

FCC Part 15B
Measurement and Test Report
For
PICOGEAR
11 Rue de la Tombe Issoire 75014 PARIS France

FCC ID: 2A089PGRX2

FCC Rule(s):	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>Wireless microphone receiver</u>
Tested Model:	<u>PG-RX2</u>
Report No.:	<u>STR18078394I-2</u>
Sample Receipt Date:	<u>2018-07-31</u>
Tested Date:	<u>2018-08-01 to 2018-08-23</u>
Issued Date:	<u>2018-08-23</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: PICOGEAR
Address of applicant: 11 Rue de la Tombe Issoire 75014 PARIS France

Manufacturer: PICOGEAR
Address of manufacturer: 11 Rue de la Tombe Issoire 75014 PARIS France

General Description of EUT	
Product Name:	Wireless microphone receiver
Trade Name:	PicoGear
Model No.:	PG-RX2
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 3.7V by Battery
Rated Current:	/
Rated Power:	/
Power Adapter Model:	/
Lowest Internal Frequency:	32MHz
Highest Internal Frequency:	2479MHz
Classification of ITE:	Class B

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15 Subpart B: Unintentional Radiators

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. 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	Receiving	/	AC120V 60Hz for adapter
TM2	Downloading firmware	/	USB 5V Connected to PC

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
/	/	/	/

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 ± 3.74 dB
		0.15-30MHz ± 3.34 dB
Radiated Emissions	Radiated	30-200MHz ± 4.52 dB
		0.2-1GHz ± 5.56 dB
		1-6GHz ± 3.84 dB
		6-18GHz ± 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	2020-06-07
Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
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

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

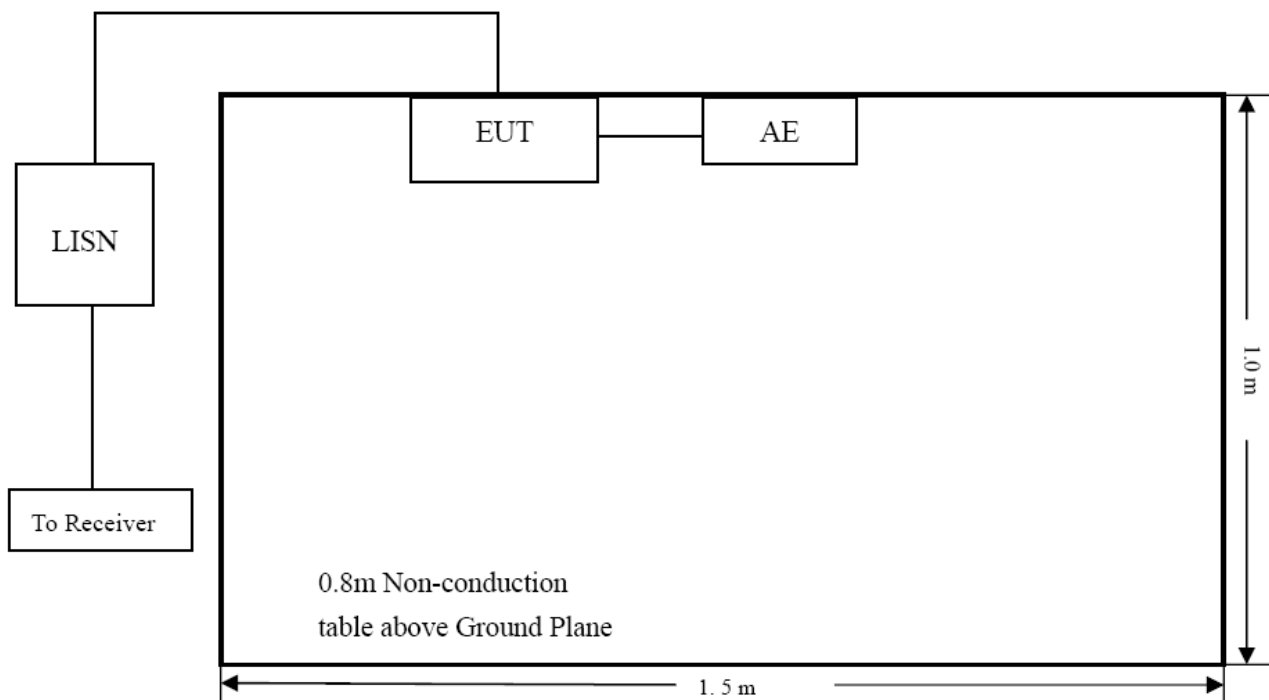
N/A: not applicable

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of 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.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

