FCC Test Report

Product Name	Humly Room Display One
Model No	HUM1001
FCC ID.	2APYB-HUM1001

Applicant	Certus Eiger Ltd.
Address	814, Houston Center, Mody Road, TST East Kowloon, Hong Kong

Date of Receipt	Oct. 08, 2019
Issue Date	Nov. 13, 2019
Report No.	19A0116R-RFUSP34V00
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
This report must not be used to claim product endorsement by TAF or any agency of the government.
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Test Report

Issue Date: Nov. 13, 2019
Report No.: 19A0116R-RFUSP34V00

Product Name	Humly Room Display One
Applicant	Certus Eiger Ltd.
Address	814, Houston Center, Mody Road, TST East Kowloon, Hong Kong
Manufacturer	Certus Eiger Ltd.
Model No.	HUM1001
FCC ID.	2APYB-HUM1001
EUT Rated Voltage	AC 100-240V, 50/60Hz
EUT Test Voltage	AC 110 V / 50 Hz
Trade Name	Humly
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Rita Huang

(Senior Adm. Specialist / Rita Huang)

Tested By : Yun Che Chen

(Engineer / Yunche Chen)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Humly Room Display One
Trade Name	Humly
Model No.	HUM1001
FCC ID.	2APYB-HUM1001
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW
Number of Channels	802.11b/g/n-20MHz:11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 144.4Mbps
Type of Modulation	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	ANJIE	AJDQ1J-B0027 (Main), AJDQ1J-W0020 (Aux)	PIFA Antenna	2.17dBi for 2.4GHz

Note: The antenna of EUT conforms to FCC 15.203.

802.11b/g/n-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

Note:

1. The EUT is a Humly Room Display One with built-in WLAN (802.11a/b/g/n/ac) and Bluetooth (5.0 and V3.0+HS, V2.1+EDR) transceiver, this report for 2.4GHz WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report.
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
6. The consider Co-Location based on KDB 996369 D02 Question 1 and KDB 996369 D04 for Radiated Spurious Emission.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW)
	Mode 4: Transmit (802.11b 1Mbps)+NFC
	Mode 5: Transmit (802.11g 6Mbps)+NFC
	Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC

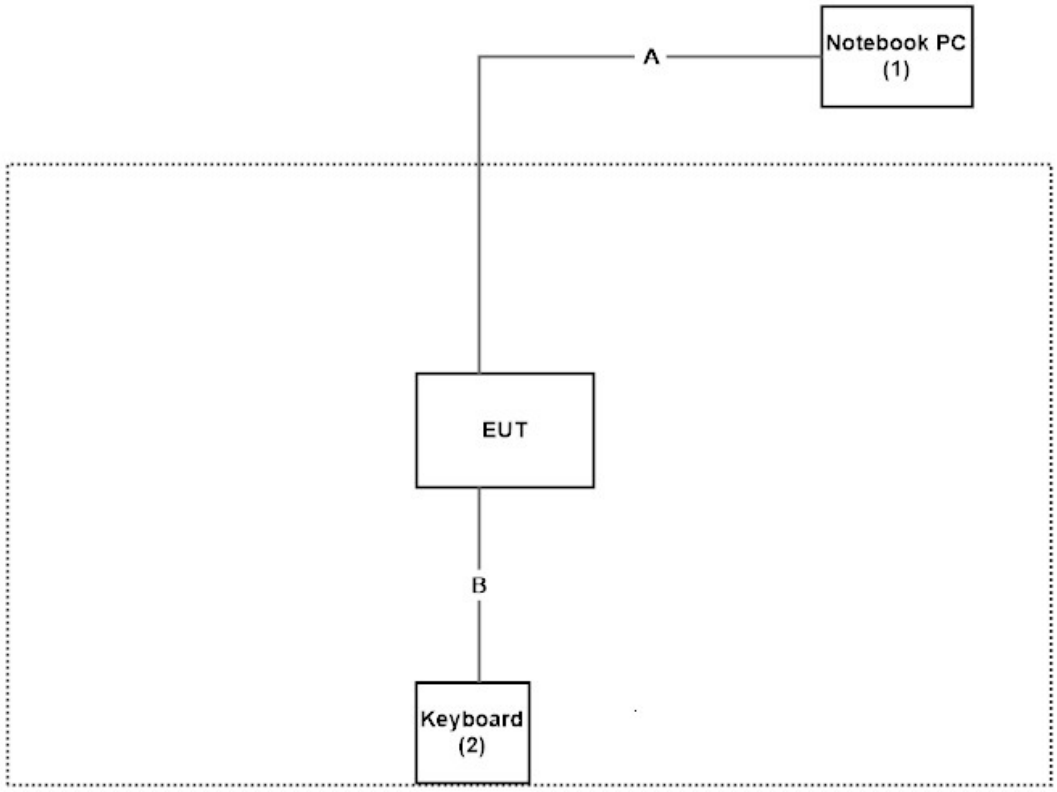
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude E5440	B6TYTZ1	Non-Shielded, 0.8m
2	Keyboard	Dell	SK-8175	MY-0W217F-71619-092-0497-A01	N/A

Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 2.0m
B	Keyboard Cable	Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Cmd” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

USA : FCC Registration Number: TW3023

Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
Phone number: 886-2-8601-3788
Fax number: 886-2-8601-3789
Email address: info.tw@dekra.com
Website: http://www.dekra.com.tw

1.7. List of Test Equipment

Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2019/02/26	2020/02/25
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2019/09/25	2020/09/24
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/30	2020/07/29
X	EMI Test Receiver	R&S	ESCS 30	100369	2018/11/19	2019/11/18
X	LISN	R&S	ENV216	101105	2019/04/10	2020/04/09
X	LISN	R&S	ESH3-Z5	836679/014	2019/04/10	2020/04/09
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2019/06/20	2020/06/19

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version :DEKRA Conduction Test SystemV9.0.5.

For Radiated measurements /Site3/CB8

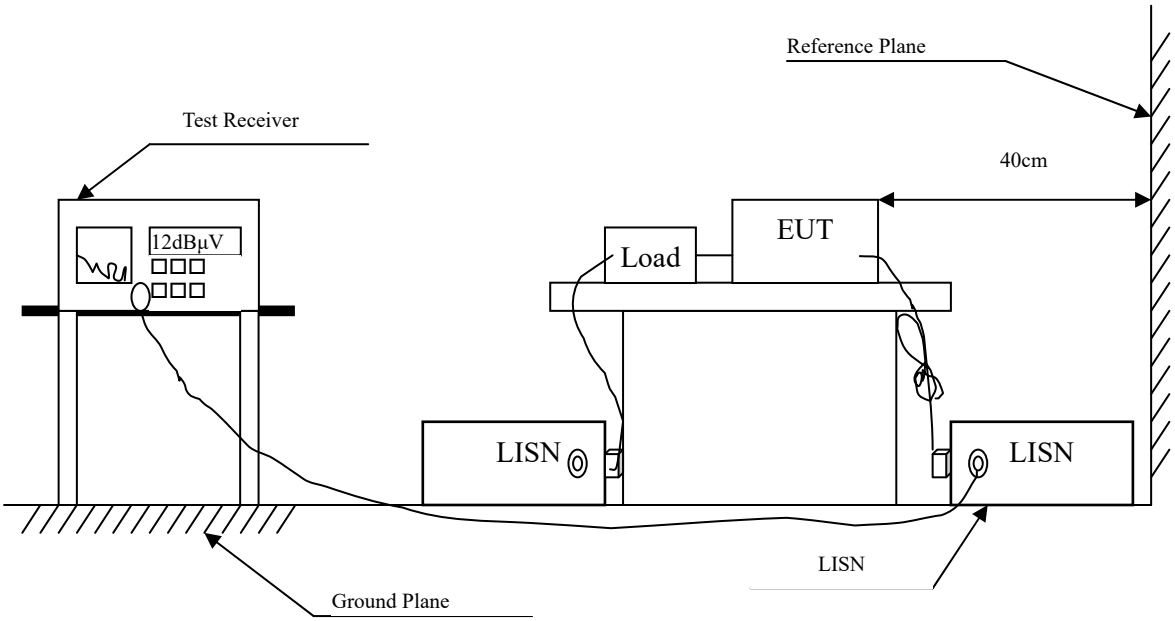
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2019/03/11	2020/03/10
X	Loop Antenna	Teseq	HLA6121	37133	2019/10/15	2021/10/14
X	Bilog Antenna	Schaffner Chase	CBL6112B	2794	2019/06/23	2020/06/22
X	Coaxial Cable	DEKRA	L1907-001C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC001330	980254	2019/08/22	2020/08/21
X	Horn Antenna	ETS-LINDGREN	3117	00228113	2019/05/02	2020/05/01
X	Coaxial Cable	DEKRA	L1907-002C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC05820SE	980362	2019/06/26	2020/06/25
X	Amplifier	EMCI	EMC051845SE	SN980632	2019/08/08	2020/08/07
	Horn Antenna	Com-Power	AH-1840	101101	2019/10/31	2020/10/30
	Amplifier + Cable	EMCI	EMC184045SE	980369	2019/04/16	2020/04/15
	Bilog Antenna	Schaffner Chase	CBL6112B	2916	2019/06/23	2020/06/22
	Coaxial Cable	DEKRA	L1907-003C	00100A1B3A120M	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC001330	980255	2019/06/28	2020/06/27
X	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/08	2020/08/07
	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/08	2020/08/07

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version :QuieTek EMI System V2.1.134.

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. 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.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

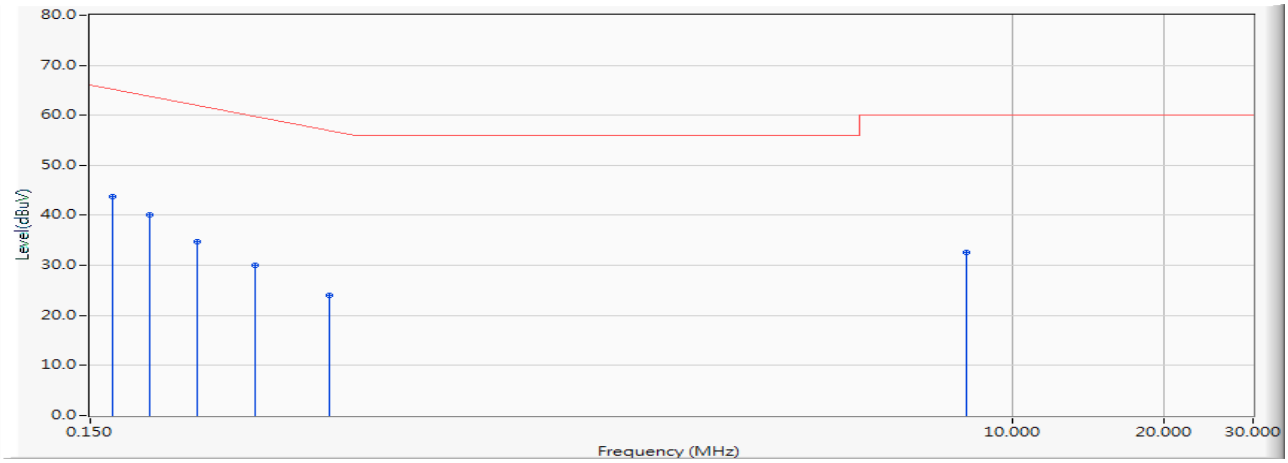
2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : Humly Room Display One
Test Item : Conducted Emission Test
Power Line : Line 1
Test Date : 2019/11/02
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2437MHz)

Line1



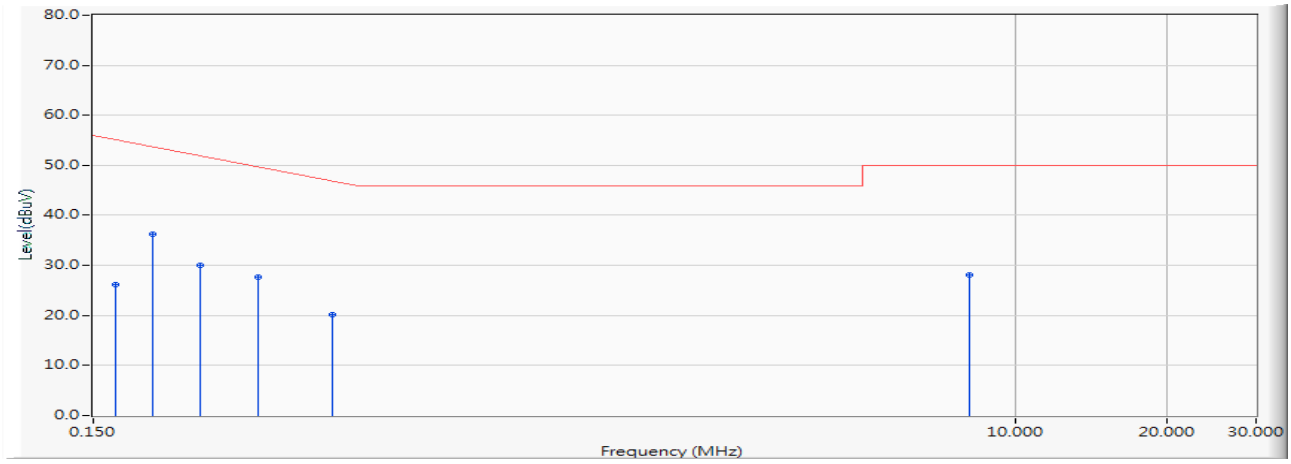
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.166	9.669	34.010	43.679	-21.864	65.543	QUASIPEAK
2		0.197	9.670	30.540	40.210	-24.447	64.657	QUASIPEAK
3		0.244	9.673	25.050	34.723	-28.591	63.314	QUASIPEAK
4		0.318	9.677	20.360	30.037	-31.163	61.200	QUASIPEAK
5		0.447	9.684	14.240	23.924	-33.590	57.514	QUASIPEAK
6		8.115	9.964	22.700	32.664	-27.336	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test Date	:	2019/11/02
Test Mode	:	Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2437MHz)

Line1



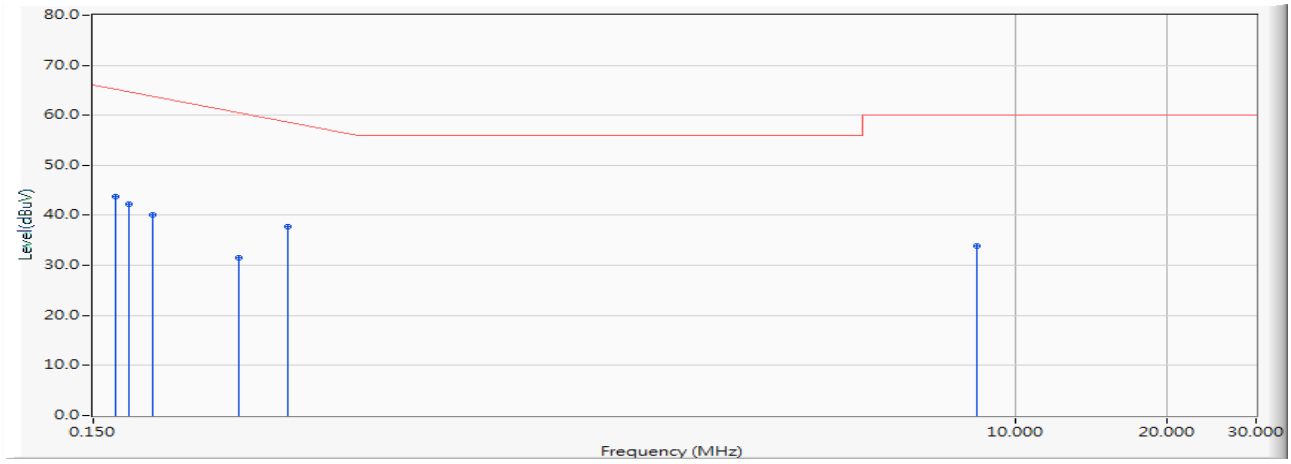
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.166	9.669	16.390	26.059	-29.484	55.543	AVERAGE
2	*	0.197	9.670	26.620	36.290	-18.367	54.657	AVERAGE
3		0.244	9.673	20.410	30.083	-23.231	53.314	AVERAGE
4		0.318	9.677	17.920	27.597	-23.603	51.200	AVERAGE
5		0.447	9.684	10.520	20.204	-27.310	47.514	AVERAGE
6		8.115	9.964	18.090	28.054	-21.946	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test Date	:	2019/11/02
Test Mode	:	Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2437MHz)

Line2



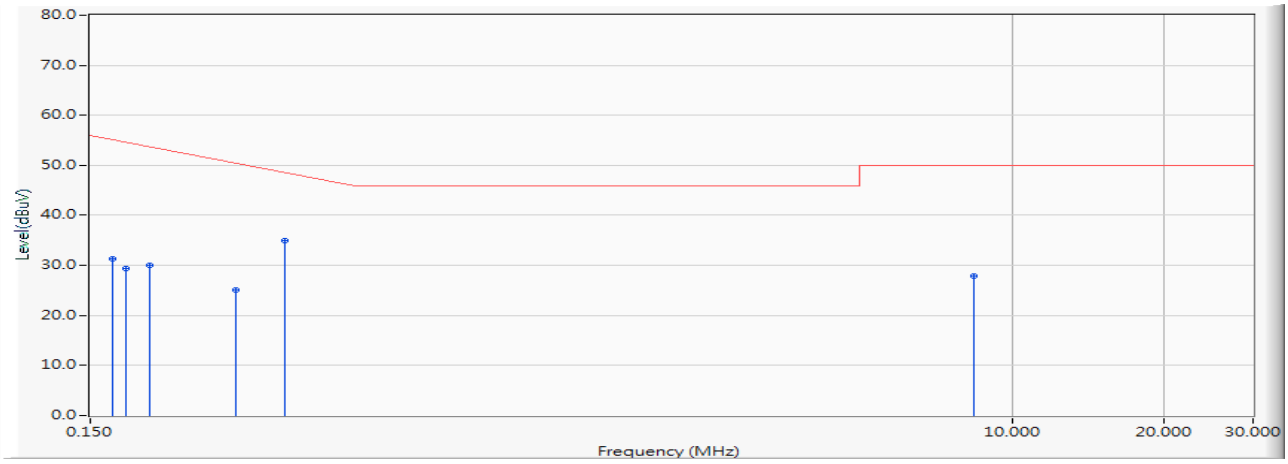
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.166	9.707	33.960	43.666	-21.877	65.543	QUASIPEAK
2		0.177	9.703	32.600	42.303	-22.926	65.229	QUASIPEAK
3		0.197	9.700	30.470	40.170	-24.487	64.657	QUASIPEAK
4		0.291	9.705	21.910	31.615	-30.356	61.971	QUASIPEAK
5		0.365	9.709	27.970	37.679	-22.178	59.857	QUASIPEAK
6		8.404	10.041	23.780	33.821	-26.179	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Conducted Emission Test
Power Line : Line 2
Test Date : 2019/11/02
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2437MHz)

Line2



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.166	9.707	21.630	31.336	-24.207	55.543	AVERAGE
2		0.177	9.703	19.730	29.433	-25.796	55.229	AVERAGE
3		0.197	9.700	20.430	30.130	-24.527	54.657	AVERAGE
4		0.291	9.705	15.460	25.165	-26.806	51.971	AVERAGE
5	*	0.365	9.709	25.220	34.929	-14.928	49.857	AVERAGE
6		8.404	10.041	17.810	27.851	-22.149	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup

3.2. Limits

The maximum peak power shall be less 1 Watt.

3.3. Test Procedure

Tested according to C63.10:2013 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using C63.10:2013 Section 11.9.1.3 PKPM1 Peak power meter method (Measurement using a gated RF average-reading power meter)

3.4. Uncertainty

± 1.19 dB

3.5. Test Result of Peak Power Output

Product : Humly Room Display One
Test Item : Peak Power Output Data
Test Date : 2019/11/01
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	15.1	--	--	--	18.3	<30dBm	Pass
06	2437	17.14	17.11	16.68	16.4	20.36	<30dBm	Pass
11	2462	17.25	--	--	--	20.13	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : Humly Room Display One
Test Item : Peak Power Output Data
Test Date : 2019/11/01
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		6	9	12	18	24	36	48	54	6
		Measurement Level (dBm)								
01	2412	12.78	--	--	--	--	--	--	--	22.52
06	2437	13.19	13.02	12.71	12.39	12.02	11.95	11.82	11.66	23.51
11	2462	13.24	--	--	--	--	--	--	--	22.99

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		6	9	12	18	24	36	48	54	6
		Measurement Level (dBm)								
01	2412	15.22	--	--	--	--	--	--	--	24.46
06	2437	15.07	15.02	14.68	14.39	14.35	14.2	13.93	13.86	24.96
11	2462	14.82	--	--	--	--	--	--	--	24.65

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	6	22.52	24.46	26.61	<30dBm	Pass
6	2437	6	23.51	24.96	27.31	<30dBm	Pass
11	2462	6	22.99	24.65	26.91	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Product : Humly Room Display One
Test Item : Peak Power Output Data
Test Date : 2019/11/01
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	14.4
		Measurement Level (dBm)								
01	2412	12.72	--	--	--	--	--	--	--	21.93
06	2437	13.01	12.74	12.43	12.08	11.92	11.51	11.44	11.14	22.45
11	2462	13.16	--	--	--	--	--	--	--	22.51

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	14.4
		Measurement Level (dBm)								
01	2412	15.05	--	--	--	--	--	--	--	24.24
06	2437	14.92	14.56	14.23	13.89	13.5	13.42	13.32	12.91	24.14
11	2462	14.69	--	--	--	--	--	--	--	24.12

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

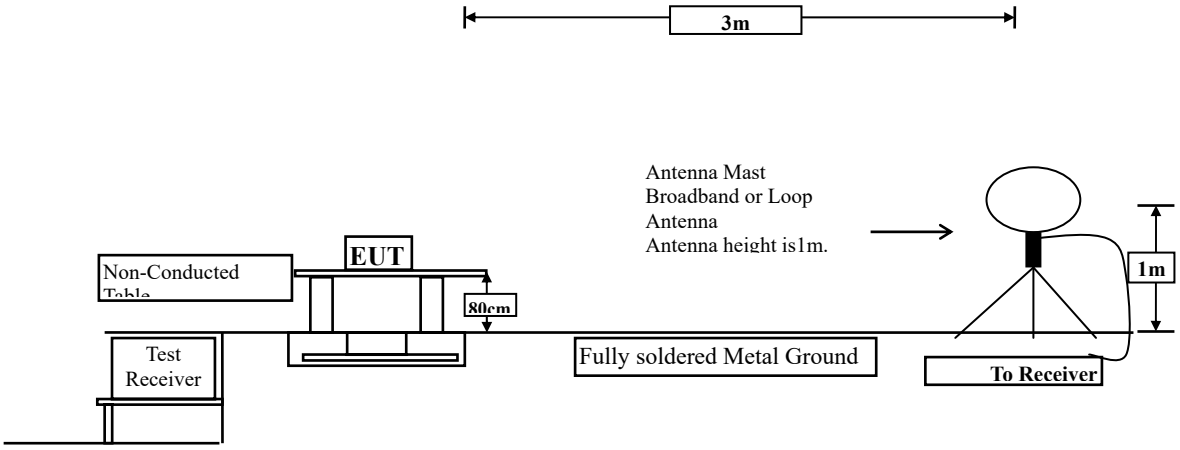
Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	14.4	21.93	24.24	26.25	<30dBm	Pass
6	2437	14.4	22.45	24.14	26.39	<30dBm	Pass
11	2462	14.4	22.51	24.12	26.40	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

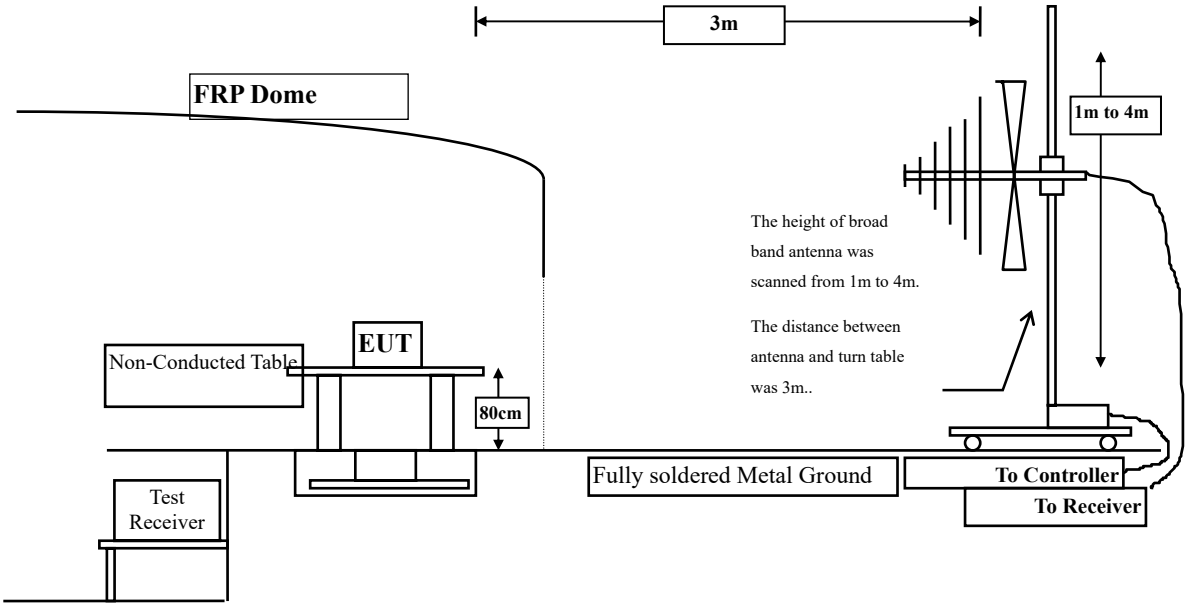
4. Radiated Emission

4.1. Test Setup

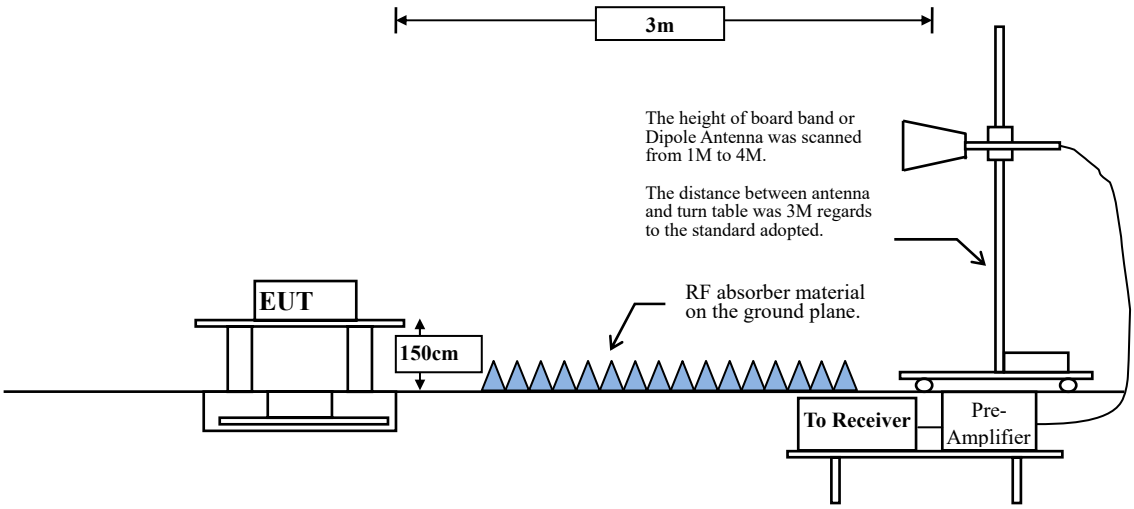
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dBμV/m) = 20 log E field strength (uV/m)

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to C63.10:2013 Section 11.12.1 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	98.64	8.4041	119	10
802.11g	92.57	1.3899	719	1000
802.11n20	85.58	0.6667	1500	2000

Note: Duty Cycle Refer to Section 9.

