

# FCC Part 18 Measurement and Test Report

For

**Fuse Chicken LLC**

2251 Front Street, Suite 200, Cuyahoga Falls, Ohio, 44221 USA

**FCC ID: 2ARVW-WGA**

<b>Test Rule(s):</b>	<u>FCC Part 18</u>
<b>Product Description:</b>	<u>Gravity Auto</u>
<b>Tested Model:</b>	<u>WGA</u>
<b>Report No.:</b>	<u>STR18118254I</u>
<b>Sample Receipt Date:</b>	<u>2018-11-21</u>
<b>Tested Date:</b>	<u>2018-11-21 to 2018-12-04</u>
<b>Issued Date:</b>	<u>2018-12-04</u>
<b>Tested By:</b>	<u>Jason Su / Engineer</u>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.

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## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: Fuse Chicken LLC  
Address of applicant: 2251 Front Street, Suite 200, Cuyahoga Falls, Ohio,  
44221 USA

Manufacturer: Shenzhen Ucool Technology Co., Ltd  
Address of manufacturer: 3 / f, building A, datang industrial area, datang road,  
guanlan street, longhua district, Shenzhen city

General Description of EUT	
Product Name:	Gravity Auto
Trade Name:	
Model No.:	WGA
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:	110~205kHz
Antenna Type:	Coil Antenna
Rated Voltage:	DC5V/DC 9V (Wireless output)
Rated Current:	1A (Wireless output)
Rated Power:	5W/9W(Wireless output)

## 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

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

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

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

The 3m Semi-anechoic chamber of Shenzhen SEM Test Technology 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 Output	/	Input: DC5V(with a adapter input AC 120V/60Hz)
TM2	Wireless Output	/	Input: DC9V(with a adapter input AC 120V/60Hz)

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.48	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Quick Charge	UGREE	CD122	30387
iPhone 8 Plus	Apple	MQ8E2CH/A	/

Special Cable List and Details

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

## 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	2018-05-22	2019-05-21
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
Amplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
Amplifier	C&D	PAP-1G18	2002	2018-05-22	2019-05-21
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2018-06-07
Horn Antenna	ETS	3117	00086197	2017-06-08	2018-06-07
Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2018-06-07
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2018-05-22	2019-05-21
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2018-05-22	2019-05-21
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2018-05-22	2019-05-21

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## 2. SUMMARY OF TEST RESULTS

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<b>FCC RULES</b>	<b>DESCRIPTION OF TEST</b>	<b>RESULT</b>
§ 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:

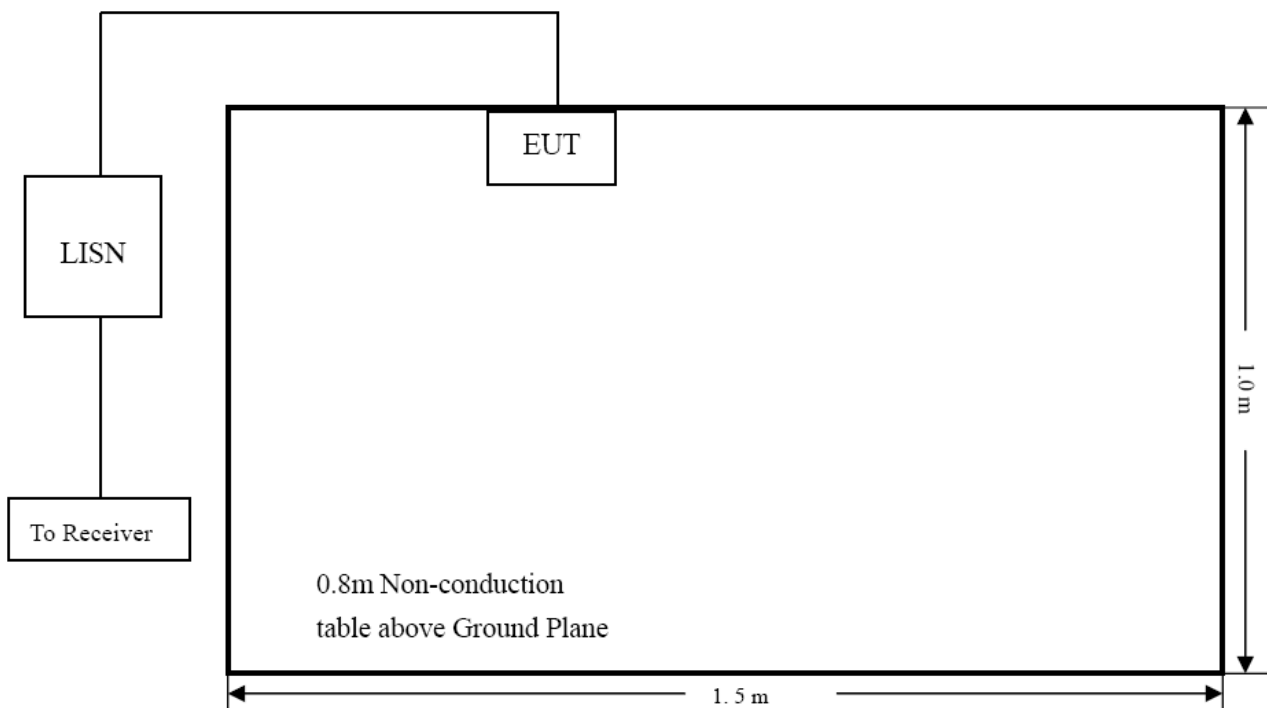
Frequency (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

