

FCC Part 15B

Measurement and Test Report

For

Ocean Digital Technology Ltd.

**Flat 12B, Yeung Yiu Chung (No.8) Ind. Bldg., 20 Wang Hoi
Road, Kowloon Bay, Hong Kong**

FCC ID: 2ABD3-MA80000000

Test Rule(s):	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>Internet Radio</u>
Tested Model:	<u>MA-80</u>
Report No.:	<u>STR15118216I-2</u>
Tested Date:	<u>2015-11-24 to 2015-12-04</u>
Issued Date:	<u>2015-12-05</u>
Tested By:	<u>Rode Liu / Engineer</u> <i>Rode Liu</i>
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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: Ocean Digital Technology Ltd.
Address of applicant: Flat 12B, Yeung Yiu Chung (No.8) Ind. Bldg., 20
Wang Hoi Road, Kowloon Bay, Hong Kong
Manufacturer: Ocean Digital Technology Ltd.
Address of manufacturer: Flat 12B, Yeung Yiu Chung (No.8) Ind. Bldg., 20
Wang Hoi Road, Kowloon Bay, Hong Kong

General Description of EUT	
Product Name:	Internet Radio
Trade Name:	Ocean Digital
Model No.:	MA-80
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:	Adapter DC 5V
Rated Current:	1A
Rated Power:	/
Power Adapter Model:	MX12W8-050 INPUT:100-240V 0.35A 50~60HZ OUTPUT: 5V1A
Lowest Internal Frequency:	32.768kHz
Highest Internal Frequency:	25MHz
Classification of ITE:	CLASS B

1.2 Test Standards

The following report is prepared on behalf of the Ocean Digital Technology Ltd in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.107, and 15.109 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 C63.4-2014, 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.: 934118

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 and the Registration is 934118.

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.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

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
TM1	connect to network for playing	/
TM2	FM Receiving	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Network Cable	0.8	Unshielded	Without

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 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

N/A: not applicable

3. Conducted Emissions

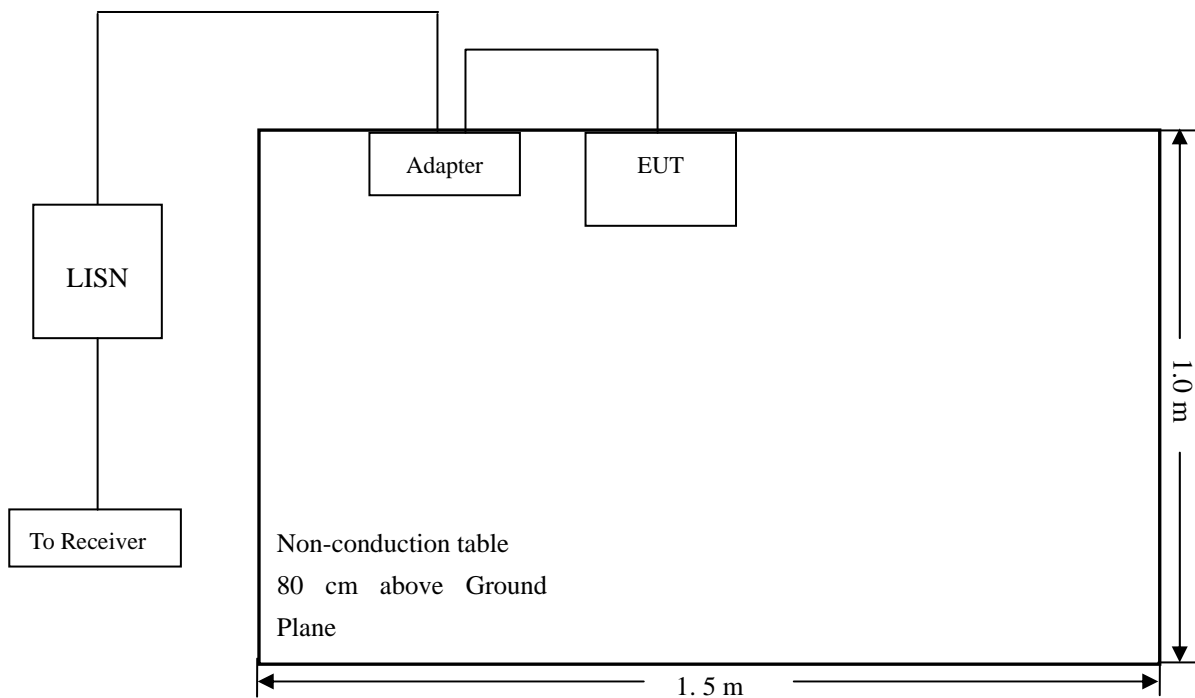
3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

3.2 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.