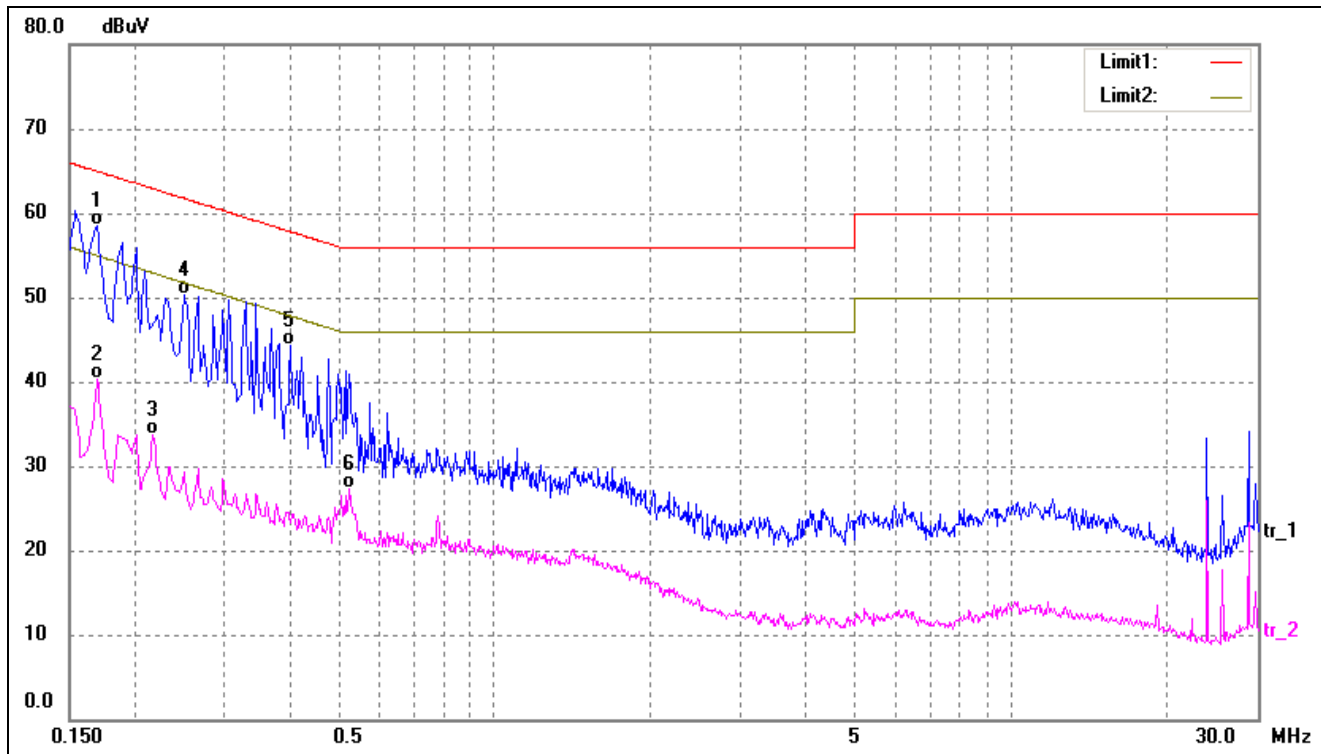
3.4 Summary of Test Results/Plots

According to the data in section 3.5, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