#### 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:	23.5° C
Relative Humidity:	55%
ATM Pressure:	1016 mbar

### 3.5 Test Receiver Setup

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

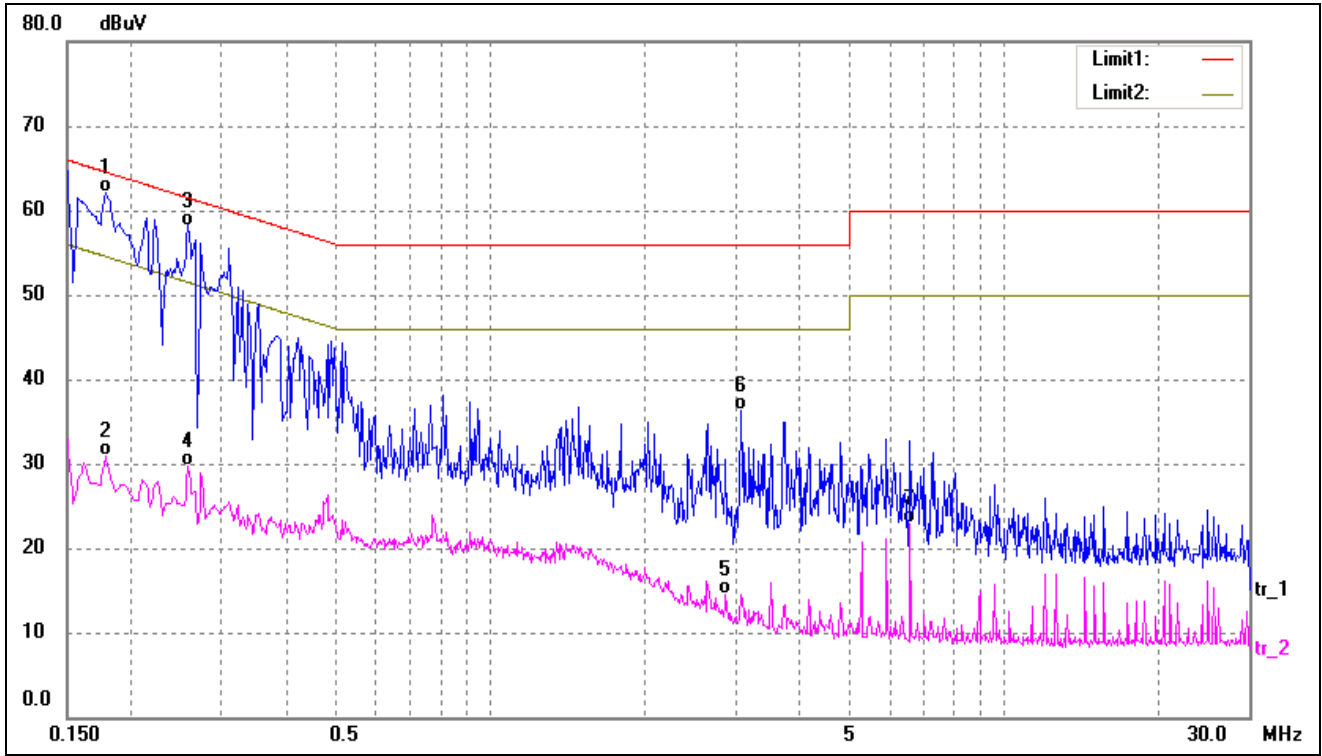
Start Frequency ..... 150 kHz  
Stop Frequency..... 30 MHz  
Sweep Speed ..... Auto  
IF Bandwidth..... 10 kHz  
Quasi-Peak Adapter Bandwidth ..... 9 kHz  
Quasi-Peak Adapter Mode ..... Normal

### 3.6 Summary of Test Results/Plots

According to the data in this section, the EUT complied with the FCC Part 18C Conducted margin for Any non-ISM frequency device, with the *worst* margin reading of:

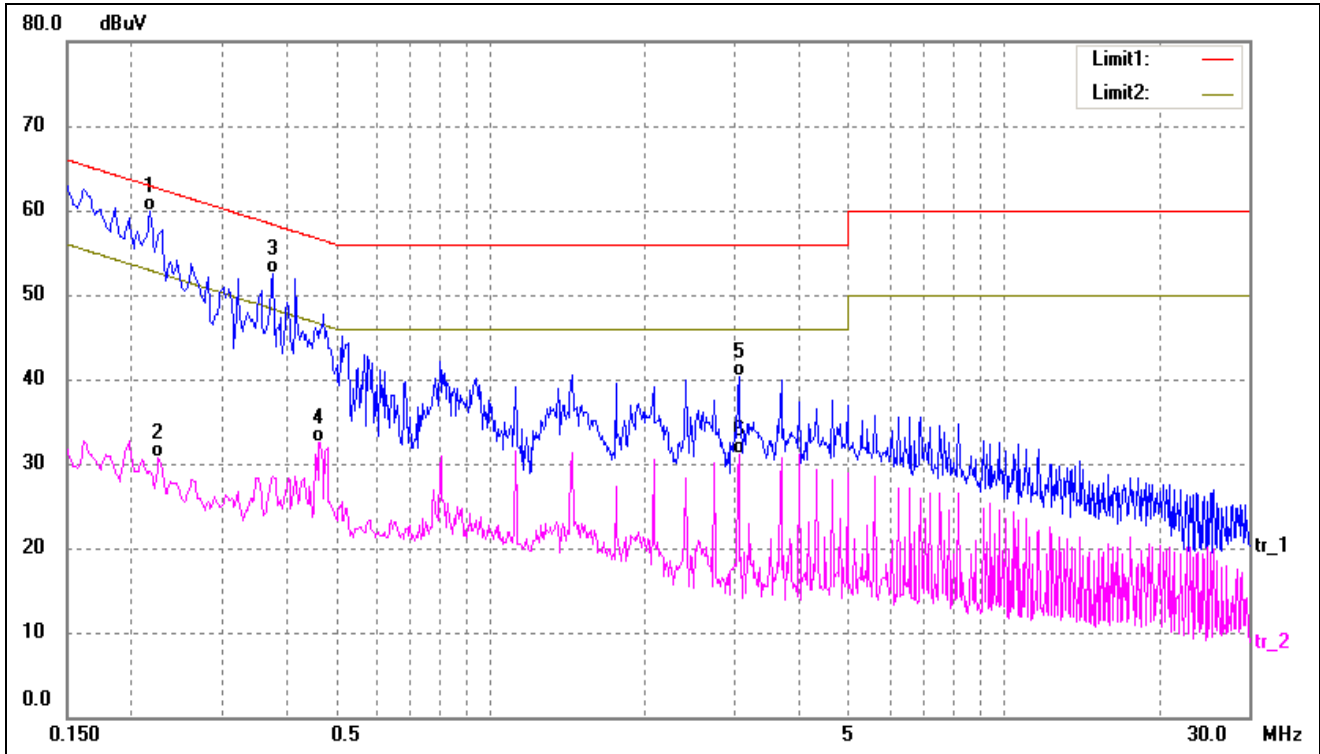
**-2.81 dB at 0.1660 MHz in the Line, QP detector, TM2 detector, 0.15-30MHz**

