

# TEST REPORT

Reference No..... : WTS20X08055638W-1  
FCC ID..... : 2AMRO-CHWRIO107GL  
Applicant..... : iOttie Inc  
Address..... : 20 West 37th Street 6th FL New York, New York 10018, United States  
Product Name..... : iON wireless Duo  
Test Model..... : CHWRIO107GL  
Standards..... : FCC Part 18  
Date of Receipt sample .... : Aug.14, 2020  
Date of Test..... : Aug.14, 2020 to Sept.02, 2020  
Date of Issue..... : Sept.02, 2020  
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

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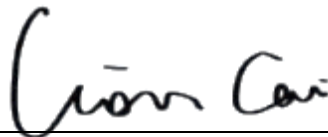
Tested by:

Reviewed By:

Approved & Authorized By:



Jason Su / Project Engineer



Lion Cai / RF Manager



Silin Chen / Manager

**TABLE OF CONTENTS**

<b>1. GENERAL INFORMATION</b> .....	<b>4</b>
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
1.2 TEST STANDARDS.....	5
1.3 TEST METHODOLOGY.....	5
1.4 TEST FACILITY.....	5
1.5 EUT SETUP AND OPERATION MODE.....	6
1.6 MEASUREMENT UNCERTAINTY.....	6
1.7 TEST EQUIPMENT LIST AND DETAILS.....	7
<b>2. SUMMARY OF TEST RESULTS</b> .....	<b>8</b>
<b>3. CONDUCTED EMISSIONS</b> .....	<b>9</b>
3.1 STANDARD APPLICABLE.....	9
3.2 TEST PROCEDURE.....	9
3.3 BASIC TEST SETUP BLOCK DIAGRAM.....	9
3.4 ENVIRONMENTAL CONDITIONS.....	9
3.5 TEST RECEIVER SETUP.....	10
3.6 SUMMARY OF TEST RESULTS/PLOTS.....	10
<b>4. RADIATED EMISSIONS</b> .....	<b>17</b>
4.1 TEST PROCEDURE.....	17
4.2 TEST RECEIVER SETUP.....	19
4.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	19
4.4 ENVIRONMENTAL CONDITIONS.....	19
4.5 SUMMARY OF TEST RESULTS/PLOTS.....	19

**Report version**

Version No.	Date of issue	Description
Rev.00	Sept.02, 2020	Original
/	/	/

## 1. GENERAL INFORMATION

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### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: iOttie Inc  
 Address of applicant: 20 West 37th Street 6th FL New York, New York  
 10018, United States

Manufacturer: NuVolta Technologies (Hefei) Co., Ltd  
 Address of manufacturer: Room 605/606, No. 2800, Building F-1, Innovation  
 Industrial Park Phase 2, Innovation Avenue,  
 High-tech Zone, Hefei

Factory#1: Shenzhen Hengtaiying Technology CO.,Ltd  
 Address of factory: 2F,11 Block,Kaetat Industrial Park,liakeng  
 Village,Shiyan Street,Bao'an District,Shenzhen,  
 Guangdong,China.

General Description of EUT	
Product Name:	iON wireless Duo
Trade Name:	/
Model No.:	CHWRIO107GL
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	110~148kHz
Antenna Type:	Coil Antenna
Rated Voltage:	Stand: DC5V/DC9V/DC12V Pad: DC5V
Rated Current:	Stand: 1A/1.1A/1.25A Pad: 1A
Rated Power:	Stand: 5W/10W/15W Pad: 5W

## 1.2 Test Standards

The tests were performed according to following standards:

**FCC Part 18 Subpart C**: Industrial, Scientific, and medical medical equipment.

**ANSI C63.4-2014**: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

*Maintenance of compliance* is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

## 1.4 Test Facility

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101)

### **FCC – Registration No.: 125990**

Waltek Testing Group (Shenzhen) Co., Ltd. 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. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

## 1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark	Power Supply Mode
TM1	Wireless Charging	/	Input DC19V/1.8A; Output: Pad DC5V/1A And Stand DC5V1A
TM2	Wireless Charging	/	Input DC19V/1.8A; Output: Pad DC5V/1A And Stand DC9V1.1A
TM3	Wireless Charging	/	Input DC19V/1.8A; Output: Pad DC5V/1A And Stand DC12V1.25A

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Power Supply	iottie	HTY36—1901800U	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC Cable	1.5	Unshielded	Without Ferrite

## 1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz $\pm 3.74$ dB
		0.15-30MHz $\pm 3.34$ dB
Radiated Emissions	Radiated	30-200MHz $\pm 4.52$ dB
		0.2-1GHz $\pm 5.56$ dB
		1-6GHz $\pm 3.84$ dB
		6-18GHz $\pm 3.92$ dB

### 1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2020-04-28	2021-04-27
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2020-04-28	2021-04-27
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2020-04-28	2021-04-27
Amplifier	Agilent	8447F	3113A06717	2020-04-28	2021-04-27
Amplifier	C&D	PAP-1G18	2002	2020-04-28	2021-04-27
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2020-04-28	2021-04-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2020-04-28	2021-04-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2020-04-28	2021-04-27

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

\*Remark: indicates software version used in the compliance certification testing

## 2. SUMMARY OF TEST RESULTS

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FCC RULES	DESCRIPTION OF TEST	RESULT
§ 18.307 (b)	Conducted Emission	Compliant
§ 18.305 (b)	Radiated Emission	Compliant



### 3. Conducted Emissions

#### 3.1 Standard Applicable

According to FCC 18.307(b), the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies shall not exceed the limits in the following tables:

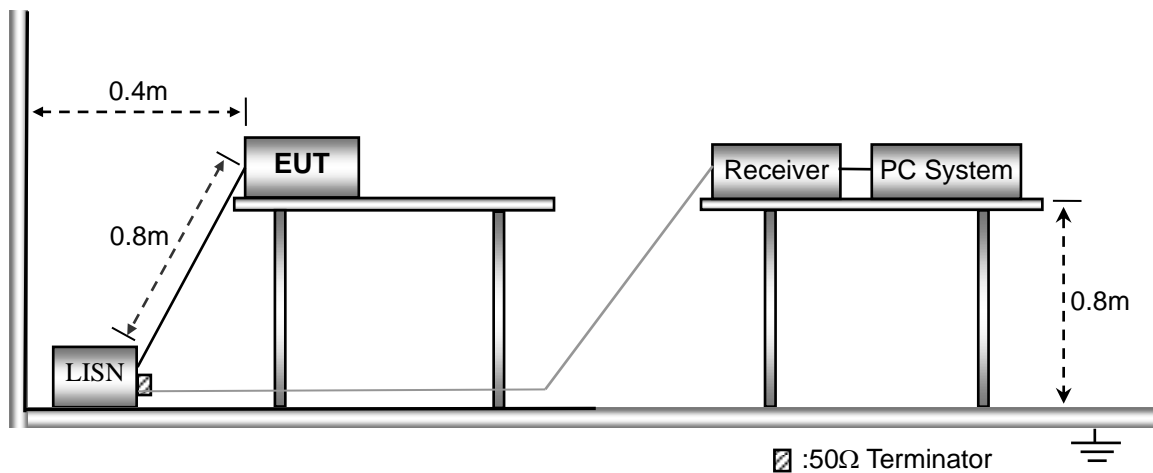
Frequency (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

#### 3.2 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 18.307 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

