FCC RADIO TEST REPORT

FCC ID: 2AAWC-1786AIO

Product:	ALL IN ONE
Trade Name:	iVIEW
Model Name:	1786AIO
Serial Model:	1780AIO
Report No.:	UNIA22022143ER-63

Prepared for

Wiltronic Corporation

13939 Central Ave, Chino, California, 91710, United States

Prepared by

Shenzhen United Testing Technology Co., Ltd.

2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

TEST RESULT CERTIFICATION

Applicant's name..... :	Wiltronic Corporation
Address..... :	13939 Central Ave, Chino, California, 91710, United States
Manufacture's Name..... :	HOPELAND DIGITAL (SHENZHEN) CO., LTD
Address..... :	RM3A02, BLOCK A, DEFENGYUAN INNOVATION VALLEY, NEIHUAN RD, SANWEI, HANGCHENG STREET, BAO'AN DISTRICT, SHENZHEN, CHINA

Product description

Product name..... :	ALL IN ONE
Trade Mark..... :	iVIEW
Model and/or type reference . :	1786AIO, 1780AIO
Standards..... :	FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.10: 2013

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test..... :	
Date (s) of performance of tests..... :	Feb. 21, 2022 ~ Mar. 16, 2022
Date of Issue..... :	Mar. 23, 2022
Test Result..... :	Pass

Prepared by: Jackson Fang

Jackson Fang/Editor

Reviewer: kahn.yang

Kahn yang/Supervisor

Approved & Authorized Signer: liuze

Liuze/Manager

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. TEST SUMMARY

TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	STANDARD	RESULT
CONDUCTED EMISSION	FCC Part 15.207	COMPLIANT
RADIATED EMISSION	FCC Part 15.209(a)	COMPLIANT
OCCUPIED BANDWIDTH	FCC Part 15.247(a)(2)	COMPLIANT
POWER SPECTRAL DENSITY	FCC Part 15.247(e)	COMPLIANT
PEAK OUTPUT POWER	FCC Part 15.247(b)	COMPLIANT
OUT OF BAND EMISSIONS	FCC Part 15.247(d)	COMPLIANT
CONDUCTED SPURIOUS EMISSION	FCC Part 15.247(d)	COMPLIANT
ANTENNA REQUIREMENT	FCC Part 15.203	COMPLIANT

TEST FACILITY

Test Firm : Shenzhen United Testing Technology Co., Ltd.

Address : 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

A2LA Certificate Number: 4747.01

The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 674885

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 21947

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 150kHz	2.96	
		150kHz ~ 30MHz	2.44	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 30MHz	2.50	
		30MHz ~ 1000MHz	4.80	
		Above 1000MHz	4.13	

. GENERAL INFORMATION

GENERAL DESCRIPTION OF EUT

Product:	ALL IN ONE
Trade Name:	iVIEW
Main Model:	1786AIO
Additional Model:	1780AIO
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: 1786AIO.
FCC ID:	2AAWC-1786AIO
Operation Frequency:	802.11b/g/n20: 2412~2462MHz 802.11n40: 2422~2452MHz
Number of Channels:	802.11b/g/n20: 11CH 802.11n40: 7CH
Modulation Type:	CCK, OFDM, DBPSK, DAPSK
Antenna Type:	Internal Antenna
Antenna Gain:	2dBi
Battery:	DC 7.4V, 2600mAh
Adapter:	M/N: JHD-AP036U-120300AA-A Input: AC 100-240V, 50/60Hz, 1.2A Output: DC 12V, 3.0A
Power Source:	DC 7.4V from Li-battery or DC 12V from adapter with AC 120(240)V/60Hz

Carrier Frequency of Channels

Channel List							
802.11b/ g/ n(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452	/	/
02	2417	06	2437	10	2457	/	/
03	2422	07	2442	11	2462	/	/
04	2427	08	2447	/	/	/	/
802.11n(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	4	2427	5	2432	6	2437
7	2442	8	2447	9	2452	/	/

Operation of EUT during testing

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11b: All Rate
Mode 2	802.11g: All Rate
Mode 3	802.11n(20MHz): All Rate
Mode 4	802.11n(40MHz) : Rate 13.5Mbps

For Conducted Emission	
Final Test Mode	Description
Mode 1	802.11b: Rate 1Mbps

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b: Rate 1Mbps
Mode 2	802.11g: Rate 6Mbps
Mode 3	802.11n(20MHz) : Rate 6.5Mbps
Mode 4	802.11n(40MHz) : Rate 13.5Mbps

Note:

The measurements are performed at the highest, middle, lowest available channels.

DESCRIPTION OF TEST SETUP

Operation of EUT during Conducted and Radiation testing:

Operation of EUT during Above1GHz Radiation testing:

Table for auxiliary equipment:

Equipment Description	Manufacturer	Model	Calibration Due Date
N/A	N/A	N/A	N/A

MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Conduction Emissions Measurement					
1	Conducted Emission Test Software	EZ-EMC	Ver.CCS-3A1-CE	N/A	N/A
2	AMN	Schwarzbeck	NNLK8121	8121370	2022.09.22
3	AAN	TESEQ	T8-Cat6	38888	2022.09.22
4	Pulse Limiter	CYBRTEK	EM5010	E115010056	2022.05.17
5	EMI Test Receiver	Rohde&Schwarz	ESCI	101210	2022.09.22
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2022.09.27
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2024.02.26
4	PREAMP	HP	8449B	3008A00160	2022.09.22
5	PREAMP	HP	8447D	2944A07999	2022.05.17
6	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2022.09.22
7	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2022.09.22
8	Signal Generator	Agilent	E4421B	MY4335105	2022.09.22
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022.09.22
10	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2022.09.22
11	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2022.05.17
12	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2022.05.17
13	RF power divider	Anritsu	K241B	992289	2022.09.22
14	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2022.09.22
15	Active Loop Antenna	Com-Power	AL-130R	10160009	2022.07.25
16	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2022.09.22
17	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2022.05.23
18	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2022.09.27
19	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2022.09.22
20	Signal Generator	Agilent	N5183A	MY47420153	2022.09.22
21	Spctrum Analyzer	Rohde&Schwarz	FSP 40	100501	2022.09.22
22	Power Meter	KEYSIGHT	N1911A	MY50520168	2022.09.22
23	Frequency Meter	VICTOR	VC2000	997406086	2022.09.22
24	DC Power Source	HYELEC	HY5020E	055161818	2022.09.22

. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

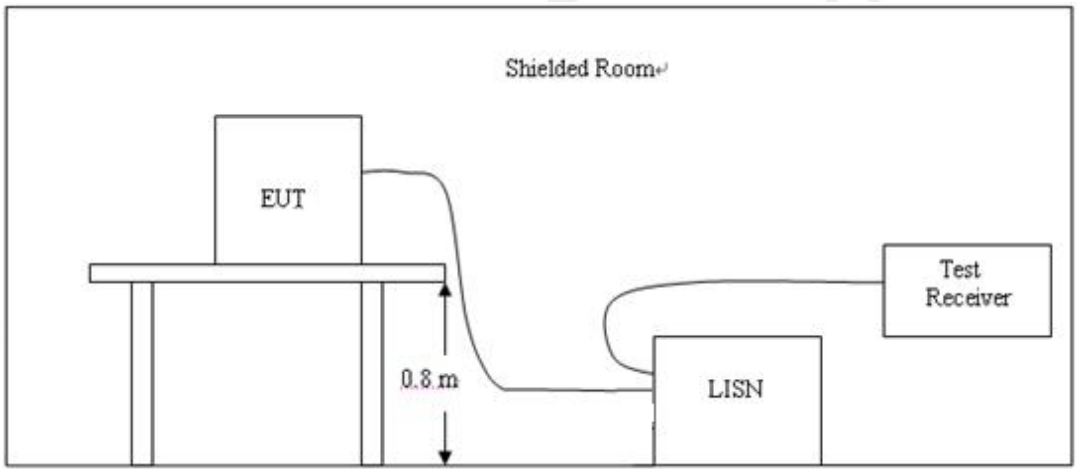
For unintentional device, according to § 15.207(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage(dB V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	79	66	66~56*	56~46*
0.50~5.00	73	60	56	46
5.00~30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



3.3 Test Procedure

1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. A wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2, Support equipment, if needed, was placed as per ANSI C63.10.
3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5, All support equipments received AC power from a second LISN, if any.
6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

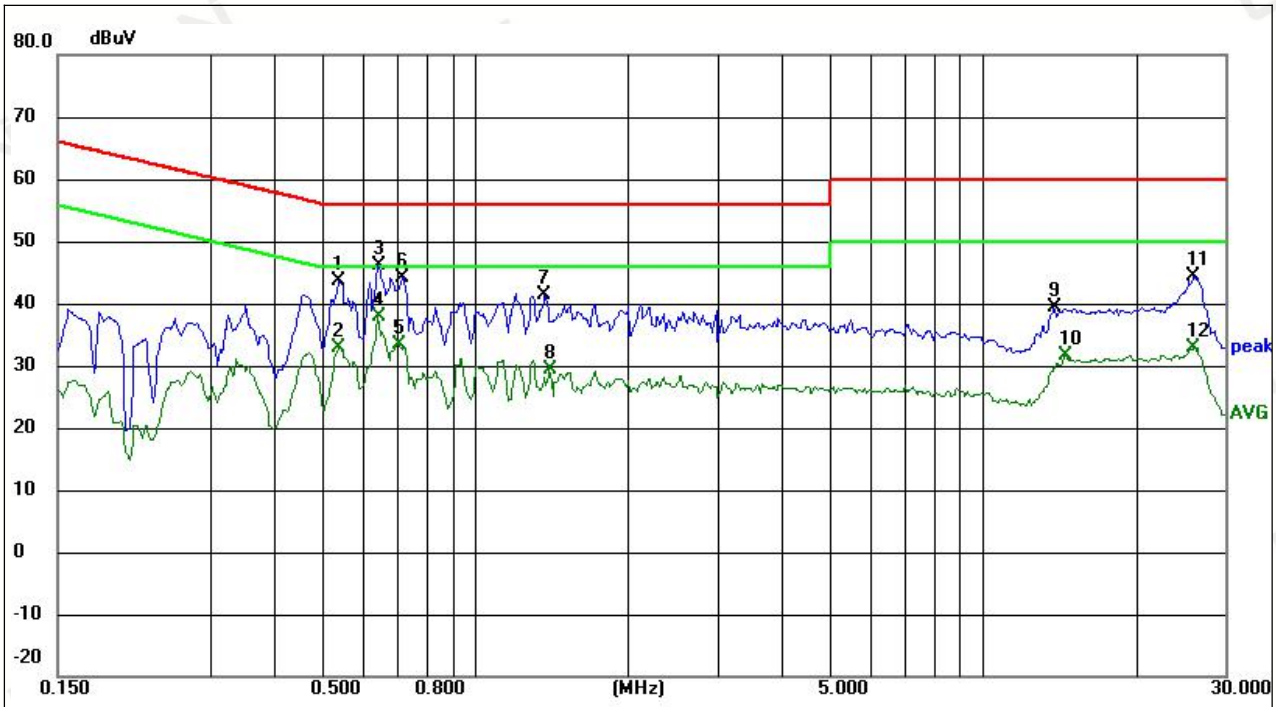
3.4 Test Result

Pass

Remark:

1. All modes were tested at AC 120V and 240V, only the worst result of AC 120V was reported.

Temperature:	24℃	Relative Humidity:	48%
Test Date:	2022-03-15	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Mode 1		

