

FCC PART 15.249

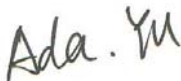

TEST REPORT

For

Changsha SunSky Electronic Design & Development Co., Ltd.

Room1024, Building A, Biaozi Business Center No. 198 Xiang Fu Road, Changsha, China

FCC ID: WSVSUNVOTEBASE4X

Report Type: Original Report		Product Type: Voting Base Station	
Test Engineer:	Ada Yu		
Report Number:	RKS160627001-00J		
Report Date:	2017-05-23		
Reviewed By:	Oscar Ye RF Leader		
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Manufacturer	Changsha SunSky Electronic Design & Development Co., Ltd.
Tested Model	EA4000T
Product Type	Voting Base Station
Dimension	137 mm(L)×125 mm(W)×25 mm(H)
Power input	DC 5.0V

Adapter information:

Model: GM-150150

Input: AC100V-240V 50/60Hz

Output: DC15V(1.5A)

**All measurement and test data in this report was gathered from production sample serial number: 20160627011.
(Assigned by the BACL. The EUT supplied by the applicant was received on 2016-06-27)*

Objective

This type approval report is prepared on behalf of Changsha SunSky Electronic Design & Development Co., Ltd. in accordance with Part 2-Subpart J, and Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: WSVSUNVOTEBASE4X.
FCC Part 15.249 DXX submissions with FCC ID: WSVSUNVOTEKEYM5S,
FCC ID: WSVSUNVOTEKEY50X.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Lab Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.26 dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	5.91dB
	1GHz~6GHz	4.68dB
	6 GHz ~18 GHz	4.92dB
	18 GHz~40 GHz	4.88dB
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road,Kunshan,Jiangsu province,China.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

For MSK Modulation, 32 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2404	17	2436
2	2406	18	2438
3	2408	19	2440
4	2410	20	2442
5	2412	21	2444
6	2414	22	2446
7	2416	23	2448
8	2418	24	2450
9	2420	25	2452
10	2422	26	2454
11	2424	27	2456
12	2426	28	2458
13	2428	29	2460
14	2430	30	2462
15	2432	31	2464
16	2434	32	2466

EUT was tested with Channel 1, 15 and 32.

EUT Exercise Software

Software “ARS PPT Standard Version” was used during the test.

Wireless module RFOUT1/RFOUT2/RFOUT3/RFOUT4 cannot transmit at the same time.

We can use the test software to control anyone transmitter at a time for radiated emission test.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Notebook	GX620	D65874152
Changsha SunSky	AC/DC Adapter	GM-150150	/