#### 3.3 Basic Test Setup Block Diagram



#### 3.4 Environmental Conditions

Temperature:	26° C
Relative Humidity:	60%
ATM Pressure:	1016 mbar

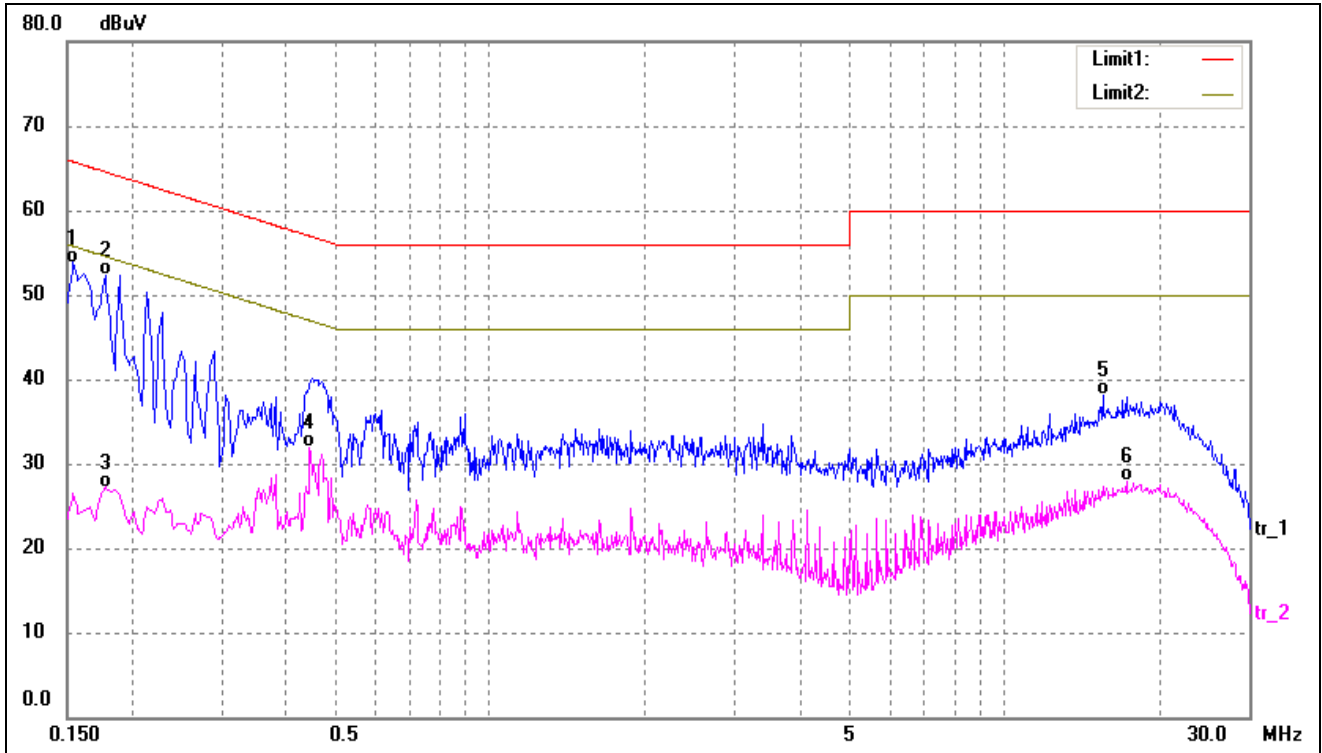
### 3.5 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz  
Stop Frequency..... 30 MHz  
Sweep Speed ..... Auto  
IF Bandwidth..... 10 kHz  
Quasi-Peak Adapter Bandwidth ..... 9 kHz  
Quasi-Peak Adapter Mode ..... Normal

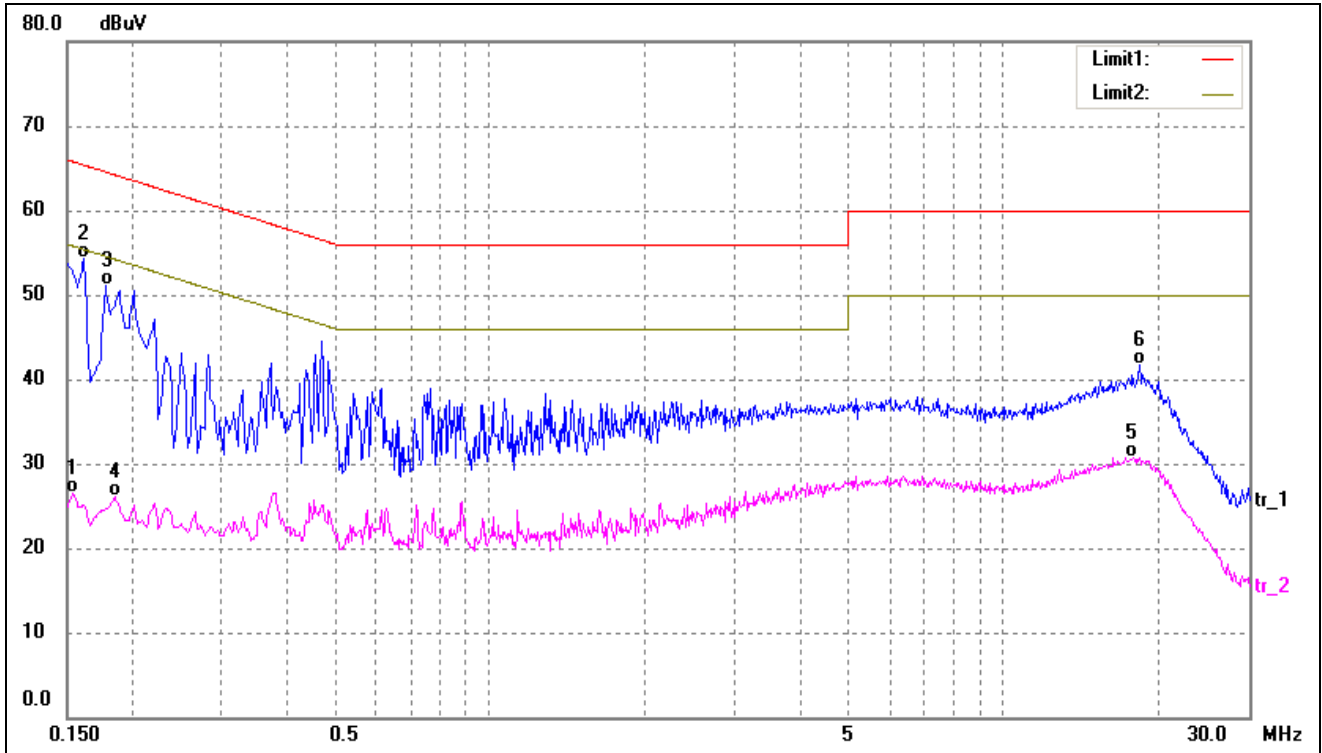
### 3.6 Summary of Test Results/Plots

Test mode:	TM1	Polarity:	Line
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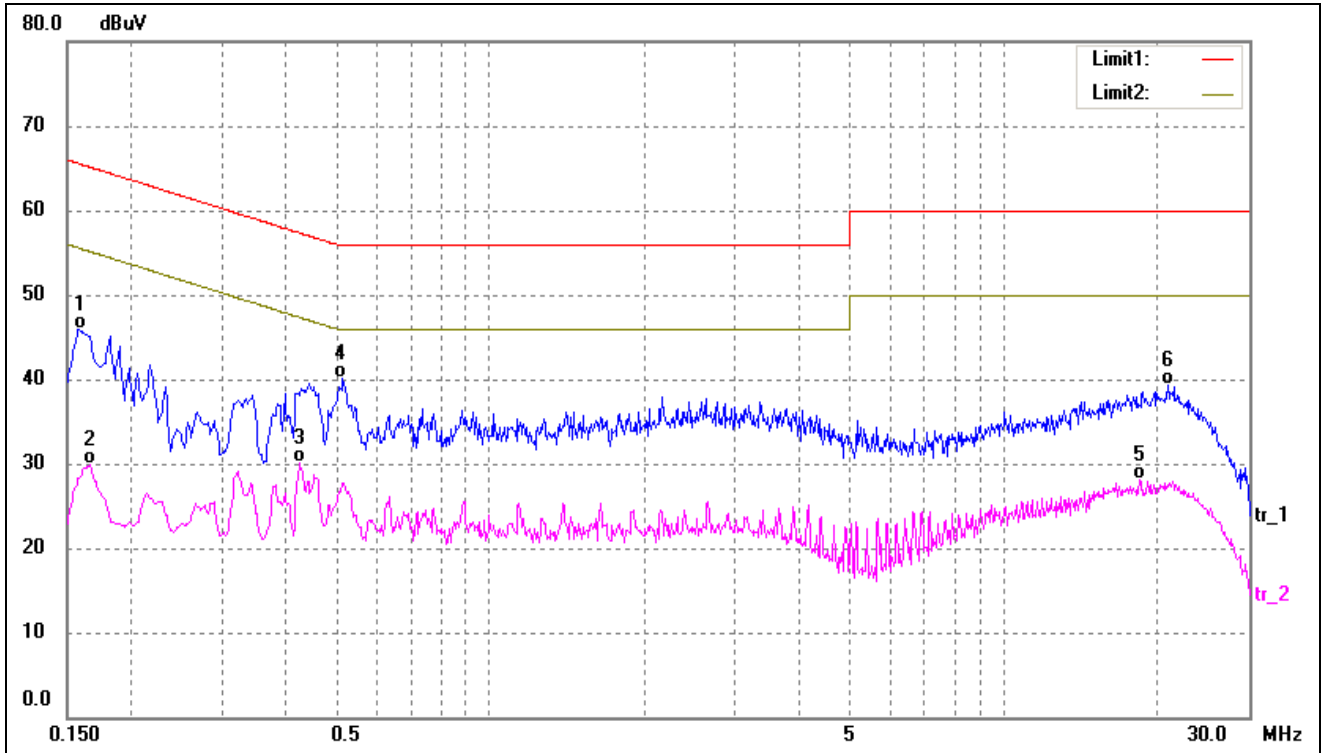
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1540	43.55	10.25	53.80	65.78	-11.98	QP
2	0.1780	42.14	10.26	52.40	64.58	-12.18	QP
3	0.1780	16.94	10.26	27.20	54.58	-27.38	AVG
4	0.4460	21.77	10.22	31.99	46.95	-14.96	AVG
5	15.5900	27.46	10.58	38.04	60.00	-21.96	QP
6	17.3500	17.25	10.59	27.84	50.00	-22.16	AVG

