

FCC Part 15C

Measurement and Test Report

For

Eggtronic Engineering Srl

Via Giorgio Campagna 8 41126 Modena (MO) Italy

FCC ID: 2ANP7PPBK2

FCC Rule(s):	<u>FCC Part 15C</u>
Product Description:	<u>Wireless Power Bank</u>
Tested Model:	<u>PRBK2</u>
Report No.:	<u>WTX19X09062900W-1</u>
Sample Receipt Date:	<u>2019-09-09</u>
Tested Date:	<u>2019-09-09 to 2019-09-16</u>
Issued Date:	<u>2019-09-16</u>
Tested By:	<u>Mike Shi / Engineer</u>
Reviewed By:	<u>Silin Chen / EMC Manager</u>
Approved & Authorized By:	<u>Jandy so / PSQ Manager</u>
Prepared By:	

Mike Shi

Silin Chen

Jandyso

Shenzhen SEM Test Technology Co., Ltd.

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

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

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.

ABLE OF CONTENTS

1. GENERAL INFORMATION.....	4
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
2. SUMMARY OF TEST RESULTS	8
3. RF EXPOSURE	9
3.1 STANDARD APPLICABLE.....	9
3.2 TEST RESULT.....	9
4. ANTENNA REQUIREMENT	10
4.1 STANDARD APPLICABLE.....	10
4.2 EVALUATION INFORMATION	10
5. CONDUCTED EMISSIONS	11
5.1 TEST PROCEDURE.....	11
5.2 BASIC TEST SETUP BLOCK DIAGRAM.....	11
5.3 ENVIRONMENTAL CONDITIONS	11
5.4 TEST RECEIVER SETUP	12
5.5 SUMMARY OF TEST RESULTS/PLOTS	12
6. FIELD STRENGTH OF SPURIOUS EMISSIONS	15
6.1 STANDARD APPLICABLE.....	15
6.2 TEST PROCEDURE.....	15
6.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	16
6.4 ENVIRONMENTAL CONDITIONS	16
6. REFERENCE MEASUREMENT AT OPEN FIELD SITE	17
6.5 SUMMARY OF TEST RESULTS/PLOTS	17
7. 20DB EMISSION BANDWIDTH.	21
7.1 STANDARD APPLICABLE.....	21
7.2 TEST PROCEDURE.....	21
7.3 ENVIRONMENTAL CONDITIONS	21
7.4 SUMMARY OF TEST RESULTS/PLOTS	21

Report version

Version No.	Date of issue	Description
Rev.00	2019-09-16	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Eggtronic Engineering Srl
Address of applicant: Via Giorgio Campagna 8 41126 Modena (MO) Italy

Manufacturer: Shenzhen Pilot Technology Co.,Ltd
Address of manufacturer: A1 Building, No.7 Shankeng Road, Shankeng Industrial Park, Shanxia Community, Pinghu Street, Longgang District, Shenzhen, China.

General Description of EUT	
Product Name:	Wireless Power Bank
Trade Name:	EGGTRONIC
Model No.:	PRBK2
Adding Model:	PRBL2,PRGR2,PPBK2,PPBL2,PPGR2
Battery Capacity	1500mAh
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model PRBK2, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	112-205kHz
Antenna Type:	Coil Antenna
Rated Voltage:	DC 5V (Wireless output)
Rated Current:	≤1A (Wireless output)
Rated Power:	≤ 5W (Wireless output)

1.2 Test Standards

The following report is prepared on behalf of the Eggtronic Engineering Srl in accordance with Part 15.207, 15.209, RSS-Gen Issue 4 and RSS-216 Issue 2 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.207, 15.209 and RSS-Gen Issue 4 and RSS-216 Issue 2 rules.

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 C63.10-2013, 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

Address of the test laboratory

Laboratory: Shenzhen SEM Test Technology Co., Ltd.