4.4. Uncertainty

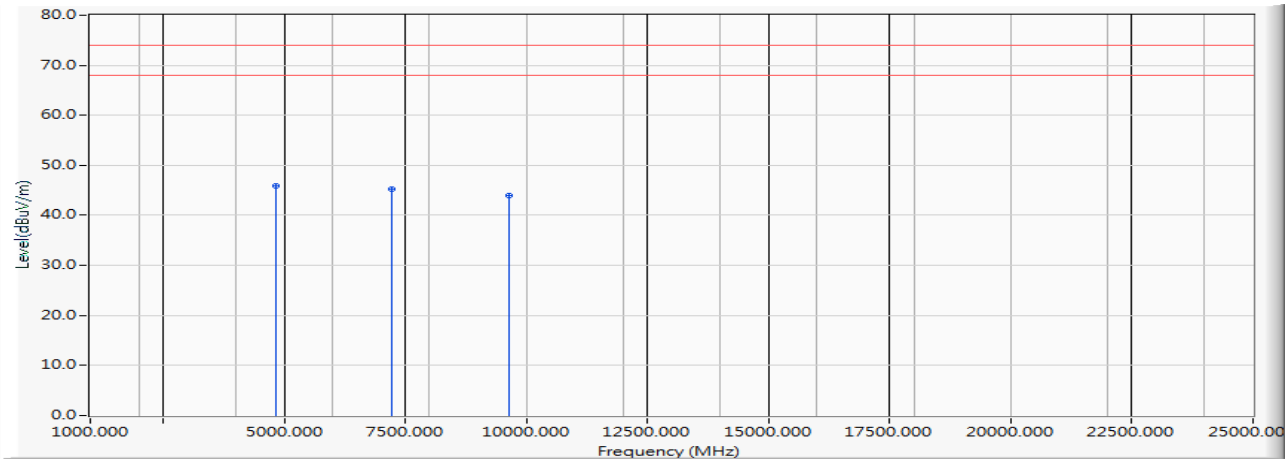
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Radiated Emission

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2412MHz)

Horizontal



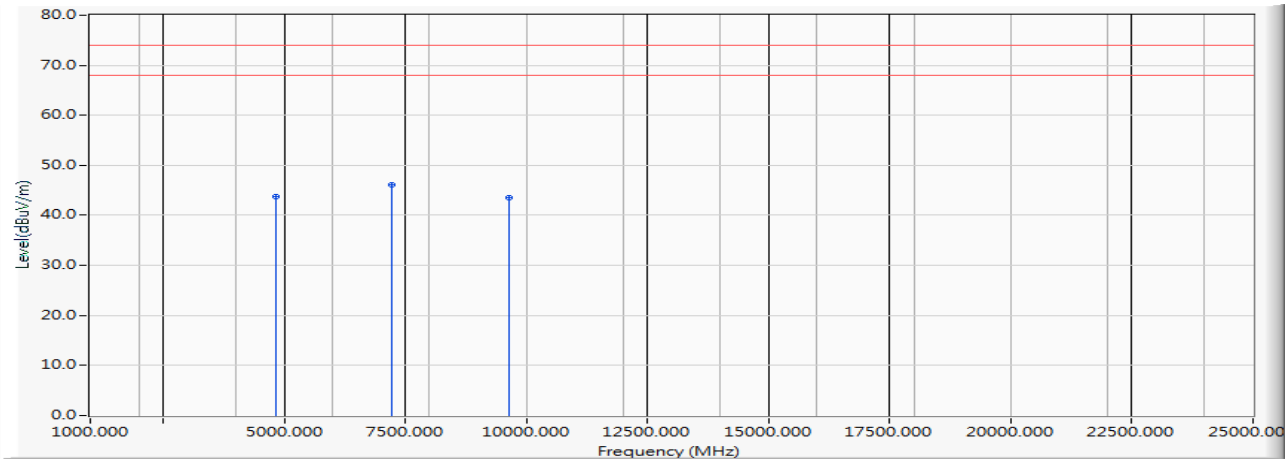
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4824.000	-11.989	57.880	45.891	-28.109	74.000	PEAK
2		7236.000	-12.957	58.130	45.173	-28.827	74.000	PEAK
3		9648.000	-13.106	57.130	44.024	-29.976	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 4: Transmit (802.11b 1Mbps)+NFC (2412MHz)

Vertical



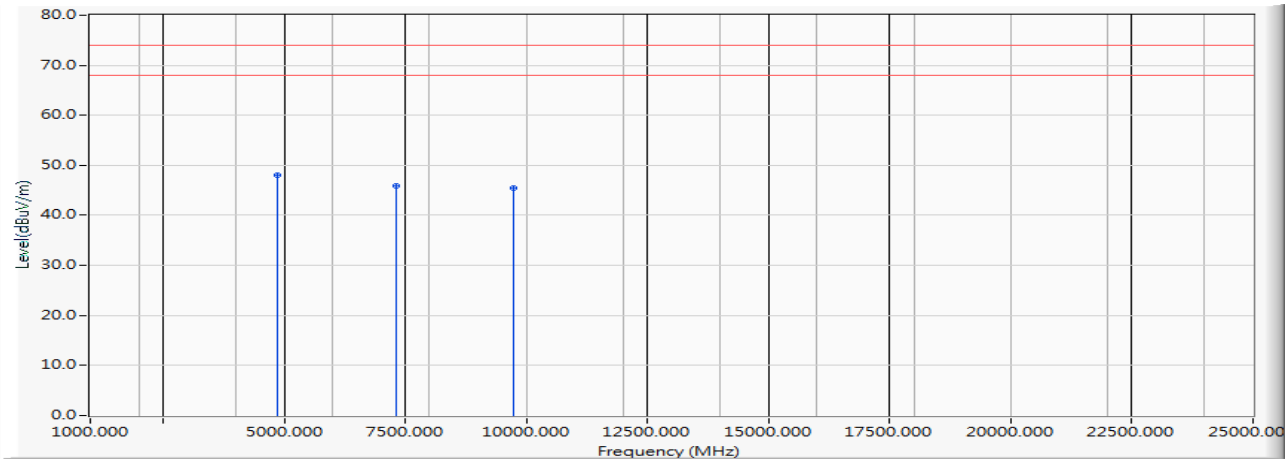
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	55.770	43.781	-30.219	74.000	PEAK
2	*	7236.000	-12.957	59.000	46.043	-27.957	74.000	PEAK
3		9648.000	-13.106	56.740	43.634	-30.366	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2437 MHz)

Horizontal



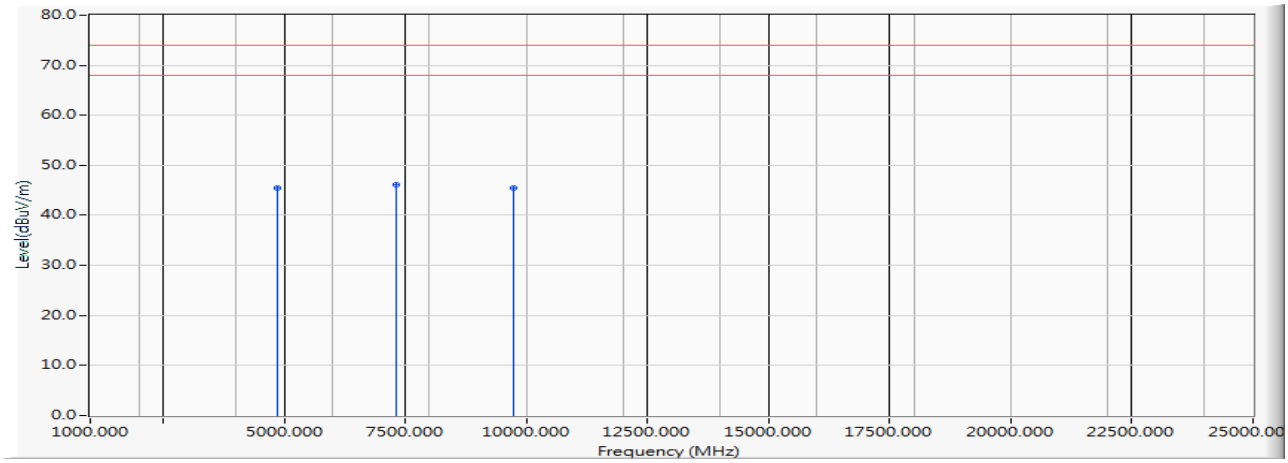
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-11.637	59.613	47.976	-26.024	74.000	PEAK
2		7311.000	-13.474	59.310	45.836	-28.164	74.000	PEAK
3		9748.000	-12.439	57.940	45.501	-28.499	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2437 MHz)

Vertical



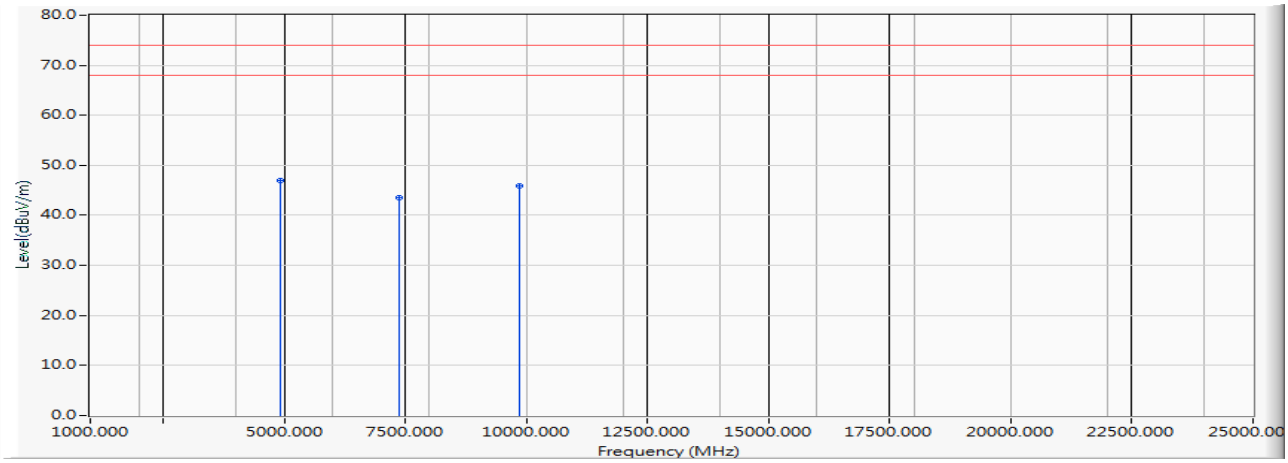
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	57.010	45.373	-28.627	74.000	PEAK
2	*	7311.000	-13.474	59.590	46.116	-27.884	74.000	PEAK
3		9748.000	-12.439	58.000	45.561	-28.439	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2462 MHz)

Horizontal



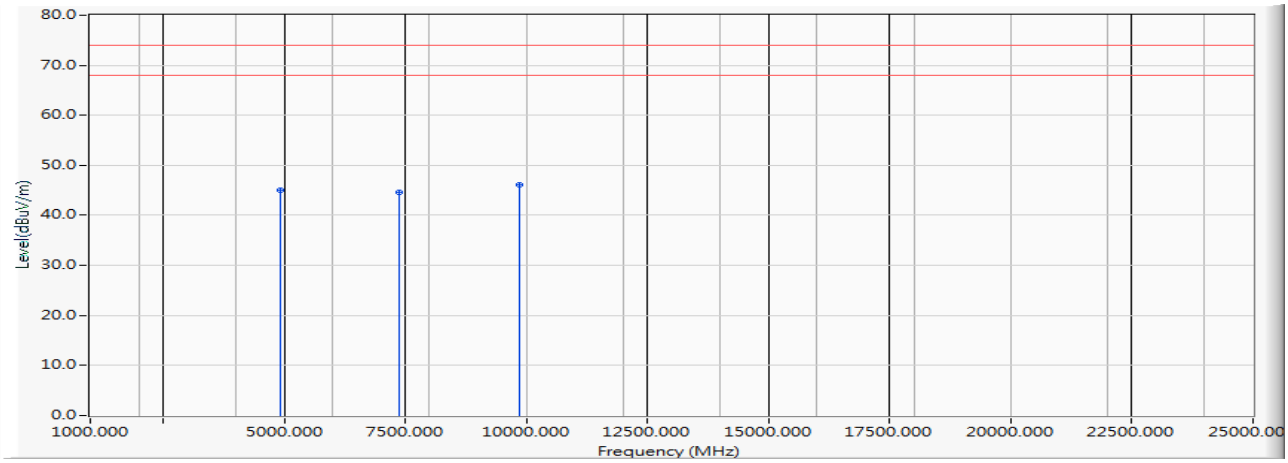
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4924.000	-11.241	58.312	47.071	-26.929	74.000	PEAK
2		7386.000	-14.095	57.570	43.475	-30.525	74.000	PEAK
3		9848.000	-13.445	59.320	45.874	-28.126	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 4: Transmit (802.11b 1Mbps)+NFC (2462 MHz)

Vertical



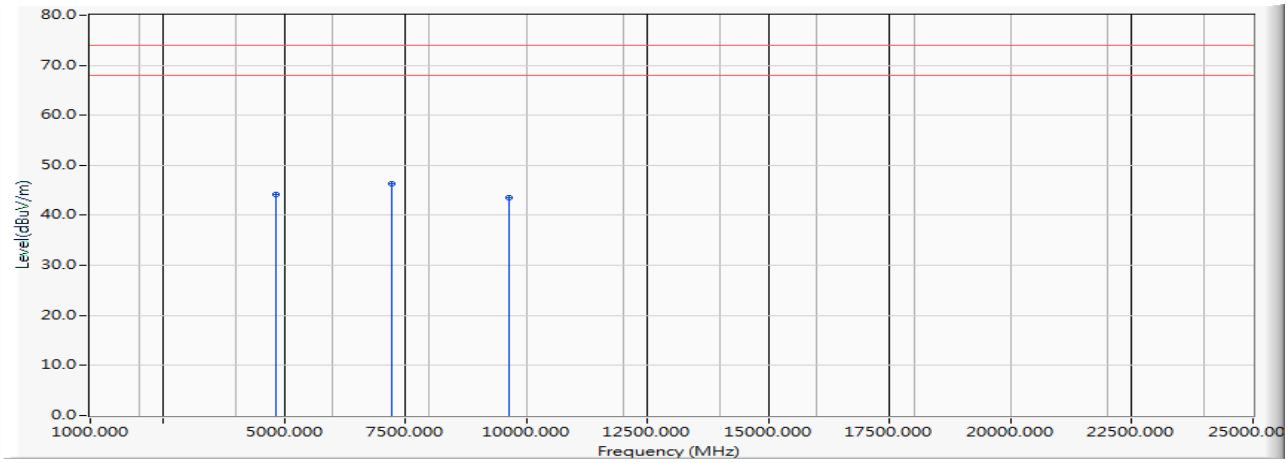
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	56.360	45.119	-28.881	74.000	PEAK
2		7386.000	-14.095	58.620	44.525	-29.475	74.000	PEAK
3	*	9848.000	-13.445	59.510	46.064	-27.936	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 5: Transmit (802.11g 6Mbps)+NFC (2412MHz)

Horizontal



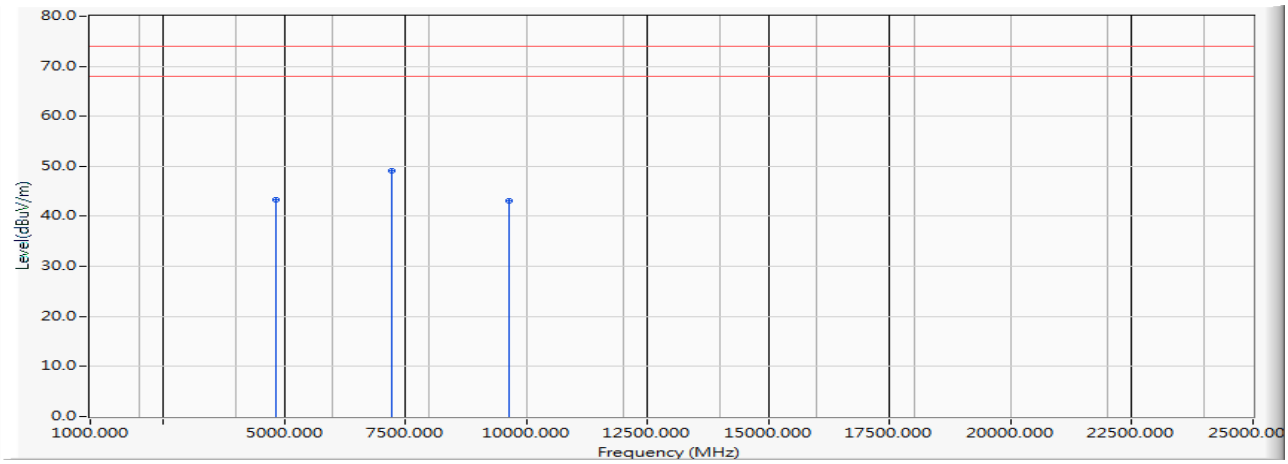
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	56.230	44.241	-29.759	74.000	PEAK
2	*	7236.000	-12.957	59.190	46.233	-27.767	74.000	PEAK
3		9648.000	-13.106	56.730	43.624	-30.376	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 5: Transmit (802.11g 6Mbps)+NFC (2412MHz)

Vertical



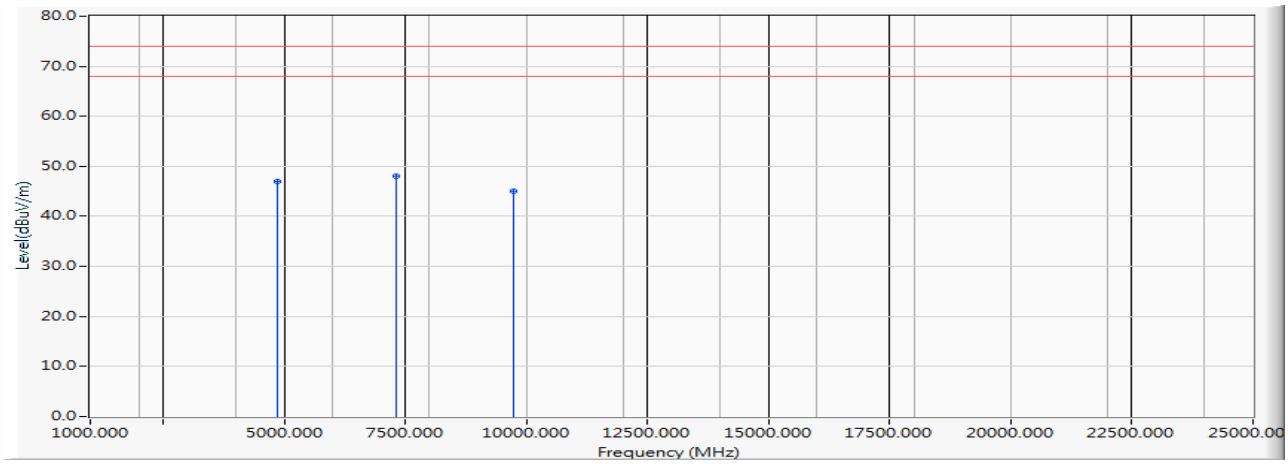
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	55.290	43.301	-30.699	74.000	PEAK
2	*	7236.000	-12.957	62.100	49.143	-24.857	74.000	PEAK
3		9648.000	-13.106	56.190	43.084	-30.916	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2437 MHz)

Horizontal



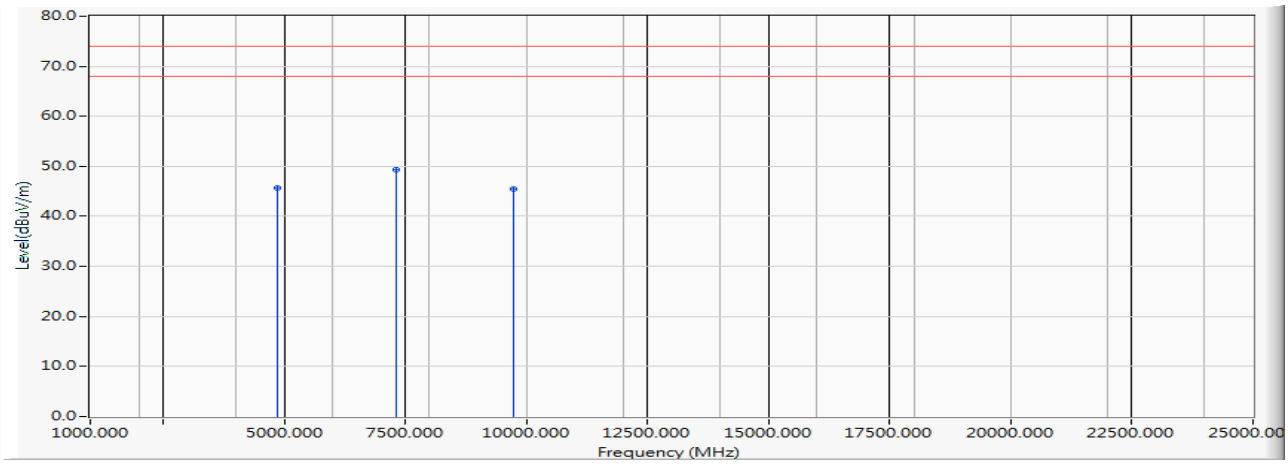
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	58.690	47.053	-26.947	74.000	PEAK
2	*	7311.000	-13.474	61.550	48.076	-25.924	74.000	PEAK
3		9748.000	-12.439	57.470	45.031	-28.969	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2437 MHz)

Vertical



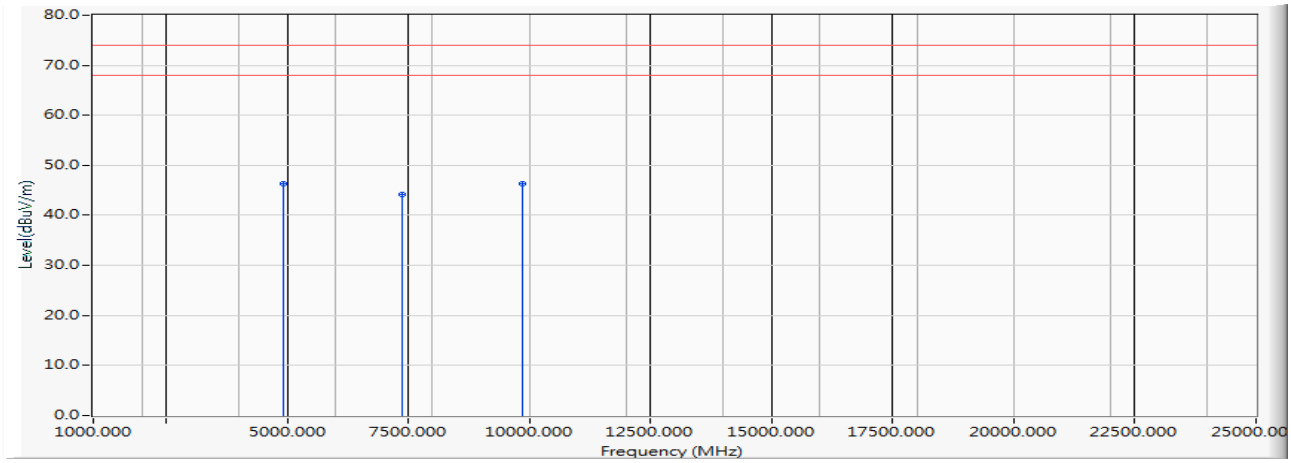
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	57.259	45.622	-28.378	74.000	PEAK
2	*	7311.000	-13.474	62.700	49.226	-24.774	74.000	PEAK
3		9748.000	-12.439	57.870	45.431	-28.569	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 5: Transmit (802.11g 6Mbps)+NFC (2462 MHz)

Horizontal



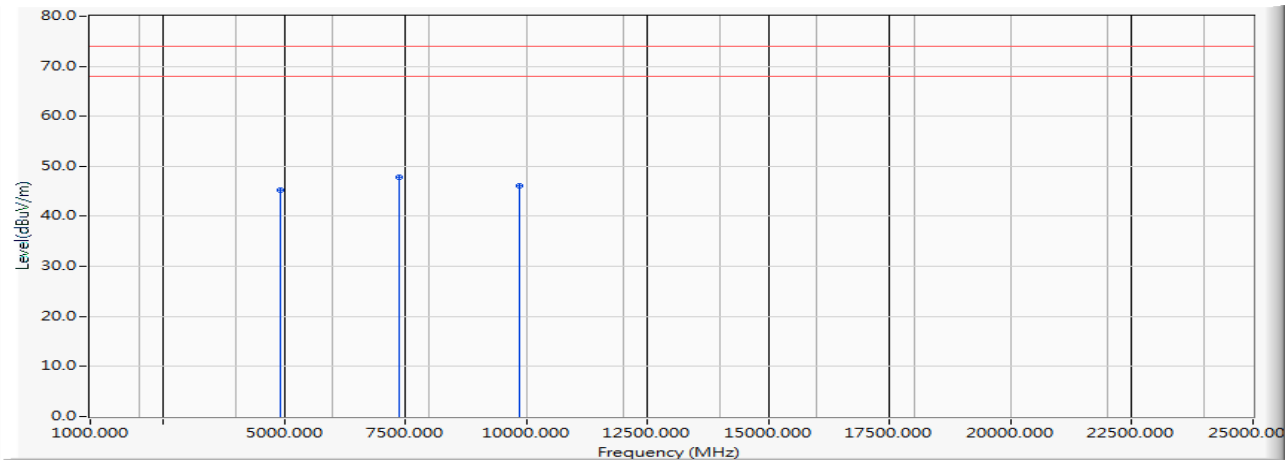
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4924.000	-11.241	57.660	46.419	-27.581	74.000	PEAK
2		7386.000	-14.095	58.220	44.125	-29.875	74.000	PEAK
3		9848.000	-13.445	59.740	46.294	-27.706	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2462 MHz)

Vertical



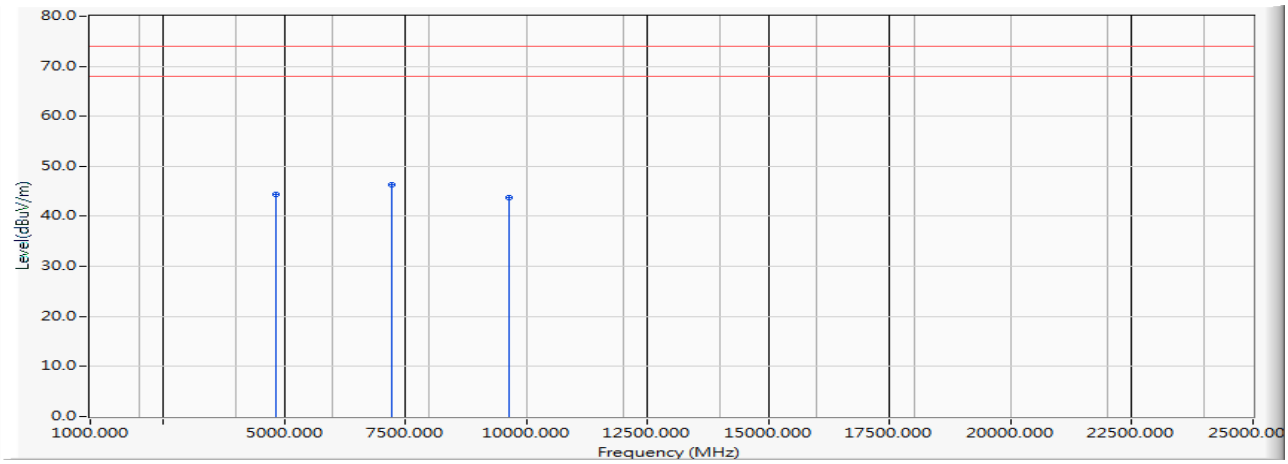
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	56.430	45.189	-28.811	74.000	PEAK
2	*	7386.000	-14.095	61.860	47.765	-26.235	74.000	PEAK
3		9848.000	-13.445	59.510	46.064	-27.936	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2412MHz)

