

FCC Part 18

Measurement and Test Report

For

Moxie corporation

10F.-1, No. 34, Sec. 1, Fuxing S. Rd., Zhongshan Dist.,
Taipei City 104, Taiwan (R.O.C.)

FCC ID: 2ASN6XCH-001

Test Rule(s): FCC Part 18

Product Description: Wireless Charger

Tested Model: XCH-001

Report No.: WTX19X02008336W-2

Sample Receipt Date: 2019-02-20

Tested Date: 2019-02-20 to 2019-03-06

Issued Date: 2019-03-07

Tested By: Mike Shi / Engineer

Reviewed By: Silin Chen / EMC Manager

Approved & Authorized By: Jandy So / PSQ Manager

Prepared By:

Mike Shi
Silin Chen
Jandy So

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.

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY	4
1.4 TEST FACILITY	4
1.5 EUT SETUP AND OPERATION MODE	5
1.6 MEASUREMENT UNCERTAINTY	5
1.7 TEST EQUIPMENT LIST AND DETAILS	6
2. SUMMARY OF TEST RESULTS	7
3. CONDUCTED EMISSIONS	8
3.1 STANDARD APPLICABLE.....	8
3.2 TEST PROCEDURE.....	8
3.3 BASIC TEST SETUP BLOCK DIAGRAM.....	8
3.4 ENVIRONMENTAL CONDITIONS	9
3.5 TEST RECEIVER SETUP	9
3.6 SUMMARY OF TEST RESULTS/PLOTS	9
4. RADIATED EMISSIONS.....	12
4.1 TEST PROCEDURE.....	12
4.2 TEST RECEIVER SETUP	12
4.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	12
4.4 ENVIRONMENTAL CONDITIONS	13
4.5 SUMMARY OF TEST RESULTS/PLOTS	13

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Moxie corporation
Address of applicant: 10F.-1, No. 34, Sec. 1, Fuxing S. Rd., Zhongshan Dist., Taipei City 104, Taiwan (R.O.C.)

Manufacturer: Shenzhen Aysemo Technology Co., Ltd.
Address of manufacturer: No. 52 Baonan Road, the 6th Industrial Zone, Nanlian, Longgang, Shenzhen, Guangdong, China

General Description of EUT

Product Name:	Wireless Charger
Trade Name:	Xcharger
Model No.:	XCH-001
Adding Model(s):	XCH-002, XCH-003

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 XCH-001, but the circuit and the electronic construction do not change, declared by the manufacturer.

Technical Characteristics of EUT

Frequency Range:	110~205kHz
Modulation Type:	ASK
Antenna Type:	Coil Antenna
Rated Voltage:	DC9V (Wireless output)
Rated Current:	≤1.1A (Wireless output)
Rated Power:	< 10W (Wireless output)

1.2 Test Standards

The tests were performed according to following standards:

FCC Part 18 Subpart C: Industrial, Scientific, and 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 charging	Transmit	AC120V 60Hz for adapter

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

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2018-05-22	2019-05-21
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2020-06-07
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2018-05-22	2019-05-21
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2018-05-22	2019-05-21
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2018-05-22	2019-05-21
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2018-05-22	2019-05-21
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2018-05-22	2019-05-21
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2018-03-18	2019-03-17
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2018-03-18	2019-03-17
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2018-03-18	2019-03-17
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2018-03-18	2019-03-17
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2018-03-18	2019-03-17
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2018-03-18	2019-03-17

2. SUMMARY OF TEST RESULTS

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:

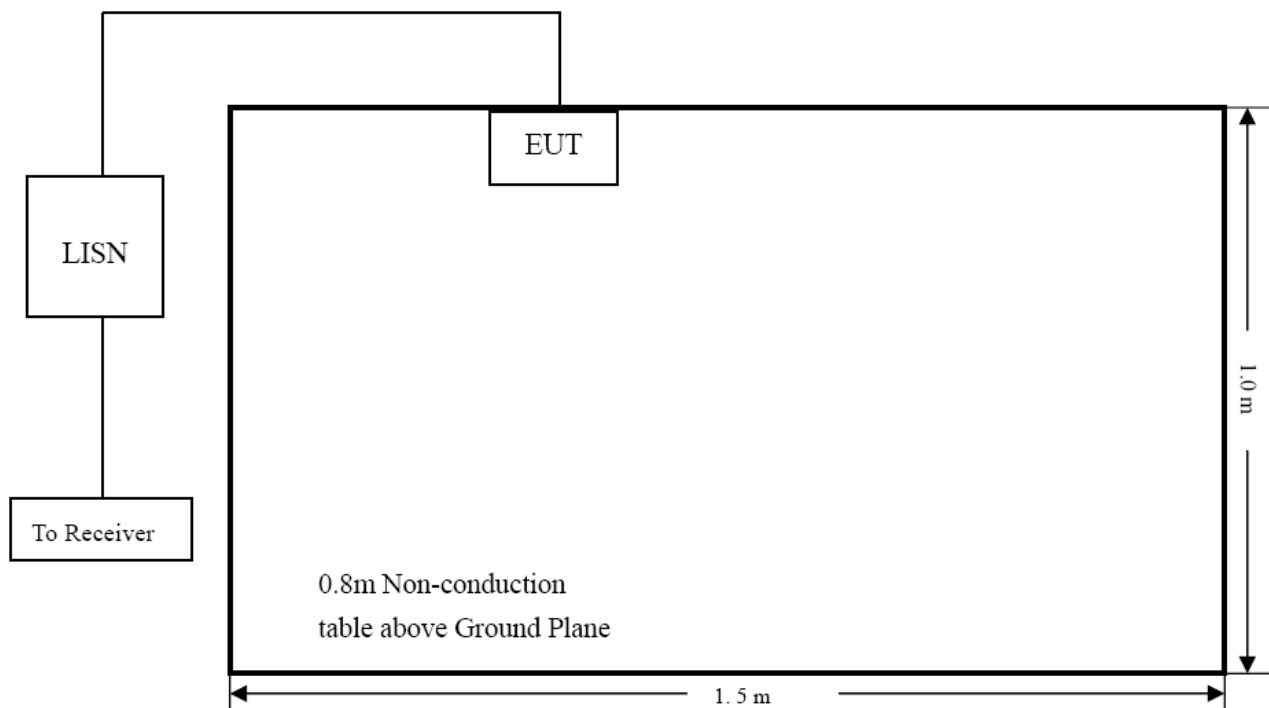
Frequency (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

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:

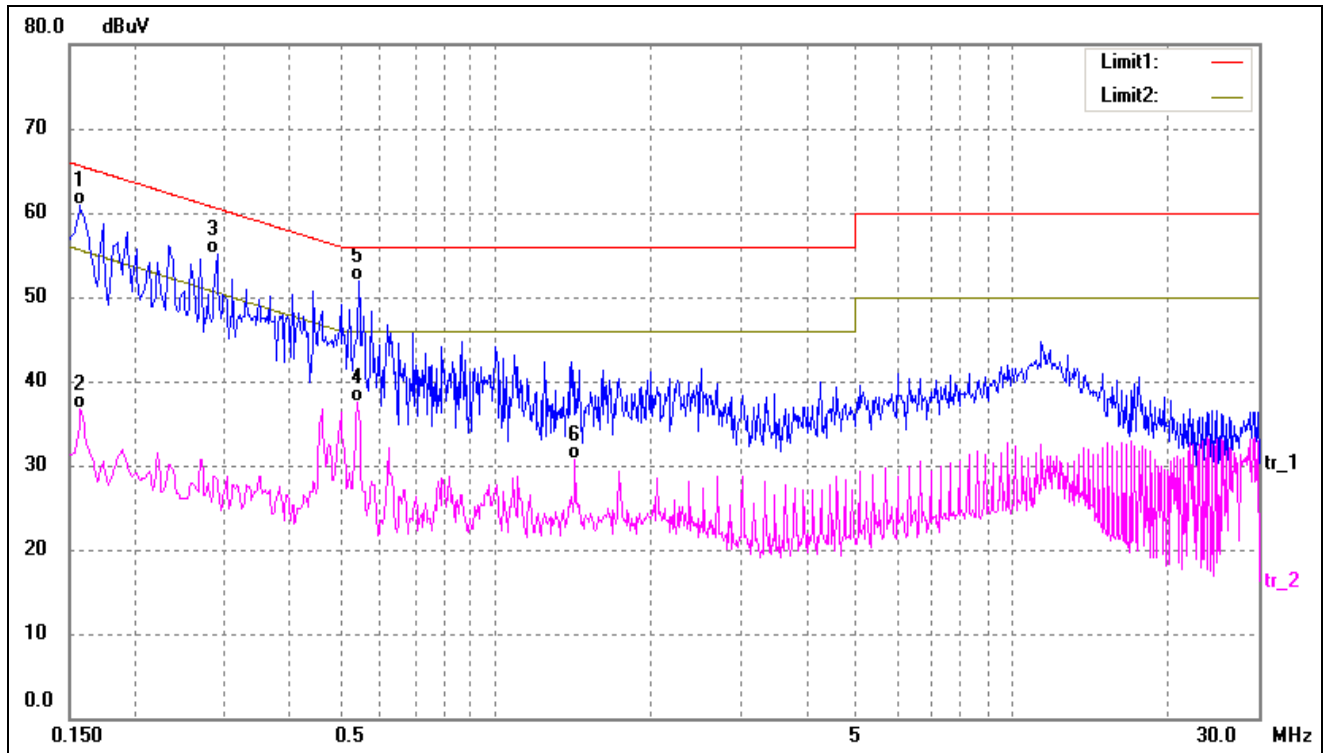
Start Frequency 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth 9 kHz
Quasi-Peak Adapter Mode Normal