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

FCC – Registration No.: 125990

Shenzhen SEM Test Technology 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

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 charging	Working	Input: DC5V(with a adapter input AC 120V/60Hz)

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
Adapter	AoHai	A138A-120150U-CN 2	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Type-C Cable	0.8	Unshielded	Without Ferrite

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2019-04-30	2020-04-29
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2019-04-30	2020-04-29
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2019-04-30	2020-04-29
Loop Antenna	ETS-LINDGREN	6502	00071730	2019-05-05	2021-05-04
Receiver	R&S	ESCI	100435	2019-04-30	2020-04-29
Spectrum Analyzer	R&S	FSP40	100416	2019-04-30	2020-04-29

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§ 15.207(a) Conducted Emission	Compliant
§ 15.209(a) Radiated Emission	Compliant
§ 15.215 20dB Emission Bandwidth	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, 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 shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has a Coil antenna, fulfill the requirement of this section.

5. Conducted Emissions

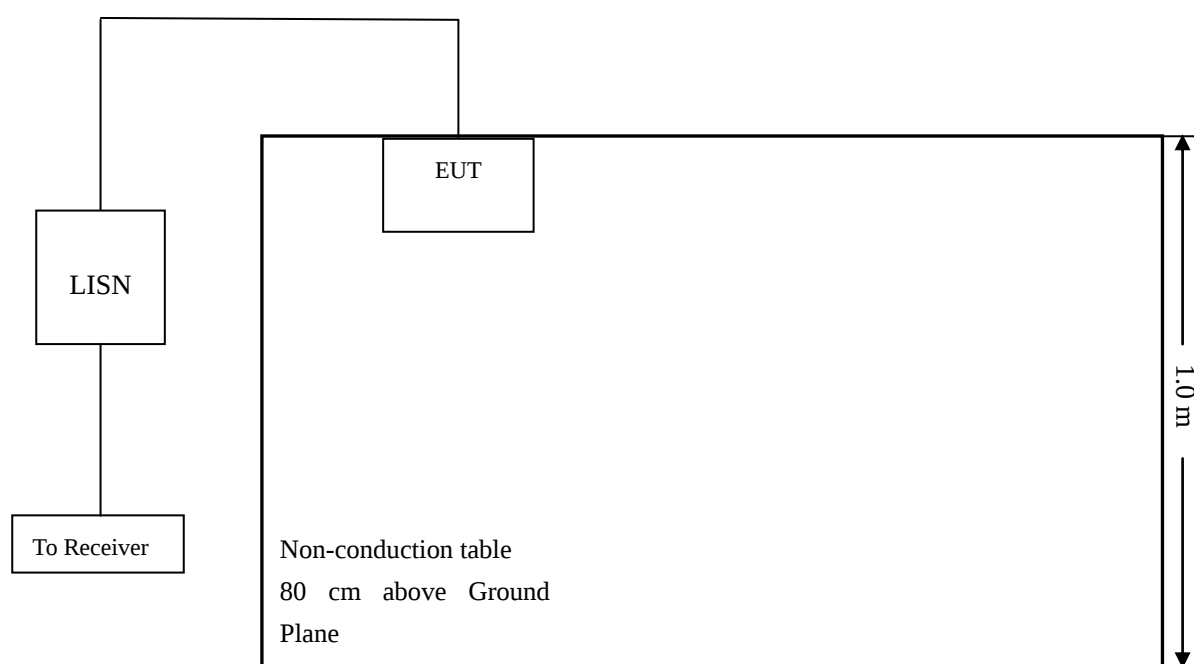
5.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 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.