-4.57 dB at 0.1620 MHz in the Neutral, QP detector, TM1 mode, 0.15-30MHz

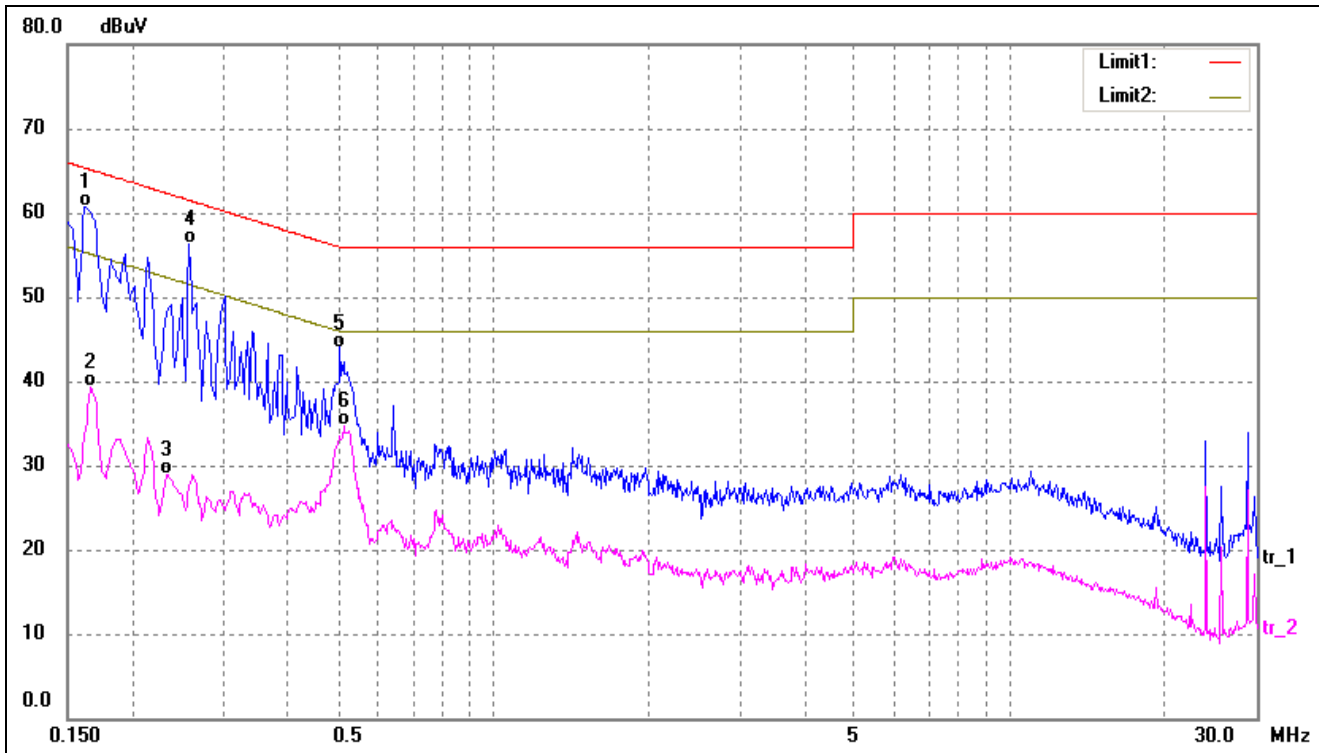
3.5 Conducted Emissions Test Data

Test mode:	TM1	Polarity:	Line
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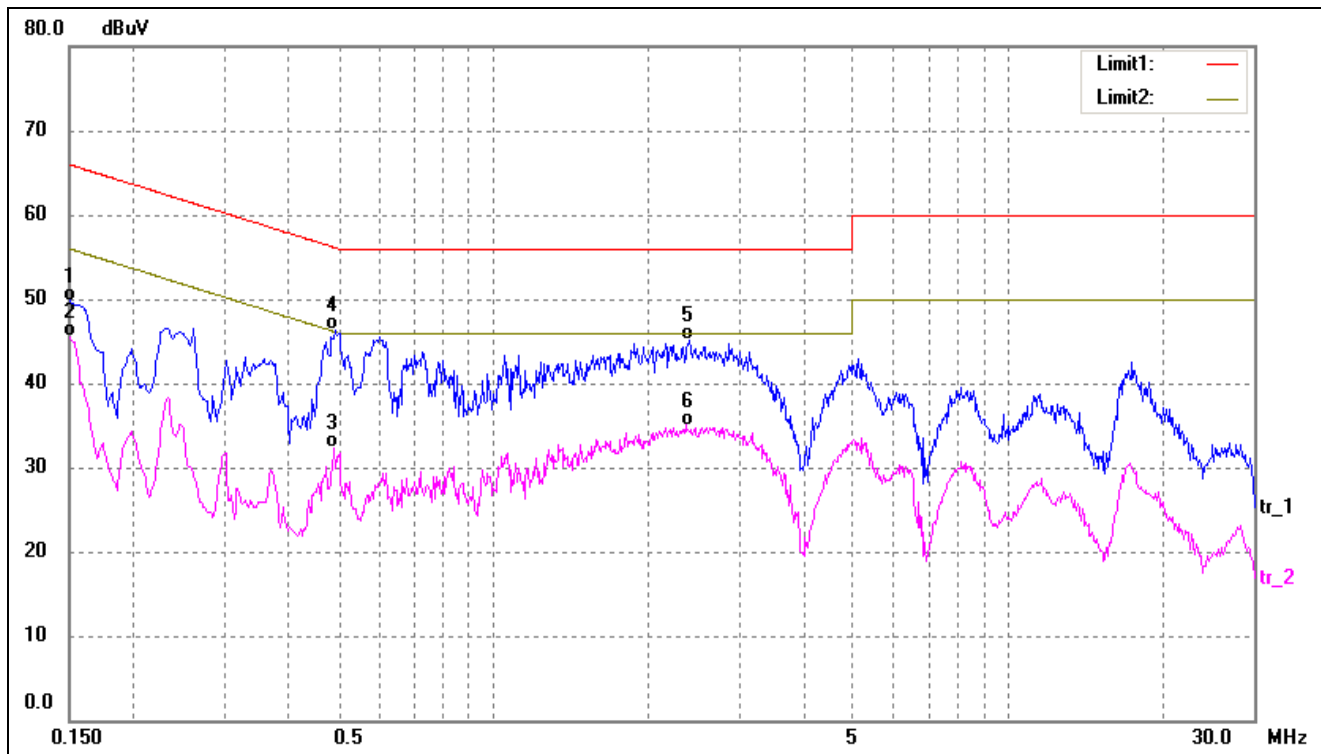
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1700	48.30	10.11	58.41	64.96	-6.55	QP
2	0.1700	30.14	10.11	40.25	54.96	-14.71	AVG
3	0.2180	23.64	10.13	33.77	52.89	-19.12	AVG
4	0.2500	40.24	10.16	50.40	61.75	-11.35	QP
5	0.4020	34.13	10.25	44.38	57.81	-13.43	QP
6	0.5220	17.04	10.30	27.34	46.00	-18.66	AVG