3.3 Basic Test Setup Block Diagram



3.4 Environmental Conditions

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

3.5 Summary of Test Results/Plots

According to the data in section 3.6, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

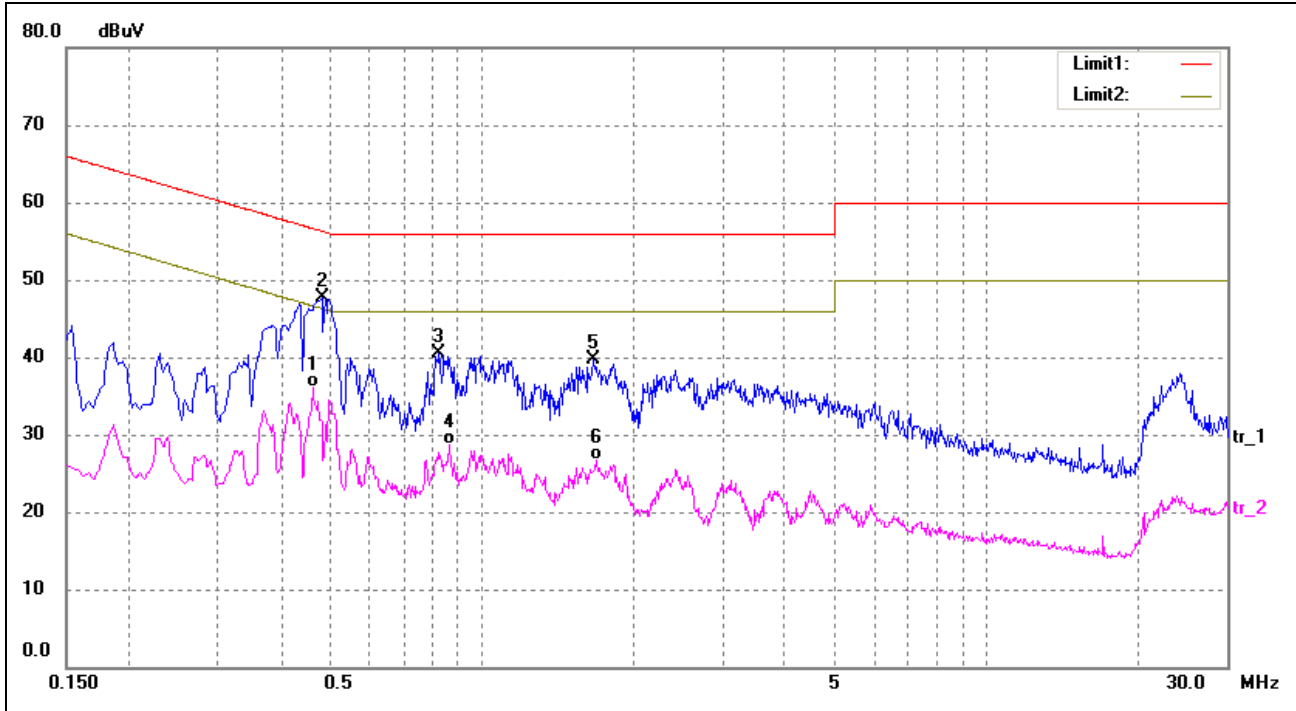
-5.29 dB at **0.4860 MHz** in the **Line**, TM2 mode, **Peak** detector, 0.15-30MHz