Test mode:	TM1	Polarity:	Line
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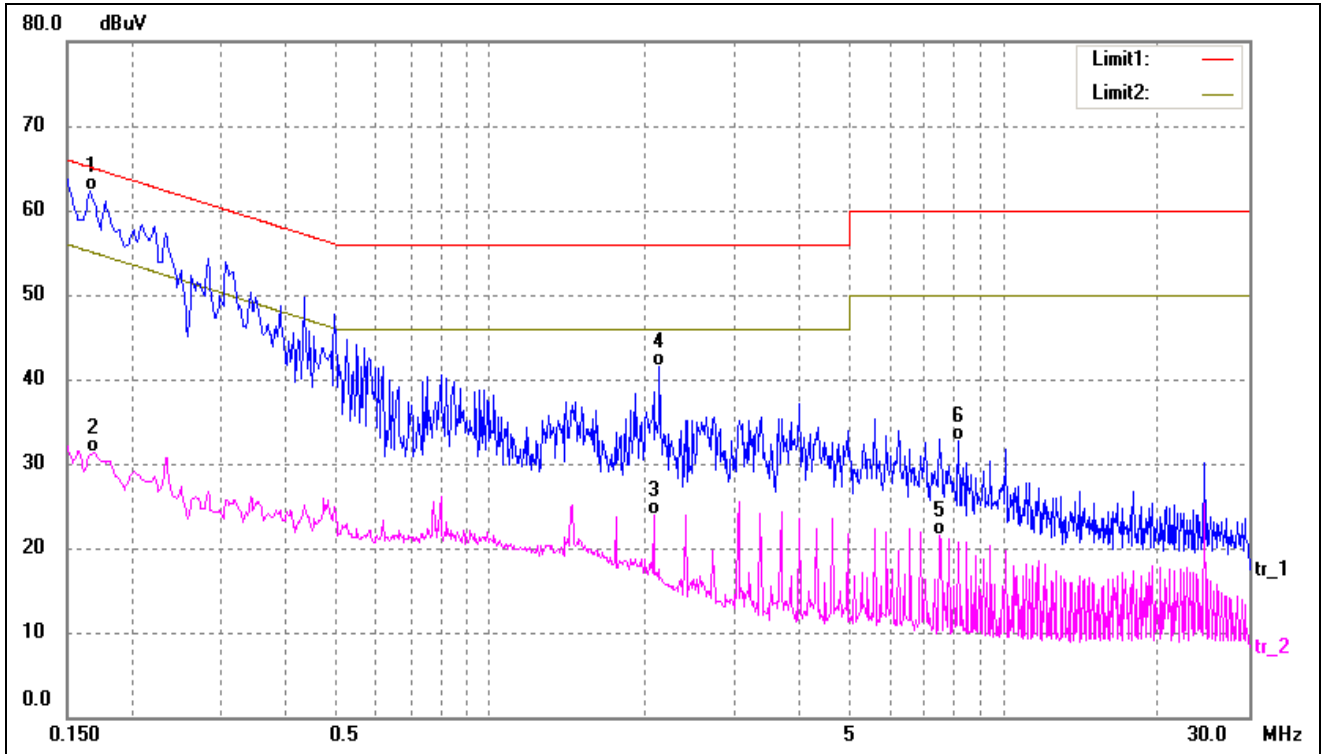
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1780	52.09	10.11	62.20	64.58	-2.38	QP
2	0.1780	20.88	10.11	30.99	54.58	-23.59	AVG
3	0.2580	48.04	10.16	58.20	61.50	-3.30	QP
4	0.2580	19.52	10.16	29.68	51.50	-21.82	AVG
5	2.8820	3.90	10.67	14.57	46.00	-31.43	AVG
6	3.0780	25.66	10.68	36.34	56.00	-19.66	QP
7	6.5620	12.01	10.82	22.83	50.00	-27.17	AVG