5.2 Basic Test Setup Block Diagram



5.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

5.4 Test Receiver Setup

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

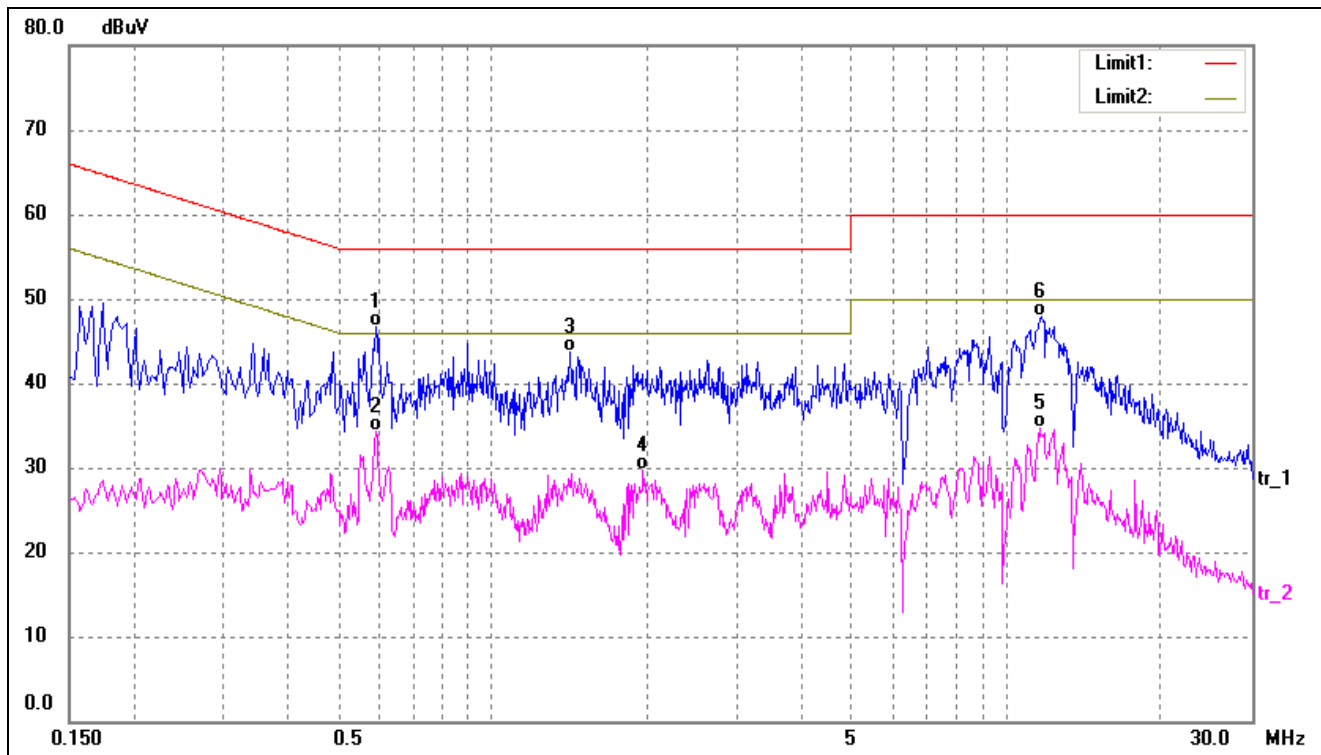
Start Frequency 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth 9 kHz
Quasi-Peak Adapter Mode Normal

5.5 Summary of Test Results/Plots

According to the data in section 5.5, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