Test mode:	TM1	Polarity:	Neutral
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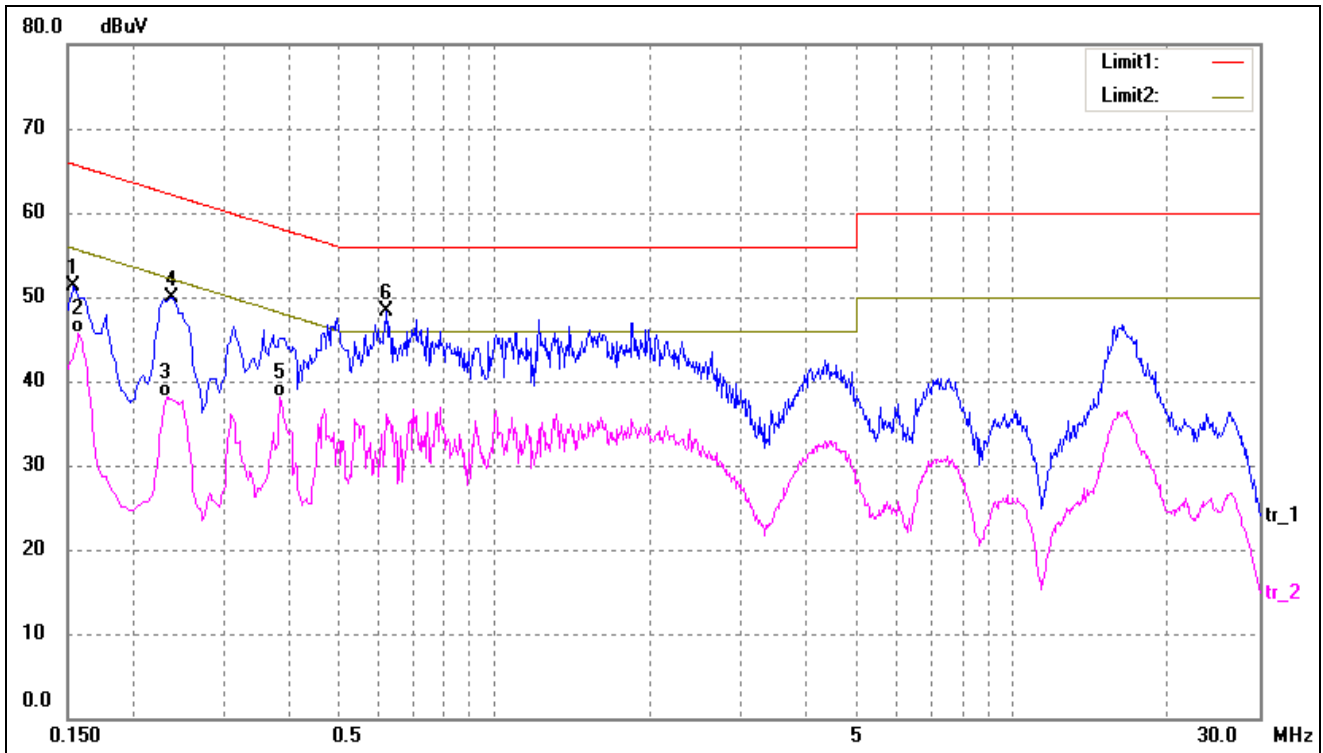
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1620	50.69	10.10	60.79	65.36	-4.57	QP
2	0.1660	29.20	10.11	39.31	55.15	-15.84	AVG
3	0.2340	18.79	10.14	28.93	52.30	-23.37	AVG
4	0.2580	46.06	10.16	56.22	61.49	-5.27	QP
5	0.5060	33.71	10.29	44.00	56.00	-12.00	QP
6	0.5140	24.41	10.29	34.70	46.00	-11.30	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	0.1500	39.70	10.10	49.80	66.00	-16.20	QP
2	0.1500	35.47	10.10	45.57	56.00	-10.43	AVG
3	0.4900	21.97	10.29	32.26	46.17	-13.91	AVG
4*	0.4940	36.11	10.29	46.40	56.10	-9.70	QP
5	2.4020	34.48	10.63	45.11	56.00	-10.89	QP
6	2.4020	24.29	10.63	34.92	46.00	-11.08	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	41.26	10.10	51.36	65.78	-14.42	peak
2	0.1580	35.63	10.10	45.73	55.57	-9.84	AVG
3	0.2340	27.87	10.14	38.01	52.31	-14.30	AVG
4	0.2380	39.81	10.15	49.96	62.17	-12.21	peak
5	0.3860	27.78	10.24	38.02	48.15	-10.13	AVG
6*	0.6180	37.86	10.35	48.21	56.00	-7.79	peak