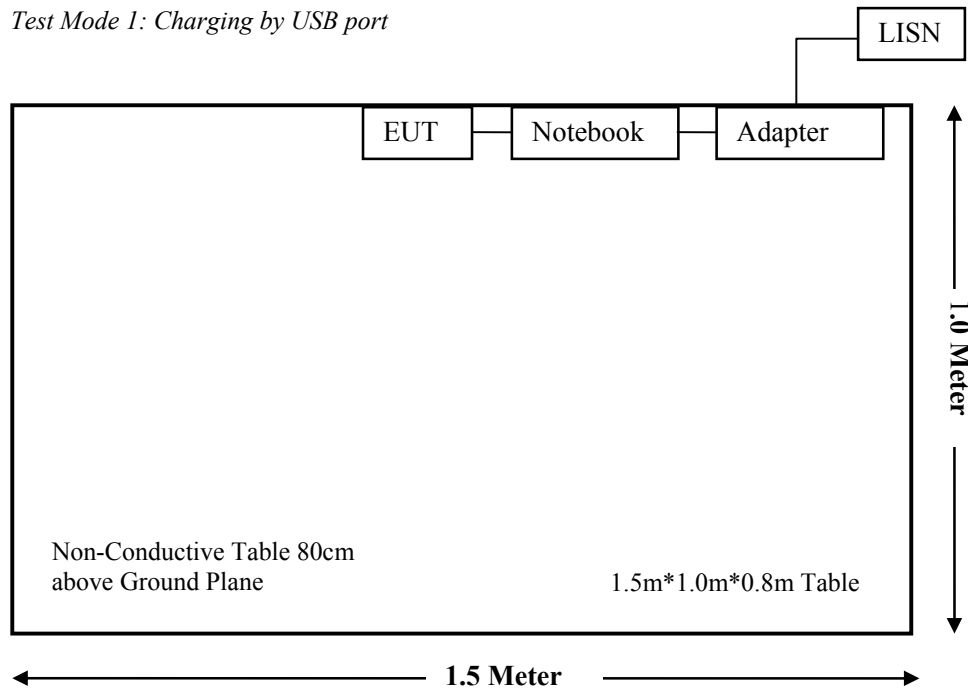
External I/O Cable

Cable Description	Length (m)	From Port	To
USB Cable	0.5	EUT	Notebook

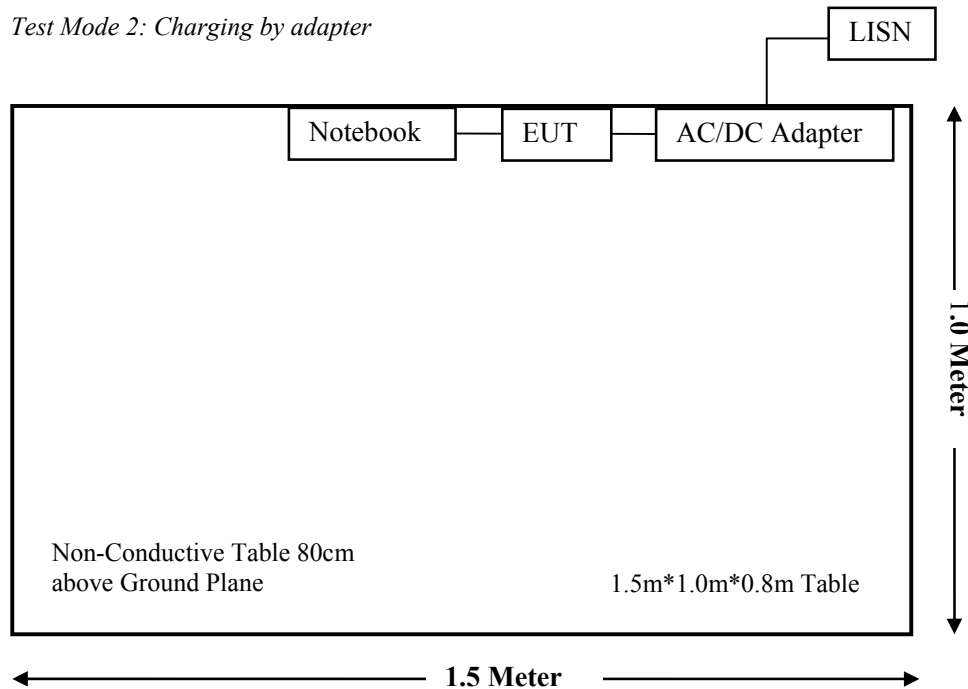
Block Diagram of Test Setup

For Conducted Emissions:

Test Mode 1: Charging by USB port



Test Mode 2: Charging by adapter



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Compliance
15.205, §15.209, §15.249	Radiated Emissions& Out of Band Emission	Compliance
§15.215 (c)	20 dB Bandwidth	Compliance

Note1: The EUT has four modules RFOUT1/RFOUT2/RFOUT3/RFOUT4 which are exactly the same as each other.

Note2: The four modules are unable to transmit at the same time.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-24
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
ETS-LINDGREN	Horn Antenna	3115	6229	2016-01-11	2019-01-10
Sonoma Instrunent	Amplifier	330	171377	2016-12-12	2017-12-11
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-12-12	2017-12-11
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
Haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-11
Haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-11
Haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-11
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
RF Conducted Test					
Rohde & Schwarz	OSP120 Base Unit	OSP120	101247	2016-07-04	2017-07-03
BACL	EMC32 Version	EMC32	09106	/	/
Rohde & Schwarz	SMBV100A Vector Signal Generator	SMBV100A	261558	2016-07-04	2017-07-03
Rohde & Schwarz	SMB 100A Signal Generator	SMB100A	110390	2016-07-04	2017-07-03
Rohde & Schwarz	FSV40 Signal Analyzer	FSV40	101116	2016-07-04	2017-07-03
BACL	Temperature & Humidity Chamber	BTH-150	30023	2016-10-10	2017-10-09
Agilent	Power Meter	N1912A	MY5000492	2016-11-18	2017-11-17
Agilent	Power Sensor	N1921A	MY54210024	2016-11-18	2017-11-17
Changsha SunSky	RF Cable	N/A	N/A	2017-03-28	2018-03-27
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	834115/007	2016-11-25	2017-11-24
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-09
Rohde & Schwarz	LISN	ENV216	3560655016	2016-11-25	2017-11-24
Rohde & Schwarz	CE Test software	EMC32	100357	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2016-09-08	2017-09-07

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

The EUT has four antenna, The EUT has two IPEX antennas and two monopole antennas. The IPEX antennas are fixed in the internal of the EUT, The monopole antennas with a RP-SMA connector. All of the antennas gain is 0dBi.

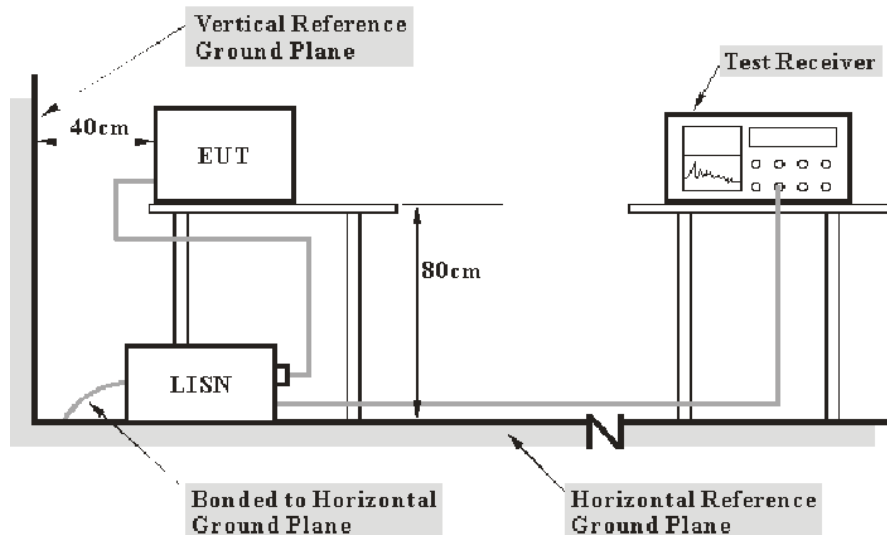
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