Horizontal



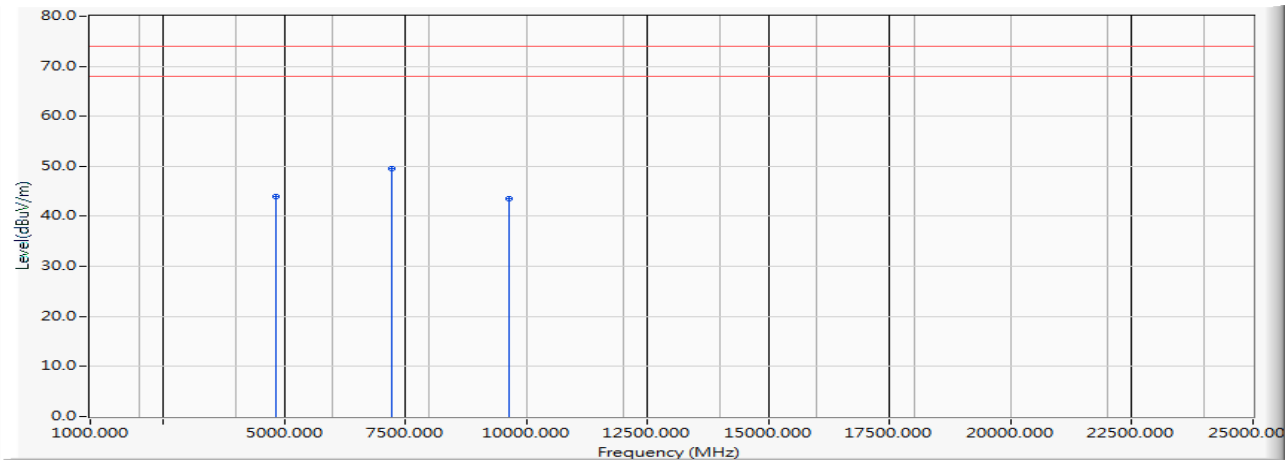
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	56.330	44.341	-29.659	74.000	PEAK
2	*	7236.000	-12.957	59.280	46.323	-27.677	74.000	PEAK
3		9648.000	-13.106	56.880	43.774	-30.226	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2412MHz)

Vertical



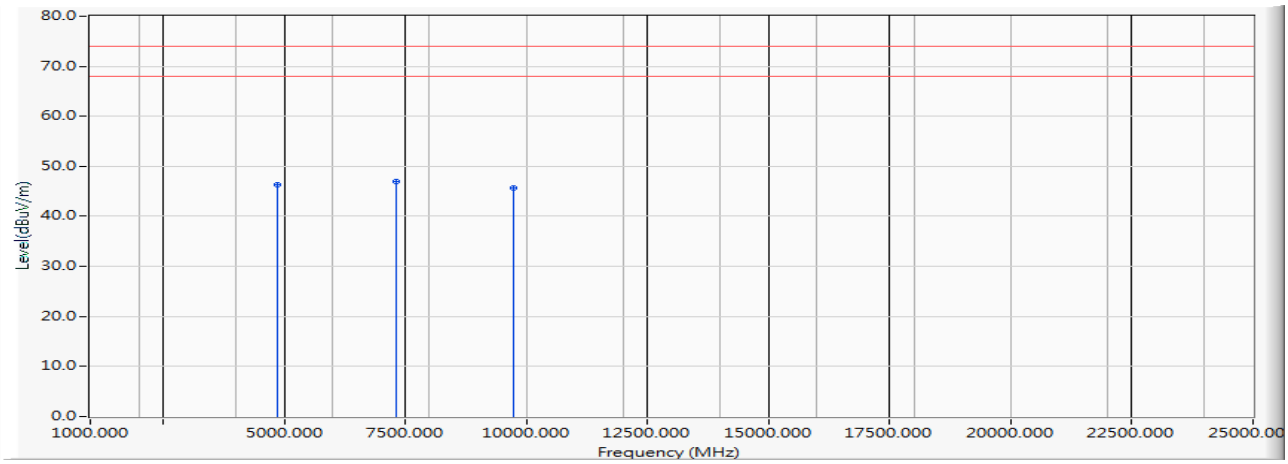
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	55.910	43.921	-30.079	74.000	PEAK
2	*	7236.000	-12.957	62.580	49.623	-24.377	74.000	PEAK
3		9648.000	-13.106	56.740	43.634	-30.366	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2437 MHz)

Horizontal



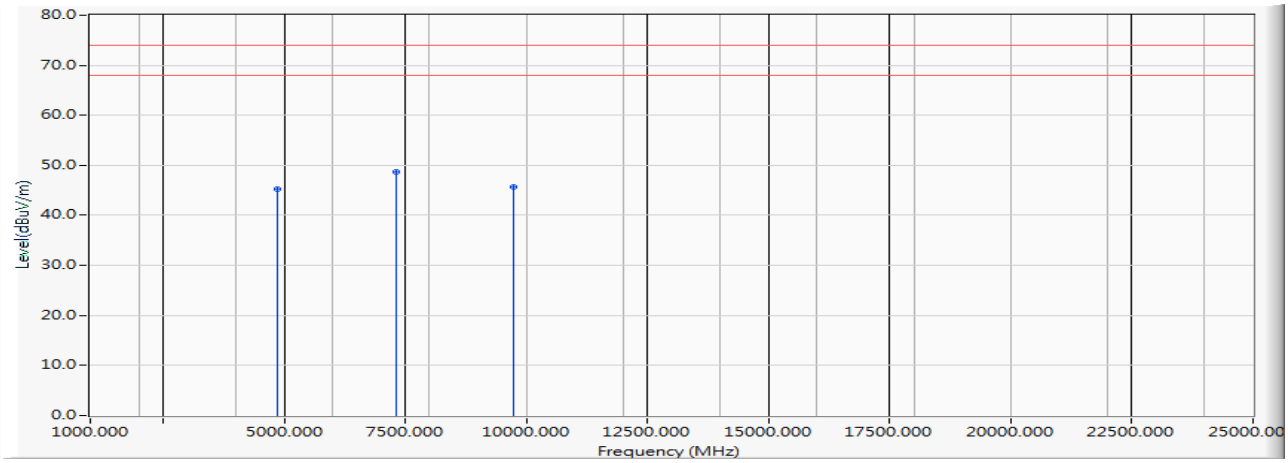
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	57.880	46.243	-27.757	74.000	PEAK
2	*	7311.000	-13.474	60.430	46.956	-27.044	74.000	PEAK
3		9748.000	-12.439	58.140	45.701	-28.299	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2019/11/04
Test Mode	:	Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2437 MHz)

Vertical



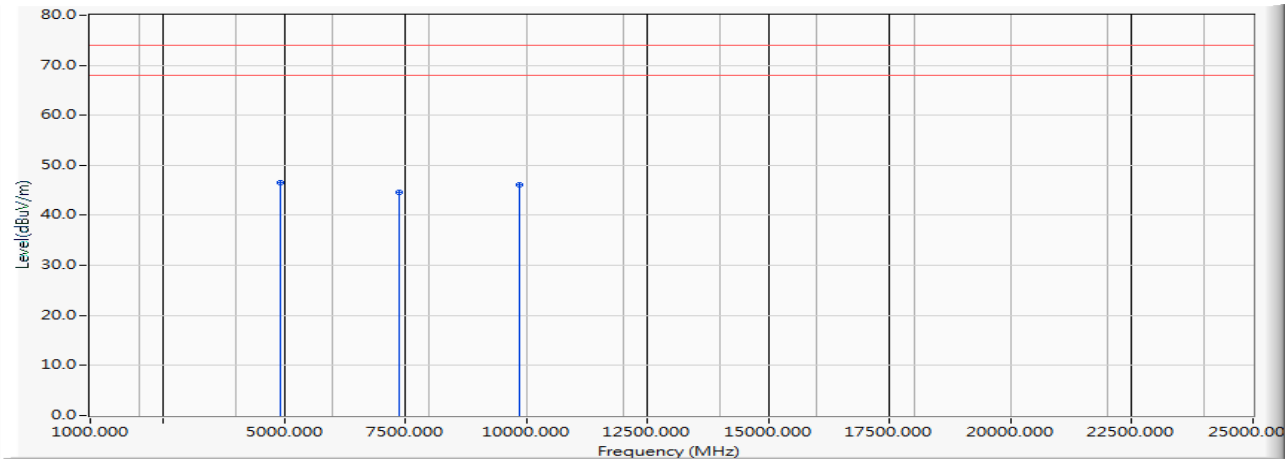
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	56.870	45.233	-28.767	74.000	PEAK
2	*	7311.000	-13.474	62.260	48.786	-25.214	74.000	PEAK
3		9748.000	-12.439	58.140	45.701	-28.299	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2462 MHz)

Horizontal



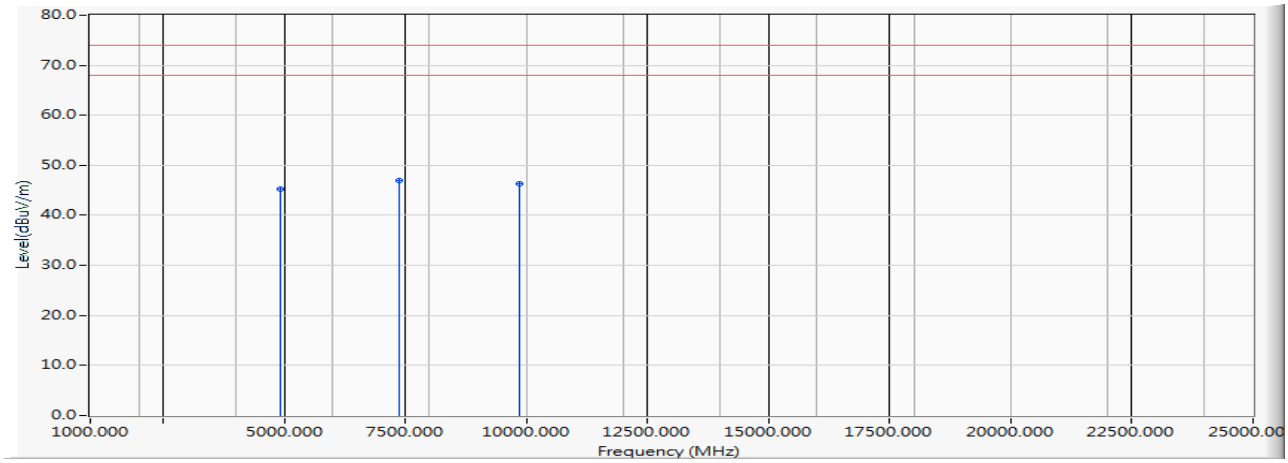
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4924.000	-11.241	57.770	46.529	-27.471	74.000	PEAK
2		7386.000	-14.095	58.610	44.515	-29.485	74.000	PEAK
3		9848.000	-13.445	59.610	46.164	-27.836	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Harmonic Radiated Emission Data
Test Date : 2019/11/04
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2462 MHz)

Vertical



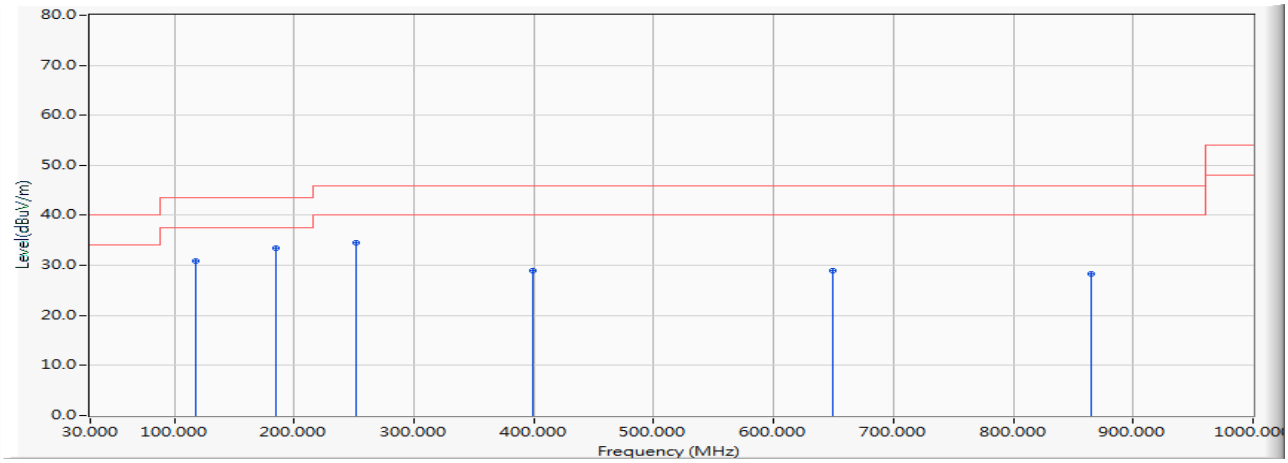
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	56.560	45.319	-28.681	74.000	PEAK
2	*	7386.000	-14.095	60.990	46.895	-27.105	74.000	PEAK
3		9848.000	-13.445	59.800	46.354	-27.646	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : General Radiated Emission Data
Test Date : 2019/11/01
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2437 MHz)

Horizontal



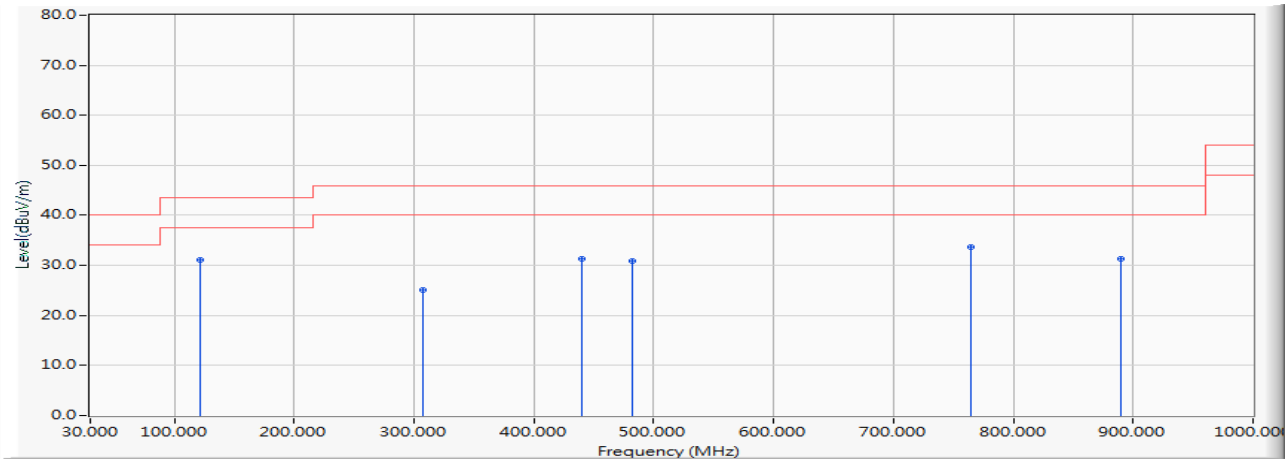
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		118.565	-16.901	47.862	30.960	-12.540	43.500	QUASIPEAK
2	*	184.638	-19.055	52.415	33.361	-10.139	43.500	QUASIPEAK
3		252.116	-17.982	52.485	34.503	-11.497	46.000	QUASIPEAK
4		399.725	-13.656	42.625	28.969	-17.031	46.000	QUASIPEAK
5		649.957	-9.372	38.253	28.882	-17.118	46.000	QUASIPEAK
6		865.043	-8.419	36.803	28.384	-17.616	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : General Radiated Emission Data
Test Date : 2019/11/01
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2437 MHz)

Vertical



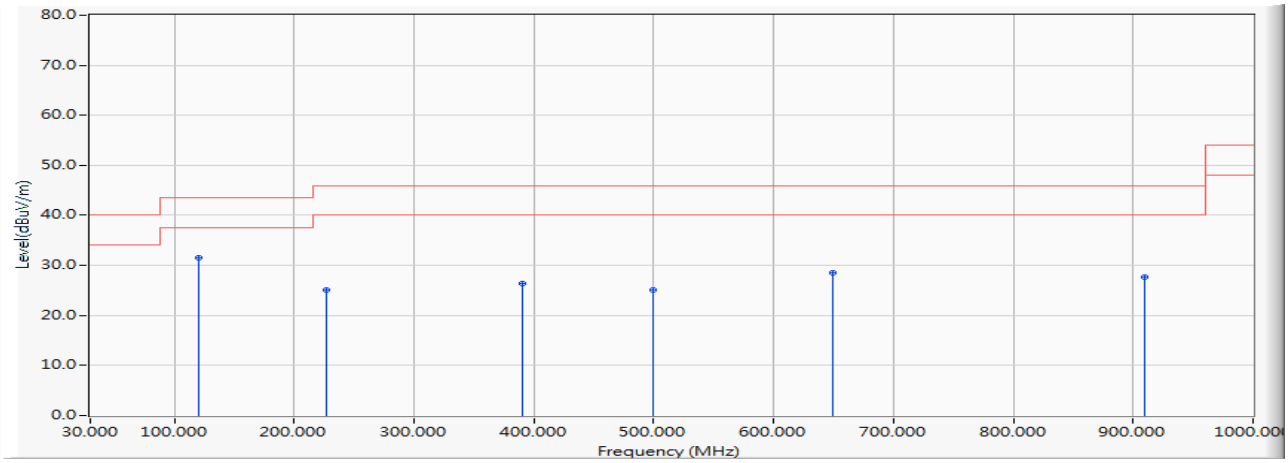
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		121.377	-16.799	47.814	31.014	-12.486	43.500	QUASIPEAK
2		306.942	-14.476	39.662	25.187	-20.813	46.000	QUASIPEAK
3		440.493	-9.775	41.133	31.359	-14.641	46.000	QUASIPEAK
4		482.667	-11.985	42.778	30.793	-15.207	46.000	QUASIPEAK
5	*	765.232	-7.956	41.707	33.751	-12.249	46.000	QUASIPEAK
6		890.348	-9.126	40.421	31.295	-14.705	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : General Radiated Emission Data
Test Date : 2019/11/01
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2437 MHz)

Horizontal



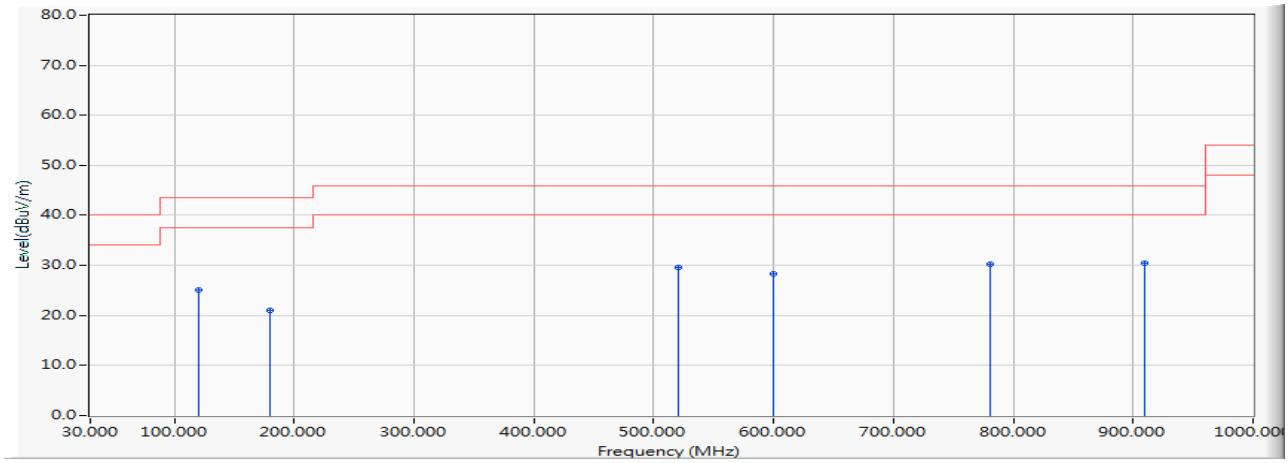
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	119.971	-16.904	48.505	31.602	-11.898	43.500	QUASIPEAK
2		226.812	-17.741	42.885	25.143	-20.857	46.000	QUASIPEAK
3		389.884	-12.845	39.217	26.372	-19.628	46.000	QUASIPEAK
4		499.536	-10.867	36.049	25.183	-20.817	46.000	QUASIPEAK
5		649.957	-9.372	37.979	28.608	-17.392	46.000	QUASIPEAK
6		910.029	-10.072	37.682	27.610	-18.390	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	General Radiated Emission Data
Test Date	:	2019/11/01
Test Mode	:	Mode 5: Transmit (802.11g 6Mbps)+NFC (2437 MHz)

Vertical



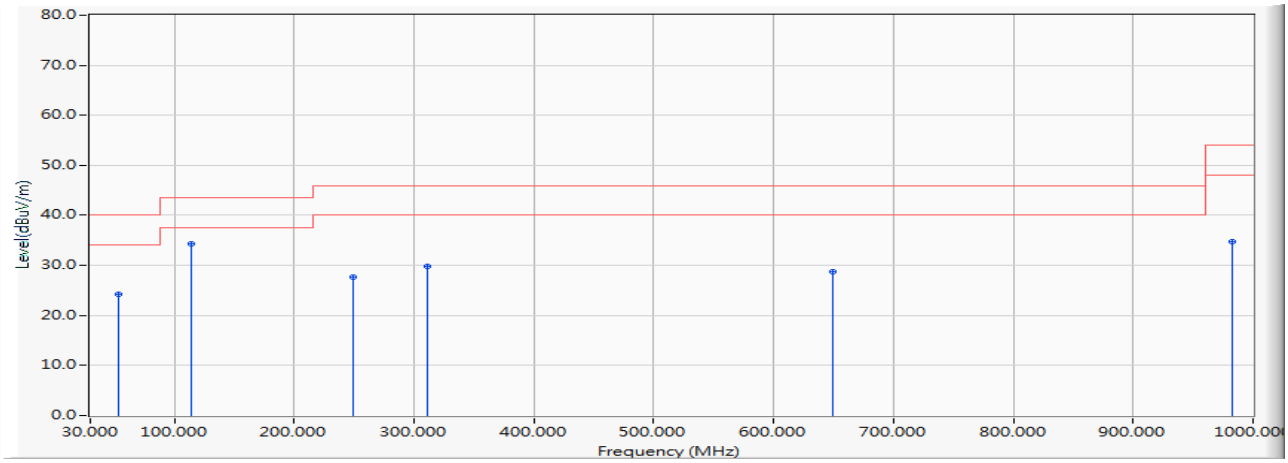
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		119.971	-16.904	42.098	25.195	-18.305	43.500	QUASIPEAK
2		180.420	-19.273	40.243	20.971	-22.529	43.500	QUASIPEAK
3		520.623	-11.251	40.794	29.543	-16.457	46.000	QUASIPEAK
4		599.348	-6.631	34.835	28.204	-17.796	46.000	QUASIPEAK
5		780.696	-8.577	38.741	30.164	-15.836	46.000	QUASIPEAK
6	*	910.029	-10.072	40.573	30.501	-15.499	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : General Radiated Emission Data
Test Date : 2019/11/01
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2437 MHz)

Horizontal



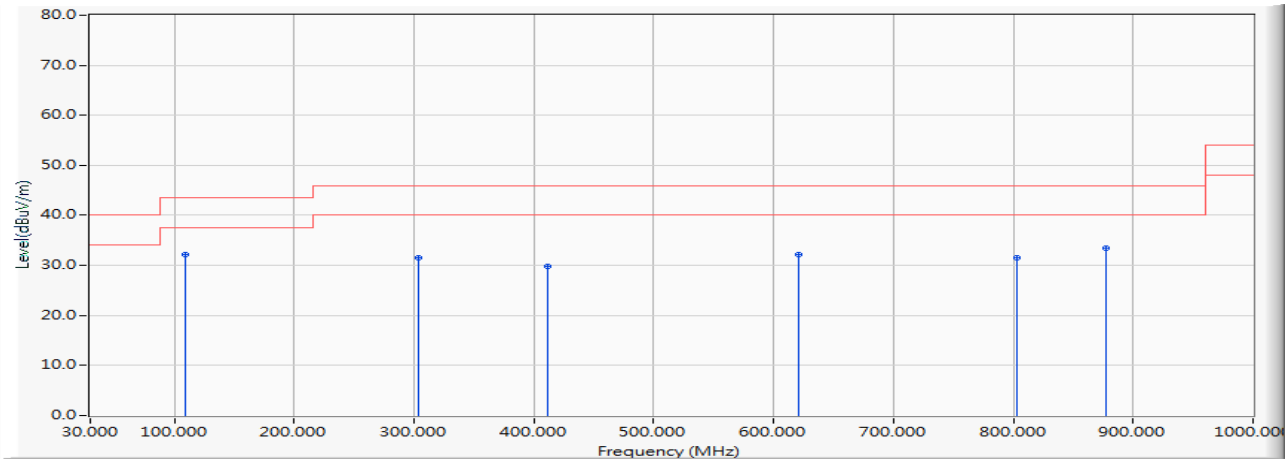
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		53.899	-17.676	41.830	24.153	-15.847	40.000	QUASIPEAK
2	*	114.348	-16.854	51.146	34.292	-9.208	43.500	QUASIPEAK
3		249.304	-17.969	45.638	27.669	-18.331	46.000	QUASIPEAK
4		311.159	-14.328	44.127	29.799	-16.201	46.000	QUASIPEAK
5		649.957	-9.372	38.079	28.708	-17.292	46.000	QUASIPEAK
6		983.130	-7.930	42.668	34.737	-19.263	54.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Humly Room Display One
Test Item	:	General Radiated Emission Data
Test Date	:	2019/11/01
Test Mode	:	Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2437 MHz)

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	108.725	-16.705	48.892	32.188	-11.312	43.500	QUASIPEAK
2		304.130	-14.569	46.114	31.546	-14.454	46.000	QUASIPEAK
3		410.971	-12.944	42.806	29.862	-16.138	46.000	QUASIPEAK
4		620.435	-8.099	40.302	32.203	-13.797	46.000	QUASIPEAK
5		803.188	-8.945	40.490	31.546	-14.454	46.000	QUASIPEAK
6		877.696	-8.401	41.934	33.533	-12.467	46.000	QUASIPEAK

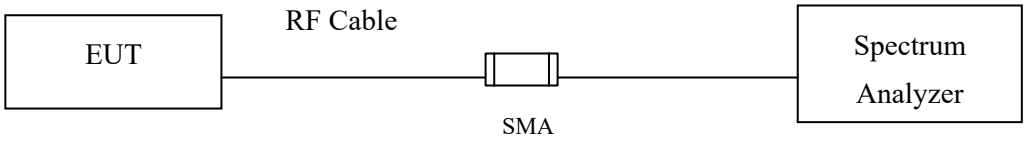
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

5. RF antenna conducted test

5.1. Test Setup

RF antenna Conducted Measurement:



5.2. Limits

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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.3. Test Procedure

Tested according to C63.10:2013 Section 11.11 section 8.5 DTS emissions in non-restricted frequency bands for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