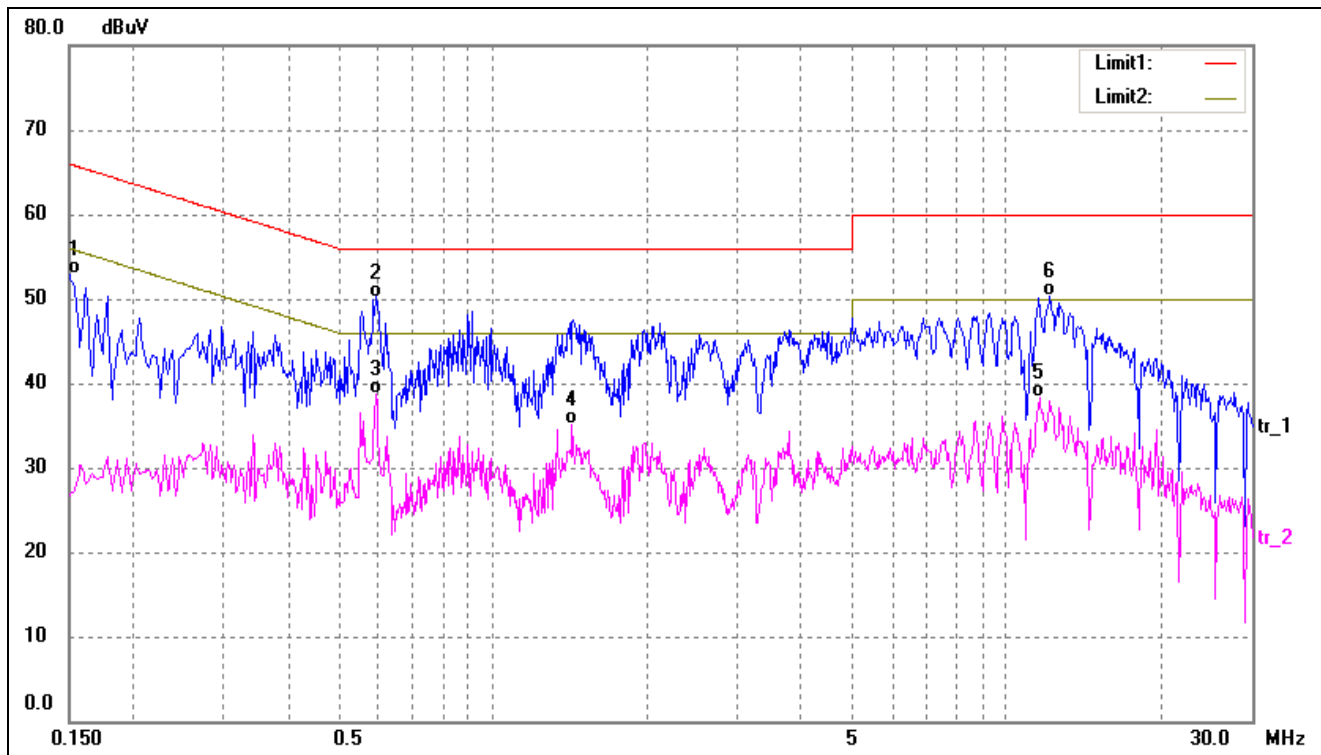
-5.80 dB at 0.5940 MHz in the Line, QP detector, 0.15-30MHz

Test mode:	TM1	Polarity:	Line
------------	-----	-----------	------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.5940	36.56	10.05	46.61	56.00	-9.39	QP
2	0.5940	24.19	10.05	34.24	46.00	-11.76	AVG
3	1.4140	33.25	10.37	43.62	56.00	-12.38	QP
4	1.9620	19.36	10.37	29.73	46.00	-16.27	AVG
5	11.6180	24.17	10.59	34.76	50.00	-15.24	AVG
6	11.7060	37.25	10.59	47.84	60.00	-12.16	QP

Test mode:	TM1	Polarity:	Neutral
------------	-----	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	43.02	9.95	52.97	65.99	-13.02	QP
2*	0.5940	40.15	10.05	50.20	56.00	-5.80	QP
3	0.5940	28.74	10.05	38.79	46.00	-7.21	AVG
4	1.4260	24.65	10.36	35.01	46.00	-10.99	AVG
5	11.5980	27.62	10.59	38.21	50.00	-11.79	AVG
6	12.1459	39.63	10.60	50.23	60.00	-9.77	QP

6. Field Strength of Spurious Emissions

6.1 Standard Applicable

According to §15.209(a), Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:.