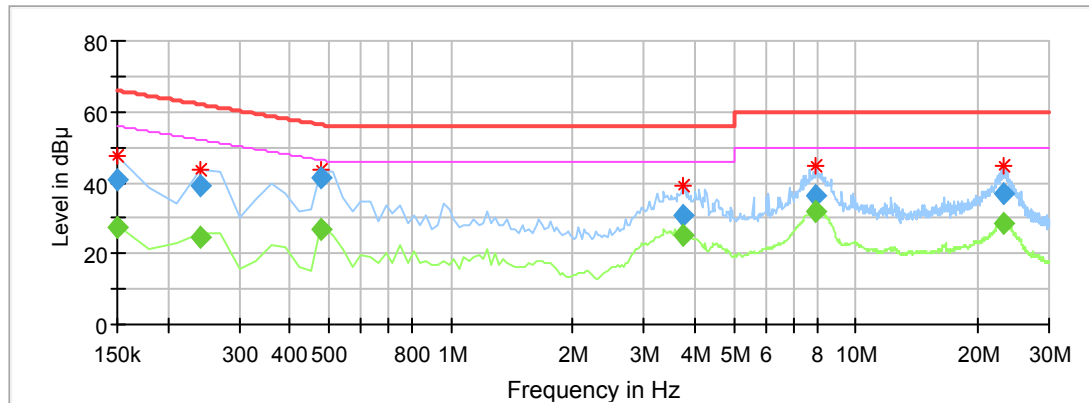
Temperature:	22 °C
Relative Humidity:	55 %
ATM Pressure:	101.1kPa

The testing was performed by Ada Yu on 2017-03-28.

EUT operation mode: Transmitting in middle channel (worst cast).

*Test Mode 1: Charging by USB port***AC 120V/60 Hz, Line**

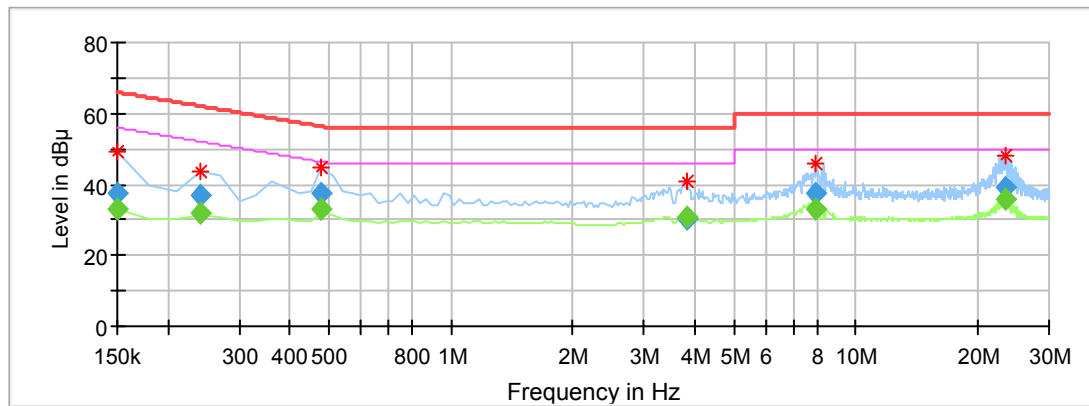
Full Spectrum



Frequency (MHz)	QuasiPeak (dBμV)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	---	27.42	9	L1	10.10	28.58	56.00	Compliance
0.150000	41.07	---	9	L1	10.10	24.93	66.00	Compliance
0.240000	---	24.87	9	L1	10.00	27.23	52.10	Compliance
0.240000	39.19	---	9	L1	10.00	22.91	62.10	Compliance
0.480000	---	27.02	9	L1	10.10	19.32	46.34	Compliance
0.480000	41.35	---	9	L1	10.10	14.99	56.34	Compliance
3.750000	---	25.43	9	L1	9.90	20.57	46.00	Compliance
3.750000	30.63	---	9	L1	9.90	25.37	56.00	Compliance
7.980000	---	31.98	9	L1	10.00	18.02	50.00	Compliance
7.980000	36.27	---	9	L1	10.00	23.73	60.00	Compliance
23.250000	---	28.62	9	L1	10.50	21.38	50.00	Compliance
23.250000	37.06	---	9	L1	10.50	22.94	60.00	Compliance