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:

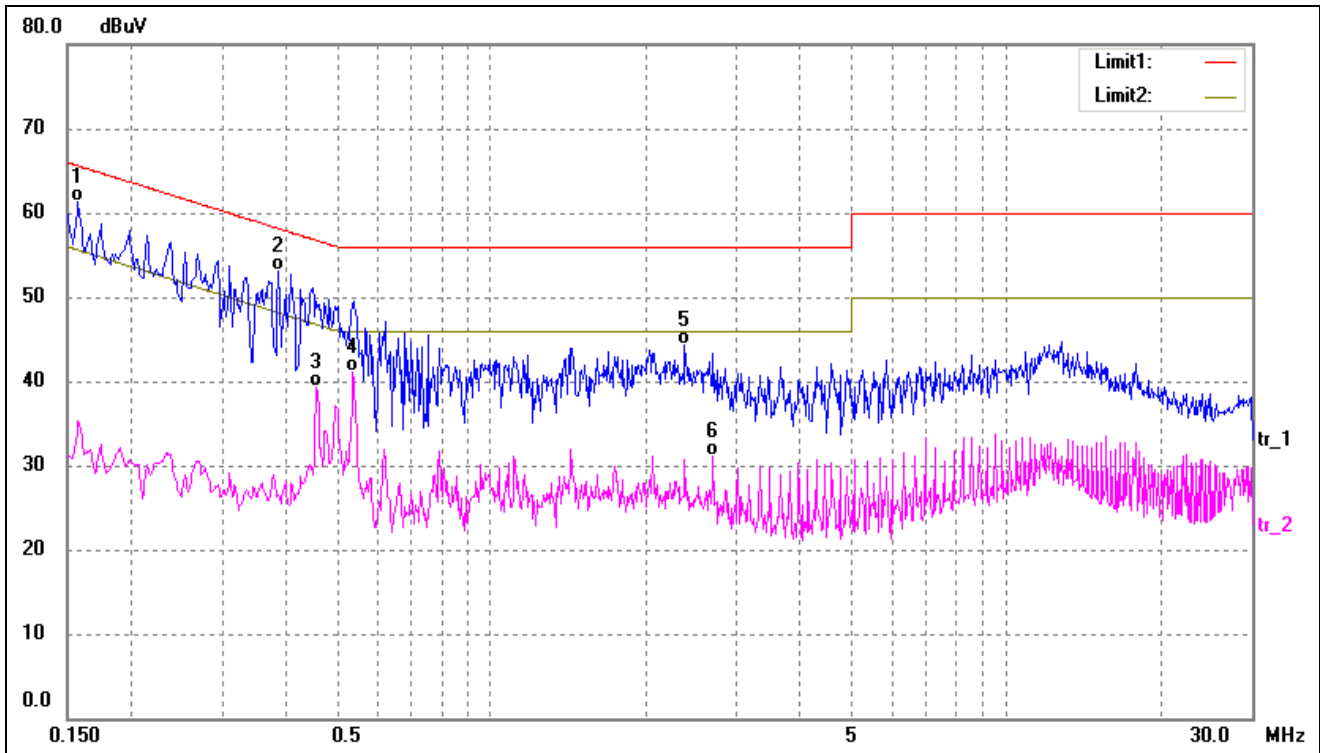
-4.17 dB at 0.5460 MHz in the Line, QP detector, TM1 detector, 0.15-30MHz

