

FCC Test Report

Report No.: RF160705C01-3

FCC ID: PY7-93041M

Received Date: Jul. 05, 2016

Test Date: Jul. 16, 2016 ~ Aug. 05, 2016

Issued Date: Aug. 11, 2016

Applicant: Sony Mobile Communications Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results.....	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes.....	8
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Duty Cycle of Test Signal	11
3.4 Description of Support Units	12
3.4.1 Configuration of System under Test	12
3.5 General Description of Applied Standards.....	12
4 Test Types and Results	13
4.1 Radiated Emission and Bandedge Measurement	13
4.1.1 Limits of Radiated Emission and Bandedge Measurement	13
4.1.2 Test Instruments	14
4.1.3 Test Procedures.....	15
4.1.4 Deviation from Test Standard	15
4.1.5 Test Set Up	16
4.1.6 EUT Operating Conditions.....	16
4.1.7 Test Results	17
4.2 Conducted Emission Measurement.....	73
4.2.1 Limits of Conducted Emission Measurement	73
4.2.2 Test Instruments	73
4.2.3 Test Procedures.....	74
4.2.4 Deviation from Test Standard	74
4.2.5 Test Setup.....	74
4.2.6 EUT Operating Conditions.....	74
4.2.7 Test Results	75
4.3 6 dB Bandwidth Measurement.....	77
4.3.1 Limits of 6 dB Bandwidth Measurement.....	77
4.3.2 Test Setup.....	77
4.3.3 Test Instruments	77
4.3.4 Test Procedure	77
4.3.5 Deviation from Test Standard	77
4.3.6 EUT Operating Conditions.....	77
4.3.7 Test Result	78
4.4 Conducted Output Power Measurement	80
4.4.1 Limits of Conducted Output Power Measurement.....	80
4.4.2 Test Setup.....	80
4.4.3 Test Instruments	80
4.4.4 Test Procedures.....	80
4.4.5 Deviation from Test Standard	80
4.4.6 EUT Operating Conditions.....	80
4.4.7 Test Results	81
4.5 Power Spectral Density Measurement	82
4.5.1 Limits of Power Spectral Density Measurement.....	82
4.5.2 Test Setup.....	82
4.5.3 Test Instruments	82
4.5.4 Test Procedure	82
4.5.5 Deviation from Test Standard	82
4.5.6 EUT Operating Condition	82

4.5.7 Test Results	83
4.6 Conducted Out of Band Emission Measurement	85
4.6.1 Limits of Conducted Out of Band Emission Measurement.....	85
4.6.2 Test Setup.....	85
4.6.3 Test Instruments	85
4.6.4 Test Procedure	85
4.6.5 Deviation from Test Standard	85
4.6.6 EUT Operating Condition	85
4.6.7 Test Results	86
5 Pictures of Test Arrangements.....	95
Appendix – Information on the Testing Laboratories	96

Release Control Record

Issue No.	Description	Date Issued
RF160705C01-3	Original Release	Aug. 11, 2016

1 Certificate of Conformity

Product: Mobile Phone

Brand: Sony

Sample Status: Identical Prototype

Applicant: Sony Mobile Communications Inc.

Test Date: Jul. 16, 2016 ~ Aug. 05, 2016

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Gina Liu , **Date:** Aug. 11, 2016
Gina Liu / Specialist

Approved by : Stanley Wu , **Date:** Aug. 11, 2016
Stanley Wu / Assistant Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -18.41 dB at 0.20511 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.02 dB at 2484 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Mobile Phone
Brand	Sony
Status of EUT	Identical Prototype
Power Supply Rating	3.8Vdc (Embedded Battery) 5Vdc or 9Vdc or 12Vdc (Adapter)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
Operating Frequency	2412 ~ 2472 MHz
Number of Channel	13 for 802.11b, 802.11g, 802.11n (HT20)
Output Power	261.22 mW
Antenna Type	PIFA antenna with -2.7 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX

2. The EUT contains following accessory devices.

Product	Brand	Model	Type	Description
Adapter	Sony	UCH12	AC-0051	I/P: 100- 240Vac, 400mA, 50~60 Hz,
Earphone	Sony	MH410c	AG-1100	1.5m non-shielded cable w/o core
USB Cable	Sony	UCB20	AI-0160	0.95m shielded cable w/o core

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

13 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz **RE<1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
NOTE: “-” means no effect.

Radiated Emission Test (Above 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	MCS0

Radiated Emission Test (Below 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	13	DSSS	DBPSK	1.0

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	13	DSSS	DBPSK	1.0

Bandedge Measurement:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 11, 12, 13	OFDM	BPSK	MCS0

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	MCS0

Test Condition:

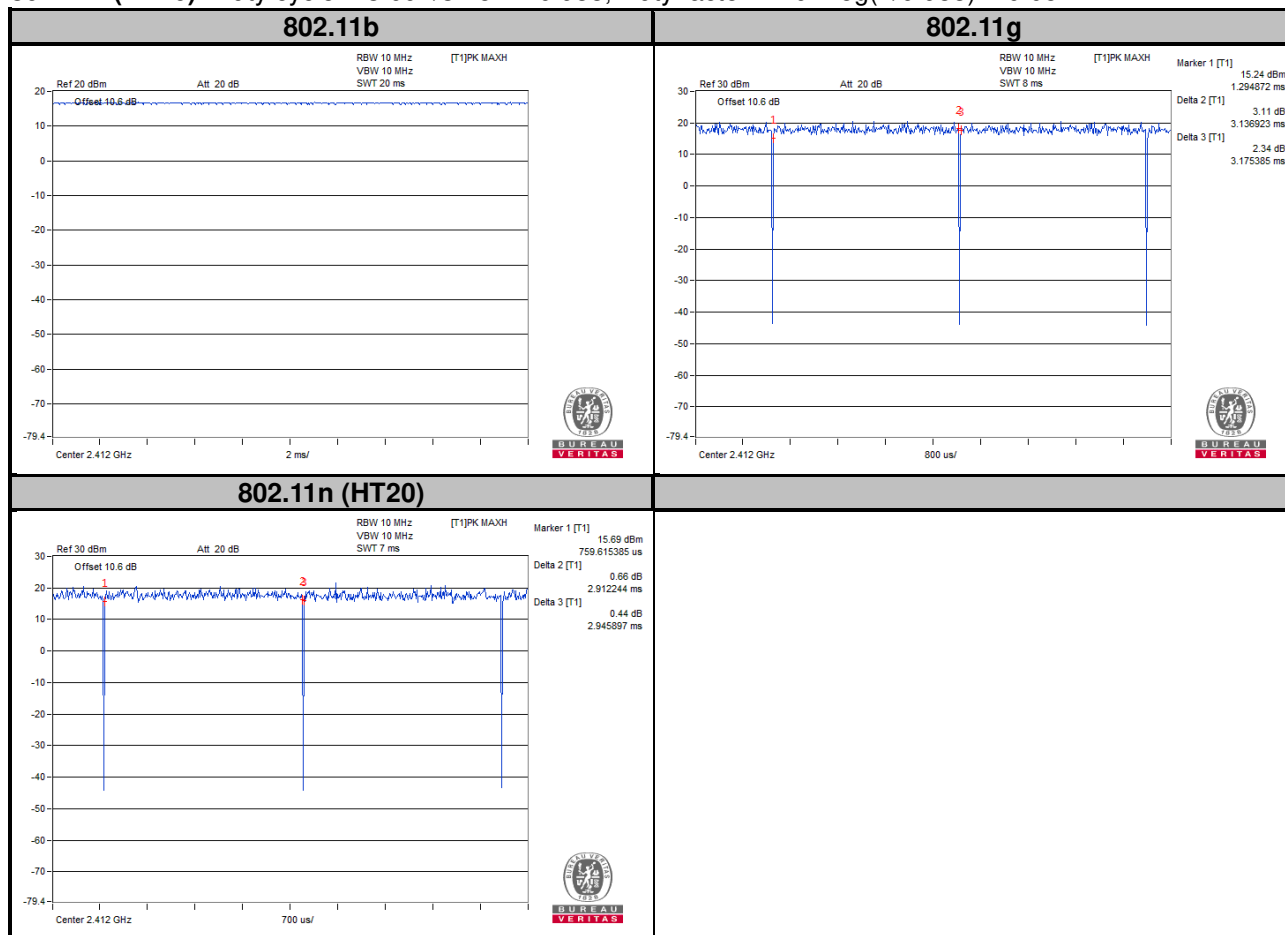
Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao, Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
APCM	25 deg. C, 65 % RH	3.8 Vdc	Wayne Lin

3.3 Duty Cycle of Test Signal

802.11b: Duty cycle of test signal is 100 %, duty factor is not required.

802.11g: Duty cycle of test signal is > 98 %, duty factor is not required.

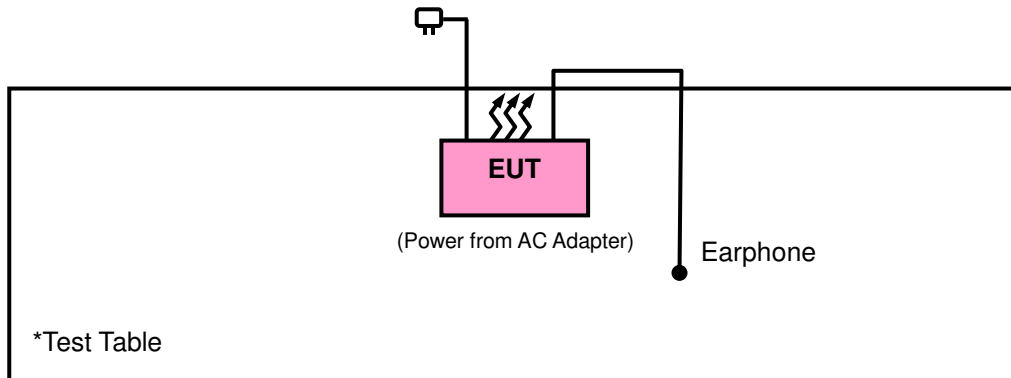
802.11n (HT20): Duty cycle = $3.092/3.157 = 0.988$, Duty factor = $10 * \log(1/0.988) = 0.05$



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r05

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY51210203	Jan. 21, 2016	Jan. 20, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Jan. 04, 2016	Jan. 03, 2017
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier Agilent	310N	187226	Jun. 24, 2016	Jun. 23, 2017
Preamplifier Agilent	83017A	MY39501357	Jun. 24, 2016	Jun. 23, 2017
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 24, 2016	Jun. 23, 2017
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 24, 2016	Jun. 23, 2017
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Site Registration No. is 149147.
5. The IC Site Registration No. is IC7450I-1.

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

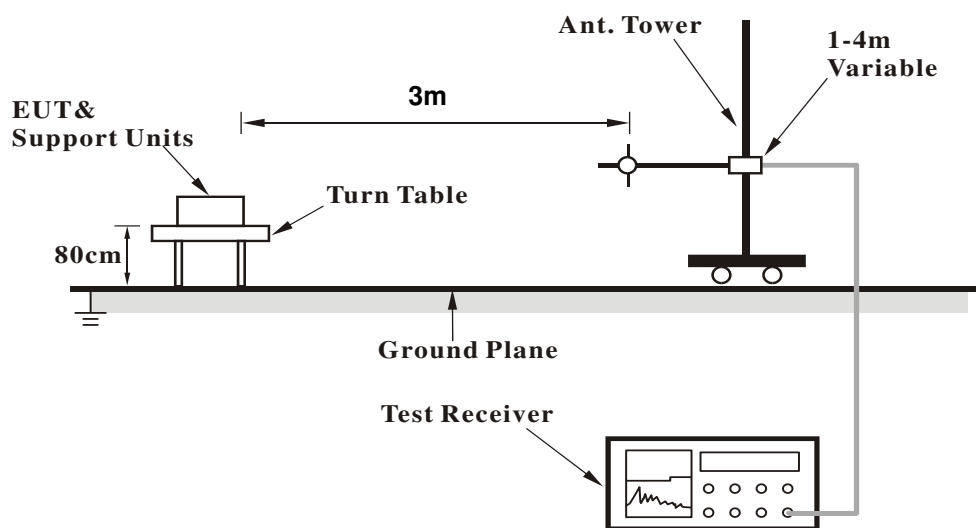
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz & 360 KHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for RMS Average (Duty cycle < 98 %) for Peak detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

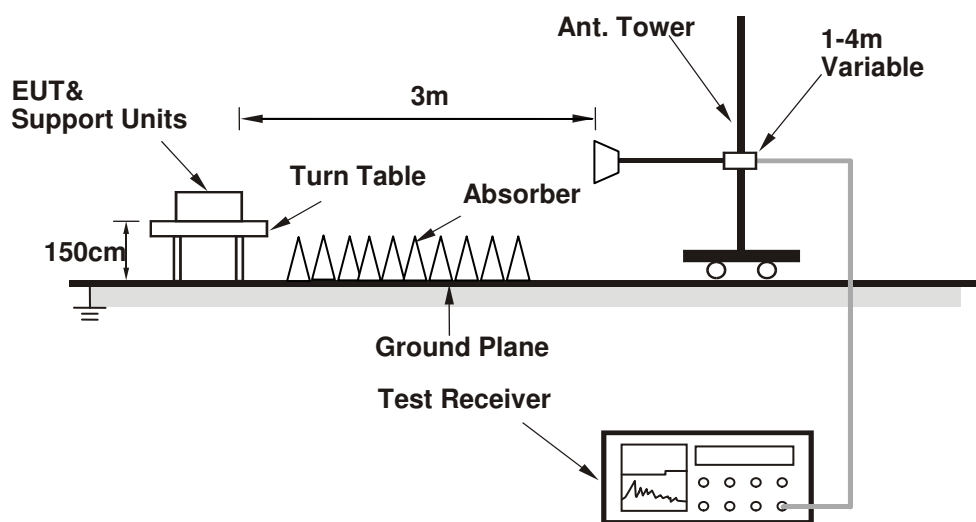
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