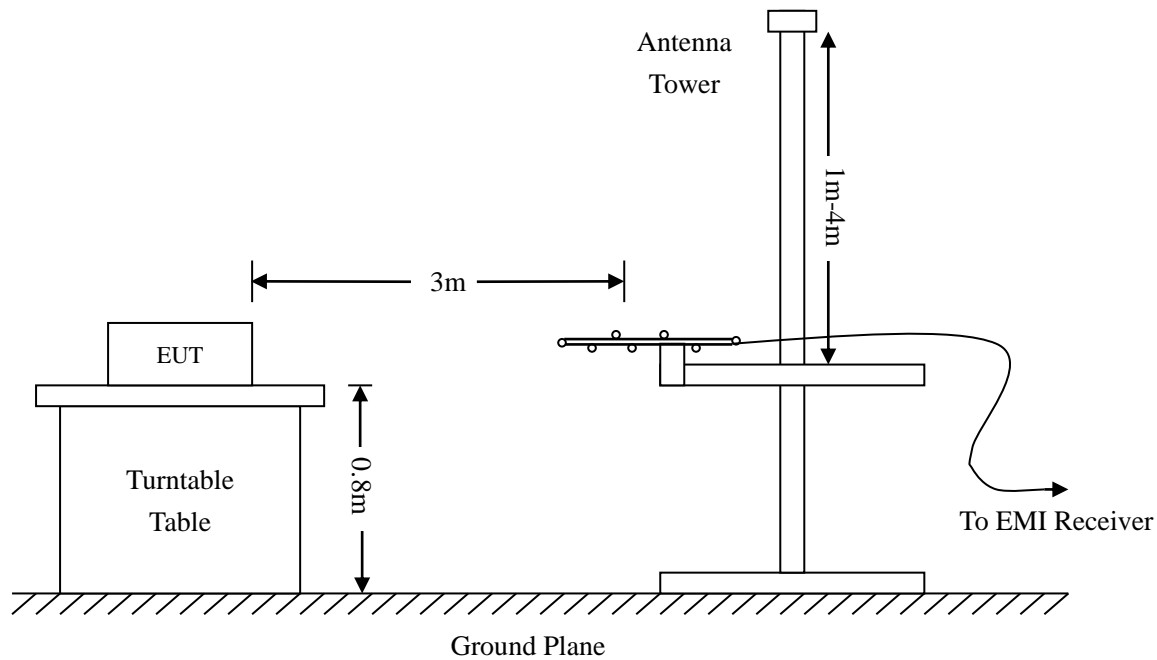
4. RADIATED EMISSION

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 15.109 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 -6dB μ V means the emission is 6dB μ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