Test mode:	TM1	Polarity:	Neutral
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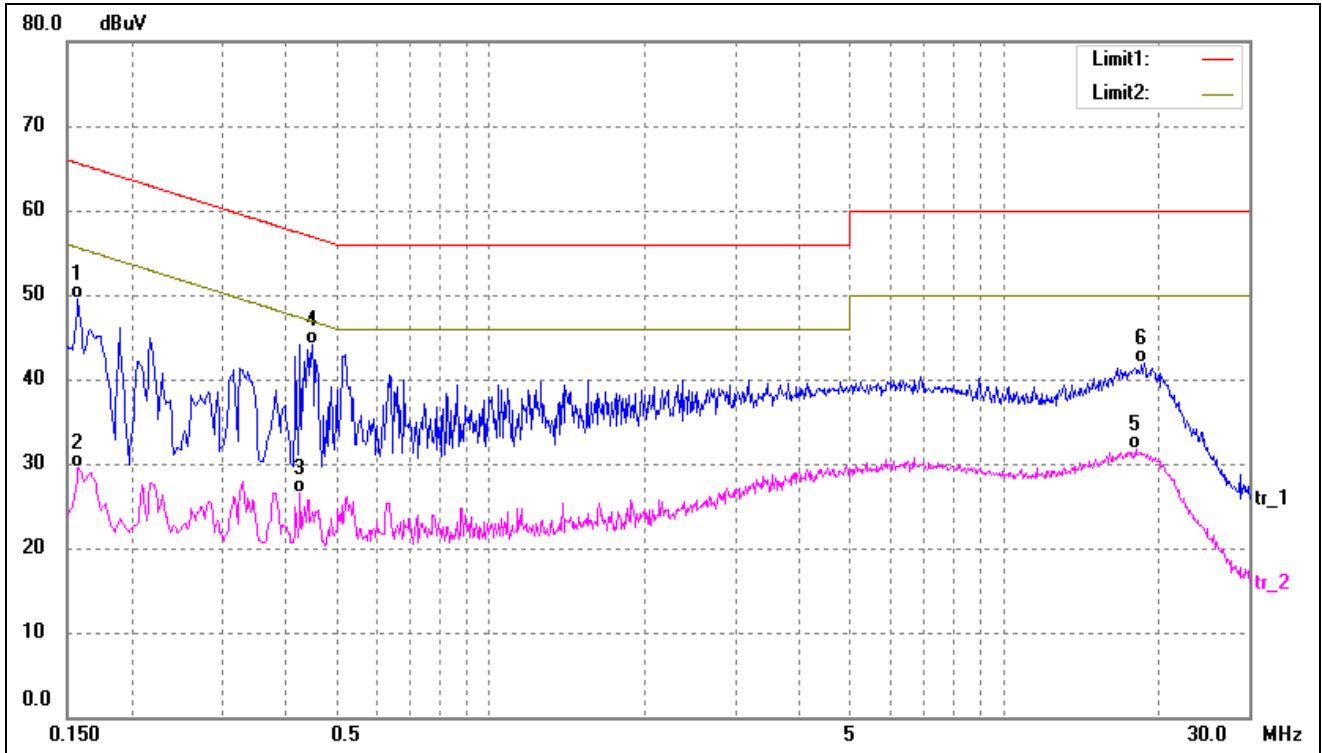
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1540	16.31	10.25	26.56	55.78	-29.22	AVG
2*	0.1620	44.08	10.26	54.34	65.36	-11.02	QP
3	0.1780	40.80	10.26	51.06	64.58	-13.52	QP
4	0.1860	15.78	10.26	26.04	54.21	-28.17	AVG
5	17.8580	20.06	10.58	30.64	50.00	-19.36	AVG
6	18.3620	31.15	10.58	41.73	60.00	-18.27	QP

Test mode:	TM2	Polarity:	Line
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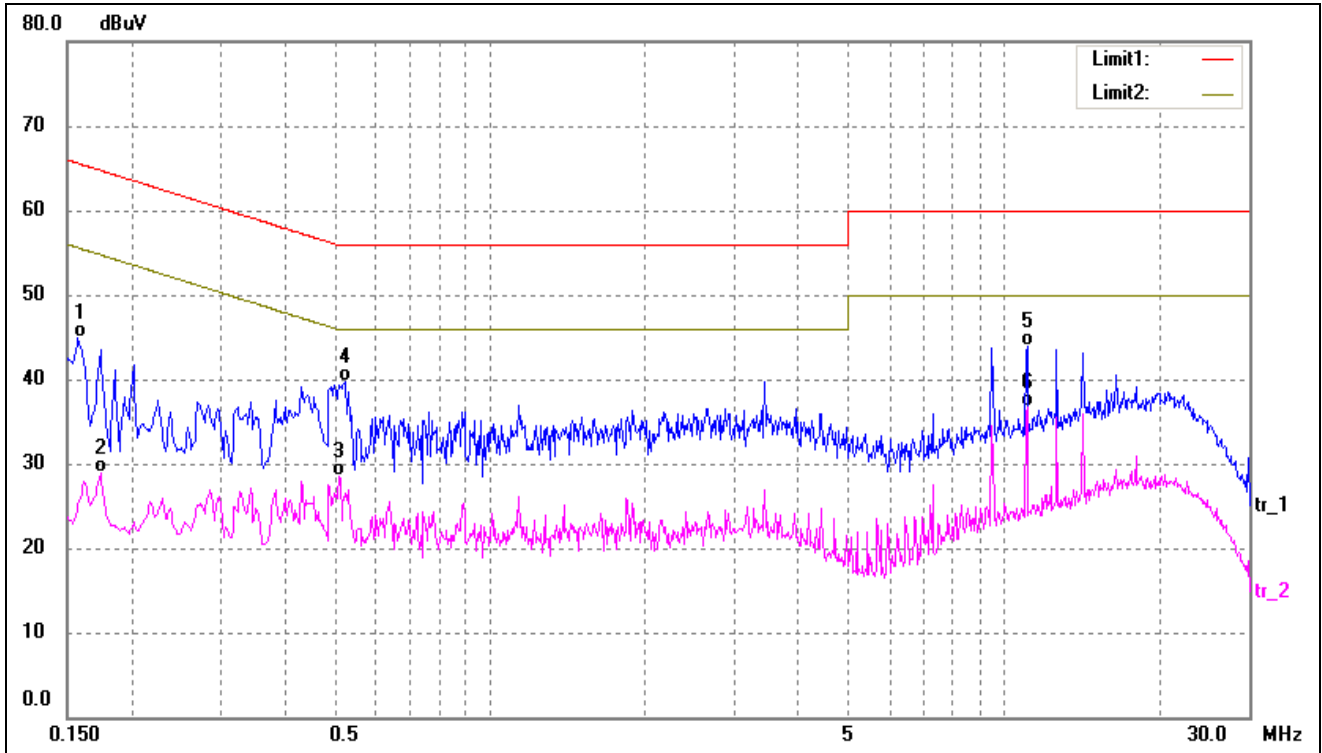
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	35.73	10.25	45.98	65.57	-19.59	QP
2	0.1660	19.62	10.26	29.88	55.16	-25.28	AVG
3	0.4260	19.88	10.22	30.10	47.33	-17.23	AVG
4*	0.5180	29.97	10.22	40.19	56.00	-15.81	QP
5	18.3500	17.53	10.58	28.11	50.00	-21.89	AVG
6	20.8900	28.75	10.60	39.35	60.00	-20.65	QP