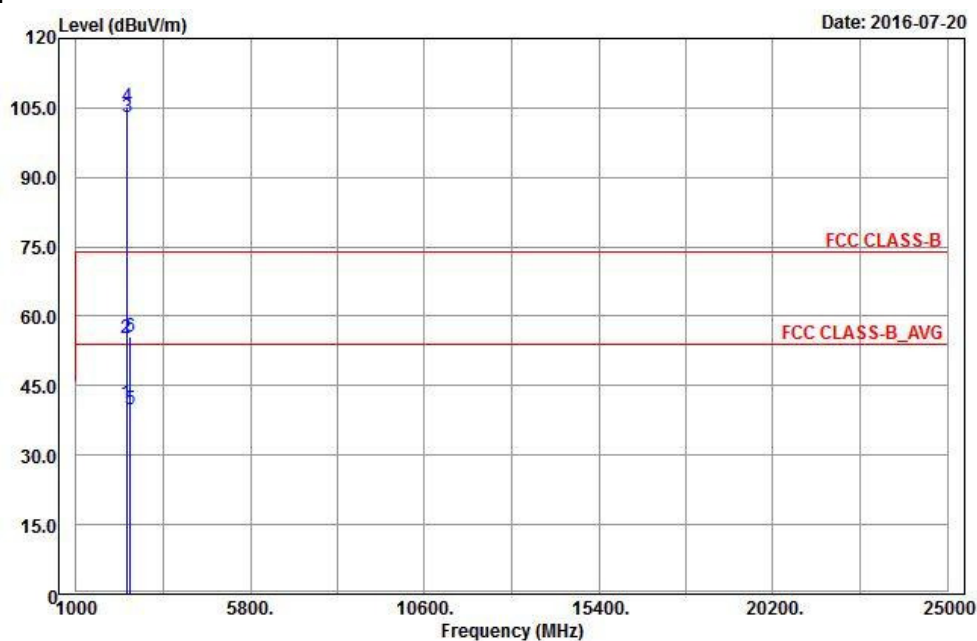
4.1.7 Test Results

Above 1 GHz Data :

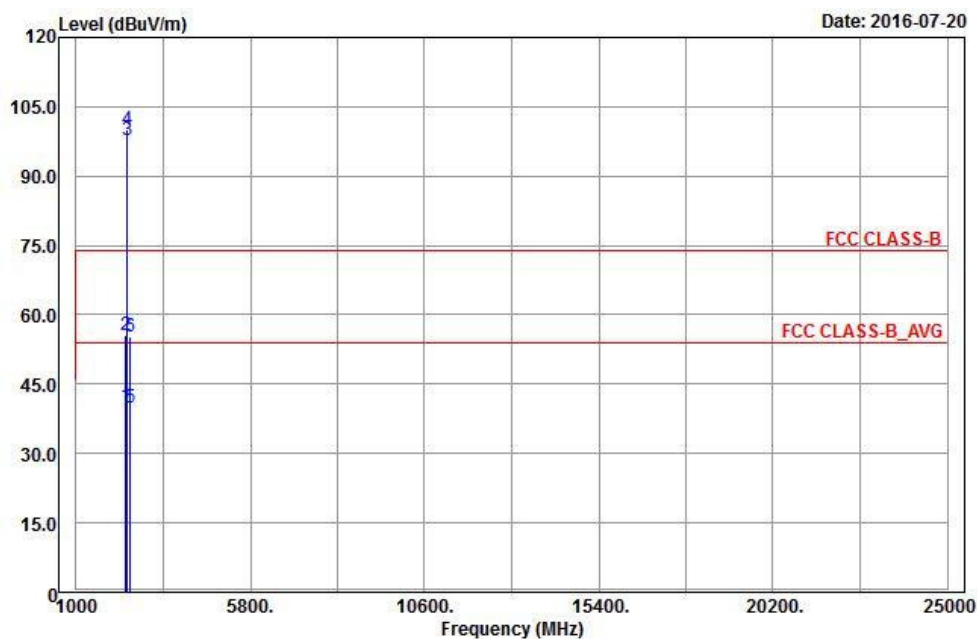
802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



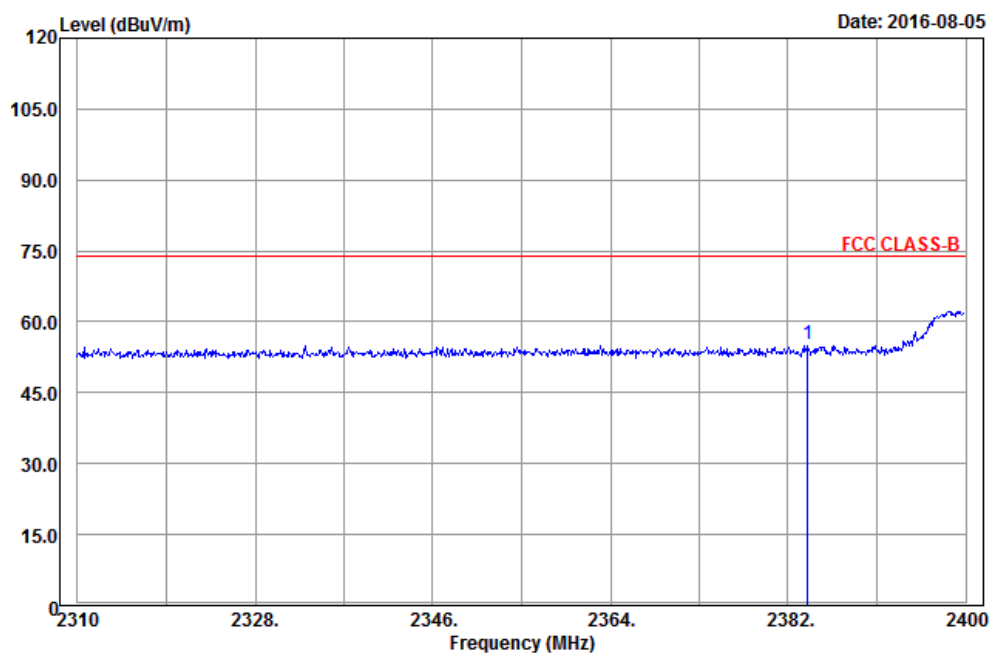
Vertical



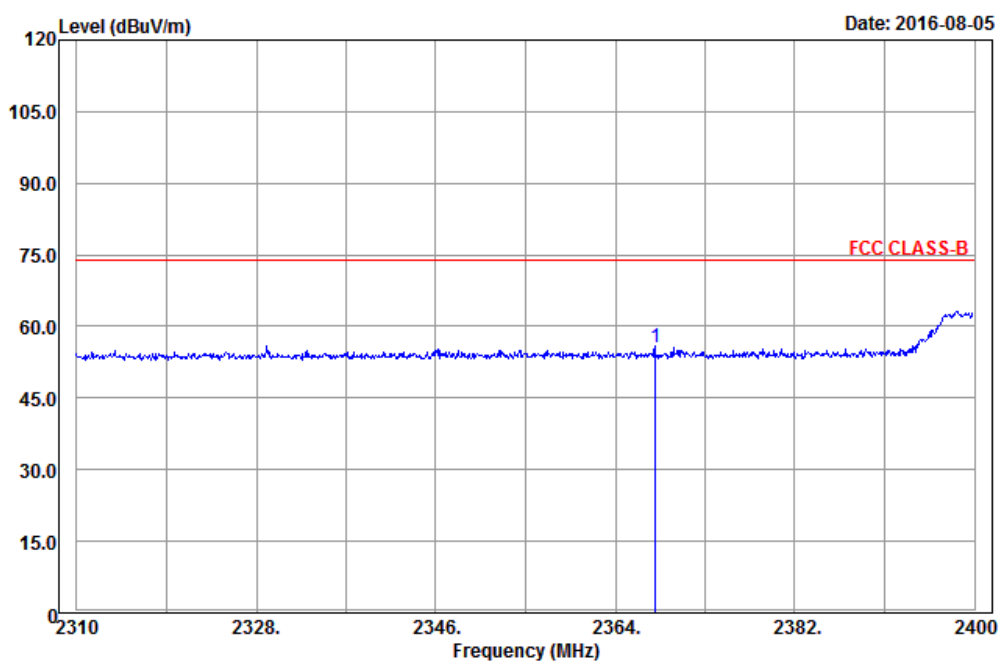
BandEdge

Peak

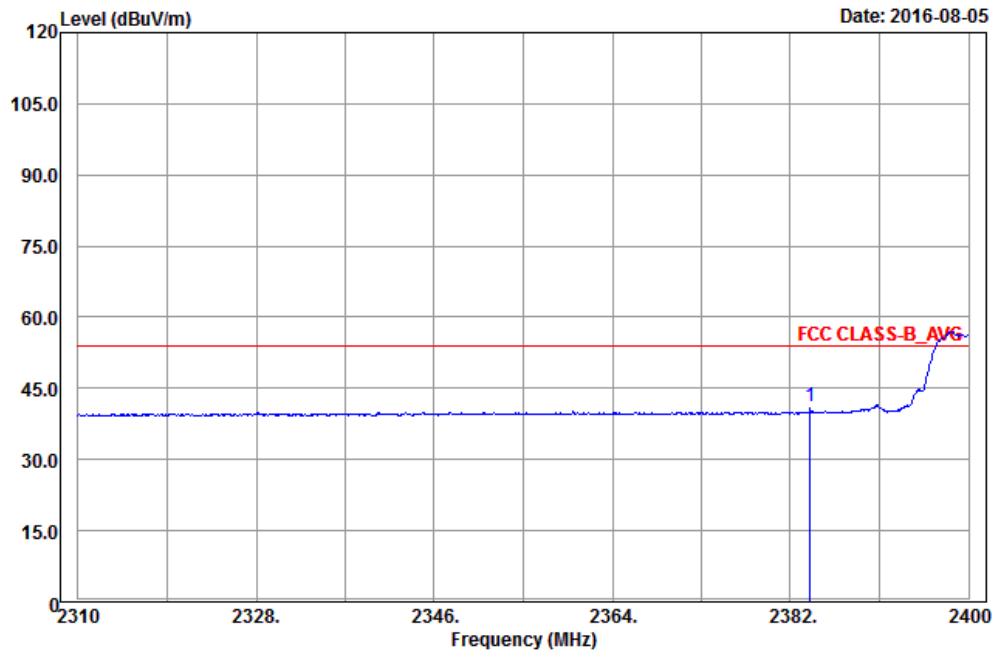
Horizontal



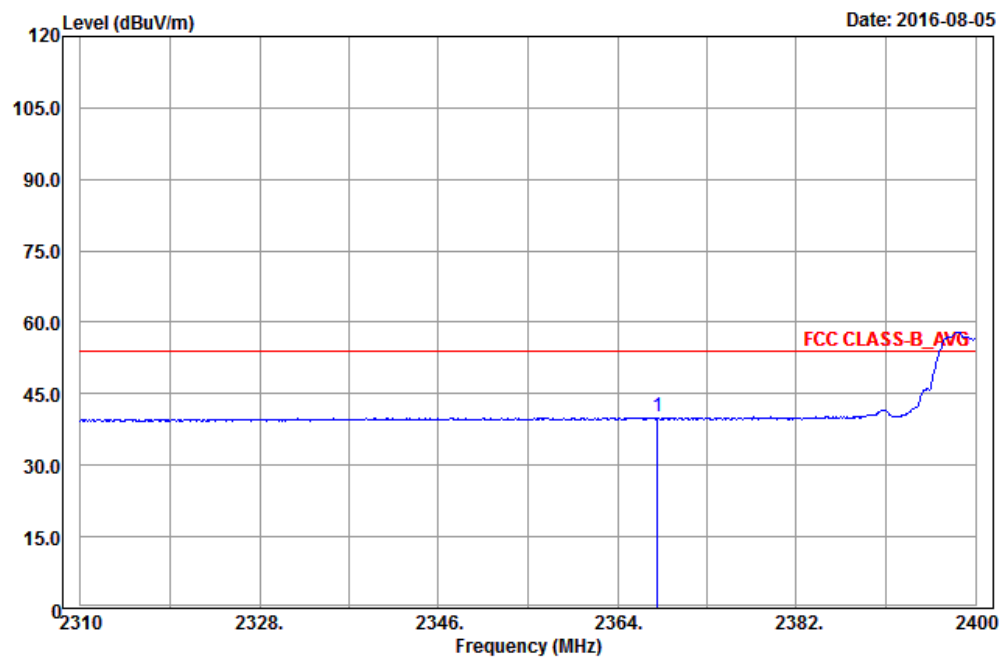
Vertical



Average Horizontal



Vertical



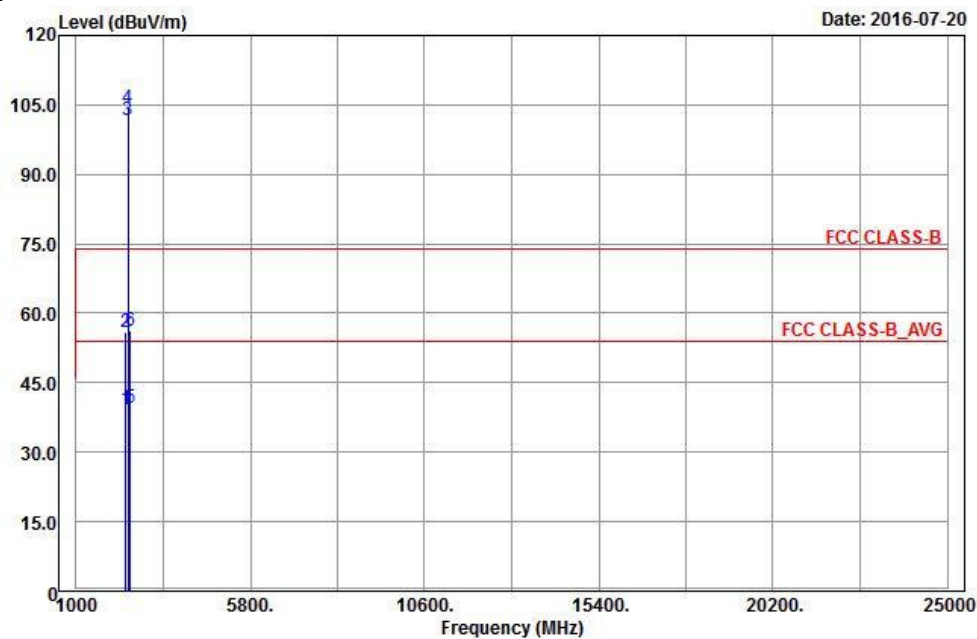
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2384	41.28	39.59	54	-12.72	31.78	5.4	35.49	141	6	Average
2384	55.12	53.43	74	-18.88	31.78	5.4	35.49	141	6	Peak
2412	102.85	101.08			31.81	5.43	35.47	141	6	Average
2412	105.21	103.44			31.81	5.43	35.47	141	6	Peak
2494	39.93	37.91	54	-14.07	31.9	5.53	35.41	141	6	Average
2494	55.48	53.46	74	-18.52	31.9	5.53	35.41	141	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2368	40.23	38.59	54	-13.77	31.76	5.37	35.49	117	100	Average
2368	55.69	54.05	74	-18.31	31.76	5.37	35.49	117	100	Peak
2412	97.67	95.9			31.81	5.43	35.47	117	100	Average
2412	100.07	98.3			31.81	5.43	35.47	117	100	Peak
2500	39.78	37.76	54	-14.22	31.9	5.53	35.41	117	100	Average
2500	55.39	53.37	74	-18.61	31.9	5.53	35.41	117	100	Peak