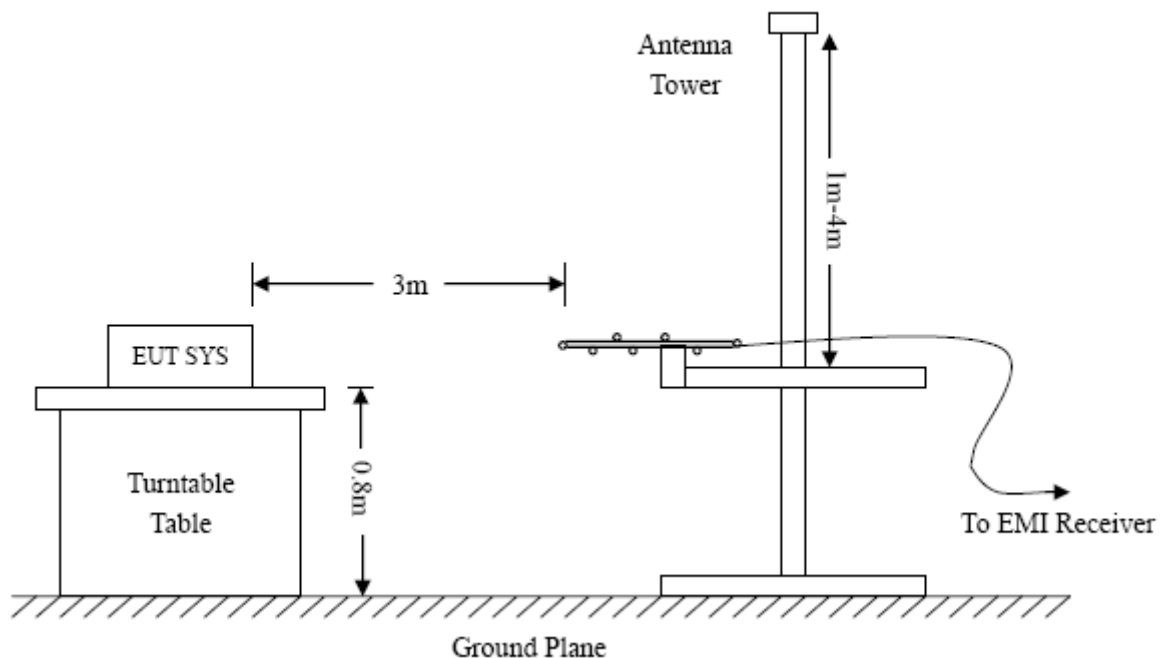
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

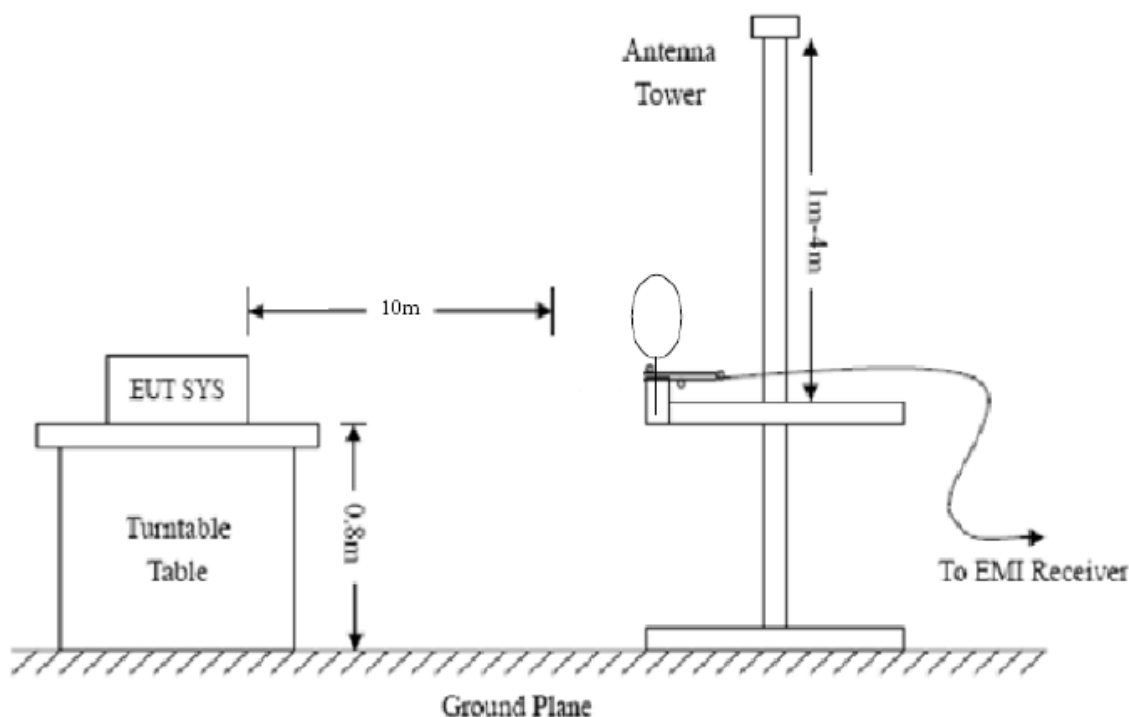
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

