

47 CFR FCC Part 15 Subpart C

Section 15.247

TEST REPORT

Product : AquaHue Bluetooth Smart LED Aquarium Light

Trade Name : AquaHue

Model Number : AH-1015; AH-1020; AH-1030; AH-1040

FCC ID : 2ATBAAH-1

Prepared for

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Remark :

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The test result in this report is only subjected to the test sample.

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Statement of Compliance

Applicant: Yalumi Corporation
Manufacturer: MaxEmil Photonics Corporation
Product: AquaHue Bluetooth Smart LED Aquarium Light
Model No.: AH-1015; AH-1020; AH-1030; AH-1040
Tested Power Voltage: 120Vac, 60Hz
Date of Final Test: May 27, 2019
Revision of Report: Rev. 03

Configuration of Measurements and Standards Used :

FCC Rules and Regulations Part 15 Subpart C

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.10 2013, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of IETC

Report Issued: 2019/09/03

Project Engineer: Ivan Wang Approved: K.C. Chen
Ivan Wang K.C. Chen

1 General Information

1.1 Description of Equipment Under Test

Product : AquaHue Bluetooth Smart LED Aquarium Light

Model Number : AH-1015; AH-1020; AH-1030; AH-1040

Applicant : **Yalumi Corporation**
14125 Telephone Ave., STE #7, Chino, CA 91710, USA

Manufacturer : **MaxEmil Photonics Corporation**
7F No133 Lane235 BaoChiao Rd., XinDian Dist., New Taipei City 231,
Taiwan ROC

Power Supply : 100~240VAC, 50/60Hz

Operating Frequency : 2402 MHz - 2480 MHz

Channel Number : 40 channels

Type of Modulation : GFSK

Antenna description : This device uses Chip Antenna.
Antenna gain: 1.69 dBi.
The antenna is integral to the device, thereby meeting the requirement of FCC 15.203.

Date of Test : May 27, 2019

Additional Description : 1) The Model Number “**AH-1015; AH-1020; AH-1030; AH-1040**” are representative selected in the test and included in this report.
(These 4 models of EUT use the same RF control module.)
2) The differences for all models included in this report are as follows:

Model No.	length	Power
AH-1015	1.5 feet	30W (24Vdc, 1.25A)
AH-1020	2.0 feet	
AH-1030	3.0 feet	60W (24Vdc, 2.5A)
AH-1040	4.0 feet	

- 3) For more detail specification about EUT, please refer to the user's manual.
- 4) Compliant with Bluetooth Ver 4.1

1.2 Details of tested peripheral equipment

N/A

1.3 Table for Channel Frequencies
Bluetooth 4.1

Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402 MHz	14	2430 MHz	28	2458 MHz
1	2404 MHz	15	2432 MHz	29	2460 MHz
2	2406 MHz	16	2434 MHz	30	2462 MHz
3	2408 MHz	17	2436 MHz	31	2464 MHz
4	2410 MHz	18	2438 MHz	32	2466 MHz
5	2412 MHz	19	2440 MHz	33	2468 MHz
6	2414 MHz	20	2442 MHz	34	2470 MHz
7	2416 MHz	21	2444 MHz	35	2472 MHz
8	2418 MHz	22	2446 MHz	36	2474 MHz
9	2420 MHz	23	2448 MHz	37	2476 MHz
10	2422 MHz	24	2450 MHz	38	2478 MHz
11	2424 MHz	25	2452 MHz	39	2480 MHz
12	2426 MHz	26	2454 MHz	--	--
13	2428 MHz	27	2456 MHz	--	--

1.4 Test Facility

- Site Description** : ☒ RF Test Room ☒ Chamber 3 ☒ Conducted 1
- Name of Firm** : Interocean EMC Technology Corp.
- Company web** : <http://www.ietc.com.tw>
- Location** : No. 5-2, Lin 1, Tin-Fu, Lin-Kou Dist., New Taipei City, Taiwan 244, R.O.C.
- Site Filing** :
 - Federal Communication Commissions – USA
Designation No.: TW1020 (Test Firm Registration #: 651092)
Designation No.: TW1113 (Test Firm Registration #: 959554)
 - Innovation, Science and Economic Development Canada (ISED)
CAB identifier: TW1113 (Ref. No 14962756)
 - Voluntary Control Council for Interference by Information Technology Equipment (VCCI) – Japan
Member No.: 1349
Registration No. (Conducted Room): C-11094
Registration No. (Conducted Room): T-11562
Registration No. (OATS 1): R-11040; G-10274
- Site Accreditation** :
 - Bureau of Standards and Metrology and Inspection (BSMI) – Taiwan, R.O.C.
Accreditation No.:
SL2-IN-E-0026 for CNS 13438 / CISPR 22
SL2-R1-E-0026 for CNS 13439 / CISPR 13
SL2-R2-E-0026 for CNS 13439 / CISPR 13
SL2-L1-E-0026 for CNS 14115 / CISPR 15
 - Taiwan Accreditation Foundation (TAF)
Accreditation No.: 1113
 - American Association for Laboratory Accreditation (A2LA)
Certificate Number: 4891.01
 - Vehicle Safety Certification Center (VSCC)
Approval No.: TW16-11
 - TÜV NORD
Certificate No: TNTW0801R

1.5 Test Equipment

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	R&S	ESI7	830154/002	2020/05/05
EMI Test Receiver	R&S	ESCS 30	100127	2019/12/06
Spectrum Analyzer	R&S	FSP30	100002	2020/03/24
Pre-Amplifier	EMCI	EMC01640	980105	2019/08/20
Pre-Amplifier	EMCI	EMC 051845	980110	2019/09/05
Pre-Amplifier	Agilent	83050A	3950M00225	2019/10/07
Bilog Antenna	ETC	MCTD 2786B	BLB17S04020	2019/07/08
Horn Antenna	Schwarzbeck	BBHA9120	9120D-1051	2019/11/05
Horn Antenna	Schwarzbeck	BBHA 9170	213	2019/09/10
L.I.S.N.	Schwarzbeck	NNLK8121	8121417	2020/03/21
L.I.S.N.	Schaffner	MN2050D	1598	2019/08/06
RF Cable	HARBOUR	27478LL142	CBL65	2019/07/30
RF Cable	Marvelous Microwave	MCBL-LL266.50	CBL70	2019/07/30
RF Cable	Junkosha	MWX241	CBL58	2019/11/01
RF Cable	IETC	CBL68	CBL68	2019/07/30

Note: The above equipments are within the valid calibration period.

1.6 Measurement Uncertainty

Item	Expended Uncertainty (k=2)
Conduction 1:	
Conducted Emission (9 kHz to 30 MHz)	3.0 dB
Chamber 3:	
Radiated Emission Test (30 MHz to 1 GHz)	5.1 dB
Radiated Emission Test (1 GHz to 18 GHz)	5.2 dB
Radiated Emission Test (18 GHz to 40 GHz)	5.4 dB
RF test:	
RF conducted measurement (9 kHz to 40 GHz)	3.0 dB

1.7 Summary of Measurement

Report Clause	Test Parameter	Reference Document CFR47 Part15	Results
3	RF Radiated spurious emission	§15.205, 15.209	PASS
4	RF Conducted spurious emission	§15.247(d)	PASS
5	Maximum Peak output power	§15.247(b)	PASS
6	6dB Bandwidth	§15.247(a)(2)	PASS
7	Power spectral density	§15.247(e)	PASS
8	Emission on the Band Edge	§15.247(d)	PASS
9	AC Power Line Conducted Emission	§15.207	PASS

1.8 Justification

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of the frequency band were all arrive limit requirement, thus we evaluate the EUT pass the specified test.

2 Test Specifications

2.1 Test Standard

The EUT was performed according to FCC Part 15 Subpart C Section 15.247 procedure and setup followed by ANSI C63.10, 2013 requirements.

2.2 Operation Mode

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

2.3 Test Step of EUT

2.3.1 Setup the EUT.

2.3.2 Turn on the power, select low, medium, high channel.

2.3.3 Let the EUT continuous transmission.

2.3.4 Executed the test.

3 RF Radiated Spurious Emission

3.1 Limit

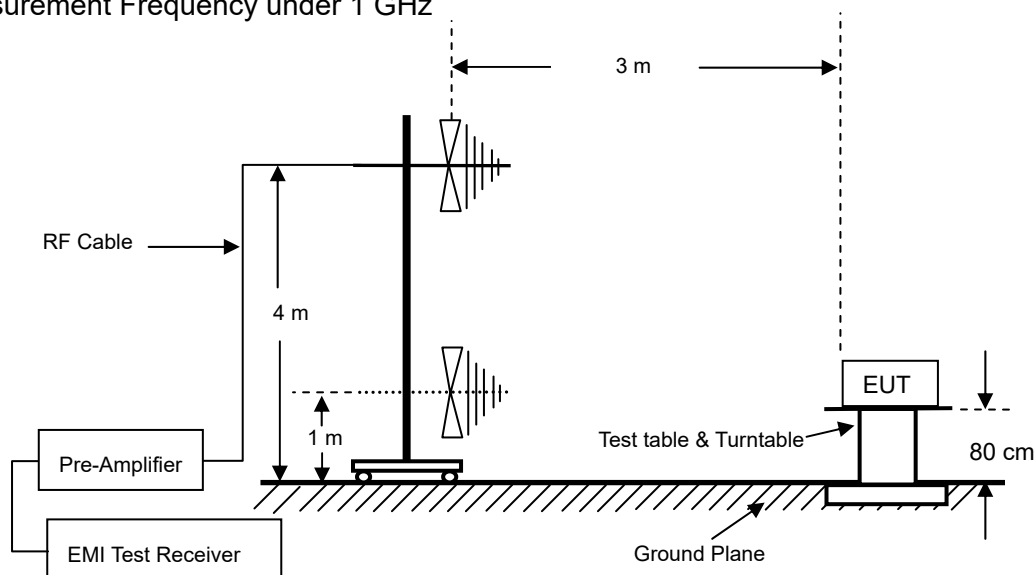
For intentional radiator, the radiated emission shall comply with FCC Part 15.209(a).

For intentional radiators, according to FCC Part 15.247 (a), operation under this provision is limited to frequency hopping and direct sequence spread spectrum, and the out band emission shall be comply with FCC Part 15.247 (c)

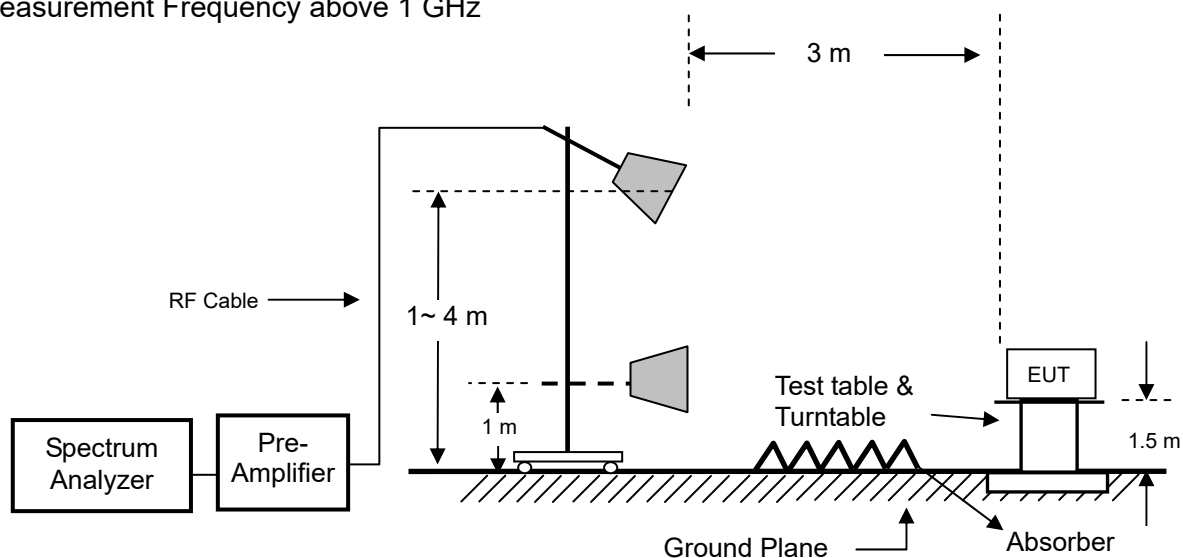
Frequency (MHz)	Field strength dB(μ V/m)	Measurement distance (meters)
1.705 ~ 30.0	29.5	30
30 ~ 88	40	3
88 ~ 216	43.5	3
216 ~ 960	46	3
Above 960	54	3

3.2 Configuration of Measurement

Measurement Frequency under 1 GHz



Measurement Frequency above 1 GHz



3.3 Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested procedure of Jan. 2016 KDB558074 D01 for compliance to FCC 47CFR 15.247 requirements.

Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer set as below: For frequency range from 30MHz to 1GHz: RBW=100kHz or greater. For frequencies above 1GHz: set RBW=VBW=1MHz for peak detector and RBW=1MHz, VBW=10Hz for average detector.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

3.4 Test Result

PASS.

The EUT has been tested low channel, middle channel and high channel, all test data pass the limit level.

The final test data is shown as following pages.

Radiated Emission Below 1 GHz

Model Number : **AH-1040**

After verifying X, Y, Z axis, the worst case was found at X axis Mid channel.

Frequency	Antenna	Reading	Factor	Result Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
117.30	H	51.95	-30.24	21.71	43.50	-21.79	PK
282.20	H	51.38	-30.43	20.95	46.02	-25.07	PK
410.24	H	52.71	-27.53	25.18	46.02	-20.84	PK
614.91	H	53.27	-25.40	27.87	46.02	-18.15	PK
815.70	H	53.15	-22.10	31.05	46.02	-14.97	PK
961.20	H	52.46	-18.46	34.00	54.00	-20.00	PK
123.12	V	52.50	-29.99	22.51	43.50	-20.99	PK
400.54	V	52.71	-27.58	25.13	46.02	-20.89	PK
465.53	V	53.67	-27.16	26.51	46.02	-19.51	PK
666.32	V	53.10	-24.76	28.34	46.02	-17.68	PK
825.40	V	53.56	-21.94	31.62	46.02	-14.40	PK
947.62	V	53.29	-18.66	34.63	46.02	-11.39	PK

Model Number : **AH-1030**

After verifying X, Y, Z axis, the worst case was found at X axis Mid channel.

Frequency	Antenna	Reading	Factor	Result Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
136.70	H	53.55	-30.23	23.32	43.50	-20.18	PK
318.09	H	52.37	-26.69	22.68	46.02	-23.34	PK
444.19	H	53.22	-27.36	25.86	46.02	-20.16	PK
608.12	H	52.75	-25.50	27.25	46.02	-18.77	PK
436.16	H	53.19	-23.66	29.53	46.02	-16.49	PK
914.60	H	53.81	-20.24	33.57	46.02	-12.45	PK
136.70	V	52.80	-30.23	22.57	43.50	-20.93	PK
258.92	V	52.54	-31.37	21.17	46.02	-24.85	PK
455.83	V	52.39	-27.27	25.12	46.02	-20.90	PK
591.63	V	52.93	-25.73	27.20	46.02	-18.82	PK
784.66	V	54.33	-22.62	31.71	46.02	-14.31	PK
959.26	V	52.58	-18.48	34.10	46.02	-11.92	PK

Remark : Result Level = Reading + Factor

Factor = Antenna Factor + Cable Loss - Preamp

Margin = Result Level - Limits

Model Number : AH-1020

After verifying X, Y, Z axis, the worst case was found at X axis Mid channel.

Frequency	Antenna	Reading	Factor	Result Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
325.85	H	53.01	-29.52	23.49	46.02	-22.53	PK
426.73	H	53.20	-27.44	25.76	46.02	-20.26	PK
560.59	H	53.24	-26.14	27.10	46.02	-18.92	PK
645.95	H	53.76	-24.81	28.95	46.02	-17.07	PK
846.74	H	53.98	-21.74	32.24	46.02	-13.78	PK
978.66	H	53.58	-18.33	35.25	54.00	-18.75	PK
239.52	V	52.83	-32.43	20.40	46.02	-25.62	PK
291.90	V	52.87	-30.23	22.64	46.02	-23.38	PK
517.91	V	52.51	-26.46	26.05	46.02	-19.97	PK
652.74	V	53.02	-24.73	28.29	46.02	-17.73	PK
836.07	V	53.21	-21.84	31.37	46.02	-14.65	PK
945.68	V	52.93	-18.74	34.19	46.02	-11.83	PK

Model Number : AH-1015

After verifying X, Y, Z axis, the worst case was found at X axis Mid channel.