Remarks:

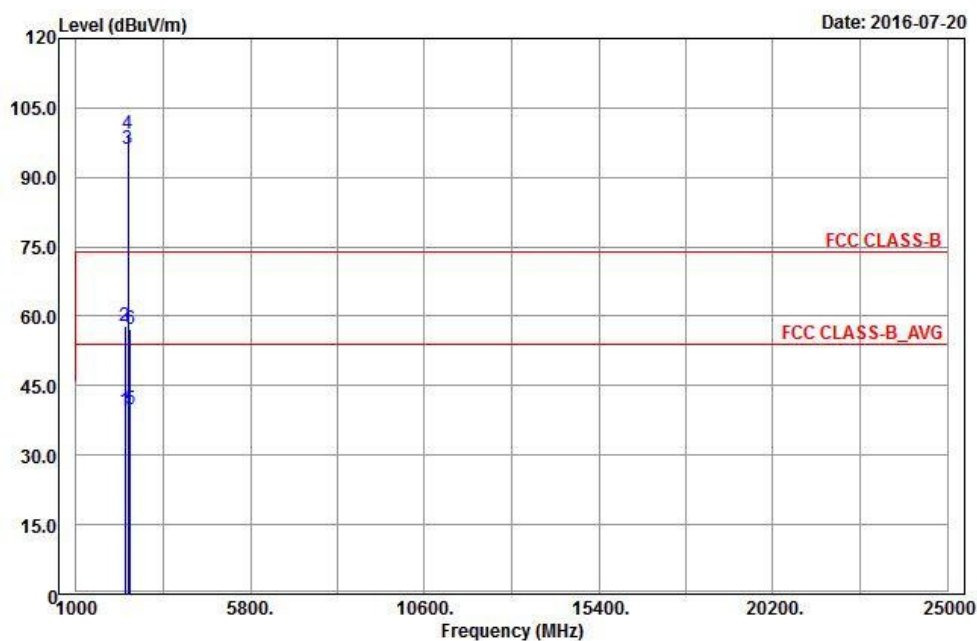
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



Vertical



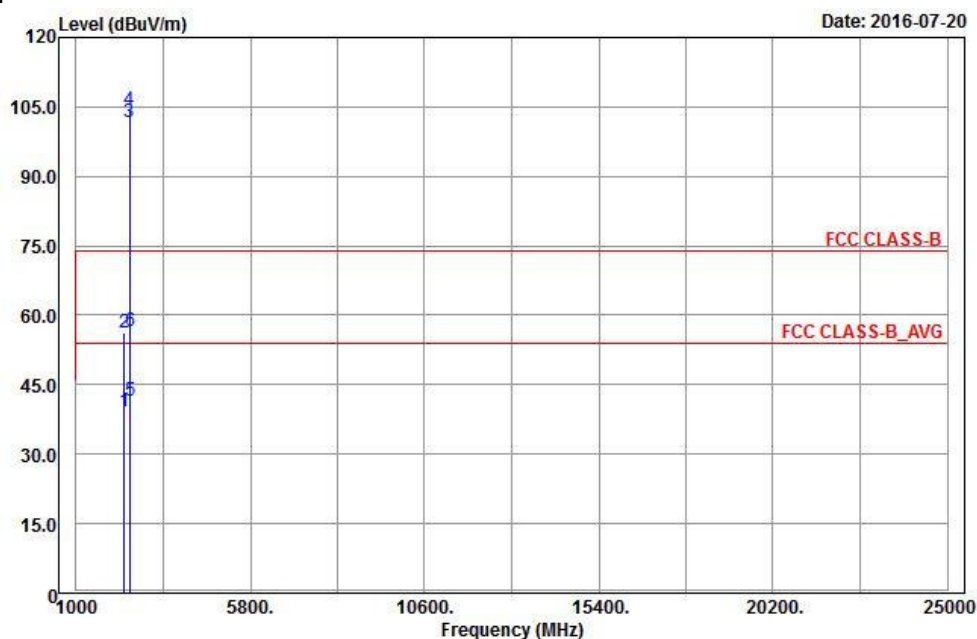
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2372	39.37	37.71	54	-14.63	31.78	5.37	35.49	141	6	Average
2372	55.85	54.19	74	-18.15	31.78	5.37	35.49	141	6	Peak
2437	101.56	99.71			31.85	5.46	35.46	141	6	Average
2437	104.37	102.52			31.85	5.46	35.46	141	6	Peak
2498	39.65	37.63	54	-14.35	31.9	5.53	35.41	141	6	Average
2498	56.3	54.28	74	-17.7	31.9	5.53	35.41	141	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2348	39.53	37.96	54	-14.47	31.74	5.33	35.5	117	100	Average
2348	57.74	56.17	74	-16.26	31.74	5.33	35.5	117	100	Peak
2437	96.16	94.31			31.85	5.46	35.46	117	100	Average
2437	99.4	97.55			31.85	5.46	35.46	117	100	Peak
2484	39.83	37.87	54	-14.17	31.88	5.5	35.42	117	100	Average
2484	57.31	55.35	74	-16.69	31.88	5.5	35.42	117	100	Peak

Remarks:

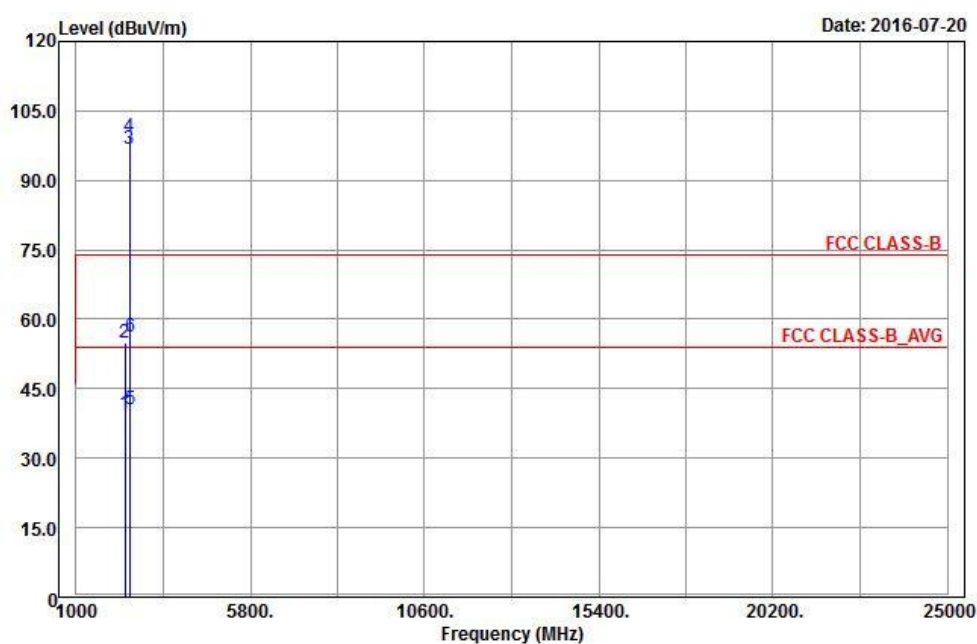
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