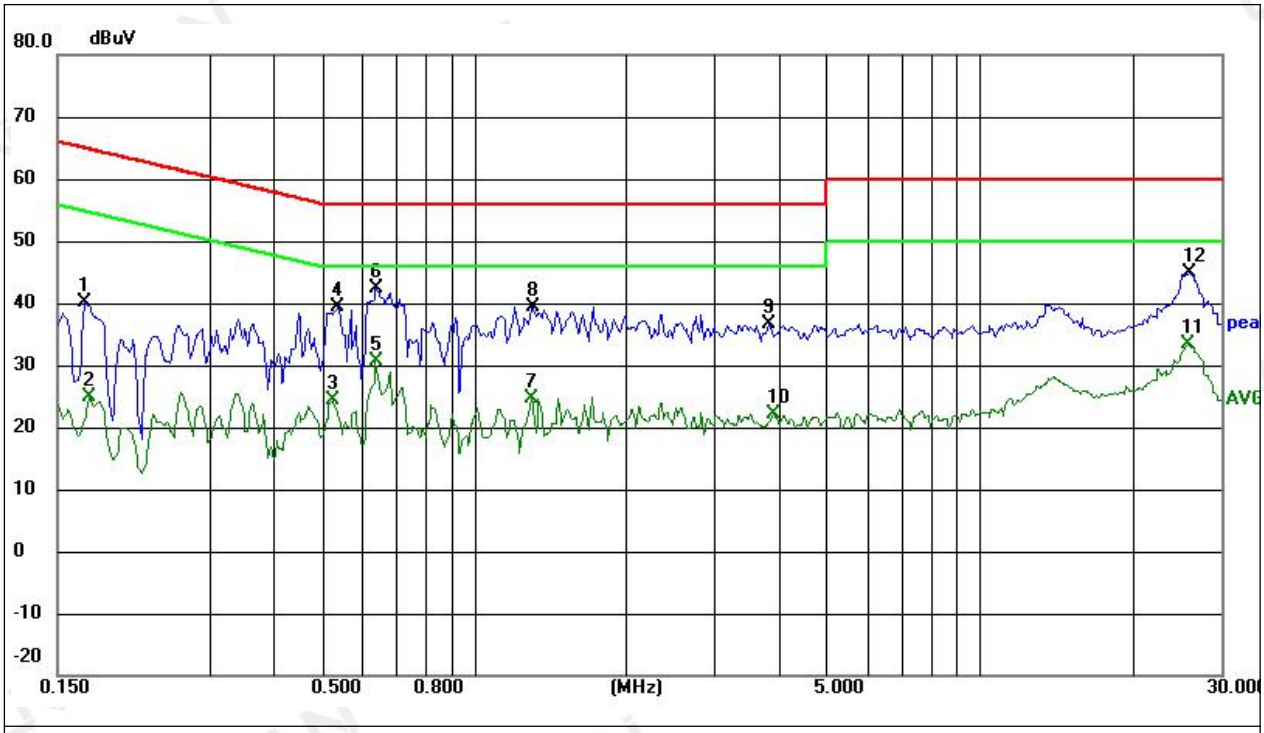


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss + Pulse limit.
3. '*' means the worst case

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.5361	33.78	9.77	43.55	56.00	-12.45	peak	P
2	0.5361	23.23	9.77	33.00	46.00	-13.00	AVG	P
3	0.6413	36.33	9.78	46.11	56.00	-9.89	peak	P
4 *	0.6413	28.05	9.78	37.83	46.00	-8.17	AVG	P
5	0.7037	23.64	9.78	33.42	46.00	-12.58	AVG	P
6	0.7194	34.27	9.78	44.05	56.00	-11.95	peak	P
7	1.3668	31.50	9.79	41.29	56.00	-14.71	peak	P
8	1.3979	19.53	9.79	29.32	46.00	-16.68	AVG	P
9	13.8263	28.98	10.33	39.31	60.00	-20.69	peak	P
10	14.5010	21.22	10.36	31.58	50.00	-18.42	AVG	P
11	26.0256	33.24	11.05	44.29	60.00	-15.71	peak	P
12	26.0256	21.79	11.05	32.84	50.00	-17.16	AVG	P

Temperature:	24℃	Relative Humidity:	48%
Test Date:	2022-03-15	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Mode 1		



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss + Pulse limit.
3. '*' means the worst case

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1695	30.38	9.77	40.15	64.98	-24.83	peak	P
2	0.1733	15.01	9.77	24.78	54.80	-30.02	AVG	P
3	0.5243	14.57	9.77	24.34	46.00	-21.66	AVG	P
4	0.5400	29.65	9.77	39.42	56.00	-16.58	peak	P
5	0.6374	20.87	9.78	30.65	46.00	-15.35	AVG	P
6 *	0.6375	32.69	9.78	42.47	56.00	-13.53	peak	P
7	1.3004	14.72	9.79	24.51	46.00	-21.49	AVG	P
8	1.3005	29.62	9.79	39.41	56.00	-16.59	peak	P
9	3.8229	26.77	9.88	36.65	56.00	-19.35	peak	P
10	3.9087	12.17	9.88	22.05	46.00	-23.95	AVG	P
11	25.7759	22.42	11.04	33.46	50.00	-16.54	AVG	P
12	25.9553	33.80	11.05	44.85	60.00	-15.15	peak	P

4 RADIATED EMISSION TEST

4.1 Radiation Limit

For unintentional device, according to § 15.209(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F (kHz)	-	Quasi-peak	300
0.490MHz-1.705MHz	24000/F (kHz)	-	Quasi-peak	30
1.705MHz-30MHz	30	-	Quasi-peak	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3
		74.0	Peak	3

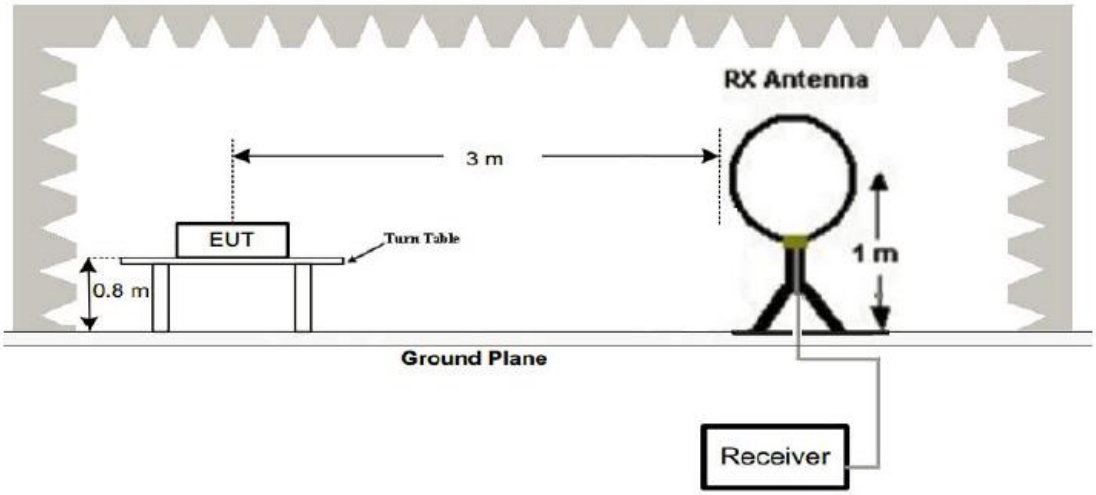
Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	Limit (dBuV/m)	Distance (m)
0.009-0.490	20log(2400/F(KHz))+40log(300/3)	3
0.490-1.705	20log(24000/F(KHz))+40log(30/3)	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

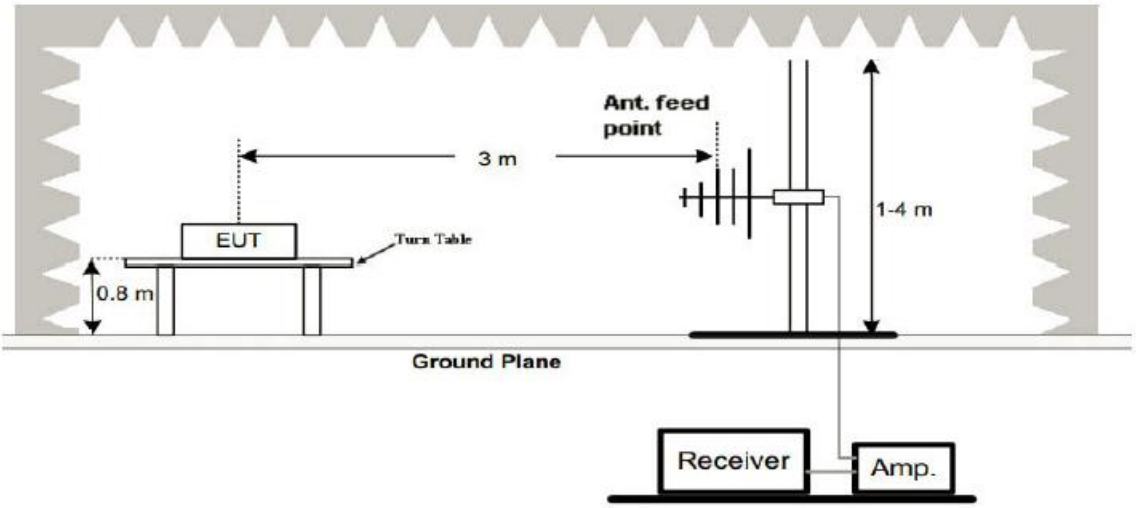
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

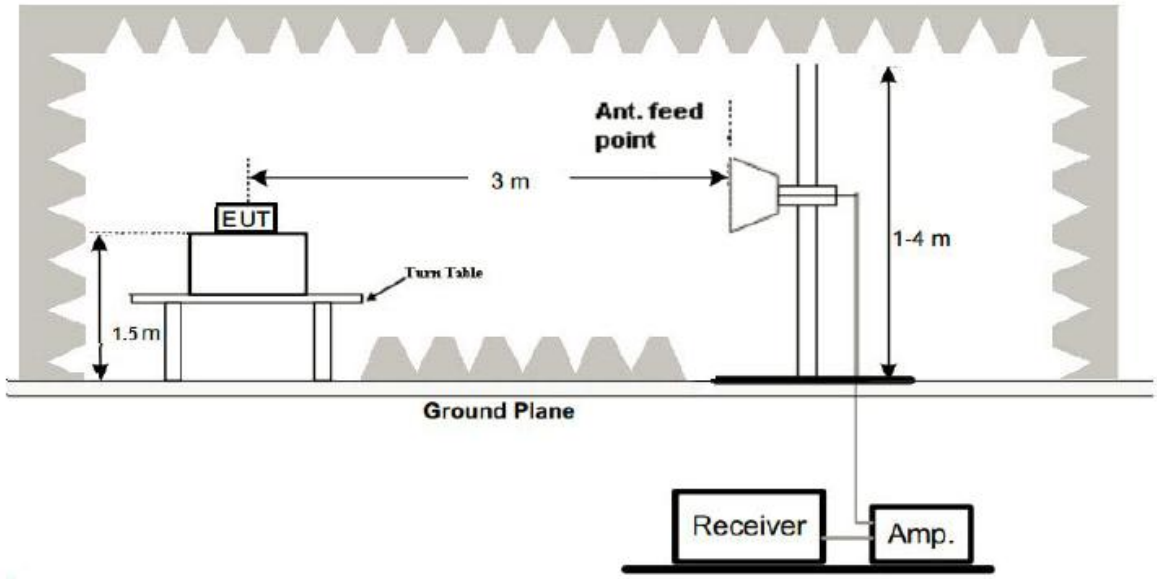
1. Radiated Emission Test-Up Frequency Below 30MHz



2. Radiated Emission Test-Up Frequency 30MHz~1GHz



3. Radiated Emission Test-Up Frequency Above 1GHz



4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:
For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result

PASS
Remark:
1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.