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	50.87	10.10	60.97	65.57	-4.60	QP
2	0.1580	26.55	10.10	36.65	55.57	-18.92	AVG
3	0.2900	44.94	10.18	55.12	60.52	-5.40	QP
4	0.5420	27.27	10.31	37.58	46.00	-8.42	AVG
5*	0.5460	41.51	10.32	51.83	56.00	-4.17	QP
6	1.4260	20.10	10.55	30.65	46.00	-15.35	AVG

Test mode:	TM2	Polarity:	Neutral
------------	-----	-----------	---------



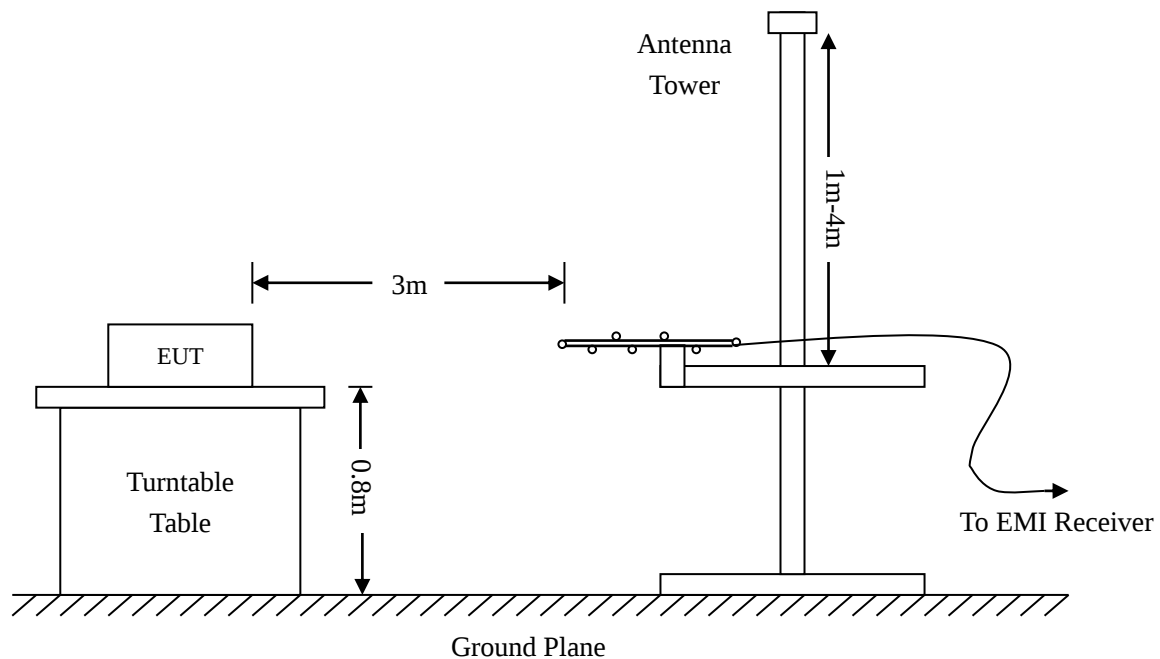
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1580	51.23	10.10	61.33	65.57	-4.24	QP
2	0.3860	42.90	10.24	53.14	58.15	-5.01	QP
3	0.4580	28.94	10.27	39.21	46.73	-7.52	AVG
4	0.5380	30.79	10.31	41.10	46.00	-4.90	AVG
5	2.3740	33.61	10.63	44.24	56.00	-11.76	QP
6	2.6940	20.48	10.65	31.13	46.00	-14.87	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 -6dB μ V means the emission is 6dB μ 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