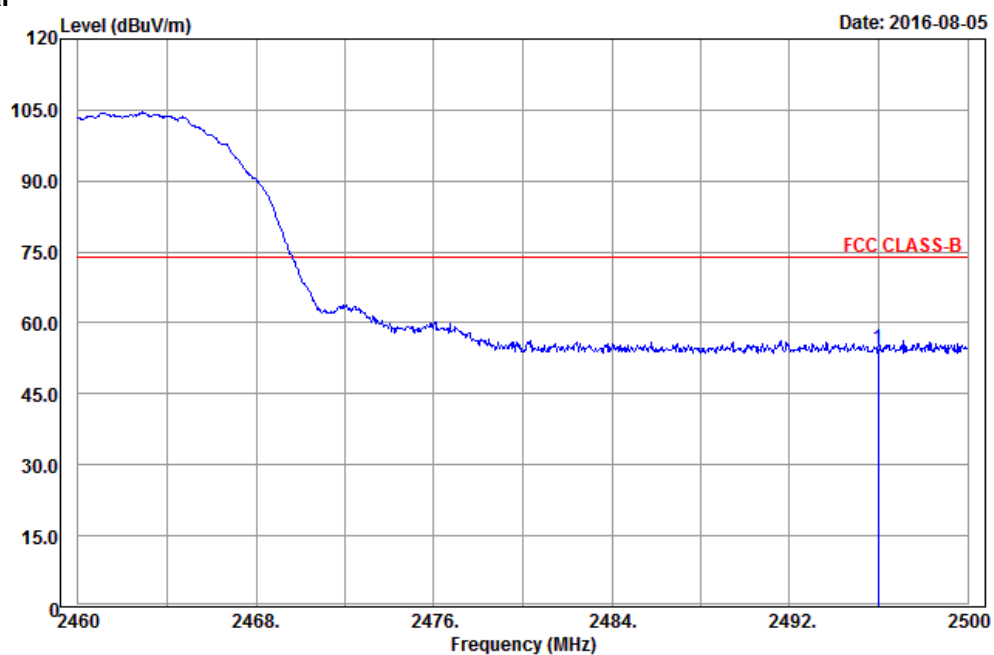
Vertical



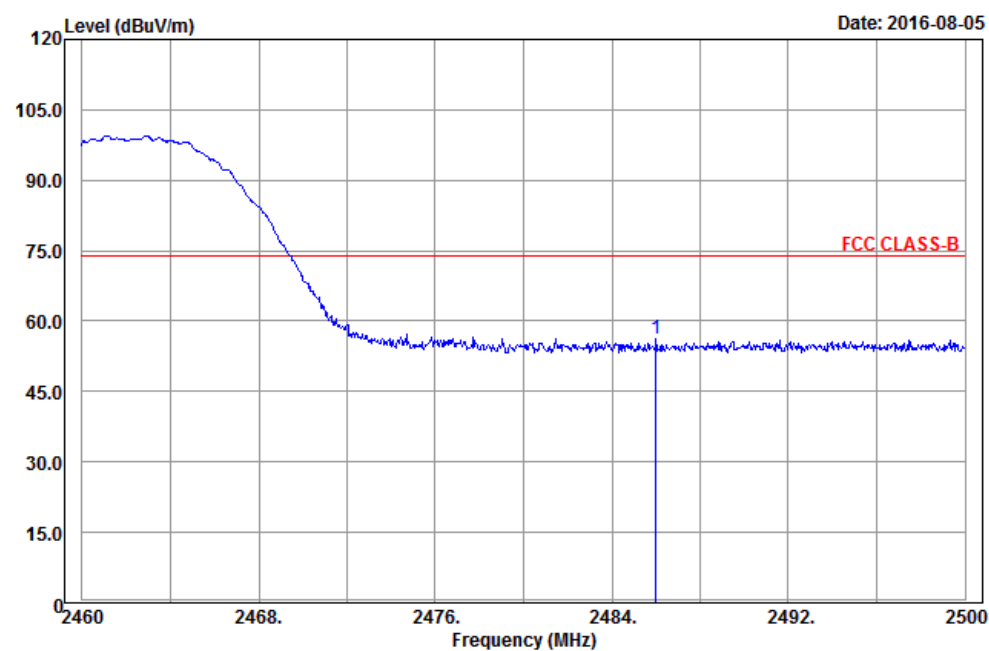
BandEdge

Peak

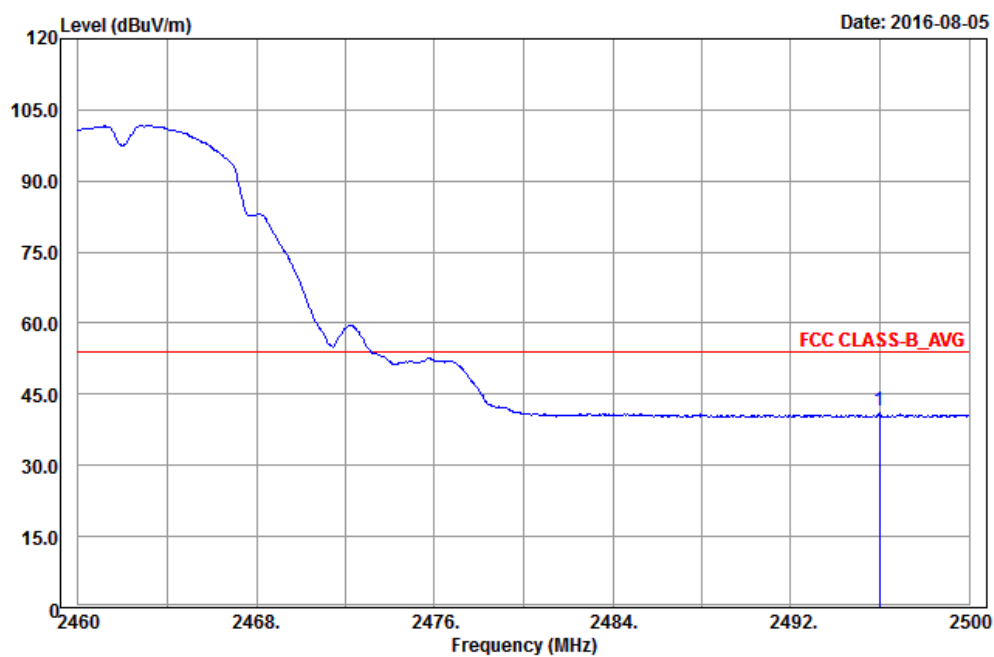
Horizontal



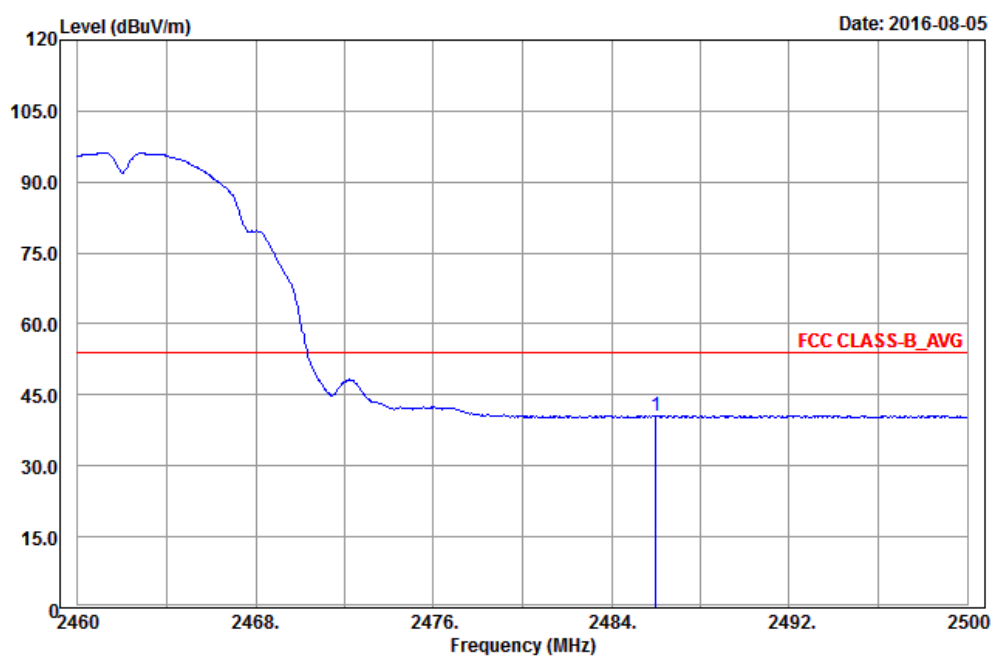
Vertical



Average Horizontal



Vertical



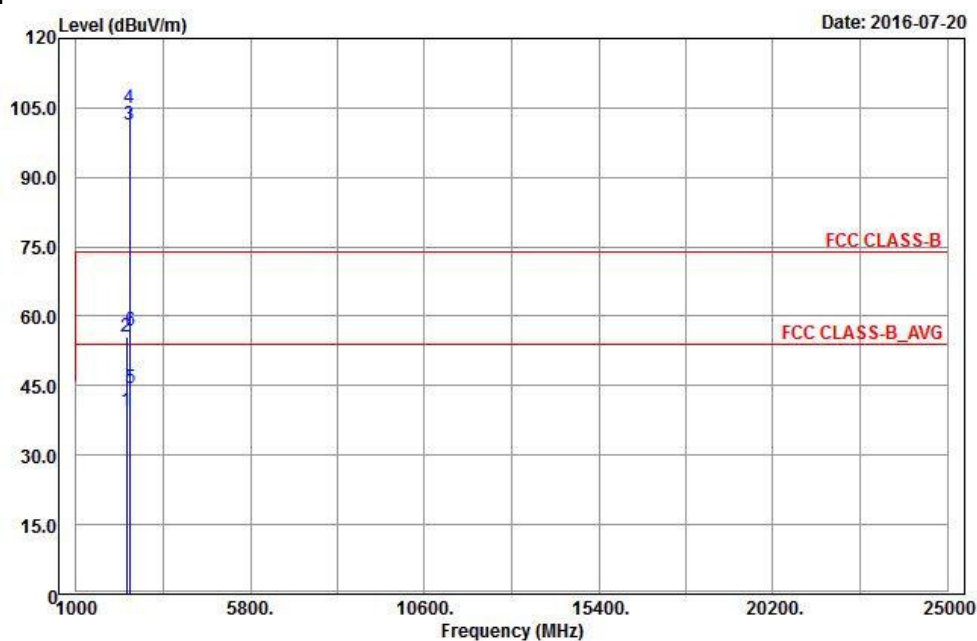
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2332	39.2	37.66	54	-14.8	31.73	5.33	35.52	141	6	Average
2332	56.21	54.67	74	-17.79	31.73	5.33	35.52	141	6	Peak
2462	101.76	99.83			31.87	5.5	35.44	141	6	Average
2462	104.16	102.23			31.87	5.5	35.44	141	6	Peak
2496	41.43	39.41	54	-12.57	31.9	5.53	35.41	141	6	Average
2496	56.57	54.55	74	-17.43	31.9	5.53	35.41	141	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2356	39.49	37.86	54	-14.51	31.76	5.37	35.5	117	100	Average
2356	55.07	53.44	74	-18.93	31.76	5.37	35.5	117	100	Peak
2462	96.74	94.81			31.87	5.5	35.44	117	100	Average
2462	99.51	97.58			31.87	5.5	35.44	117	100	Peak
2486	40.52	38.53	54	-13.48	31.88	5.53	35.42	117	100	Average
2486	56.3	54.31	74	-17.7	31.88	5.53	35.42	117	100	Peak

Remarks:

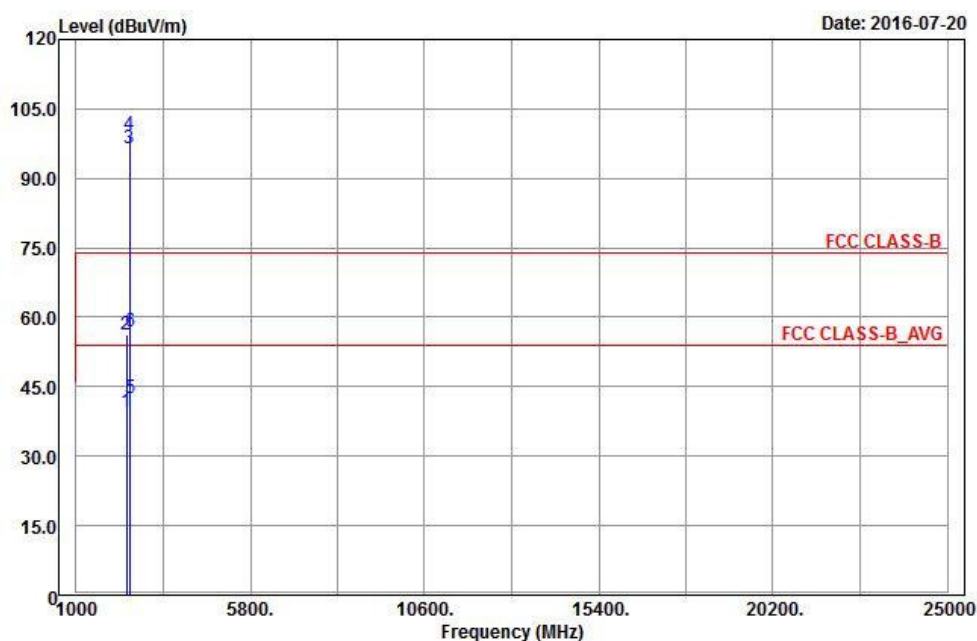
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



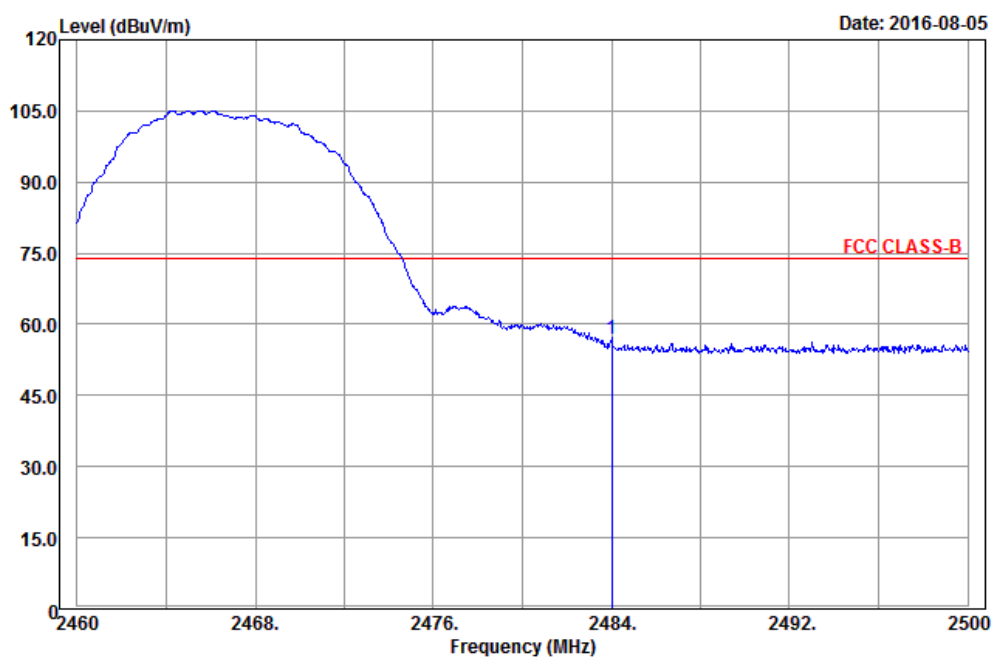
Vertical



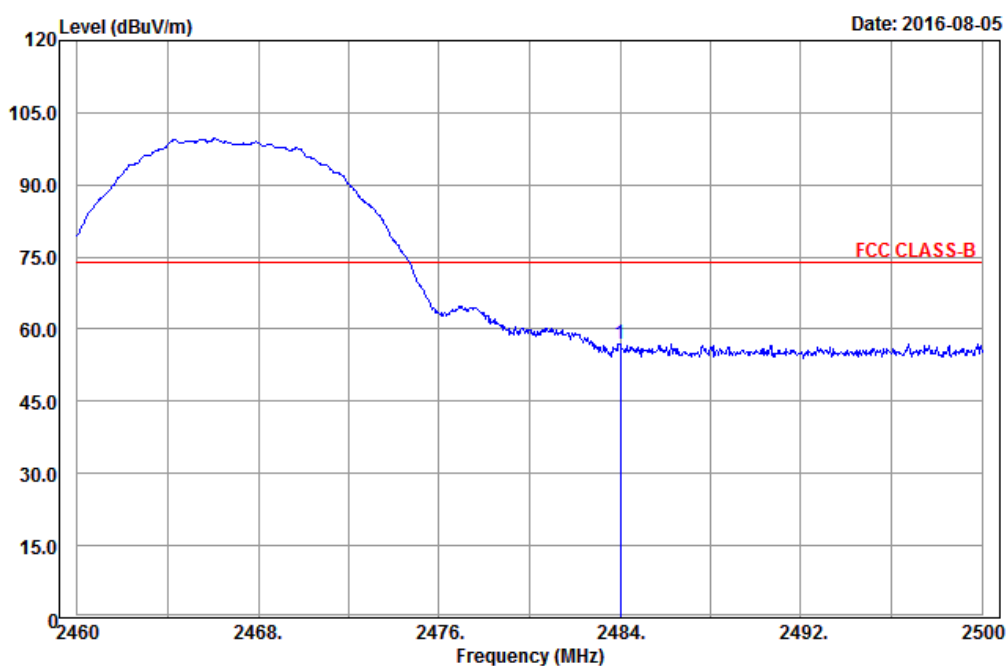
BandEdge

Peak

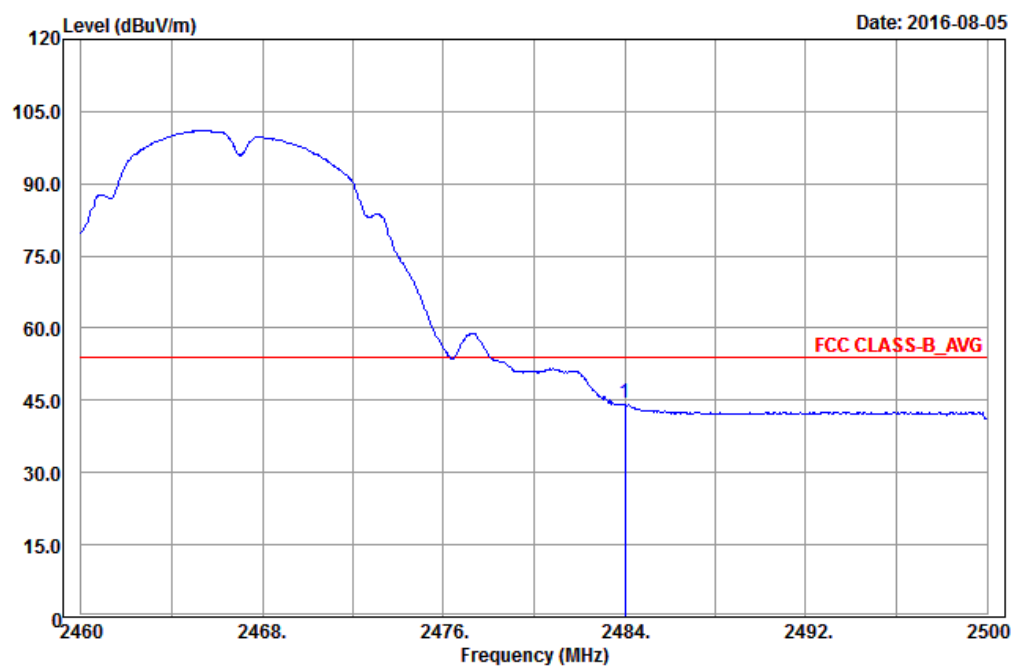
Horizontal



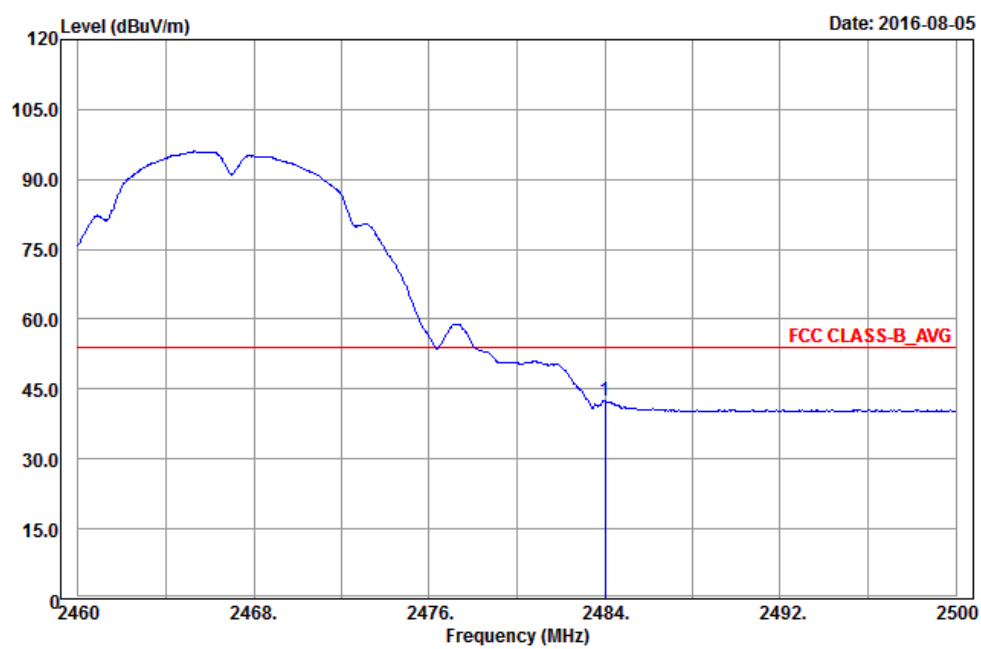
Vertical



Average Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386	39.53	37.82	54	-14.47	31.8	5.4	35.49	141	6	Average
2386	55.53	53.82	74	-18.47	31.8	5.4	35.49	141	6	Peak
2467	101.31	99.36			31.87	5.5	35.42	141	6	Average
2467	104.88	102.93			31.87	5.5	35.42	141	6	Peak
2484	44.48	42.52	54	-9.52	31.88	5.5	35.42	141	6	Average
2484	56.98	55.02	74	-17.02	31.88	5.5	35.42	141	6	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

