34.00	PK	H
1055.36	48.89	44.90	3.70	24.20	-18.24	31.99	54.00	-22.01	AV	H

Remark:

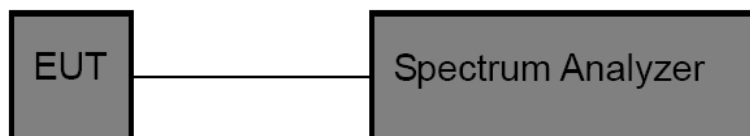
Only Worse case is reported.

5. 20DB Occupy Bandwidth Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.215
Test Limit	15.215(c), Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation. Limit: 200 MHz

5.2. Test Setup



5.3. Test Procedure

1. Place the EUT on the table and set it in the continuously 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 $\geq$ 3*RBW = 100kHz,
 Span= 3MHz
 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 Voltage : DC 12V

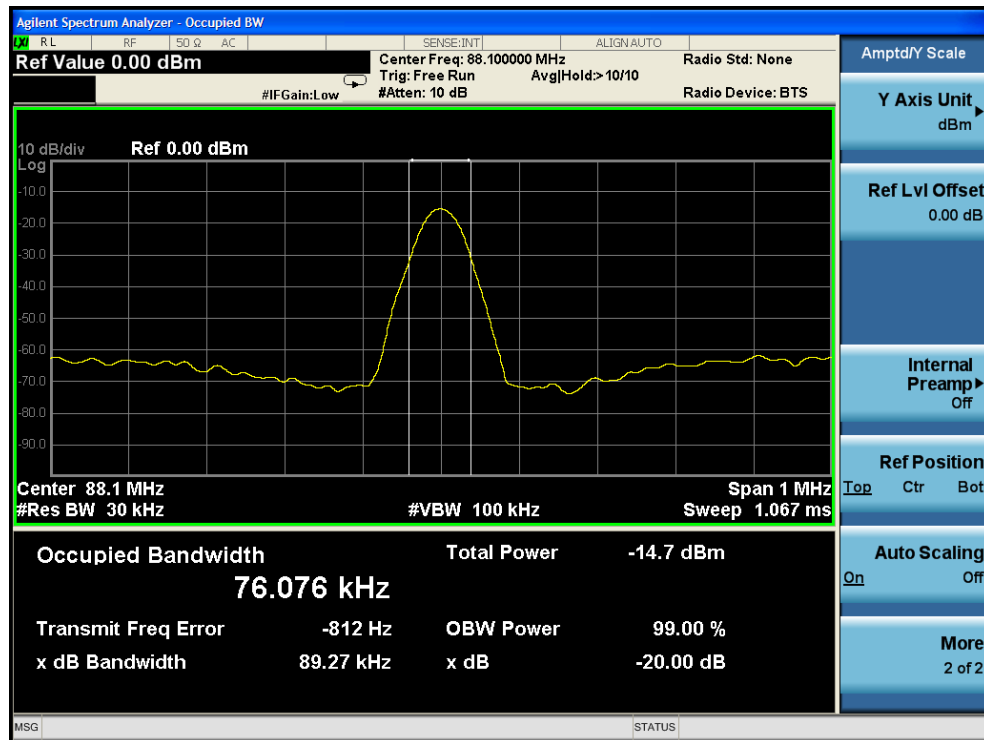
Test Result : PASS

Test Mode : TX Mode

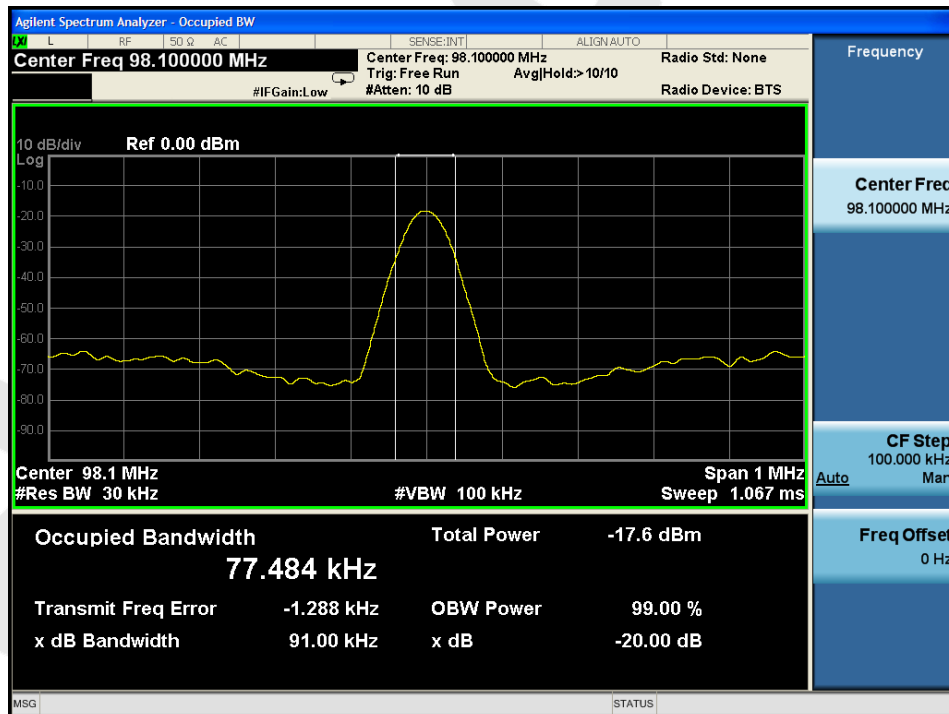
Temperature : 24°C

Humidity : 55%RH

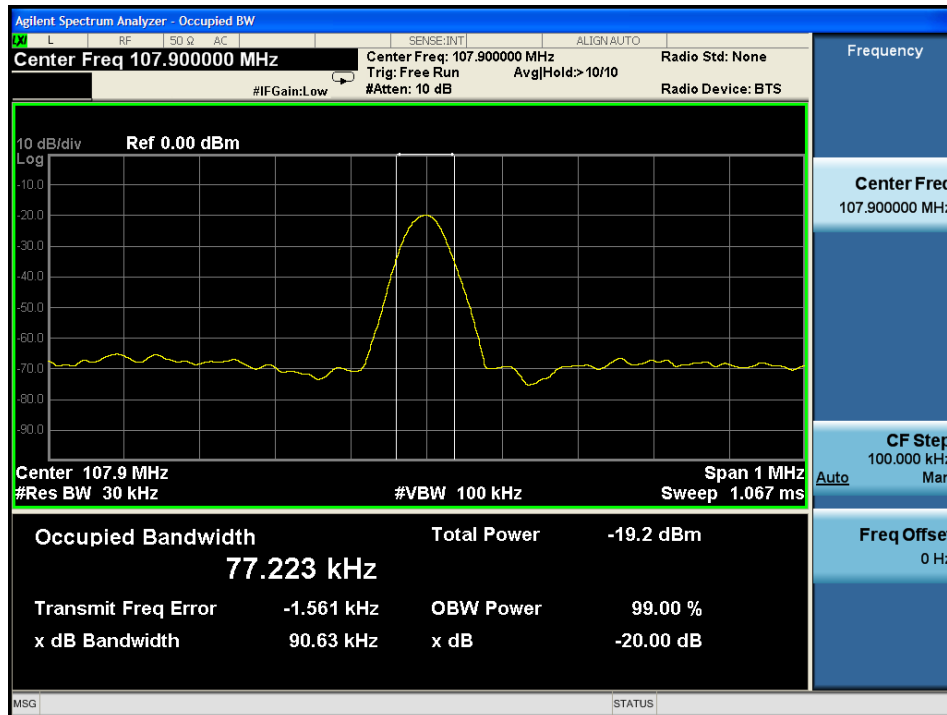
Test Channel	Frequency (MHz)	20 dBc Bandwidth (KHz)	Limit (KHz)
Low	88.1	89.27	200
Mid	98.1	91.00	200
High	107.9	90.63	200