Test mode:	TM2	Polarity:	Neutral
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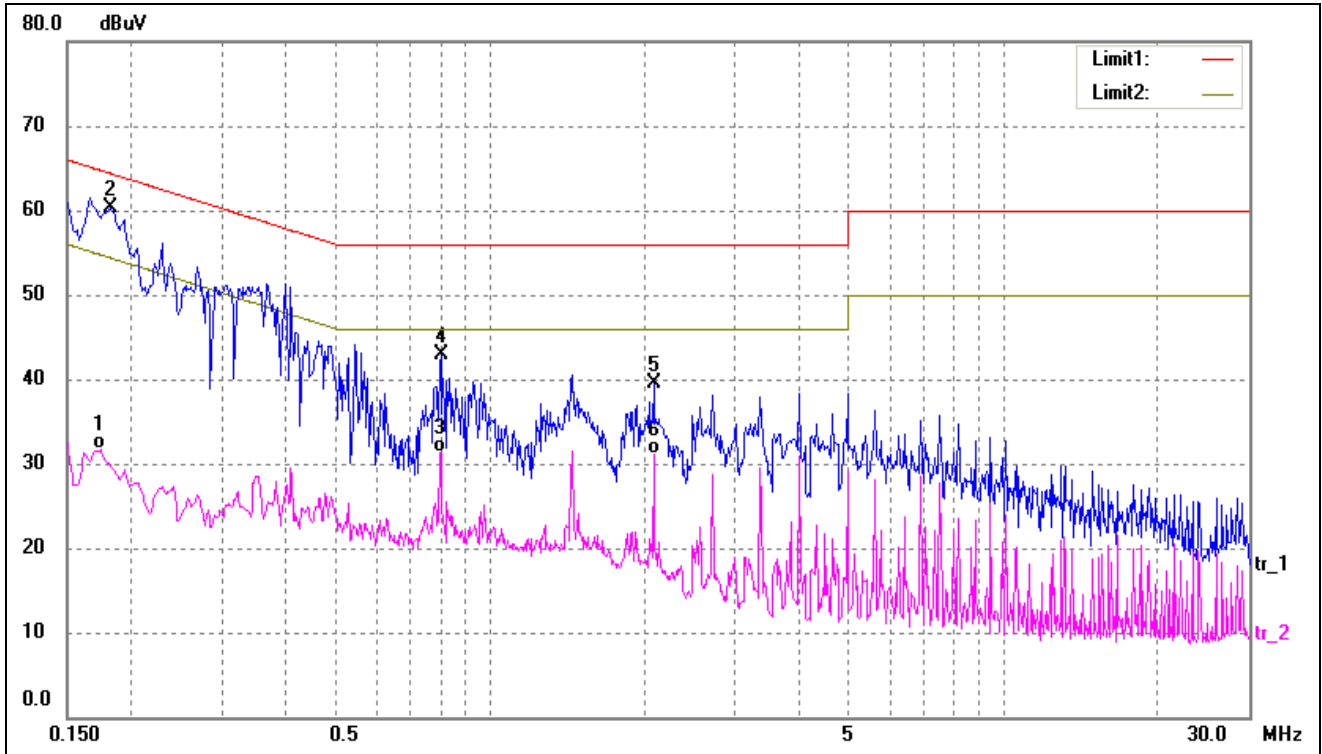
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.2180	49.81	10.13	59.94	62.89	-2.95	QP
2	0.2260	20.55	10.14	30.69	52.60	-21.91	AVG
3	0.3780	42.32	10.24	52.56	58.32	-5.76	QP
4	0.4660	22.30	10.28	32.58	46.58	-14.00	AVG
5	3.0420	29.64	10.68	40.32	56.00	-15.68	QP
6	3.0420	20.48	10.68	31.16	46.00	-14.84	AVG

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*	0.1660	52.24	10.11	62.35	65.16	-2.81	QP
2	0.1700	21.11	10.11	31.22	54.96	-23.74	AVG
3	2.0820	13.32	10.61	23.93	46.00	-22.07	AVG
4	2.1380	30.83	10.62	41.45	56.00	-14.55	QP
5	7.5220	10.74	10.86	21.60	50.00	-28.40	AVG
6	8.1620	21.90	10.89	32.79	60.00	-27.21	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	0.1740	21.50	10.11	31.61	54.77	-23.16	AVG
2*	0.1820	50.12	10.11	60.23	64.39	-4.16	QP
3	0.7980	20.92	10.43	31.35	46.00	-14.65	AVG
4	0.8020	32.38	10.43	42.81	56.00	-13.19	QP
5	2.0820	28.83	10.61	39.44	56.00	-16.56	QP
6	2.0820	20.44	10.61	31.05	46.00	-14.95	AVG

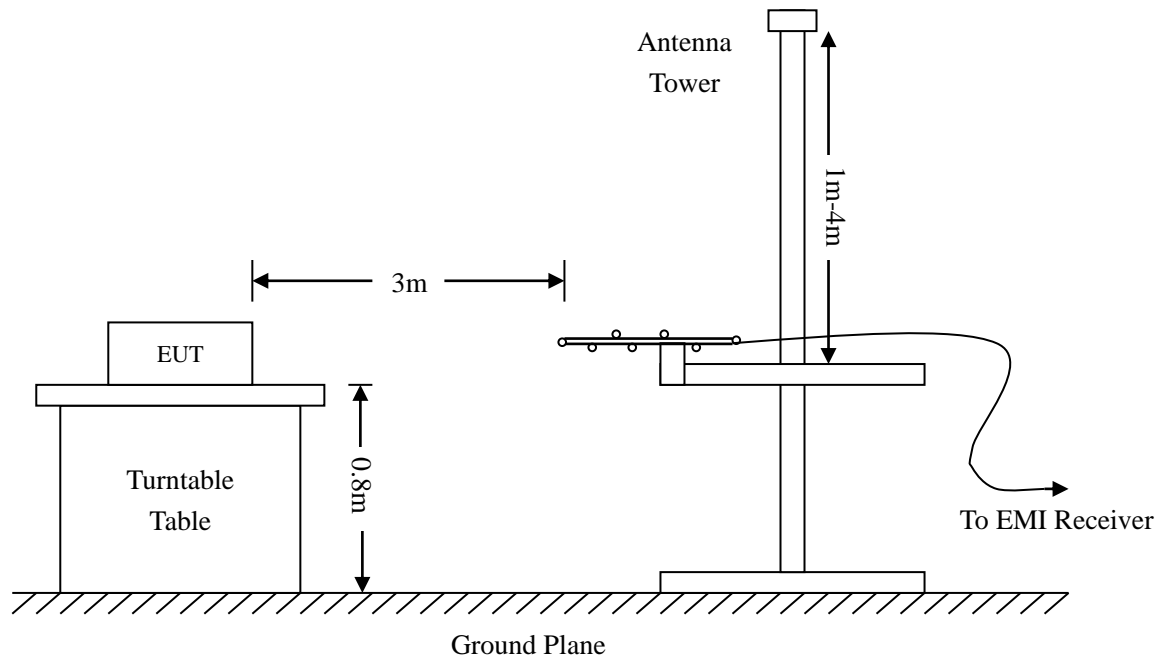
## 4. Radiated Emissions

### 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.



### 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  $-6\text{dB}\mu\text{V}$  means the emission is  $6\text{dB}\mu\text{V}$  below the maximum limit for Any non-ISM frequency device. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 18.305 Limit