4.4 Environmental Conditions

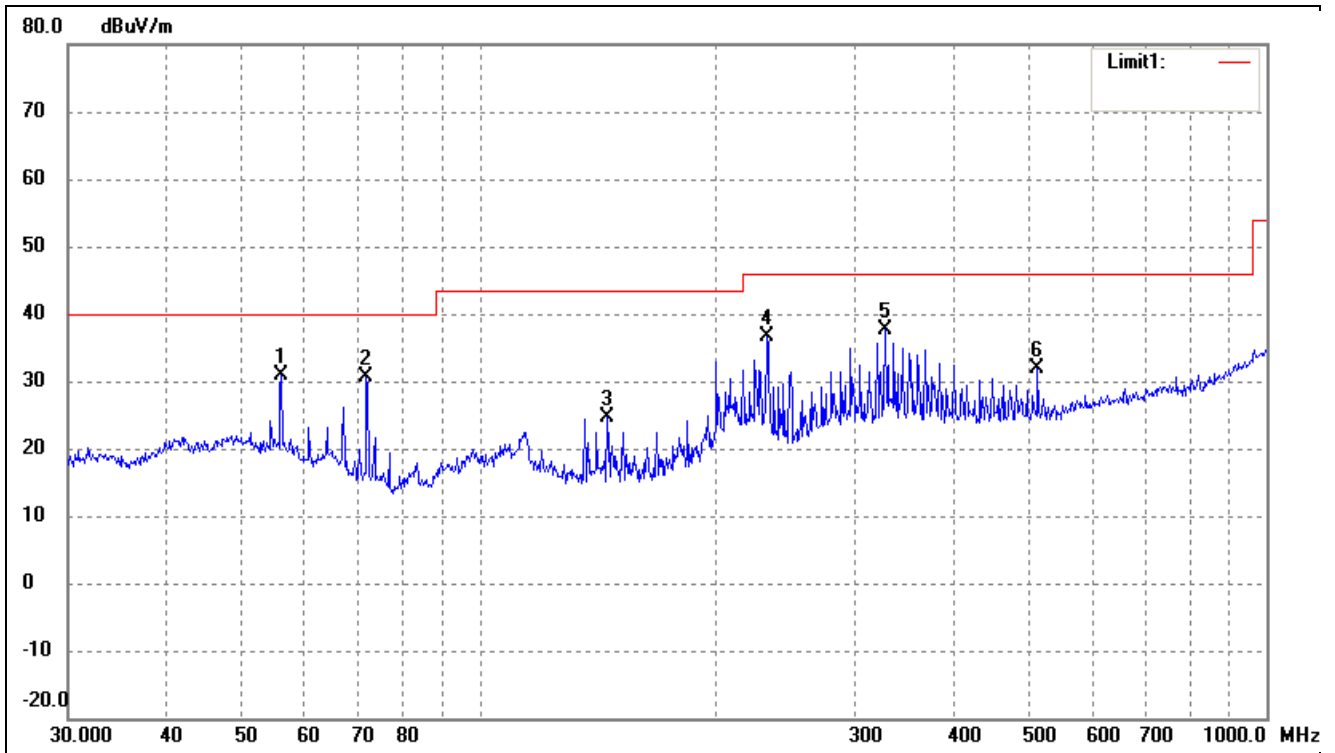
Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

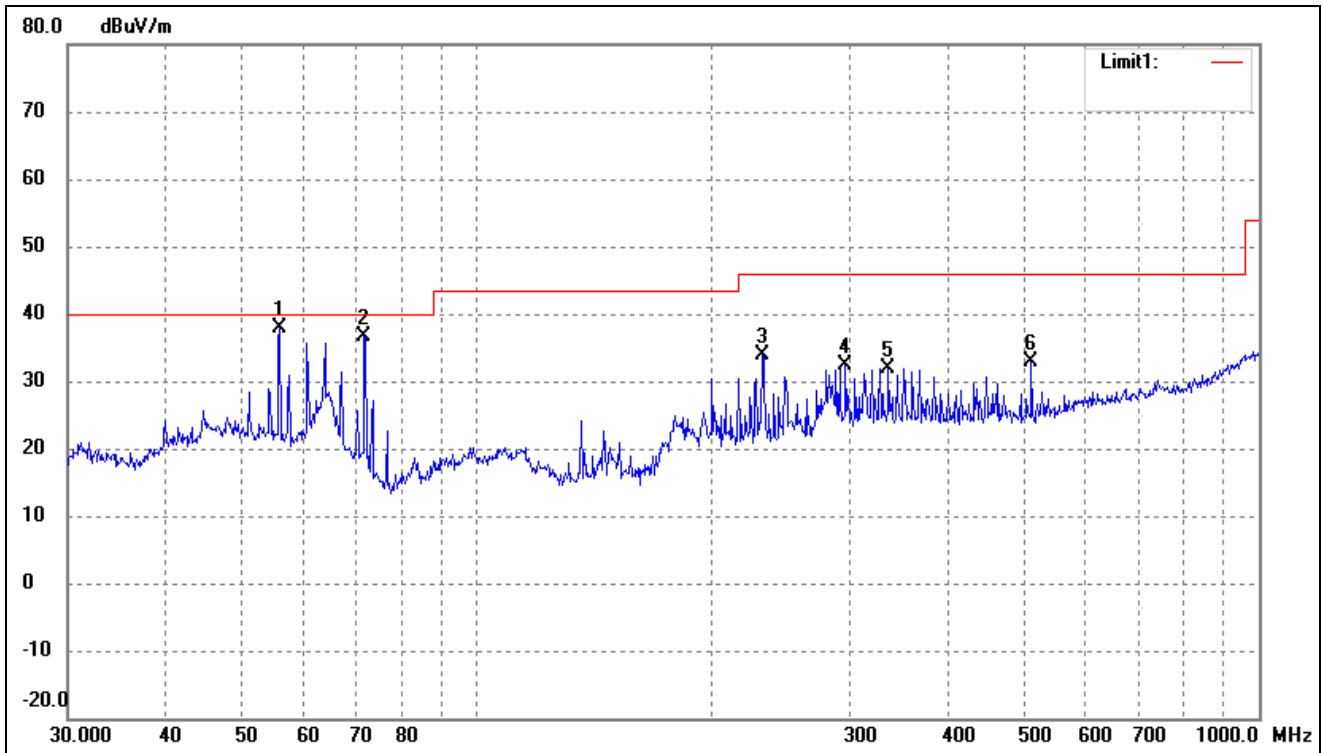
-2.14 dB at 56.0007 MHz in the Vertical polarization, TM1 mode, 9 kHz to 13 GHz, 3Meters