Below 30MHz

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	P
--	--	--	--	P

Note:

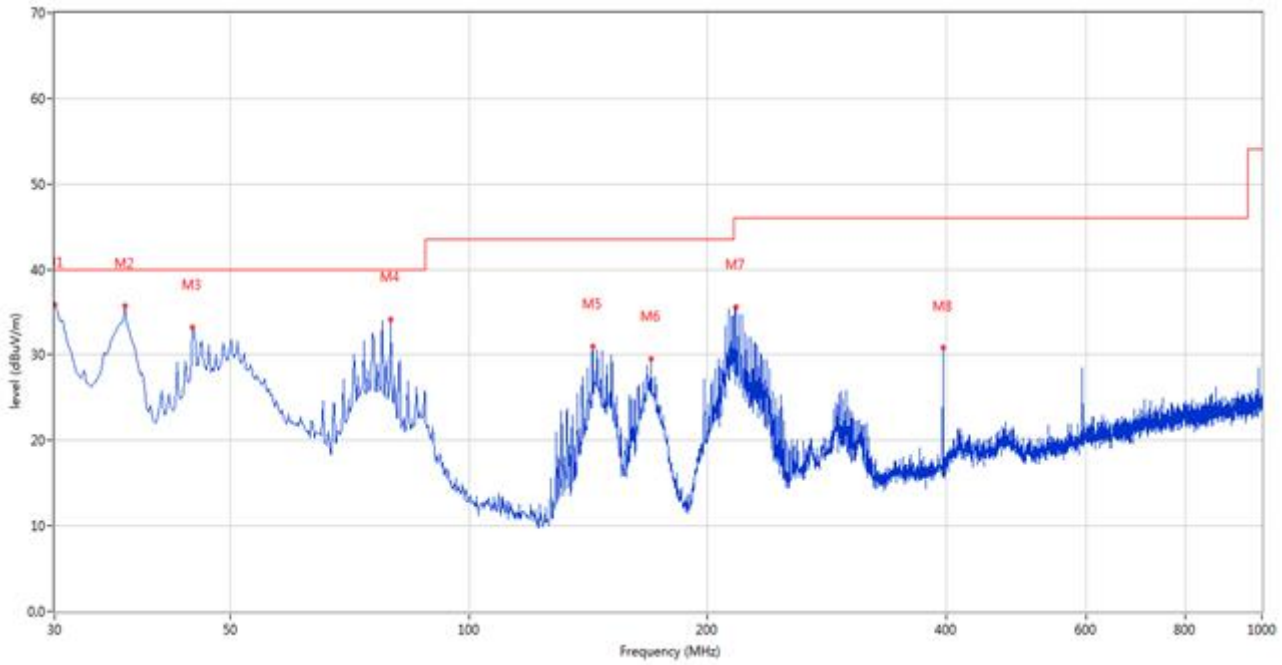
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =20 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor

Below 1GHz Test Results:

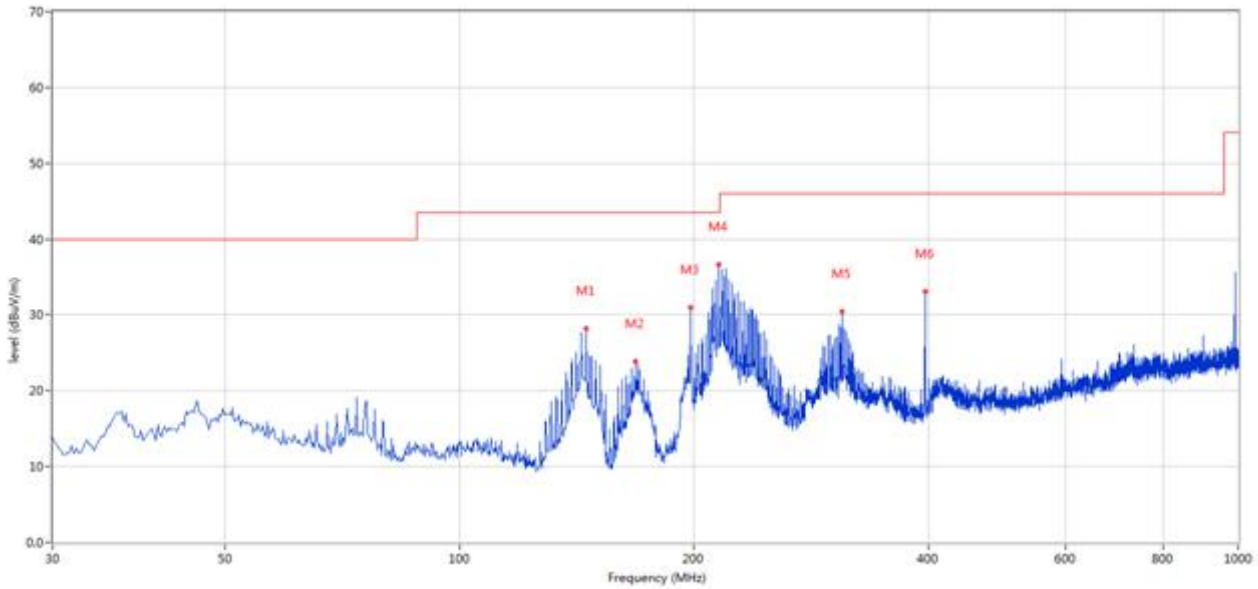
Temperature:	22℃	Relative Humidity:	48%
Test Date:	2022-03-15	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Polarization:	Vertical
Test Mode:	TX		



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1	30.000	35.91	-14.19	40.0	-4.09	Peak	Vertical	Pass
2	36.788	35.72	-13.31	40.0	-4.28	Peak	Vertical	Pass
3	44.789	33.20	-11.42	40.0	-6.80	Peak	Vertical	Pass
4	79.700	34.20	-17.45	40.0	-5.80	Peak	Vertical	Pass
5	143.219	31.02	-17.22	43.5	-12.48	Peak	Vertical	Pass
6	169.888	29.59	-16.03	43.5	-13.91	Peak	Vertical	Pass
7	216.921	35.55	-13.51	46.0	-10.45	Peak	Vertical	Pass
8	395.841	30.79	-8.70	46.0	-15.21	Peak	Vertical	Pass

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	22℃	Relative Humidity:	48%
Test Date:	2022-03-15	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Polarization:	Horizontal
Test Mode:	TX		



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1	145.401	28.22	-17.29	43.5	-15.28	Peak	Horizontal	Pass
2	167.948	23.80	-16.14	43.5	-19.70	Peak	Horizontal	Pass
3	198.010	31.04	-13.49	43.5	-12.46	Peak	Horizontal	Pass
4	215.224	36.65	-13.60	43.5	-6.85	Peak	Horizontal	Pass
5	309.533	30.49	-10.76	46.0	-15.51	Peak	Horizontal	Pass
6	395.841	33.08	-8.70	46.0	-12.92	Peak	Horizontal	Pass

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Remark：

(1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.

(2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

Above 1 GHz Test Results:

EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	25 ℃	Test Date:	2022-03-15
Pressure：	1010 hPa	Relative Humidity：	60%
Test Mode ：	TX	Test Voltage ：	DC 7.4V
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (2412 MHz)-Above 1G							
Vertical	4824.000	49.31	10.44	59.75	74	-14.25	Pk
Vertical	4824.000	28.83	10.44	39.27	54	-14.73	AV
Vertical	7236.000	37.27	12.39	49.66	74	-24.34	pk
Horizontal	4824.000	46.87	10.44	57.31	74	-16.69	pk
Horizontal	4824.000	29.41	10.44	39.85	54	-14.15	AV
Horizontal	7236.000	35.03	12.39	47.42	74	-26.58	pk
Mid Channel (2437 MHz)-Above 1G							
Vertical	4874.000	47.82	10.4	58.22	74	-15.78	pk
Vertical	4874.000	34.21	10.4	44.61	54	-9.39	AV
Vertical	7311.000	37.06	12.75	49.81	74	-24.19	Pk
Horizontal	4874.000	48.33	10.4	58.73	74	-15.27	Pk
Horizontal	4874.000	31.24	10.4	41.64	54	-12.36	AV
Horizontal	7311.000	33.06	12.75	45.81	74	-28.19	Pk
High Channel (2462 MHz)- Above 1G							
Vertical	4924.000	48.08	10.39	58.47	74	-15.53	pk
Vertical	4924.000	32.12	10.39	42.51	54	-11.49	AV
Vertical	7386.000	36.11	12.68	48.79	74	-25.21	pk
Horizontal	4924.000	46.42	10.39	56.81	74	-17.19	pk
Horizontal	4924.000	30.23	10.39	40.62	54	-13.38	AV
Horizontal	7386.000	33.28	12.68	45.96	74	-28.04	pk

Note:”802.11b” mode is the worst mode. When PK value is lower than the Average value limit, average didn't record.

Remark：
(1) Measuring frequencies from 1 GHz to the 25 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

RESTRICTED BANDS REQUIREMENTS

EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	24 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Date :	2022-03-15		
Test Mode ：	802.11b Data rate 1Mbps		
Note：	1. The transmitter was setup to transmit at the lowest channel (CH01). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was setup to transmit at the highest channel (CH11). Then the field strength was measured at 2483.5-2500 MHz. 3. The data of 2390MHz and 2483.5MHz was the worst.		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant/CF CF(dB)	Act		Limit		Note
		Peak (dBuv)	AV (dBuv)		Peak (dBuv/m)	AV (dBuv/m)	Peak (dBuv/m)	AV (dBuv/m)	
2390.00	H	45.23	--	-5.79	39.44	--	74.00	54.00	CH01
2390.00	V	43.94	--	-5.79	38.15	--	74.00	54.00	CH01
2483.50	H	43.58	--	-4.98	38.60	--	74.00	54.00	CH11
2483.50	V	43.62	--	-4.98	38.64	--	74.00	54.00	CH11

Remark：

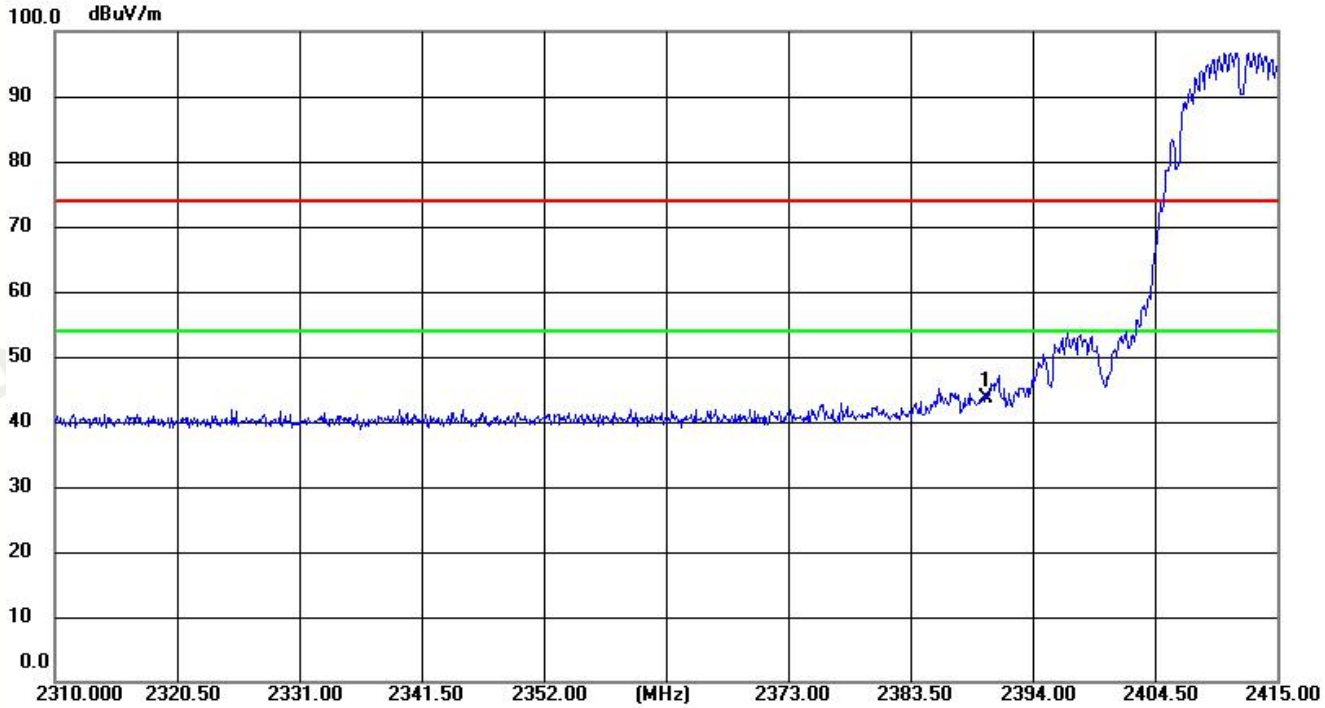
(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode

(2) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

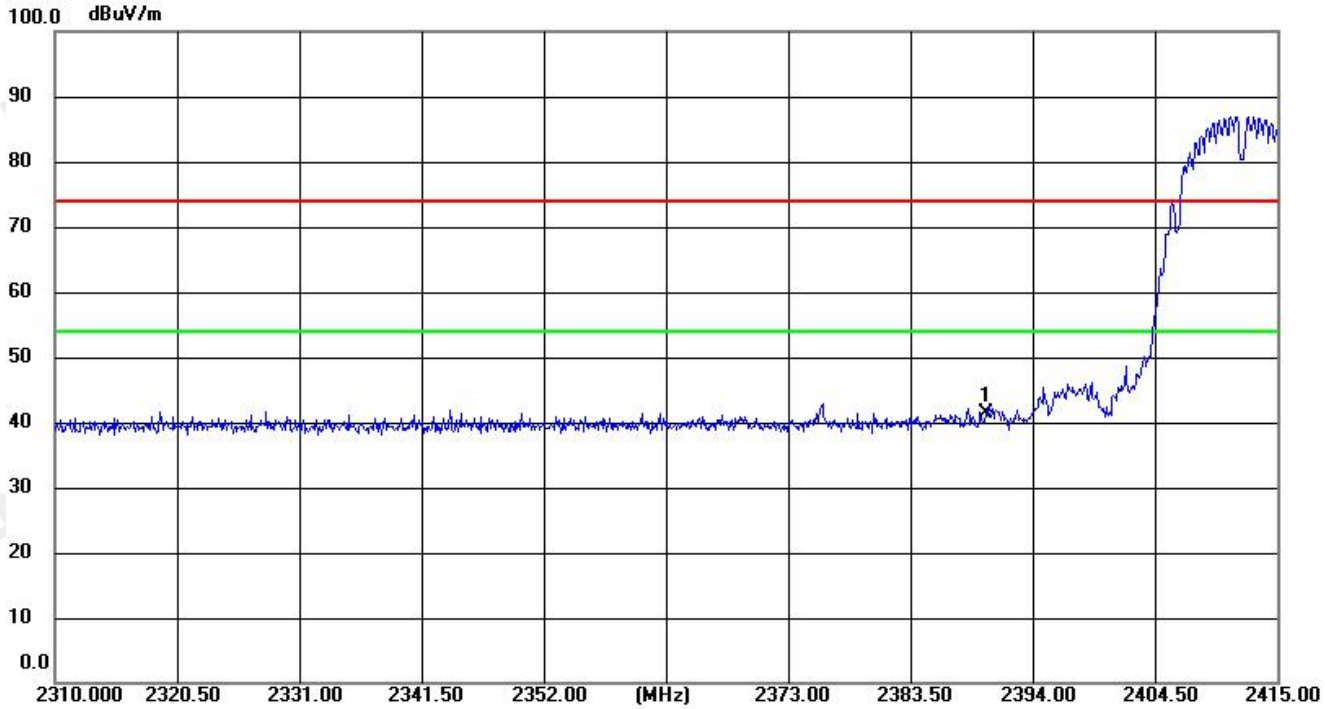
(3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

(4) Corr.Factor = Antenna Factor + Cable Loss – Pre-amplifier.

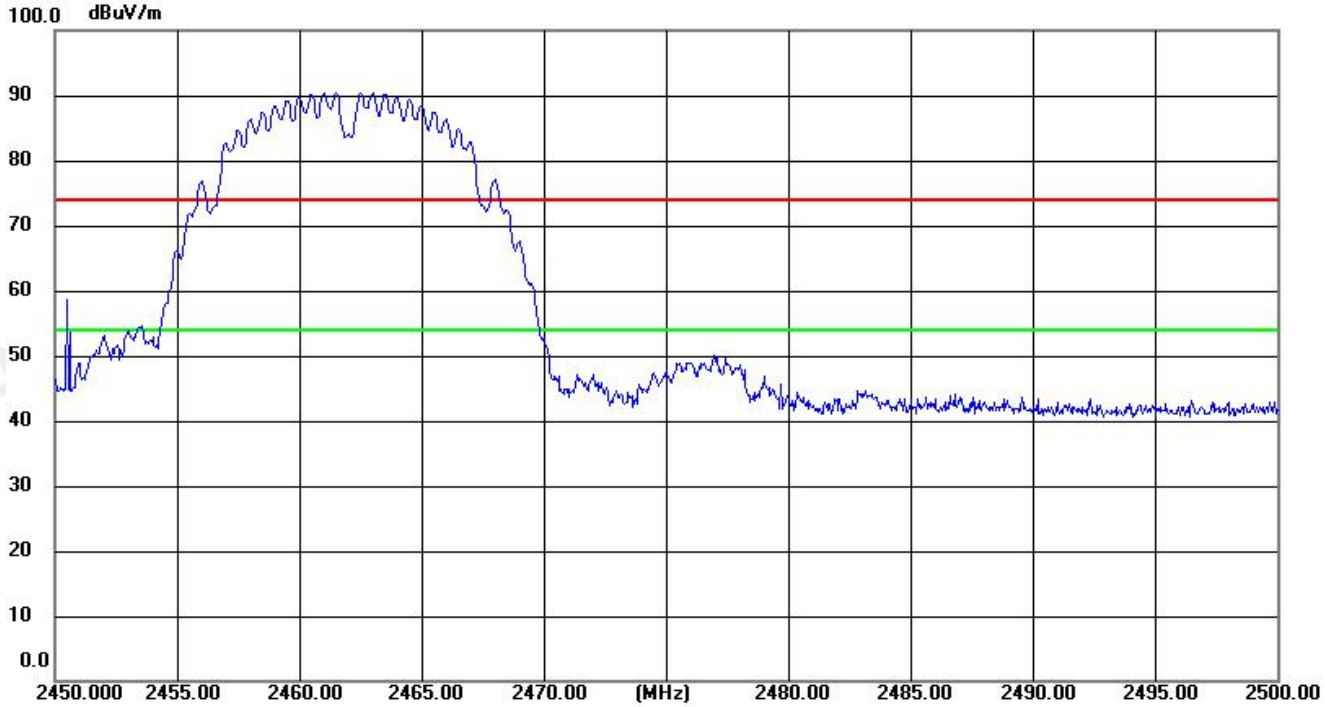
Horizontal



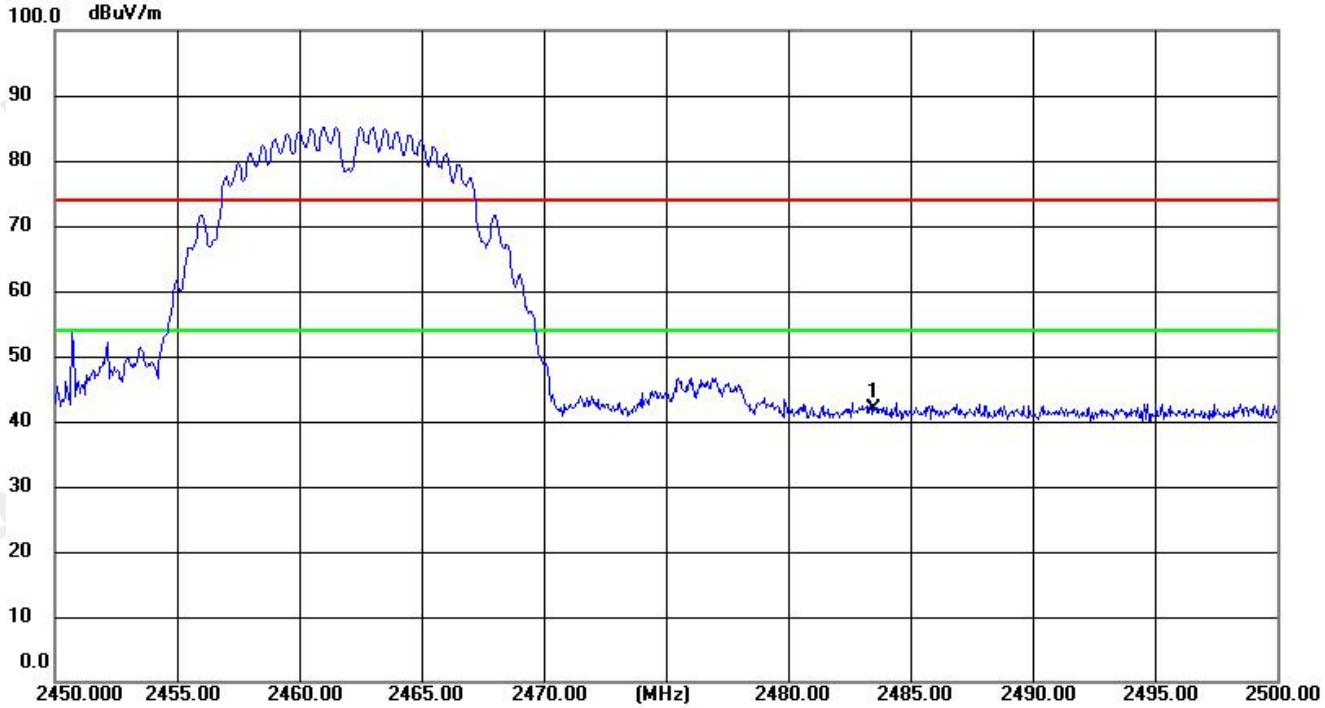
Vertical



Horizontal



Vertical



EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	24 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Date :	2022-03-15		
Test Mode ：	802.11G Data rate 6Mbps		
Note：	1. The transmitter was setup to transmit at the lowest channel (CH01). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was setup to transmit at the highest channel (CH11). Then the field strength was measured at 2483.5-2500 MHz. 3. The data of 2390MHz and 2483.5MHz was the worst.		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant/CF CF(dB)	Act		Limit		Note
		Peak (dBuv)	AV (dBuv)		Peak (dBuv/m)	AV (dBuv/m)	Peak (dBuv/m)	AV (dBuv/m)	
2390.00	H	55.43	--	-5.79	49.64	--	74.00	54.00	CH01
2390.00	V	49.63	--	-5.79	43.84	--	74.00	54.00	CH01
2483.50	H	54.72	--	-4.98	49.74	--	74.00	54.00	CH11
2483.50	V	50.36	--	-4.98	45.38	--	74.00	54.00	CH11

Remark：

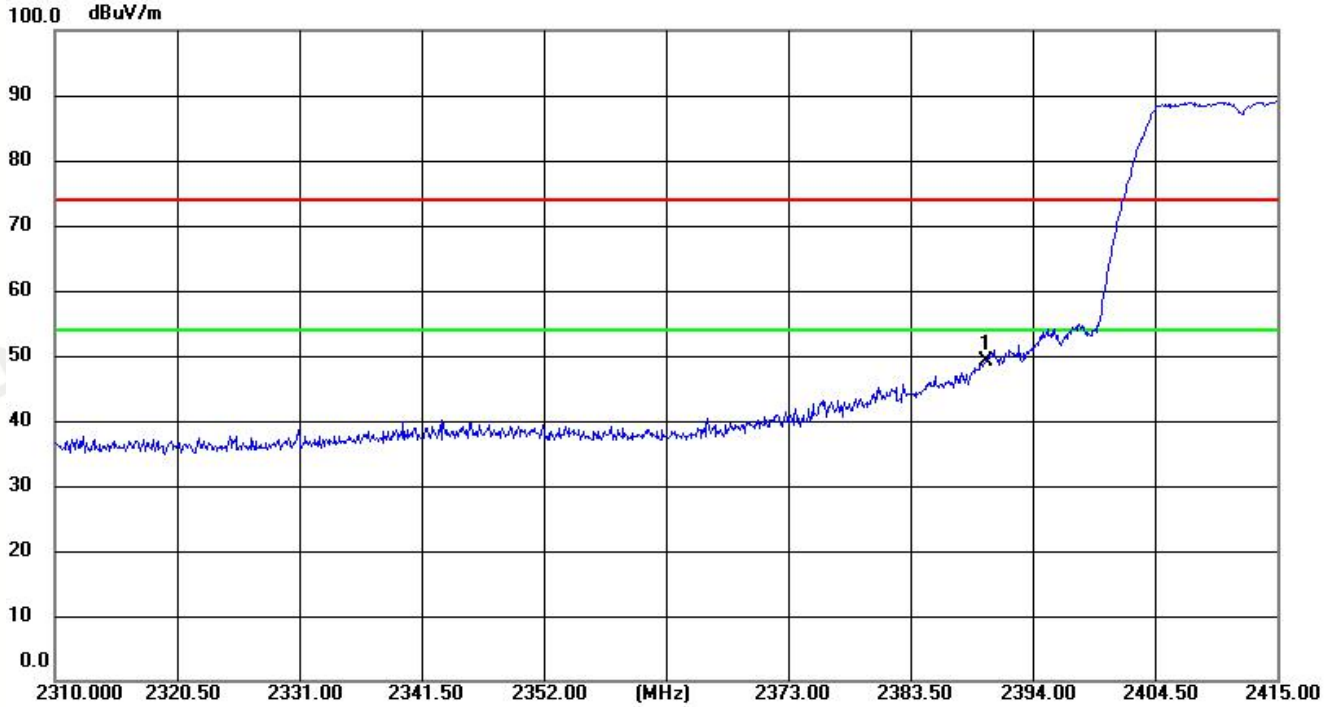
(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode

(2) EUT Orthogonal Axis：
“X” - denotes Laid on Table；”Y” - denotes Vertical Stand；”Z” - denotes Side Stand

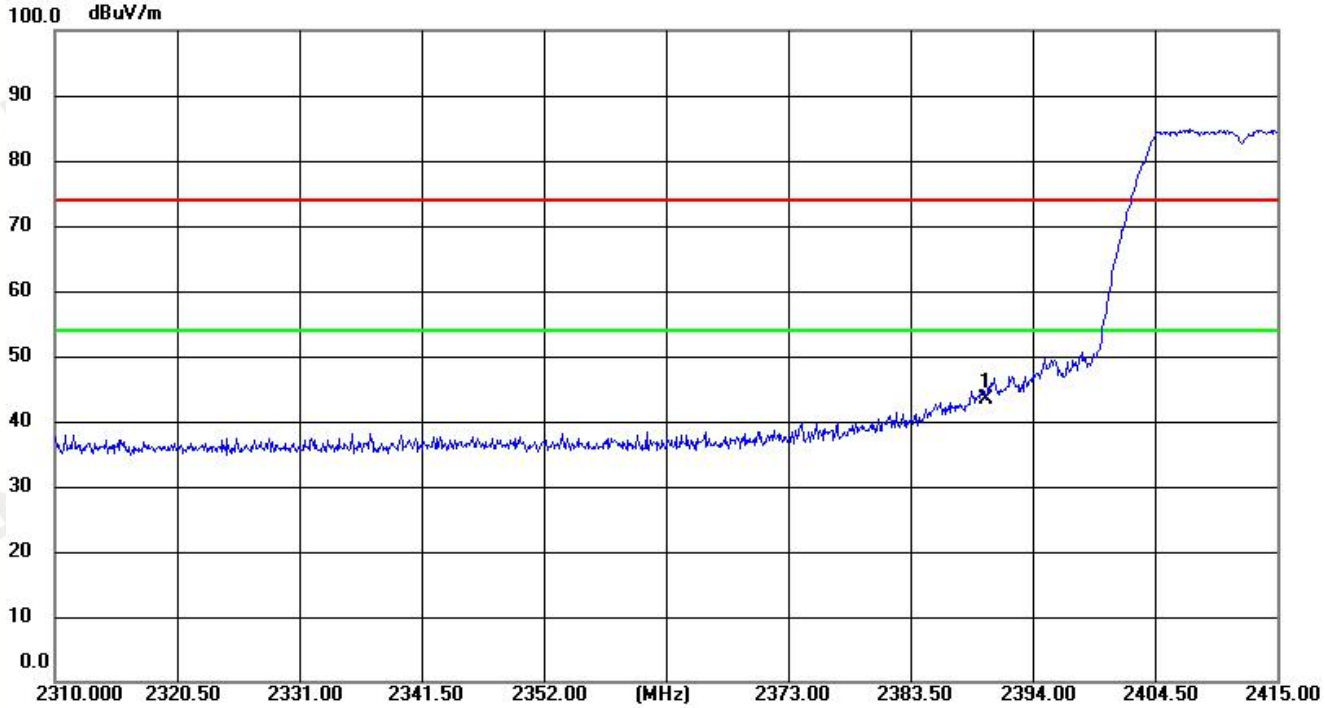
(3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

(4) Corr.Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Horizontal

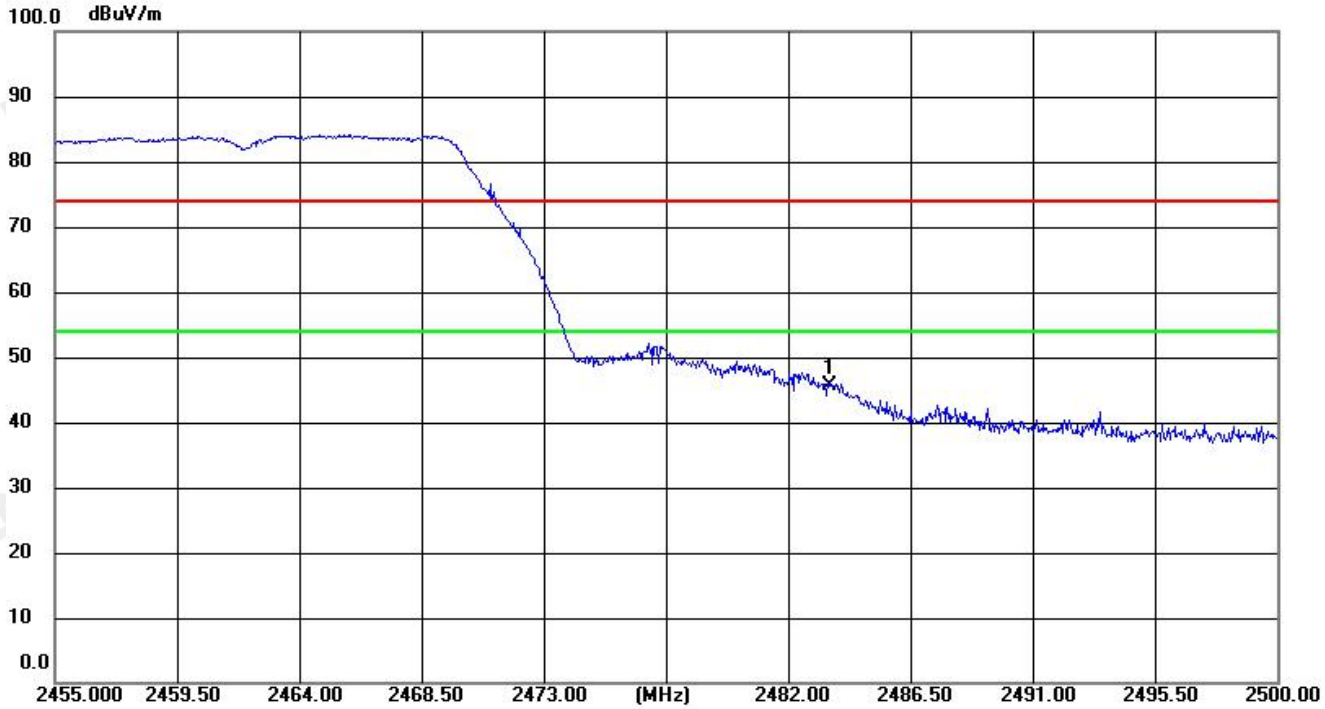


Vertical



Horizontal

Vertical



EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	24 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Date :	2022-03-15		
Test Mode ：	802.11n20 Data rate 6.5Mbps		
Note：	1. The transmitter was setup to transmit at the lowest channel (CH01). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was setup to transmit at the highest channel (CH11). Then the field strength was measured at 2483.5-2500 MHz. 3. The data of 2390MHz and 2483.5MHz was the worst.		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant/CF CF(dB)	Act		Limit		Note
		Peak (dBuv)	AV (dBuv)		Peak (dBuv/m)	AV (dBuv/m)	Peak (dBuv/m)	AV (dBuv/m)	
2390.00	H	49.85	--	-5.79	44.06	--	74.00	54.00	CH01
2390.00	V	47.28	--	-5.79	41.49	--	74.00	54.00	CH01
2483.50	H	48.62	--	-4.98	43.64	--	74.00	54.00	CH11
2483.50	V	45.25	--	-4.98	40.27	--	74.00	54.00	CH11

Remark：

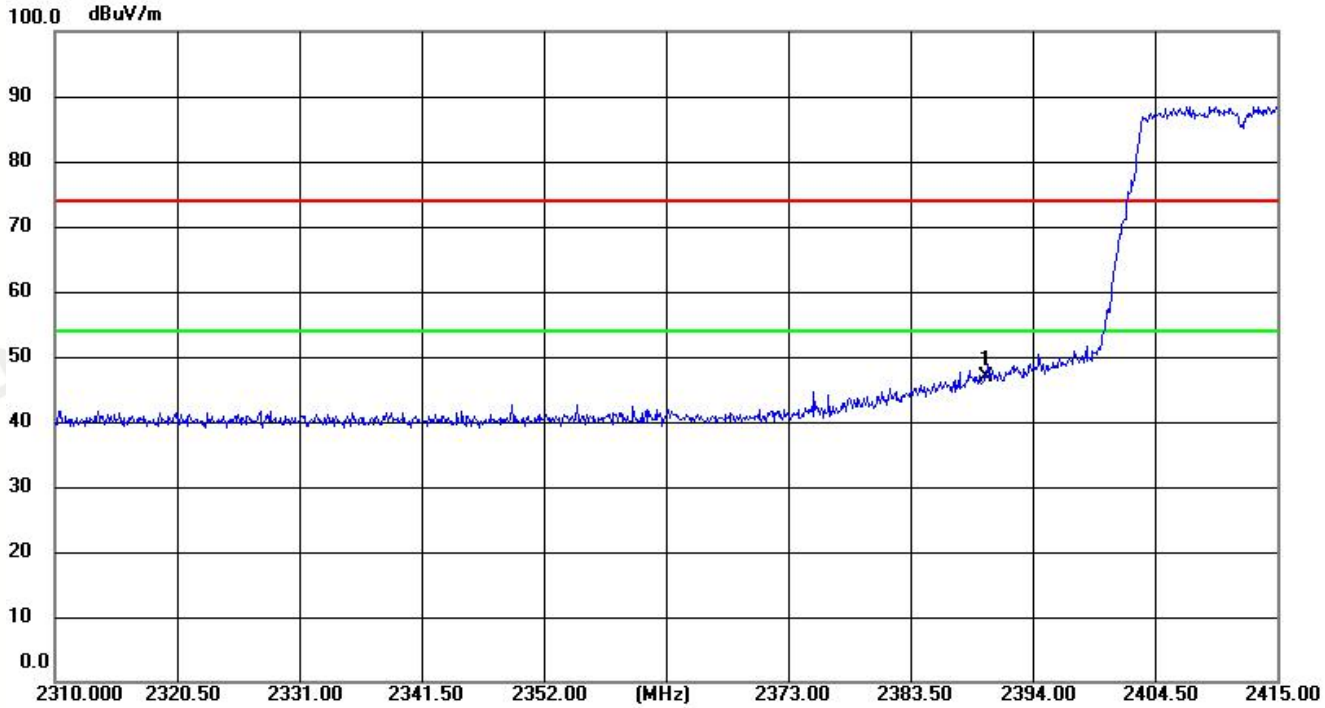
(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode

(2) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

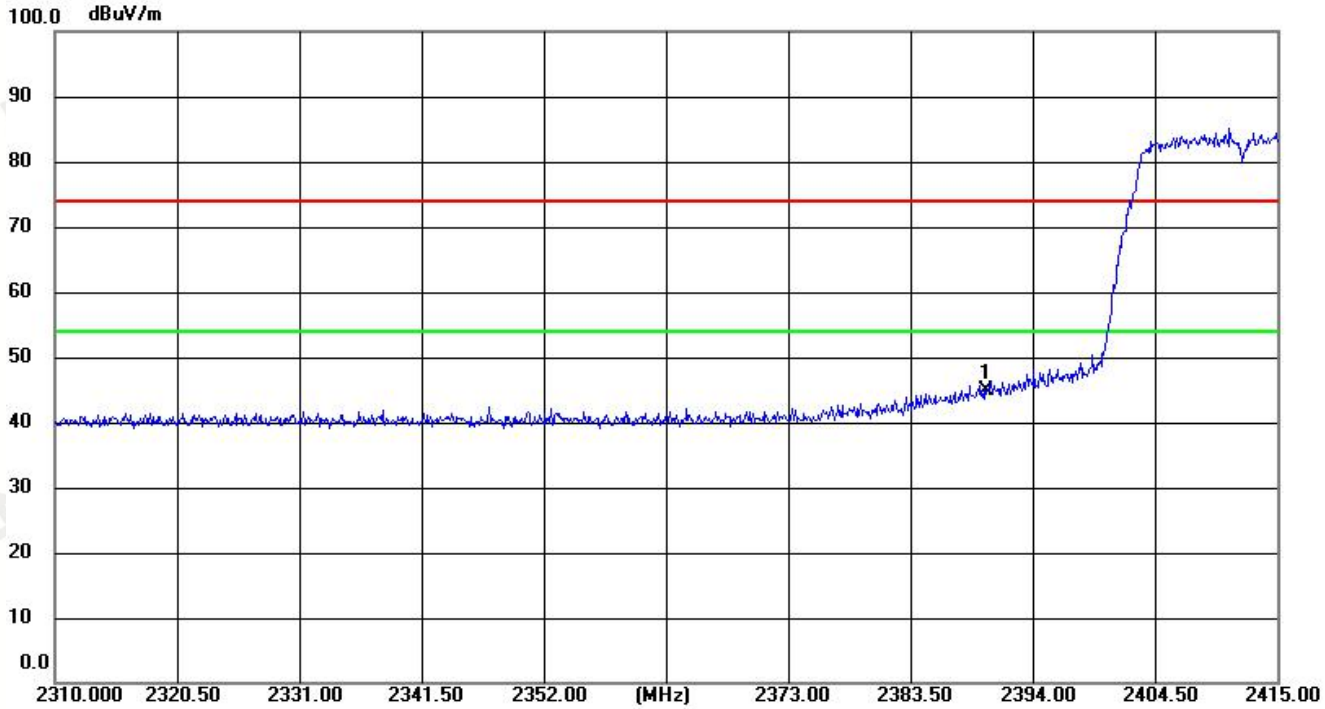
(3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

(4) Corr.Factor = Antenna Factor + Cable Loss – Pre-amplifier.

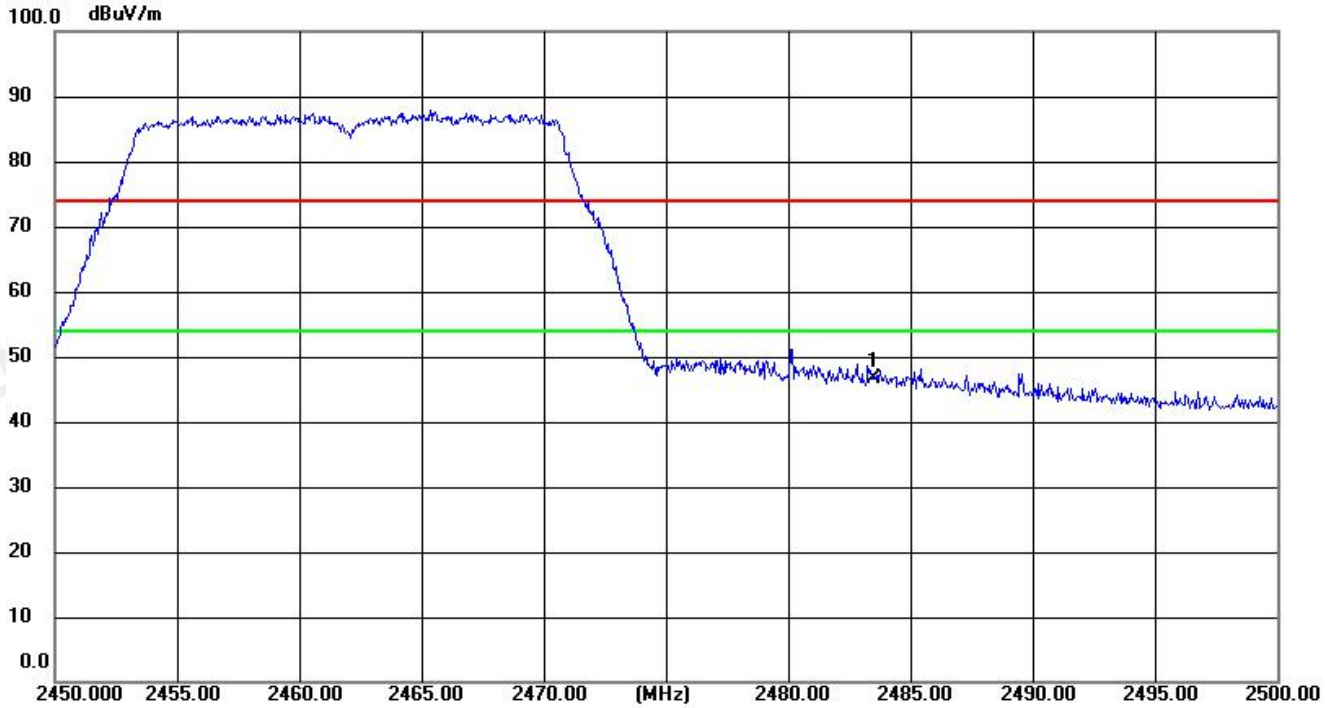
Horizontal



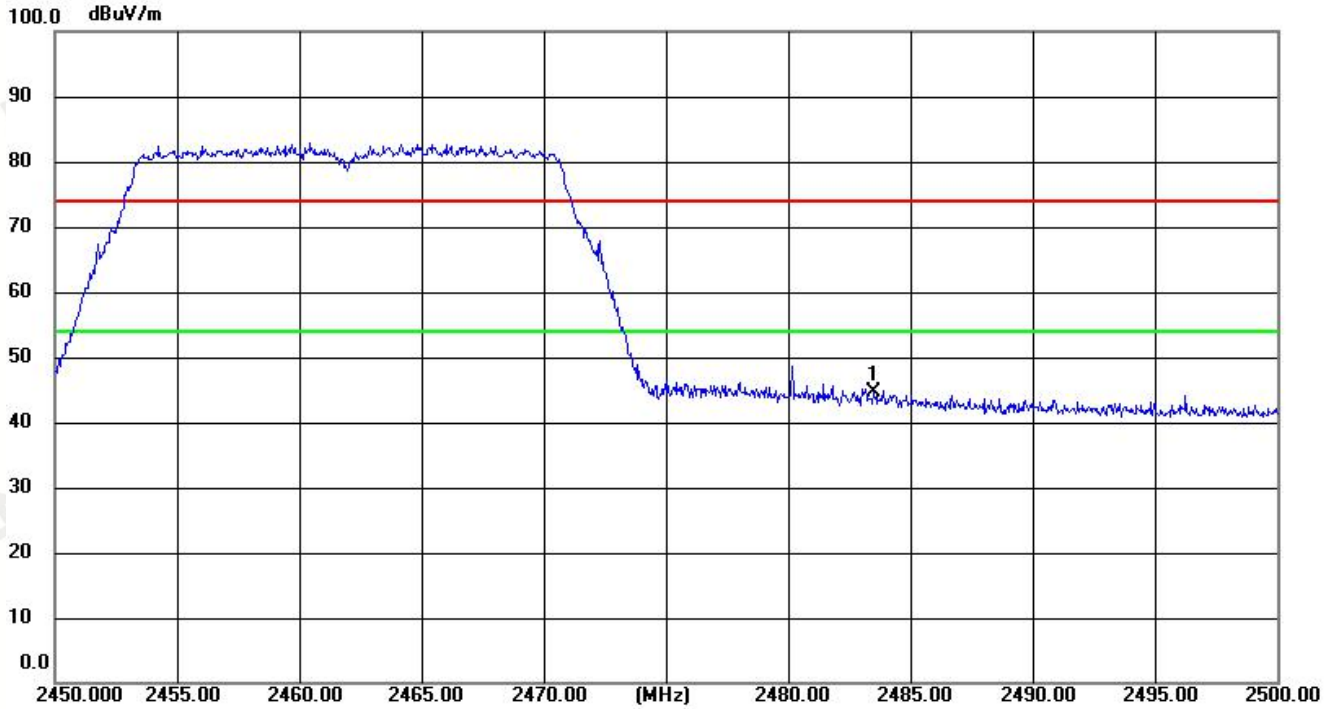
Vertical



Horizontal



Vertical



EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	24 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Date :	2022-03-15		
Test Mode ：	802.11n40 Data rate 6.5Mbps		
Note：	1. The transmitter was setup to transmit at the lowest channel (CH01). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was setup to transmit at the highest channel (CH11). Then the field strength was measured at 2483.5-2500 MHz. 3. The data of 2390MHz and 2483.5MHz was the worst.		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant/CF CF(dB)	Act		Limit		Note
		Peak (dBuv)	AV (dBuv)		Peak (dBuv/m)	AV (dBuv/m)	Peak (dBuv/m)	AV (dBuv/m)	
2390.00	H	56.73	--	-5.79	50.94	--	74.00	54.00	CH01
2390.00	V	53.37	--	-5.79	47.58	--	74.00	54.00	CH01
2483.50	H	51.17	--	-4.98	46.19	--	74.00	54.00	CH11
2483.50	V	50.84	--	-4.98	45.86	--	74.00	54.00	CH11

Remark：

(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode

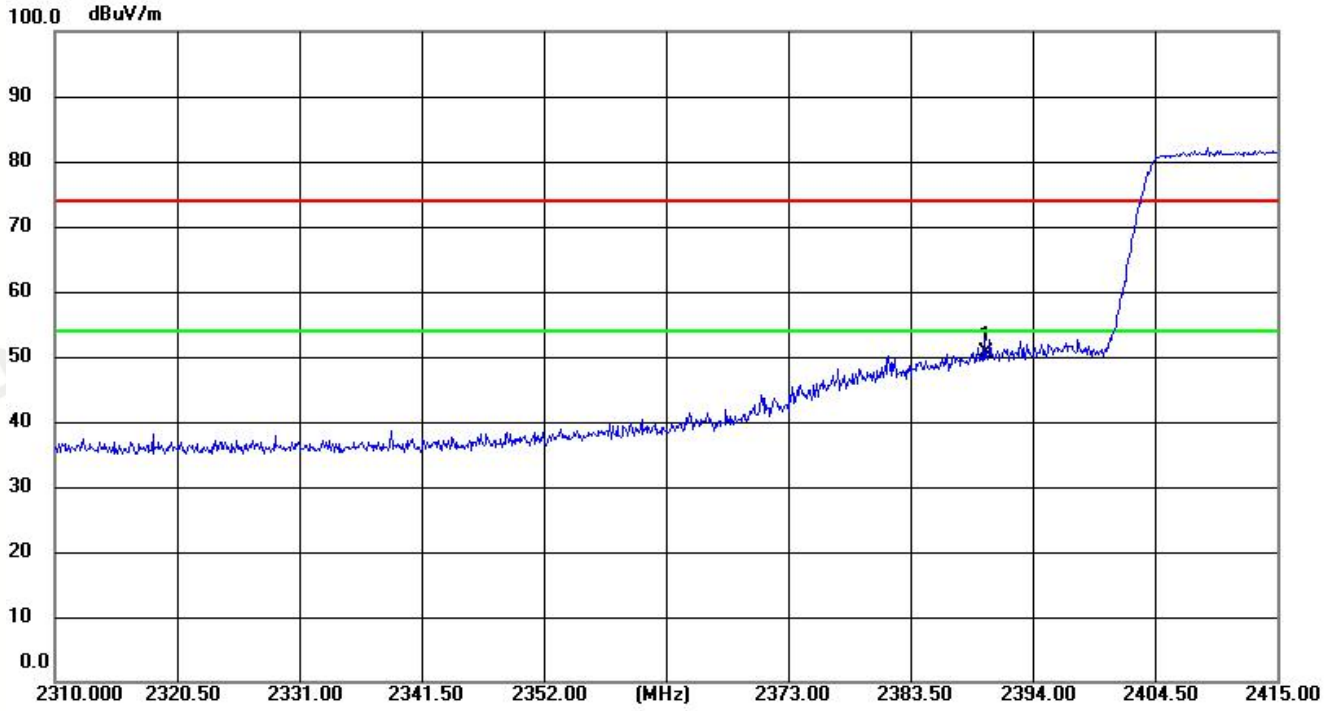
(2) EUT Orthogonal Axis：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