3.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

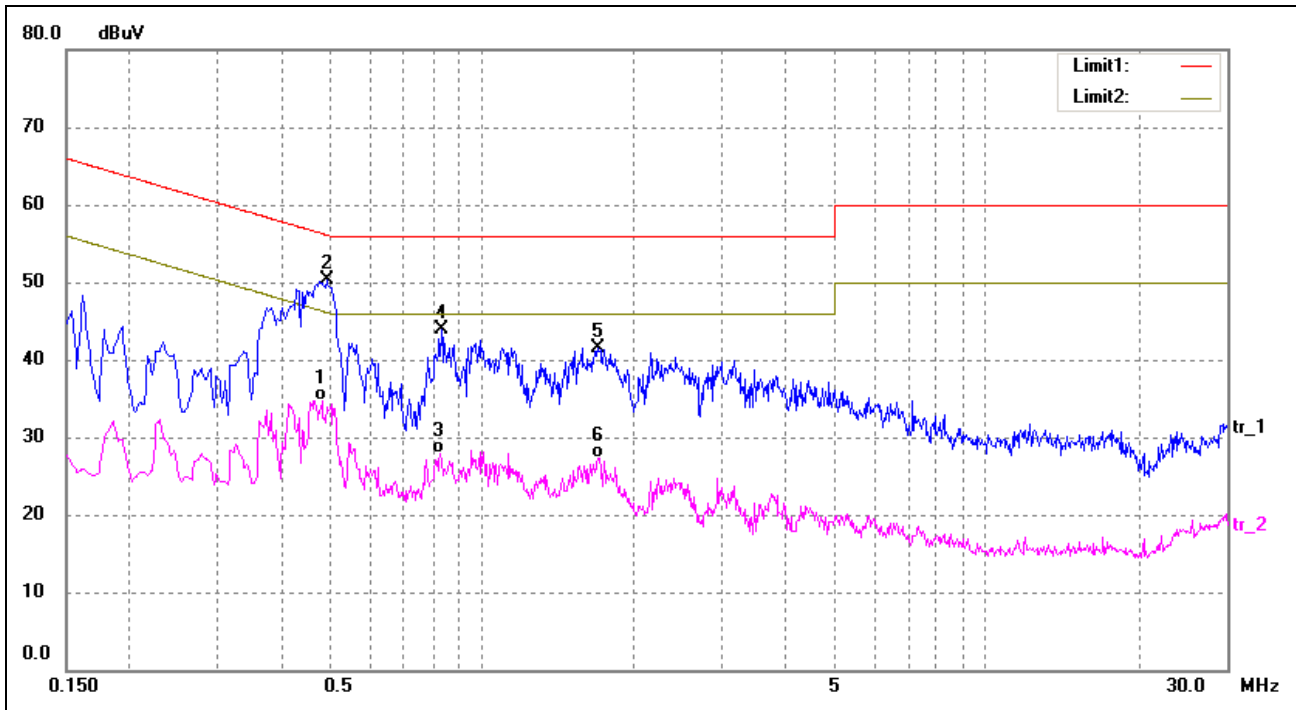
EUT: *Internet Radio*
 Tested Model: *MA-80*
 Operating Condition: *AC 120V/60HZ Adapter DC 5V*
 Comment: *TM1*

 Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4620	23.57	12.50	36.07	46.66	-10.59	AVG
2*	0.4820	35.17	12.50	47.67	56.30	-8.63	peak
3	0.8220	27.74	12.82	40.56	56.00	-15.44	peak
4	0.8620	15.82	12.86	28.68	46.00	-17.32	AVG
5	1.6660	26.67	13.00	39.67	56.00	-16.33	peak
6	1.6820	13.69	13.00	26.69	46.00	-19.31	AVG