AC 120V/60 Hz, Neutral

Full Spectrum



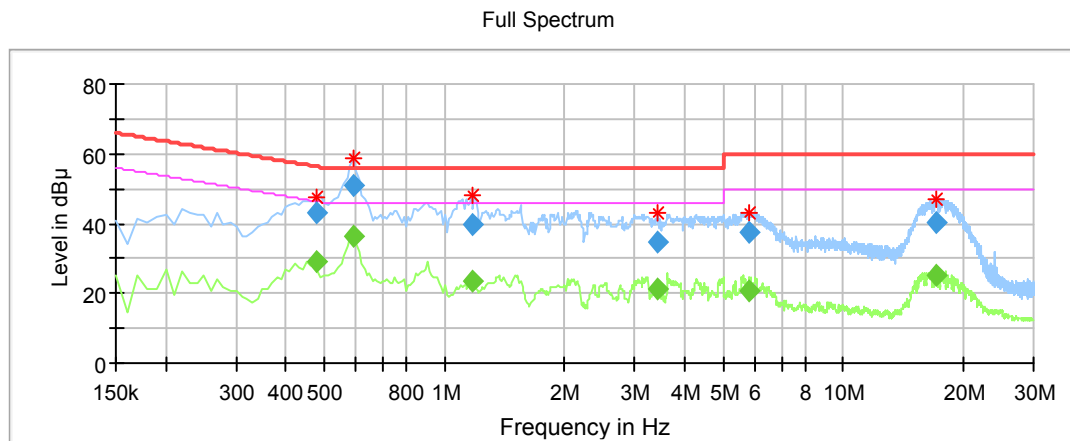
Frequency (MHz)	QuasiPeak (dBμV)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	---	32.81	9	N	10.10	23.19	56.00	Compliance
0.150000	37.52	---	9	N	10.10	28.48	66.00	Compliance
0.240000	---	32.12	9	N	10.10	19.98	52.10	Compliance
0.240000	37.04	---	9	N	10.10	25.06	62.10	Compliance
0.480000	---	32.75	9	N	10.10	13.59	46.34	Compliance
0.480000	37.49	---	9	N	10.10	18.85	56.34	Compliance
3.840000	---	30.37	9	N	9.90	15.63	46.00	Compliance
3.840000	30.64	---	9	N	9.90	25.36	56.00	Compliance
7.950000	---	32.87	9	N	9.90	17.13	50.00	Compliance
7.950000	37.38	---	9	N	9.90	22.62	60.00	Compliance
23.400000	---	35.69	9	N	10.20	14.31	50.00	Compliance
23.400000	39.14	---	9	N	10.20	20.86	60.00	Compliance

Note:

- 1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
- 2) Corrected Amplitude = Reading + Corr.
- 3) Margin = Limit –Corrected Amplitude

Test Mode2 :Charging by adapter

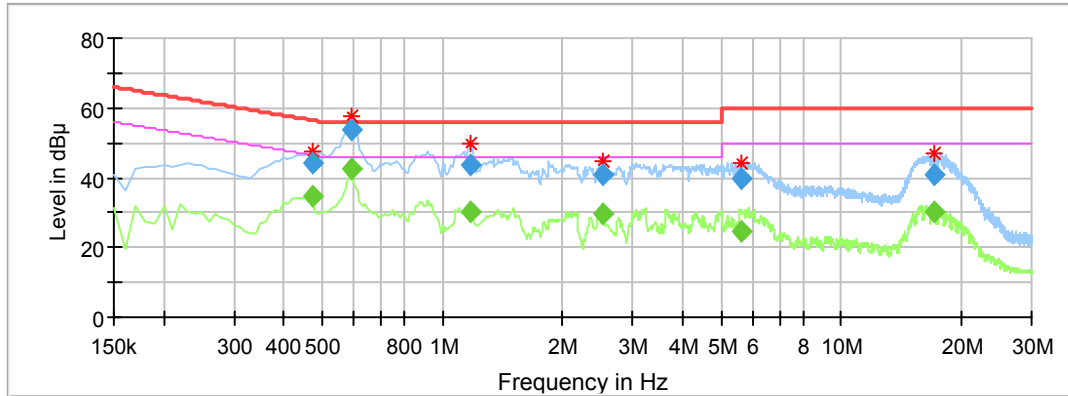
AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBμV)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.480000	42.95	---	9.000	L1	10.1	13.39	56.34	Compliance
0.480000	---	29.13	9.000	L1	10.1	17.21	46.34	Compliance
0.590000	---	36.13	9.000	L1	10.0	9.87	46.00	Compliance
0.590000	50.93	---	9.000	L1	10.0	5.07	56.00	Compliance
1.170000	---	23.75	9.000	L1	9.9	22.25	46.00	Compliance
1.170000	40.00	---	9.000	L1	9.9	16.00	56.00	Compliance
3.420000	---	21.24	9.000	L1	9.9	24.76	46.00	Compliance
3.420000	34.94	---	9.000	L1	9.9	21.06	56.00	Compliance
5.810000	---	20.48	9.000	L1	9.9	29.52	50.00	Compliance
5.810000	37.64	---	9.000	L1	9.9	22.36	60.00	Compliance
17.080000	---	25.40	9.000	L1	10.3	24.60	50.00	Compliance
17.080000	40.52	---	9.000	L1	10.3	19.48	60.00	Compliance

AC 120V/60 Hz, Neutral

Full Spectrum



Frequency (MHz)	QuasiPeak (dBμV)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.470000	---	34.54	9.000	N	10.1	11.97	46.51	Compliance
0.470000	44.39	---	9.000	N	10.1	12.12	56.51	Compliance
0.590000	---	42.67	9.000	N	10.1	3.33	46.00	Compliance
0.590000	52.46	---	9.000	N	10.1	3.54	56.00	Compliance
1.180000	---	30.43	9.000	N	9.9	15.57	46.00	Compliance
1.180000	43.69	---	9.000	N	9.9	12.31	56.00	Compliance
2.530000	---	29.40	9.000	N	9.9	16.60	46.00	Compliance
2.530000	40.56	---	9.000	N	9.9	15.44	56.00	Compliance
5.620000	---	24.42	9.000	N	9.9	25.58	50.00	Compliance
5.620000	39.71	---	9.000	N	9.9	20.29	60.00	Compliance
17.030000	---	30.23	9.000	N	10.1	19.77	50.00	Compliance
17.030000	40.80	---	9.000	N	10.1	19.20	60.00	Compliance

Note:

- 1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
- 2) Corrected Amplitude = Reading + Corr.
- 3) Margin = Limit –Corrected Amplitude