Frequency	Antenna	Reading	Factor	Result Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
256.98	H	52.59	-31.50	21.09	46.02	-24.93	PK
401.51	H	52.69	-27.58	25.11	46.02	-20.91	PK
494.63	H	53.40	-26.81	26.59	46.02	-19.43	PK
650.80	H	52.85	-24.74	28.11	46.02	-17.91	PK
787.72	H	53.94	-22.65	31.29	46.02	-14.73	PK
977.69	H	53.22	-18.34	34.88	54.00	-19.12	PK
296.75	V	52.59	-30.12	22.47	46.02	-23.55	PK
371.44	V	53.26	-28.46	24.80	46.02	-21.22	PK
513.06	V	53.27	-26.54	26.73	46.02	-19.29	PK
646.92	V	52.52	-24.80	27.72	46.02	-18.30	PK
797.27	V	53.60	-22.42	31.18	46.02	-14.84	PK
967.02	V	53.54	-18.42	35.12	54.00	-18.88	PK

Remark : Result Level = Reading + Factor

Factor = Antenna Factor + Cable Loss - Preamp

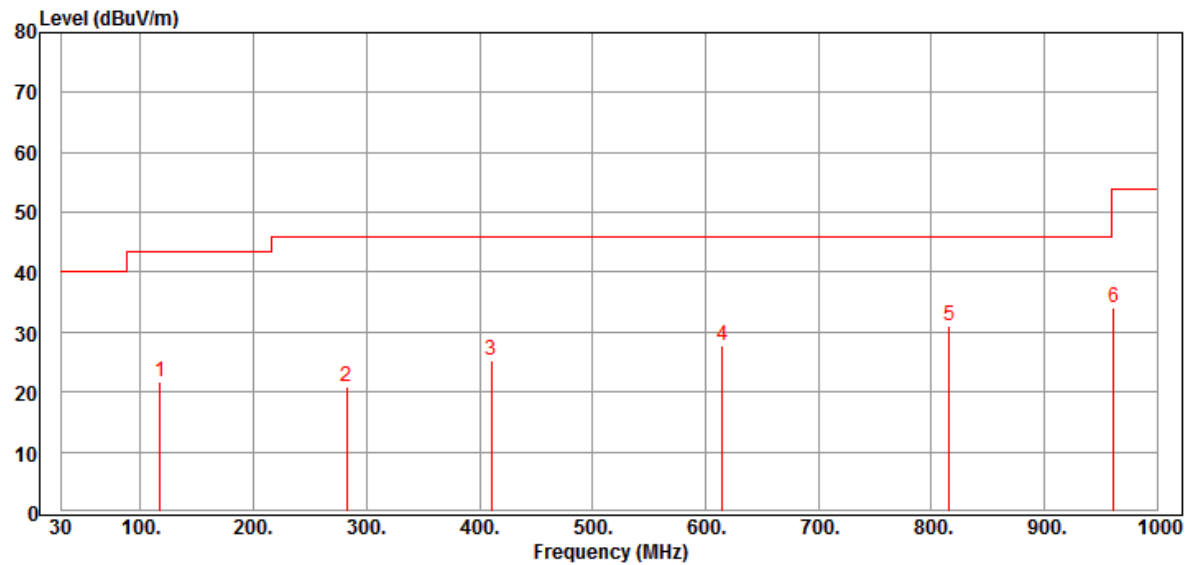
Margin = Result Level - Limits

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:26

2019-05-27



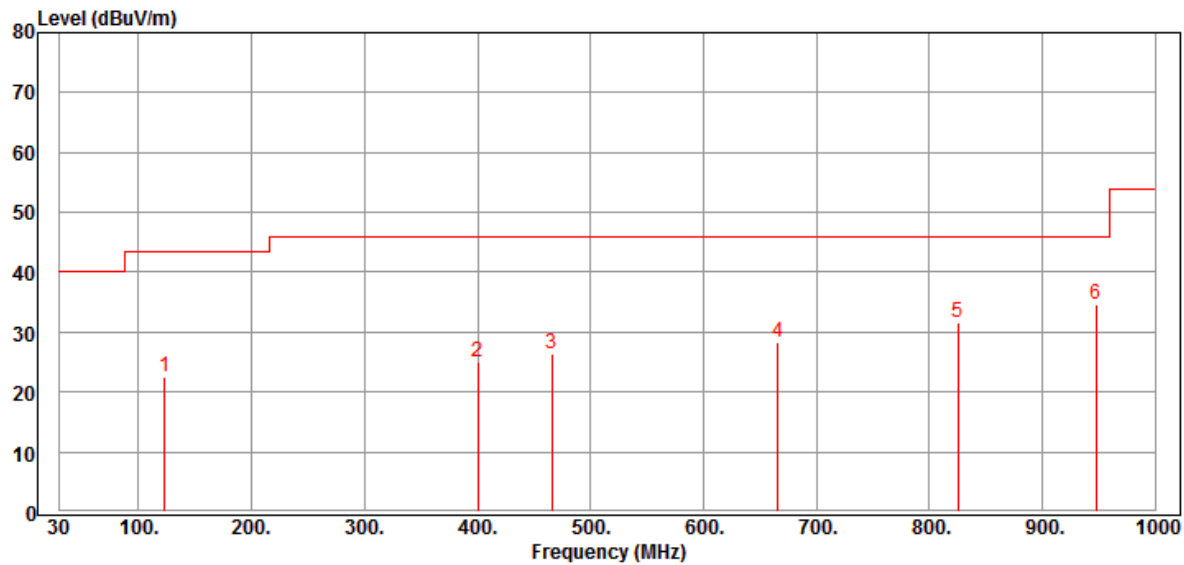
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	117.300	51.95	-30.24	21.71	43.50	-21.79	Peak
2	282.200	51.38	-30.43	20.95	46.02	-25.07	Peak
3	410.240	52.71	-27.53	25.18	46.02	-20.84	Peak
4	614.910	53.27	-25.40	27.87	46.02	-18.15	Peak
5	815.700	53.15	-22.10	31.05	46.02	-14.97	Peak
6	961.200	52.46	-18.46	34.00	54.00	-20.00	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:28

2019-05-27



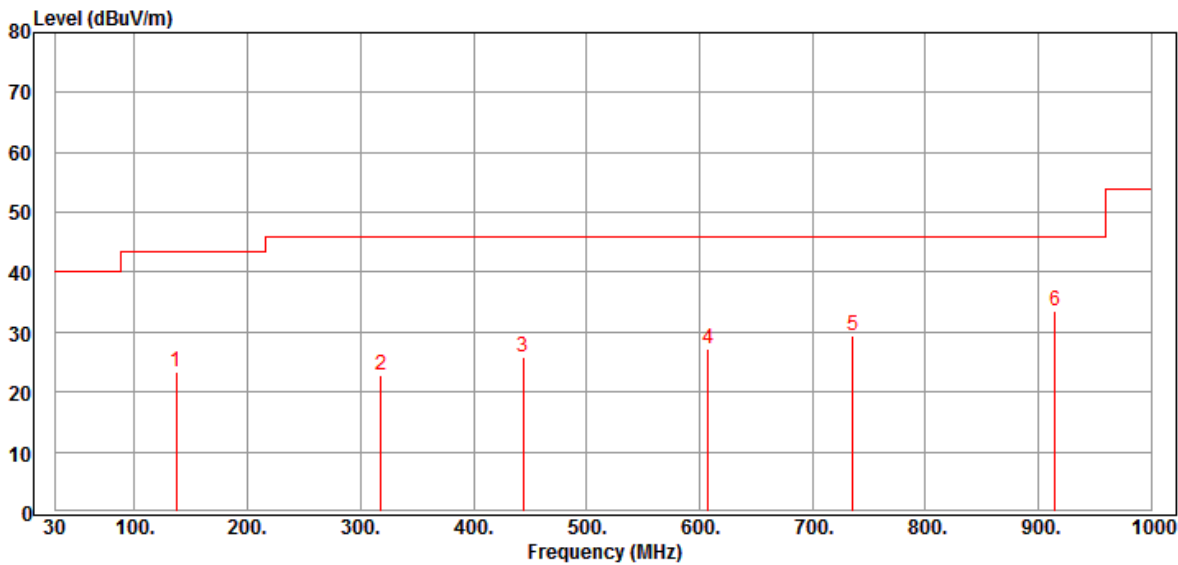
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	123.120	52.50	-29.99	22.51	43.50	-20.99	Peak
2	400.540	52.71	-27.58	25.13	46.02	-20.89	Peak
3	465.530	53.67	-27.16	26.51	46.02	-19.51	Peak
4	666.320	53.10	-24.76	28.34	46.02	-17.68	Peak
5	825.400	53.56	-21.94	31.62	46.02	-14.40	Peak
6	947.620	53.29	-18.66	34.63	46.02	-11.39	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1030
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:30

2019-05-27



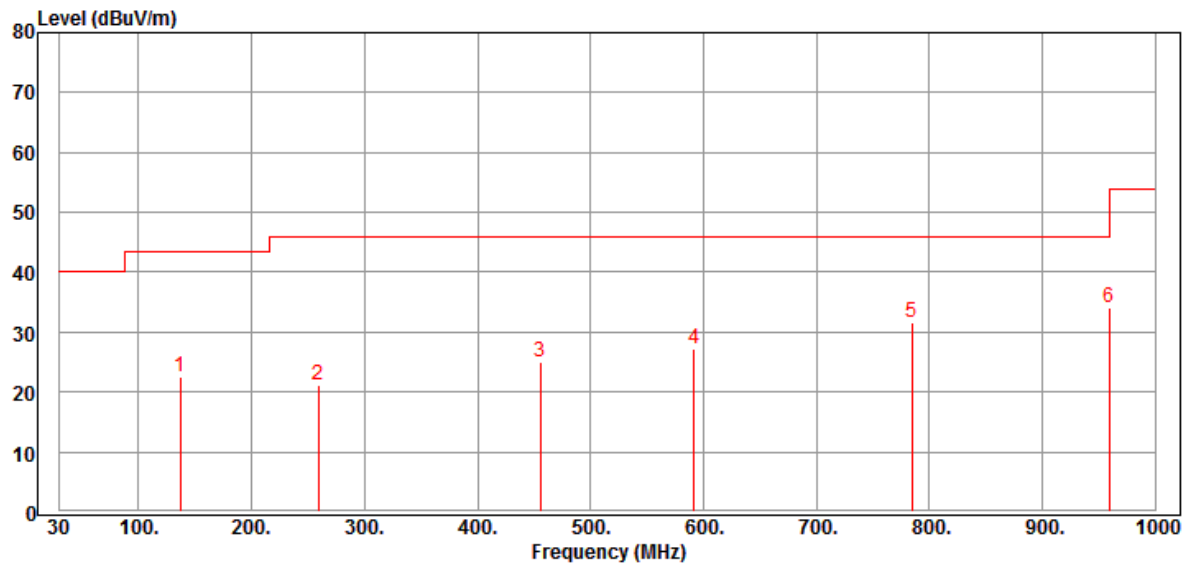
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	136.700	53.55	-30.23	23.32	43.50	-20.18	Peak
2	318.090	52.37	-29.69	22.68	46.02	-23.34	Peak
3	444.190	53.22	-27.36	25.86	46.02	-20.16	Peak
4	608.120	52.75	-25.50	27.25	46.02	-18.77	Peak
5	736.160	53.19	-23.66	29.53	46.02	-16.49	Peak
6	914.640	53.81	-20.24	33.57	46.02	-12.45	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1030
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:32

2019-05-27



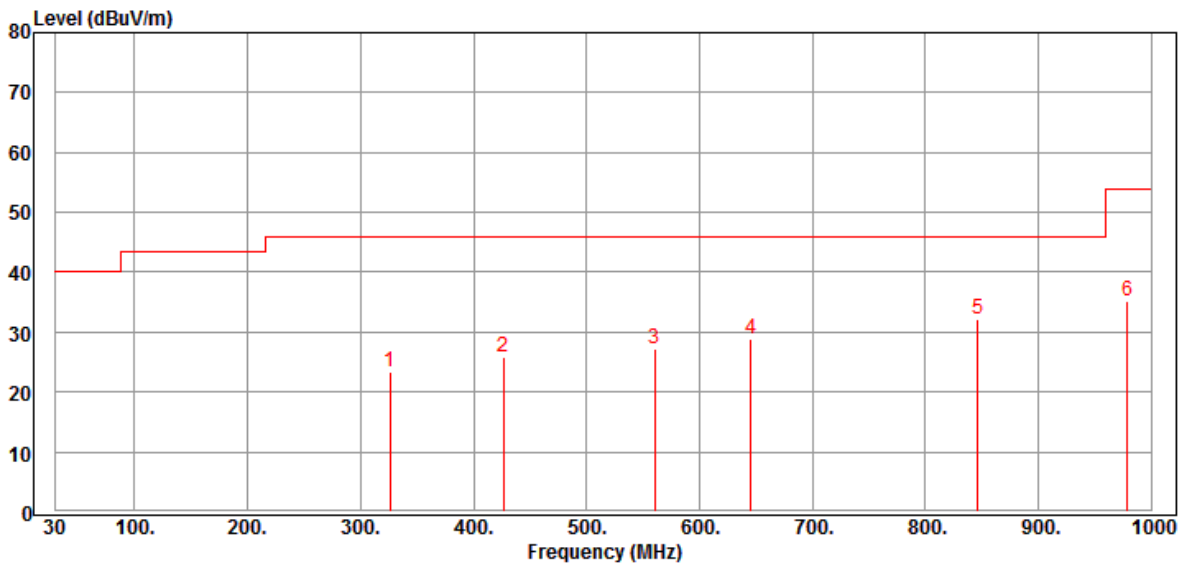
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	136.700	52.80	-30.23	22.57	43.50	-20.93	Peak
2	258.920	52.54	-31.37	21.17	46.02	-24.85	Peak
3	455.830	52.39	-27.27	25.12	46.02	-20.90	Peak
4	591.630	52.93	-25.73	27.20	46.02	-18.82	Peak
5	784.660	54.33	-22.62	31.71	46.02	-14.31	Peak
6	959.260	52.58	-18.48	34.10	46.02	-11.92	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1020
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:34

2019-05-27



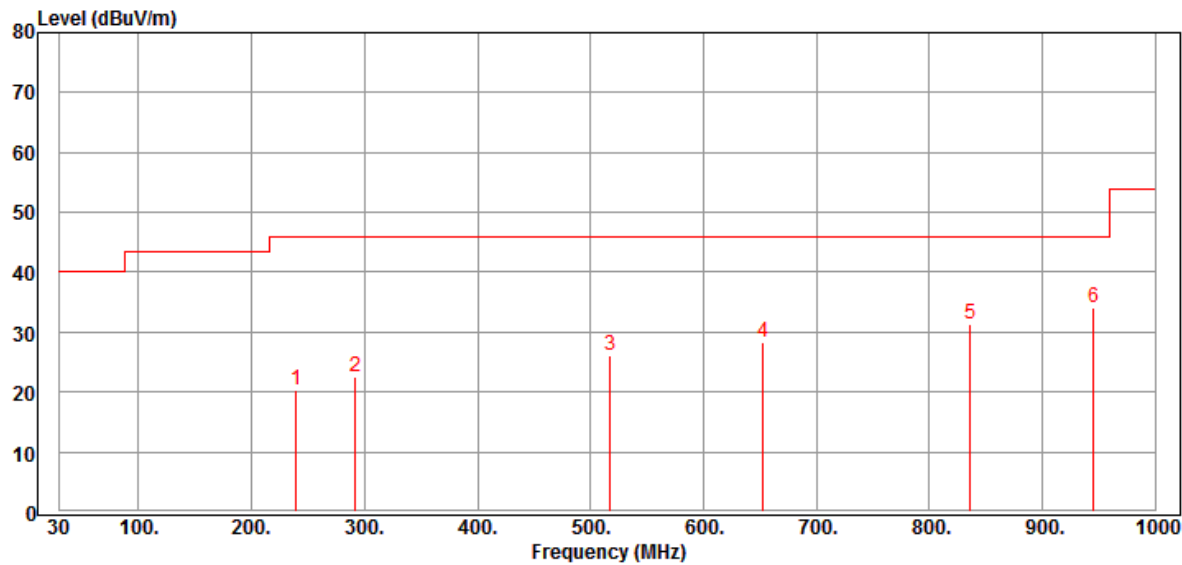
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	325.850	53.01	-29.52	23.49	46.02	-22.53	Peak
2	426.730	53.20	-27.44	25.76	46.02	-20.26	Peak
3	560.590	53.24	-26.14	27.10	46.02	-18.92	Peak
4	645.950	53.76	-24.81	28.95	46.02	-17.07	Peak
5	846.740	53.98	-21.74	32.24	46.02	-13.78	Peak
6	978.660	53.58	-18.33	35.25	54.00	-18.75	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1020
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:36

2019-05-27



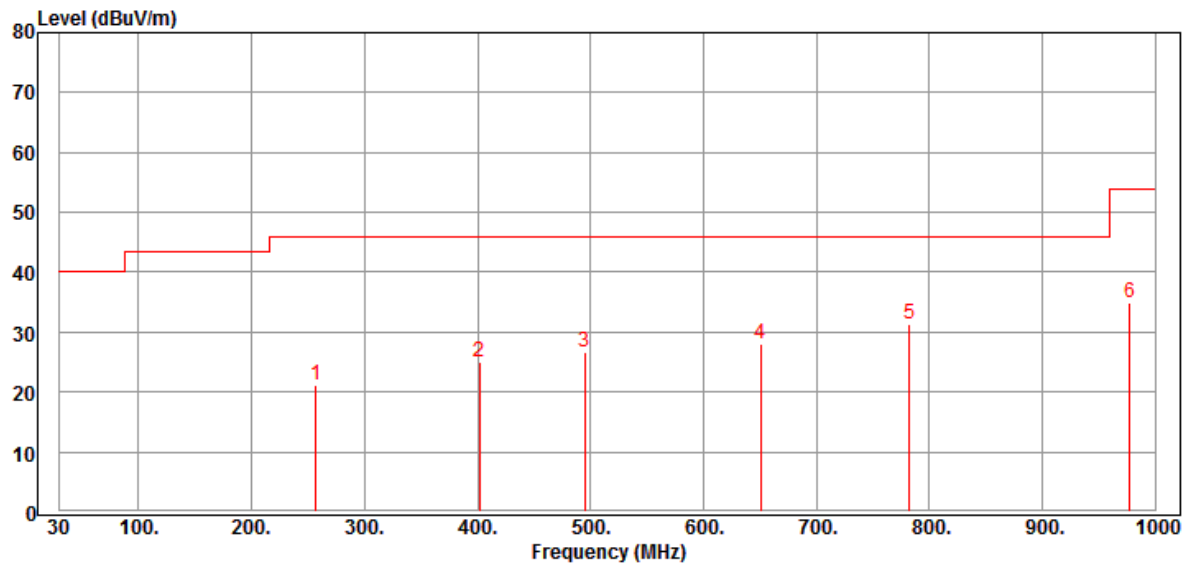
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	239.520	52.83	-32.43	20.40	46.02	-25.62	Peak
2	291.900	52.87	-30.23	22.64	46.02	-23.38	Peak
3	517.910	52.51	-26.46	26.05	46.02	-19.97	Peak
4	652.740	53.02	-24.73	28.29	46.02	-17.73	Peak
5	836.070	53.21	-21.84	31.37	46.02	-14.65	Peak
6	945.680	52.93	-18.74	34.19	46.02	-11.83	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1015
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:38