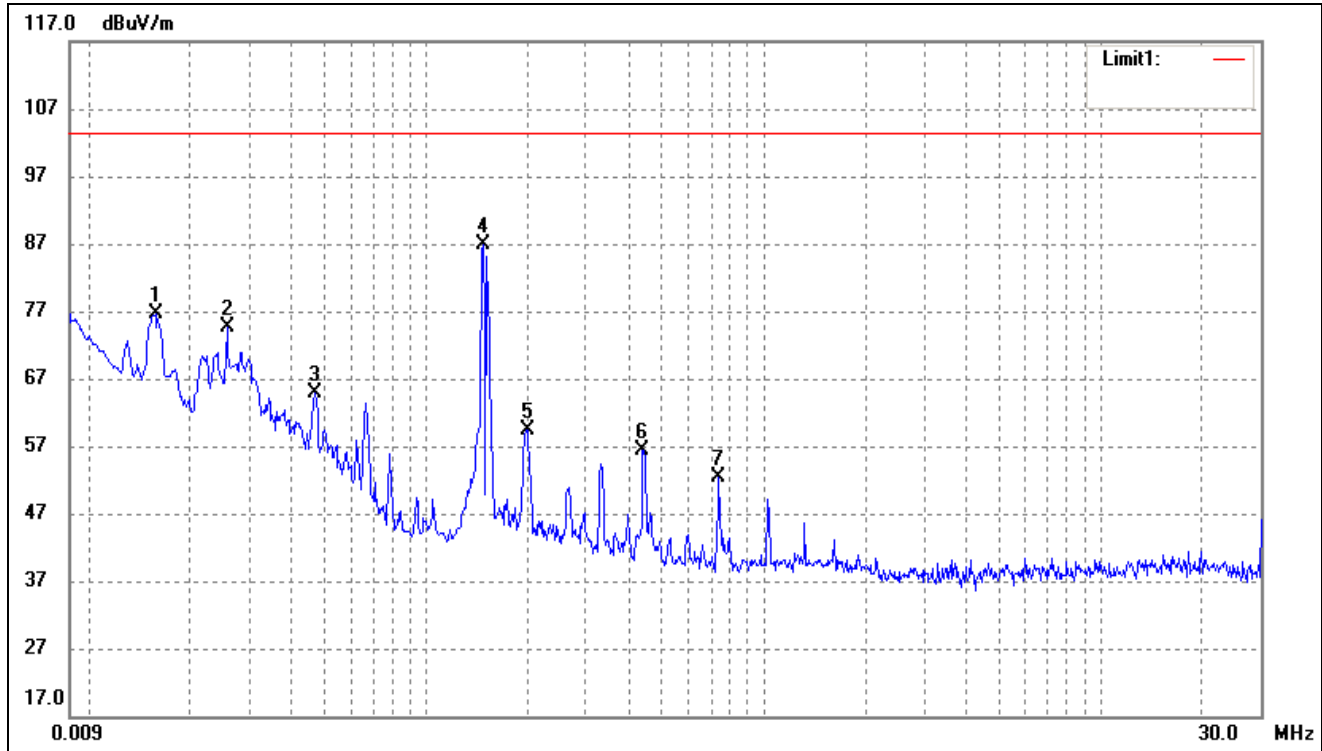
4.5 Summary of Test Results/Plots

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

-16.67 dB at 0.1471 MHz in the Vertical polarization, TM1 mode, 3Meters

Plot of Radiated Emissions Test Data (Below 30MHz)