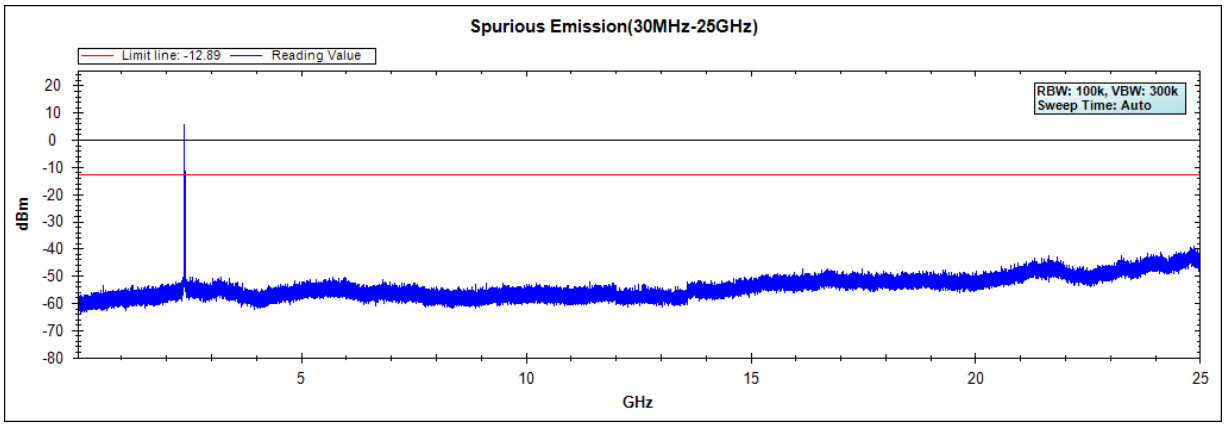
5.4. Uncertainty

The measurement uncertainty
Conducted is defined as ± 1.20dB

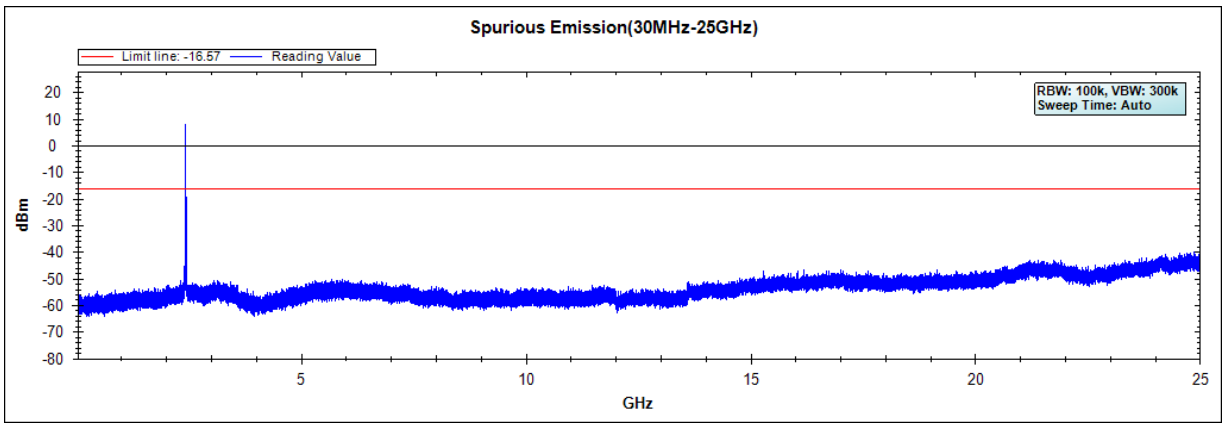
5.5. Test Result of RF antenna conducted test

Product : Humly Room Display One
Test Item : RF antenna conducted test
Test Date : 2019/11/01
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

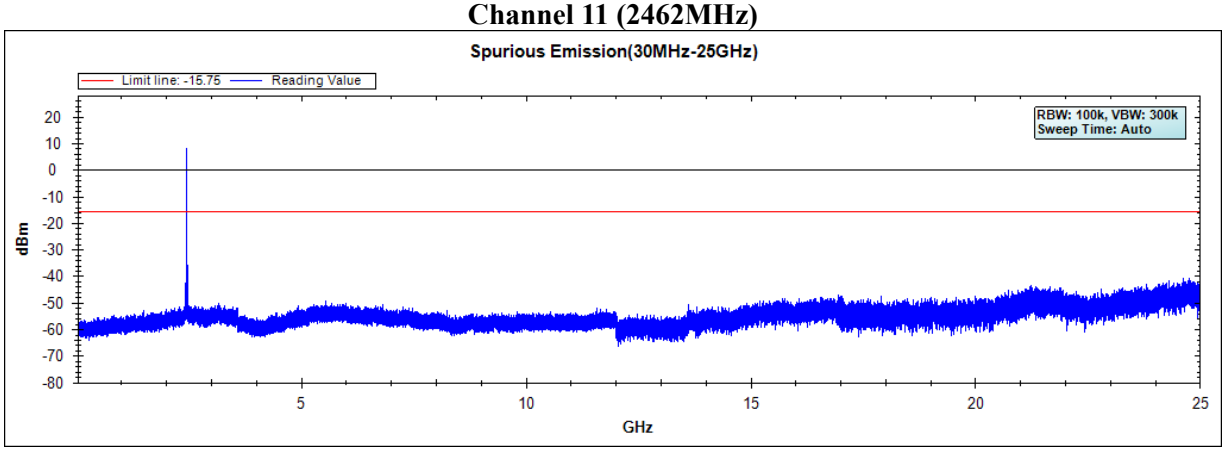
Channel 01 (2412MHz)



Channel 06 (2437MHz)



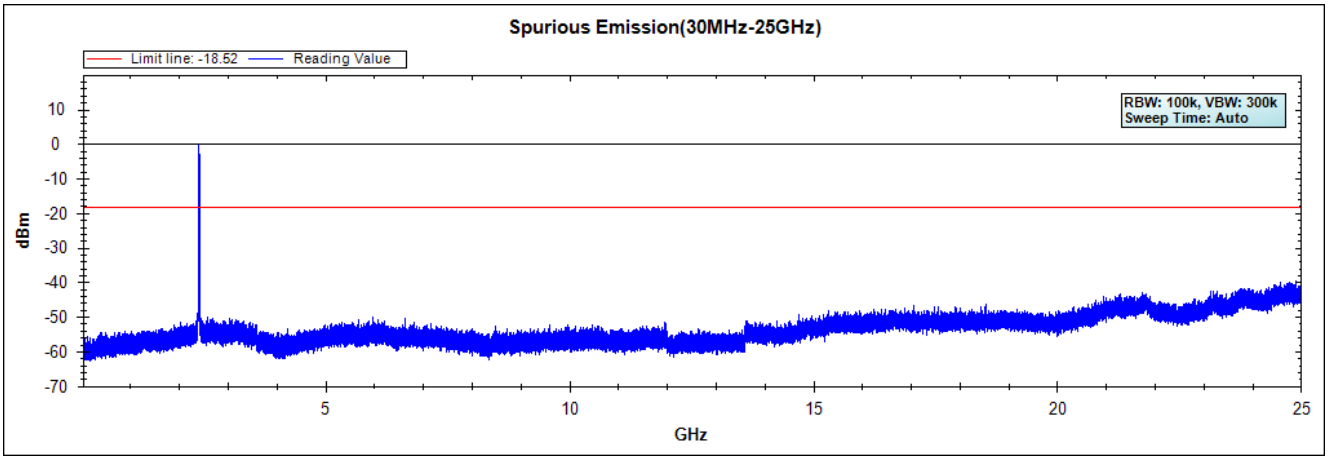
Channel 11 (2462MHz)



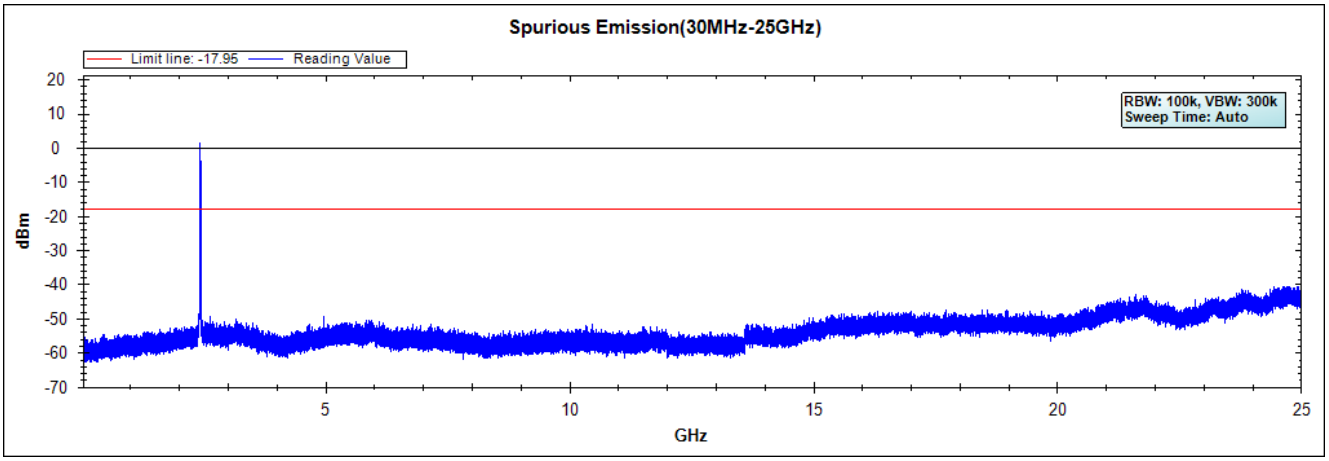
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Humly Room Display One
Test Item	:	RF Antenna Conducted Spurious
Test Date	:	2019/11/01
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

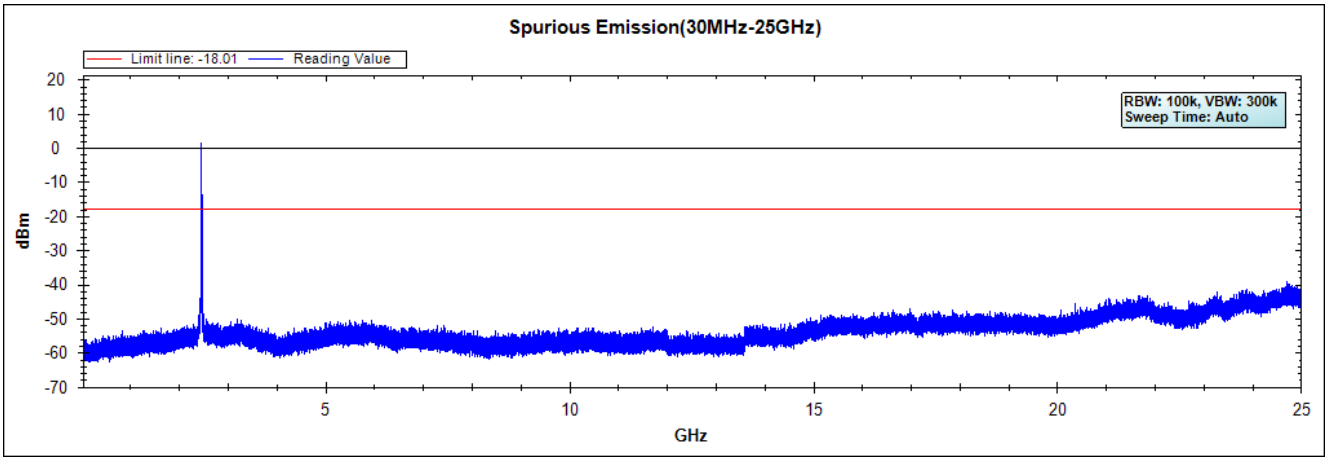
Channel 01 (2412MHz)-Chain A



Channel 06 (2437MHz)-Chain A

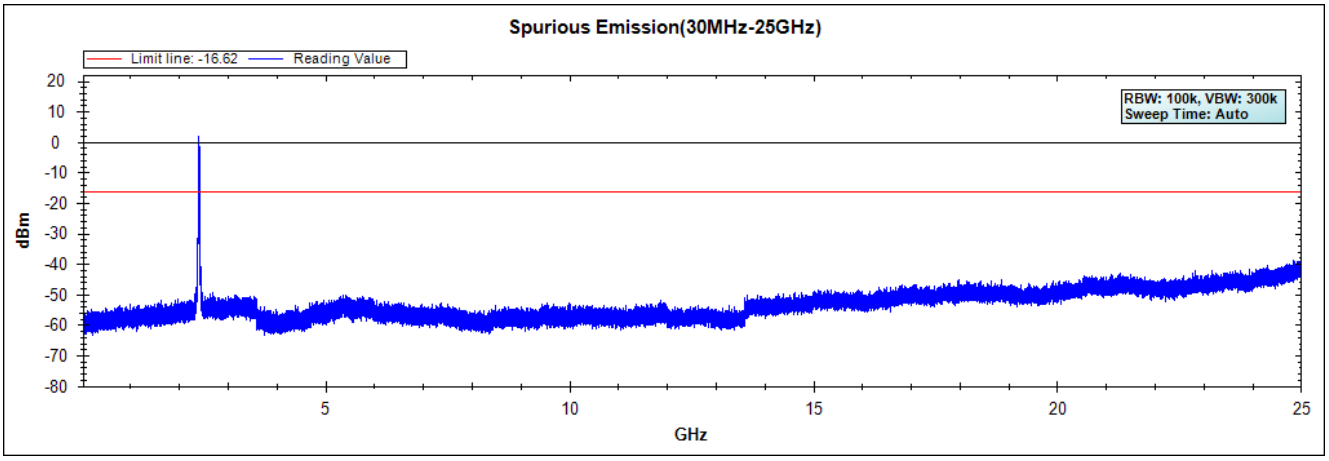


Channel 11 (2462MHz)-Chain A

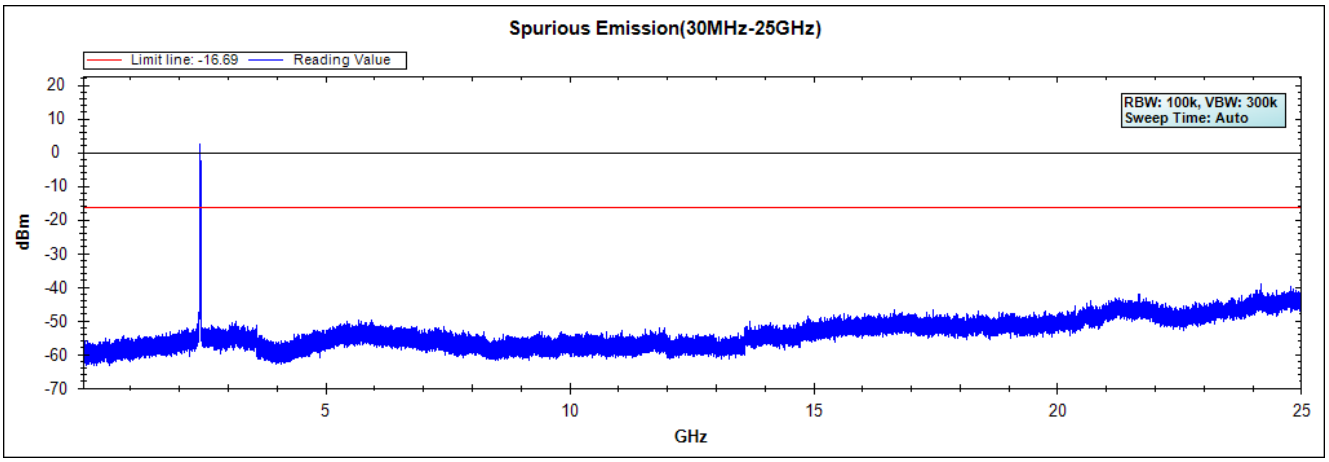


Note: The above test pattern is synthesized by multiple of the frequency range.

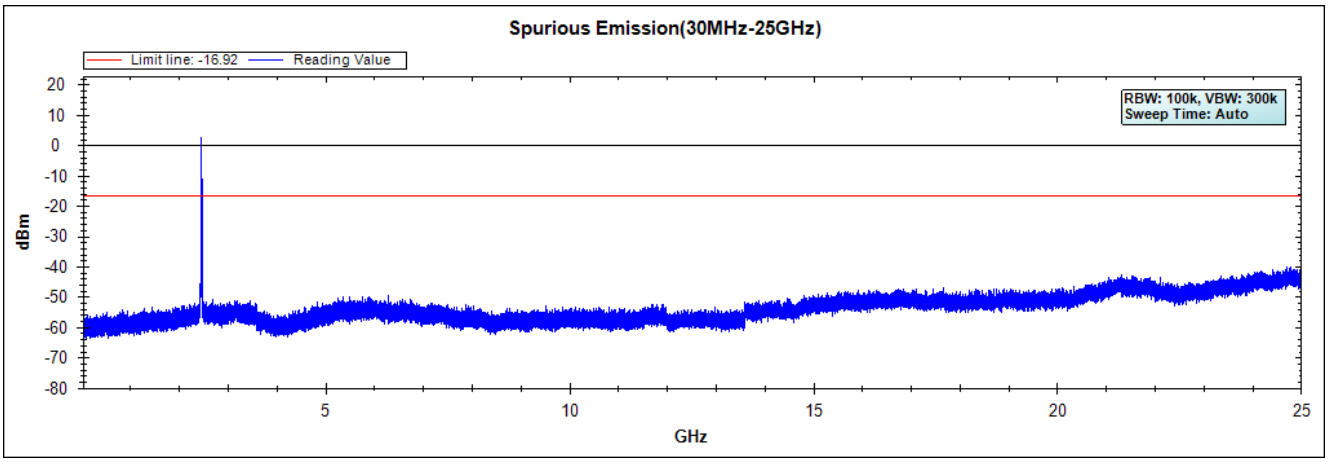
Channel 01 (2412MHz)-Chain B



Channel 06 (2437MHz)-Chain B



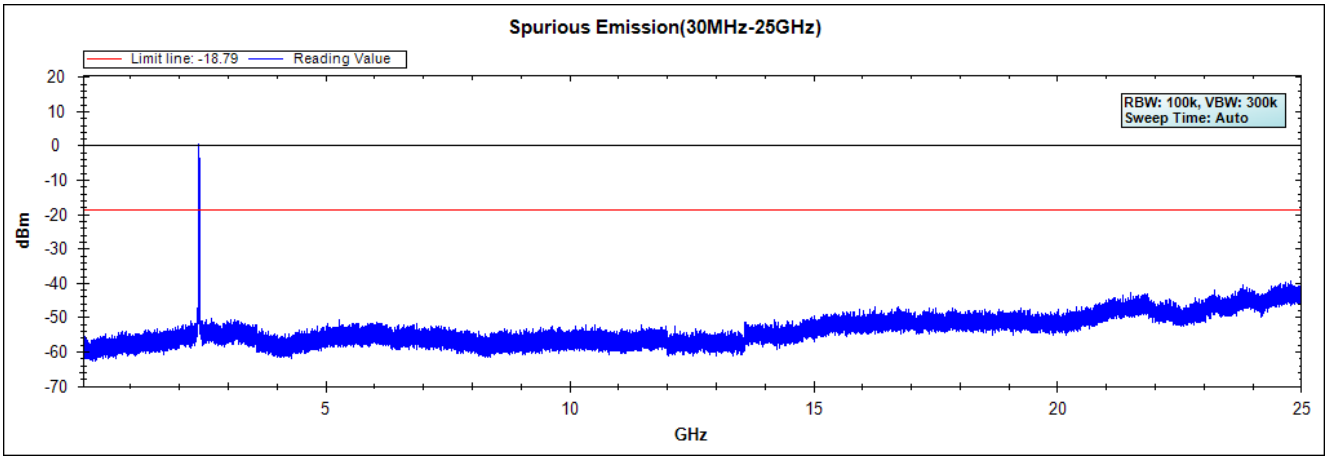
Channel 11 (2462MHz)-Chain B



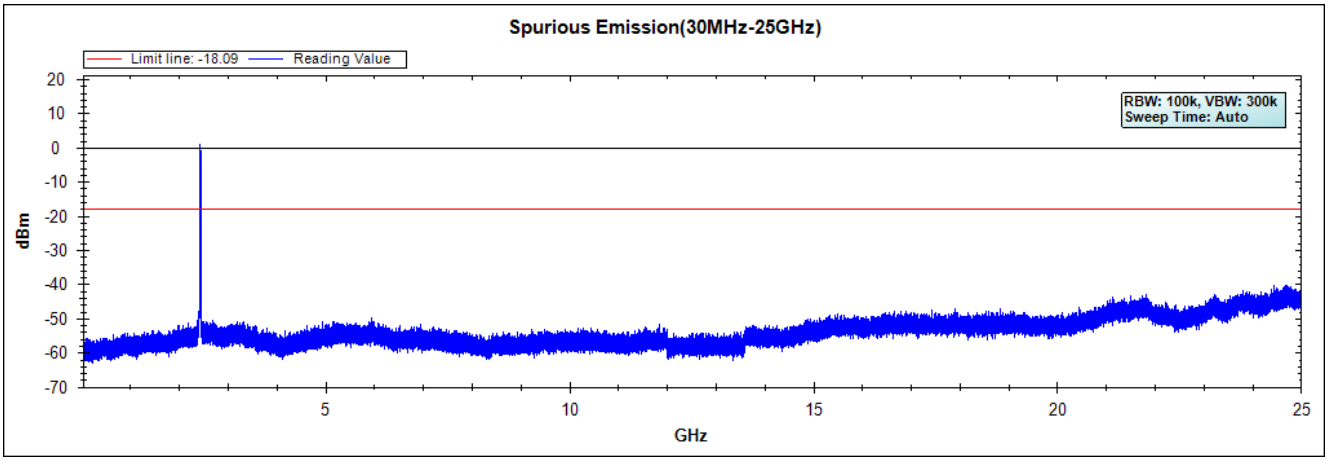
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Humly Room Display One
Test Item	:	RF Antenna Conducted Spurious
Test Date	:	2019/11/01
Test Mode	:	Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW)

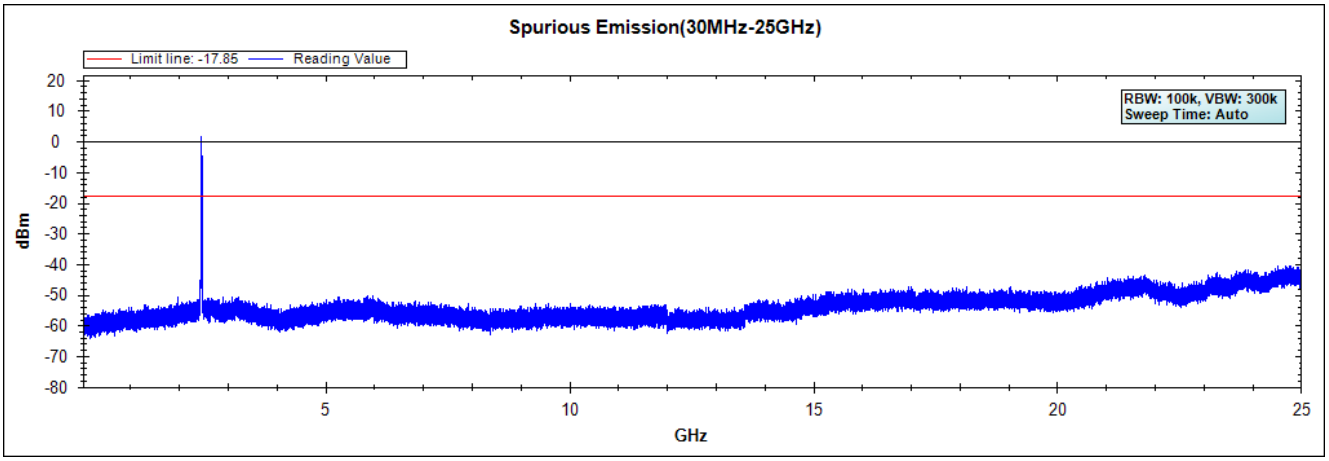
Channel 01 (2412MHz)-Chain A



Channel 06 (2437MHz)-Chain A

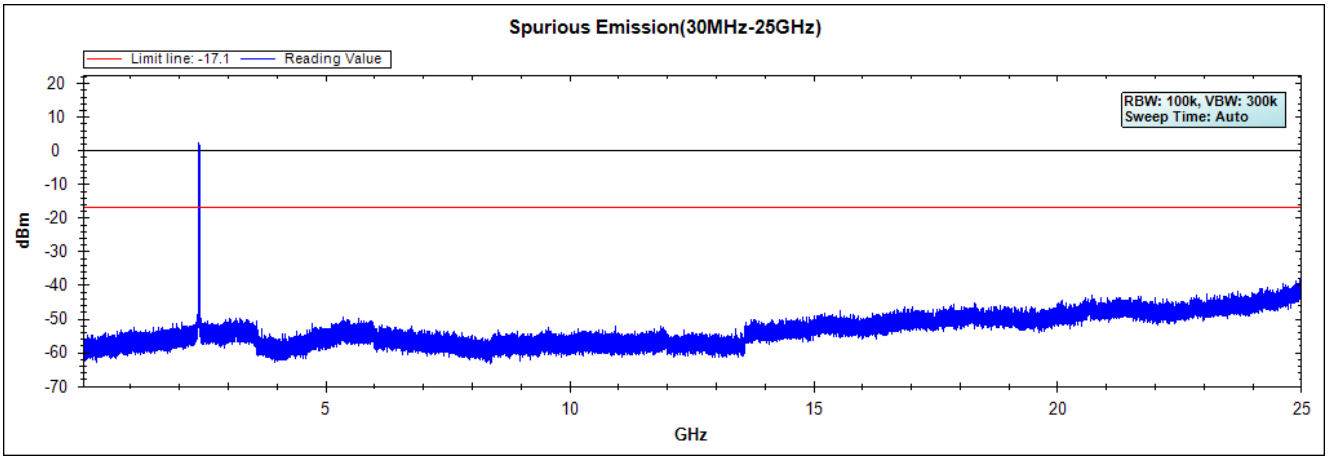


Channel 11 (2462MHz)-Chain A

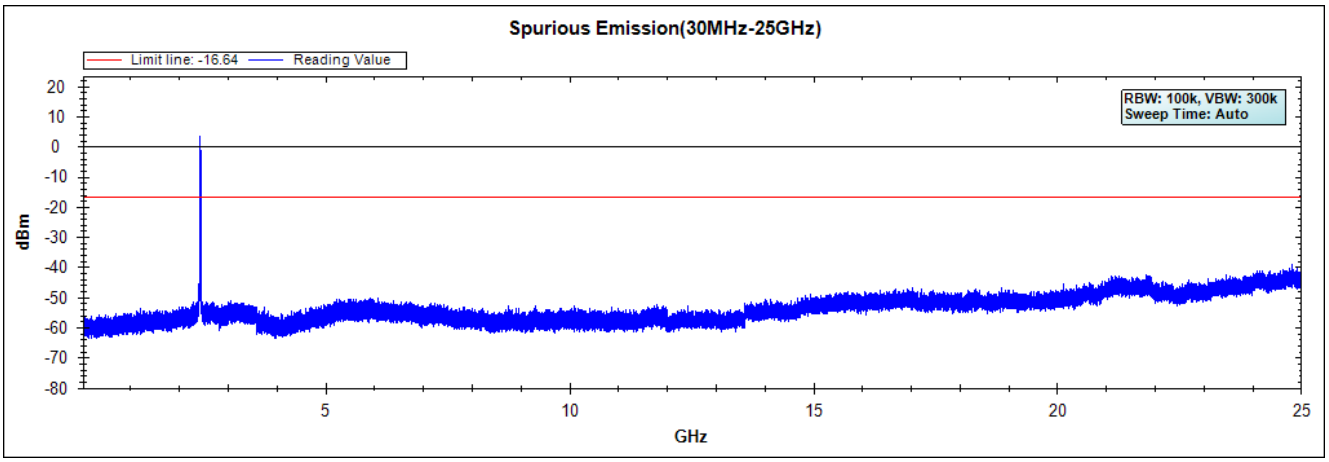


Note: The above test pattern is synthesized by multiple of the frequency range.