Test mode:	TM2	Polarity:	Neutral
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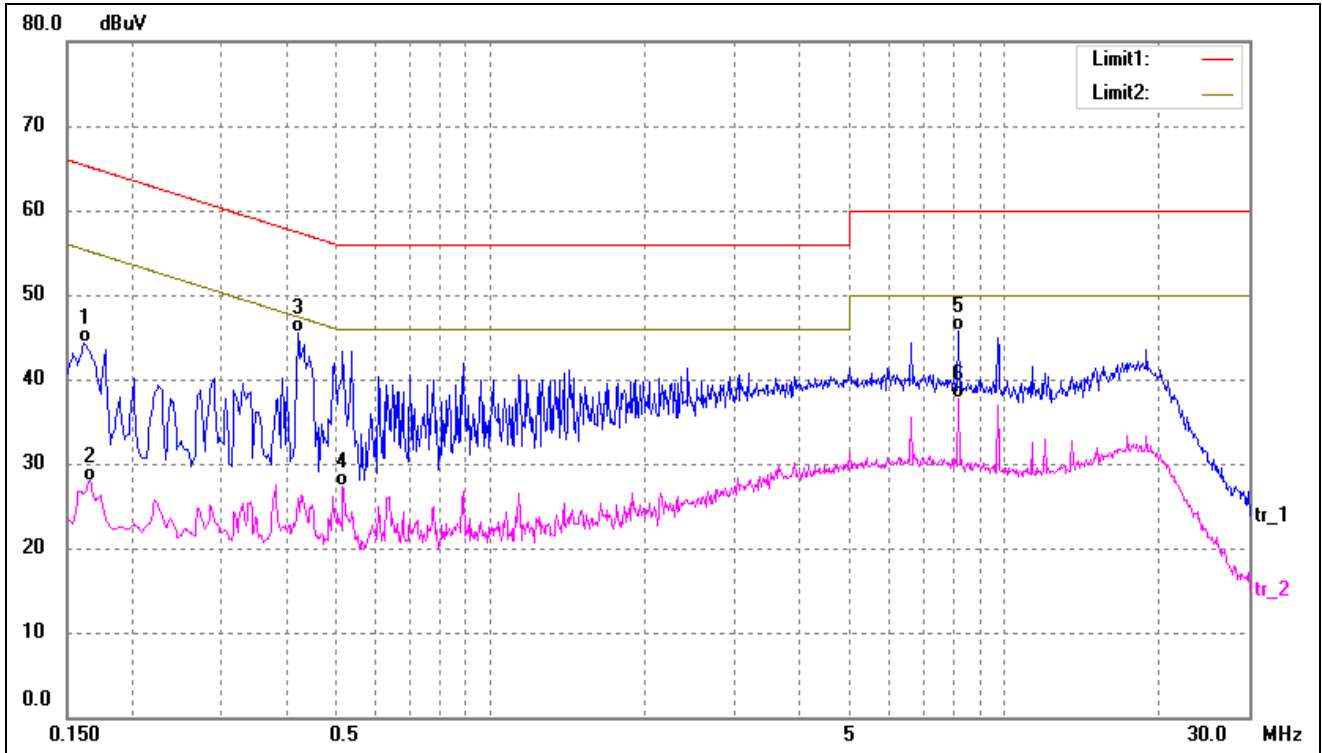
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	39.28	10.25	49.53	65.57	-16.04	QP
2	0.1580	19.35	10.25	29.60	55.57	-25.97	AVG
3	0.4260	16.26	10.22	26.48	47.33	-20.85	AVG
4*	0.4500	33.88	10.22	44.10	56.88	-12.78	QP
5	18.1100	21.03	10.58	31.61	50.00	-18.39	AVG
6	18.7220	31.40	10.58	41.98	60.00	-18.02	QP

Test mode:	TM3	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	34.60	10.25	44.85	65.57	-20.72	QP
2	0.1740	18.67	10.25	28.92	54.77	-25.85	AVG
3	0.5100	18.28	10.22	28.50	46.00	-17.50	AVG
4	0.5220	29.45	10.22	39.67	56.00	-16.33	QP
5	11.0820	33.62	10.34	43.96	60.00	-16.04	QP
6*	11.0820	26.27	10.34	36.61	50.00	-13.39	AVG

Test mode:	TM3	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1620	33.95	10.26	44.21	65.36	-21.15	QP
2	0.1660	17.74	10.26	28.00	55.16	-27.16	AVG
3*	0.4220	35.18	10.23	45.41	57.41	-12.00	QP
4	0.5180	17.09	10.22	27.31	46.00	-18.69	AVG
5	8.1740	35.50	10.27	45.77	60.00	-14.23	QP
6	8.1740	27.48	10.27	37.75	50.00	-12.25	AVG



## 4. Radiated Emissions

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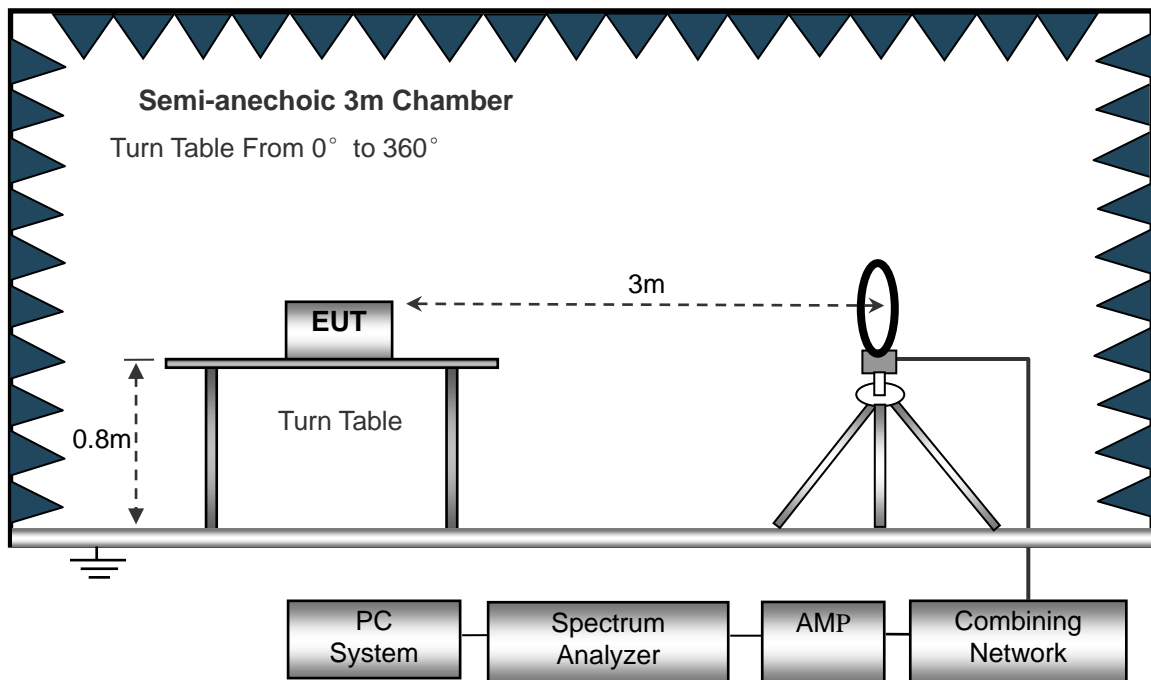
### 4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 18.305 Limit.

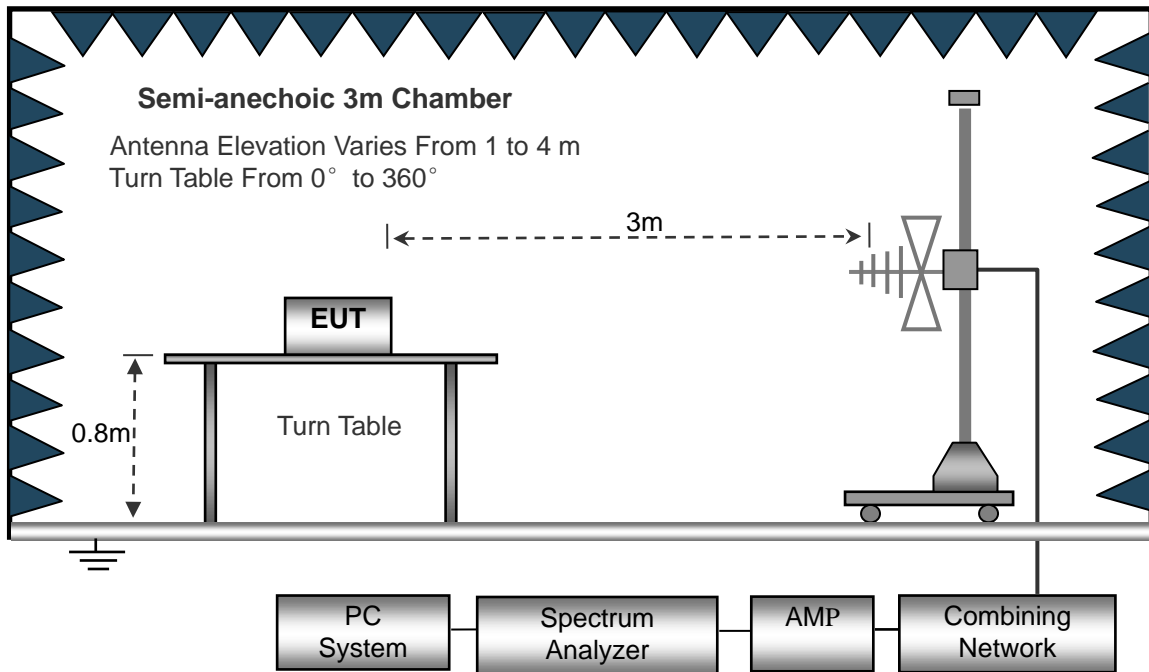
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