2019-05-27



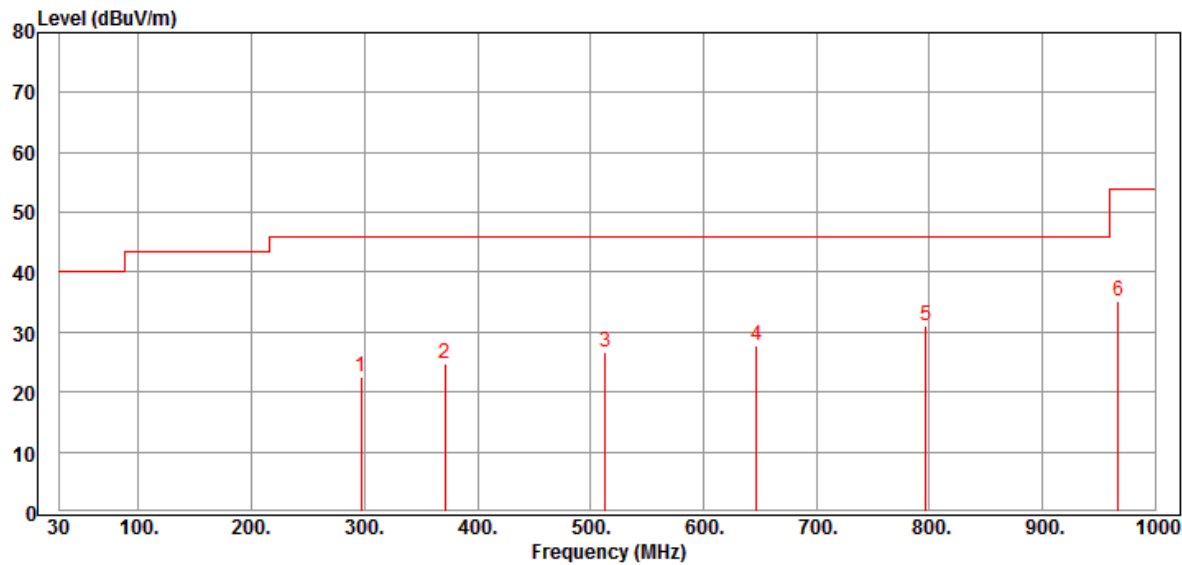
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	256.980	52.59	-31.50	21.09	46.02	-24.93	Peak
2	401.510	52.69	-27.58	25.11	46.02	-20.91	Peak
3	494.630	53.40	-26.81	26.59	46.02	-19.43	Peak
4	650.800	52.85	-24.74	28.11	46.02	-17.91	Peak
5	782.720	53.94	-22.65	31.29	46.02	-14.73	Peak
6	977.690	53.22	-18.34	34.88	54.00	-19.12	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1015
RATING: 120Vac/60Hz
COMMENT: CH19 (2440 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:40

2019-05-27



Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	296.750	52.59	-30.12	22.47	46.02	-23.55	Peak
2	371.440	53.26	-28.46	24.80	46.02	-21.22	Peak
3	513.060	53.27	-26.54	26.73	46.02	-19.29	Peak
4	646.920	52.52	-24.80	27.72	46.02	-18.30	Peak
5	797.270	53.60	-22.42	31.18	46.02	-14.84	Peak
6	967.020	53.54	-18.42	35.12	54.00	-18.88	Peak

Radiated Emission Above 1 GHz

Model Number : **AH-1040**

After verifying X, Y, Z axis, the worst case was found at X axis.

CH00 (2402 MHz)

Frequency	Antenna	Reading	Factor	Result Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
4806 (X axis)	H	55.36	-12.64	42.72	74	-31.28	PK
7207 (X axis)	H	51.89	-5.11	46.78	74	-27.22	PK
9608 (X axis)	H	52.63	-1.07	51.56	74	-22.44	PK
4806 (X axis)	V	54.78	-12.64	42.14	74	-31.86	PK
7207 (X axis)	V	52.21	-5.11	47.10	74	-26.90	PK
9608 (X axis)	V	52.76	-1.07	51.69	74	-22.31	PK

CH19 (2440 MHz)

Frequency	Antenna	Reading	Factor	Result Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
4883 (X axis)	H	54.64	-21.19	42.00	74	-32.00	PK
7319 (X axis)	H	52.72	-4.75	47.97	74	-26.03	PK
9762 (X axis)	H	52.72	-0.27	52.45	74	-21.55	PK
4883 (X axis)	V	54.95	-12.64	42.31	74	-31.69	PK
7319 (X axis)	V	52.61	-4.75	47.86	74	-26.14	PK
9762(X axis)	V	52.84	-0.27	52.57	74	-21.43	PK

CH39 (2480 MHz)

Frequency	Antenna	Reading	Factor	Result Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
4960 (X axis)	H	53.32	-12.35	40.97	74	-33.03	PK
7438 (X axis)	H	52.45	-4.50	47.95	74	-26.05	PK
9923 (X axis)	H	52.21	-0.07	52.14	74	-21.86	PK
4960 (X axis)	V	54.74	-12.35	42.39	74	-31.61	PK
7438 (X axis)	V	52.55	-4.50	48.05	74	-25.95	PK
9923 (X axis)	V	52.50	-0.07	52.43	74	-21.57	PK

Remark : Result Level = Reading + Factor

Factor = Antenna Factor + Cable Loss - Preamplifier

Margin = Result Level - Limits

The spurious emissions above 10GHz were not included, because the emissions are too low.

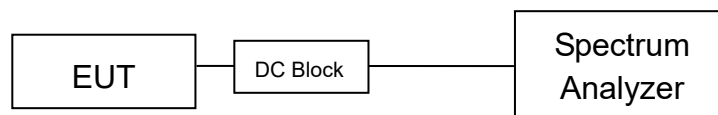
4 RF Conducted Spurious Emission

4.1 Limit

According to FCC Part 15.247(d) requirement :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

4.2 Configuration of Measurement



4.3 Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested procedure of Jan. 2016 KDB558074 D01 for compliance to FCC 47CFR 15.247 requirements.

The measurements were performed from 30MHz to 25GHz RF antenna conducted per FCC 15.247 (c) was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set $\geq$ RBW.

Harmonics and spurious noise must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limit for each channel.

4.4 Test Result

PASS.

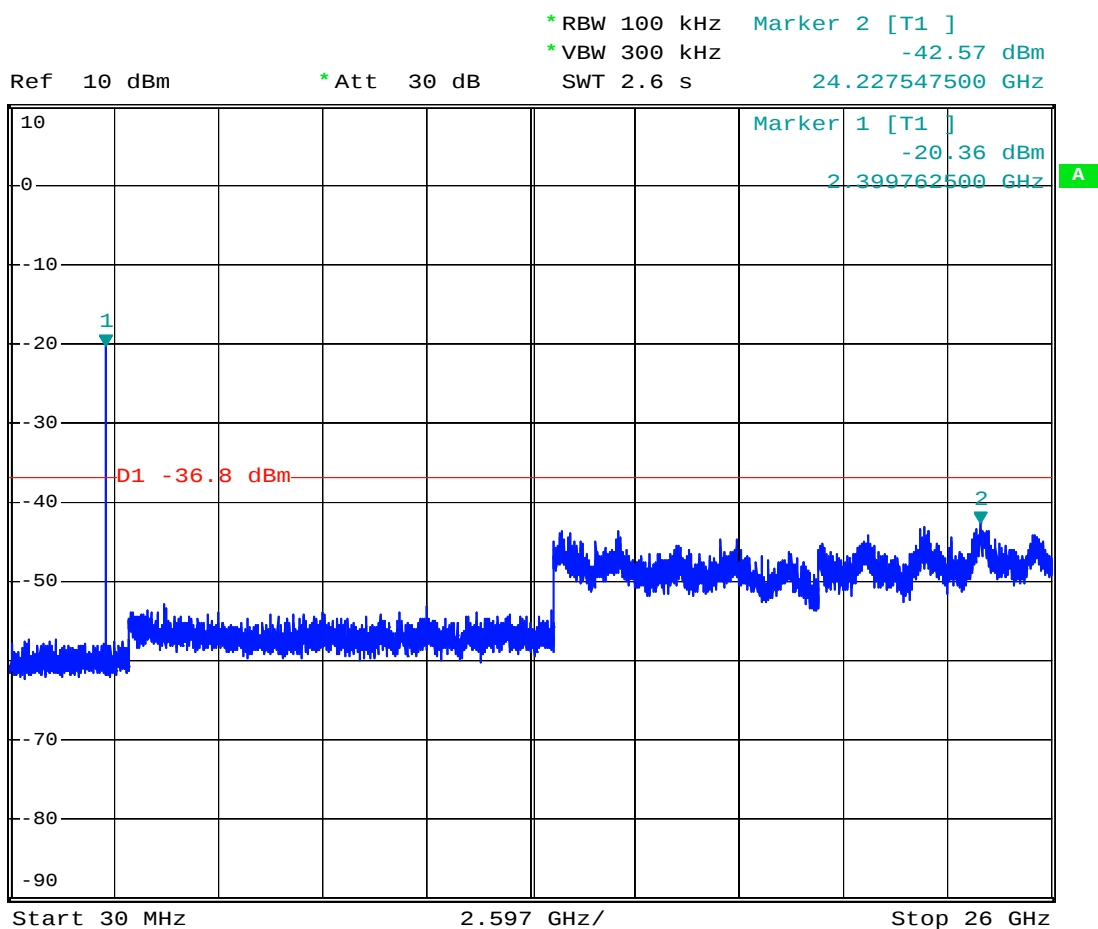
The final test data is shown as following pages.

Conducted Spurious Emission

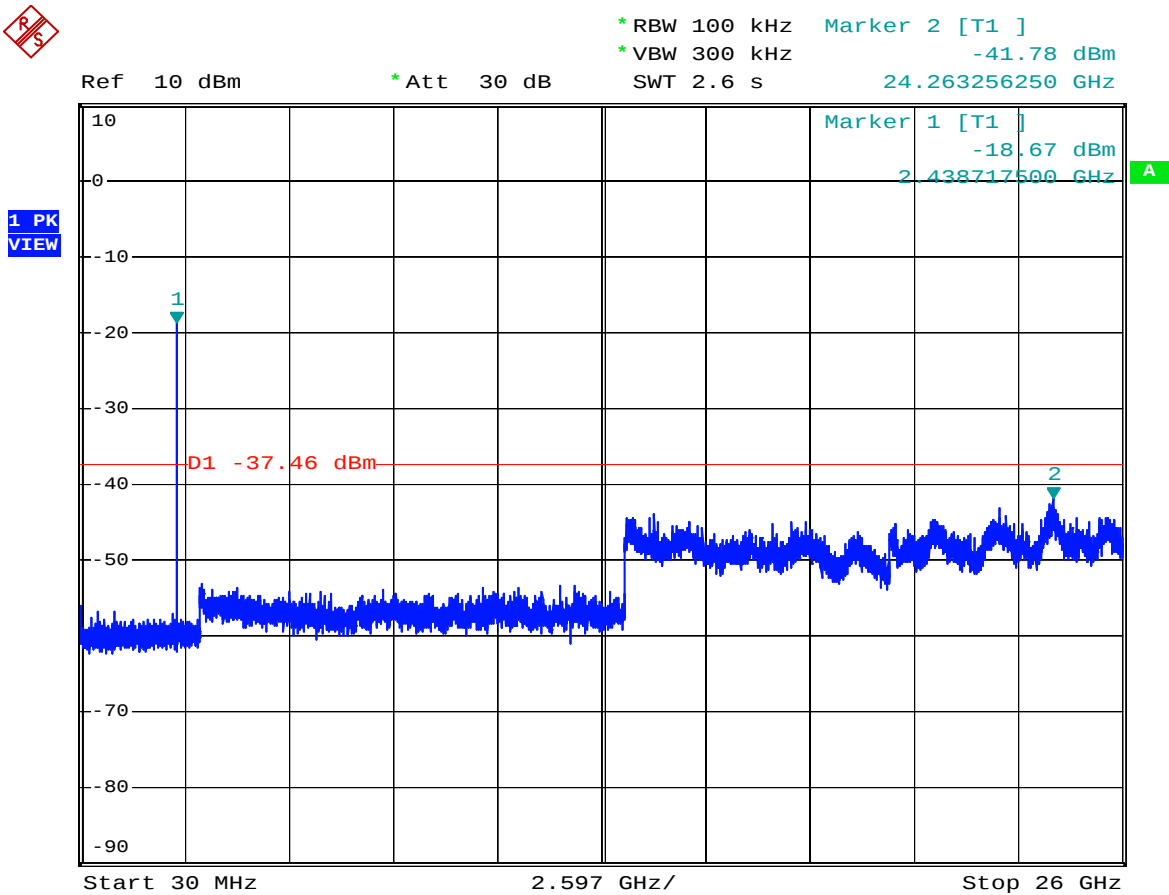
CH00 (2402 MHz)



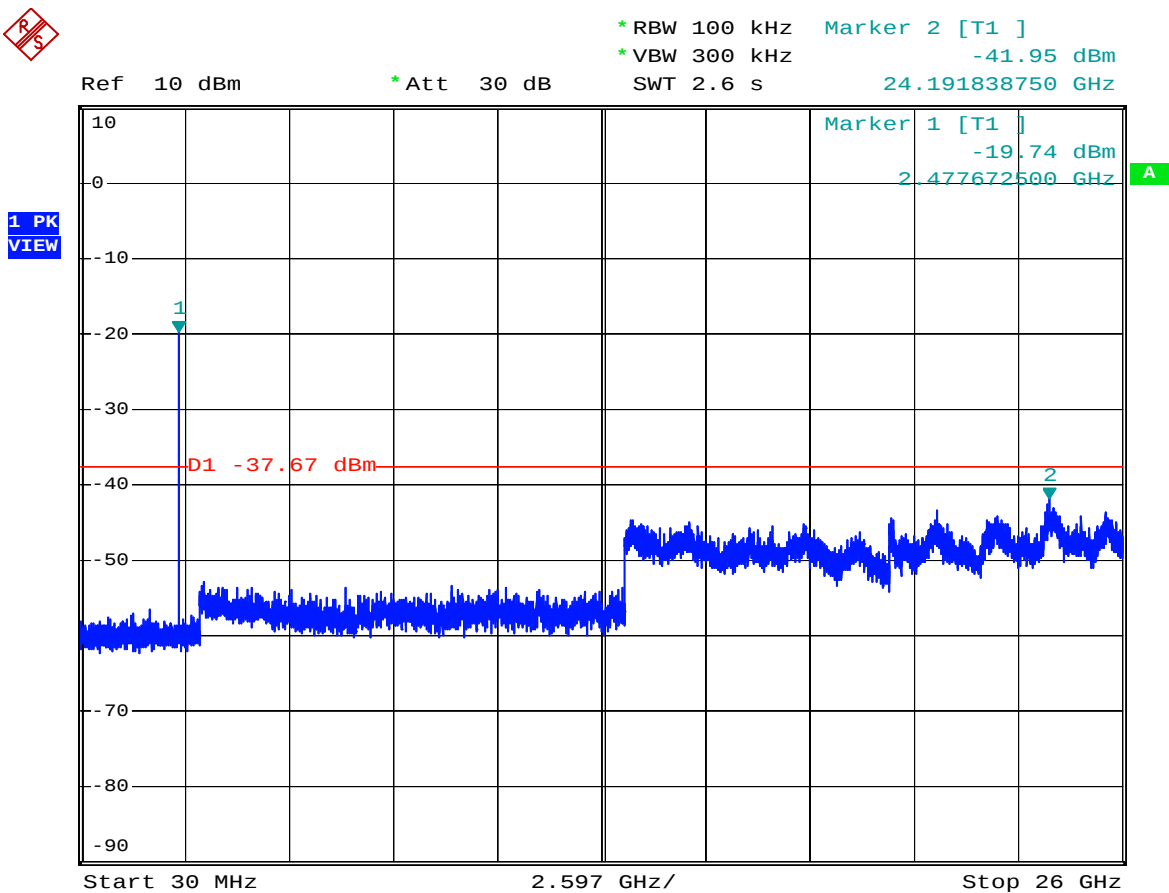
1 PK
VIEW



CH19 (2440 MHz)



CH39 (2480 MHz)



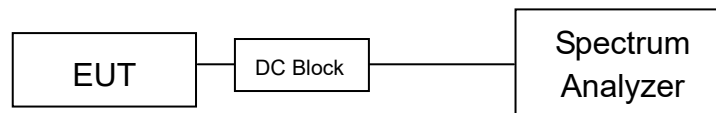
5 Maximum Peak output power

5.1 Limit

According to FCC Part15.247 (b)(3) requirement :

For systems using digital modulation in the 2400–2483.5 MHz bands: The maximum conducted output power shall be less than 1Watt.

5.2 Configuration of Measurement



5.3 Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested procedure of Jan. 2016 KDB558074 D01 for compliance to FCC 47CFR 15.247 requirements.

For FCC §15.247(b) the power output was measured on the EUT using a 50 ohm SMA cable connected to Spectrum Analyzer. Peak output power was read directly from Spectrum Analyzer.