FCC§15.205, §15.209&§15.249- RADIATED EMISSIONS& OUT OF BAND EMISSION

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

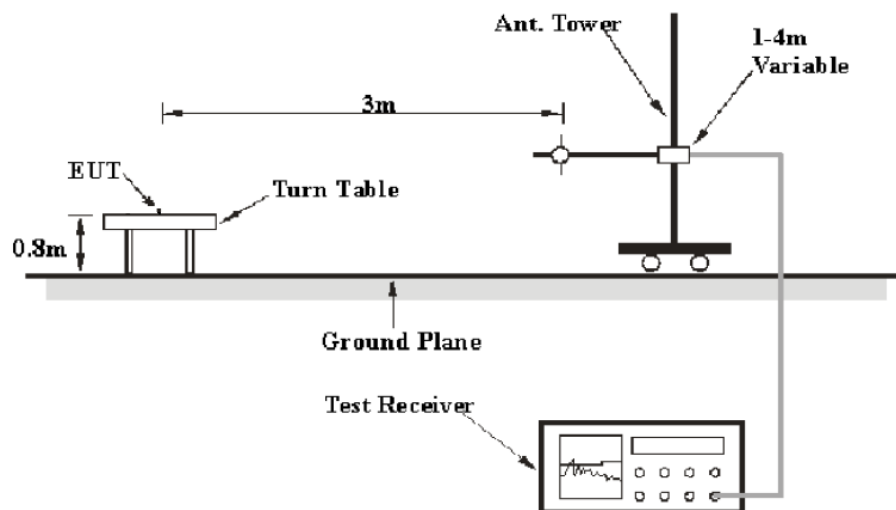
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

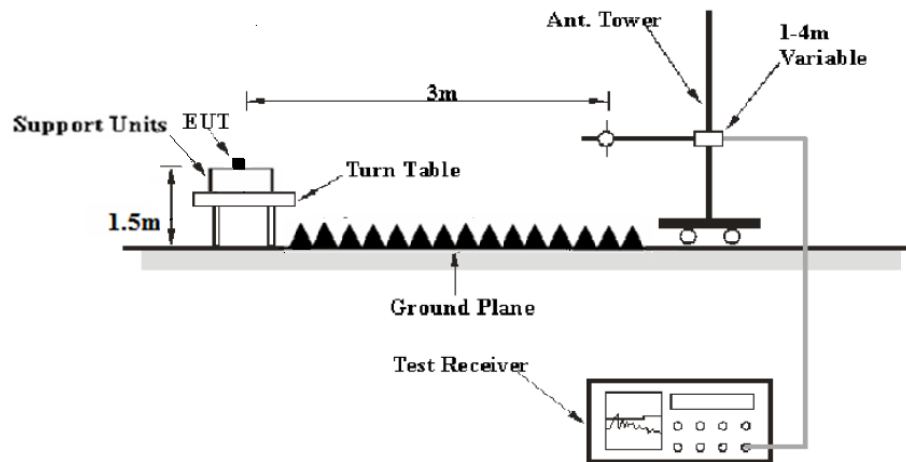
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

Test Equipment Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP

Frequency Range	RBW	Video B/W	Duty cycle	Detector
1GHz – 25GHz	1MHz	3 MHz	Any	PK
	1MHz	10 Hz	>98%	Ave.
	1MHz	1/T	<98%	

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.205 & 15.249.

Test Data

Environmental Conditions

Temperature:	24.6°C
Relative Humidity:	52%
ATM Pressure:	101.2 kPa

The testing was performed by Ada Yu on 2017-03-28 to 2017-05-23.

30MHz-1GHz:

EUT operation mode: Transmitting

Scan with module RFOUT1, RFOUT2, RFOUT3, RFOUT4 independently, the worst case RFOUT1 TX (External Antenna) and RFOUT4 TX (Internal Antenna) were recorded.

*Test Mode 1: Charging by USB port**RFOUT1(External Antenna)*

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
Low Channel (2404.00MHz)									
105.45	35.61	QP	53	104	V	-16.13	19.48	43.5	24.02
153.67	38.94	QP	10	143	V	-12.16	26.78	43.5	16.72
303.41	38.69	QP	239	144	H	-10.39	28.30	46	17.70
496.57	35.83	QP	99	231	V	-5.86	29.97	46	16.03
800.54	43.28	QP	266	168	H	-1.59	41.69	46	4.31
901.79	42.31	QP	188	203	V	-0.84	41.47	46	4.53
Middle Channel (2432.00MHz)									
101.91	37.75	QP	268	221	V	-16.47	21.28	43.5	22.22
151.64	38.96	QP	134	174	V	-12.12	26.84	43.5	16.66
302.34	39.76	QP	352	201	H	-10.41	29.35	46	16.65
500.56	36.28	QP	295	143	V	-5.36	30.92	46	15.08
801.33	43.42	QP	252	245	H	-1.58	41.84	46	4.16
900.37	42.57	QP	8	163	V	-0.85	41.72	46	4.28
High Channel (2466.00MHz)									
102.44	37.07	QP	99	102	V	-16.42	20.65	43.5	22.85
152.18	41.64	QP	186	173	V	-12.13	29.51	43.5	13.99
301.85	39.40	QP	144	219	H	-10.42	28.98	46	17.02
500.65	37.34	QP	40	231	V	-5.36	31.98	46	14.02
801.31	43.29	QP	33	242	H	-1.58	41.71	46	4.29
900.13	41.89	QP	191	229	V	-0.86	41.03	46	4.97