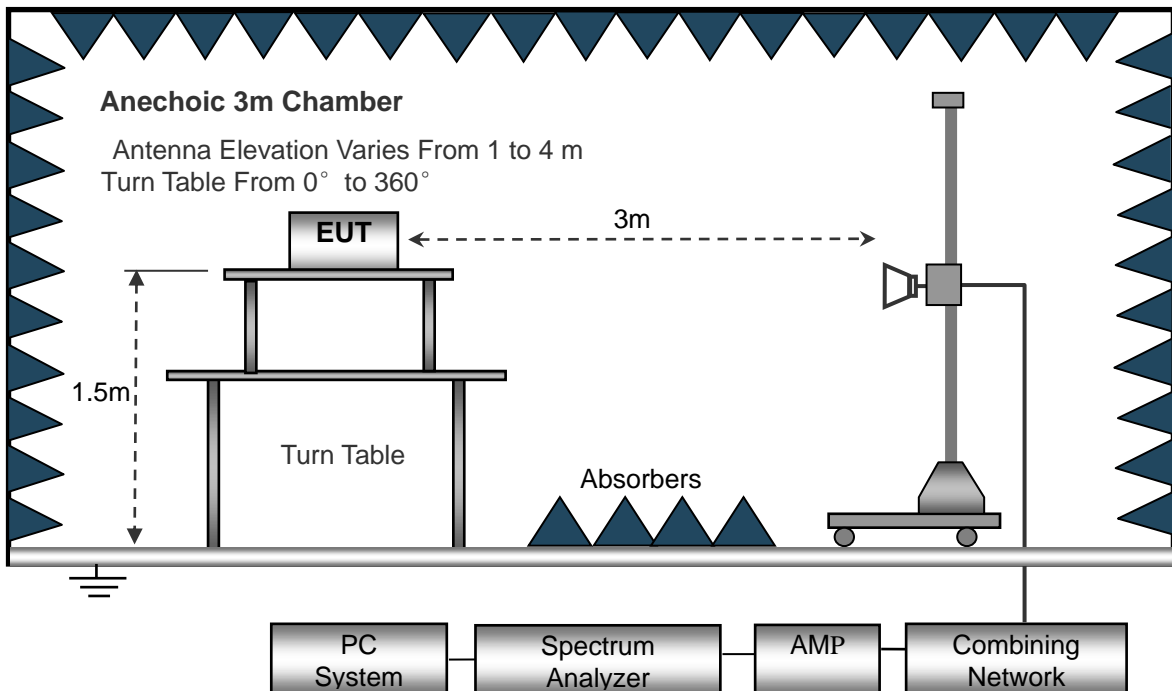
The test setup for emission measurement below 30MHz..



The test setup for emission measurement from 30 MHz to 1 GHz..



The test setup for emission measurement above 1 GHz..



## 4.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

## 4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit for Any non-ISM frequency device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 18.305 Limit}$$

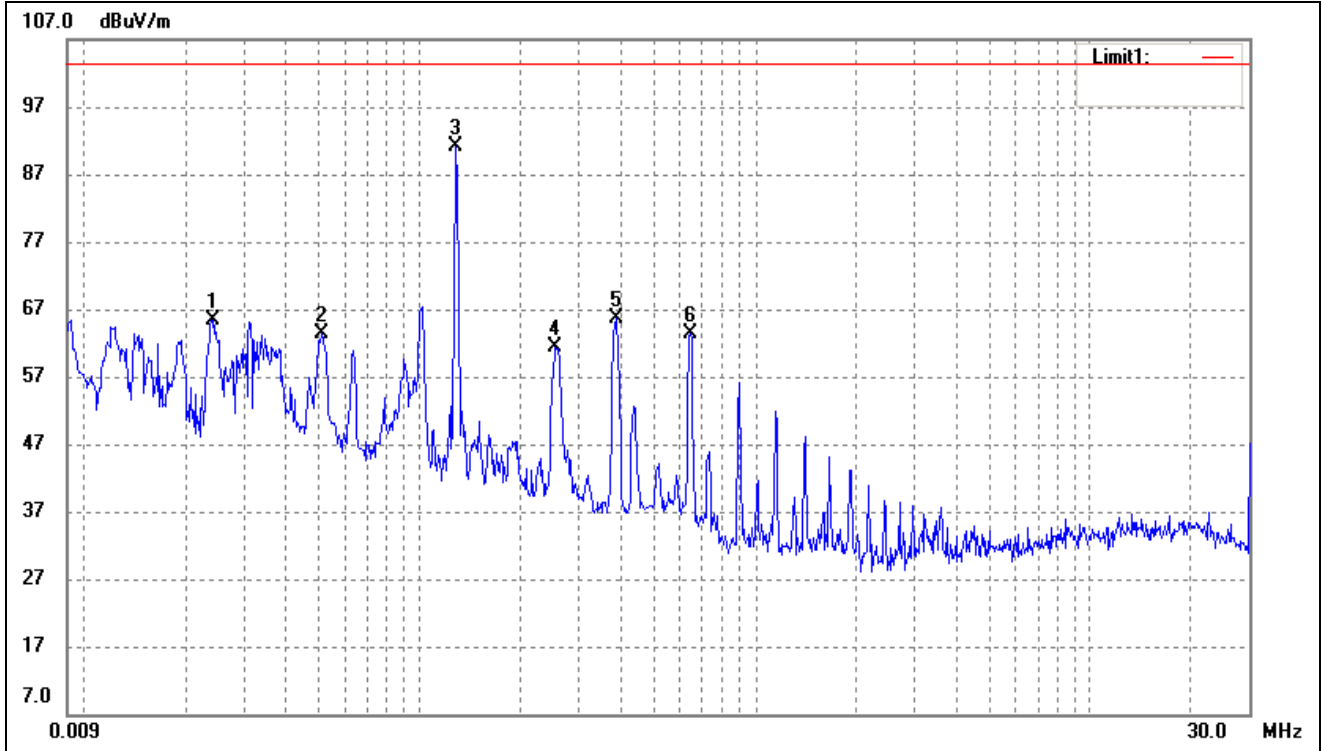
## 4.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

## 4.5 Summary of Test Results/Plots

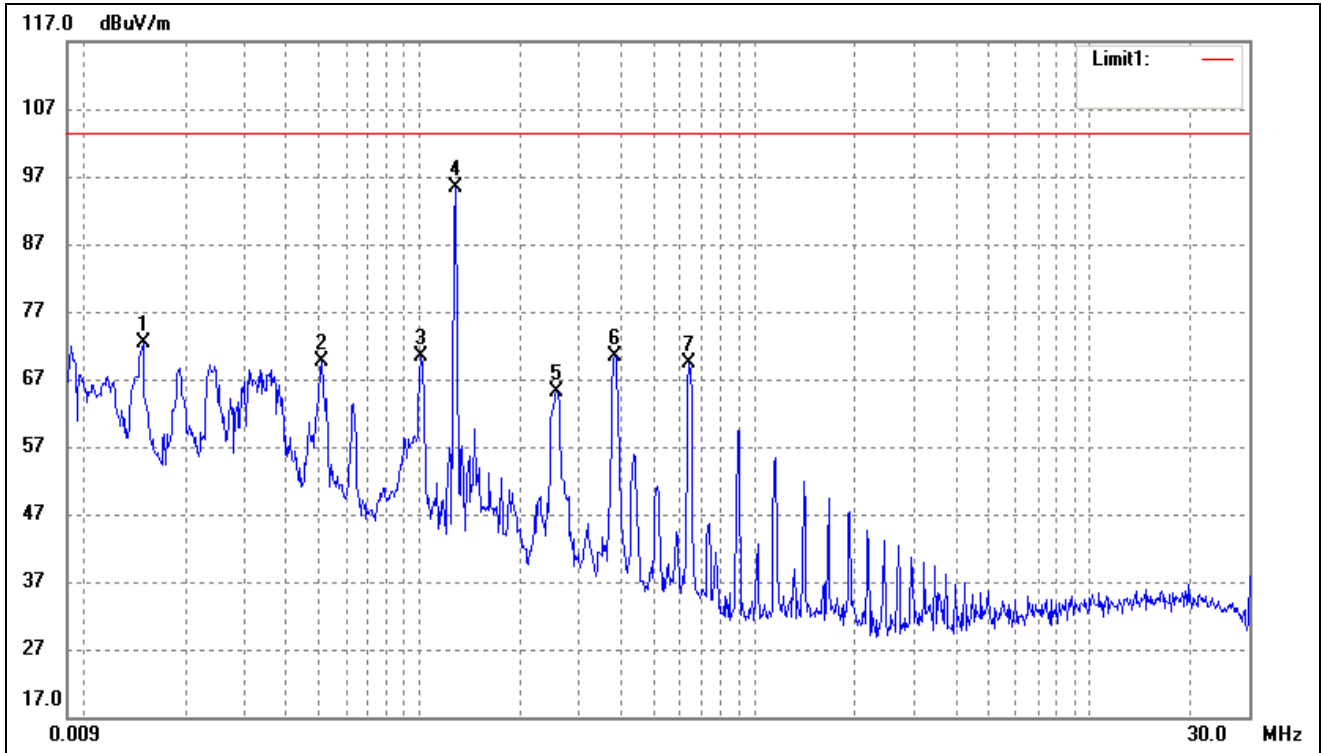
**Plot of Radiated Emissions Test Data (Below 30MHz)**