6.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 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.





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

6.3 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

6.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

6. Reference Measurement at open field site

The measurement was performed with set-up consisting of a single turn loop antenna with a diameter of 0.15 m, feeded by a signal generator. The loop dimension was chosen to simulate the EUT as far as possible. The signal generator was set to a fixed output level with an unmodulated 10 kHz and 14 kHz sinusoidal signal.

The radiated H fieldstrength at 10 kHz and 14 kHz generated by this set-up was measured with the same test setup as used in the SAC in 3 m distance first, and then repeated at the open field site in 3 m and 10 m distance

6.5 Summary of Test Results/Plots

According to the data below, the FCC Part 15.209(a) standards, and had the worst cases:

-10.72dB at 130.3789 MHz in the Vertical polarization QP detector, 9kHz to 1 GHz, 3Meters

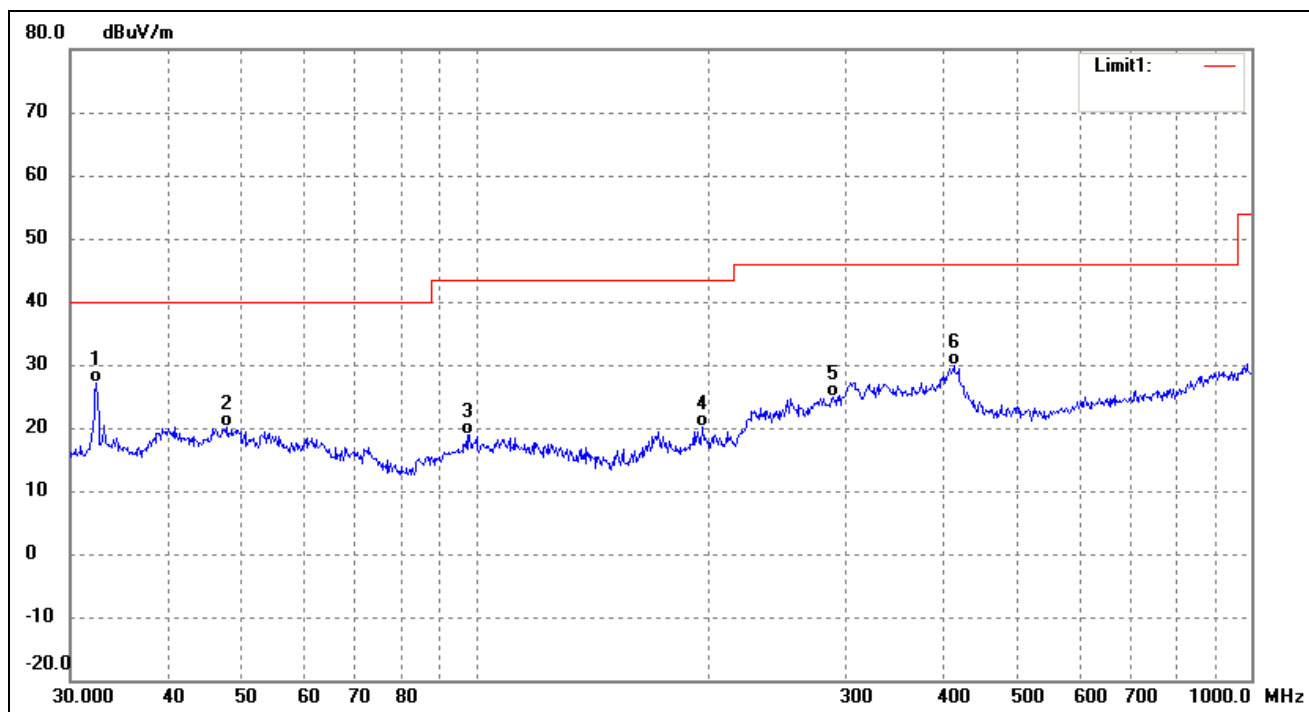
Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Radiated Emissions Test Data (Below 30MHz)(Worst case EUT X axis)