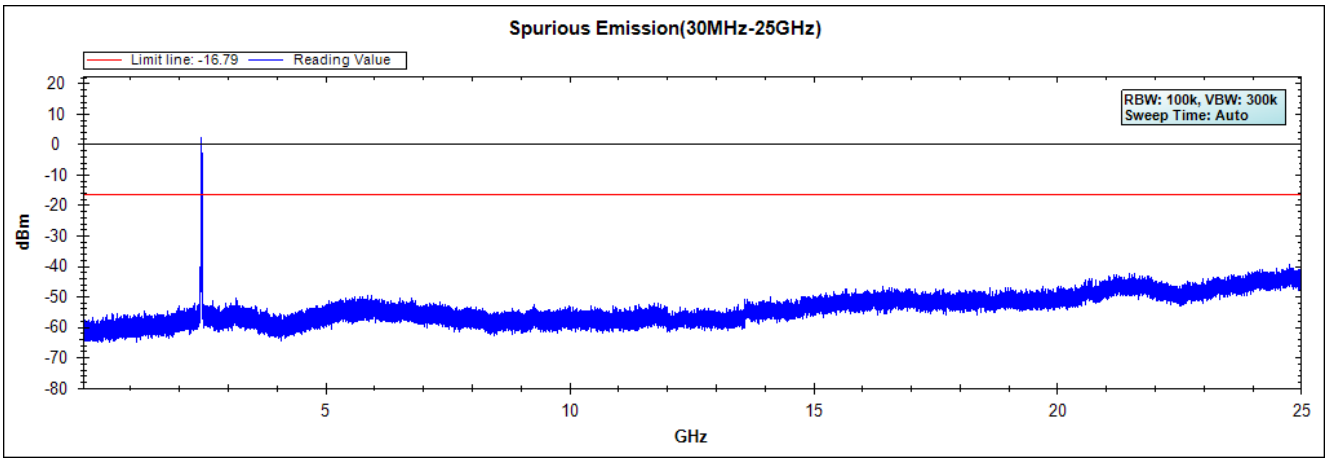
Channel 01 (2412MHz)-Chain B



Channel 06 (2437MHz)-Chain B



Channel 11 (2462MHz)-Chain B

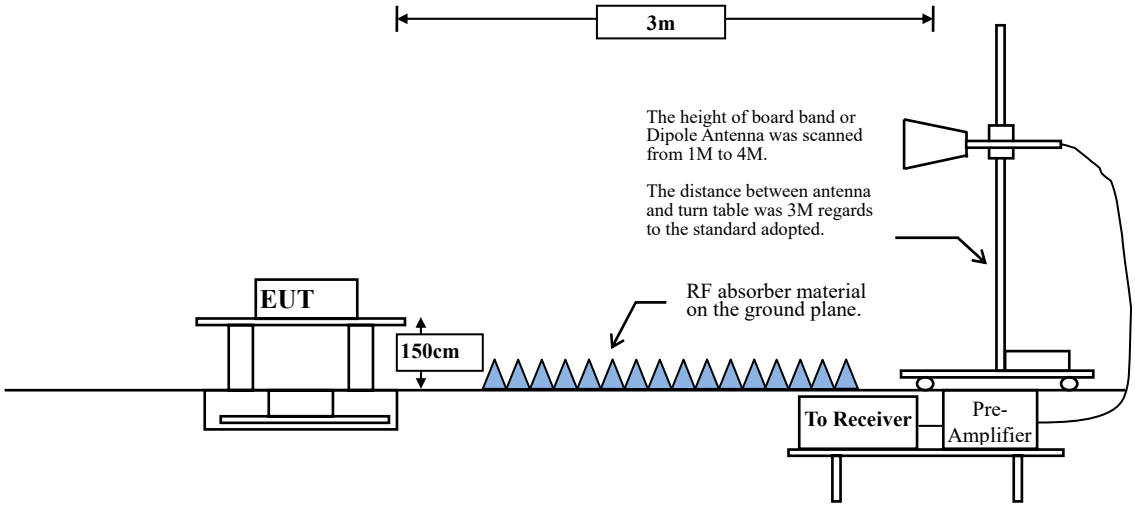


Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

6.1. Test Setup

RF Radiated Measurement:



6.2. Limits

According to FCC Section 15.247(d). 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to ANSI C63.10, 2013 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	98.64	8.4041	119	10
802.11g	92.57	1.3899	719	1000
802.11n20	85.58	0.6667	1500	2000

Note: Duty Cycle Refer to Section 9.

6.4. Uncertainty

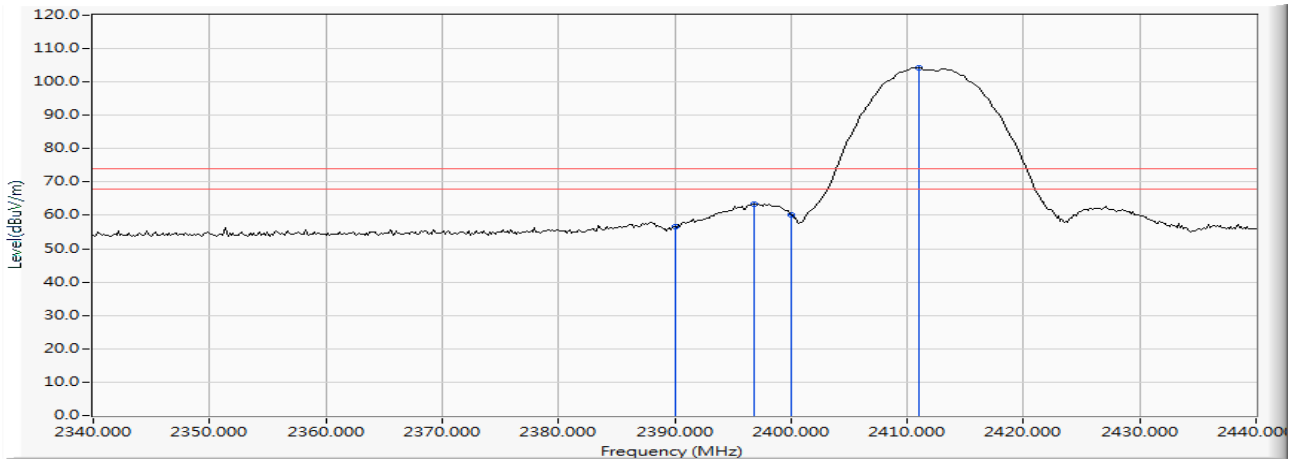
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2412MHz)

Horizontal



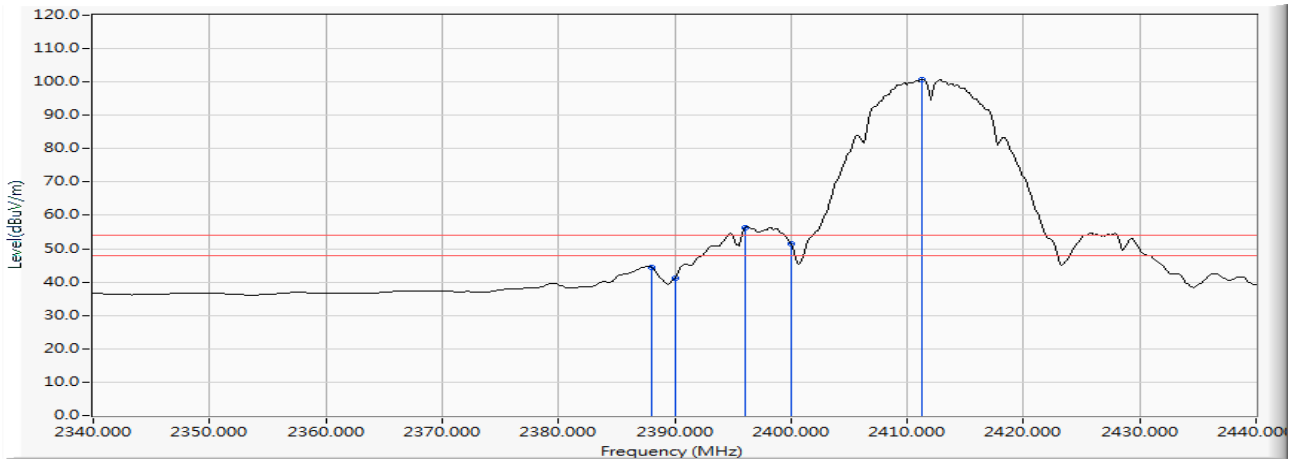
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	43.748	56.647	-17.353	74.000	PEAK
2		2396.812	12.940	50.406	63.345	--	--	PEAK
3		2400.000	12.961	47.162	60.123	--	--	PEAK
4	*	2411.014	13.035	91.336	104.371	--	--	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2412MHz)

Horizontal



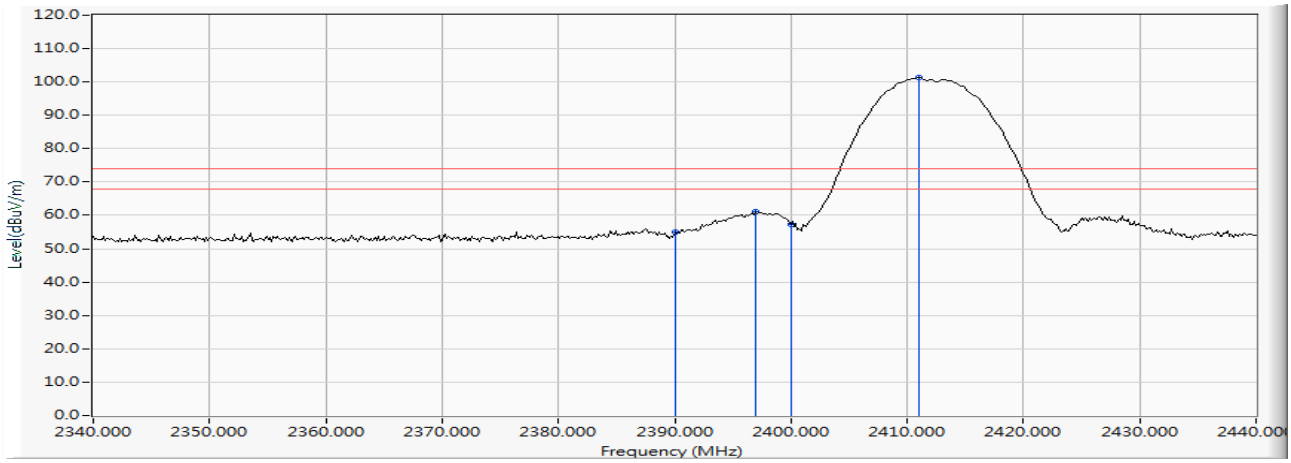
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2387.971	12.887	31.535	44.423	-9.577	54.000	AVERAGE
2		2390.000	12.899	28.340	41.239	-12.761	54.000	AVERAGE
3		2396.087	12.935	43.448	56.382	--	--	AVERAGE
4		2400.000	12.961	38.485	51.446	--	--	AVERAGE
5	*	2411.304	13.038	87.778	100.815	--	--	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2412MHz)

Vertical



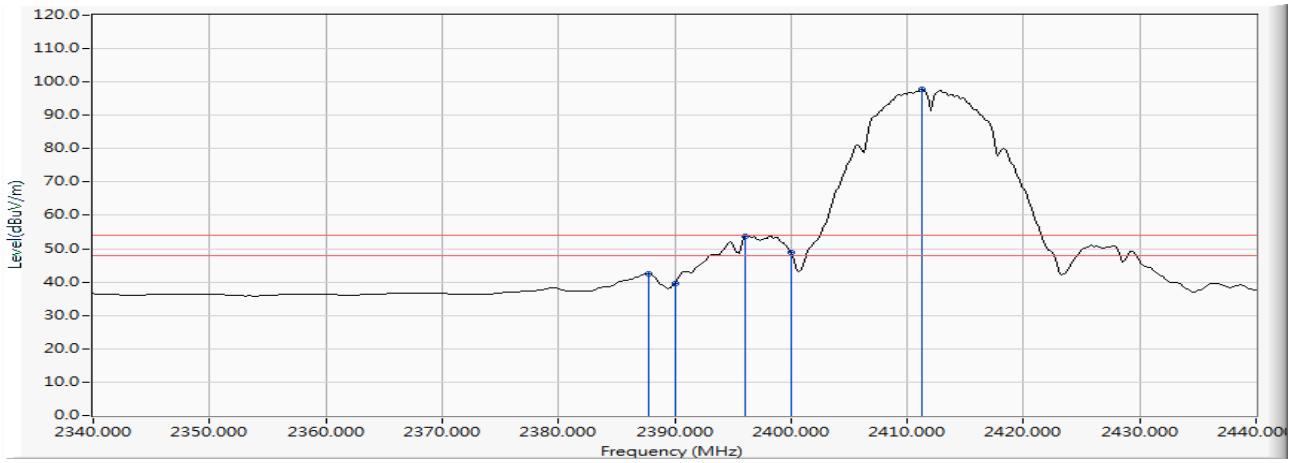
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	42.030	54.929	-19.071	74.000	PEAK
2		2396.957	12.940	48.197	61.137	--	--	PEAK
3		2400.000	12.961	44.246	57.207	--	--	PEAK
4	*	2411.014	13.035	88.228	101.263	--	--	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2412MHz)

Vertical



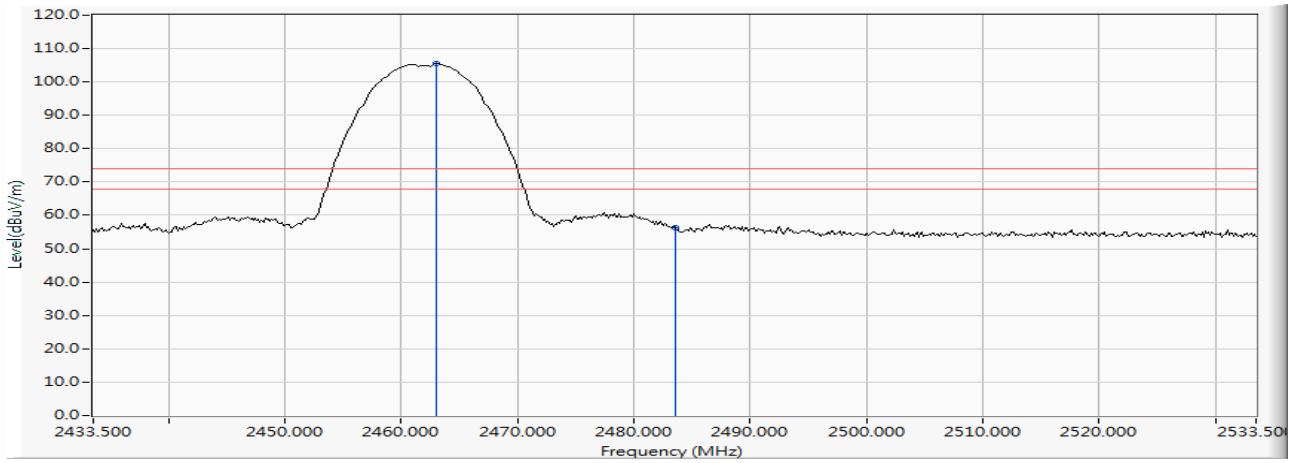
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2387.826	12.887	29.513	42.400	-11.600	54.000	AVERAGE
2		2390.000	12.899	26.686	39.585	-14.415	54.000	AVERAGE
3		2396.087	12.935	40.870	53.804	--	--	AVERAGE
4		2400.000	12.961	35.824	48.785	--	--	AVERAGE
5	*	2411.304	13.038	84.701	97.738	--	--	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2462MHz)

Horizontal



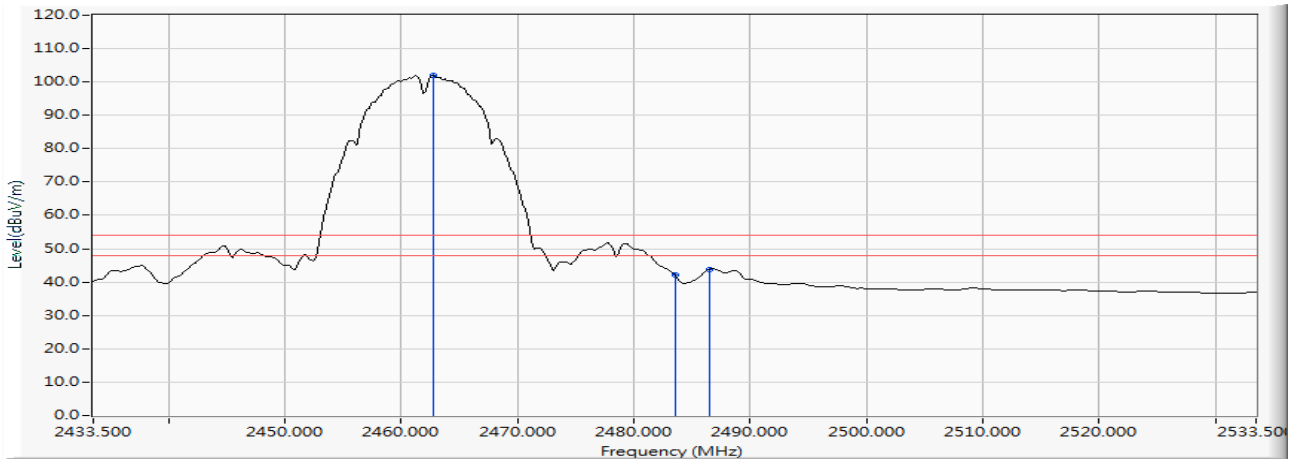
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2463.065	13.345	92.103	105.447	--	--	PEAK
2		2483.500	13.375	42.984	56.358	-17.642	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2462MHz)

Horizontal



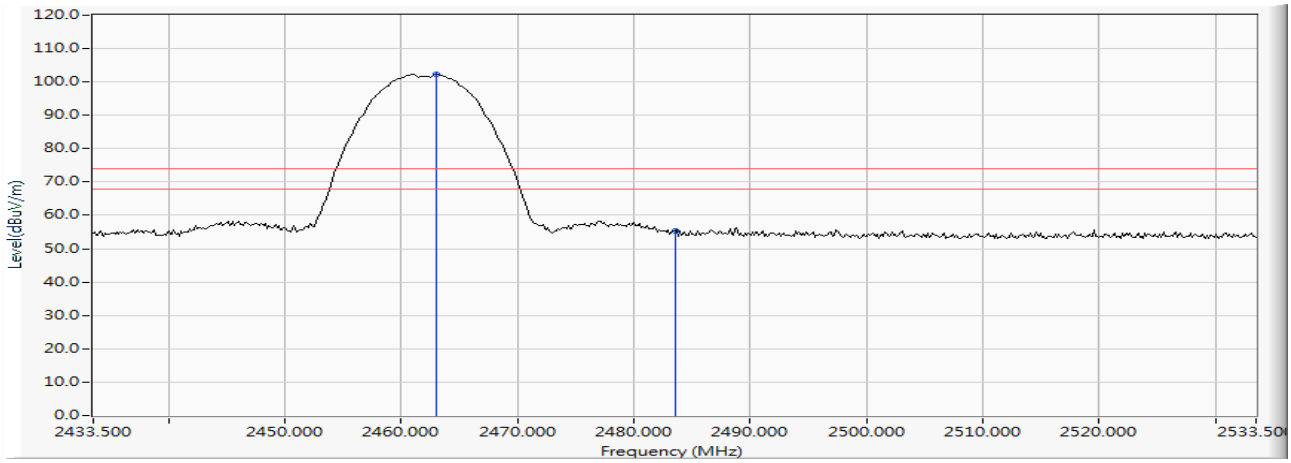
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.775	13.344	88.622	101.966	--	--	AVERAGE
2		2483.500	13.375	28.828	42.202	-11.798	54.000	AVERAGE
3		2486.543	13.379	30.469	43.848	-10.152	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2462MHz)

Vertical



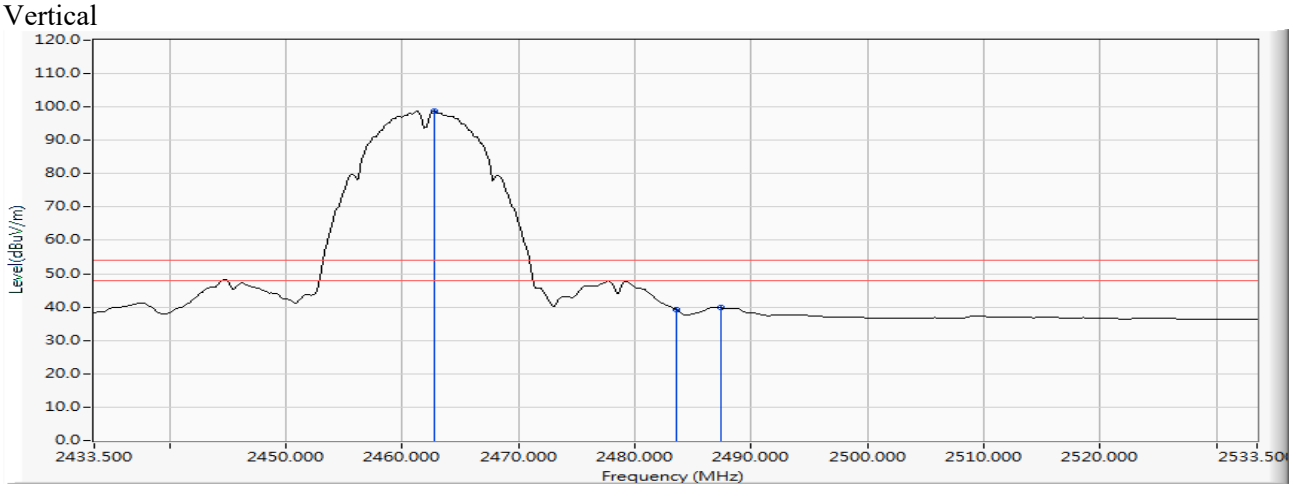
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2463.065	13.345	88.871	102.215	--	--	PEAK
2		2483.500	13.375	41.858	55.232	-18.768	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 4: Transmit (802.11b 1Mbps)+NFC (2462MHz)

Vertical



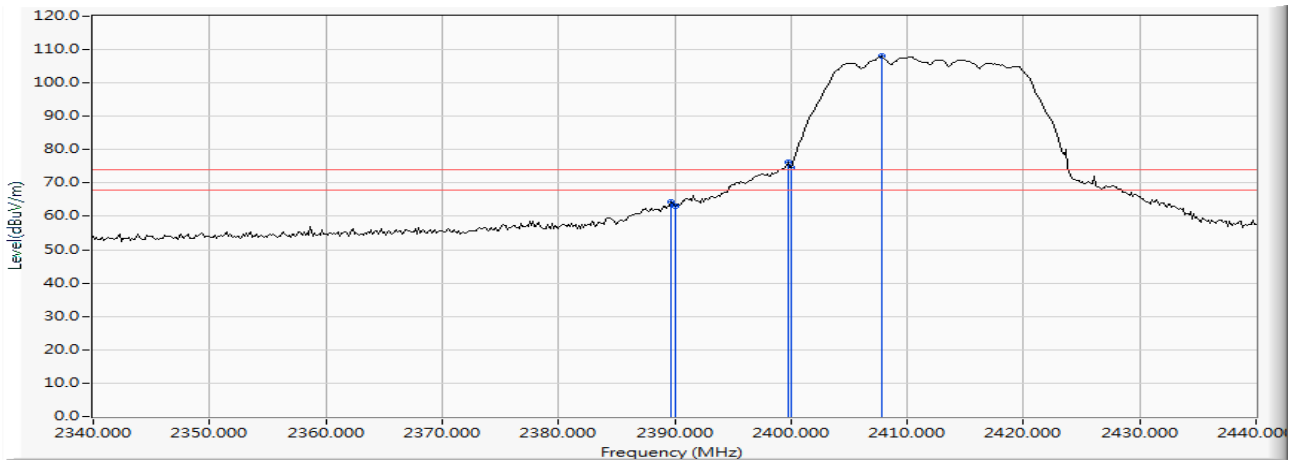
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.775	13.344	85.405	98.749	--	--	AVERAGE
2		2483.500	13.375	25.853	39.227	-14.773	54.000	AVERAGE
3		2487.413	13.380	26.391	39.771	-14.229	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2412MHz)

Horizontal



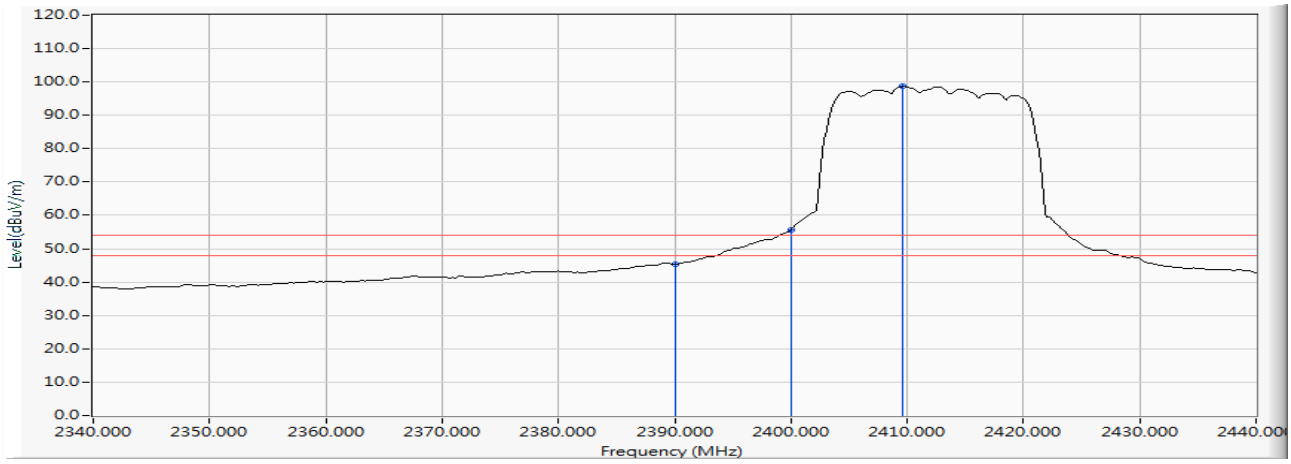
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2389.710	12.898	51.559	64.456	-9.544	74.000	PEAK
2		2390.000	12.899	50.302	63.201	-10.799	74.000	PEAK
3		2399.710	12.959	63.413	76.372	--	--	PEAK
4		2400.000	12.961	61.548	74.509	--	--	PEAK
5	*	2407.826	13.014	94.993	108.007	--	--	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2412MHz)

Horizontal



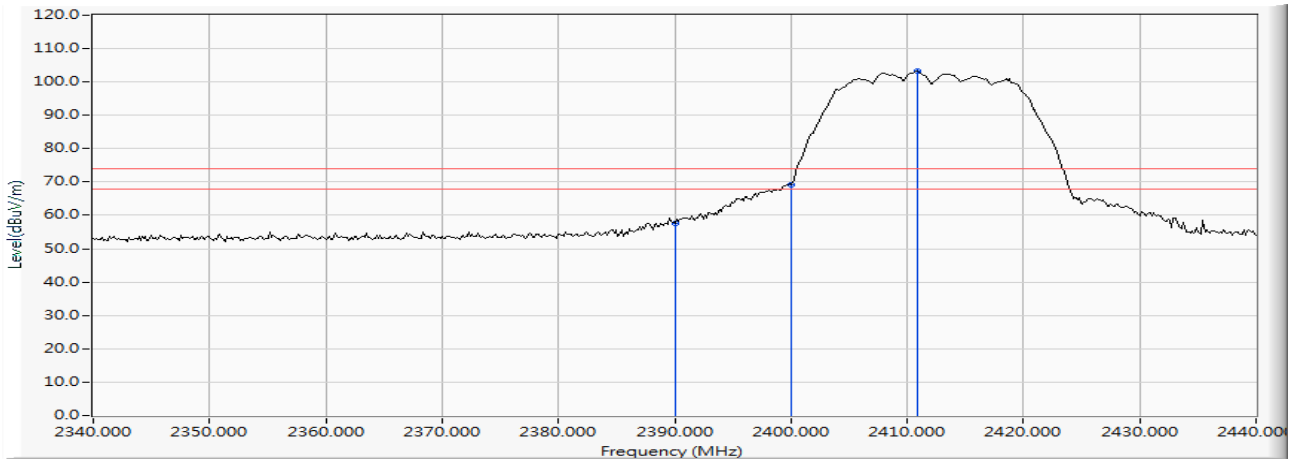
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	32.533	45.432	-8.568	54.000	AVERAGE
2		2400.000	12.961	42.788	55.749	--	--	AVERAGE
3	*	2409.565	13.025	85.689	98.714	--	--	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2412MHz)