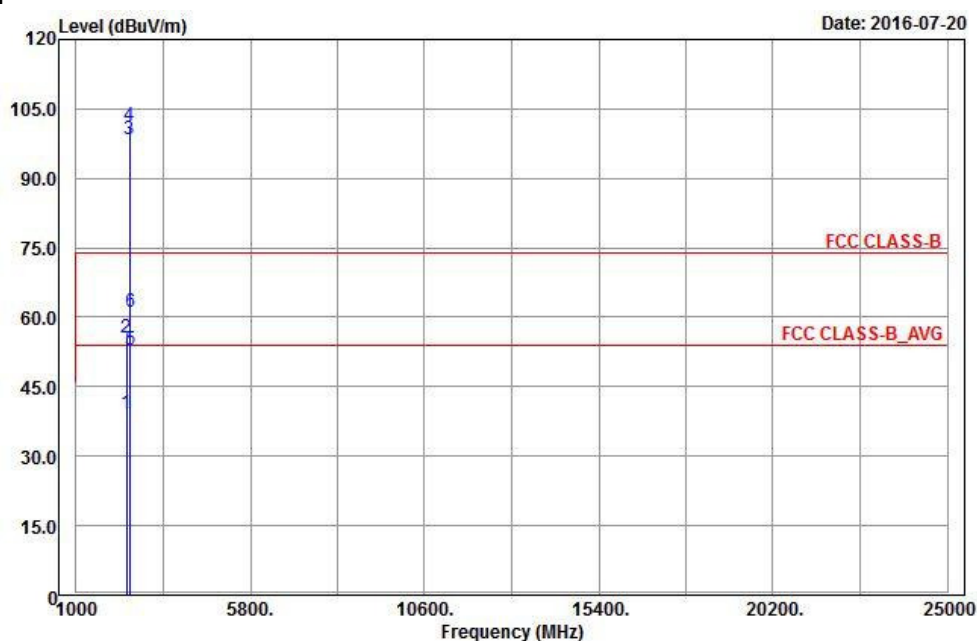
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	39.59	37.86	54	-14.41	31.8	5.4	35.47	117	100	Average
2390	56.12	54.39	74	-17.88	31.8	5.4	35.47	117	100	Peak
2467	96.61	94.66			31.87	5.5	35.42	117	100	Average
2467	99.43	97.48			31.87	5.5	35.42	117	100	Peak
2484	42.5	40.54	54	-11.5	31.88	5.5	35.42	117	100	Average
2484	56.82	54.86	74	-17.18	31.88	5.5	35.42	117	100	Peak

Remarks:

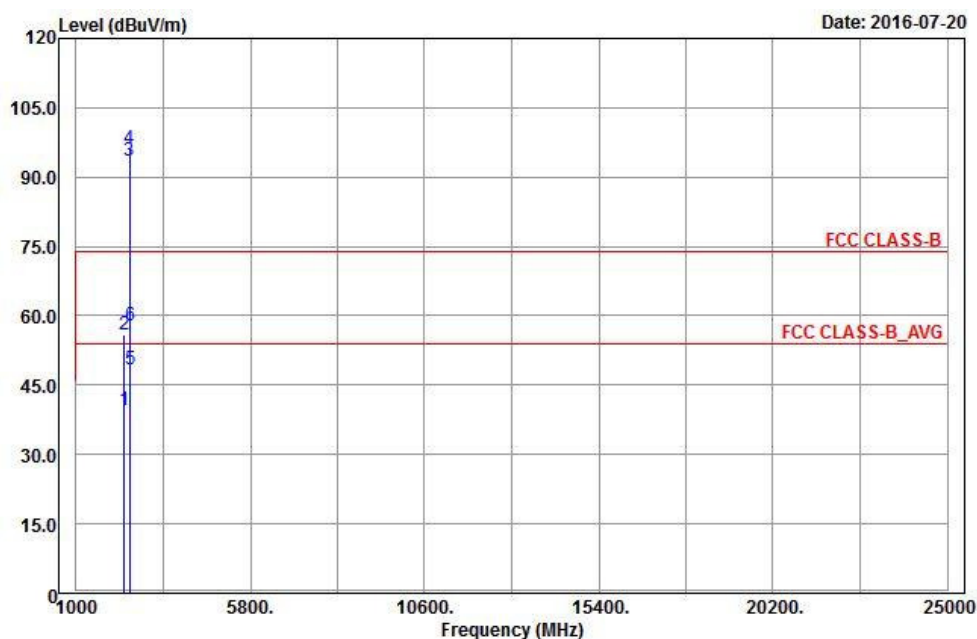
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



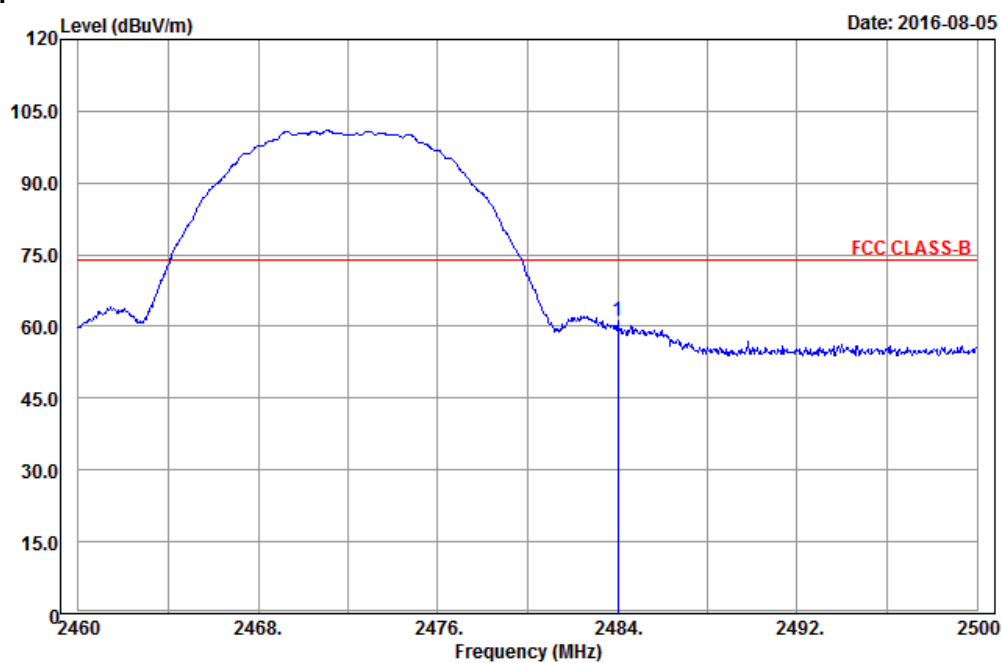
Vertical



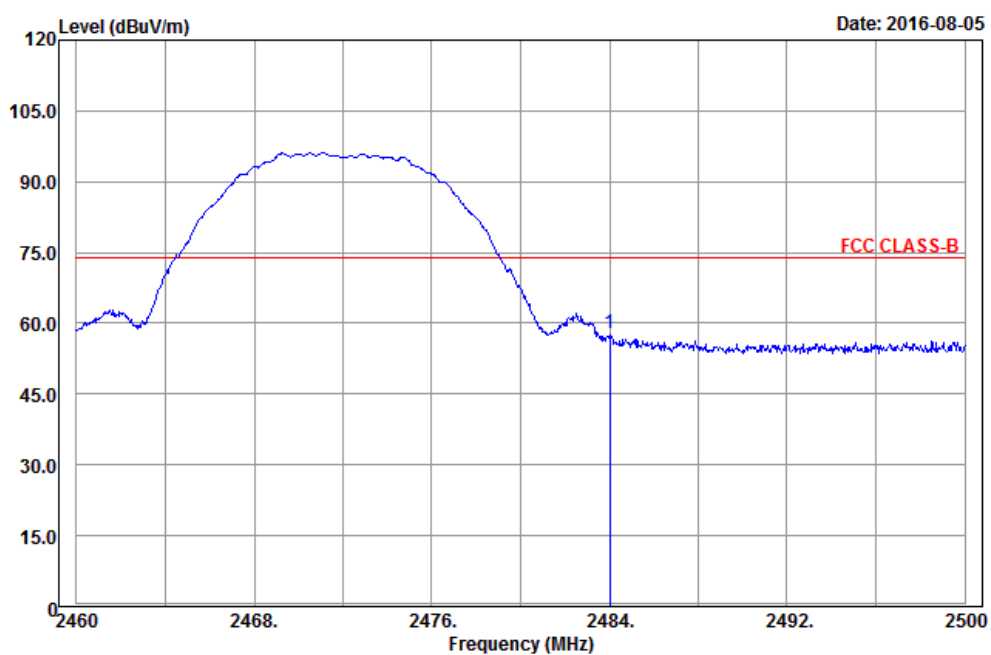
BandEdge

Peak

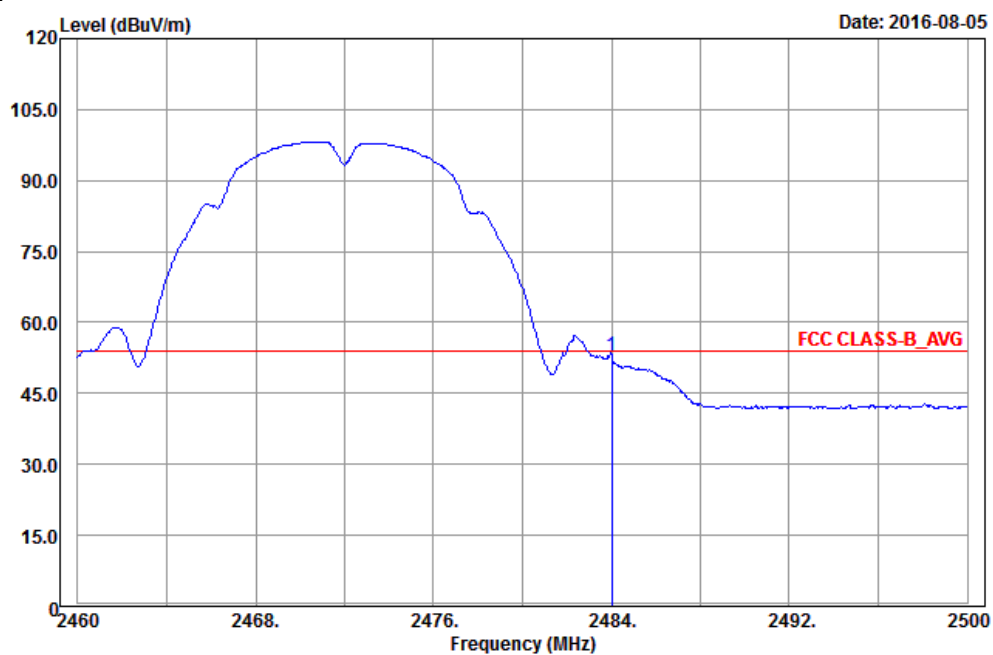
Horizontal



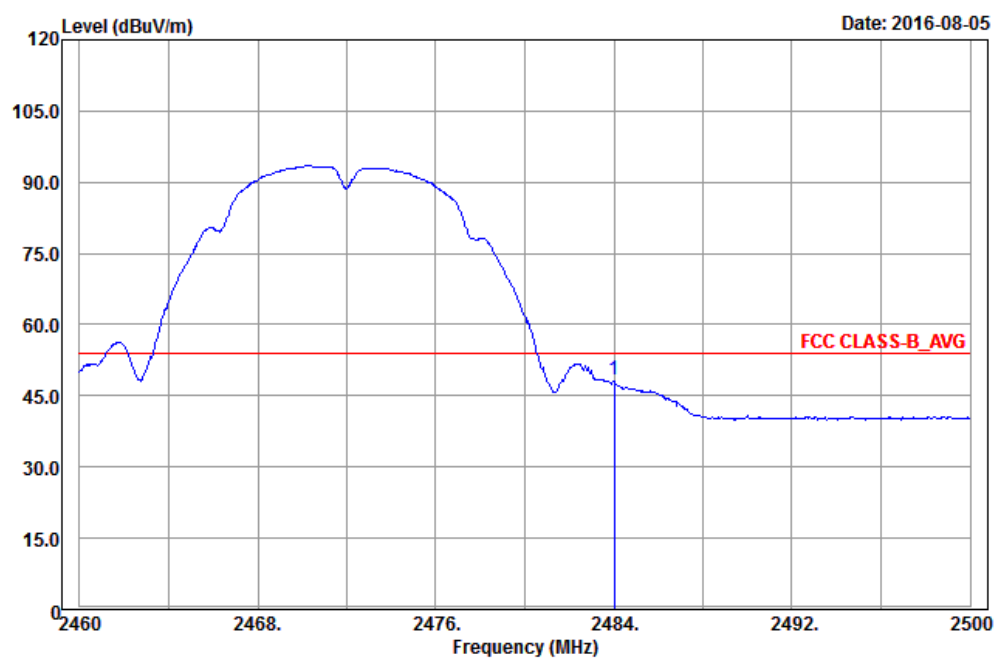
Vertical



Average Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	39.34	37.61	54	-14.66	31.8	5.4	35.47	136	6	Average
2390	55.67	53.94	74	-18.33	31.8	5.4	35.47	136	6	Peak
2472	98.28	96.32			31.88	5.5	35.42	136	6	Average
2472	101.5	99.54			31.88	5.5	35.42	136	6	Peak
2484	52.98	51.02	54	-1.02	31.88	5.5	35.42	136	6	Average
2484	61.3	59.34	74	-12.7	31.88	5.5	35.42	136	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2326	39.41	37.9	54	-14.59	31.73	5.3	35.52	115	100	Average
2326	56.03	54.52	74	-17.97	31.73	5.3	35.52	115	100	Peak
2472	93.58	91.62			31.88	5.5	35.42	115	100	Average
2472	96.21	94.25			31.88	5.5	35.42	115	100	Peak
2484	48.38	46.42	54	-5.62	31.88	5.5	35.42	115	100	Average
2484	58.01	56.05	74	-15.99	31.88	5.5	35.42	115	100	Peak