Test mode:	TM1	Polarity:	Horizontal
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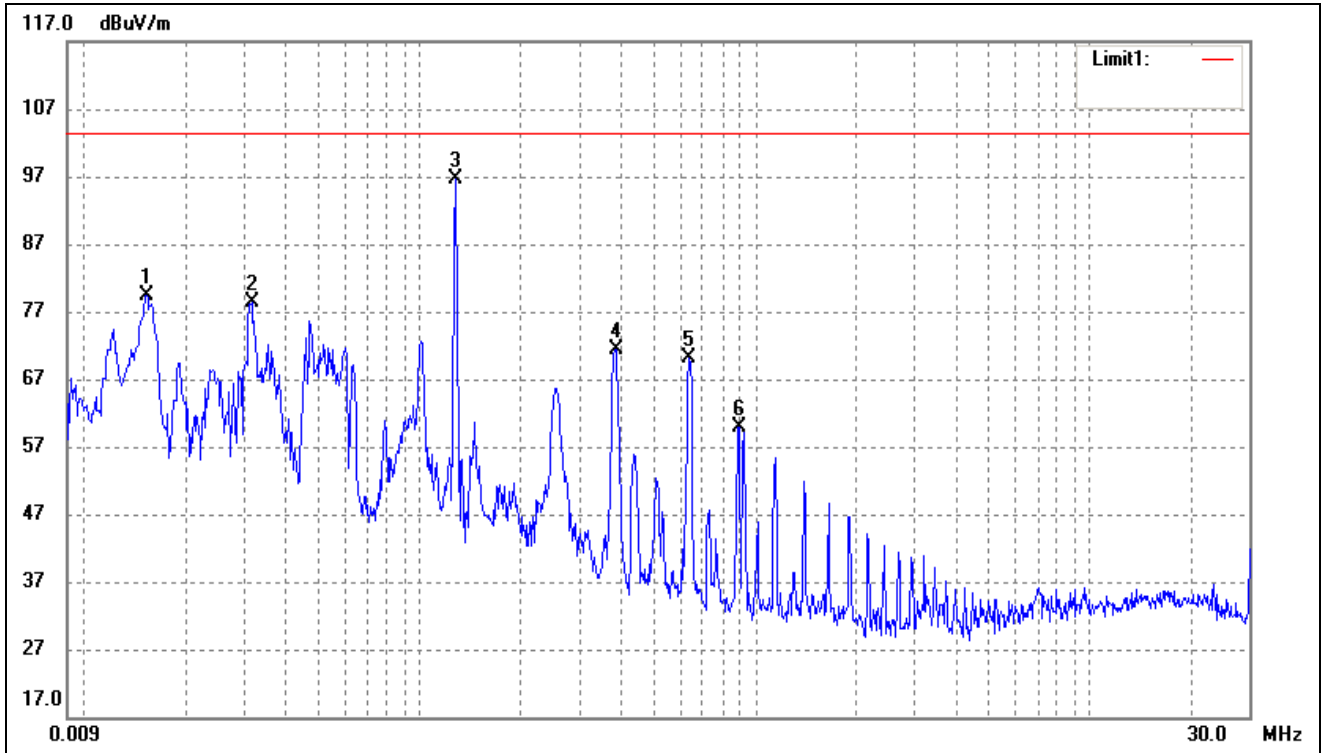
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	0.0241	71.99	-6.55	65.44	103.50	-38.06	-	-	peak
2	0.0511	68.21	-4.75	63.46	103.50	-40.04	-	-	peak
3	0.1285	96.22	-5.13	91.09	103.50	-12.41	-	-	peak
4	0.2548	68.72	-7.42	61.30	103.50	-42.20	-	-	peak
5	0.3852	73.43	-7.83	65.60	103.50	-37.90	-	-	peak
6	0.6406	70.45	-7.01	63.44	103.50	-40.06	-	-	peak

Test mode:	TM2	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	0.0149	78.88	-6.58	72.30	103.50	-31.20	-	-	peak
2	0.0507	74.50	-4.75	69.75	103.50	-33.75	-	-	peak
3	0.1006	75.45	-5.06	70.39	103.50	-33.11	-	-	peak
4	0.1278	100.60	-5.13	95.47	103.50	-8.03	-	-	peak
5	0.2562	72.47	-7.44	65.03	103.50	-38.47	-	-	peak
6	0.3811	78.25	-7.83	70.42	103.50	-33.08	-	-	peak

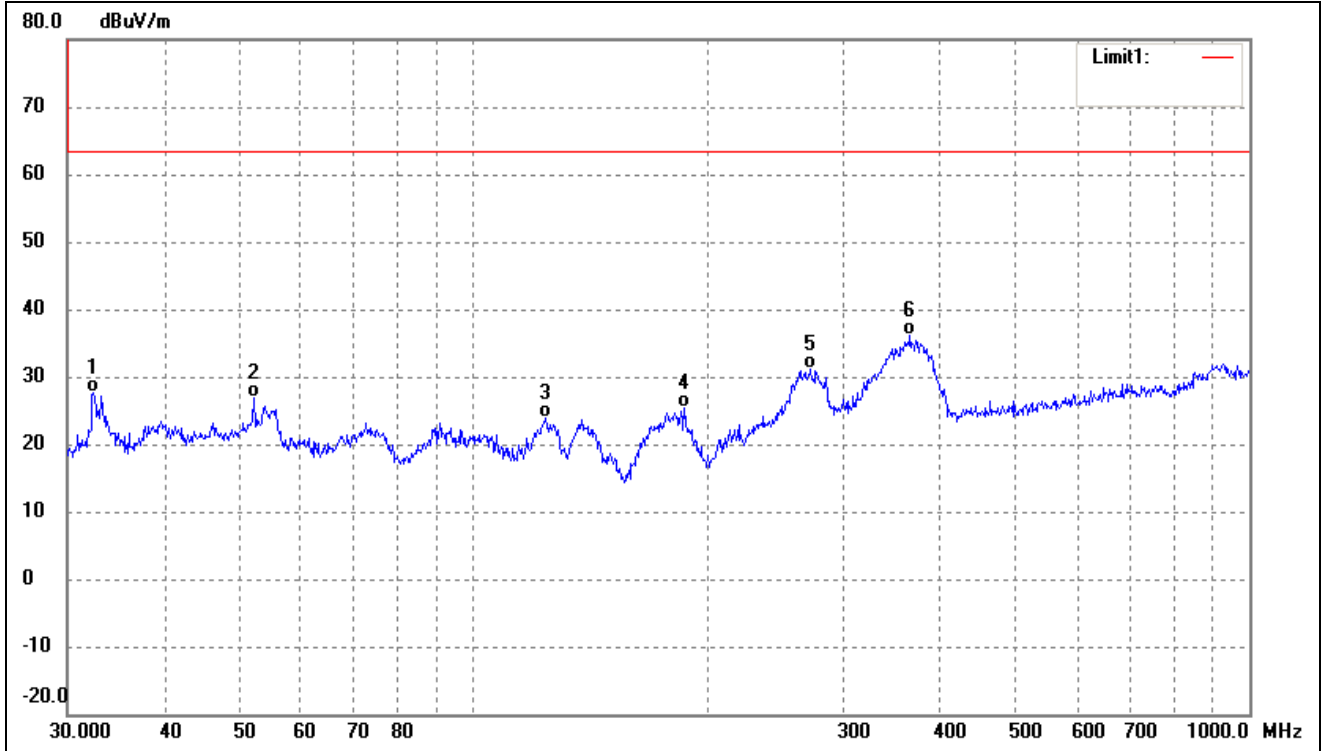
Test mode:	TM3	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	0.0153	85.99	-6.60	79.39	103.50	-24.11	-	-	peak
2	0.0317	84.48	-6.01	78.47	103.50	-25.03	-	-	peak
3	0.1278	101.72	-5.13	96.59	103.50	-6.91	-	-	peak
4	0.3832	79.18	-7.83	71.35	103.50	-32.15	-	-	peak
5	0.6372	77.15	-7.03	70.12	103.50	-33.38	-	-	peak
6	0.8944	66.30	-6.41	59.89	103.50	-43.61	-	-	peak