Set :

1. $RBW \geq$ DTS bandwidth, $VBW \geq 3 \times RBW$
2. $Span \geq 3 \times RBW$
3. Detector = peak, trace mode = max hold
4. All trace to fully stabilize
5. Use peak marker function to determine the peak amplitude

5.4 Test Result

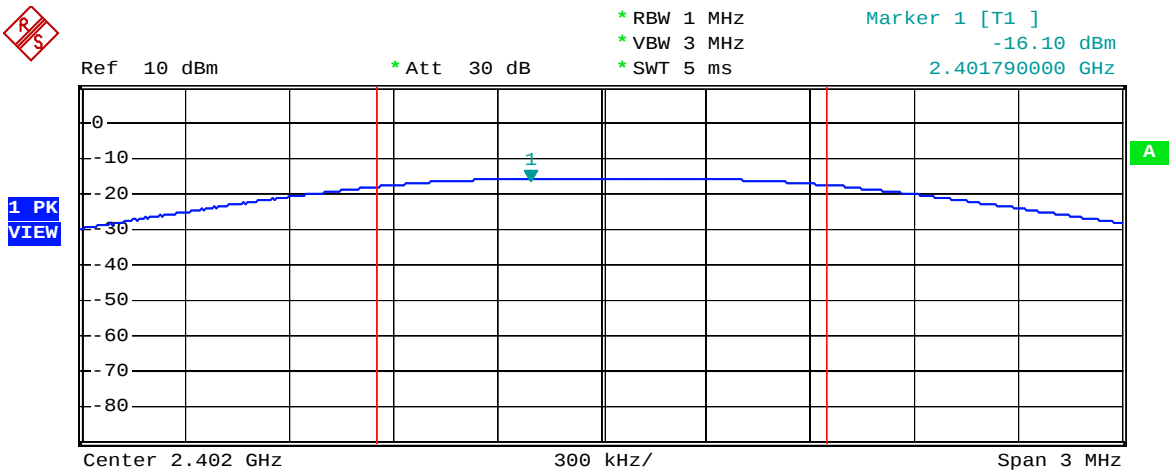
PASS.

The final test data is shown as following table.

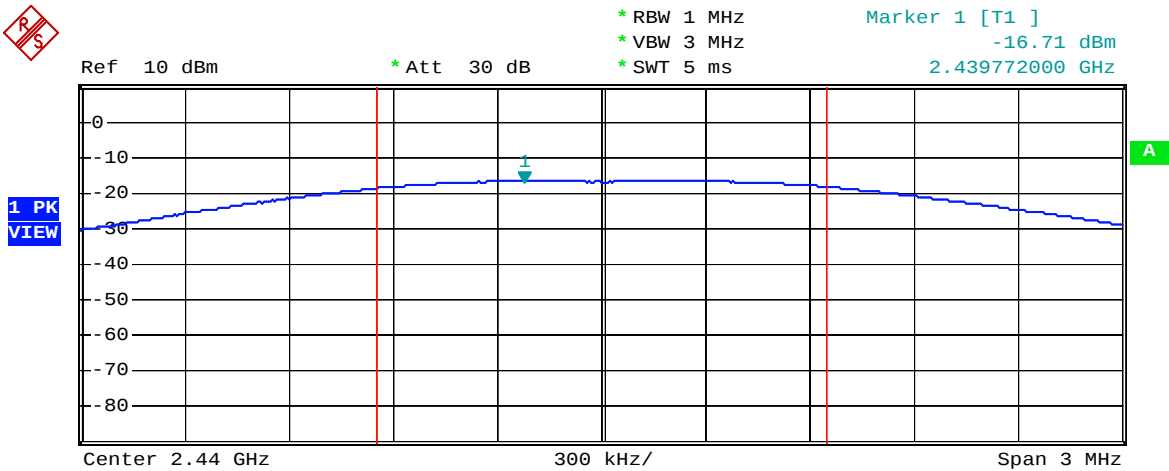
Maximum Peak Power

Test CH		Output Power (dBm)	Output Power (W)	Limit (dBm)	Magrin (dB)
CH No.	Freq. (MHz)				
0	2402	-16.10	0.00002	30	-46.10
19	2440	-16.71	0.00002	30	-46.71
39	2480	-17.28	0.00002	30	-47.28

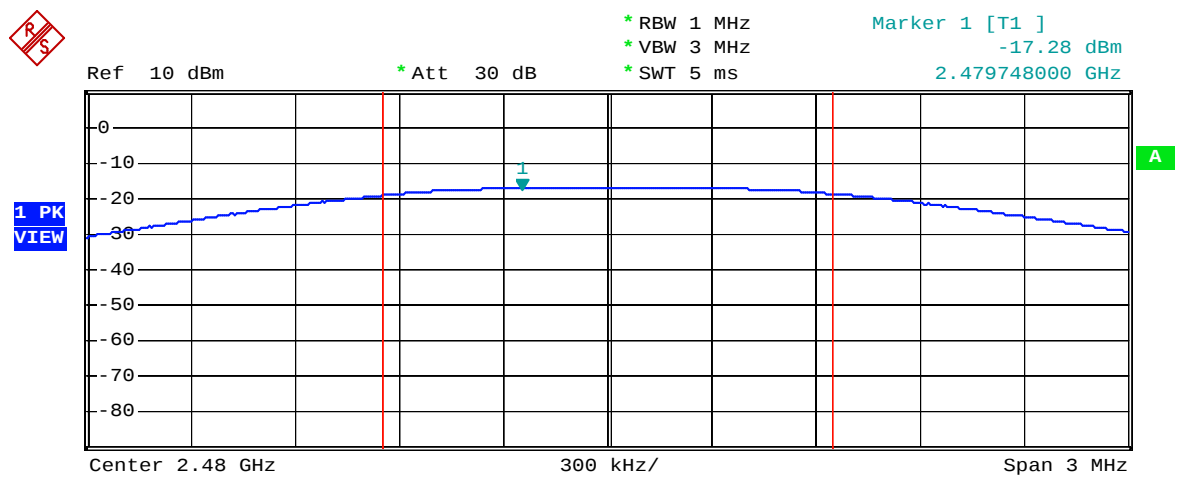
2402 MHz Maximum Peak Power



2440 MHz Maximum Peak Power



2480 MHz Maximum Peak Power



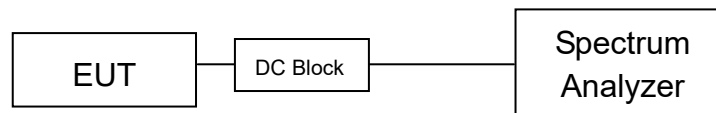
6 6dB Bandwidth

6.1 Limit

According to FCC Part 15.247 (a)(2) requirement :

Systems using digital modulation techniques may operate in the 2400–2483.5 MHz, The minimum 6dB bandwidth shall be at least 500 kHz.

6.2 Configuration of Measurement



6.3 Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested procedure of Jan. 2016 KDB558074 D01 for compliance to FCC 47 CFR 15.247 requirements.

The minimum 6dB bandwidth was measured using a 50 ohm spectrum analyzer.

- 1) RBW = 100kHz
- 2) VBW $\geq$ 3 x RBW
- 3) Detector = Peak
- 4) Trace mode = Max hold
- 5) Sweep = auto couple
- 6) All trace to fully stabilize
- 7) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

6.4 Test Result

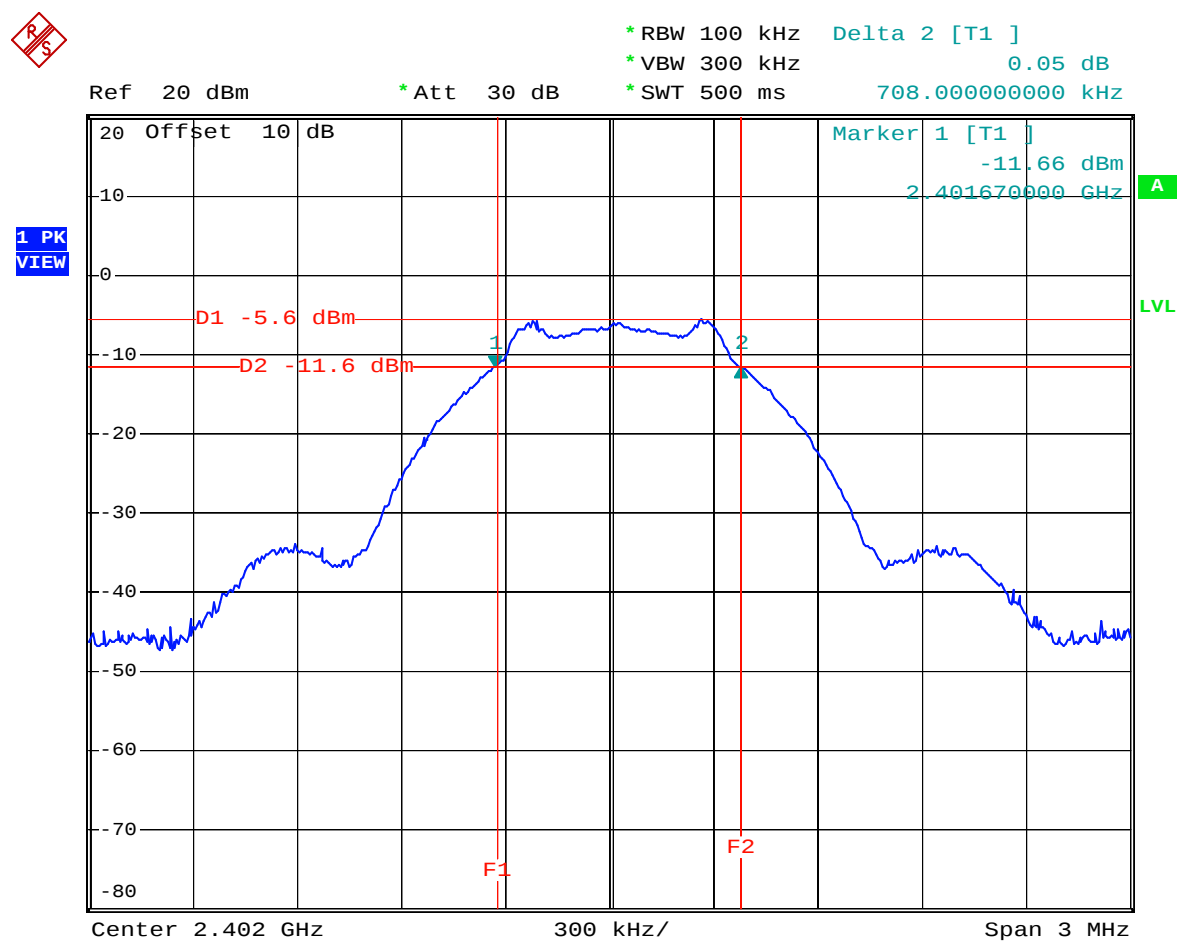
PASS.

The final test data is shown on as following pages.

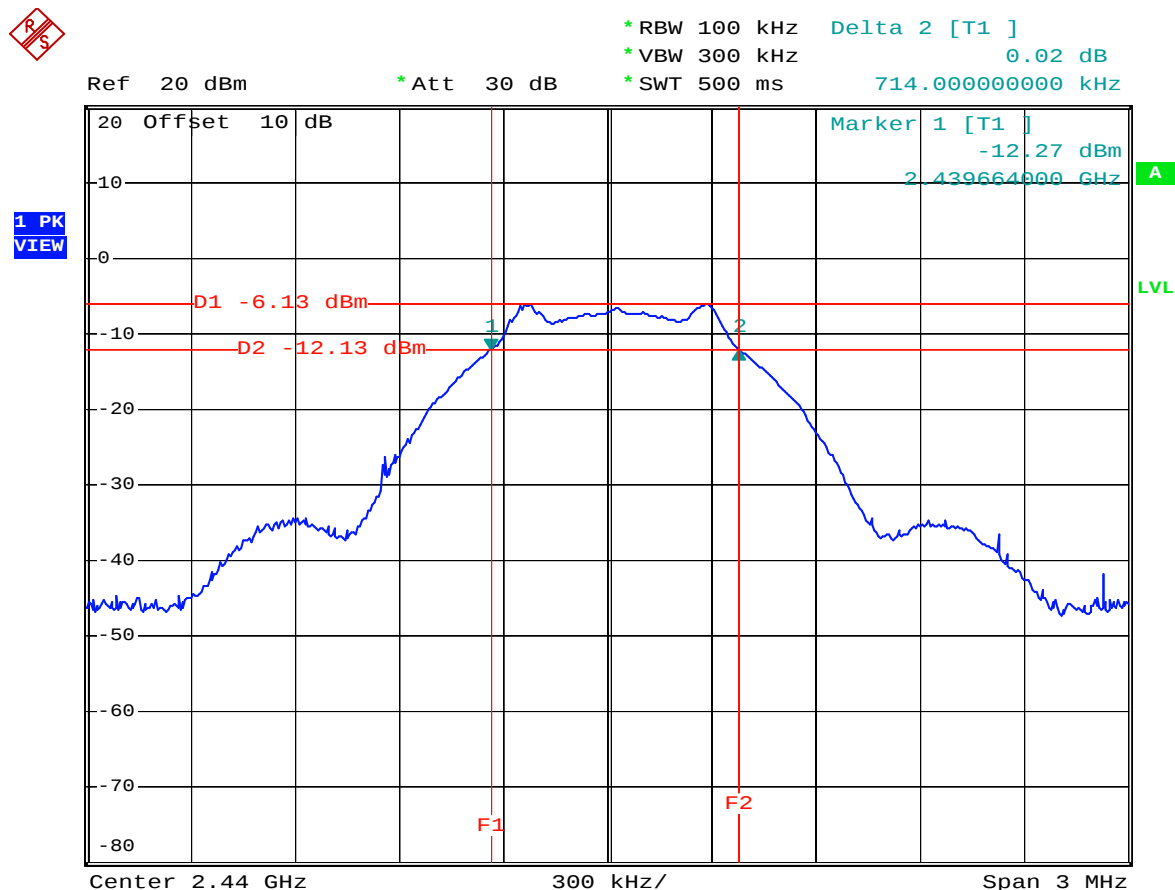
6dB Bandwidth

Test CH		6dB Bandwidth (kHz)	Limit (kHz)	Result
CH No.	Freq. (MHz)			
0	2402	708.00	>500	PASS
19	2440	714.00	>500	PASS
39	2480	726.00	>500	PASS

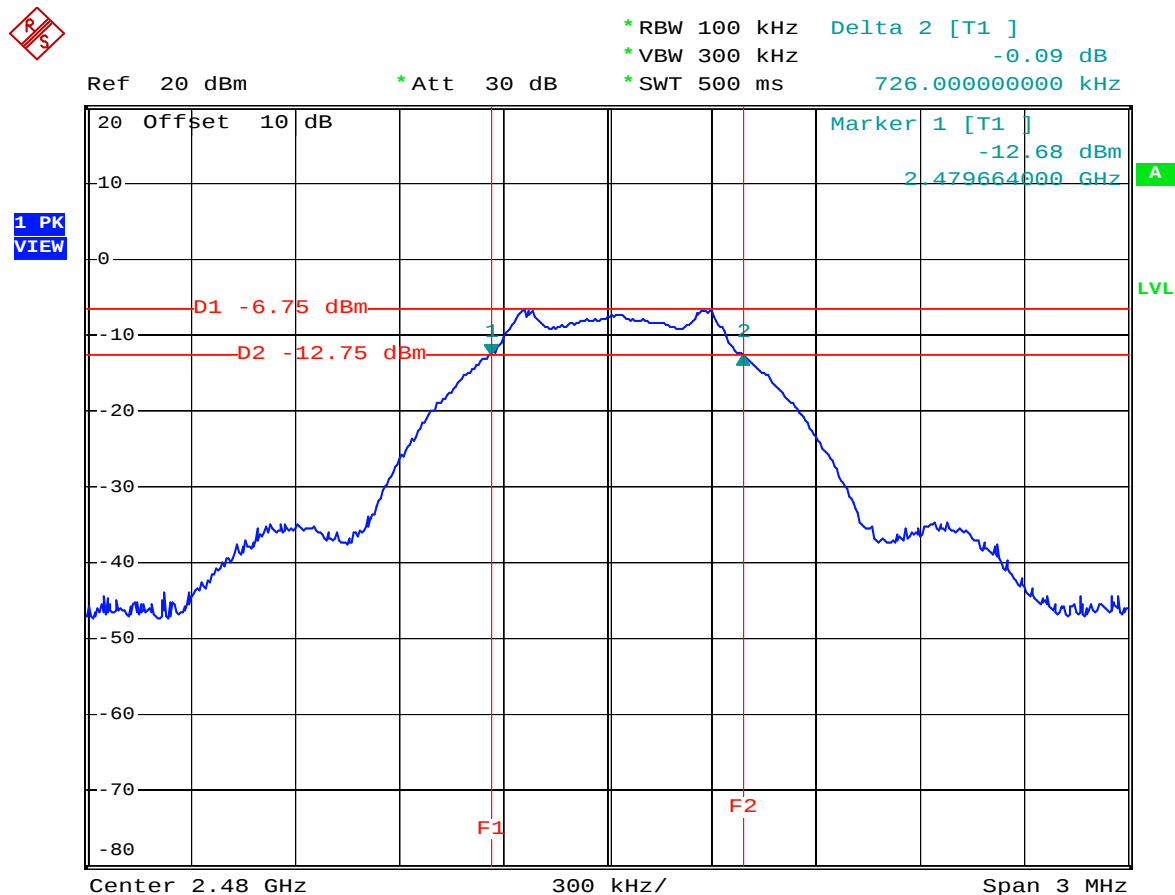
2402 MHz 6dB Bandwidth



2440 MHz 6dB Bandwidth



2480 MHz 6dB Bandwidth



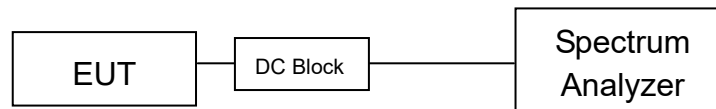
7 Power Spectral Density

7.1 Limit

According to FCC Part15.247 (e) requirement :

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.2 Configuration of Measurement



7.3 Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested procedure of Jan. 2016 KDB558074 D01 for compliance to FCC 47CFR 15.247 requirements.