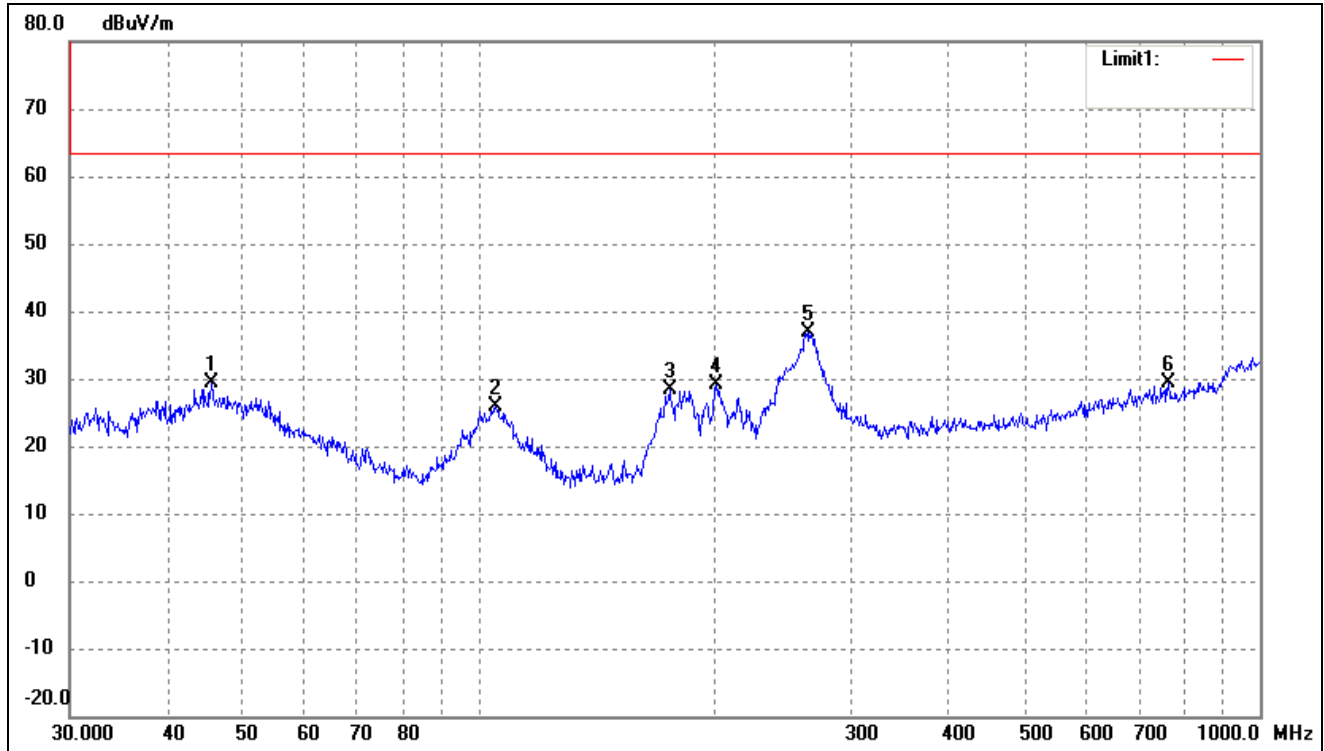
Test mode:	TM1	Polarity:	Vertical
------------	-----	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	0.0158	102.79	-26.28	76.51	103.5	-26.99	330	100	peak
2	0.0258	100.82	-26.28	74.54	103.5	-28.96	90	100	peak
3	0.0468	91.21	-26.27	64.94	103.5	-38.56	120	100	peak
4	0.1471	113.08	-26.25	86.83	103.5	-16.67	98	100	peak
5	0.1985	85.71	-26.24	59.47	103.5	-44.03	354	100	peak
6	0.4396	84.01	-27.62	56.39	103.5	-47.11	240	100	peak
7	0.7351	81.67	-29.32	52.35	103.5	-51.15	330	100	peak