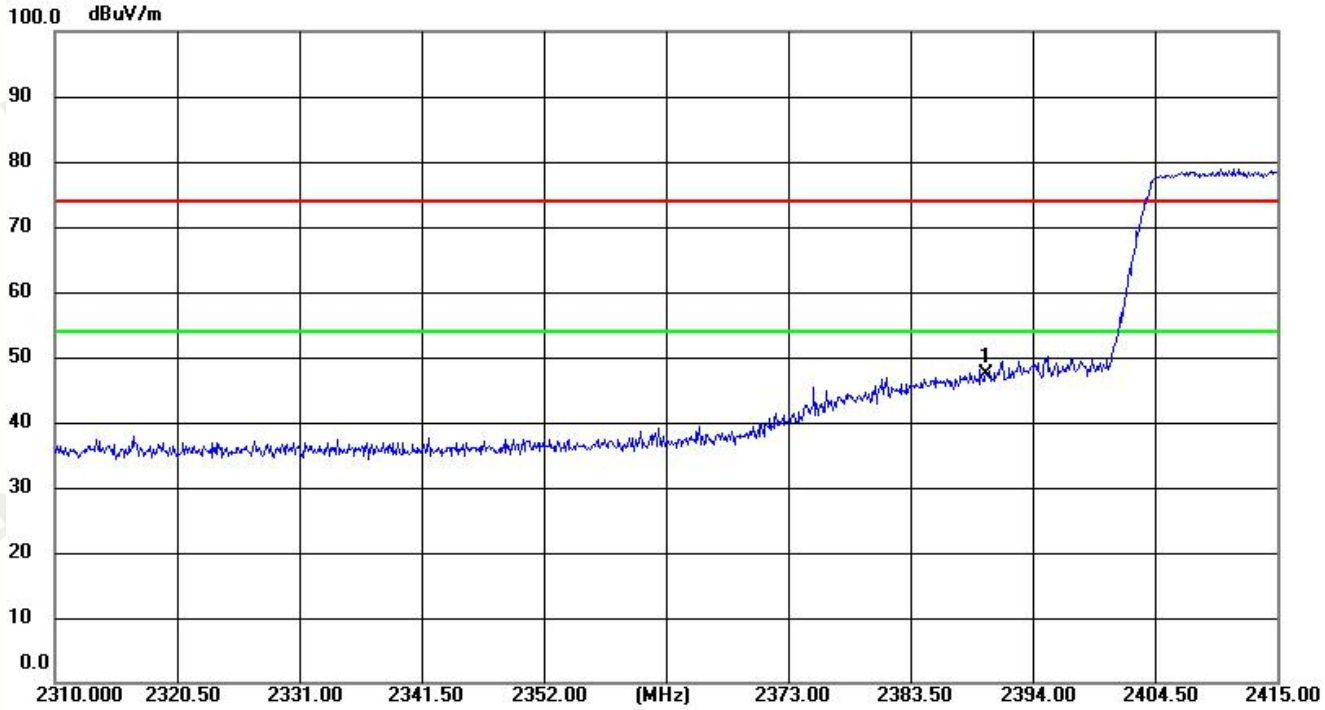
(3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

(4) Corr.Factor = Antenna Factor + Cable Loss – Pre-amplifier.

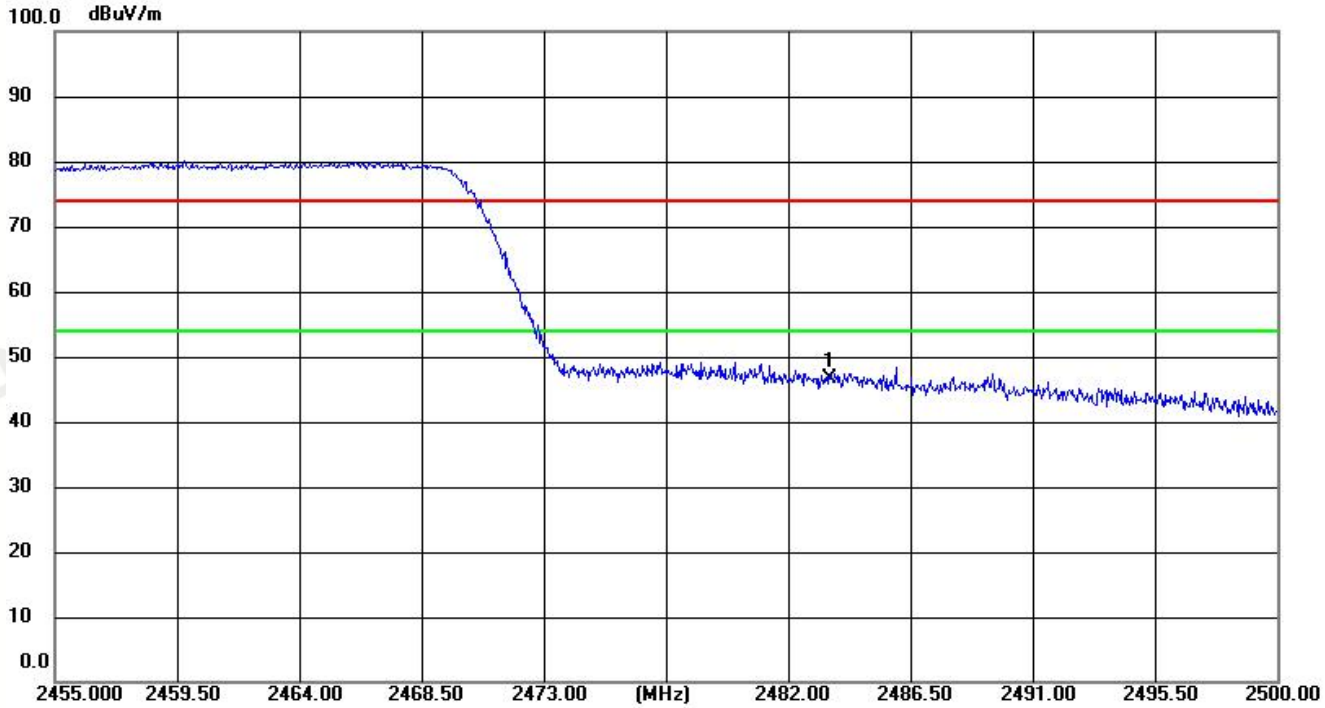
Horizontal



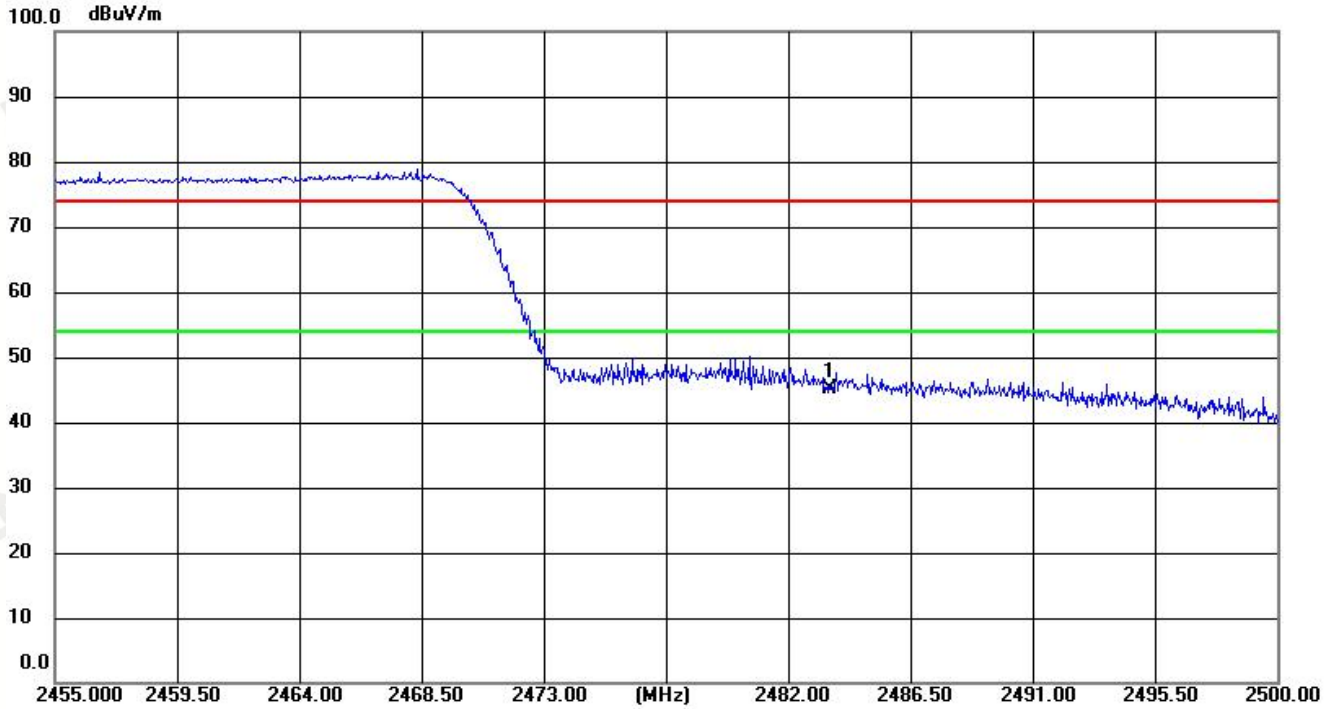
Vertical



Horizontal



Vertical



5 OCCUPIED BANDWIDTH MEASUREMENT

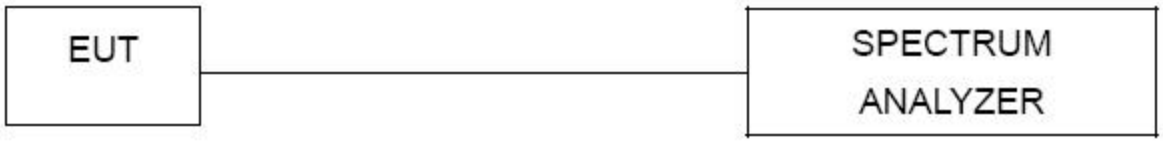
5.1 Test Limit

FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

5.2 Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
2. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = Auto, Span=6MHz.

5.3 TEST SETUP



5.4 Test Result

PASS

EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Mode ：	CH01 / CH06 /CH11(802.11b Data rate 1Mbps)		
Test Date :	2022-03-03		

Frequency	6dB Bandwidth (MHz)	Limit （kHz）	Result
2412 MHz	10.14	≧500	Pass
2437 MHz	10.13	≧500	Pass
2462 MHz	10.13	≧500	Pass

CH01


Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:PULSE
ALIGN OFF
02:05:53 AM Mar 03, 2022
Ref Value 20.00 dBm
#IFGain:Low
Center Freq: 2.412000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.412 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
15.129 MHz
Total Power
23.9 dBm
Transmit Freq Error
-37.839 kHz
OBW Power
99.00 %
x dB Bandwidth
10.14 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

CH06


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
#IFGain:Low
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
02:06:16 AM Mar 03, 2022
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 20.00 dBm
Log
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
15.079 MHz
Total Power
22.8 dBm
Transmit Freq Error
-26.604 kHz
OBW Power
99.00 %
x dB Bandwidth
10.13 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

CH11


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.462000000 GHz
#IFGain:Low
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
02:06:49 AM Mar 03, 2022
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 20.00 dBm
Log
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
15.061 MHz
Total Power
22.3 dBm
Transmit Freq Error
-26.745 kHz
OBW Power
99.00 %
x dB Bandwidth
10.13 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Mode ：	CH01 / CH06 / CH11(802.11g Data rate 6Mbps)		
Test Date :	2022-03-03		

Frequency	6dB Bandwidth (MHz)	Limit （kHz）	Result
2412 MHz	16.37	≧500	Pass
2437 MHz	16.40	≧500	Pass
2462 MHz	16.37	≧500	Pass

CH01

CH06


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
01:58:43 AM Mar 03, 2022
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.491 MHz
Total Power
20.1 dBm
Transmit Freq Error
-13.723 kHz
OBW Power
99.00 %
x dB Bandwidth
16.40 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