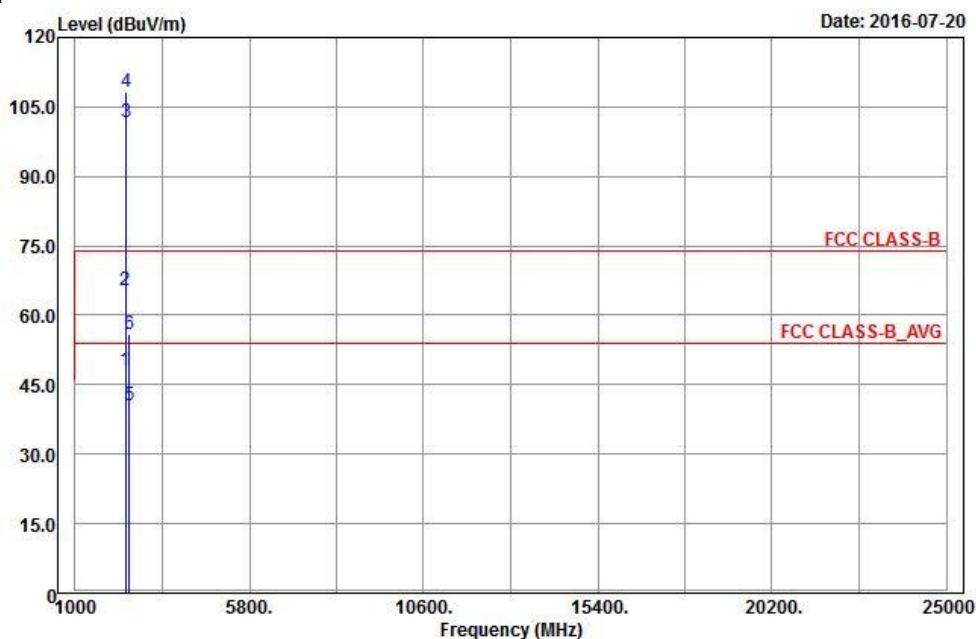
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 MHz: Fundamental frequency.

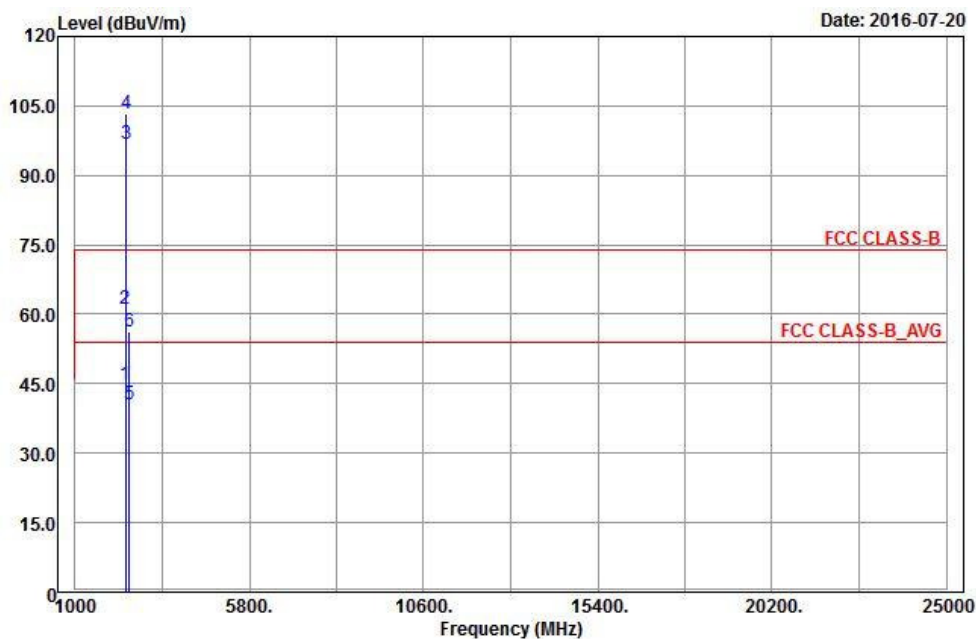
802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



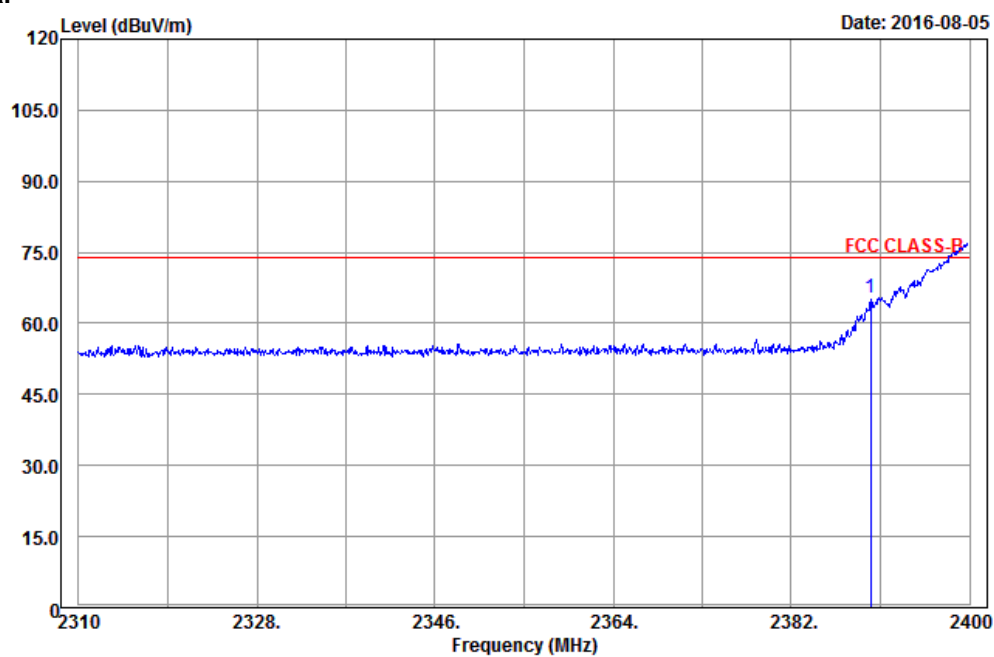
Vertical



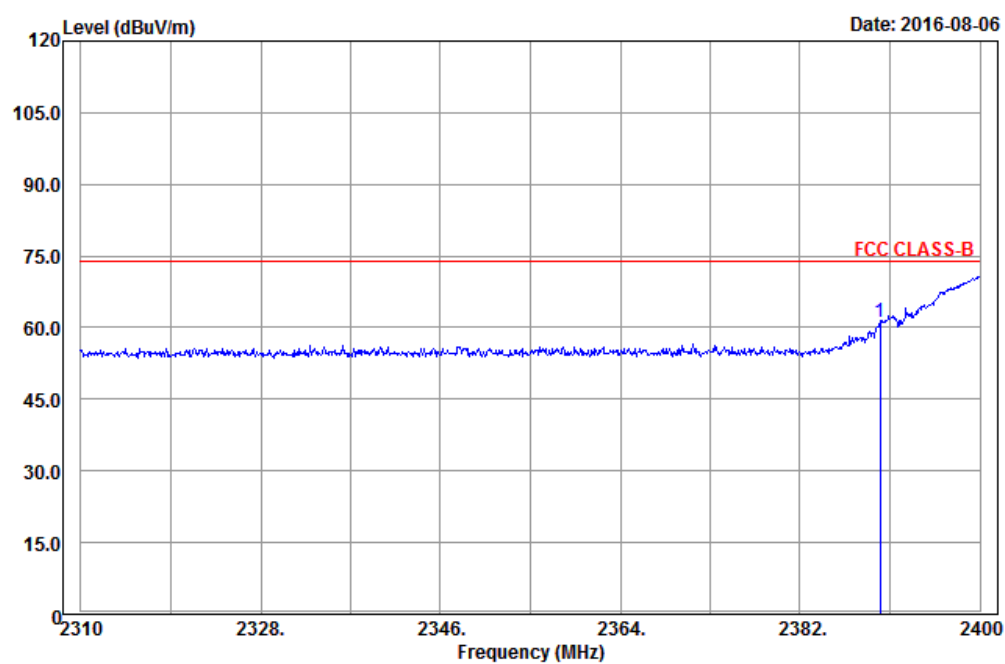
BandEdge

Peak

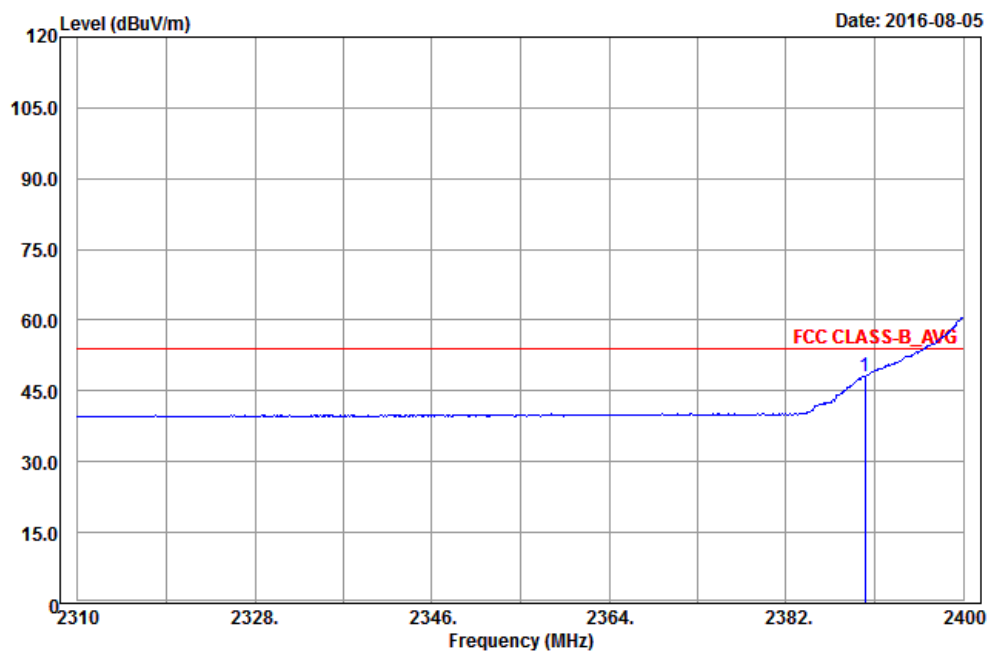
Horizontal



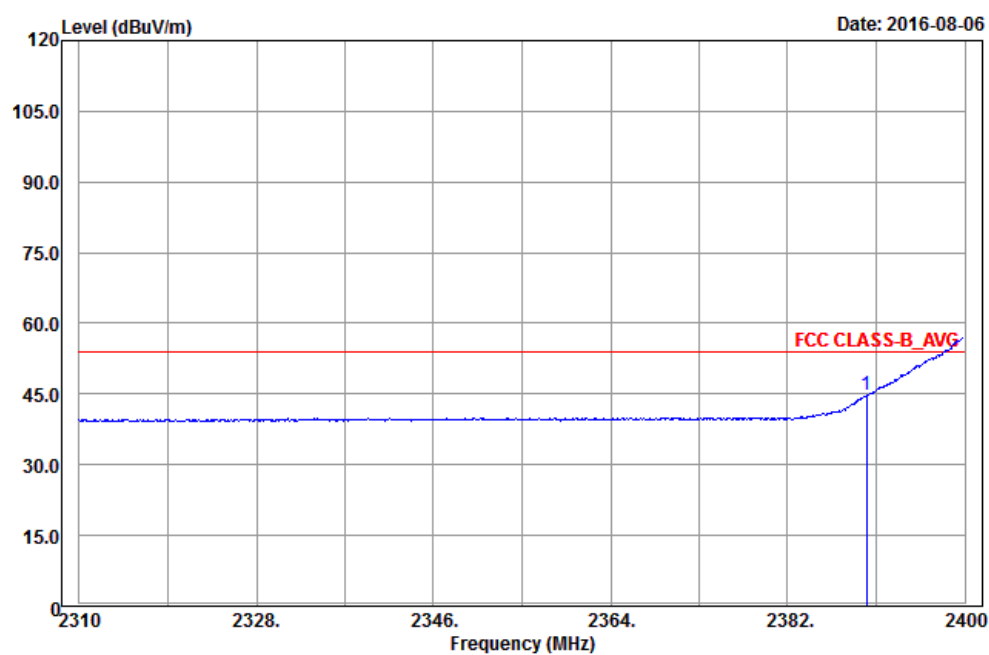
Vertical



Average Horizontal



Vertical



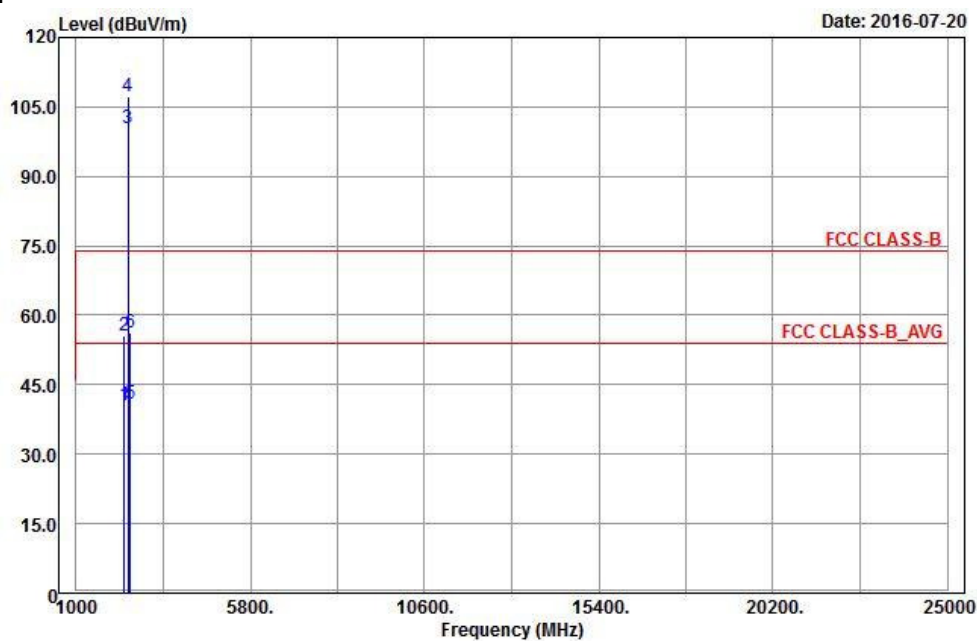
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	48.09	46.36	54	-5.91	31.8	5.4	35.47	141	6	Average
2390	65.27	63.54	74	-8.73	31.8	5.4	35.47	141	6	Peak
2412	101.81	100.04			31.81	5.43	35.47	141	6	Average
2412	108.07	106.3			31.81	5.43	35.47	141	6	Peak
2496	40.57	38.55	54	-13.43	31.9	5.53	35.41	141	6	Average
2496	56.07	54.05	74	-17.93	31.9	5.53	35.41	141	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	44.78	43.05	54	-9.22	31.8	5.4	35.47	117	100	Average
2390	61.04	59.31	74	-12.96	31.8	5.4	35.47	117	100	Peak
2412	96.7	94.93			31.81	5.43	35.47	117	100	Average
2412	103.41	101.64			31.81	5.43	35.47	117	100	Peak
2490	40.43	38.42	54	-13.57	31.9	5.53	35.42	117	100	Average
2490	56.15	54.14	74	-17.85	31.9	5.53	35.42	117	100	Peak