Test Specification: Line

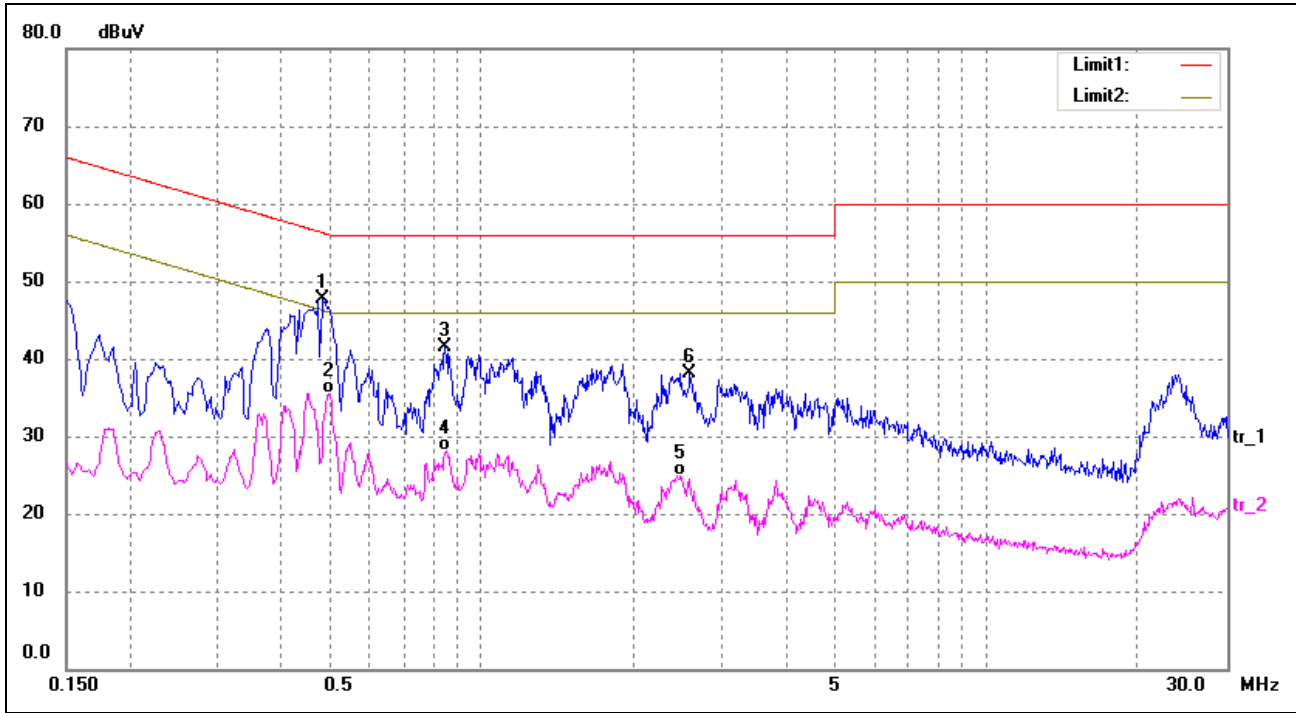


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4820	22.18	12.50	34.68	46.30	-11.62	AVG
2*	0.4940	37.79	12.50	50.29	56.10	-5.81	peak
3	0.8300	15.02	12.83	27.85	46.00	-18.15	AVG
4	0.8340	31.05	12.83	43.88	56.00	-12.12	peak
5	1.7020	28.53	13.00	41.53	56.00	-14.47	peak
6	1.7140	14.39	13.00	27.39	46.00	-18.61	AVG

Operating Condition: AC 120V/60HZ Adapter DC 5V

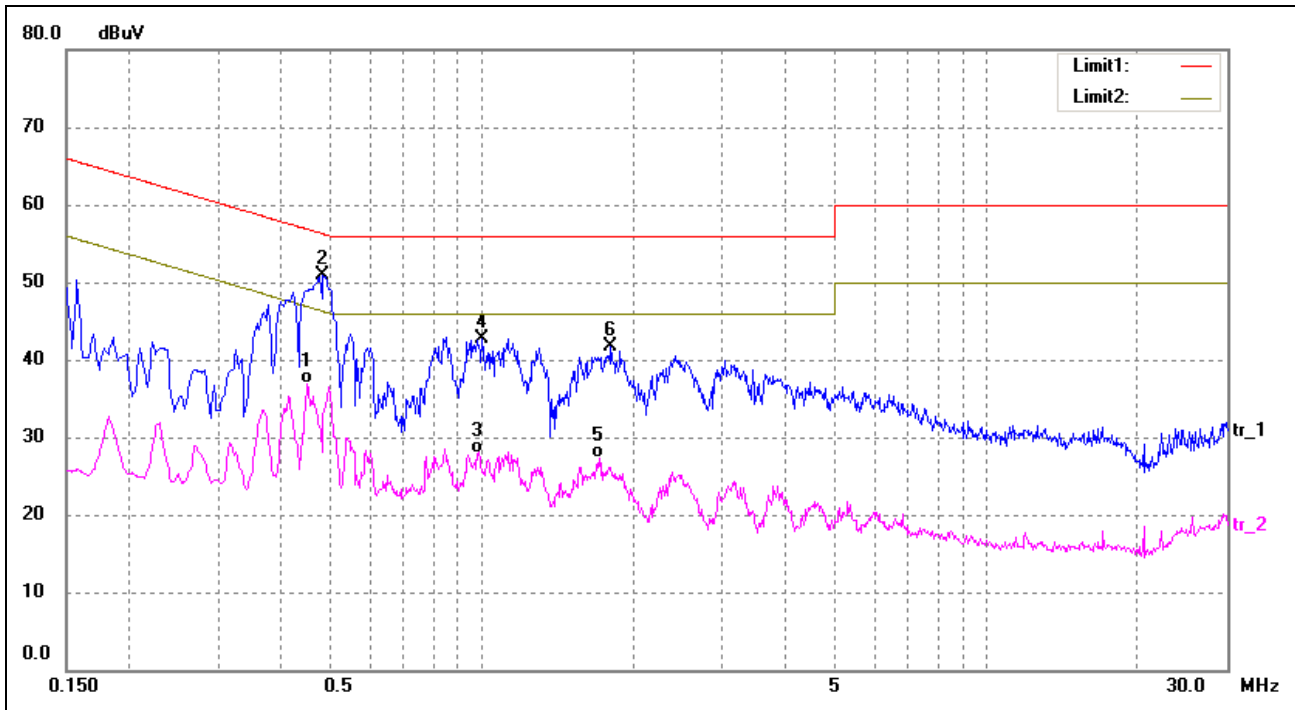
Comment: TM2

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.4860	35.11	12.50	47.61	56.24	-8.63	peak
2	0.4980	22.96	12.50	35.46	46.03	-10.57	AVG
3	0.8460	28.75	12.85	41.60	56.00	-14.40	peak
4	0.8500	15.27	12.85	28.12	46.00	-17.88	AVG
5	2.4780	11.95	13.00	24.95	46.00	-21.05	AVG
6	2.5820	25.09	13.00	38.09	56.00	-17.91	peak

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4500	24.44	12.50	36.94	46.88	-9.94	AVG
2*	0.4860	38.45	12.50	50.95	56.24	-5.29	peak
3	0.9860	15.01	12.99	28.00	46.00	-18.00	AVG
4	1.0020	29.70	13.00	42.70	56.00	-13.30	peak
5	1.7140	14.29	13.00	27.29	46.00	-18.71	AVG
6	1.8060	28.63	13.00	41.63	56.00	-14.37	peak