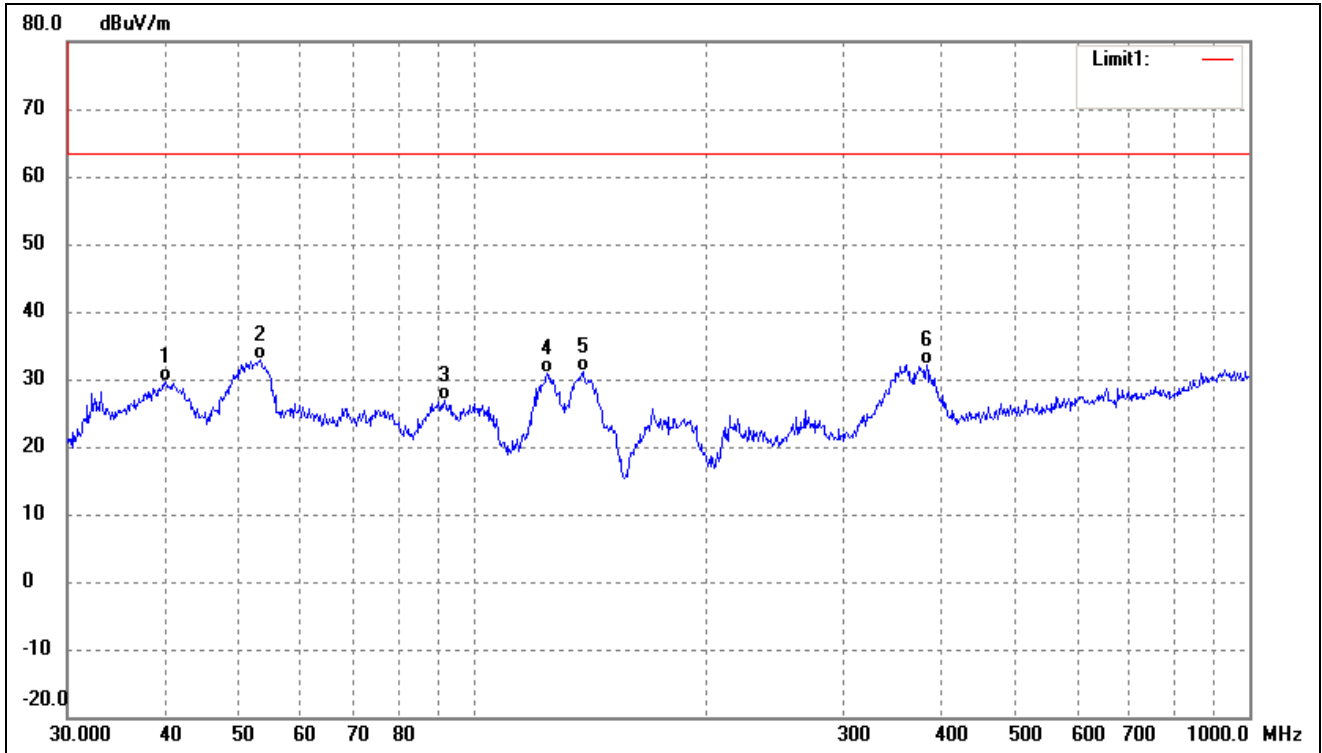
**Plot of Radiated Emissions Test Data ( Above 30MHz)**

Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	32.4059	41.66	-14.02	27.64	63.50	-35.86	-	-	QP
2	52.2079	38.95	-12.15	26.80	63.50	-36.70	-	-	QP
3	124.1330	39.37	-15.40	23.97	63.50	-39.53	-	-	QP
4	187.0958	38.74	-13.46	25.28	63.50	-38.22	-	-	QP
5	272.2776	42.01	-10.77	31.24	63.50	-32.26	-	-	QP
6	365.5391	43.36	-7.29	36.07	63.50	-27.43	-	-	QP

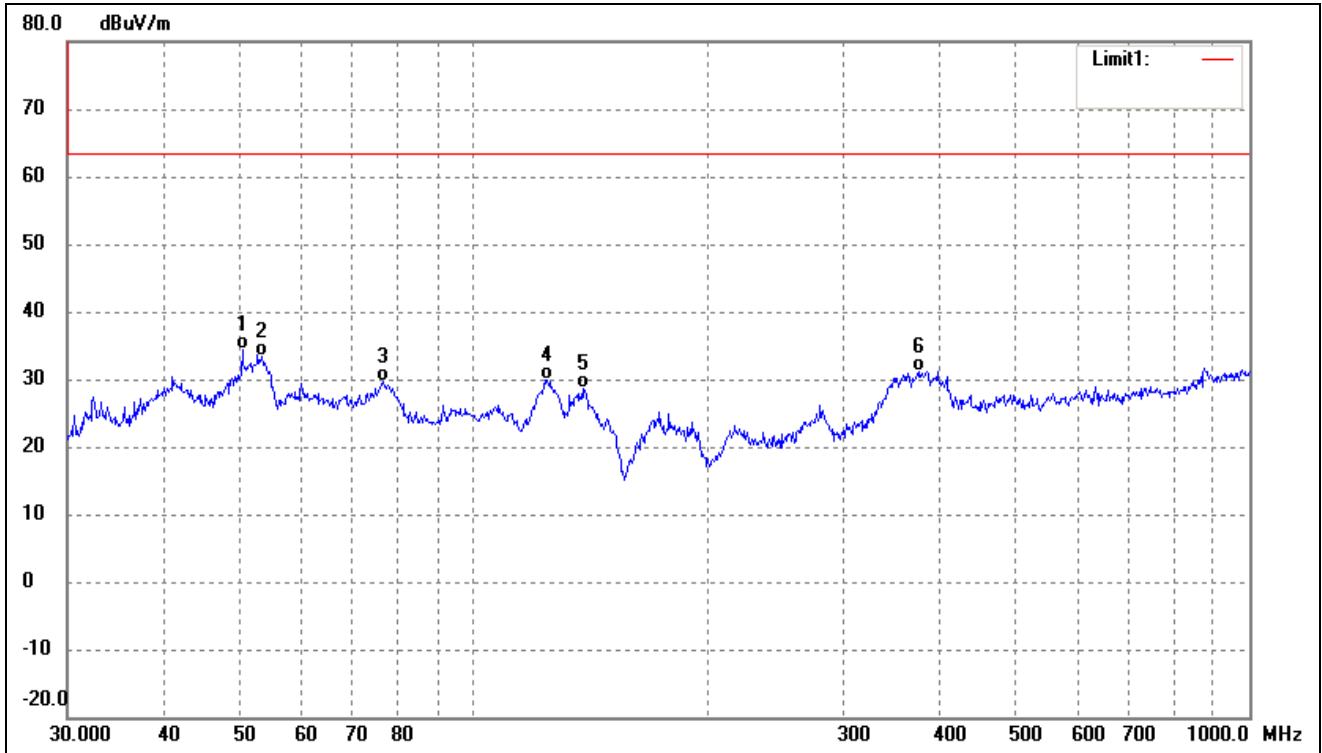
Test mode:	TM1	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	40.1347	41.54	-11.98	29.56	63.50	-33.94	-	-	QP
2	53.1313	45.38	-12.41	32.97	63.50	-30.53	-	-	QP
3	91.8163	41.46	-14.66	26.80	63.50	-36.70	-	-	QP
4	124.5690	46.40	-15.52	30.88	63.50	-32.62	-	-	QP
5	138.3873	47.60	-16.36	31.24	63.50	-32.26	-	-	QP
6	383.9318	39.11	-6.93	32.18	63.50	-31.32	-	-	QP