Set::

- 1) Analyzer center frequency to DTS channel center frequency
- 2) The span ≥ 1.5 times the DTS bandwidth
- 3) RBW: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$
- 4) VBW $\geq 3 \times \text{RBW}$
- 5) Detector = Peak
- 6) Trace mode = Max hold
- 7) Sweep = auto couple
- 8) All trace to fully stabilize
- 9) Use the peak marker function to determine the maximum amplitude level within the RBW
- 10) If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.

7.4 Test Result

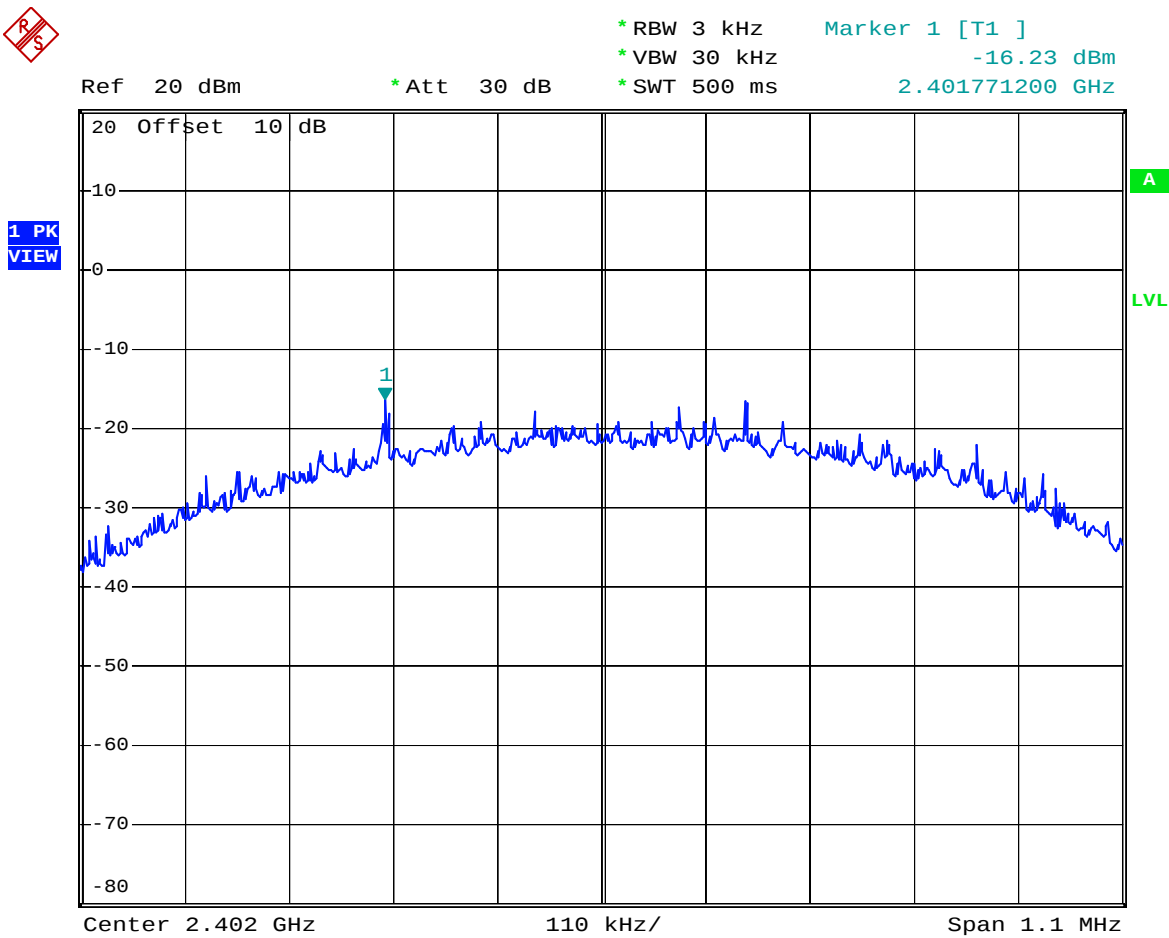
PASS.

The final test data is shown on as following pages.

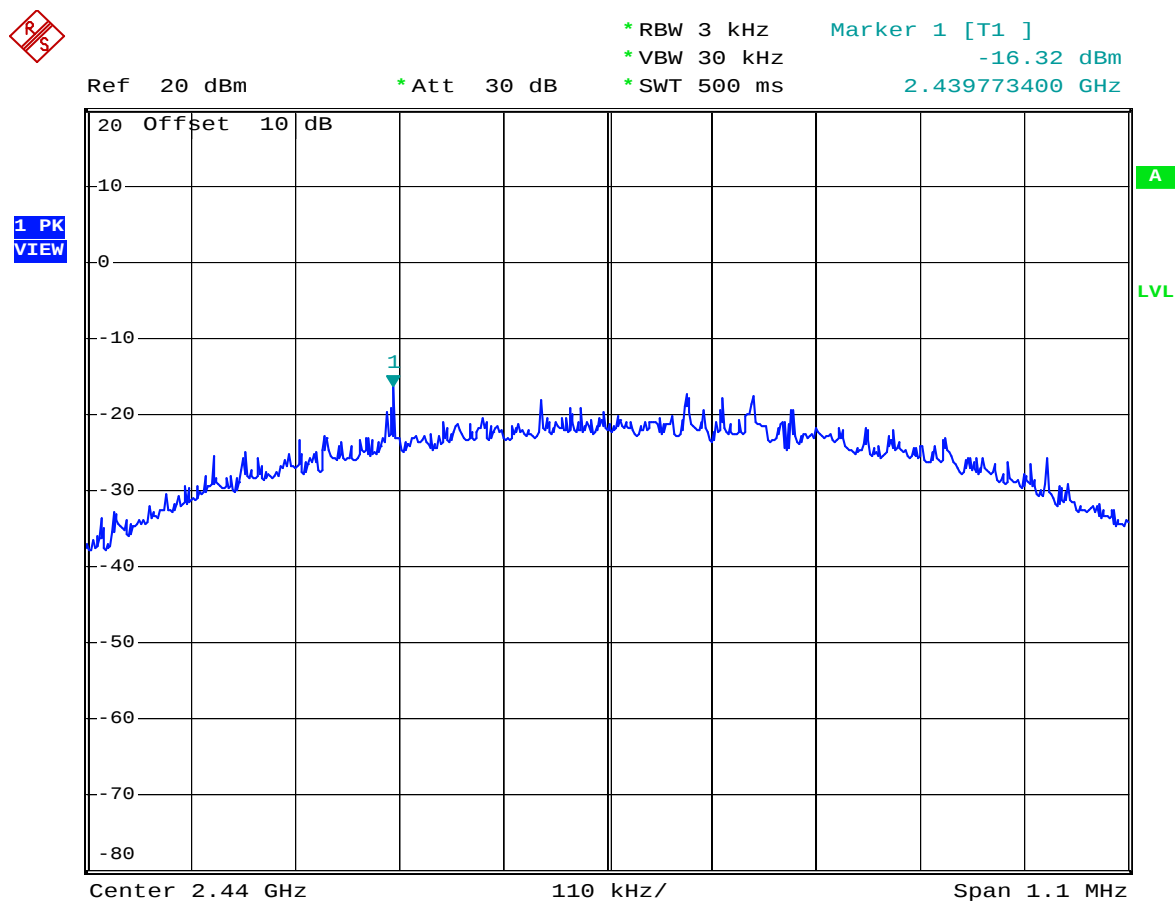
Power Spectral Density

Test CH		PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH No.	Freq. (MHz)			
0	2402	-16.23	8	PASS
19	2440	-16.32	8	PASS
39	2480	-17.90	8	PASS

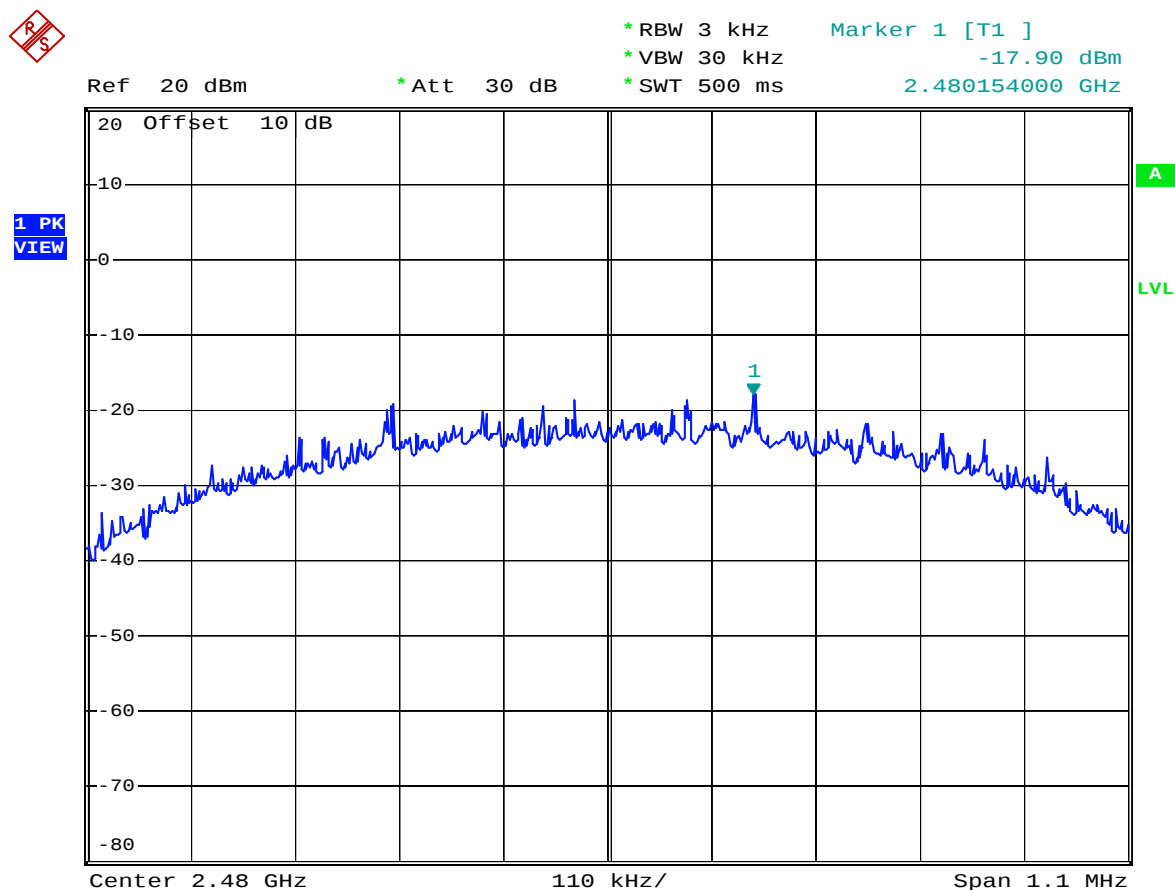
2402 MHz Power Spectral Density



2440 MHz Power Spectral Density



2480 MHz Power Spectral Density



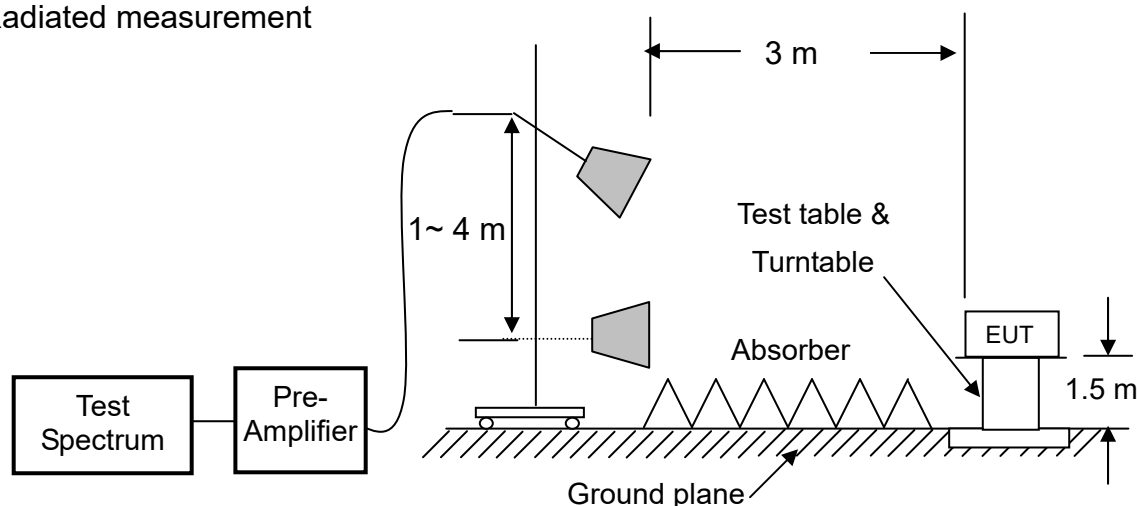
8 Emission on the Band Edge

8.1 Limit

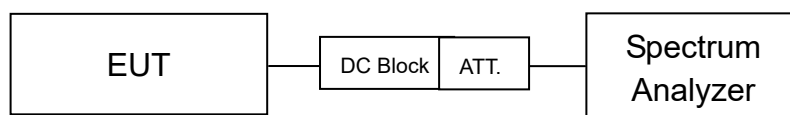
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

8.2 Configuration of Measurement

Radiated measurement



Conducted measurement



8.3 Test Procedure

Radiated measurement

The EUT was setup to ANSI C63.10, 2013; tested procedure of Jan. 2016 KDB558074 D01 for compliance to FCC 47 CFR 15.247 requirements.

Set RBW =1MHz, VBW= RBW for peak, and RBW =1MHz, VBW=10Hz for average.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

Conducted measurement

The EUT was setup to ANSI C63.10, 2013; tested procedure of Jan. 2016 KDB558074 D01 for compliance to FCC 47 CFR 15.247 requirements.

Set:

- 1) RBW = 100kHz.
- 2) VBW = 300kHz.
- 3) Detector: Peak.
- 4) Trace: Max hold.
- 5) All the trace to stabilize.
- 6) Use peak marker function to determine the peak amplitude.

8.4 Test Result

PASS.

The final test data is shown as following pages.

Band Edge _Radiated (Worse case: X-Plane)

Test CH		Antenna Polarization	Detector Mode	Reading (dBuV)	Factor (dB/m)	Maximum level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
CH No.	Freq. (MHz)							
0 (2402MHz)	2310~2390	H	PK	57.33	-18.73	38.60	74	-35.40
		H	AV	42.91	-18.66	24.25	54	-29.75
		V	PK	54.62	-18.69	35.93	74	-38.07
		V	AV	42.89	-18.7	24.19	54	-29.81
39 (2480MHz)	2483.5~2500	H	PK	57.59	-18.64	38.95	74	-35.05
		H	AV	44.00	-18.63	25.37	54	-28.63
		V	PK	57.30	-18.63	38.67	74	-35.33
		V	AV	43.40	-18.63	24.77	54	-29.23

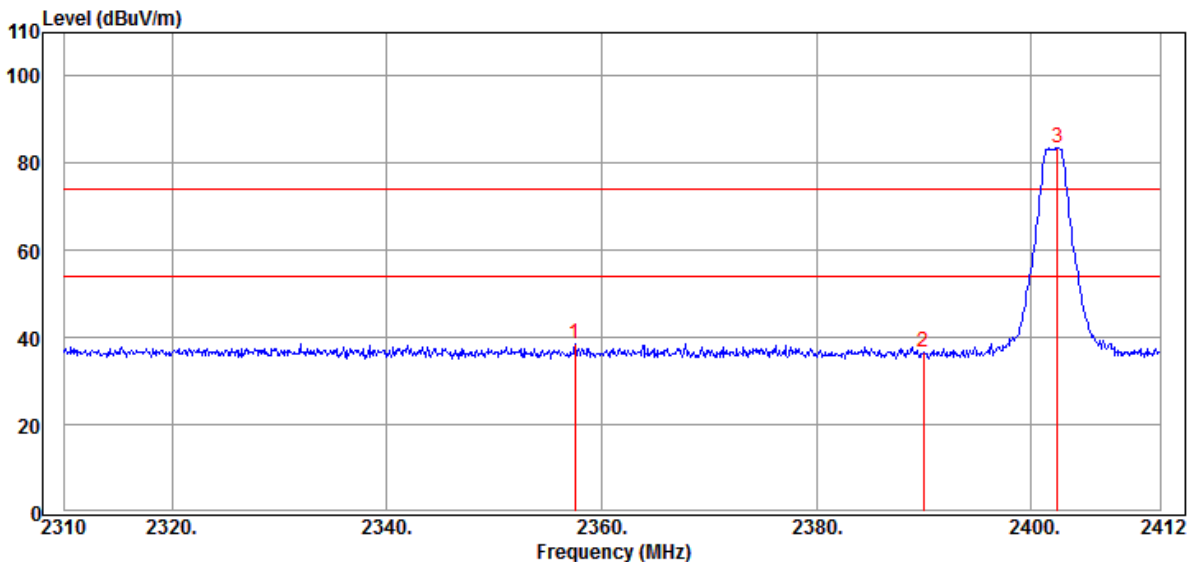
Remark : Maximum Level = Reading + Factor
Factor = Antenna Factor + Cable Loss - Preamp
Margin = Maximum level - Limit