Vertical



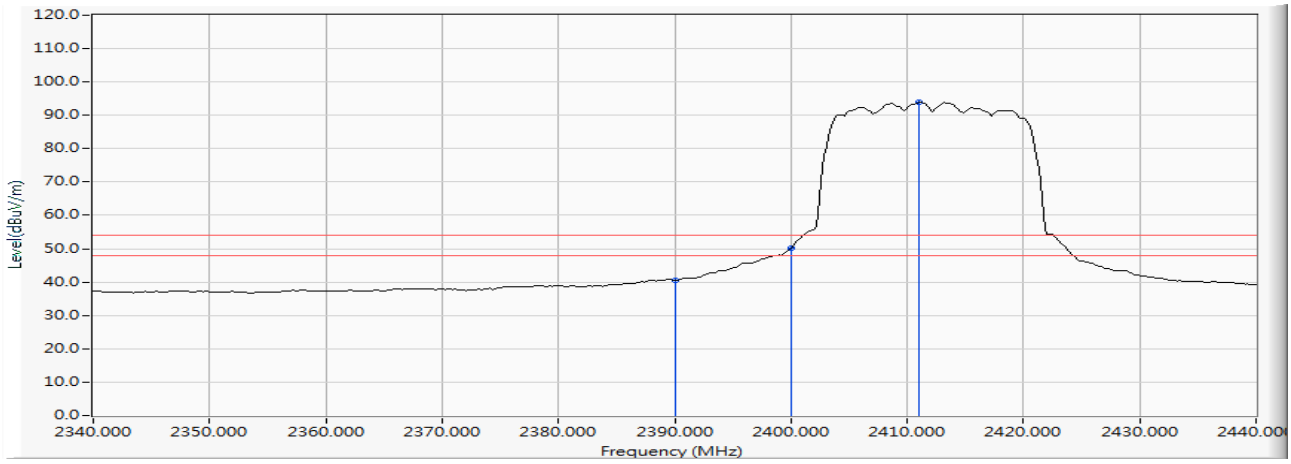
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	44.666	57.565	-16.435	74.000	PEAK
2		2400.000	12.961	56.252	69.213	--	--	PEAK
3	*	2410.870	13.034	90.186	103.220	--	--	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2412MHz)

Vertical



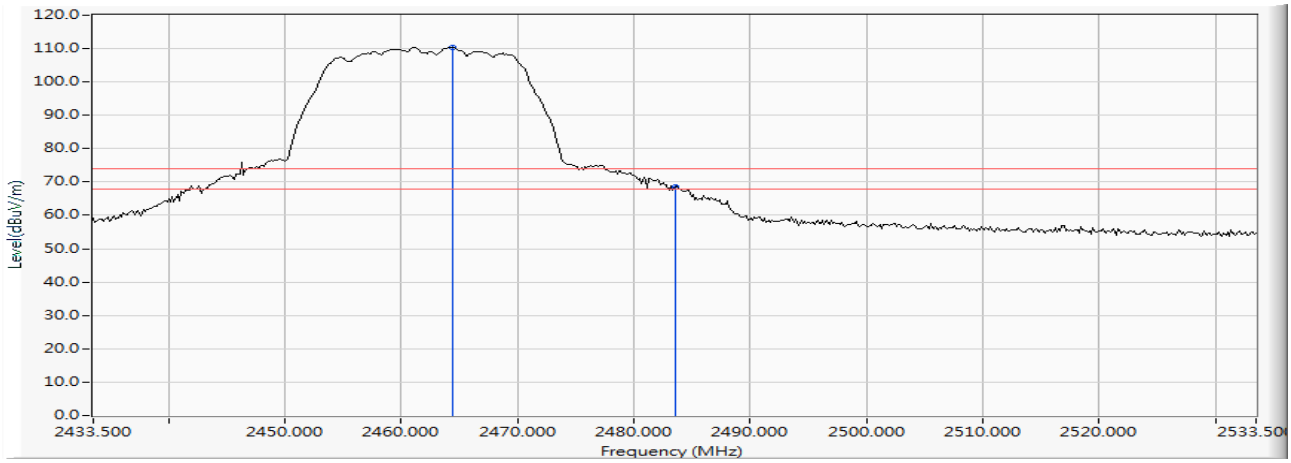
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	27.639	40.538	-13.462	54.000	AVERAGE
2		2400.000	12.961	37.235	50.196	--	--	AVERAGE
3	*	2411.014	13.035	80.829	93.864	--	--	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2462MHz)

Horizontal



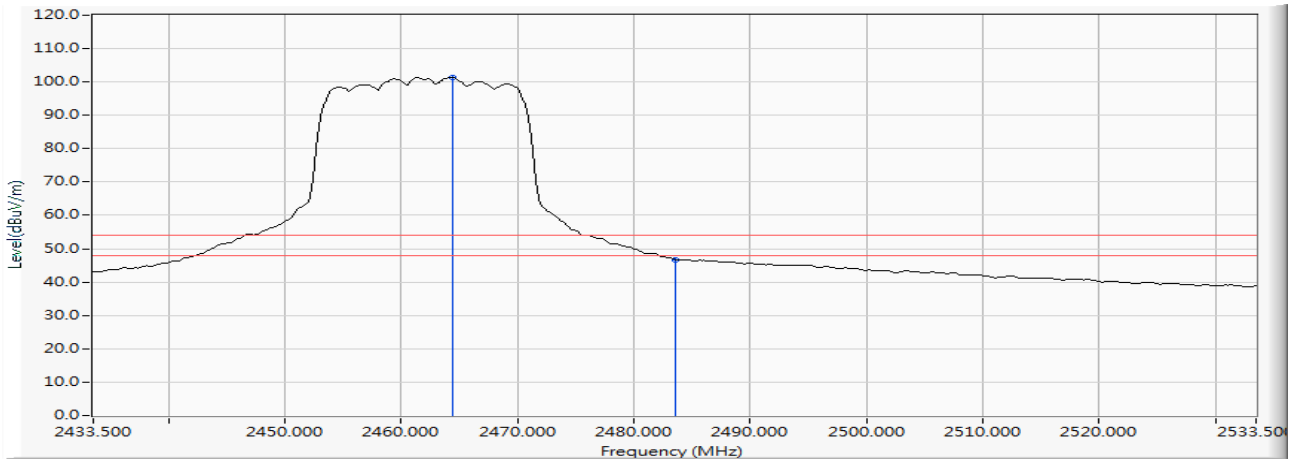
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2464.370	13.346	97.144	110.490	--	--	PEAK
2		2483.500	13.375	55.223	68.597	-5.403	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2462MHz)

Horizontal



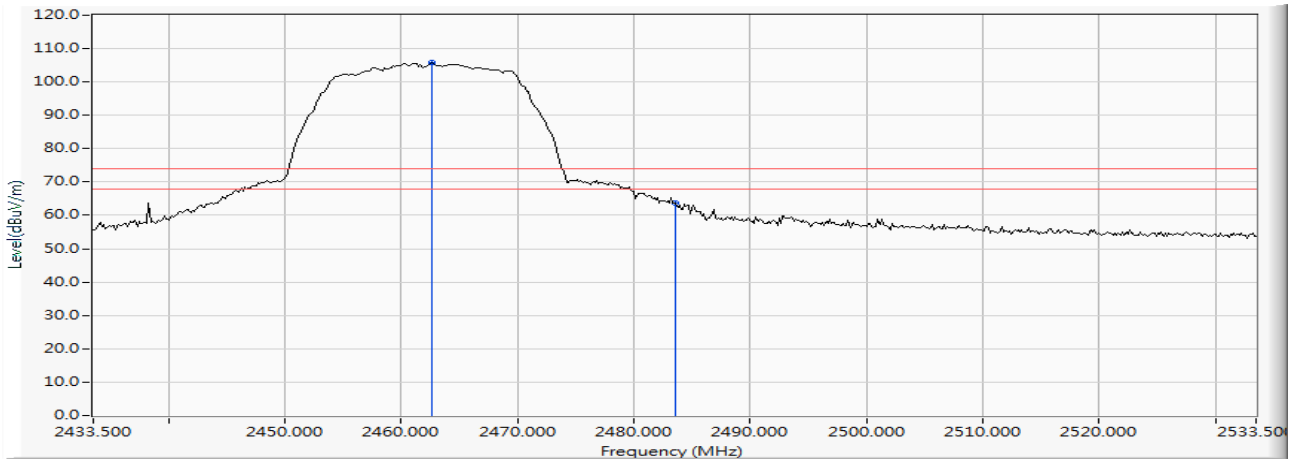
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2464.370	13.346	88.145	101.491	--	--	AVERAGE
2		2483.500	13.375	33.273	46.647	-7.353	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2462MHz)

Vertical



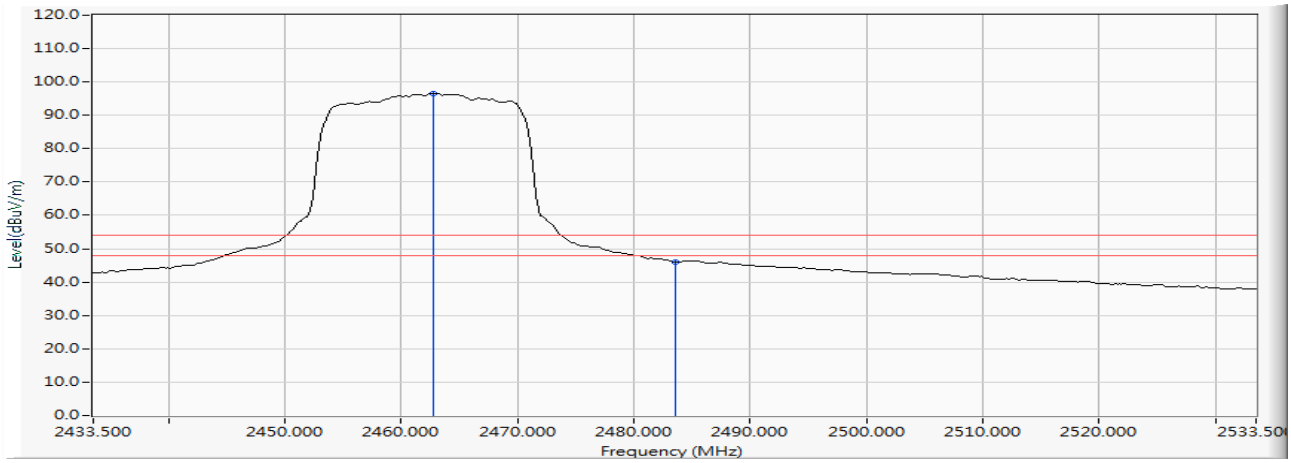
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.630	13.343	92.344	105.688	--	--	PEAK
2		2483.500	13.375	50.188	63.562	-10.438	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 5: Transmit (802.11g 6Mbps)+NFC (2462MHz)

Vertical



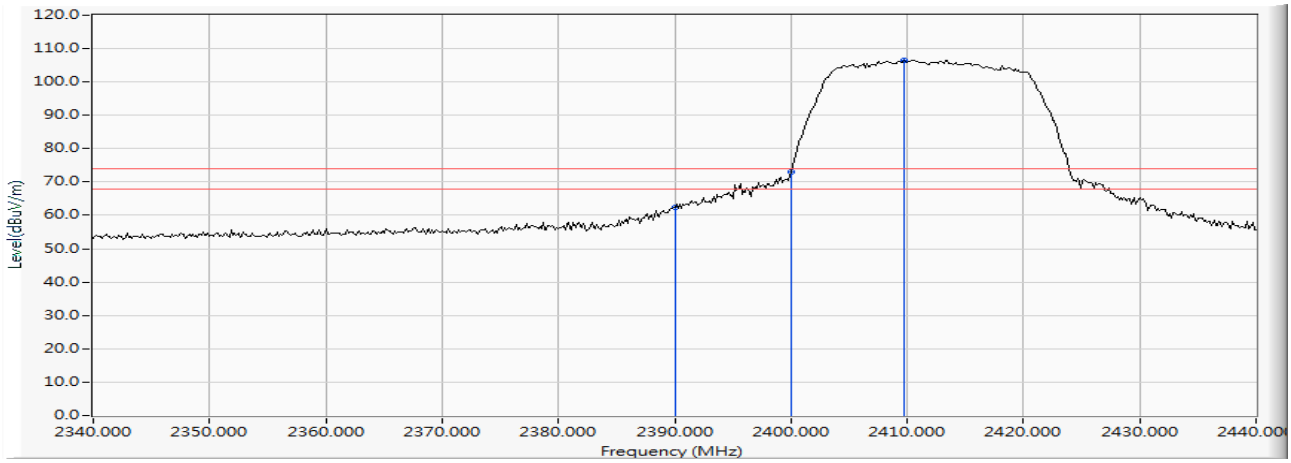
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.775	13.344	83.279	96.623	--	--	AVERAGE
2		2483.500	13.375	32.614	45.988	-8.012	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2412MHz)

Horizontal



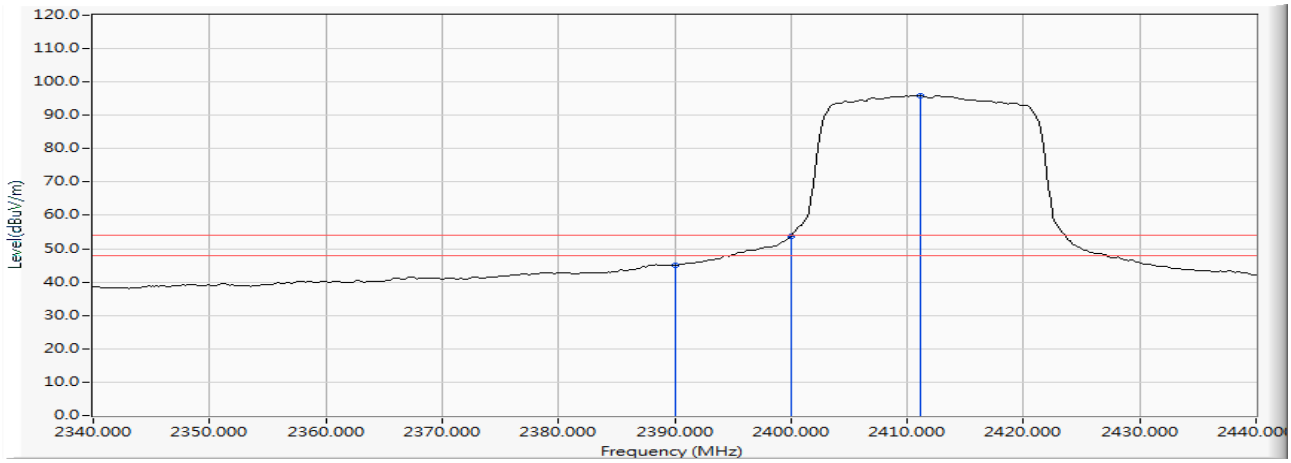
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	49.463	62.362	-11.638	74.000	PEAK
2		2400.000	12.961	60.041	73.002	--	--	PEAK
3	*	2409.710	13.025	93.577	106.603	--	--	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2412MHz)

Horizontal



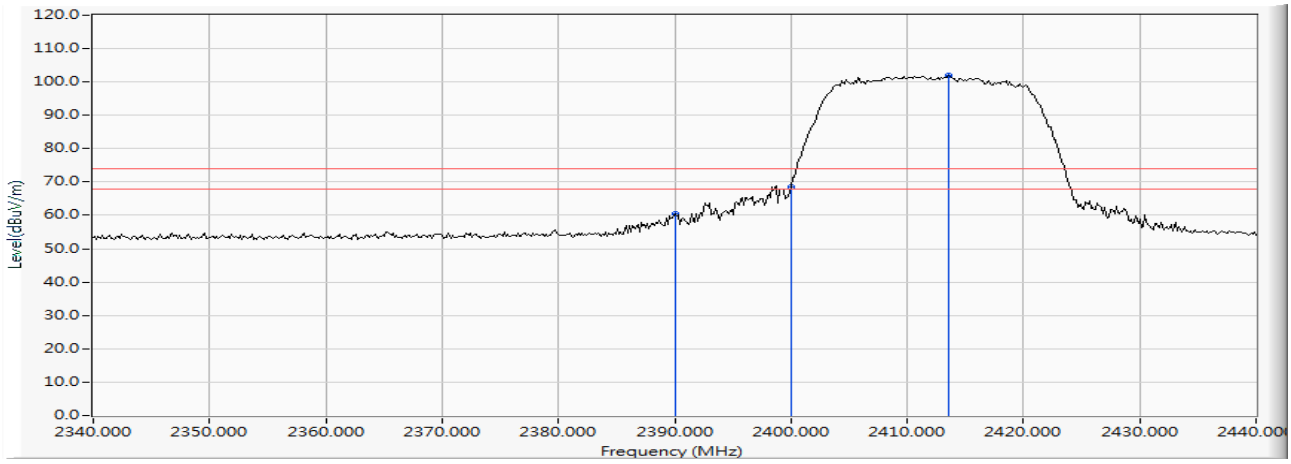
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	32.020	44.919	-9.081	54.000	AVERAGE
2		2400.000	12.961	40.812	53.773	--	--	AVERAGE
3	*	2411.159	13.036	82.972	96.008	--	--	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2412MHz)

Vertical



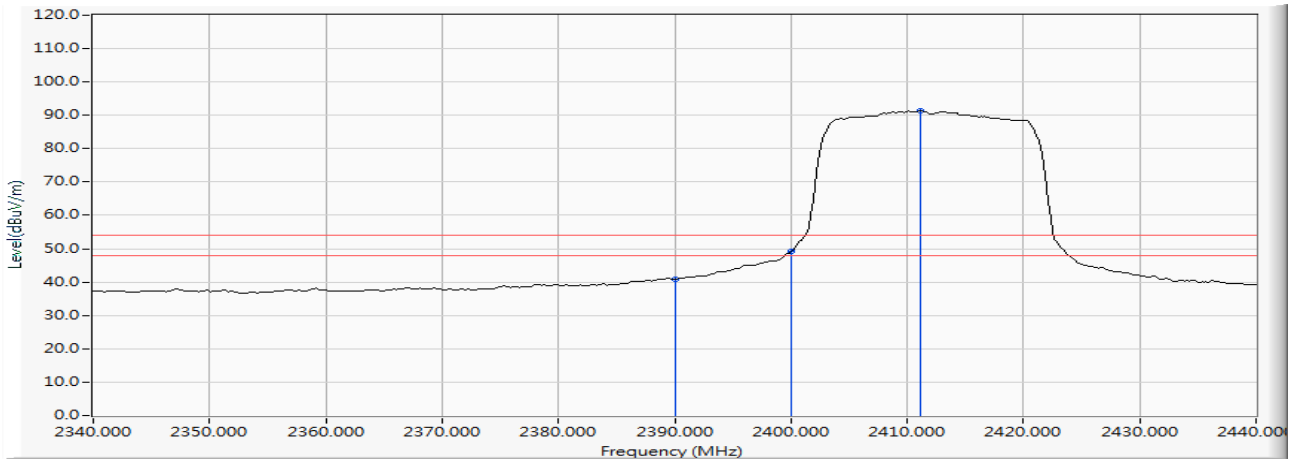
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	47.714	60.613	-13.387	74.000	PEAK
2		2400.000	12.961	55.476	68.437	--	--	PEAK
3	*	2413.623	13.054	88.782	101.836	--	--	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2412MHz)

Vertical



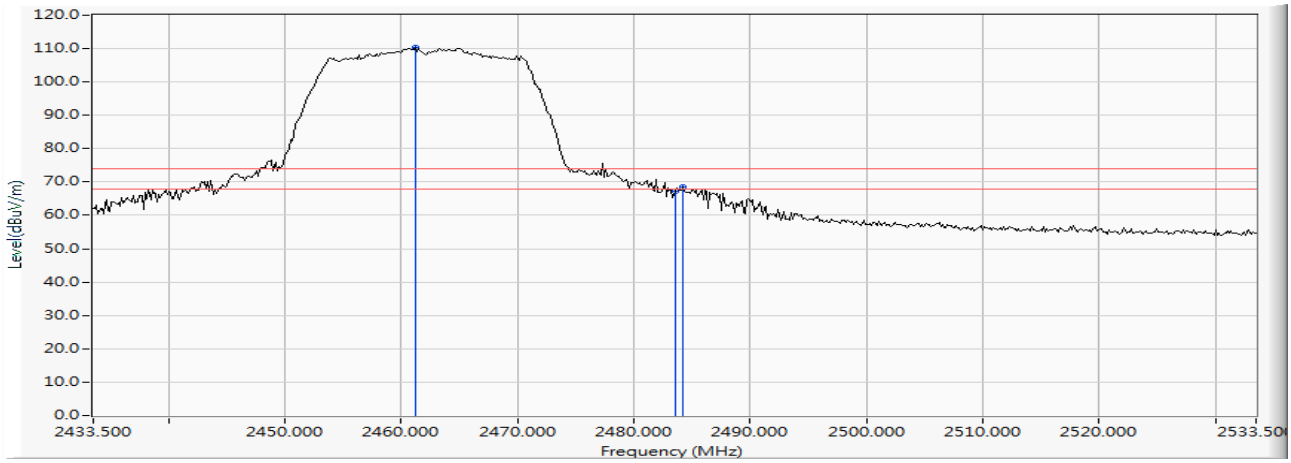
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	27.969	40.868	-13.132	54.000	AVERAGE
2		2400.000	12.961	36.159	49.120	--	--	AVERAGE
3	*	2411.159	13.036	78.274	91.310	--	--	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2462MHz)

Horizontal



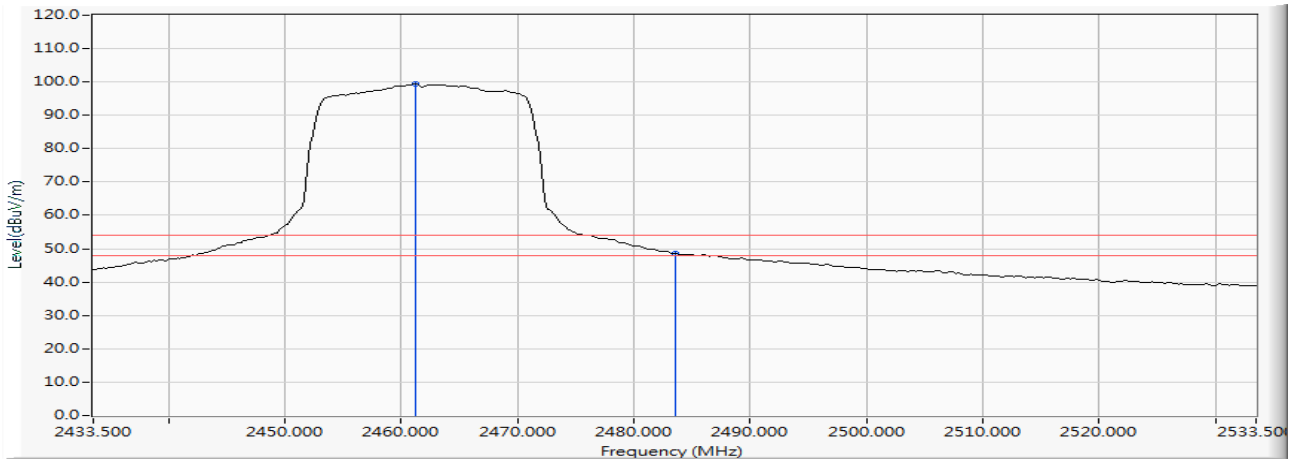
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2461.181	13.340	97.009	110.349	--	--	PEAK
2		2483.500	13.375	53.978	67.352	-6.648	74.000	PEAK
3		2484.225	13.375	55.059	68.435	-5.565	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2462MHz)

Horizontal



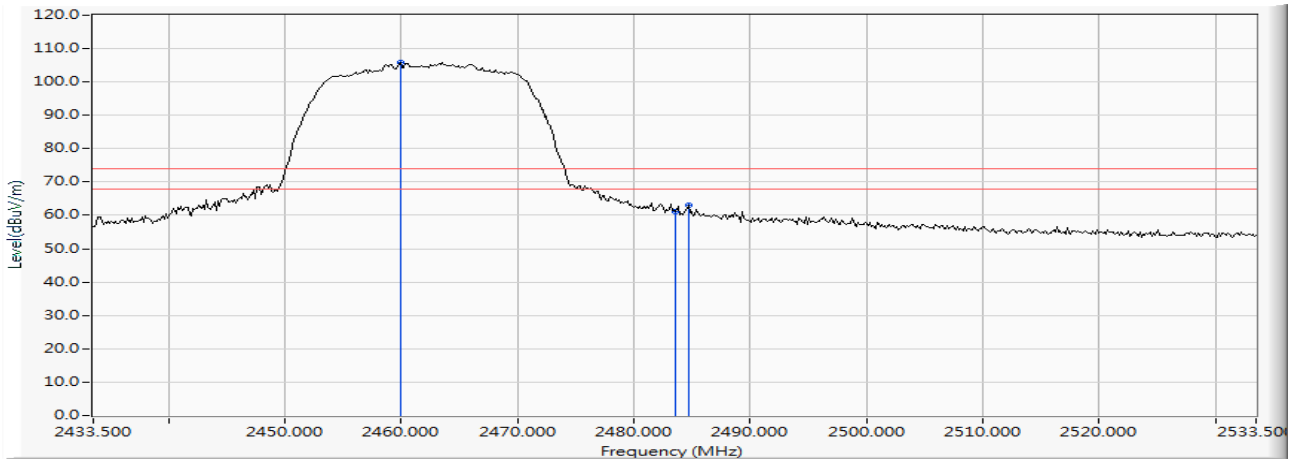
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2461.181	13.340	85.961	99.301	--	--	AVERAGE
2		2483.500	13.375	35.200	48.574	-5.426	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2462MHz)

Vertical



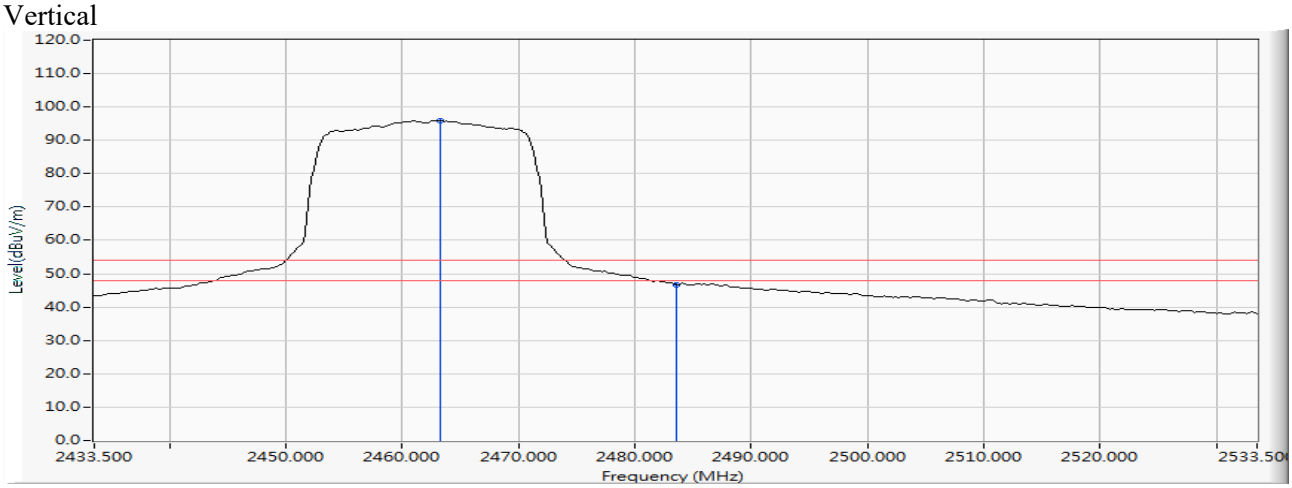
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2459.877	13.336	92.411	105.747	--	--	PEAK
2		2483.500	13.375	47.699	61.073	-12.927	74.000	PEAK
3		2484.659	13.376	49.804	63.180	-10.820	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Humly Room Display One
Test Item : Band Edge Data
Test Date : 2019/10/29
Test Mode : Mode 6: Transmit (802.11n MCS8 14.4Mbps 20M-BW)+NFC (2462MHz)

Vertical



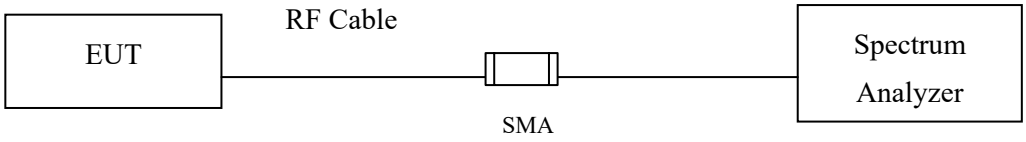
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2463.210	13.344	82.675	96.020	--	--	AVERAGE
2		2483.500	13.375	33.409	46.783	-7.217	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

Tested according to ANSI C63.10 Section 11.8 section 8.2 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 1-5% of the emission bandwidth, VBW≥3*RBW.