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	0.0091	82.81	-4.99	77.82	128.42	-50.60	252	100	peak
2	0.0278	73.2	-5.26	67.94	118.72	-50.78	90	100	peak
3	0.049	53.49	-4.07	49.42	113.80	-64.38	340	100	peak
4	0.1382	79.97	-4.75	75.22	104.79	-29.57	104	100	peak
5	0.4105	60.13	-6.33	53.8	95.34	-41.54	186	100	peak
6	0.6863	52.34	-7.14	45.2	70.87	-25.67	312	100	peak
7	3.5843	48.88	-7.59	41.29	56.52	-15.23	100	100	peak

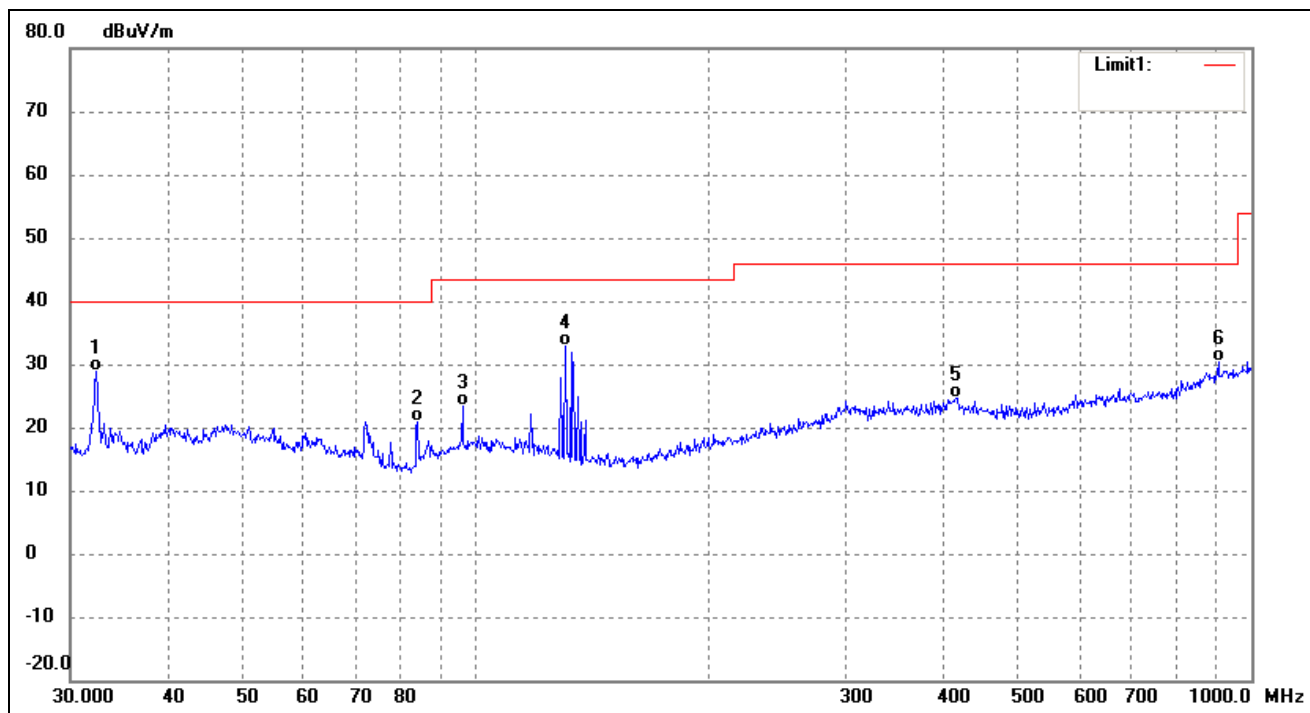
Plot of Radiated Emissions Test Data (Above 30MHz)