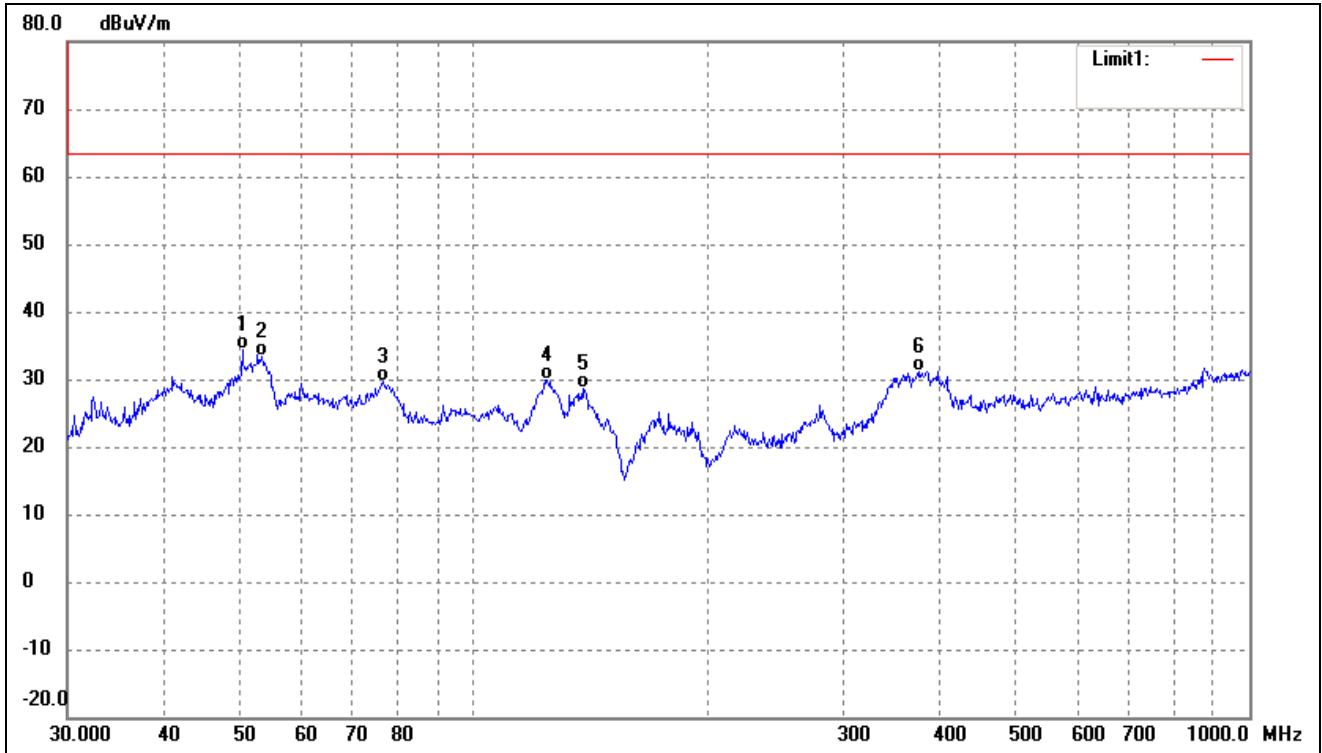


Test mode:	TM2	Polarity:	Horizontal
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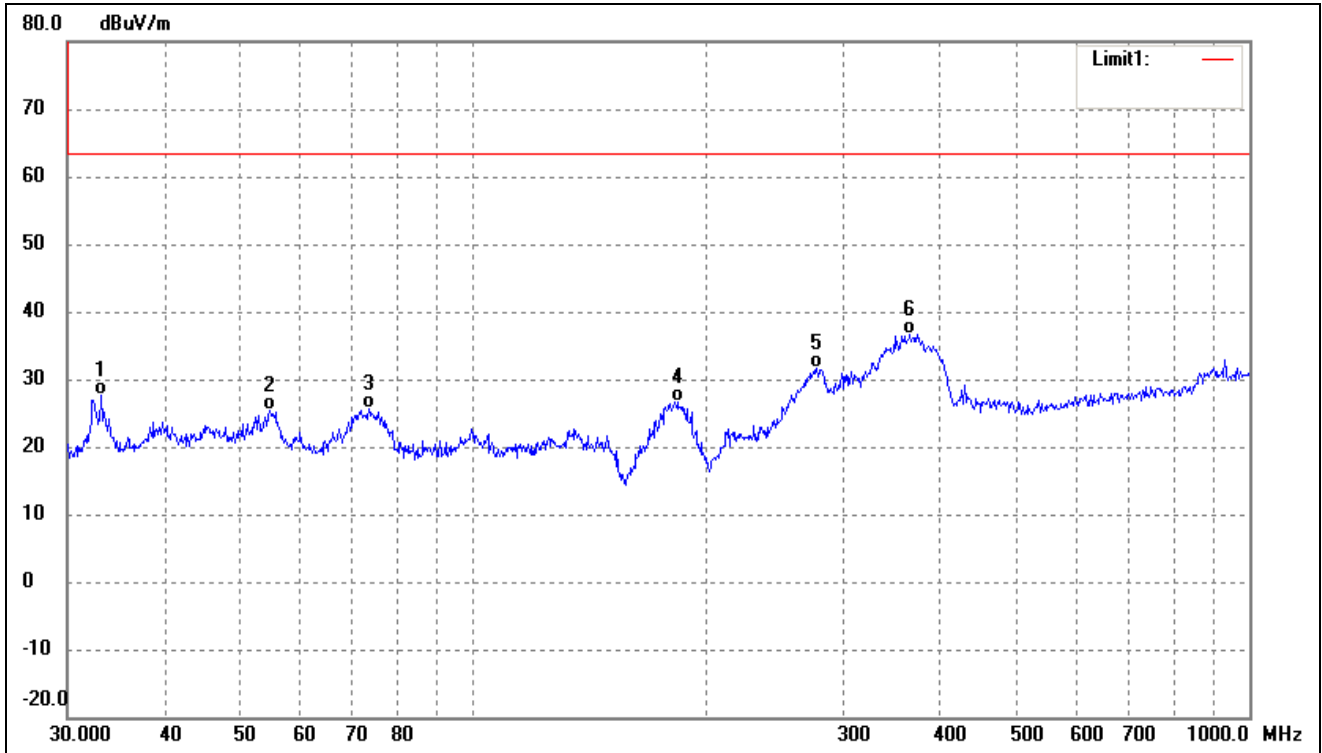
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	50.4089	46.15	-11.65	34.50	63.50	-29.00	-	-	QP
2	53.3179	45.85	-12.47	33.38	63.50	-30.12	-	-	QP
3	76.5121	45.81	-16.27	29.54	63.50	-33.96	-	-	QP
4	124.5690	45.49	-15.52	29.97	63.50	-33.53	-	-	QP
5	138.3873	45.00	-16.36	28.64	63.50	-34.86	-	-	QP
6	374.6226	38.33	-7.19	31.14	63.50	-32.36	-	-	QP

Test mode:	TM2	Polarity:	Vertical
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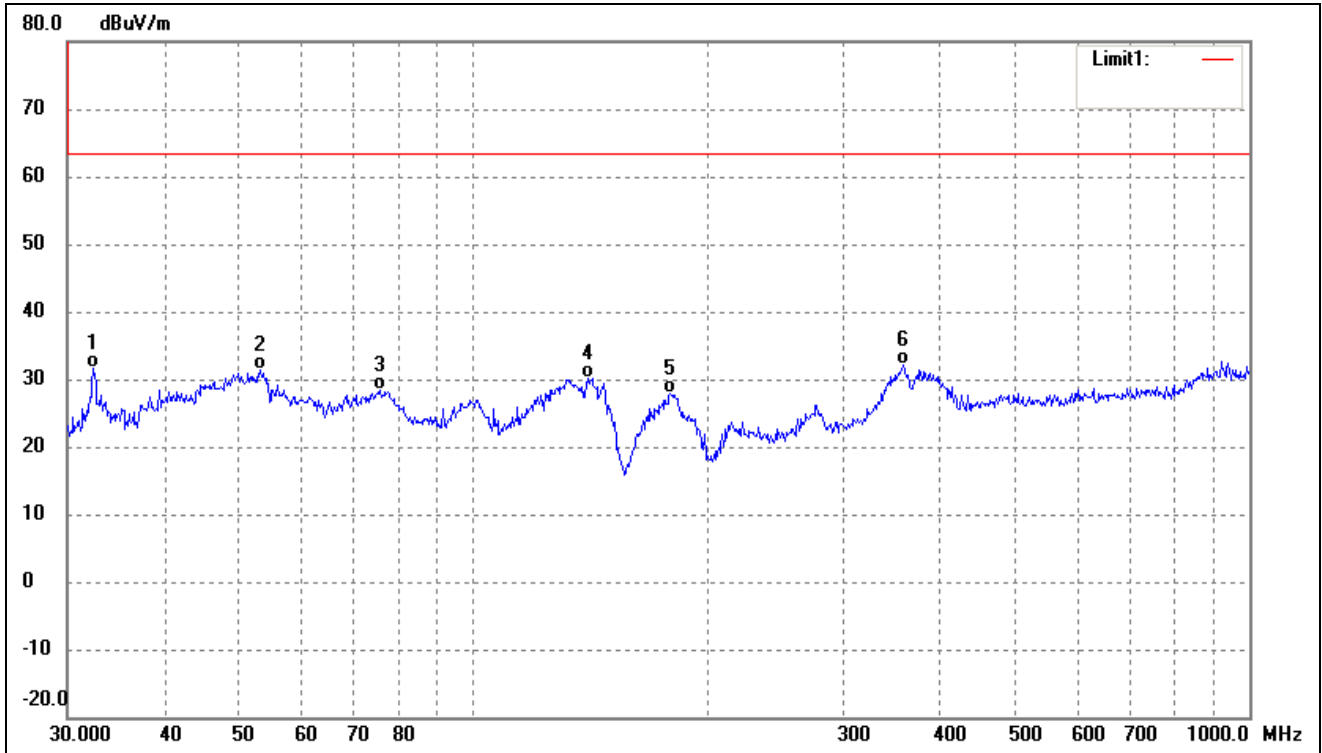
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	50.4089	46.15	-11.65	34.50	63.50	-29.00	-	-	QP
2	53.3179	45.85	-12.47	33.38	63.50	-30.12	-	-	QP
3	76.5121	45.81	-16.27	29.54	63.50	-33.96	-	-	QP
4	124.5690	45.49	-15.52	29.97	63.50	-33.53	-	-	QP
5	138.3873	45.00	-16.36	28.64	63.50	-34.86	-	-	QP
6	374.6226	38.33	-7.19	31.14	63.50	-32.36	-	-	QP

Test mode:	TM3	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	33.2112	41.69	-13.97	27.72	63.50	-35.78	-	-	QP
2	54.6429	38.28	-12.84	25.44	63.50	-38.06	-	-	QP
3	73.3593	41.27	-15.57	25.70	63.50	-37.80	-	-	QP
4	183.2005	40.60	-13.93	26.67	63.50	-36.83	-	-	QP
5	277.0935	42.15	-10.61	31.54	63.50	-31.96	-	-	QP
6	365.5391	43.94	-7.29	36.65	63.50	-26.85	-	-	QP

Test mode:	TM3	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	32.4059	45.65	-14.02	31.63	63.50	-31.87	-	-	QP
2	53.1313	43.83	-12.41	31.42	63.50	-32.08	-	-	QP
3	75.9773	44.48	-16.18	28.30	63.50	-35.20	-	-	QP
4	140.3421	46.40	-16.22	30.18	63.50	-33.32	-	-	QP
5	179.3864	42.28	-14.35	27.93	63.50	-35.57	-	-	QP
6	357.9287	39.48	-7.36	32.12	63.50	-31.38	-	-	QP

Remark: '-' Means the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

\*\*\*\*\* END OF REPORT \*\*\*\*\*