7.4. Uncertainty

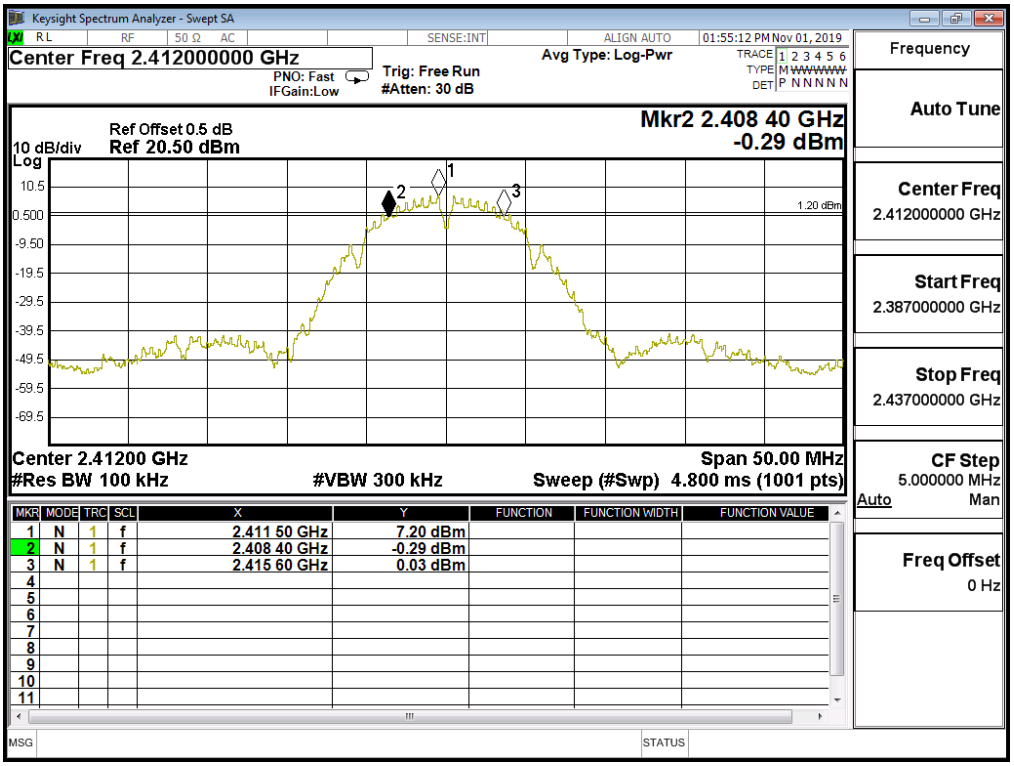
± 283Hz

7.5. Test Result of 6dB Bandwidth

Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	7200	>500	Pass

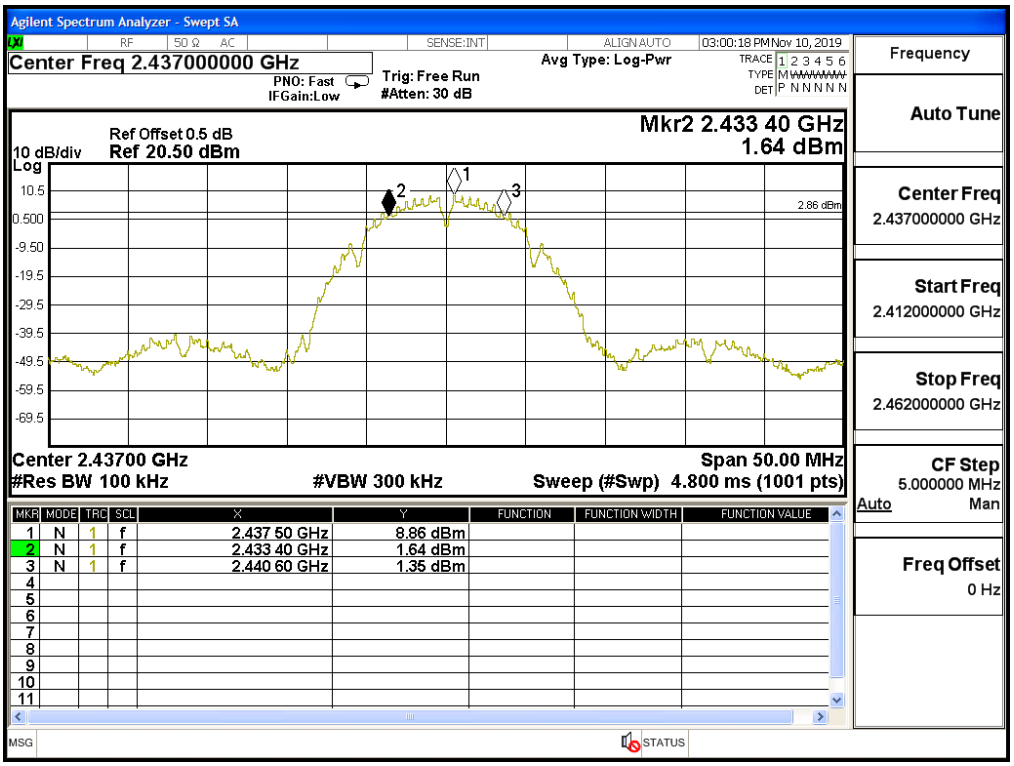
Figure Channel 1:



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	7200	>500	Pass

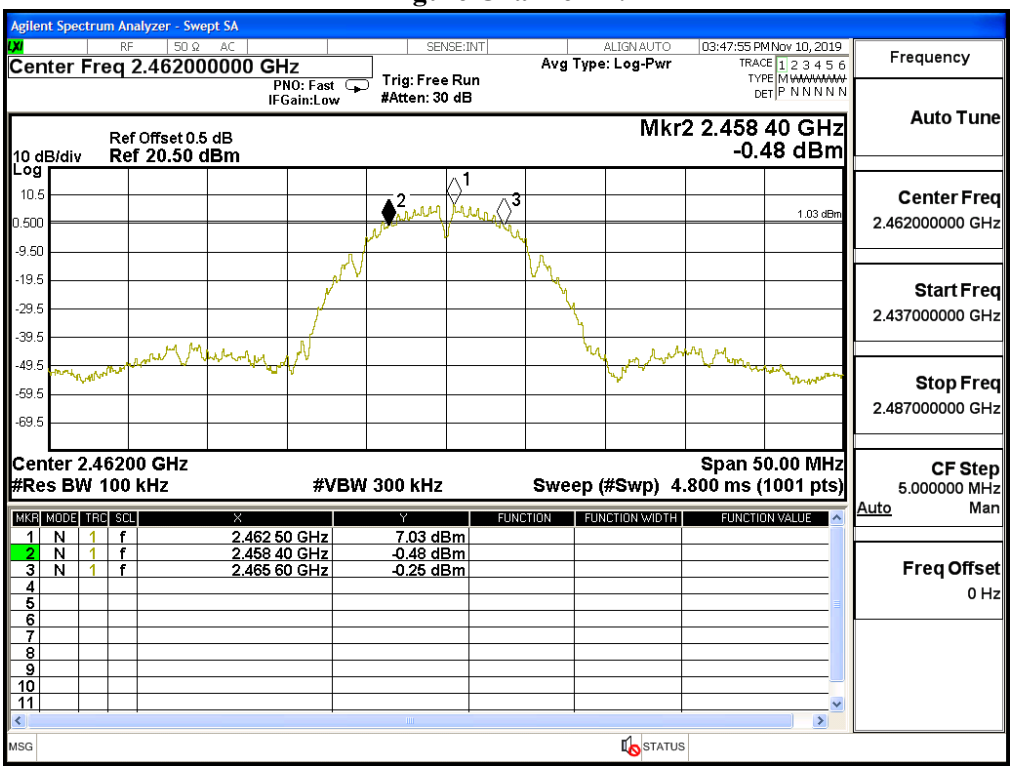
Figure Channel 6:



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	7200	>500	Pass

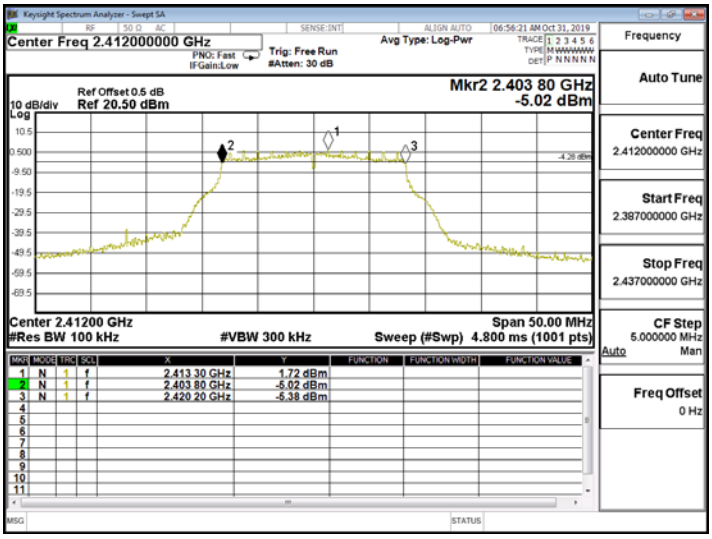
Figure Channel 11:



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

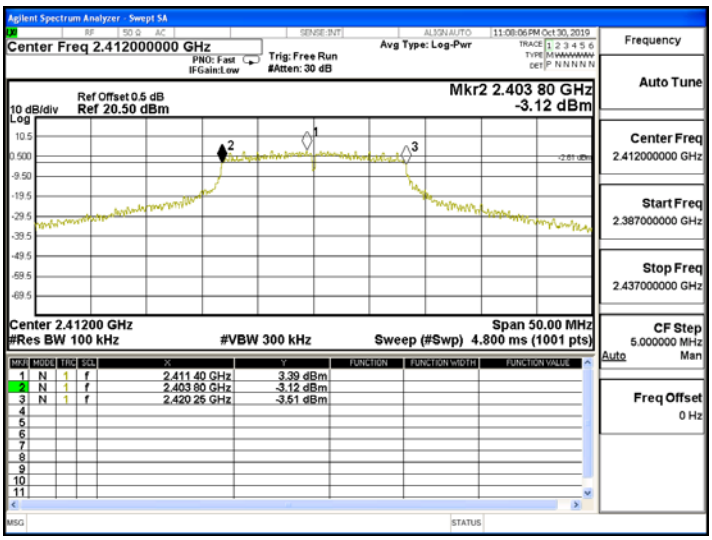
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	16400	>500	Pass

Figure Channel 1: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	16450	>500	Pass

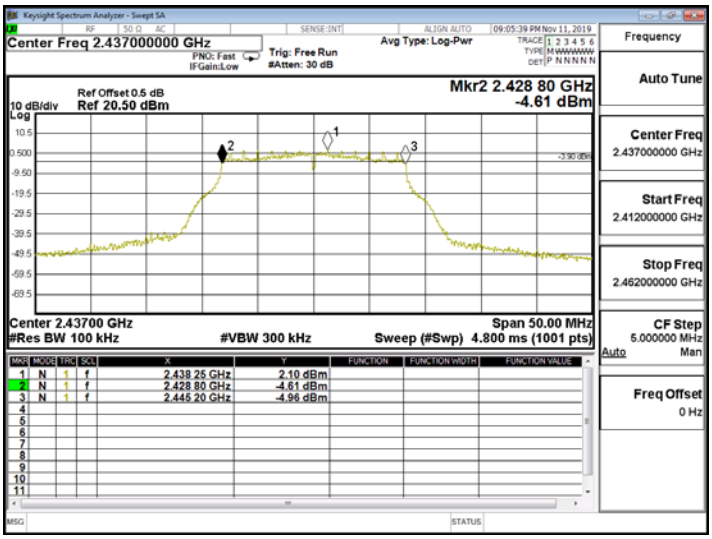
Figure Channel 1: (Chain B)



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

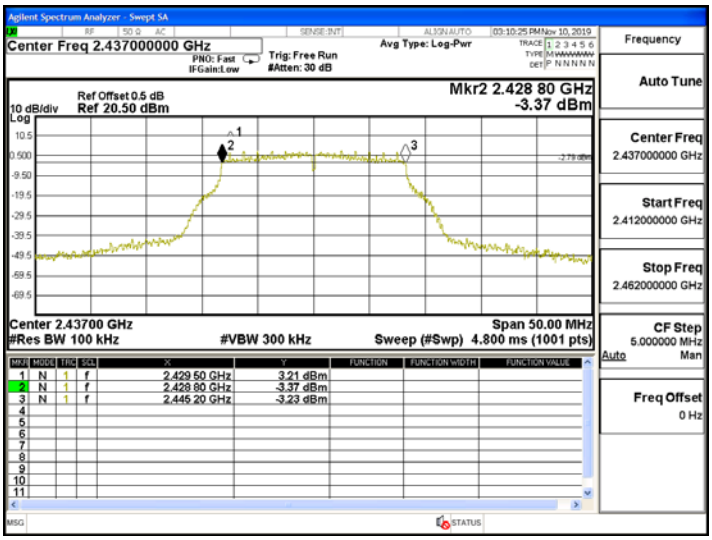
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	16400	>500	Pass

Figure Channel 6: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	16400	>500	Pass

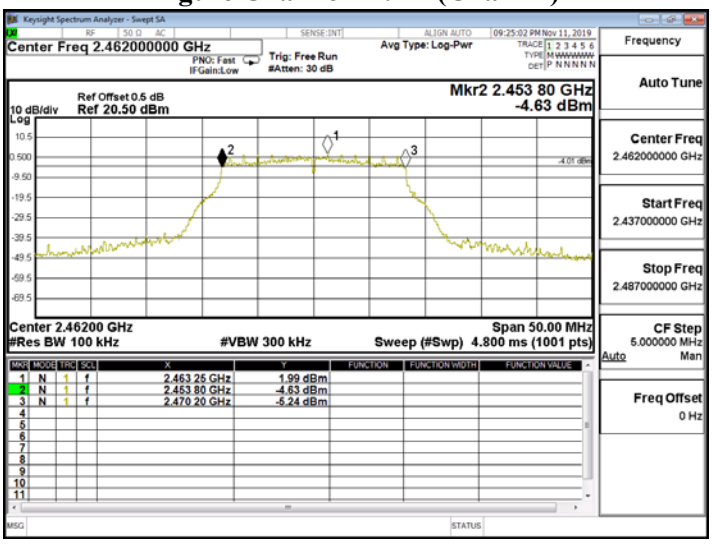
Figure Channel 6: (Chain B)



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

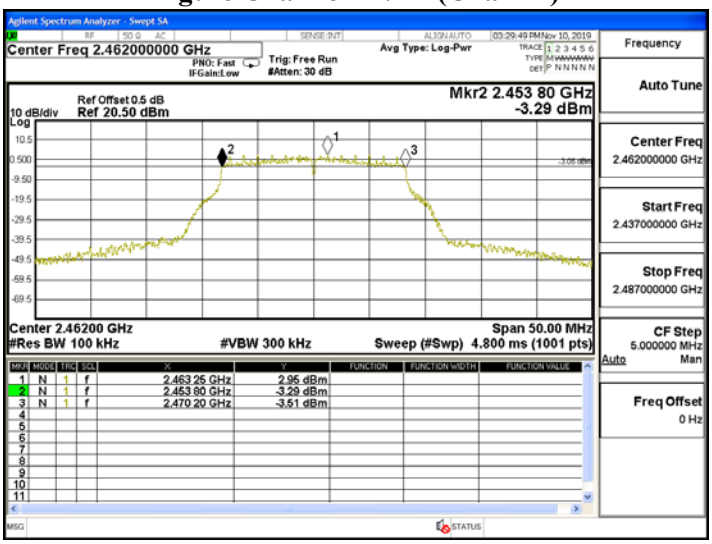
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	16400	>500	Pass

Figure Channel 11: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	16400	>500	Pass

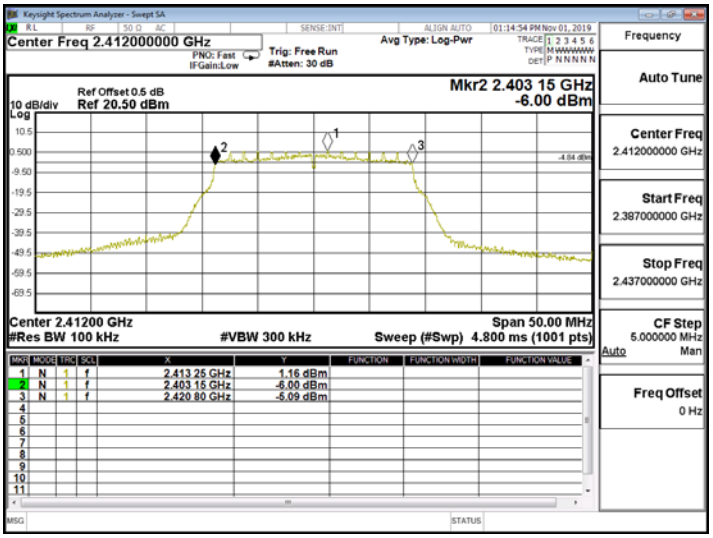
Figure Channel 11: (Chain B)



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2412MHz)

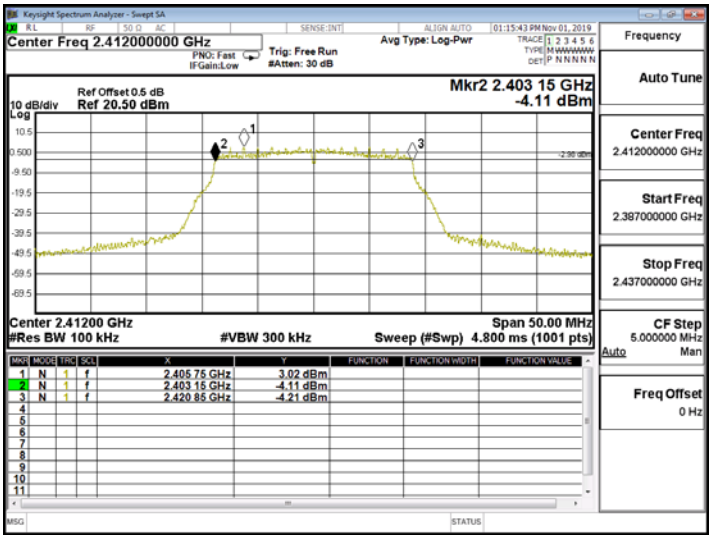
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	17650	>500	Pass

Figure Channel 1: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	17700	>500	Pass

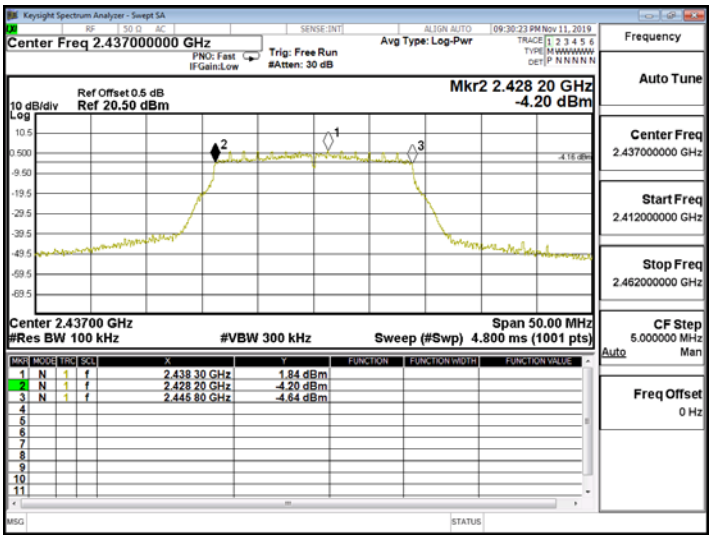
Figure Channel 1: (Chain B)



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2437MHz)

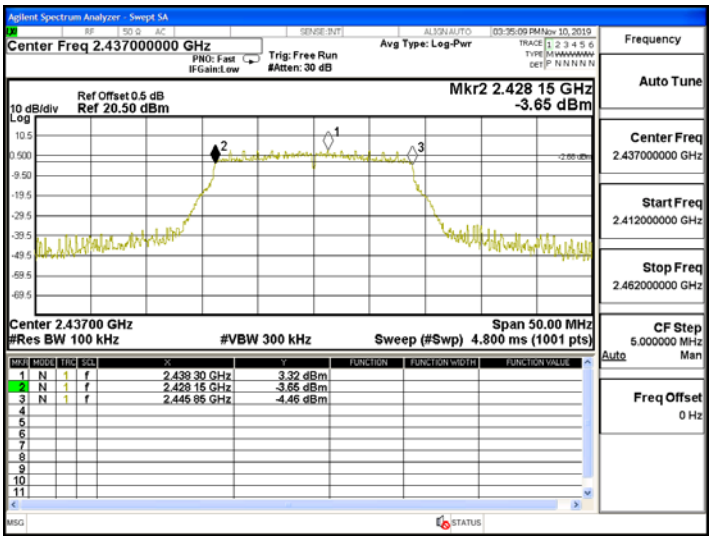
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	17600	>500	Pass

Figure Channel 6: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	17700	>500	Pass

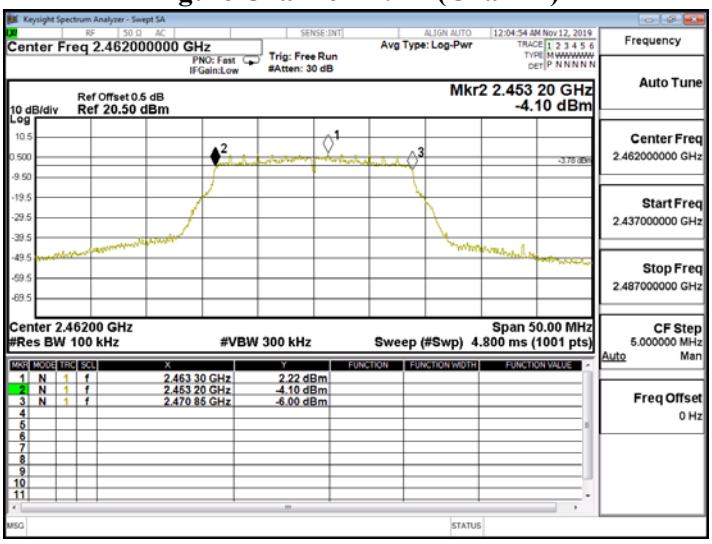
Figure Channel 6: (Chain B)



Product : Humly Room Display One
Test Item : 6dB Bandwidth Data
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2462MHz)

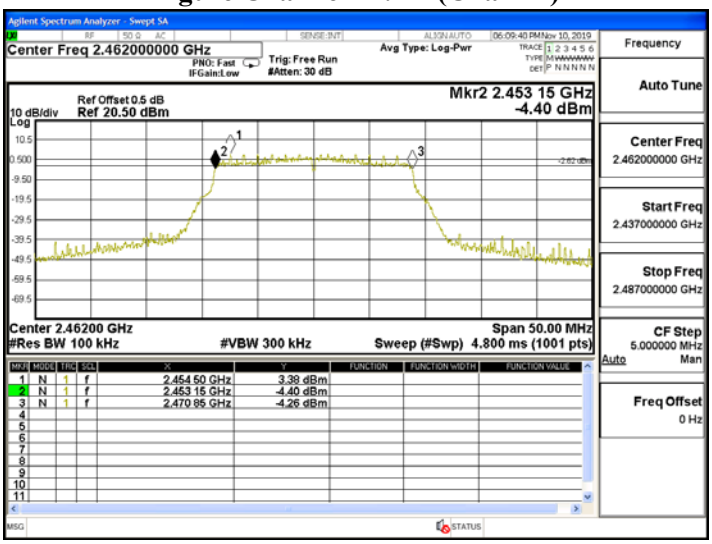
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	17650	>500	Pass

Figure Channel 11: (Chain A)



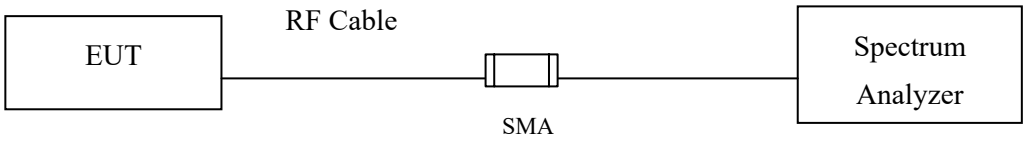
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	17700	>500	Pass

Figure Channel 11: (Chain B)



8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.3. Test Procedure

Tested according to DTS test procedure of C63.10 Section 11.10.2 Method PKPSD (peak PSD).