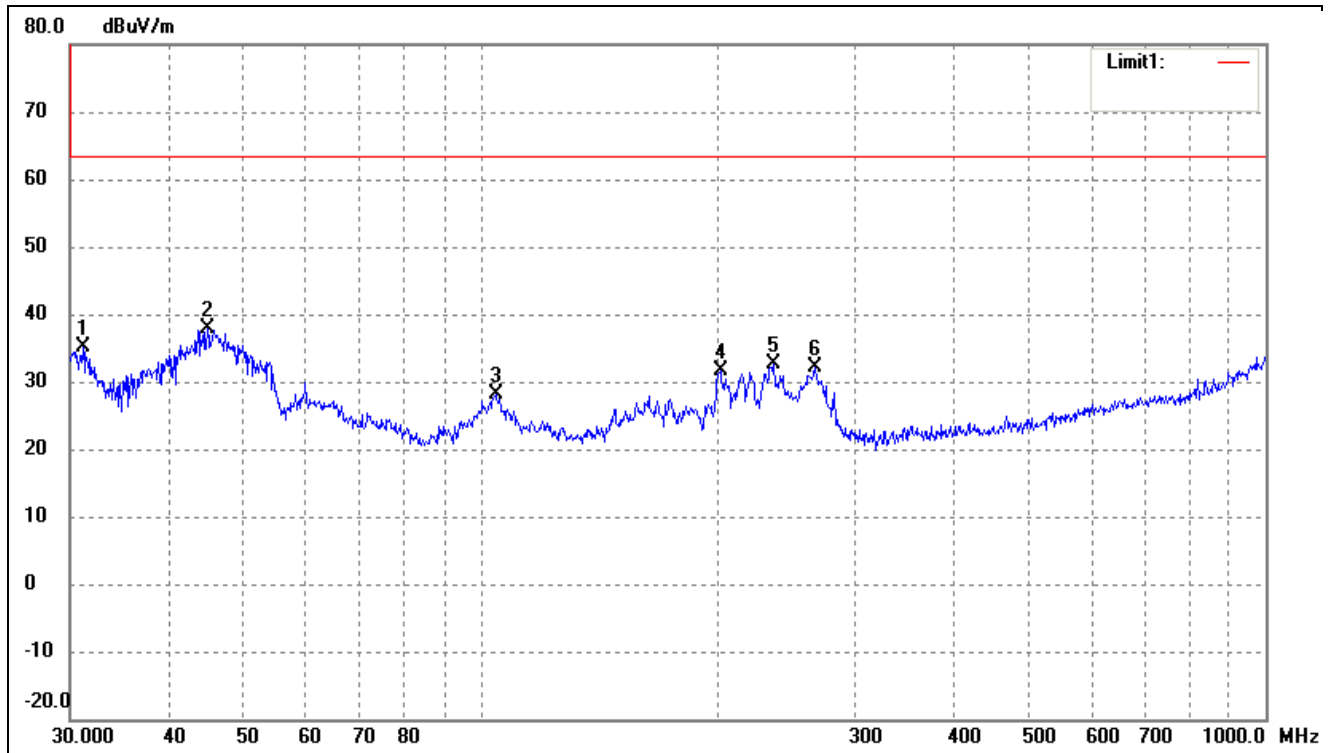
Plot of Radiated Emissions Test Data (Above 30MHz)

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	45.5348	37.48	-8.07	29.41	63.50	-34.09	321	100	peak
2	105.2718	40.41	-14.51	25.90	63.50	-37.60	96	100	peak
3	175.6516	43.90	-15.56	28.34	63.50	-35.16	191	100	peak
4	201.3930	42.18	-13.10	29.08	63.50	-34.42	95	100	peak
5	263.8190	47.49	-10.67	36.82	63.50	-26.68	124	100	peak
6	763.3757	31.07	-1.67	29.40	63.50	-34.10	316	100	peak

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	31.1798	44.60	-9.57	35.03	63.50	-28.47	128	100	peak
2	44.9006	45.86	-8.04	37.82	63.50	-25.68	115	100	peak
3	104.5361	42.77	-14.56	28.21	63.50	-35.29	65	100	peak
4	202.1005	44.87	-13.14	31.73	63.50	-31.77	122	100	peak
5	236.6447	44.29	-11.70	32.59	63.50	-30.91	292	100	peak
6	266.6089	42.68	-10.56	32.12	63.50	-31.38	185	100	peak

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