Test carry out on the worst case input 88MHZ

4. Radiated Emissions

4.1 Measurement Uncertainty

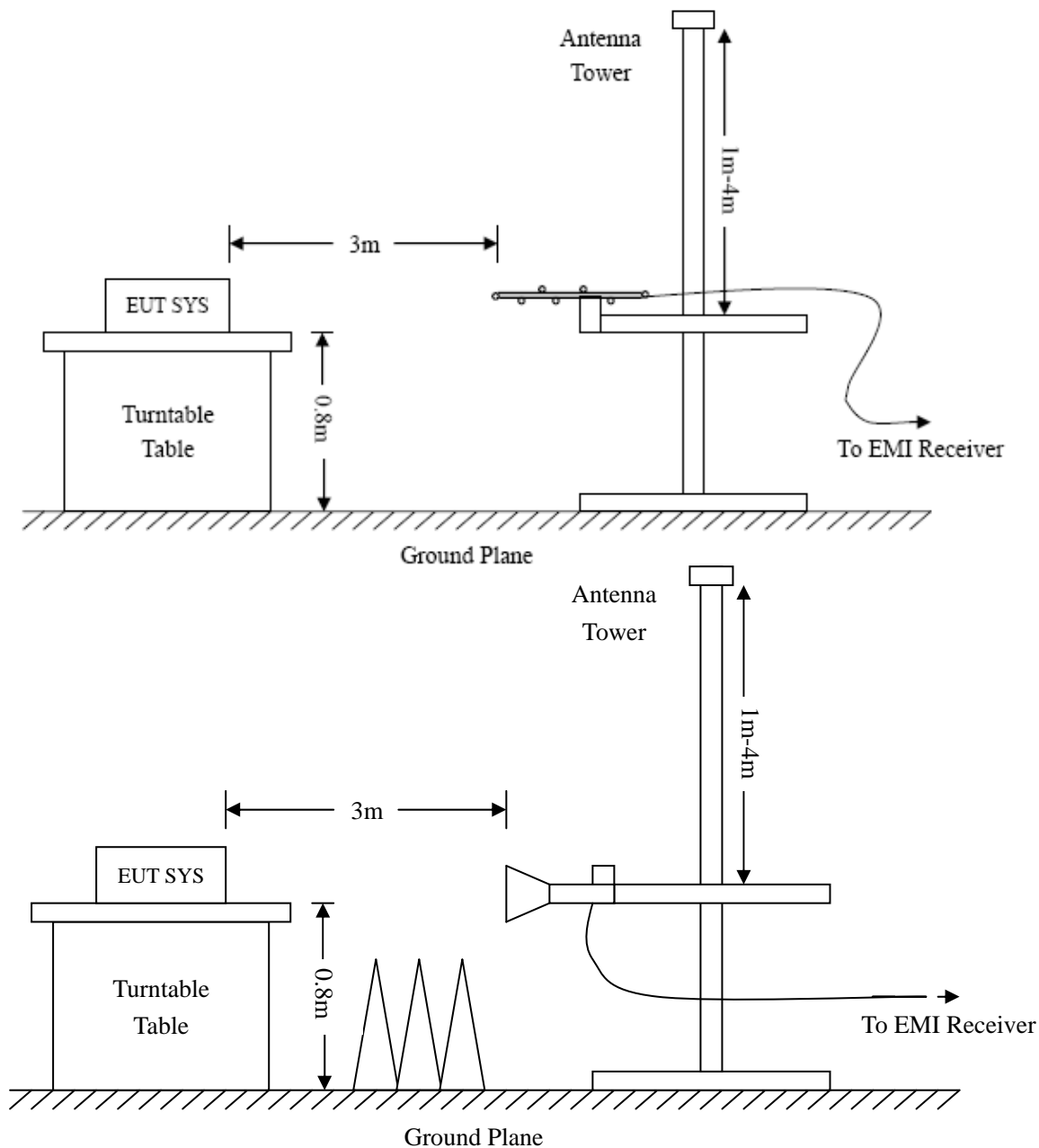
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Procedure

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



4.3 Test Receiver Setup

Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

4.4 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:

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

4.5 Environmental Conditions

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

4.6 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:

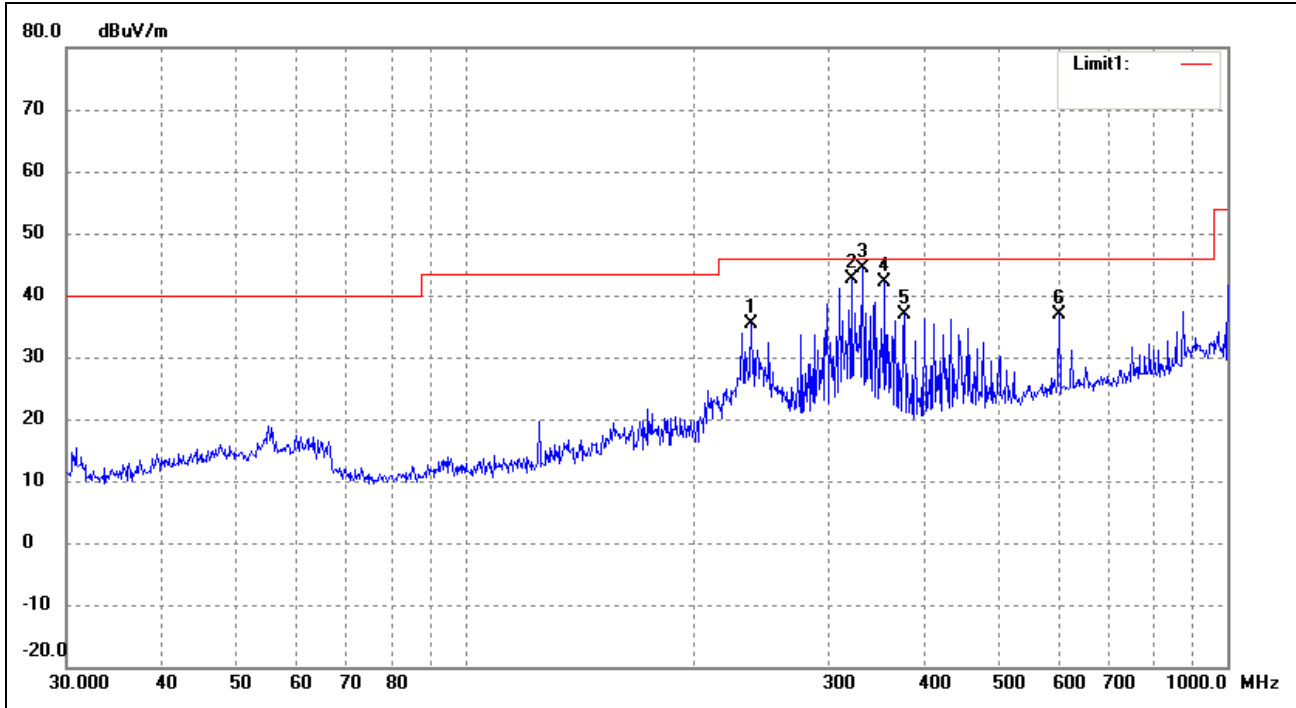
-0.70dB at 332.5187MHz in the Horizontal polarization, 9 kHz to 1 GHz, 3Meters

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

Plot of Radiated Emissions Test Data

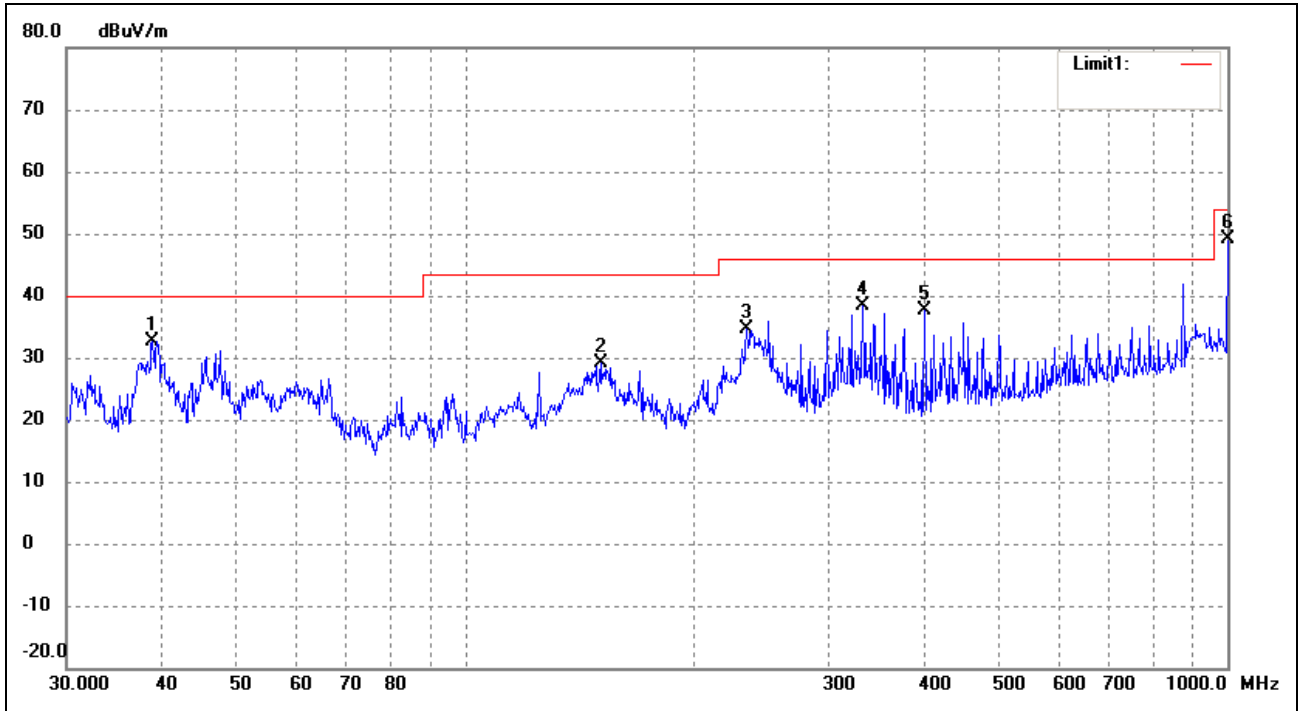
EUT: *Internet Radio*
 Tested Model: *MA-80*
 Operating Condition: *AC 120V/60HZ Adapter DC 5V*
 Comment: *TM1*

 Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	237.4760	42.04	-6.54	35.50	46.00	-10.50	100	100	peak
2	321.0608	47.05	-4.37	42.68	46.00	-3.32	100	100	peak
3	332.5187	48.31	-3.93	44.38	46.00	-1.62	100	100	peak
4	355.4273	45.22	-3.14	42.08	46.00	-3.92	100	100	peak
5	377.2591	39.81	-2.96	36.85	46.00	-9.15	100	100	peak
6	601.4265	35.19	1.75	36.94	46.00	-9.06	100	100	peak

Test Specification: Vertical

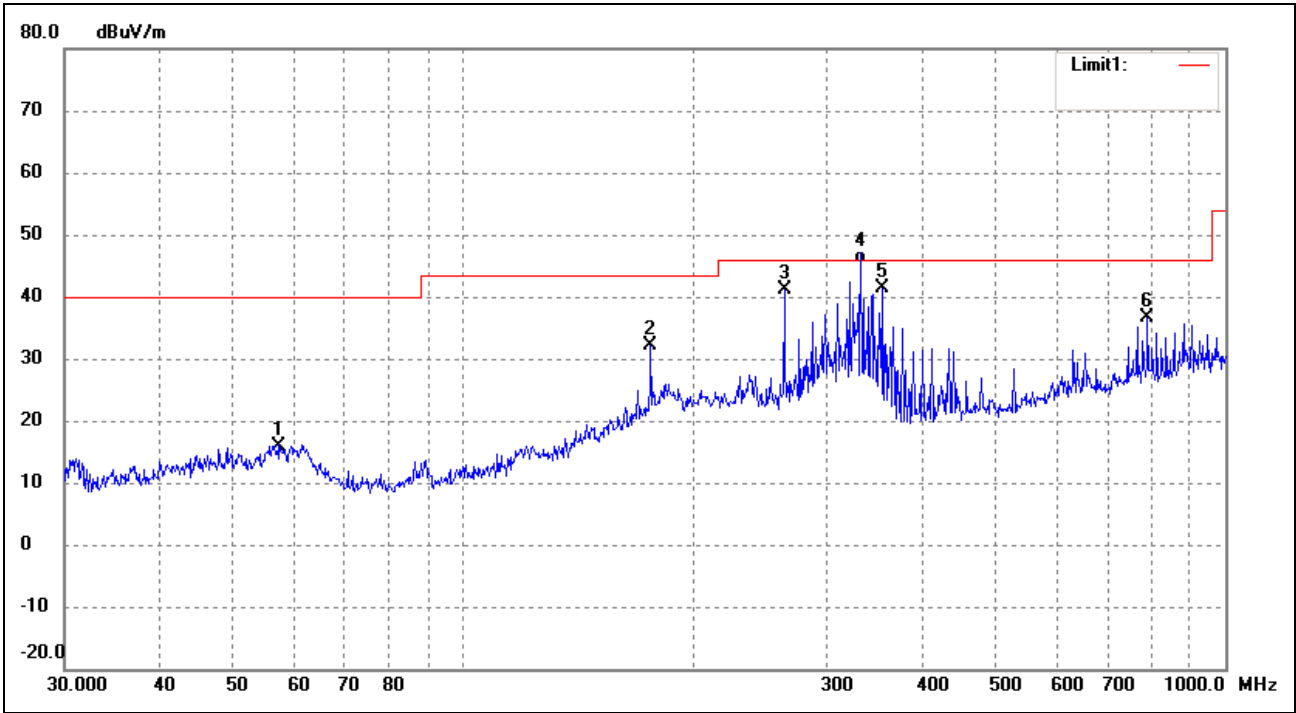


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	38.8879	42.73	-10.00	32.73	40.00	-7.27	100	100	peak
2	150.5378	40.11	-11.02	29.09	43.50	-14.41	100	100	peak
3	234.1684	41.24	-6.63	34.61	46.00	-11.39	100	100	peak
4	332.5187	42.32	-3.93	38.39	46.00	-7.61	100	100	peak
5	400.4319	39.84	-2.26	37.58	46.00	-8.42	100	100	peak
6	1000.0000	42.53	6.49	49.02	54.00	-4.98	100	100	peak