Remarks:

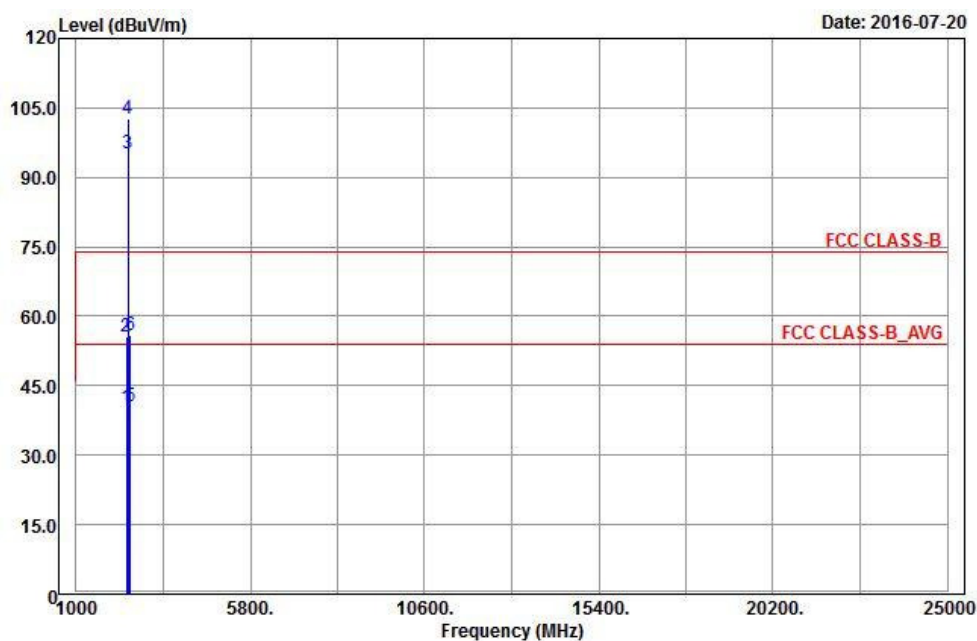
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



Vertical



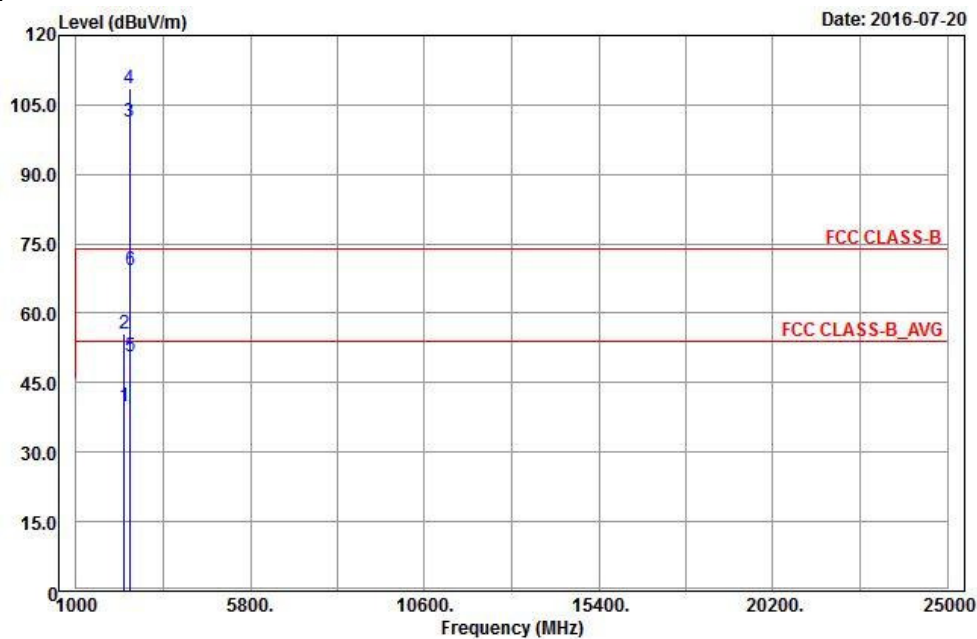
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2318	40.39	38.88	54	-13.61	31.73	5.3	35.52	141	6	Average
2318	55.45	53.94	74	-18.55	31.73	5.3	35.52	141	6	Peak
2437	100.54	98.69			31.85	5.46	35.46	141	6	Average
2437	107.36	105.51			31.85	5.46	35.46	141	6	Peak
2488	40.79	38.78	54	-13.21	31.9	5.53	35.42	141	6	Average
2488	56.13	54.12	74	-17.87	31.9	5.53	35.42	141	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386	40.35	38.64	54	-13.65	31.8	5.4	35.49	117	100	Average
2386	55.5	53.79	74	-18.5	31.8	5.4	35.49	117	100	Peak
2437	95.31	93.46			31.85	5.46	35.46	117	100	Average
2437	102.61	100.76			31.85	5.46	35.46	117	100	Peak
2494	40.58	38.56	54	-13.42	31.9	5.53	35.41	117	100	Average
2494	55.8	53.78	74	-18.2	31.9	5.53	35.41	117	100	Peak

Remarks:

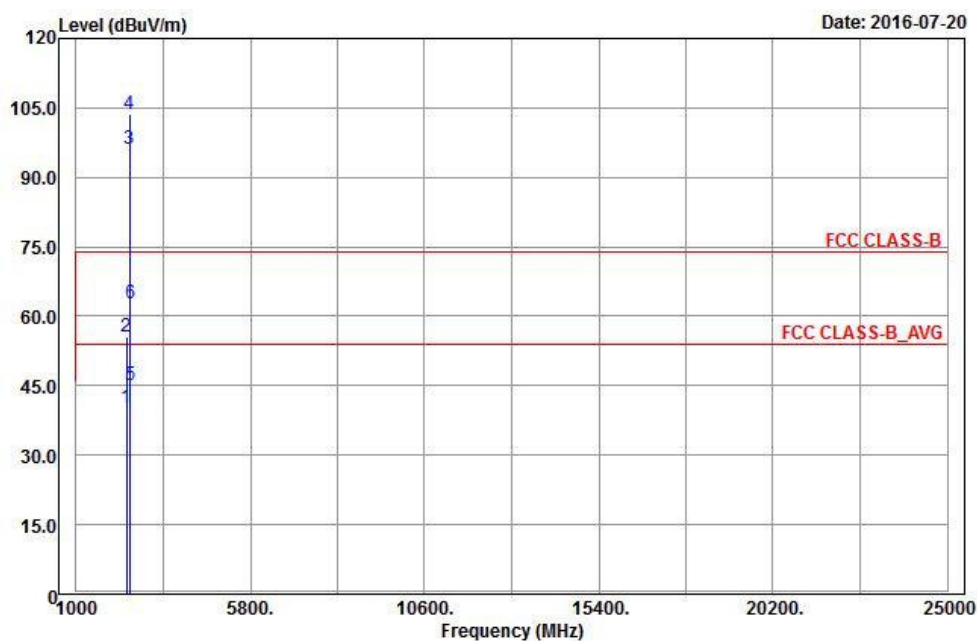
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