The Low Channel



The Mid Channel



The High Channel

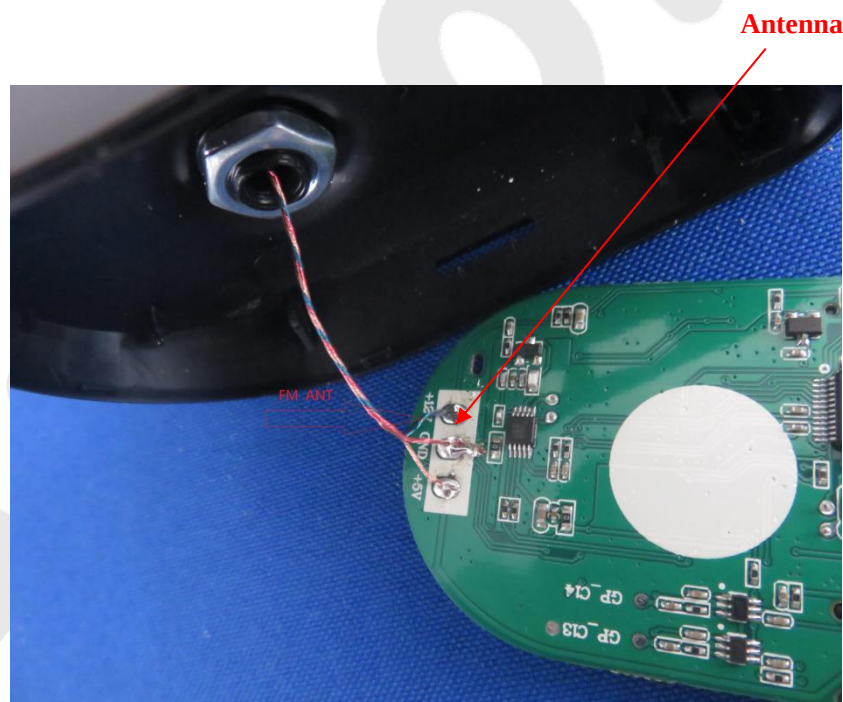
6. Antenna Requirement

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. Antenna requirement must meet at least one of the following: 1) Antenna must be permanently attached to device. 2) The antenna must use a unique type of connector to attach to the device. 3) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device.

6.2. Antenna Connected Construction

The RF antenna is a FM antenna which permanently attached, and the best case gain of the antenna is 0.5 dBi. It complies with the standard requirement.



APPENDIX I -- TEST SETUP PHOTOGRAPH

Please see the test report of R021710032W1

Anbotek

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please see the test report of R021710032W1

Anbotek

APPENDIX III -- INTERNAL PHOTOGRAPH

Please see the test report of R021710032W1

Anbotek