CH11

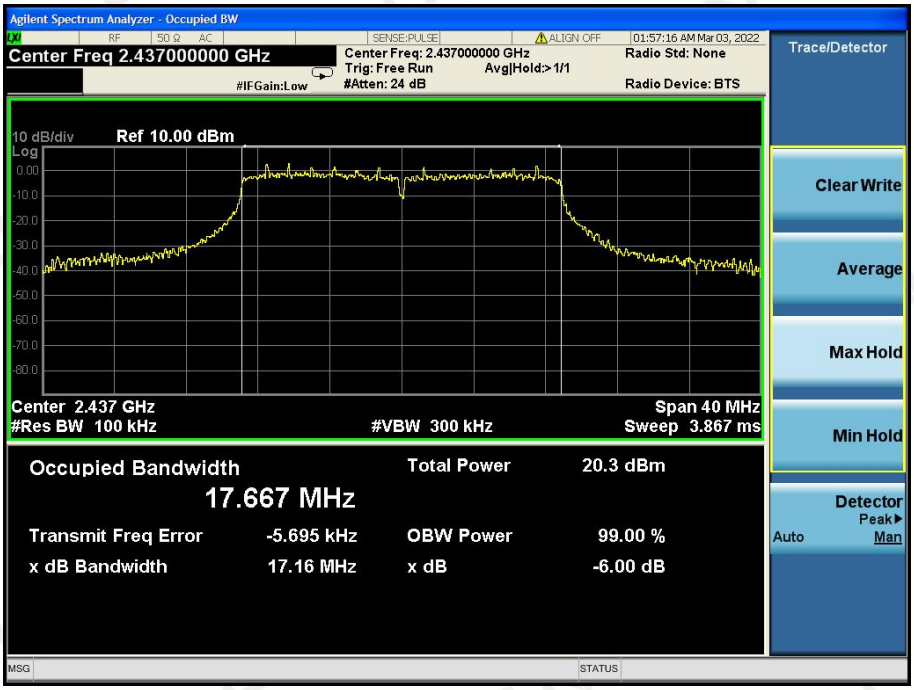

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
01:58:16 AM Mar 03, 2022
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.487 MHz
Total Power
16.3 dBm
Transmit Freq Error
-14.524 kHz
OBW Power
99.00 %
x dB Bandwidth
16.37 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
File <Screen_0010.png> saved
STATUS

EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Mode ：	CH01 / CH06/ CH11(802.11n20 Data rate 6.5Mbps)		
Test Date :	2022-03-03		

Frequency	6dB Bandwidth (MHz)	Limit （kHz）	Result
2412 MHz	17.31	≧500	Pass
2437 MHz	17.16	≧500	Pass
2462 MHz	17.31	≧500	Pass

CH01

CH06


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
#IFGain:Low
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
01:57:16 AM Mar 03, 2022
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
17.667 MHz
Total Power
20.3 dBm
Transmit Freq Error
-5.695 kHz
OBW Power
99.00 %
x dB Bandwidth
17.16 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

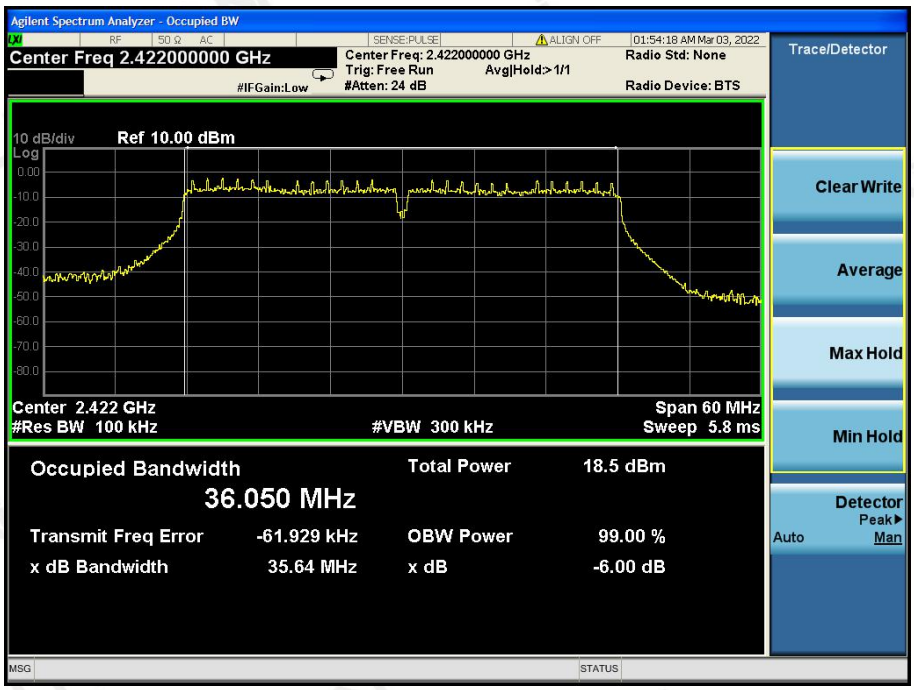
CH11


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.462000000 GHz
#IFGain:Low
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
01:57:44 AM Mar 03, 2022
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
17.670 MHz
Total Power
19.8 dBm
Transmit Freq Error
-2.329 kHz
OBW Power
99.00 %
x dB Bandwidth
17.31 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

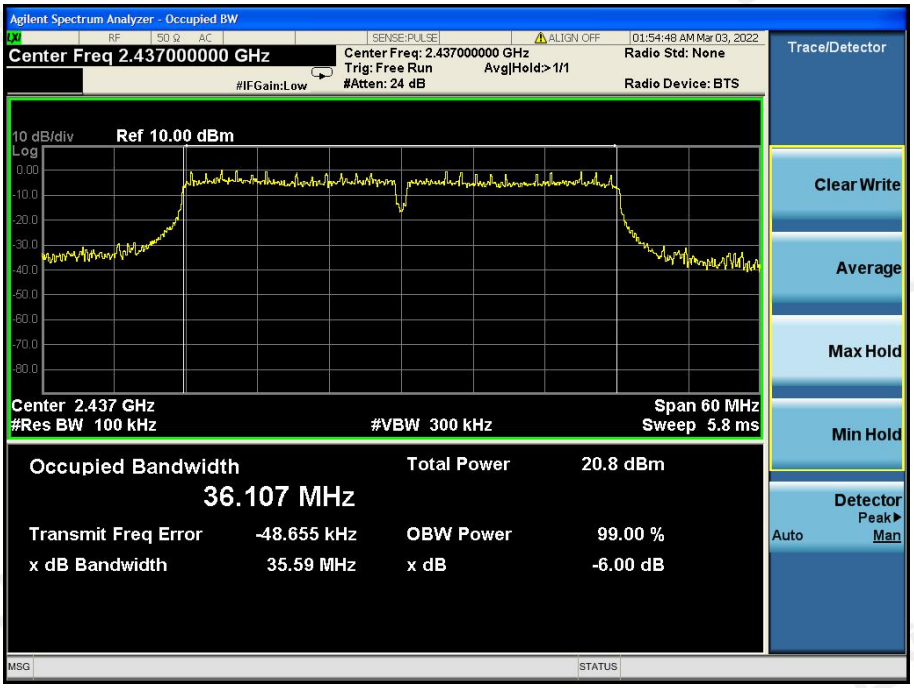
EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Mode ：	CH03 / CH06/ CH09(802.11n40 Data rate 13.5Mbps)		
Test Date :	2022-03-03		

Frequency	6dB Bandwidth (MHz)	Limit （kHz）	Result
2422 MHz	35.64	≧500	Pass
2437 MHz	35.59	≧500	Pass
2452 MHz	35.64	≧500	Pass

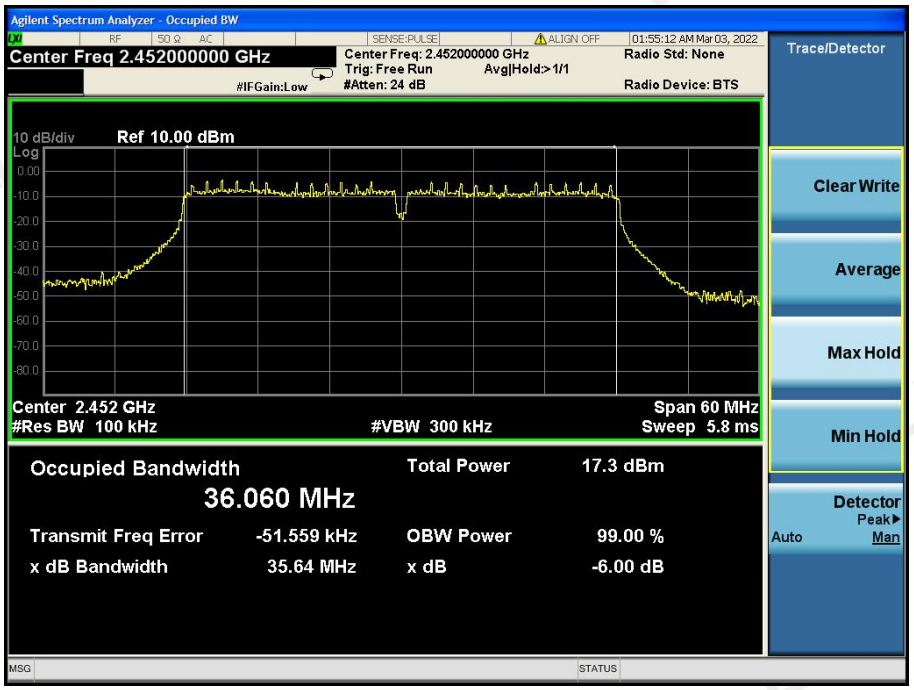
CH03



CH06


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
#IFGain:Low
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
Radio Std: None
Radio Device: BTS
01:54:48 AM Mar 03, 2022
Trace/Detector
10 dB/div
Log
Ref 10.00 dBm
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
Occupied Bandwidth
36.107 MHz
Total Power
20.8 dBm
Transmit Freq Error
-48.655 kHz
OBW Power
99.00 %
x dB Bandwidth
35.59 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

CH09


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.452000000 GHz
#IFGain:Low
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#Atten: 24 dB
Radio Std: None
Radio Device: BTS
01:55:12 AM Mar 03, 2022
Trace/Detector
10 dB/div
Log
Ref 10.00 dBm
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
Occupied Bandwidth
36.060 MHz
Total Power
17.3 dBm
Transmit Freq Error
-51.559 kHz
OBW Power
99.00 %
x dB Bandwidth
35.64 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

6 POWER SPECTRAL DENSITY

6.1 TEST LIMIT

FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3kHz)	2400-2483.5	PASS

6.2 TEST PROCEDURE

1. The EUT was directly connected to the spectrum analyzer.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.247: RBW=3kHz, VBW=10kHz.
4. Set detected by the spectrum analyzer with peak detector.

6.3 TEST SETUP

6.4 TEST RESULT

EUT：	ALL IN ONE	Model Name ：	1786AIO
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1010 hPa	Test Voltage ：	DC 7.4V
Test Mode ：	CH01 /CH06 /CH11 (802.11b Data rate 1Mbps)		
Test Date :	2022-03-03		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2412 MHz	-6.553	8
CH06	2437 MHz	-8.519	8
CH11	2462 MHz	-8.578	8

CH01


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.411437230000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 14 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
03:11:41 AM Mar 03, 2022
Ref Offset 6.5 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.411 437 GHz
-6.553 dBm
Center 2.412000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 15.21 MHz
Sweep 1.604 s (1001 pts)
Trace/Detector
Select Trace
1
Clear Write
Trace Average
Max Hold
Min Hold
View Blank
Trace On
More
1 of 3
MSG
STATUS

CH06


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.437471510000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 14 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
03:12:11 AM Mar 03, 2022
Ref Offset 6.5 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.437 472 GHz
-8.519 dBm
Center 2.437000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 15.21 MHz
Sweep 1.604 s (1001 pts)
Trace/Detector
Select Trace
1
Clear Write
Trace Average
Max Hold
Min Hold
View Blank
Trace On
More
1 of 3
MSG
STATUS