RFOUT4(Internal Antenna)

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
Low Channel (2404.00MHz)									
102.15	33.26	QP	138	212	V	-16.45	16.81	43.5	26.69
151.23	35.71	QP	347	192	V	-12.09	23.62	43.5	19.88
301.45	35.69	QP	107	178	H	-10.43	25.26	46	20.74
496.08	32.08	QP	279	175	V	-5.87	26.21	46	19.79
800.01	41.72	QP	140	187	H	-1.59	40.13	46	5.87
900.01	41.99	QP	342	196	V	-0.86	41.13	46	4.87
Middle Channel (2432.00MHz)									
100.01	34.18	QP	191	153	V	-16.66	17.52	43.5	25.98
150.50	36.39	QP	26	241	V	-12.09	24.30	43.5	19.20
300.50	36.51	QP	348	195	H	-10.45	26.06	46	19.94
500.05	33.02	QP	312	100	V	-5.36	27.66	46	18.34
800.01	43.23	QP	169	170	H	-1.59	41.64	46	4.36
900.01	42.73	QP	104	103	V	-0.86	41.87	46	4.13
High Channel (2466.00MHz)									
100.94	34.88	QP	133	123	V	-16.57	18.31	43.5	25.19
151.30	37.96	QP	198	216	V	-12.11	25.85	43.5	17.65
301.25	36.91	QP	143	132	H	-10.44	26.47	46	19.53
498.85	33.62	QP	326	235	V	-5.79	27.83	46	18.17
800.01	43.04	QP	317	117	H	-1.59	41.45	46	4.55
900.01	42.52	QP	94	206	V	-0.86	41.66	46	4.34

*Test Mode 2: Charging by adapter**RFOUT1(External Antenna)*

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
Low Channel (2404.00MHz)									
98.33	35.60	QP	339	184	V	-16.70	18.90	43.5	24.60
252.72	34.86	QP	5	202	V	-11.88	22.98	46	23.02
303.12	30.32	QP	164	110	H	-10.40	19.92	46	26.08
453.31	46.37	QP	240	246	V	-7.11	39.26	46	6.74
551.75	43.28	QP	155	177	H	-5.18	38.10	46	7.90
801.47	43.31	QP	179	212	V	-1.58	41.73	46	4.27
Middle Channel (2432.00MHz)									
97.15	35.92	QP	66	108	V	-16.73	19.19	43.5	24.31
256.22	36.18	QP	135	232	V	-11.77	24.41	46	21.59
304.43	32.21	QP	152	239	H	-10.39	21.82	46	24.18
451.69	46.75	QP	34	224	V	-7.16	39.59	46	6.41
553.09	38.37	QP	140	128	H	-5.18	33.19	46	12.81
801.97	43.08	QP	78	249	V	-1.58	41.50	46	4.50
High Channel (2466.00MHz)									
98.37	36.69	QP	320	139	V	-16.73	19.96	43.5	23.54
263.6	38.14	QP	227	167	V	-11.77	26.37	46	19.63
302.98	33.53	QP	181	146	H	-10.39	23.14	46	22.86
455.03	48.05	QP	36	145	V	-7.06	40.99	46	5.01
552.93	40.15	QP	257	121	H	-5.18	34.97	46	11.03
801.74	43.28	QP	160	133	V	-1.58	41.70	46	4.30

RFOUT4(Internal Antenna)

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
Low Channel (2404.00MHz)									
97.02	35.72	QP	90	135	V	-16.73	18.99	43.5	24.51
250.50	31.79	QP	222	228	V	-11.95	19.84	46	26.16
300.01	27.85	QP	343	217	H	-10.39	17.46	46	28.54
450.01	42.61	QP	349	211	V	-7.21	35.40	46	10.60
550.02	34.87	QP	36	125	H	-5.19	29.68	46	16.32
800.50	40.08	QP	51	115	V	-1.59	38.49	46	7.51
Middle Channel (2432.00MHz)									
95.25	35.51	QP	281	233	V	-16.78	18.73	43.5	24.77
254.37	33.23	QP	355	220	V	-11.83	21.40	46	24.60
303.32	29.11	QP	189	231	H	-10.39	18.72	46	27.28
451.45	43.54	QP	279	114	V	-7.17	36.37	46	9.63
552.28	35.40	QP	152	179	H	-5.18	30.22	46	15.78
800.47	40.56	QP	236	223	V	-1.59	38.97	46	7.03
High Channel (2466.00MHz)									
96.54	36.97	QP	179	236	V	-16.75	20.22	43.5	23.28
262.17	35.21	QP	220	181	V	-11.58	23.63	46	22.37
302.85	30.85	QP	112	246	H	-10.40	20.45	46	25.55
454.50	44.43	QP	255	213	V	-7.08	37.35	46	8.65
551.62	37.29	QP	27	150	H	-5.18	32.11	46	13.89
800.50	42.31	QP	9	100	V	-1.59	40.72	46	5.28