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:3

2019-05-27

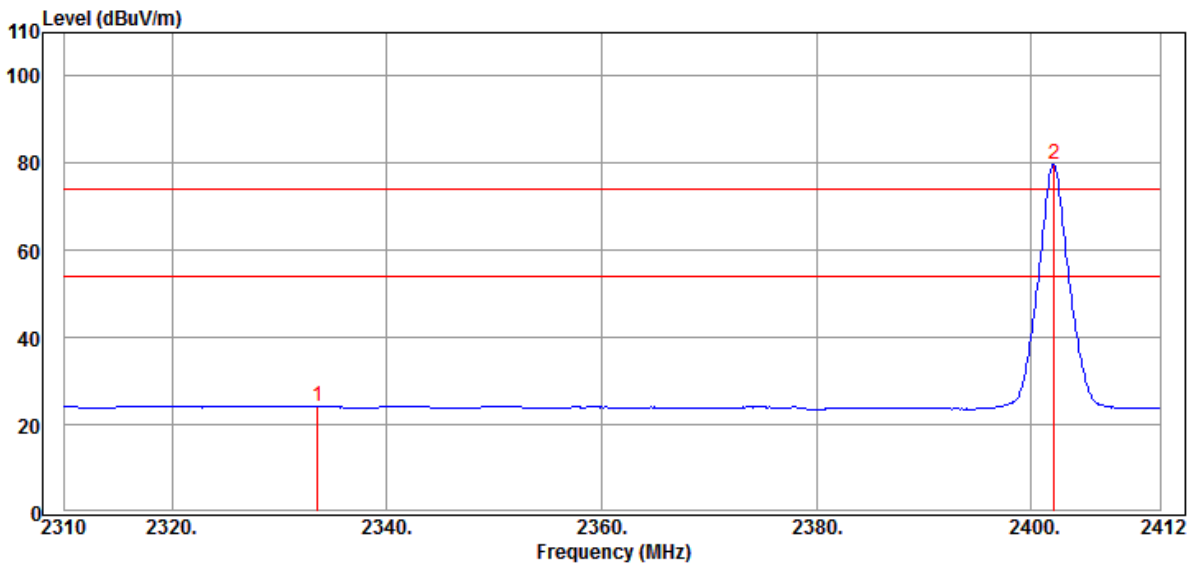


Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	2357.532	57.33	-18.73	38.60	74.00	-35.40	Peak
2	2389.968	55.47	-18.73	36.74	74.00	-37.26	Peak
* 3	2402.412	102.21	-18.76	83.45	74.00	9.45	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:4 2019-05-27



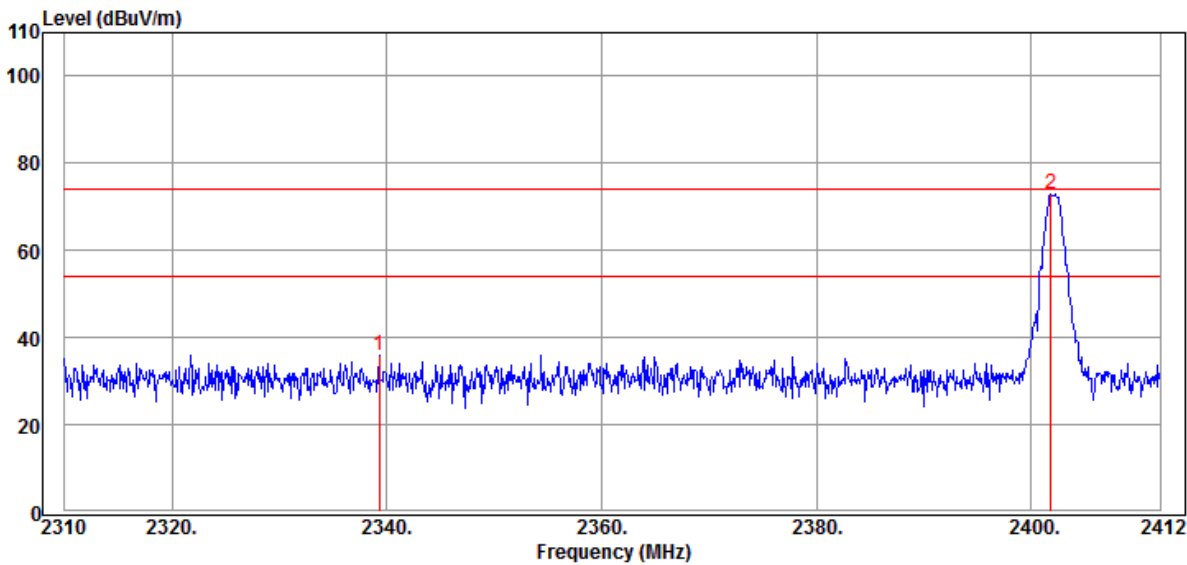
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
*	1	2333.562	42.91	-18.66	24.25	54.00	Average
	2	2402.106	98.55	-18.76	79.79	54.00	Average

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:1

2019-05-27



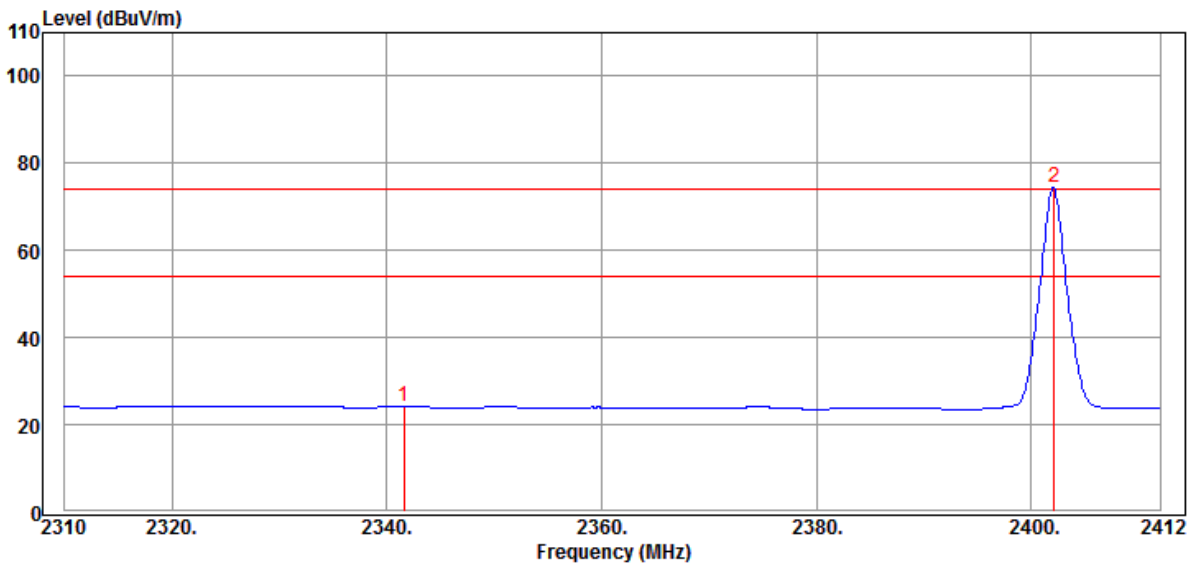
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	2339.274	54.62	-18.69	35.93	74.00	-38.07	PK
2	2401.800	91.67	-18.76	72.91	74.00	-1.09	PK

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:2

2019-05-27

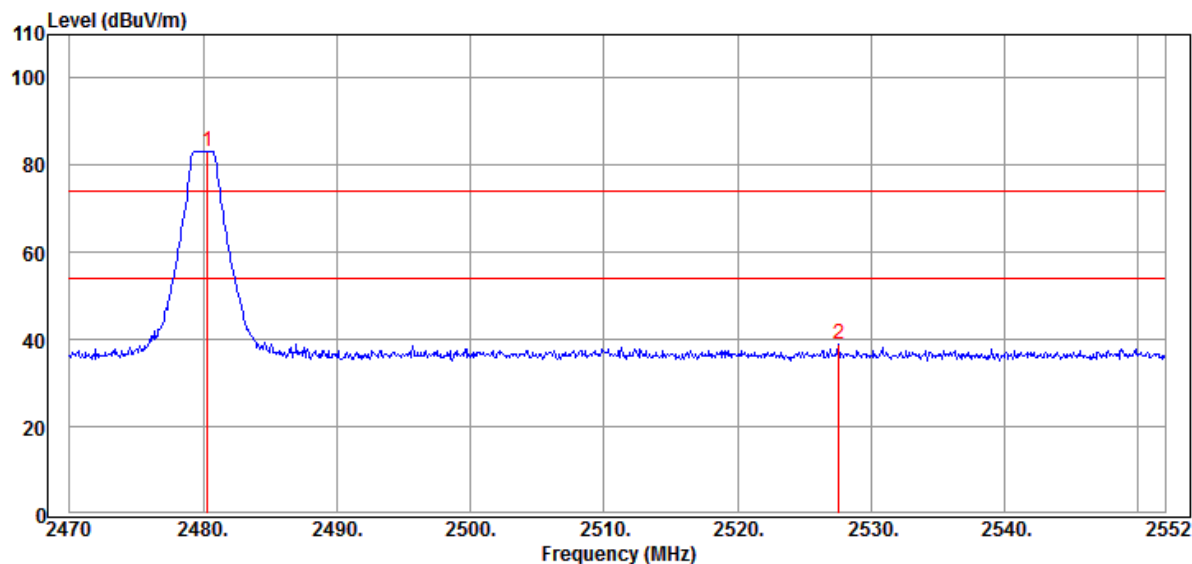


Item	Freq.	Reading	Factor	Level	Limit	Margin	Remark
Mark	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
*	1	2341.620	42.89	-18.70	24.19	54.00	-29.81
	2	2402.106	93.16	-18.76	74.40	54.00	20.40
							Average
							Average

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH39 (2480 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:5 2019-05-27



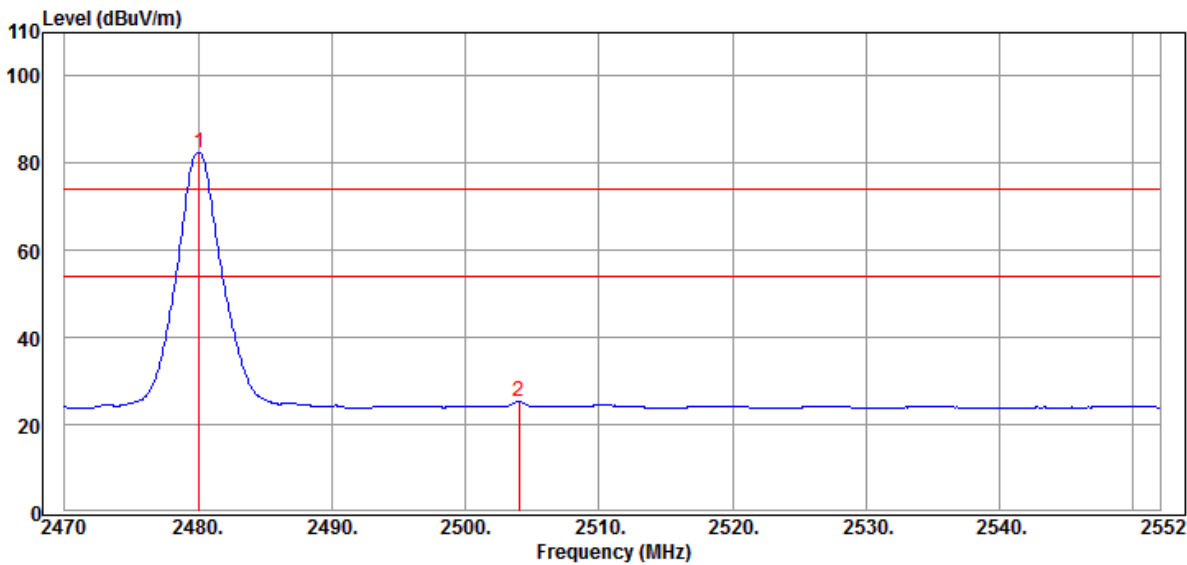
Item	Freq.	Reading	Factor	Level	Limit	Margin	Remark
Mark	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
*	1	2480.332	102.21	-18.91	83.30	74.00	9.30
	2	2527.564	57.59	-18.64	38.95	74.00	-35.05
							Peak
							Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH39 (2480 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : HORIZONTAL
TEMP/HUM : 27°C/59%

Data:6

2019-05-27



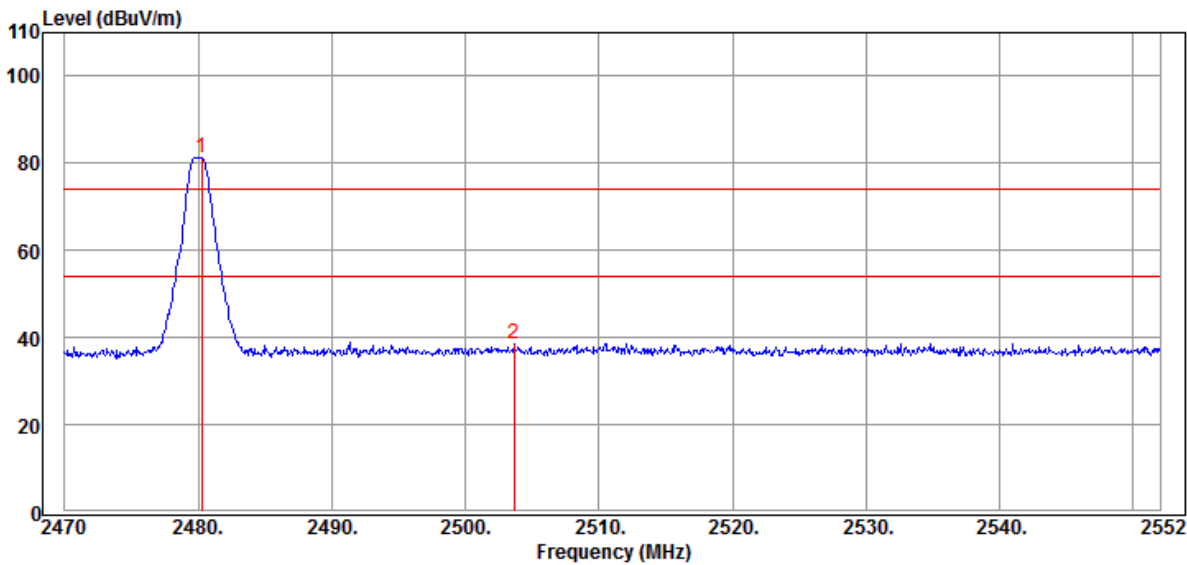
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
* 1	2480.086	101.36	-18.91	82.45	54.00	28.45	Average
2	2504.030	44.00	-18.63	25.37	54.00	-28.63	Average

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH39 (2480 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:7

2019-05-27



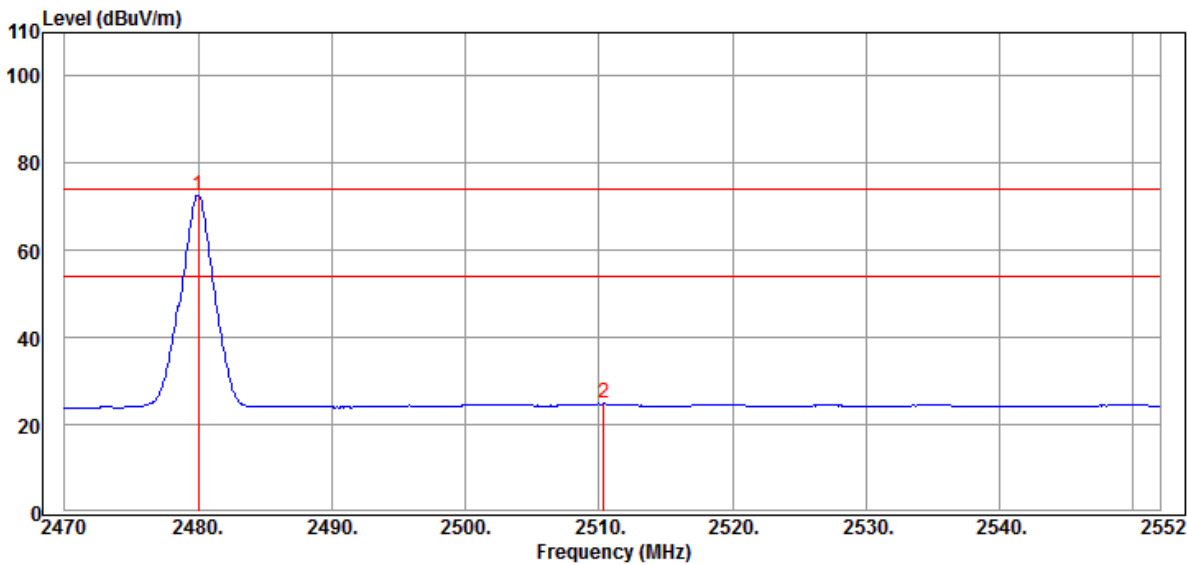
Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
* 1	2480.250	100.35	-18.91	81.44	74.00	7.44	Peak
2	2503.620	57.30	-18.63	38.67	74.00	-35.33	Peak

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH39 (2480 MHz)