Test mode:	TM1	Polarity:	Horizontal
------------	-----	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	32.4059	43.46	-16.25	27.21	40.00	-12.79	183	100	QP
2	47.8260	33.82	-13.76	20.06	40.00	-19.94	179	100	QP
3	97.4560	34.40	-15.44	18.96	43.50	-24.54	51	100	QP
4	195.8220	33.26	-13.01	20.25	43.50	-23.25	293	100	QP
5	289.0021	33.57	-8.77	24.80	46.00	-21.20	86	100	QP
6	413.2706	37.84	-7.89	29.95	46.00	-16.05	245	100	QP

Test mode:	TM1	Polarity:	Vertical
------------	-----	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	32.4059	45.06	-16.25	28.81	40.00	-11.19	107	100	QP
2	84.1100	39.23	-18.33	20.90	40.00	-19.10	292	100	QP
3	96.0986	39.13	-15.70	23.43	43.50	-20.07	58	100	QP
4	130.3789	50.91	-18.13	32.78	43.50	-10.72	312	100	QP
5	416.1791	32.61	-7.89	24.72	46.00	-21.28	116	100	QP
6	906.4824	31.53	-1.10	30.43	46.00	-15.57	291	100	QP

7. 20dB Emission bandwidth.

7.1 Standard Applicable

According to 15.215,20dB emission bandwidth.

7.2 Test Procedure

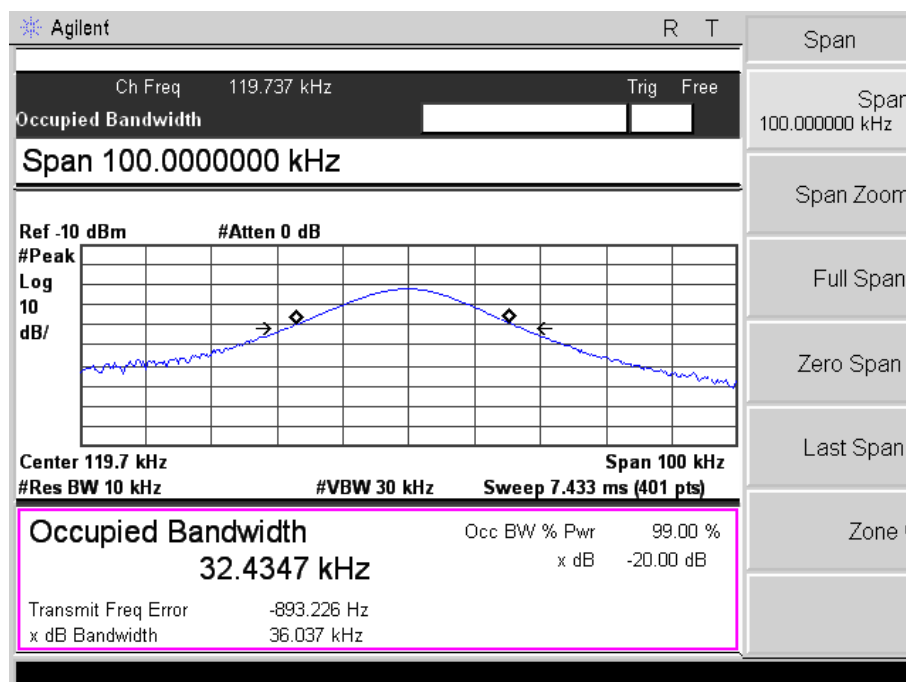
- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

7.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

7.4 Summary of Test Results/Plots

Test Channel(kHz)	20dB Emission Bandwidth(kHz)
138.25	36.037



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