1GHz-25GHz:*EUT operation mode: Transmitting**RFOUT1(External Antenna)*

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
Low Channel (2404.00MHz)									
2404.00	108.37	PK	112	150	V	-6.19	102.18	114.00	11.82
2404.00	95.21	Ave	112	150	V	-6.19	89.02	94.00	4.98
2404.00	106.54	PK	184	206	H	-6.19	100.35	114.00	13.65
2404.00	93.56	Ave	184	206	H	-6.19	87.37	94.00	6.63
2390.00	52.20	PK	12	183	H	-6.22	45.98	74.00	28.02
2390.00	47.00	Ave	12	183	H	-6.22	40.78	54.00	13.22
2400.00	62.42	PK	152	124	H	-6.19	56.23	74.00	17.77
2400.00	54.50	Ave	152	124	H	-6.19	48.31	54.00	5.69
4808.00	51.29	PK	284	240	H	1.62	52.91	74.00	21.09
4808.00	45.38	Ave	284	240	H	1.62	47.00	54.00	7.00
7212.00	42.39	PK	181	192	H	7.56	49.95	74.00	24.05
7212.00	38.26	Ave	181	192	H	7.56	45.82	54.00	8.18
Middle Channel (2432.00MHz)									
2432.00	108.17	PK	164	129	V	-6.12	102.05	114.00	11.95
2432.00	96.03	Ave	164	129	V	-6.12	89.91	94.00	4.09
2432.00	103.16	PK	87	228	H	-6.12	97.04	114.00	16.96
2432.00	92.87	Ave	87	228	H	-6.12	86.75	94.00	7.25
4864.00	51.58	PK	202	219	H	1.75	53.33	74.00	20.67
4864.00	45.19	Ave	202	219	H	1.75	46.94	54.00	7.06
6615.00	44.85	PK	158	194	H	6.24	51.09	74.00	22.91
6615.00	41.39	Ave	158	194	H	6.24	47.63	54.00	6.37
7296.00	42.16	PK	119	243	H	7.64	49.80	74.00	24.20
7296.00	38.78	Ave	119	243	H	7.64	46.42	54.00	7.58

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
High Channel (2466.00MHz)									
2466.00	108.22	PK	163	130	V	-6.05	102.17	114.00	11.83
2466.00	94.82	Ave	163	130	V	-6.05	88.77	94.00	5.23
2466.00	103.09	PK	313	184	H	-6.05	97.04	114.00	16.96
2466.00	93.46	Ave	313	184	H	-6.05	87.41	94.00	6.59
2483.50	63.05	PK	354	127	H	-6.01	57.04	74.00	16.96
2483.50	55.39	Ave	354	127	H	-6.01	49.38	54.00	4.62
4932.00	52.16	PK	113	107	H	1.90	54.06	74.00	19.94
4932.00	45.37	Ave	113	107	H	1.90	47.27	54.00	6.73
7398.00	41.09	PK	151	152	H	7.75	48.84	74.00	25.16
7398.00	37.26	Ave	151	152	H	7.75	45.01	54.00	8.99

RFOUT4(Internal Antenna)

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
Low Channel (2404.00MHz)									
2404.00	109.64	PK	116	145	V	-6.19	103.45	114	10.55
2404.00	95.87	Ave	116	145	V	-6.19	89.68	94	4.32
2404.00	107.87	PK	198	185	H	-6.19	101.68	114	12.32
2404.00	95.15	Ave	198	185	H	-6.19	88.96	94	5.04
2390.00	53.23	PK	14	170	H	-6.22	47.01	74	26.99
2390.00	48.81	Ave	14	170	H	-6.22	42.59	54	11.41
2400.00	63.70	PK	165	134	H	-6.19	57.51	74	16.49
2400.00	55.36	Ave	165	134	H	-6.19	49.17	54	4.83
4808.00	52.41	PK	294	155	H	1.62	54.03	74	19.97
4808.00	45.49	Ave	294	155	H	1.62	47.11	54	6.89
7212.00	43.66	PK	188	180	H	7.56	51.22	74	22.78
7212.00	38.36	Ave	188	180	H	7.56	45.92	54	8.08

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
Middle Channel (2432.00MHz)									
2432.00	108.35	PK	174	154	V	-6.12	102.23	114	11.77
2432.00	95.27	Ave	174	154	V	-6.12	89.15	94	4.85
2432.00	103.22	PK	106	210	H	-6.12	97.10	114	16.90
2432.00	93.49	Ave	106	210	H	-6.12	87.37	94	6.63
4864.00	52.56	PK	203	189	H	1.75	54.31	74	19.69
4864.00	46.15	Ave	203	189	H	1.75	47.90	54	6.10
6615.00	46.01	PK	174	154	H	6.24	52.25	74	21.75
6615.00	42.89	Ave	174	154	H	6.24	49.13	54	4.87
7296.00	44.05	PK	136	220	H	7.64	51.69	74	22.31
7296.00	40.22	Ave	136	220	H	7.64	47.86	54	6.14
High Channel (2466.00MHz)									
2466.00	109.36	PK	181	145	V	-6.05	103.31	114	10.69
2466.00	95.11	Ave	181	145	V	-6.05	89.06	94	4.94
2466.00	104.30	PK	332	180	H	-6.05	98.25	114	15.75
2466.00	95.40	Ave	332	180	H	-6.05	89.35	94	4.65
2483.50	64.63	PK	265	128	H	-6.01	58.62	74	15.38
2483.5	55.96	Ave	265	128	H	-6.01	49.95	54	4.05
4932.00	53.57	PK	115	124	H	1.9	55.47	74	18.53
4932.00	46.84	Ave	115	124	H	1.9	48.74	54	5.26
7398.00	42.39	PK	162	189	H	7.75	50.14	74	23.86
7398.00	38.40	Ave	162	189	H	7.75	46.15	54	7.85