OPERATOR : Ivan
TEST SITE : Chamber 3
TEST DISTANCE : 3m
POLARIZATION : VERTICAL
TEMP/HUM : 27°C/59%

Data:8

2019-05-27



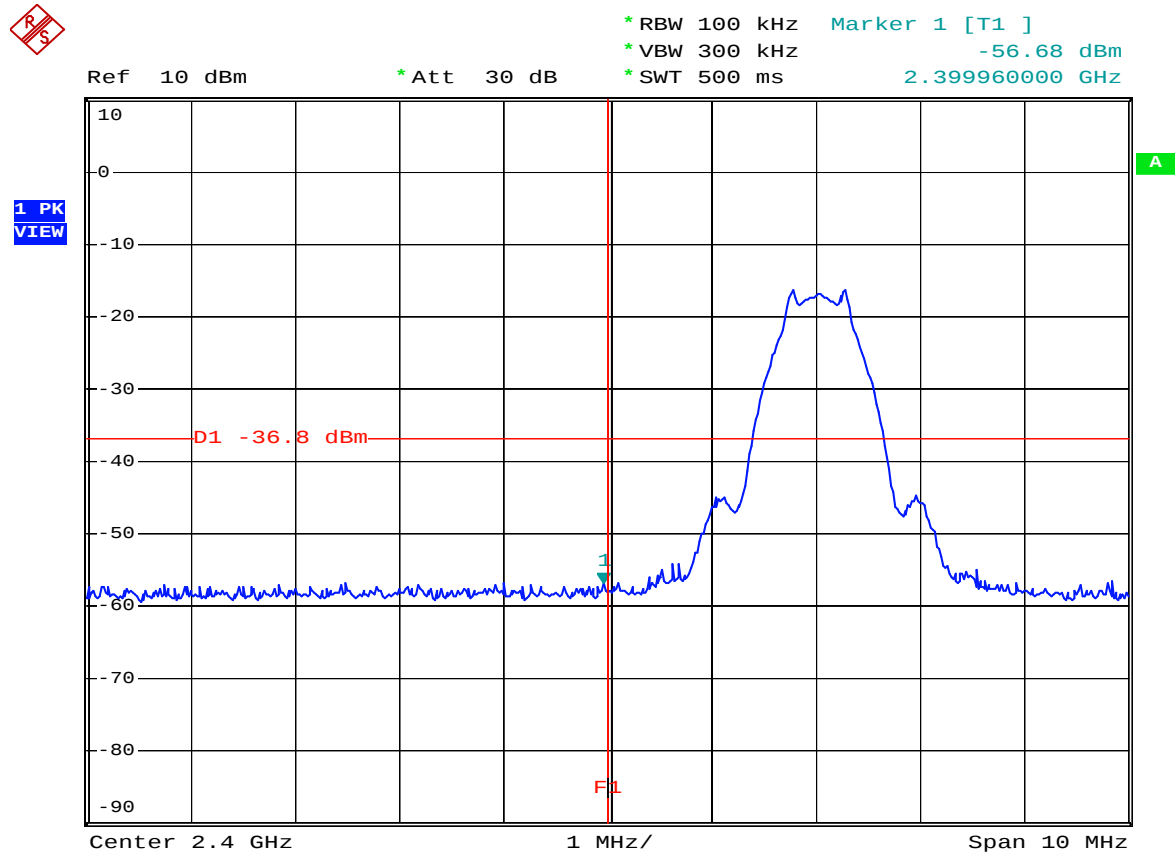
Item	Freq.	Reading	Factor	Level	Limit	Margin	Remark	
Mark	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
*	1	2480.004	91.68	-18.91	72.77	54.00	18.77	Average
	2	2510.344	43.40	-18.63	24.77	54.00	-29.23	Average

Band Edge_Conducted

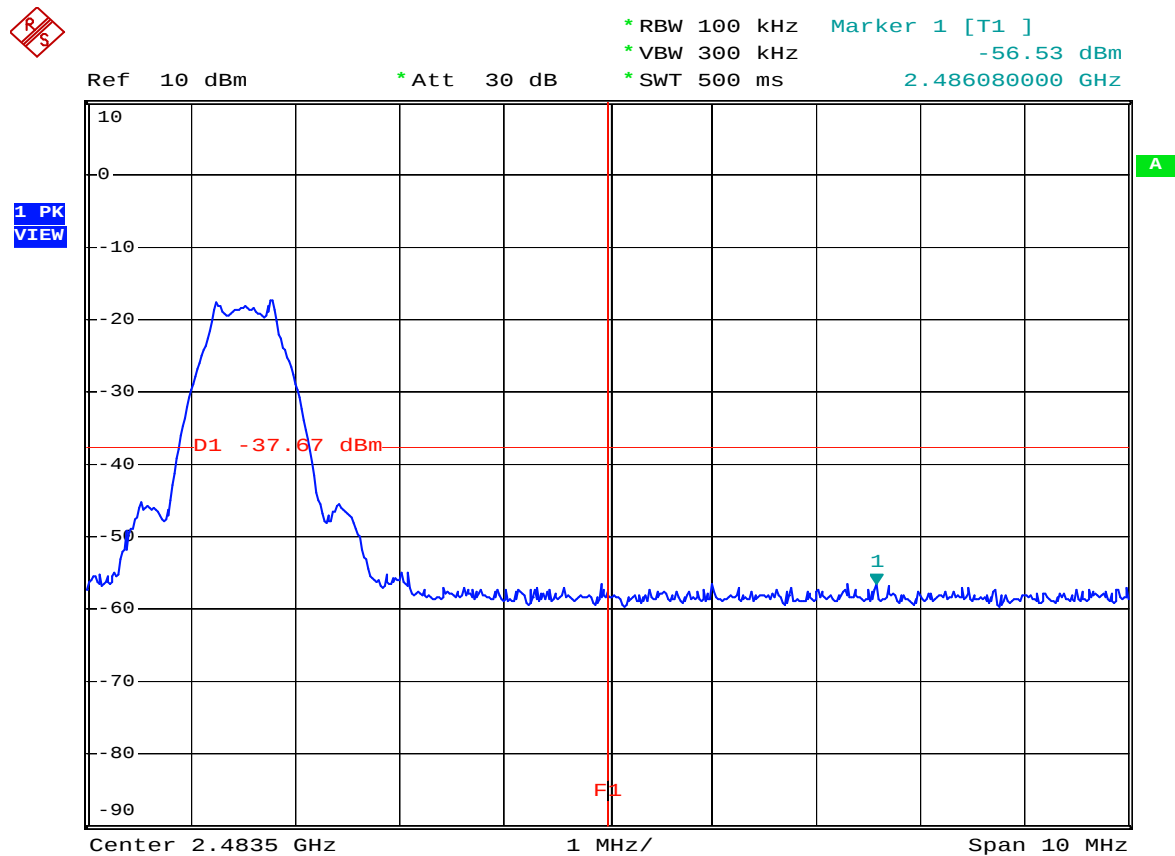
CH No.	Freq. (MHz)	Detector Mode	Measure Result (dBm)	Limit (dBm)	Magin (dB)
0 (2402MHz)	Marker 2: 2399.960	PK	-56.68	-36.8	-19.88
39 (2480MHz)	Marker 2: 2486.080	PK	-56.53	-37.67	-18.86

Remark : Margin = Measure Result - Limit

CH00 (2402 MHz)



CH39 (2480 MHz)



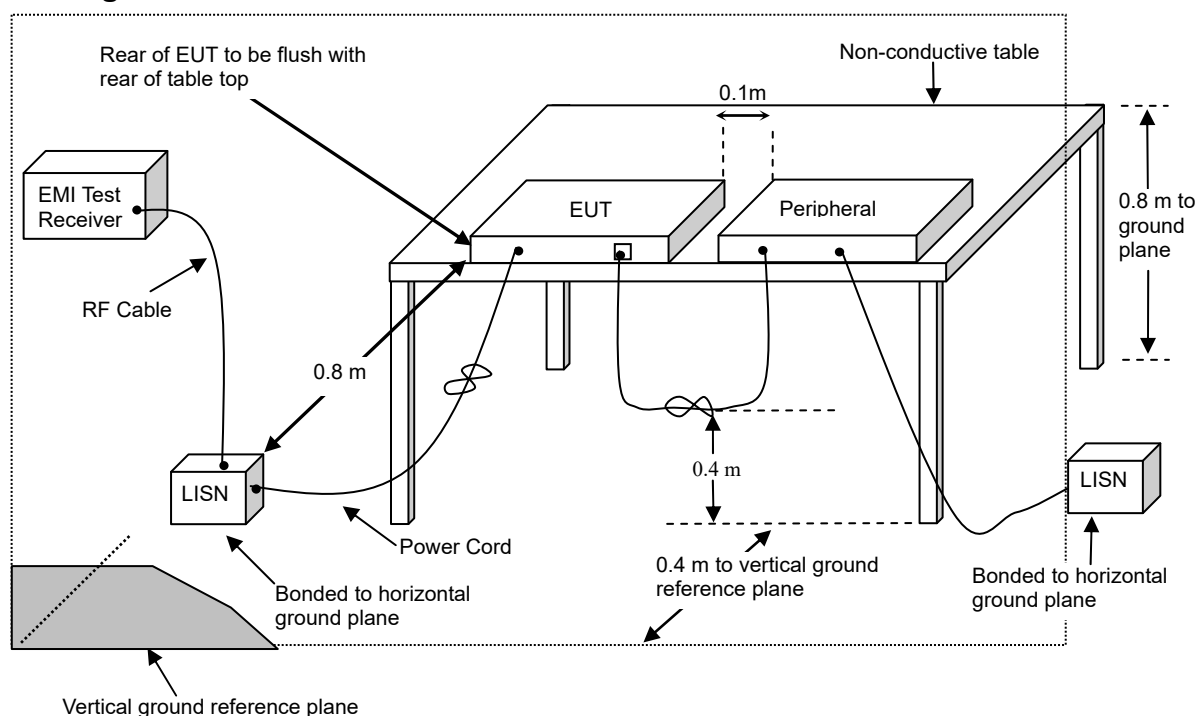
9 AC Power Line Conducted Emission

9.1 Limits

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

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 30 MHz.

9.2 Configuration of Measurement



9.3 Test Procedures

- 1.) The EUT was placed 80cm height above ground on a non-conductive table and vertical conducting plane located 40cm to the rear of the EUT.
- 2.) The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50ohm/50mH coupling impedance for the measuring equipment. The auxiliary equipment will place in secondary LISN.
- 3.) Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4, 2014 on conducted measurement.

9.4 Test Result

PASS.

The final test data is shown as following pages.

Power Line Conducted Test Data

CLIENT: Yalumi Corporation

EUT: AquaHue Bluetooth Smart LED Aquarium Light

MODEL: AH-1040

RATING: 120Vac/60Hz

COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan

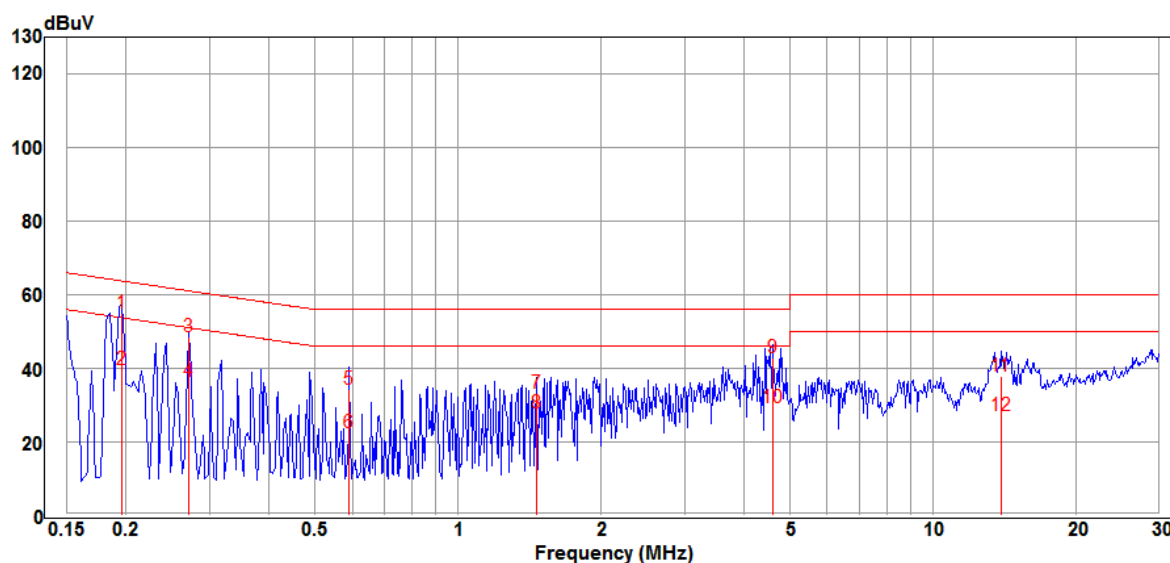
TEST SITE: Conducted 1

POLARIZATION: Line

TEMP/HUM: 24°C / 59%

Data:1

2019-05-27



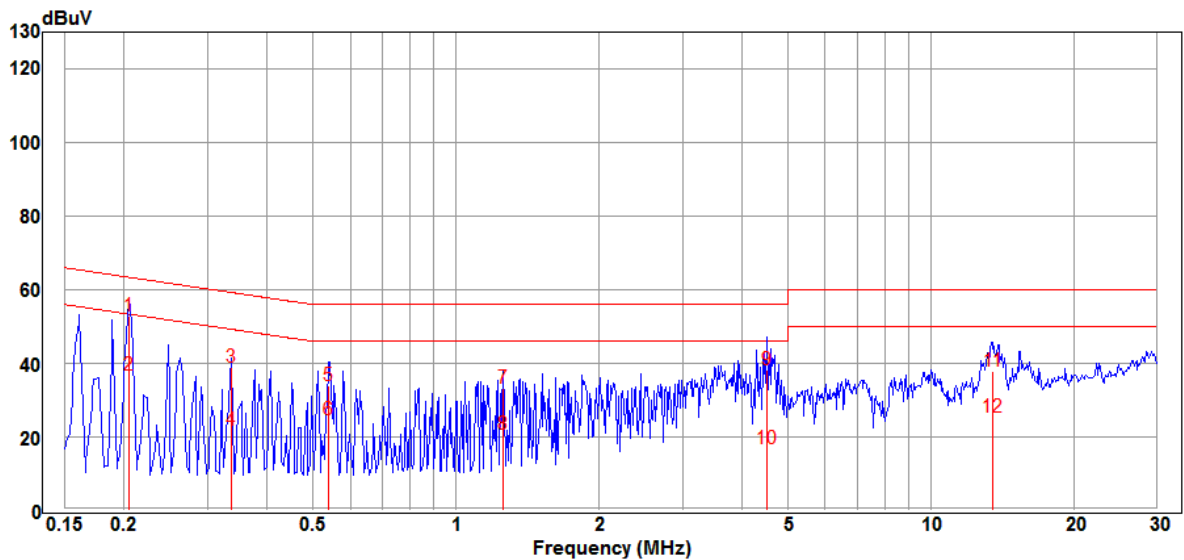
Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.1965	44.60	10.28	54.88	63.76	-8.88	QP
2	0.1965	29.33	10.28	39.61	53.76	-14.15	Average
3	0.2715	38.06	10.40	48.46	61.07	-12.61	QP
4	0.2715	25.96	10.40	36.36	51.07	-14.71	Average
5	0.5916	23.63	10.68	34.31	56.00	-21.69	QP
6	0.5916	11.87	10.68	22.55	46.00	-23.45	Average
7	1.4640	22.26	11.06	33.32	56.00	-22.68	QP
8	1.4640	16.73	11.06	27.79	46.00	-18.21	Average
9	4.5980	31.65	11.15	42.80	56.00	-13.20	QP
10	4.5980	18.28	11.15	29.43	46.00	-16.57	Average
11	13.9150	26.65	11.27	37.92	60.00	-22.08	QP
12	13.9150	15.78	11.27	27.05	50.00	-22.95	Average

Power Line Conducted Test Data

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1040
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan
TEST SITE: Conducted 1
POLARIZATION: Neutral
TEMP/HUM: 24°C / 59%

Data:2 2019-05-27



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.2051	42.50	10.30	52.80	63.40	-10.60	QP
2	0.2051	26.58	10.30	36.88	53.40	-16.52	Average
3	0.3374	28.51	10.47	38.98	59.27	-20.29	QP
4	0.3374	11.38	10.47	21.85	49.27	-27.42	Average
5	0.5407	23.25	10.64	33.89	56.00	-22.11	QP
6	0.5407	13.91	10.64	24.55	46.00	-21.45	Average
7	1.2620	22.42	10.97	33.39	56.00	-22.61	QP
8	1.2620	9.78	10.97	20.75	46.00	-25.25	Average
9	4.5250	27.12	11.14	38.26	56.00	-17.74	QP
10	4.5250	5.69	11.14	16.83	46.00	-29.17	Average
11	13.5510	26.83	11.17	38.00	60.00	-22.00	QP
12	13.5510	14.15	11.17	25.32	50.00	-24.68	Average