#### 4.4 Environmental Conditions

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

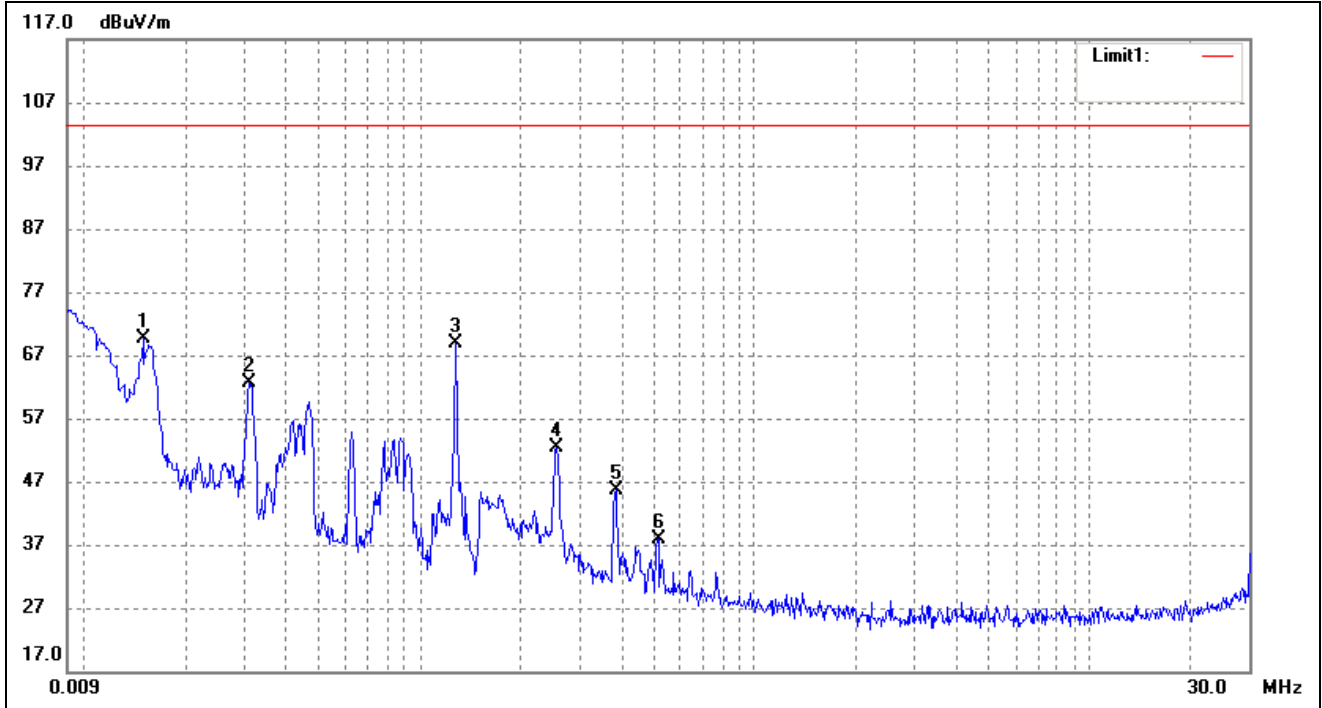
#### 4.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 18.305 rule, and had the worst margin of:

**-25.77 dB at 64.4331 MHz in the Vertical polarization, TM1 mode, 3Meters**

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

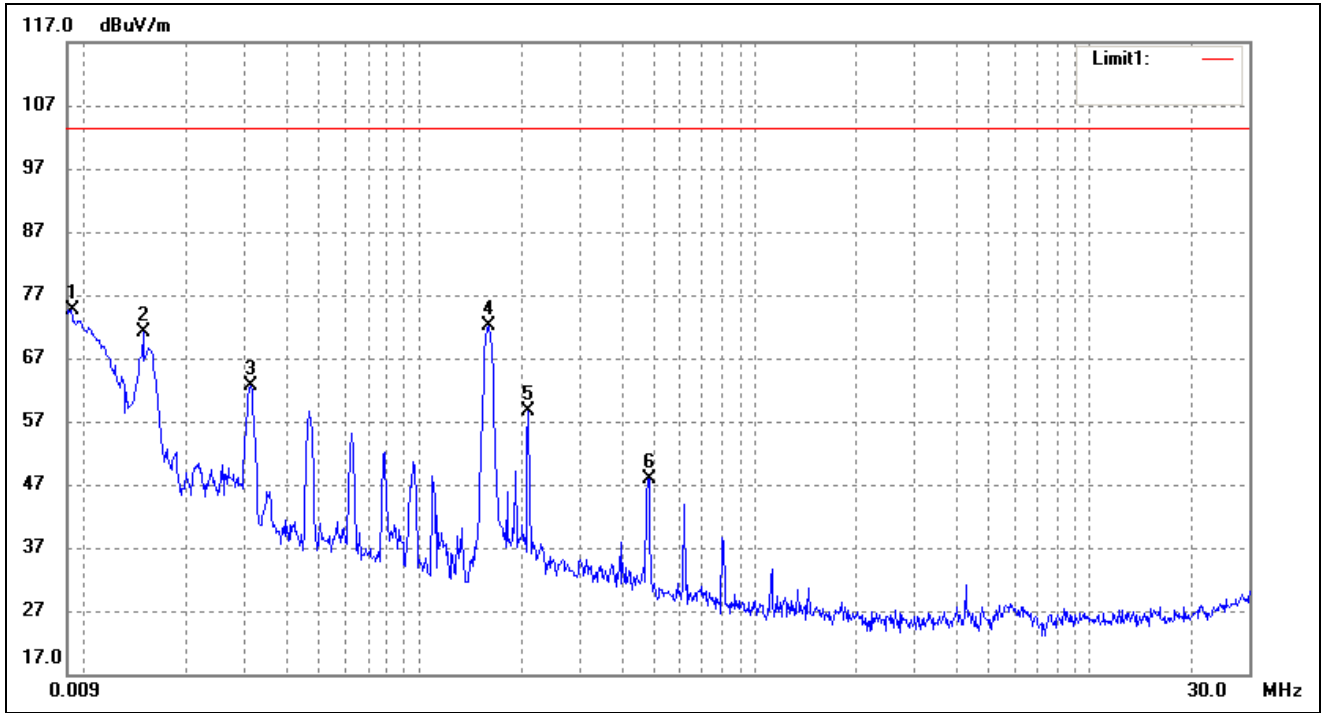
Test mode:	TM1	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	0.0150	76.04	-6.38	69.66	103.50	-33.84	301	100	peak
2	0.0312	69.62	-7.10	62.52	103.50	-40.98	99	100	peak
3	0.1281	74.58	-5.61	68.97	103.50	-34.53	97	100	peak
4	0.2562	58.80	-6.48	52.32	103.50	-51.18	114	100	peak
5	0.3832	53.19	-7.67	45.52	103.50	-57.98	280	100	peak
6	0.5128	46.67	-8.78	37.89	103.50	-65.61	266	100	peak



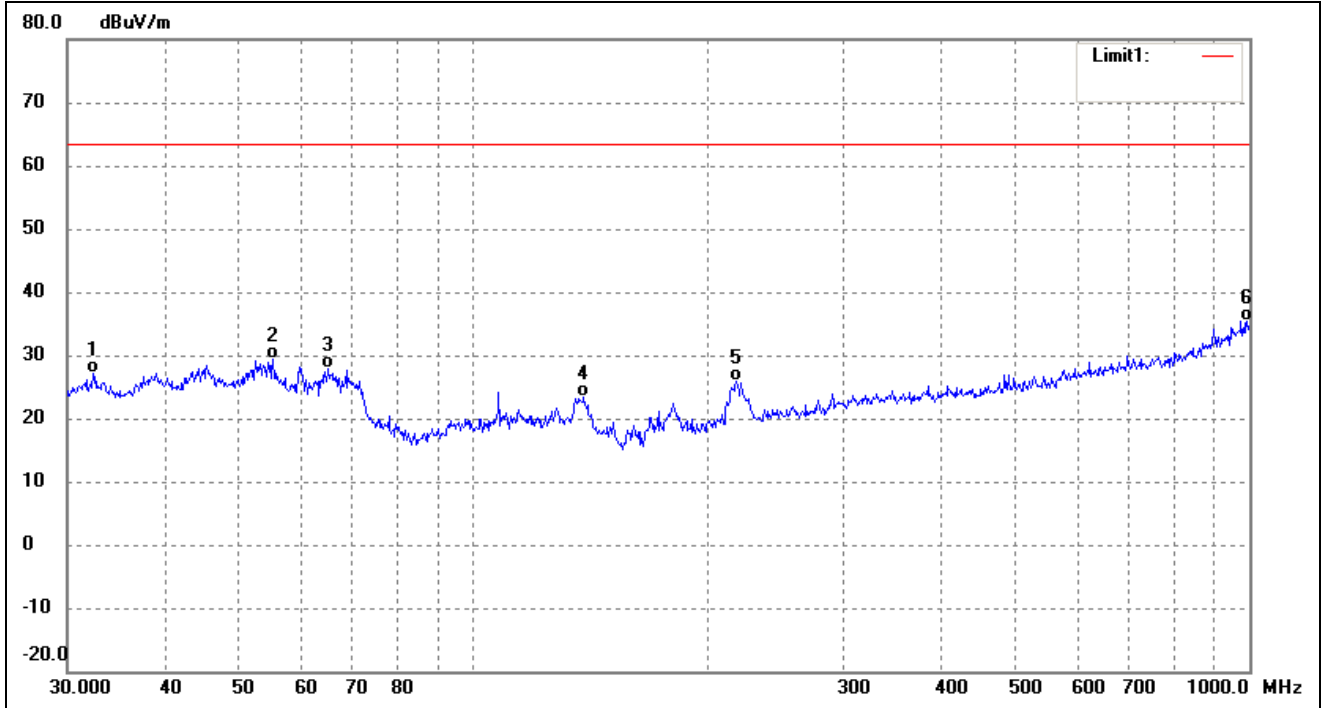
Test mode:	TM2	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	0.0092	80.28	-5.65	74.63	103.50	-28.87	337	100	peak
2	0.0150	77.41	-6.38	71.03	103.50	-32.47	336	100	peak
3	0.0313	69.63	-7.09	62.54	103.50	-40.96	50	100	peak
4	0.1598	77.46	-5.42	72.04	103.50	-31.46	108	100	peak
5	0.2106	64.59	-5.88	58.71	103.50	-44.79	88	100	peak
6	0.4812	56.56	-8.59	47.97	103.50	-55.53	139	100	peak