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor = Antenna factor (Rx) + cable loss – amplifier factor

Margin = Limit - Corr. Amplitude

FCC §15.215(c) – 20 dB BANDWIDTH TESTING

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	24.2°C
Relative Humidity:	51 %
ATM Pressure:	101.2kPa

** The testing was performed by Ada Yu on 2017-03-28.*

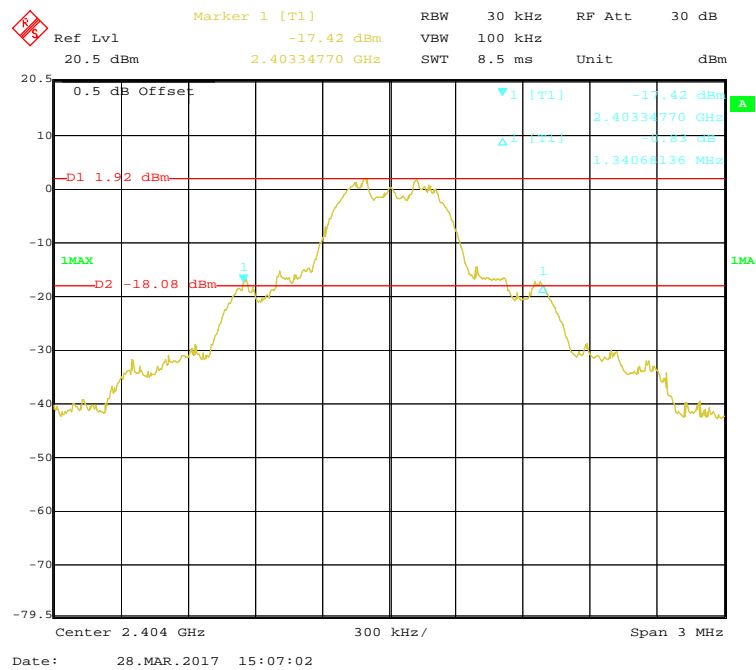
Test Result: Compliant.

Please refer to following tables and plots

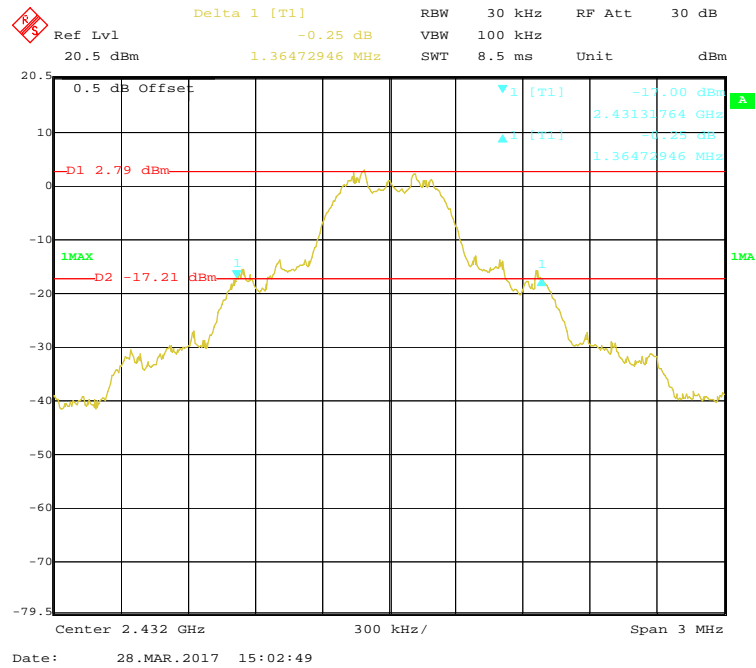
Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2404.00	1.341
Middle	2432.00	1.365
High	2466.00	1.335

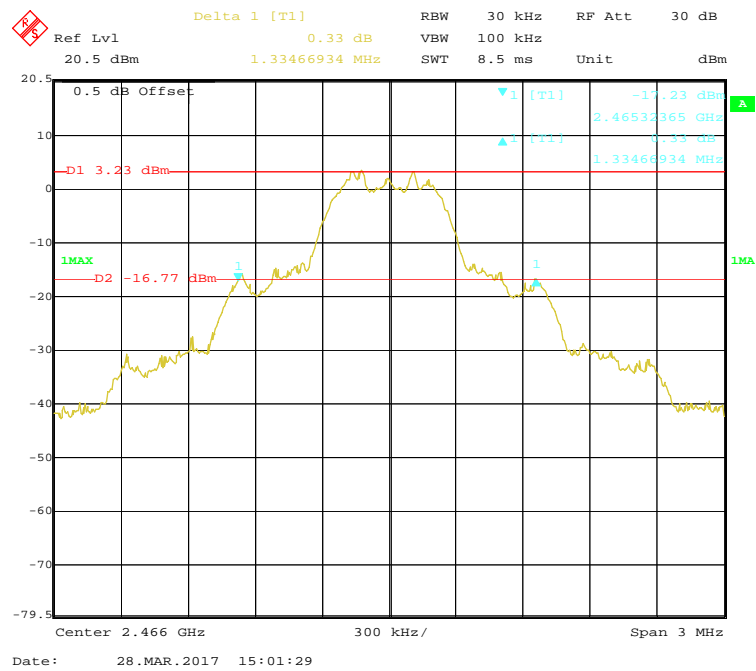
Low Channel



Middle Channel



High Channel



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