Power Line Conducted Test Data

CLIENT: Yalumi Corporation

EUT: AquaHue Bluetooth Smart LED Aquarium Light

MODEL: AH-1030

RATING: 120Vac/60Hz

COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan

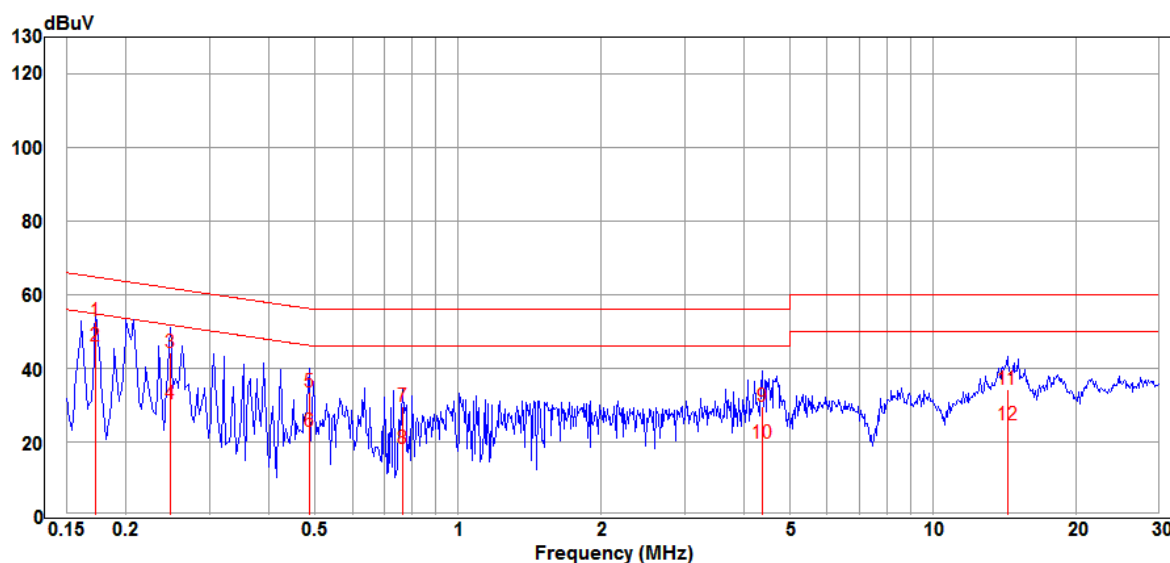
TEST SITE: Conducted 1

POLARIZATION: Line

TEMP/HUM: 24°C / 59%

Data:3

2019-05-27



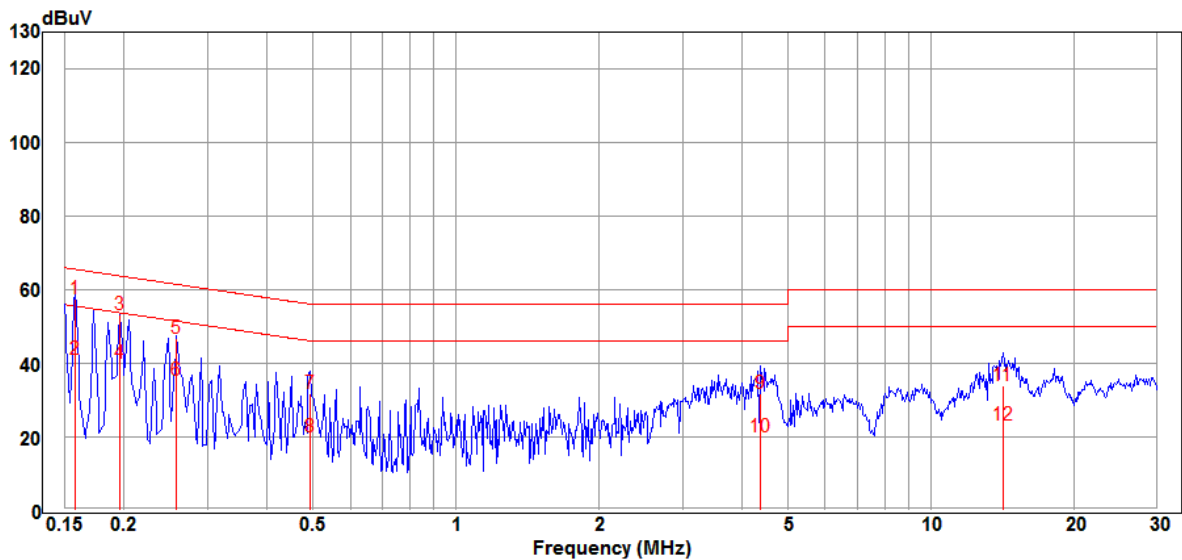
Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.1731	42.48	10.24	52.72	64.81	-12.09	QP
2	0.1731	35.85	10.24	46.09	54.81	-8.72	Average
3	0.2481	34.04	10.37	44.41	61.82	-17.41	QP
4	0.2481	19.83	10.37	30.20	51.82	-21.62	Average
5	0.4863	22.87	10.60	33.47	56.23	-22.76	QP
6	0.4863	12.33	10.60	22.93	46.23	-23.30	Average
7	0.7670	18.87	10.77	29.64	56.00	-26.36	QP
8	0.7670	7.54	10.77	18.31	46.00	-27.69	Average
9	4.3840	18.55	11.18	29.73	56.00	-26.27	QP
10	4.3840	8.54	11.18	19.72	46.00	-26.28	Average
11	14.3640	22.93	11.28	34.21	60.00	-25.79	QP
12	14.3640	13.47	11.28	24.75	50.00	-25.25	Average

Power Line Conducted Test Data

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1030
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan
TEST SITE: Conducted 1
POLARIZATION: Neutral
TEMP/HUM: 24°C / 59%

Data:4 2019-05-27



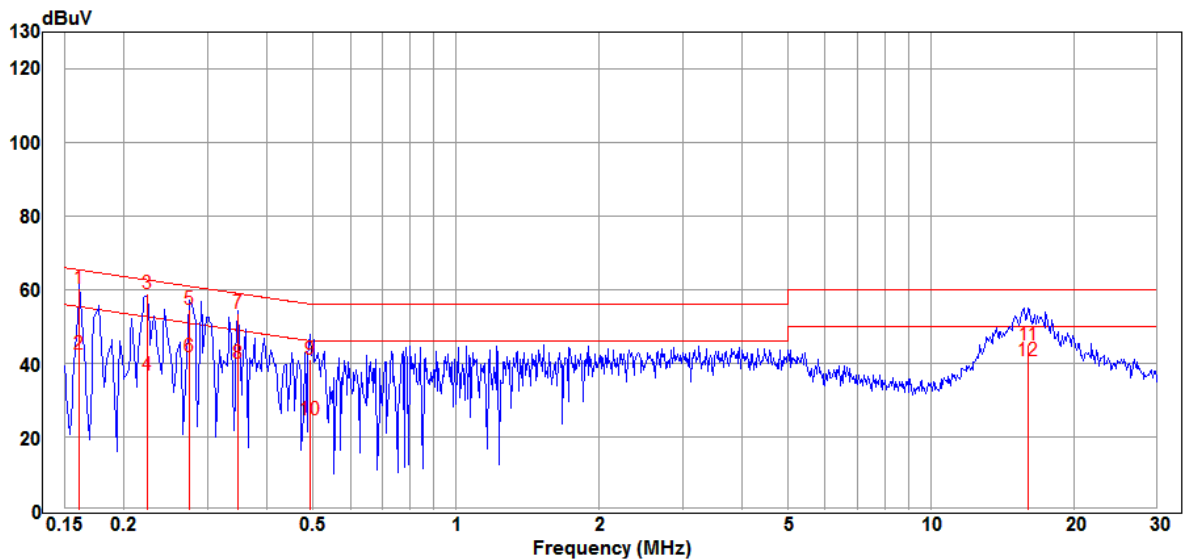
Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.1582	47.27	10.21	57.48	65.56	-8.08	QP
2	0.1582	30.74	10.21	40.95	55.56	-14.61	Average
3	0.1965	43.05	10.28	53.33	63.76	-10.43	QP
4	0.1965	29.78	10.28	40.06	53.76	-13.70	Average
5	0.2589	36.47	10.38	46.85	61.47	-14.62	QP
6	0.2589	25.17	10.38	35.55	51.47	-15.92	Average
7	0.4941	21.20	10.60	31.80	56.10	-24.30	QP
8	0.4941	9.27	10.60	19.87	46.10	-26.23	Average
9	4.3840	20.79	11.15	31.94	56.00	-24.06	QP
10	4.3840	8.90	11.15	20.05	46.00	-25.95	Average
11	14.2130	22.73	11.18	33.91	60.00	-26.09	QP
12	14.2130	12.15	11.18	23.33	50.00	-26.67	Average

Power Line Conducted Test Data

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1020
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan
TEST SITE: Conducted 1
POLARIZATION: Line
TEMP/HUM: 24°C / 59%

Data:5 2019-05-27



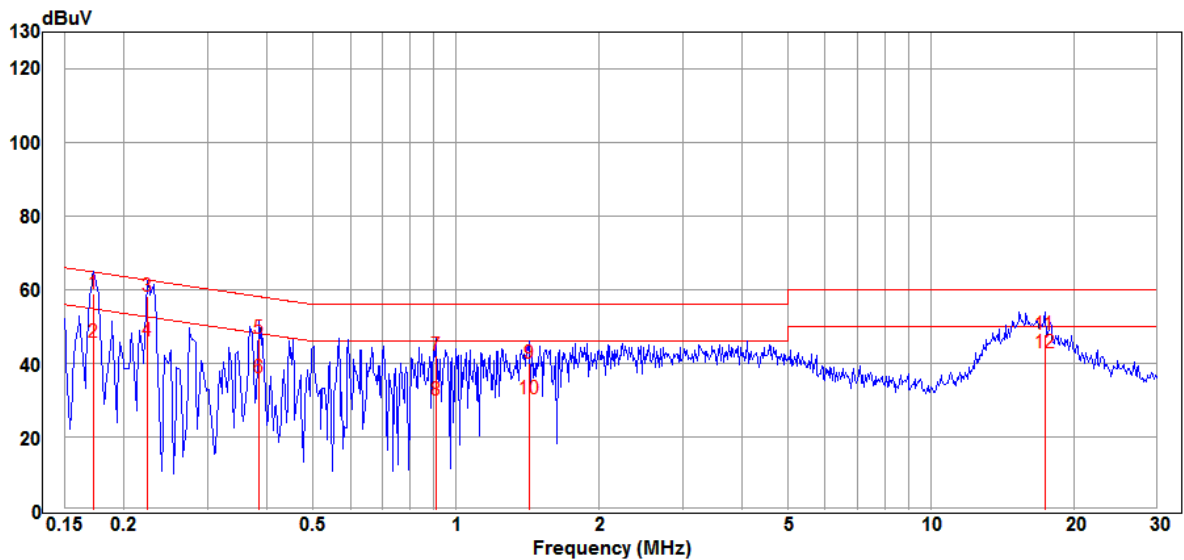
Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.1616	50.00	10.22	60.22	65.38	-5.16	QP
2	0.1616	32.27	10.22	42.49	55.38	-12.89	Average
3	0.2244	48.46	10.33	58.79	62.66	-3.87	QP
4	0.2244	26.36	10.33	36.69	52.66	-15.97	Average
5	0.2744	44.35	10.40	54.75	60.98	-6.23	QP
6	0.2744	31.45	10.40	41.85	50.98	-9.13	Average
7	0.3483	43.00	10.48	53.48	59.00	-5.52	QP
8	0.3483	29.48	10.48	39.96	49.00	-9.04	Average
9	0.4941	30.44	10.60	41.04	56.10	-15.06	QP
10	0.4941	14.23	10.60	24.83	46.10	-21.27	Average
11	16.0550	33.81	11.27	45.08	60.00	-14.92	QP
12	16.0550	29.56	11.27	40.83	50.00	-9.17	Average

Power Line Conducted Test Data

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1020
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan
TEST SITE: Conducted 1
POLARIZATION: Neutral
TEMP/HUM: 24°C / 59%

Data:6 2019-05-27



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.1731	48.85	10.24	59.09	64.81	-5.72	QP
2	0.1731	35.45	10.24	45.69	54.81	-9.12	Average
3	0.2244	47.87	10.33	58.20	62.66	-4.46	QP
4	0.2244	35.76	10.33	46.09	52.66	-6.57	Average
5	0.3852	36.36	10.52	46.88	58.17	-11.29	QP
6	0.3852	25.43	10.52	35.95	48.17	-12.22	Average
7	0.9087	31.29	10.83	42.12	56.00	-13.88	QP
8	0.9087	19.30	10.83	30.13	56.00	-25.87	Average
9	1.4330	29.00	11.04	40.04	56.00	-15.96	QP
10	1.4330	19.35	11.04	30.39	56.00	-25.61	Average
11	17.3830	36.75	11.13	47.88	60.00	-12.12	QP
12	17.3830	31.89	11.13	43.02	60.00	-16.98	Average

Power Line Conducted Test Data

CLIENT: Yalumi Corporation

EUT: AquaHue Bluetooth Smart LED Aquarium Light

MODEL: AH-1015

RATING: 120Vac/60Hz

COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan

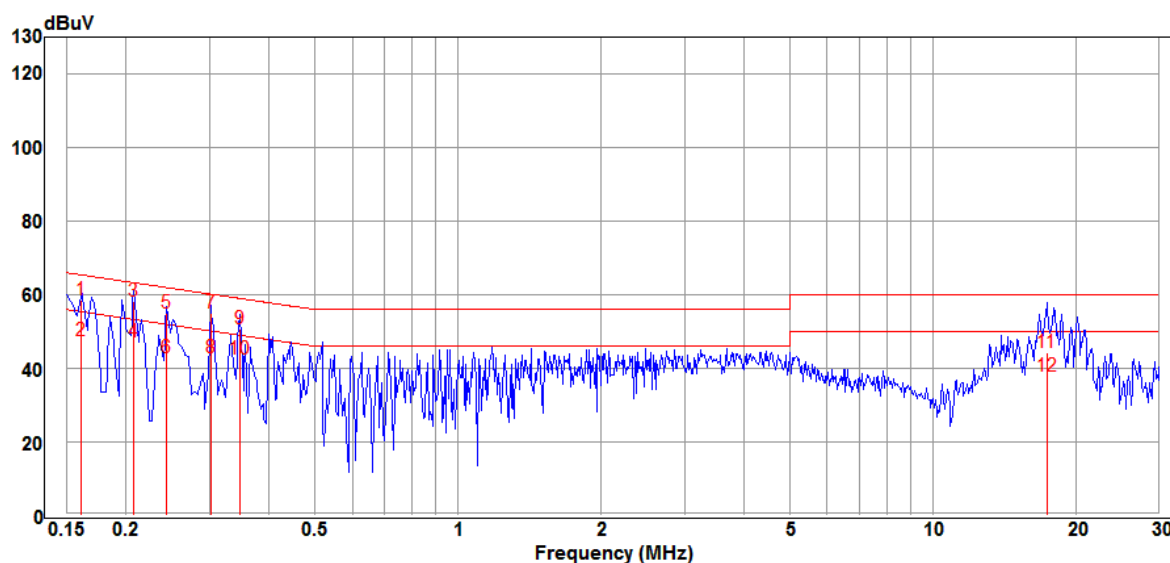
TEST SITE: Conducted 1

POLARIZATION: Line

TEMP/HUM: 24°C / 59%

Data:7

2019-05-27



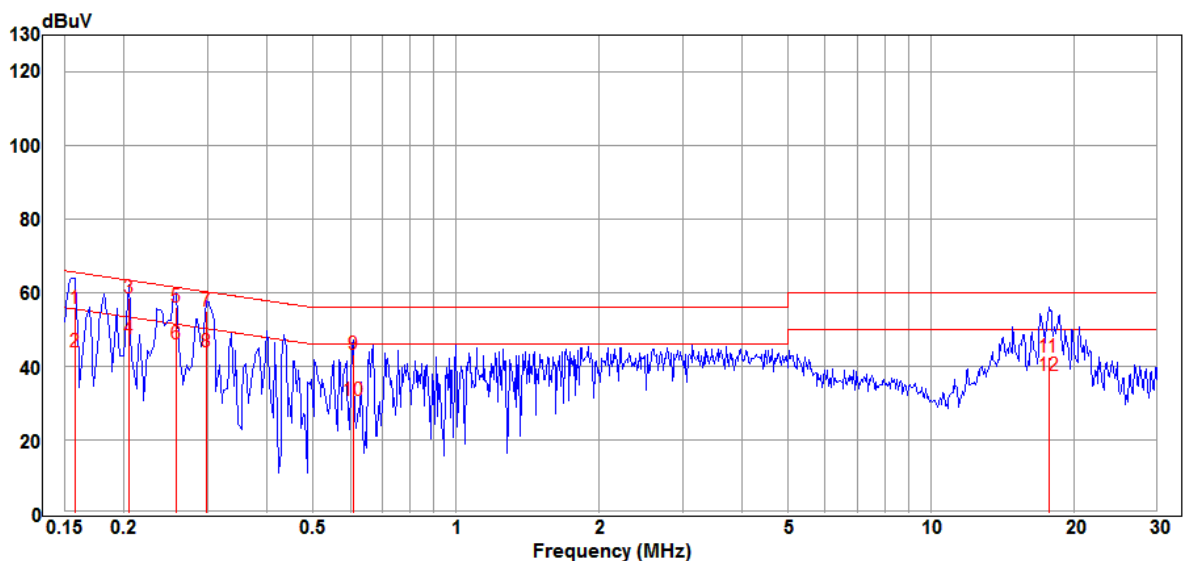
Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.1616	48.32	10.22	58.54	65.38	-6.84	QP
2	0.1616	37.25	10.22	47.47	55.38	-7.91	Average
3	0.2083	48.10	10.30	58.40	63.27	-4.87	QP
4	0.2083	37.01	10.30	47.31	53.27	-5.96	Average
5	0.2442	44.68	10.36	55.04	61.95	-6.91	QP
6	0.2442	32.43	10.36	42.79	51.95	-9.16	Average
7	0.3019	44.44	10.43	54.87	60.19	-5.32	QP
8	0.3019	32.58	10.43	43.01	50.19	-7.18	Average
9	0.3483	40.24	10.48	50.72	59.00	-8.28	QP
10	0.3483	31.96	10.48	42.44	49.00	-6.56	Average
11	17.3830	32.95	11.25	44.20	60.00	-15.80	QP
12	17.3830	26.74	11.25	37.99	50.00	-12.01	Average

Power Line Conducted Test Data

CLIENT: Yalumi Corporation
EUT: AquaHue Bluetooth Smart LED Aquarium Light
MODEL: AH-1015
RATING: 120Vac/60Hz
COMMENT: CH00 (2402 MHz)

OPERATOR: Ivan
TEST SITE: Conducted 1
POLARIZATION: Neutral
TEMP/HUM: 24°C / 59%

Data:8 2019-05-27



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.1582	45.57	10.21	55.78	65.56	-9.78	QP
2	0.1582	33.73	10.21	43.94	55.56	-11.62	Average
3	0.2051	48.25	10.30	58.55	63.40	-4.85	QP
4	0.2051	37.22	10.30	47.52	53.40	-5.88	Average
5	0.2589	45.68	10.38	56.06	61.47	-5.41	QP
6	0.2589	35.68	10.38	46.06	51.47	-5.41	Average
7	0.2987	44.58	10.43	55.01	60.28	-5.27	QP
8	0.2987	33.61	10.43	44.04	50.28	-6.24	Average
9	0.6075	32.62	10.68	43.30	56.00	-12.70	QP
10	0.6075	20.08	10.68	30.76	46.00	-15.24	Average
11	17.7550	31.34	11.11	42.45	60.00	-17.55	QP
12	17.7550	26.43	11.11	37.54	50.00	-12.46	Average