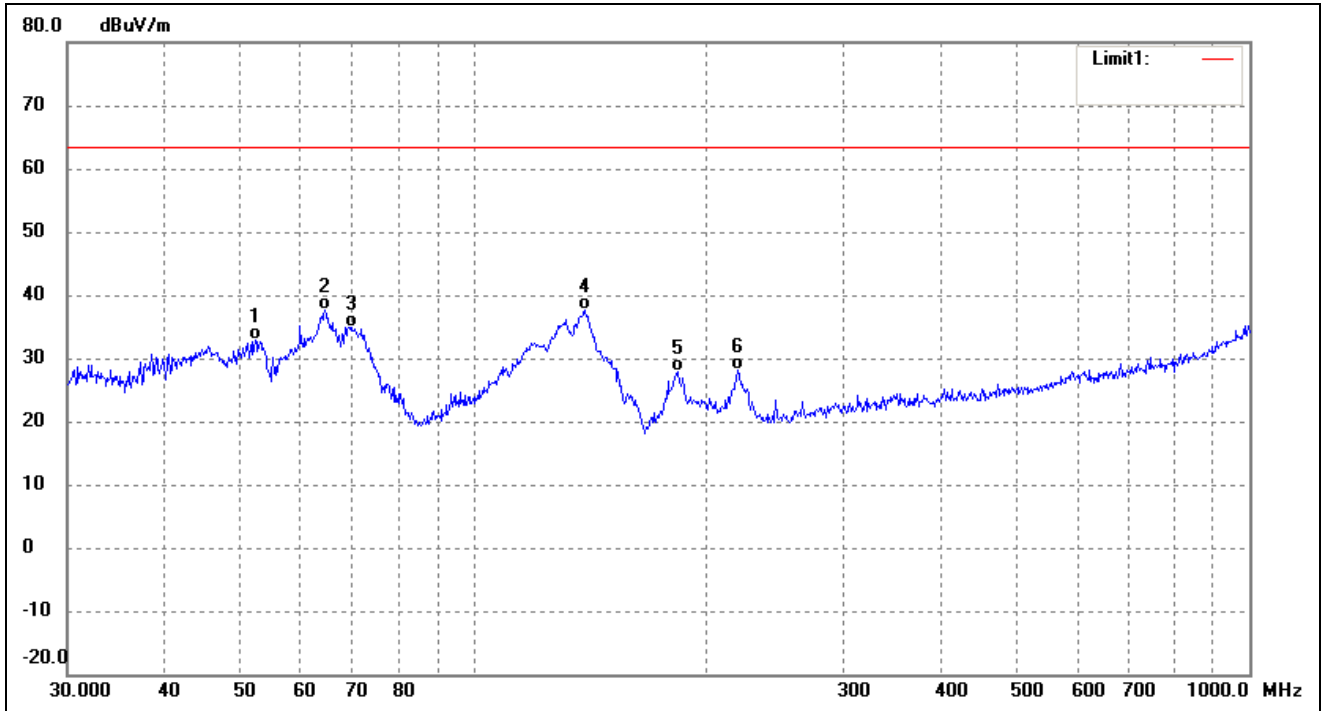
**Plot of Radiated Emissions Test Data ( Above 30MHz)**

Test mode:	TM1	Polarity:	Horizontal
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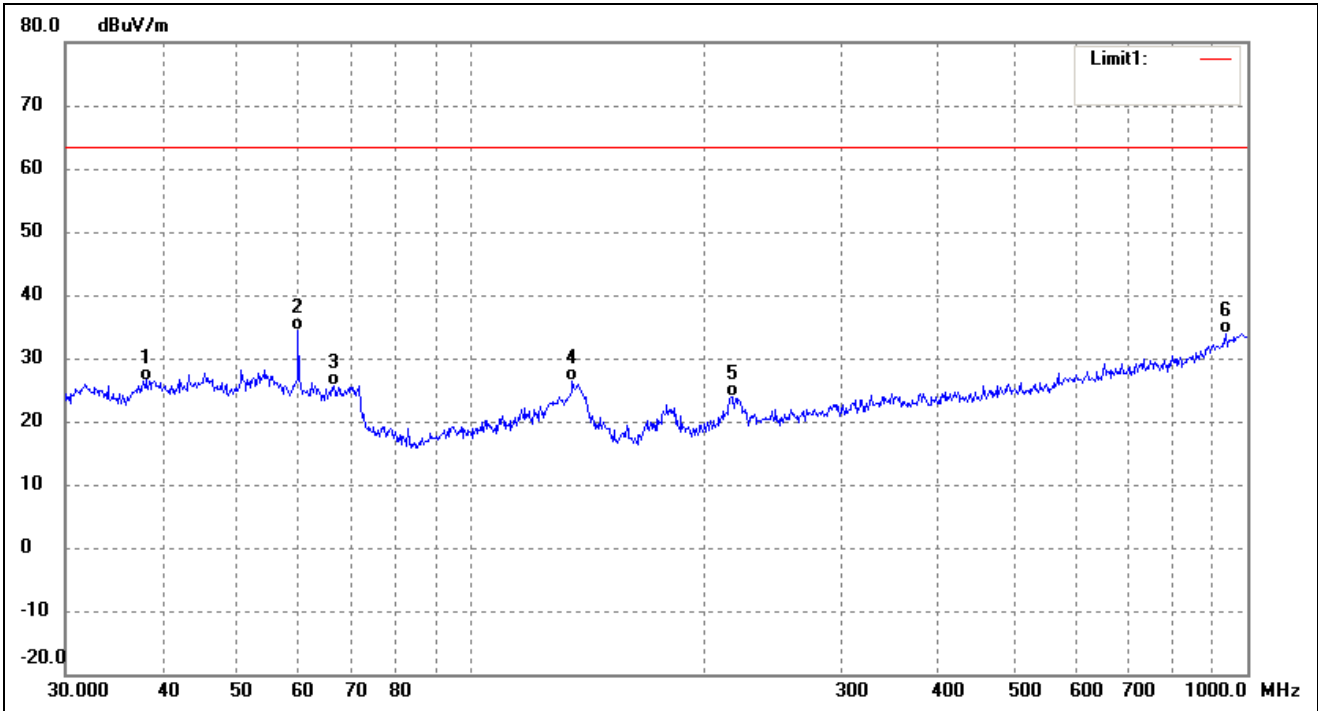
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	32.4059	36.90	-9.74	27.16	63.50	-36.34	307	100	QP
2	55.2207	38.65	-9.34	29.31	63.50	-34.19	100	100	QP
3	65.1145	39.99	-12.21	27.78	63.50	-35.72	138	100	QP
4	138.8735	41.03	-17.63	23.40	63.50	-40.10	100	100	QP
5	218.3085	38.39	-12.61	25.78	63.50	-37.72	136	100	QP
6	993.0114	31.48	3.93	35.41	63.50	-28.09	260	100	QP