Operating Condition: AC 120V/60HZ Adapter DC 5V

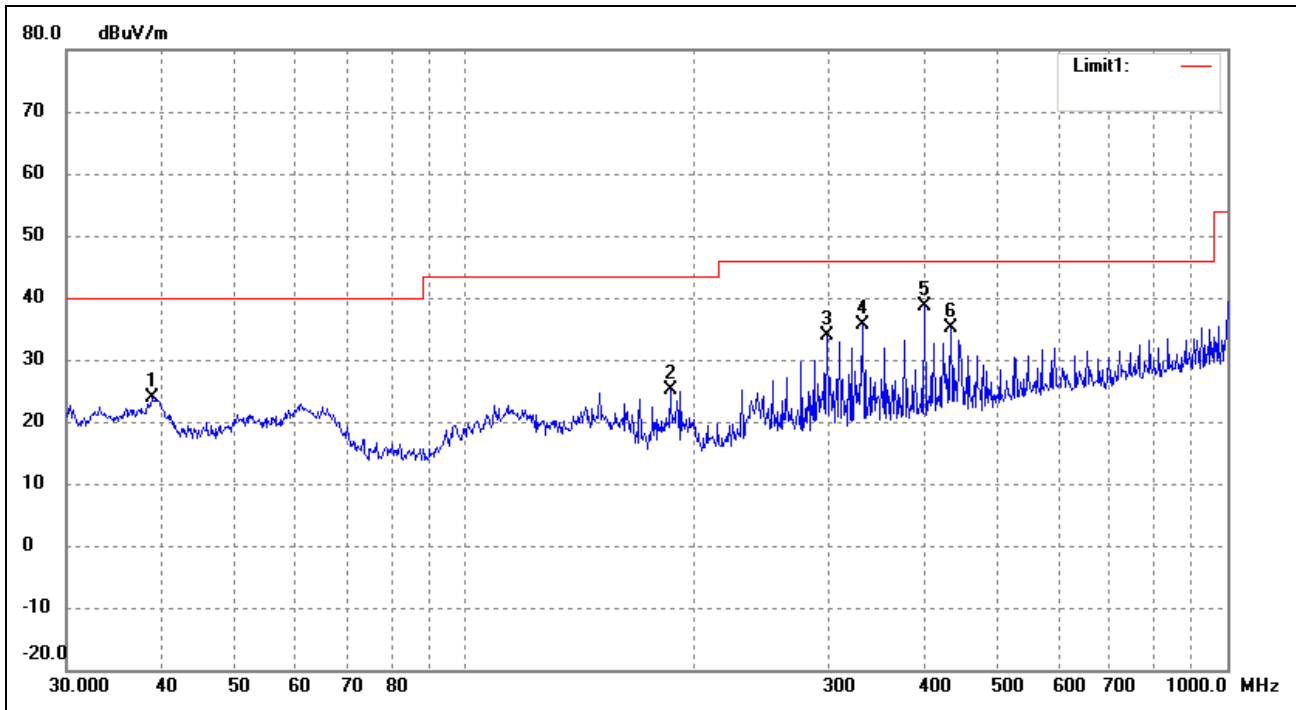
Comment: TM2

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	57.3923	25.89	-9.89	16.00	40.00	-24.00	100	100	peak
2	176.2686	41.58	-9.56	32.02	43.50	-11.48	100	100	peak
3	263.8190	47.11	-6.08	41.03	46.00	-4.97	100	100	peak
4	332.5187	49.23	-3.93	45.30	46.00	-0.70	100	100	QP
5	355.4273	44.45	-3.14	41.31	46.00	-4.69	100	100	peak
6	790.6188	32.51	4.21	36.72	46.00	-9.28	100	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	38.8878	33.83	-10.00	23.83	40.00	-16.17	100	100	peak
2	185.7881	33.82	-8.78	25.04	43.50	-18.46	100	100	peak
3	298.2681	38.95	-5.02	33.93	46.00	-12.07	100	100	peak
4	332.5187	39.52	-3.93	35.59	46.00	-10.41	100	100	peak
5	400.4318	40.98	-2.26	38.72	46.00	-7.28	100	100	peak
6	434.0650	36.71	-1.66	35.05	46.00	-10.95	100	100	peak

Test carry out on the worst case input 88MHZ

The measurements greater than 20dB below the limit from 9kHz to 30MHz, test data are not provided.

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