8.4. Uncertainty

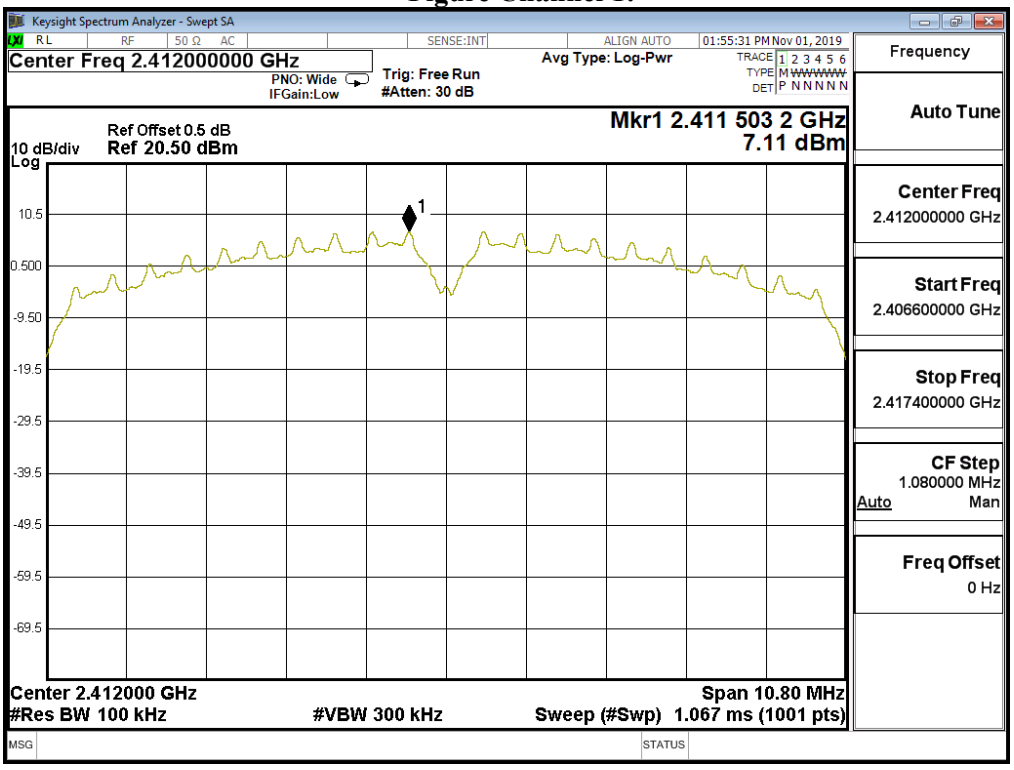
± 1.20 dB

8.5. Test Result of Power Density

Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	7.110	≦8dBm	Pass

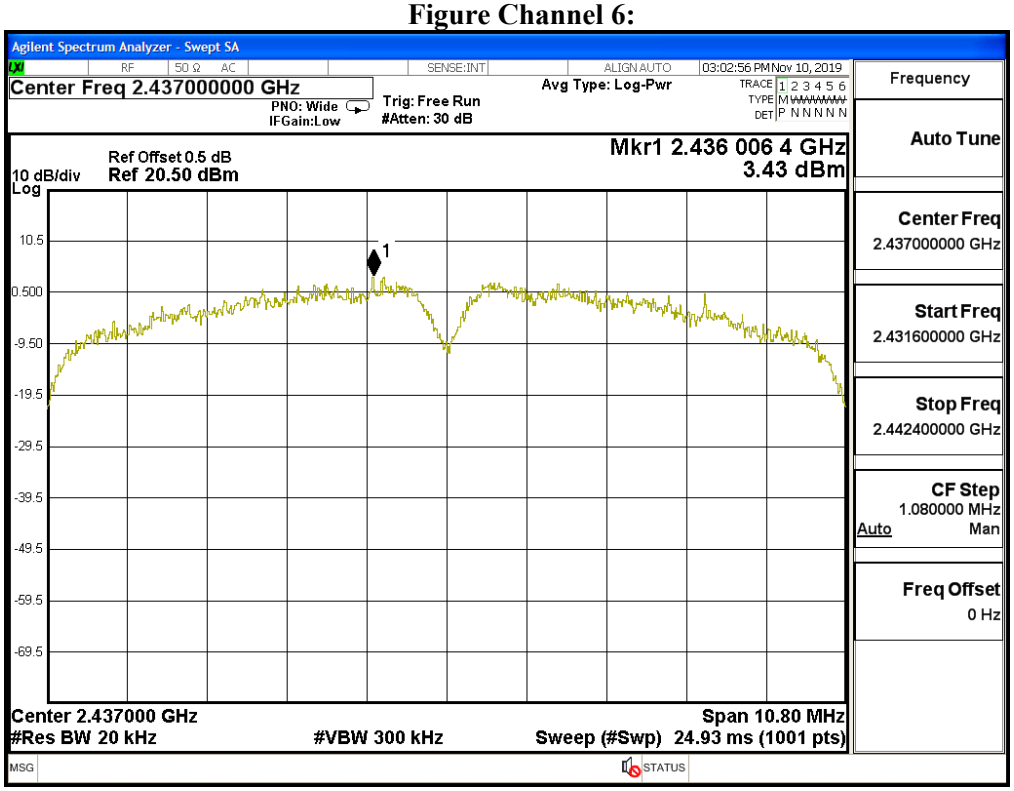
Figure Channel 1:



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
6	2437	3.430	≦8dBm	Pass

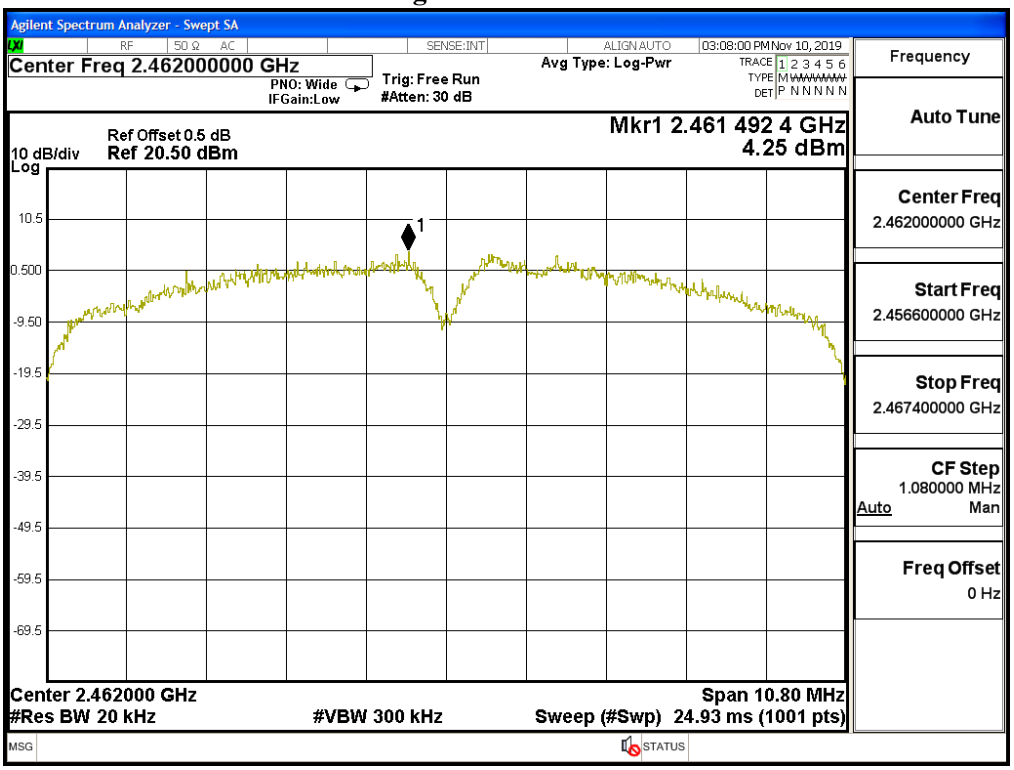
Figure Channel 6:



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
11	2462	4.250	≦8dBm	Pass

Figure Channel 11:



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Limit	Result
A	1.480	4.490	≦8dBm	Pass
B	3.380	6.390	≦8dBm	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

Figure Channel 1: (Chain A)

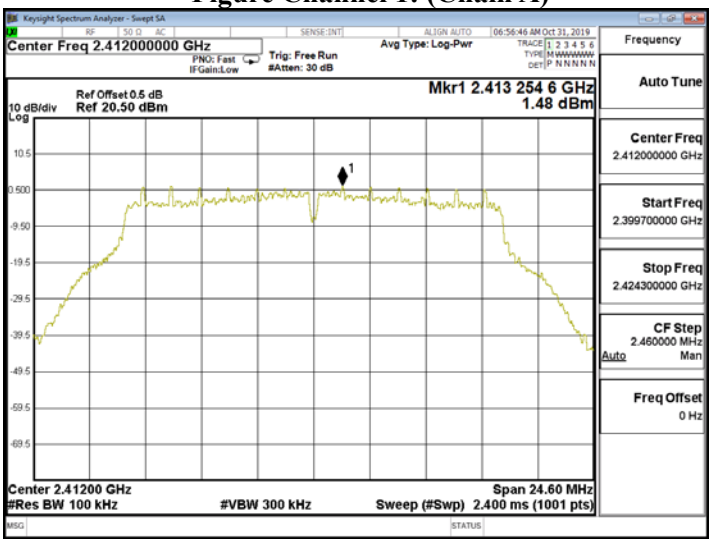
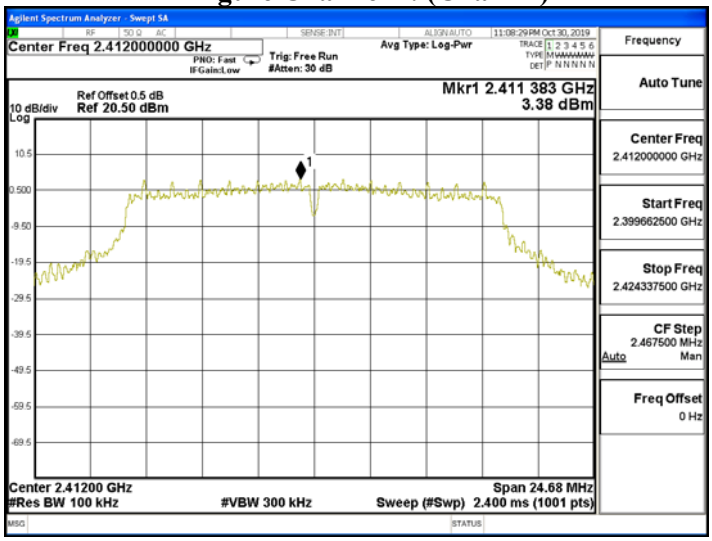


Figure Channel 1: (Chain B)



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Limit	Result
A	2.050	5.060	≦8dBm	Pass
B	3.310	6.320	≦8dBm	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

Figure Channel 6: (Chain A)

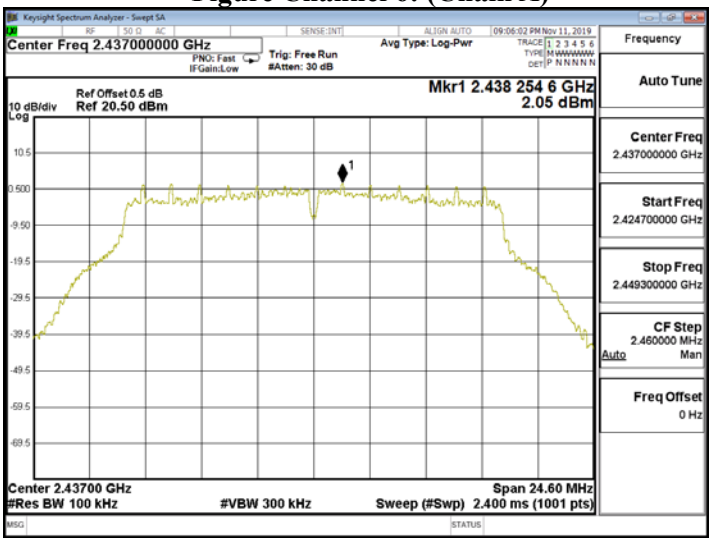
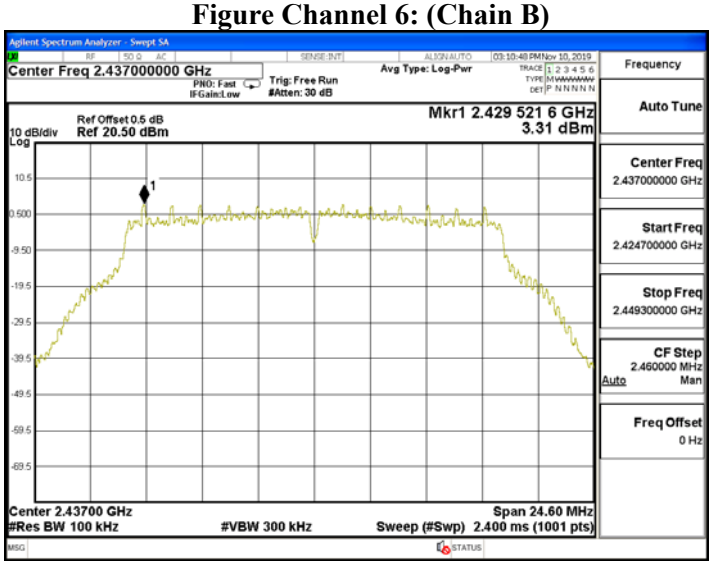


Figure Channel 6: (Chain B)



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Limit	Result
A	1.990	5.000	≦8dBm	Pass
B	3.080	6.090	≦8dBm	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

Figure Channel 11: (Chain A)

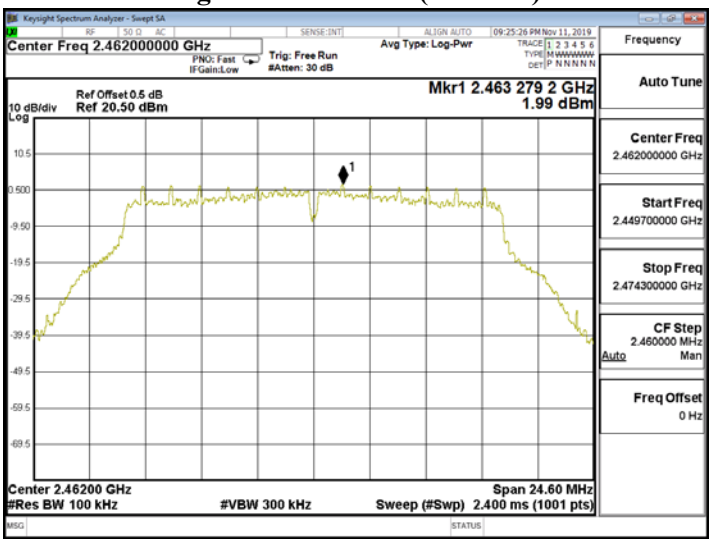
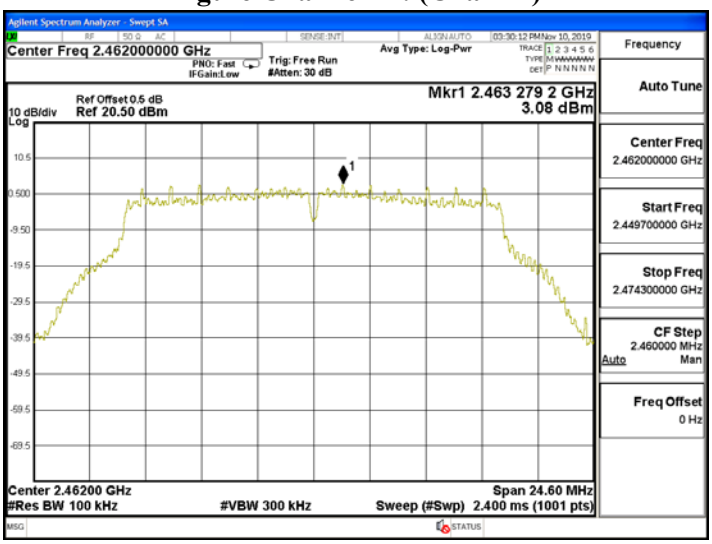


Figure Channel 11: (Chain B)



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2412MHz)

CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Limit	Result
A	1.210	4.220	≦8dBm	Pass
B	2.900	5.910	≦8dBm	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

Figure Channel 1: (Chain A)

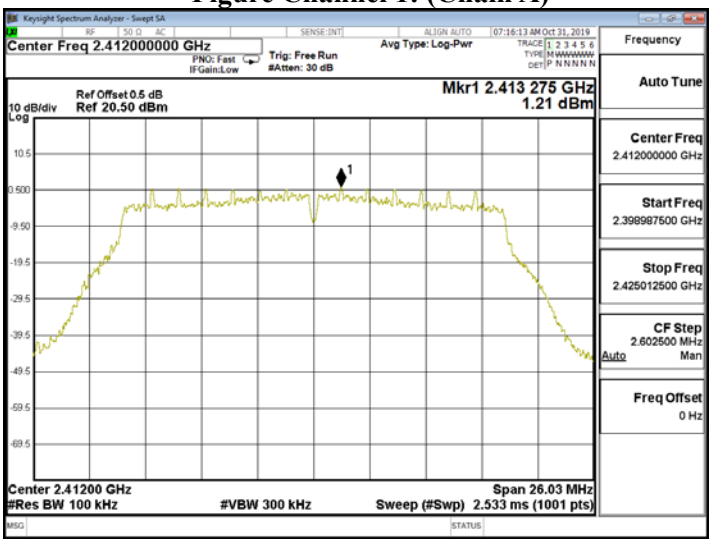
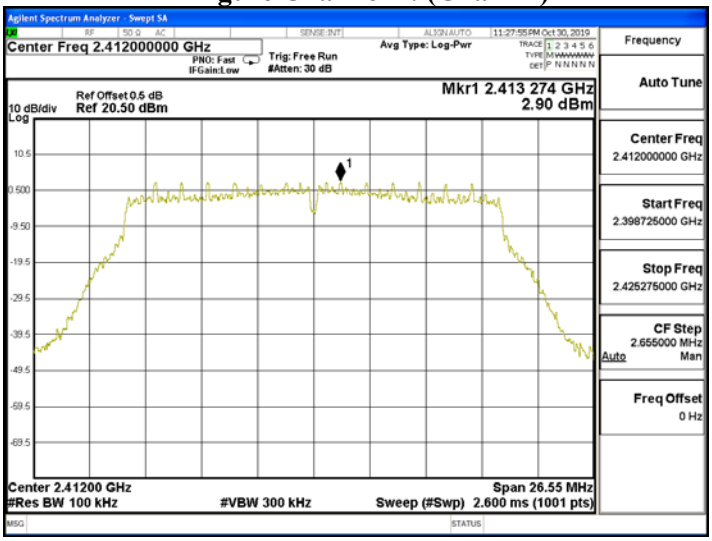


Figure Channel 1: (Chain B)



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2437MHz)

CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Limit	Result
A	1.910	4.920	≦8dBm	Pass
B	3.360	6.370	≦8dBm	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

Figure Channel 6: (Chain A)

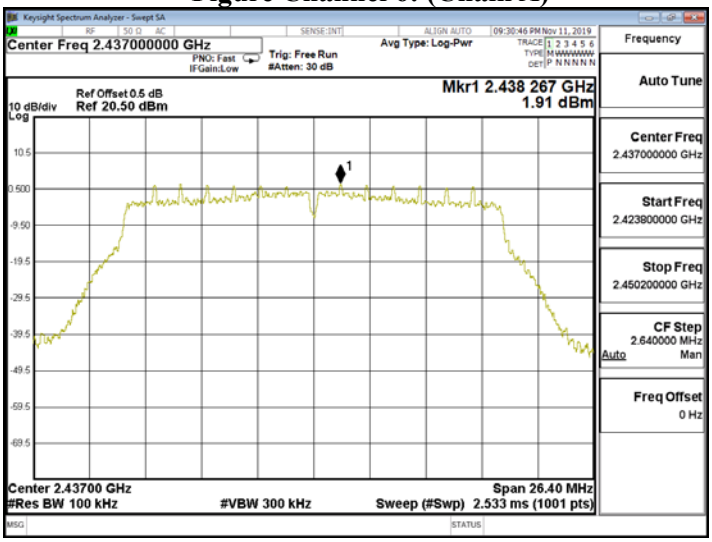
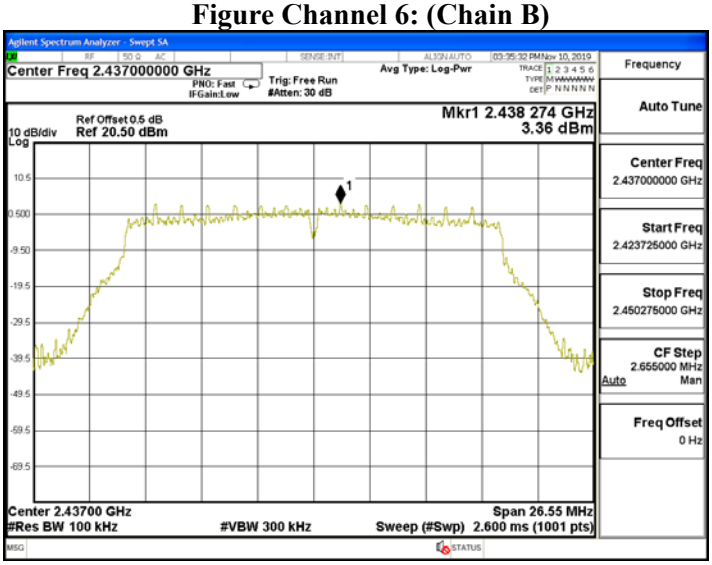


Figure Channel 6: (Chain B)



Product : Humly Room Display One
Test Item : Power Density Data
Test Mode : Mode 3: Transmit (802.11n MCS8 14.4Mbps 20M-BW) (2462MHz)

CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Limit	Result
A	2.150	5.160	≦8dBm	Pass
B	3.210	6.220	≦8dBm	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

Figure Channel 11: (Chain A)

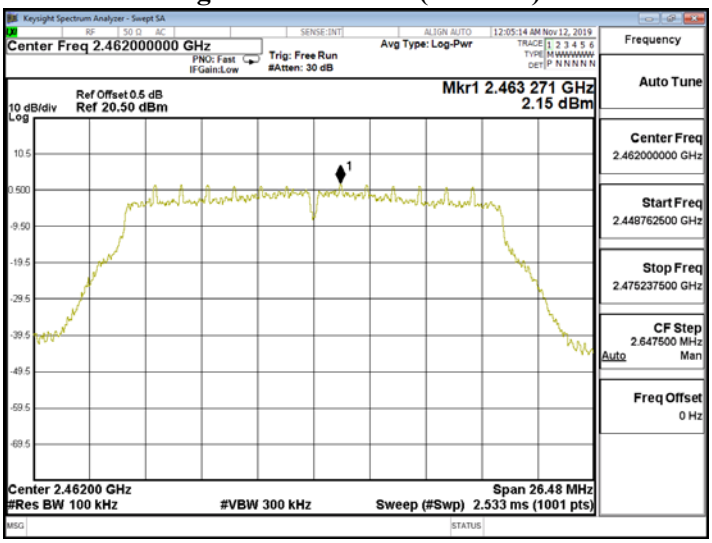
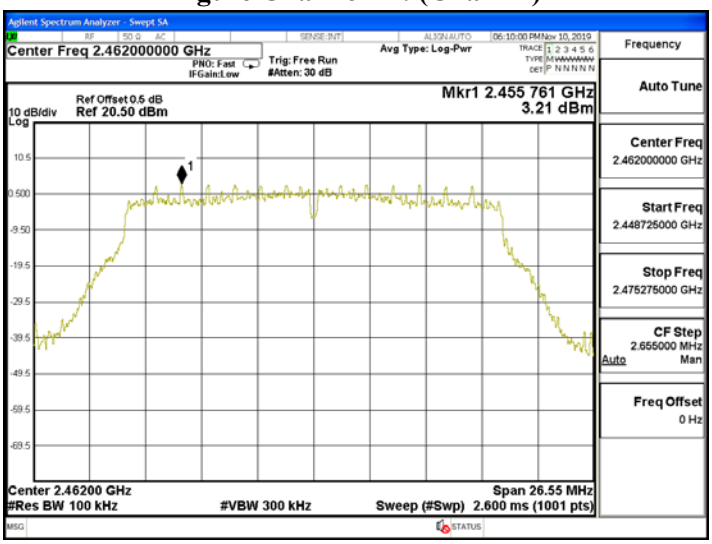
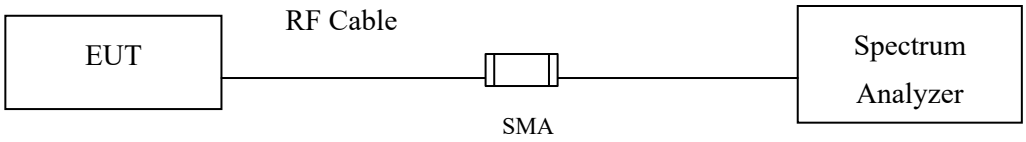


Figure Channel 11: (Chain B)



9. Duty Cycle

9.1. Test Setup



9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to ANSI C63.10 2013 for compliance to FCC 47CFR 15.247 requirements.

9.3. Uncertainty

± 2.31msec

9.4. Test Result of Duty Cycle

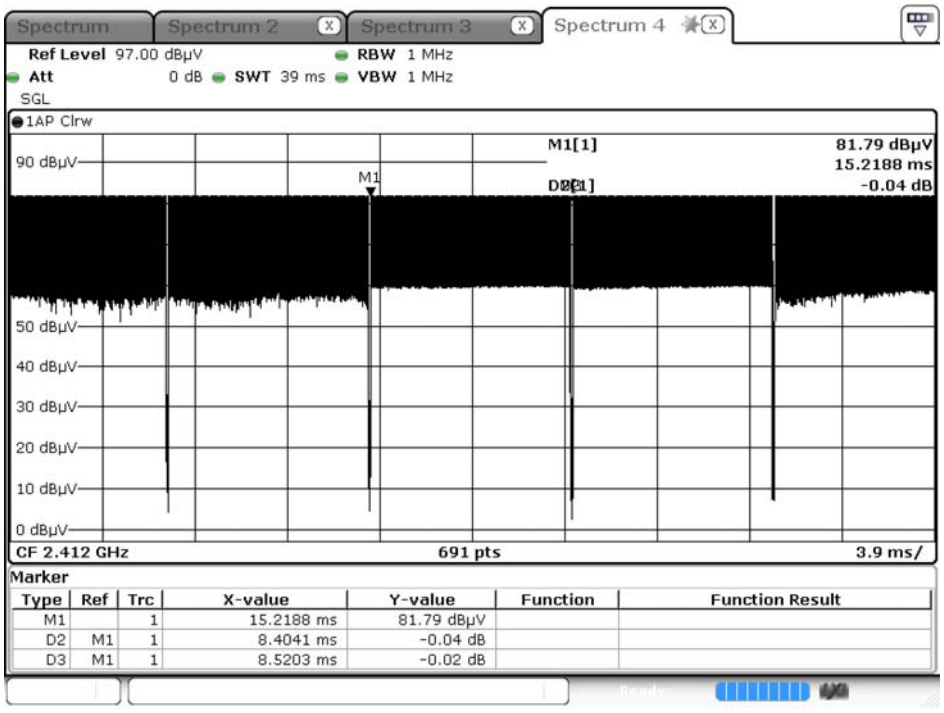
Product : Humly Room Display One
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

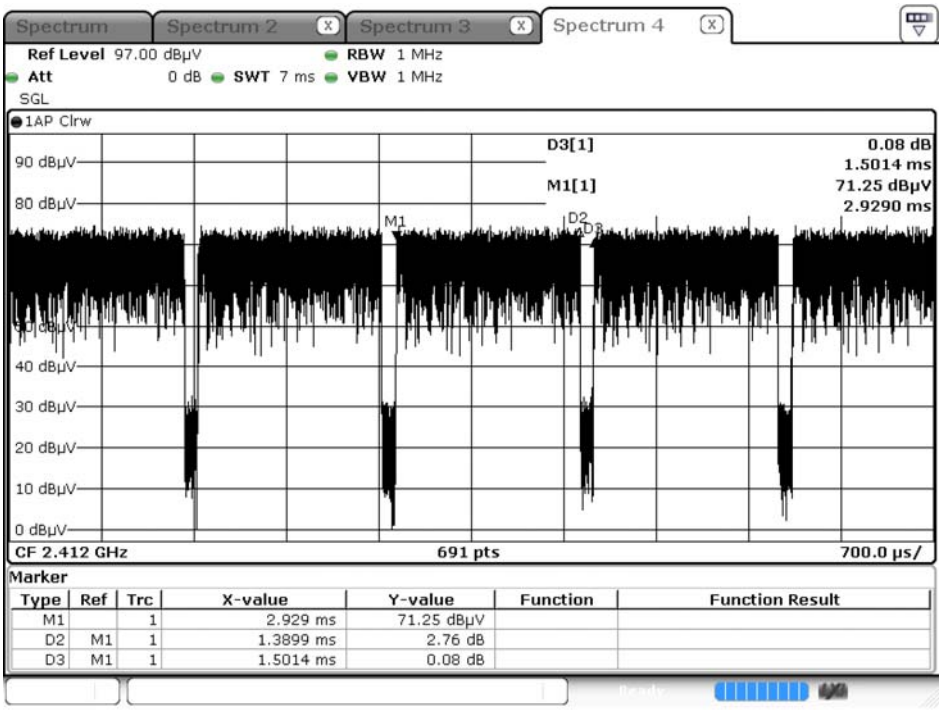
Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	8.4041	8.5203	98.64	0.06
802.11g	1.3899	1.5014	92.57	0.34
802.11n20	0.6667	0.7790	85.58	0.68

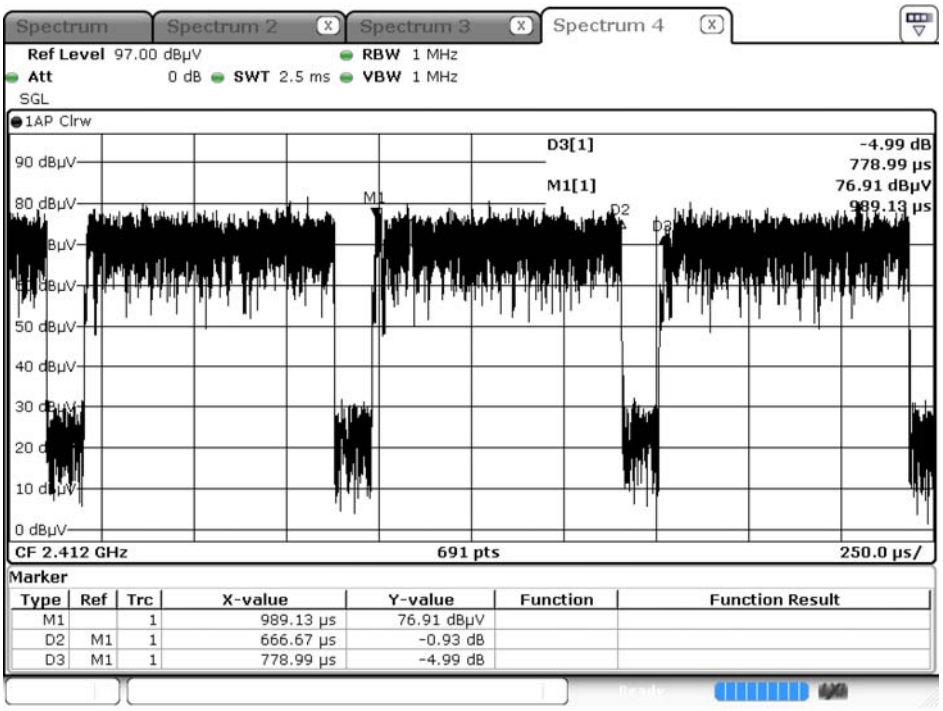
802.11b



802.11g



802.11n20



10. EMI Reduction Method During Compliance Testing

No modification was made during testing.