Test mode:	TM1	Polarity:	Vertical
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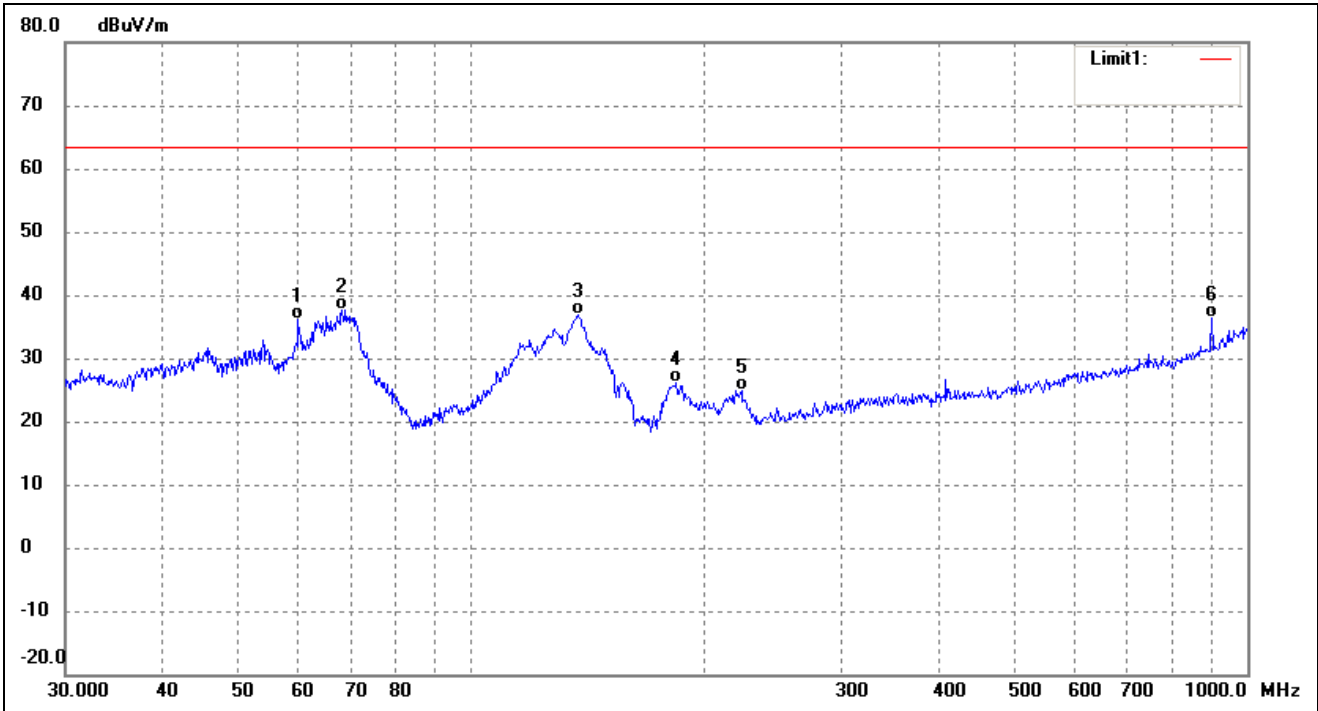
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	52.3913	41.53	-8.66	32.87	63.50	-30.63	60	100	QP
2	64.4331	49.77	-12.04	37.73	63.50	-25.77	304	100	QP
3	69.8450	49.40	-14.45	34.95	63.50	-28.55	76	100	QP
4	139.3613	55.29	-17.61	37.68	63.50	-25.82	302	100	QP
5	183.8440	42.46	-14.69	27.77	63.50	-35.73	87	100	QP
6	219.0753	40.57	-12.54	28.03	63.50	-35.47	151	100	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	38.0783	35.26	-8.76	26.50	63.50	-37.00	82	100	QP
2	59.8588	45.49	-11.04	34.45	63.50	-29.05	152	100	QP
3	66.4989	38.51	-12.87	25.64	63.50	-37.86	142	100	QP
4	135.0319	44.21	-17.77	26.44	63.50	-37.06	148	100	QP
5	216.7828	36.70	-12.76	23.94	63.50	-39.56	136	100	QP
6	938.8326	31.58	2.28	33.86	63.50	-29.64	302	100	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	59.8588	47.28	-11.04	36.24	63.50	-27.26	225	100	QP
2	68.1514	51.16	-13.65	37.51	63.50	-25.99	97	100	QP
3	137.4202	54.52	-17.69	36.83	63.50	-26.67	84	100	QP
4	183.8440	40.75	-14.69	26.06	63.50	-37.44	115	100	QP
5	222.9502	37.30	-12.41	24.89	63.50	-38.61	127	100	QP
6	900.1474	35.11	1.39	36.50	63.50	-27.00	255	100	QP

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