Test mode:	TM1	Polarity:	Horizontal
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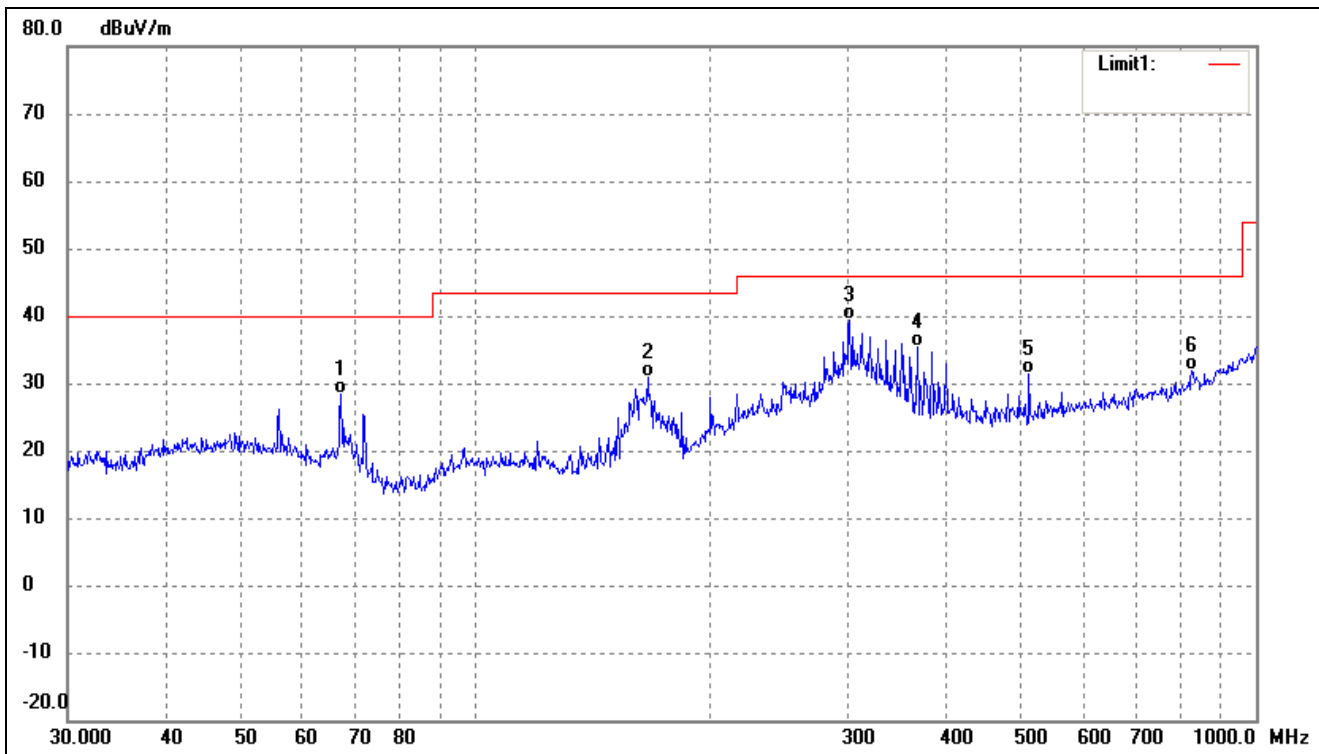
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	56.0007	44.35	-13.45	30.90	40.00	-9.10	329	100	peak
2	71.8320	48.26	-17.70	30.56	40.00	-9.44	99	100	peak
3	145.3506	41.72	-17.08	24.64	43.50	-18.86	356	100	peak
4	231.7179	47.30	-10.70	36.60	46.00	-9.40	105	100	peak
5	327.8873	44.60	-6.85	37.75	46.00	-8.25	202	100	peak
6	511.8352	37.81	-5.94	31.87	46.00	-14.13	263	100	peak

Test mode:	TM1	Polarity:	Vertical
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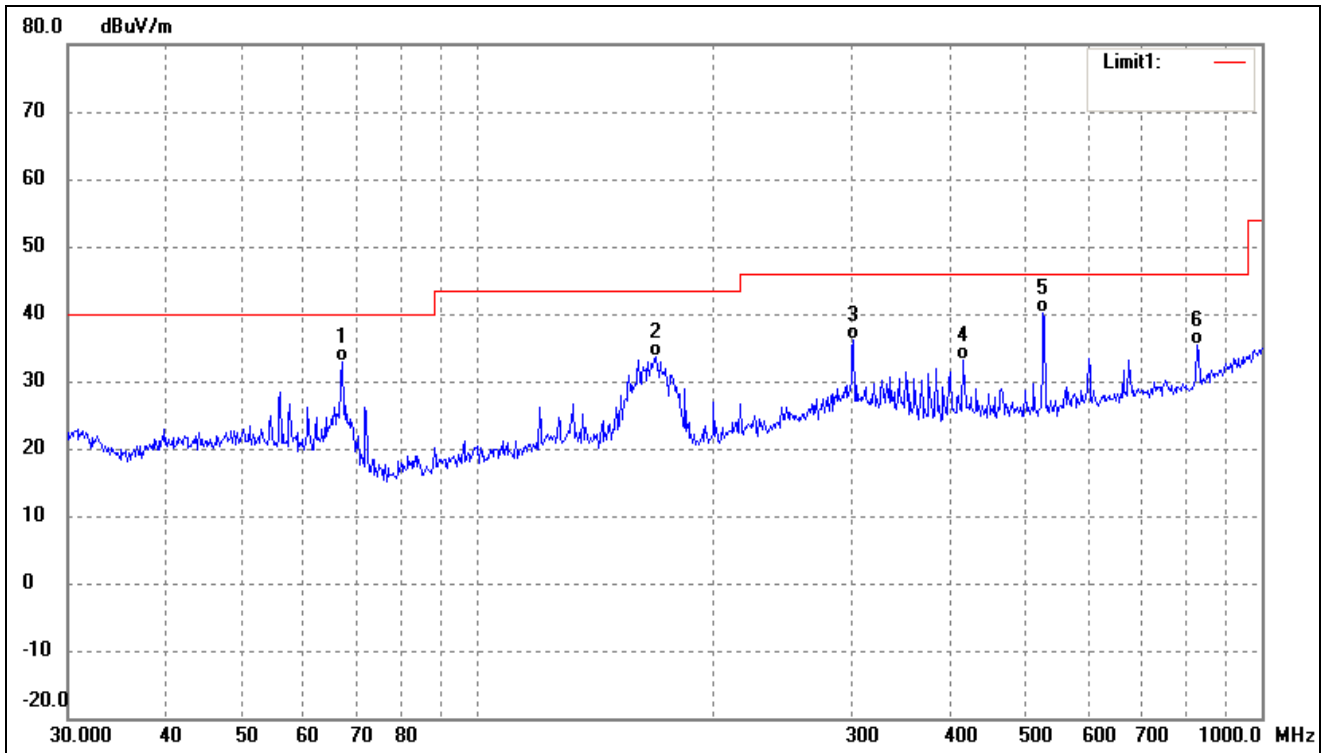
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	56.0007	51.31	-13.45	37.86	40.00	-2.14	225	100	peak
2	71.8320	54.40	-17.70	36.70	40.00	-3.30	98	100	peak
3	231.7179	44.51	-10.70	33.81	46.00	-12.19	250	100	peak
4	296.1836	39.98	-7.49	32.49	46.00	-13.51	115	100	peak
5	336.0352	38.60	-6.62	31.98	46.00	-14.02	138	100	peak
6	511.8352	38.91	-5.94	32.97	46.00	-13.03	150	100	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	67.2022	44.46	-16.08	28.38	40.00	-11.62	125	100	QP
2	166.0680	46.48	-15.59	30.89	43.50	-12.61	147	100	QP
3	301.4224	46.83	-7.40	39.43	46.00	-6.57	24	100	QP
4	368.1116	42.29	-7.00	35.29	46.00	-10.71	136	100	QP
5	511.8352	37.34	-5.94	31.40	46.00	-14.60	64	100	QP
6	827.4934	32.71	-0.76	31.95	46.00	-14.05	360	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	67.2022	48.99	-16.08	32.91	40.00	-7.09	143	100	QP
2	168.4138	49.10	-15.43	33.67	43.50	-9.83	62	100	QP
3	301.4224	43.52	-7.40	36.12	46.00	-9.88	138	100	QP
4	416.1791	39.40	-6.17	33.23	46.00	-12.77	29	100	QP
5	526.3967	45.69	-5.62	40.07	46.00	-5.93	241	100	QP
6	827.4934	36.04	-0.76	35.28	46.00	-10.72	11	100	QP

Emissions 1 - 6 GHz

During measurements from 1 GHz to 13 GHz, only base noise was detected.

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