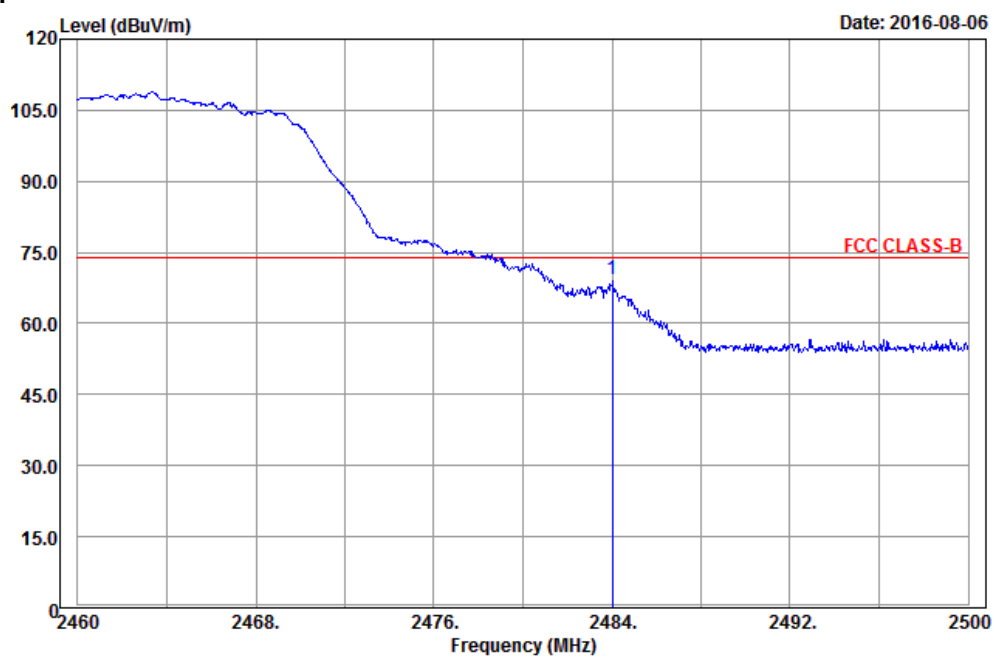
Vertical



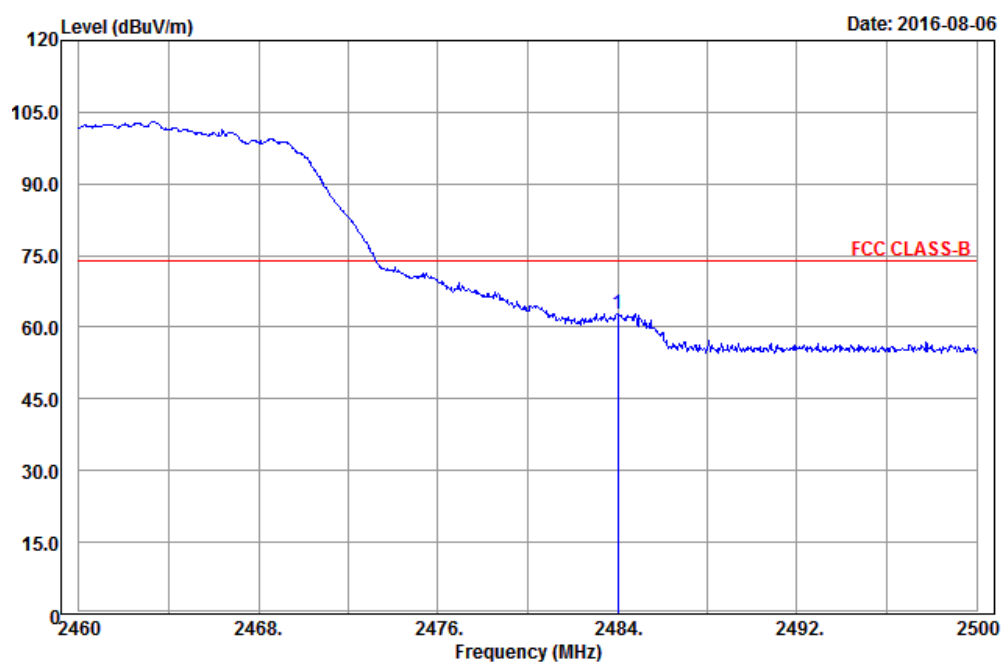
BandEdge

Peak

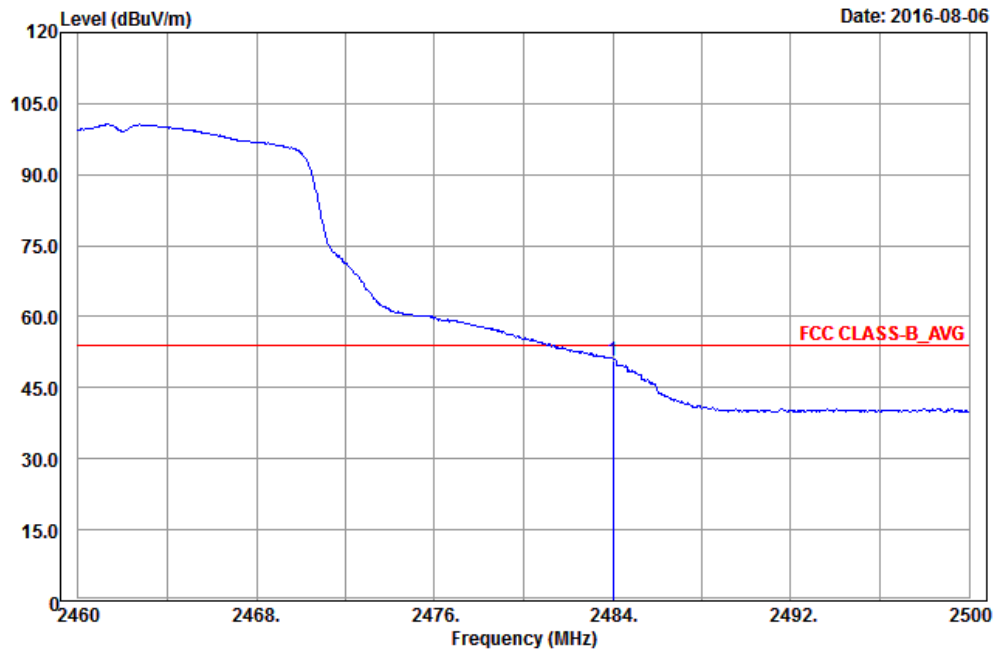
Horizontal



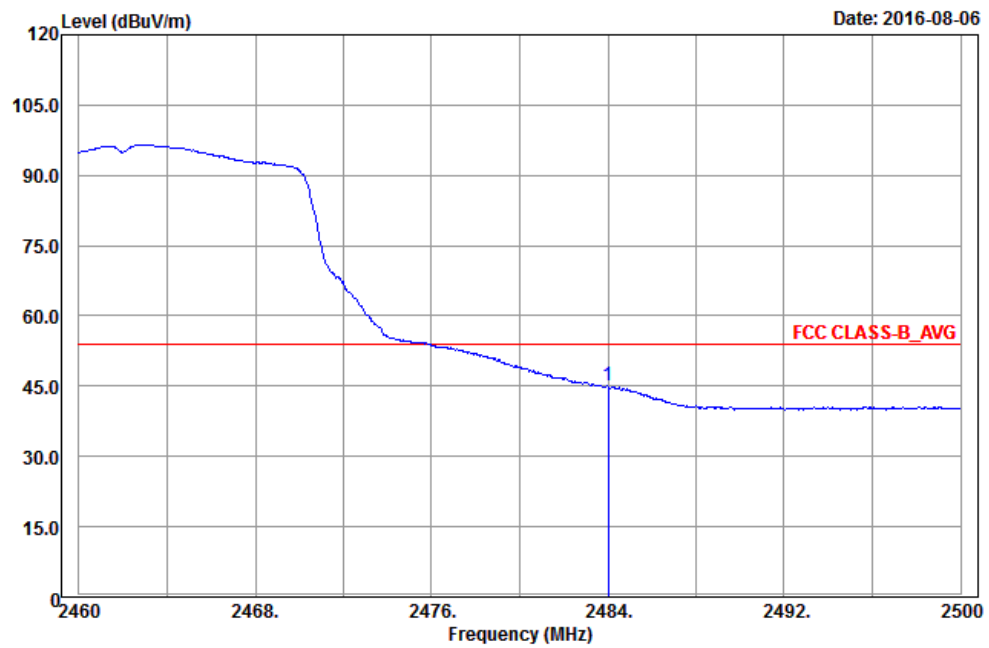
Vertical



Average Horizontal



Vertical



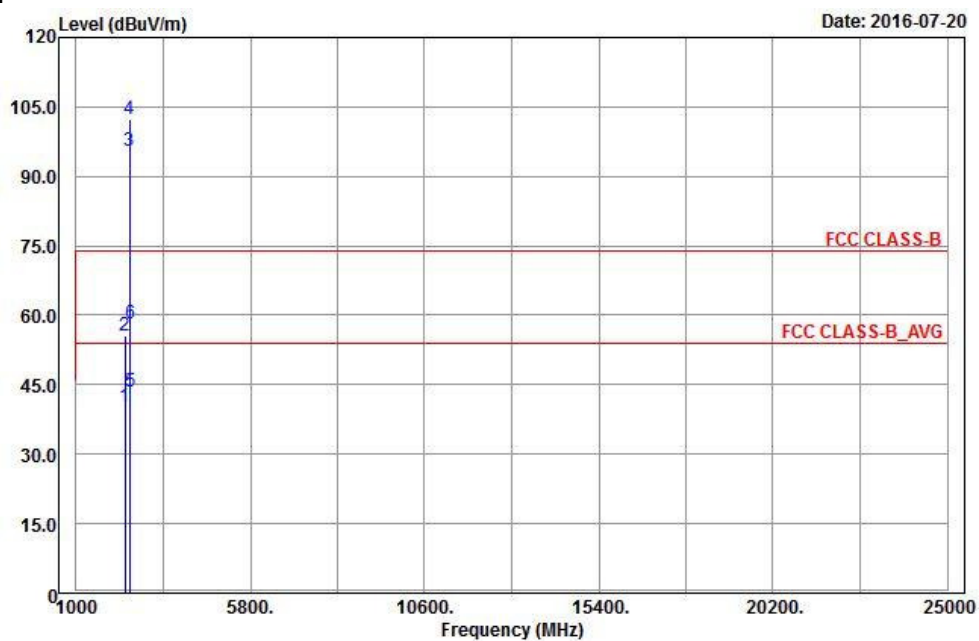
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2316	40.02	38.53	54	-13.98	31.71	5.3	35.52	137	6	Average
2316	55.62	54.13	74	-18.38	31.71	5.3	35.52	137	6	Peak
2462	101.21	99.28			31.87	5.5	35.44	137	6	Average
2462	108.67	106.74			31.87	5.5	35.44	137	6	Peak
2484	50.75	48.79	54	-3.25	31.88	5.5	35.42	137	6	Average
2484	69.17	67.21	74	-4.83	31.88	5.5	35.42	137	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2378	40.15	38.49	54	-13.85	31.78	5.37	35.49	117	100	Average
2378	55.72	54.06	74	-18.28	31.78	5.37	35.49	117	100	Peak
2462	96.14	94.21			31.87	5.5	35.44	117	100	Average
2462	103.65	101.72			31.87	5.5	35.44	117	100	Peak
2484	45.18	43.22	54	-8.82	31.88	5.5	35.42	117	100	Average
2484	62.62	60.66	74	-11.38	31.88	5.5	35.42	117	100	Peak

Remarks:

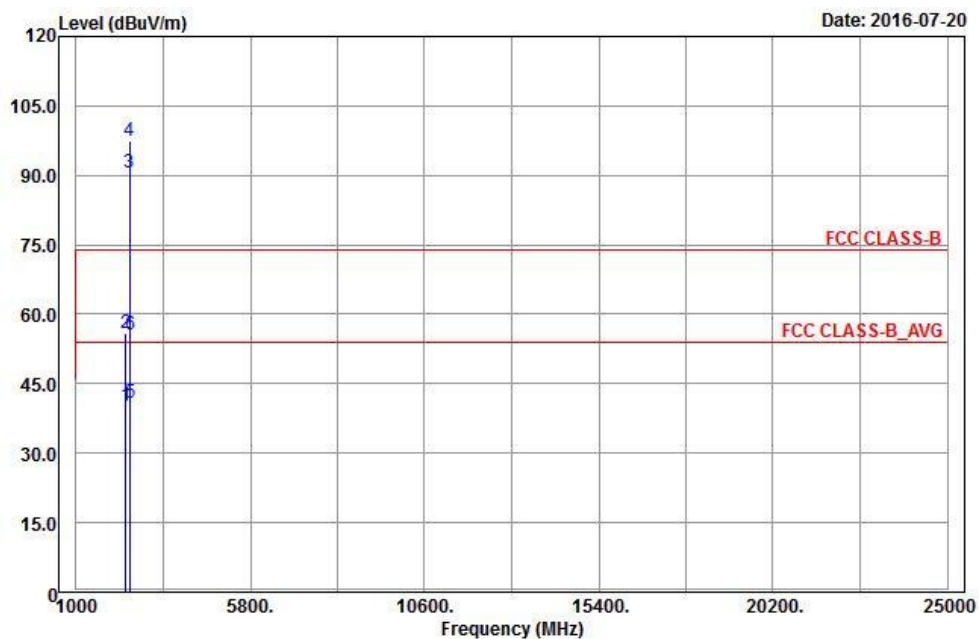
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



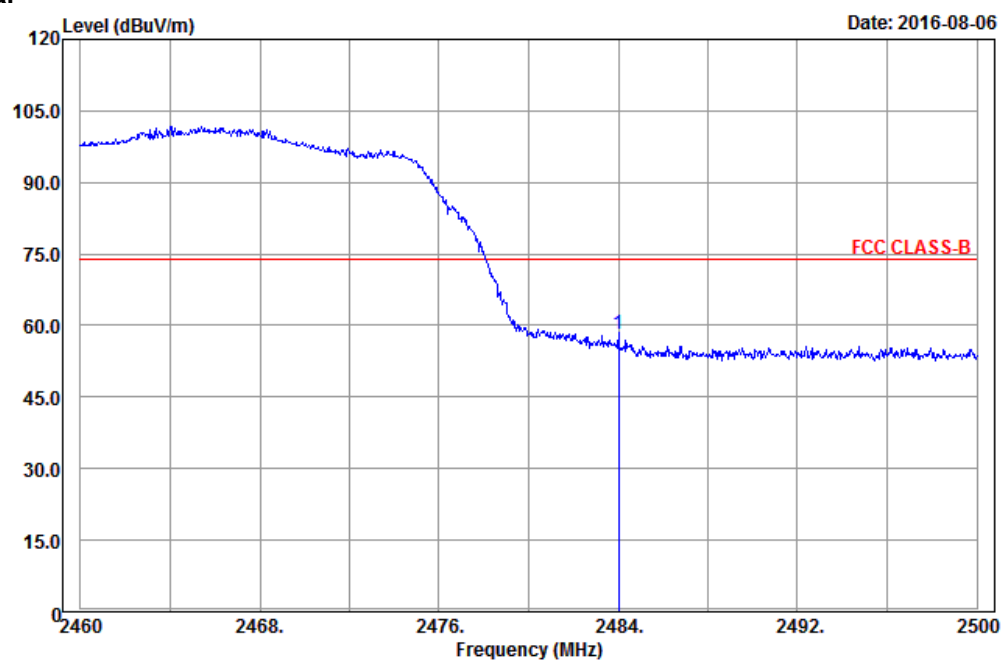
Vertical



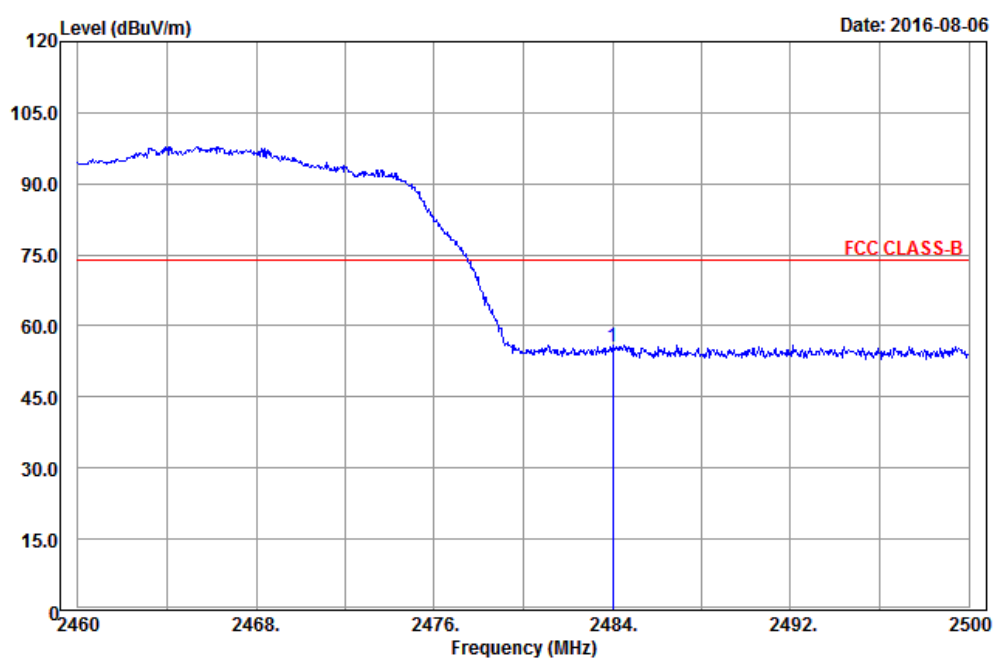
BandEdge

Peak

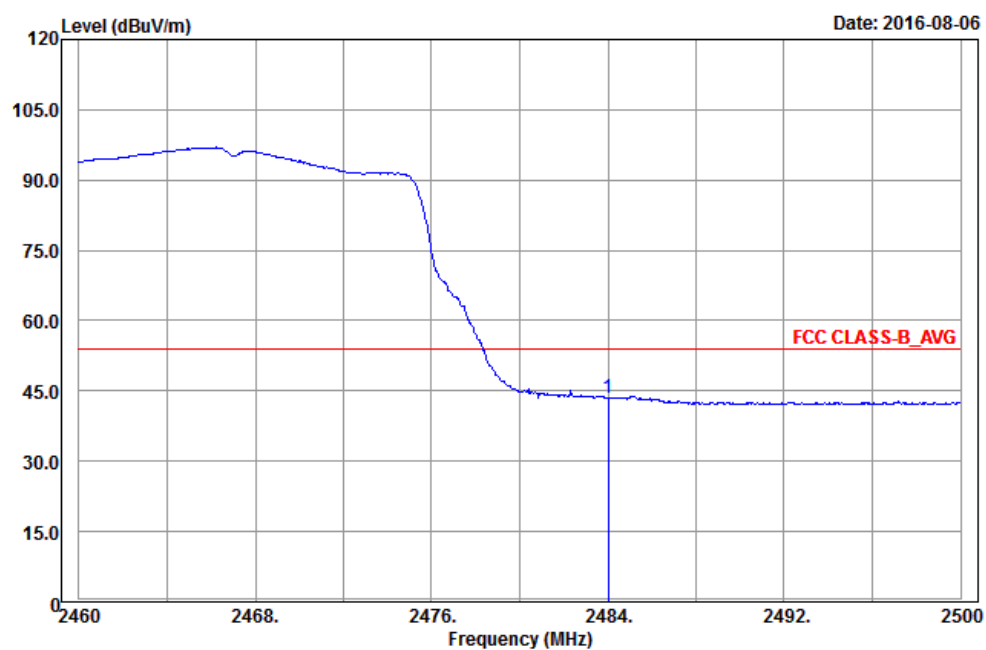
Horizontal



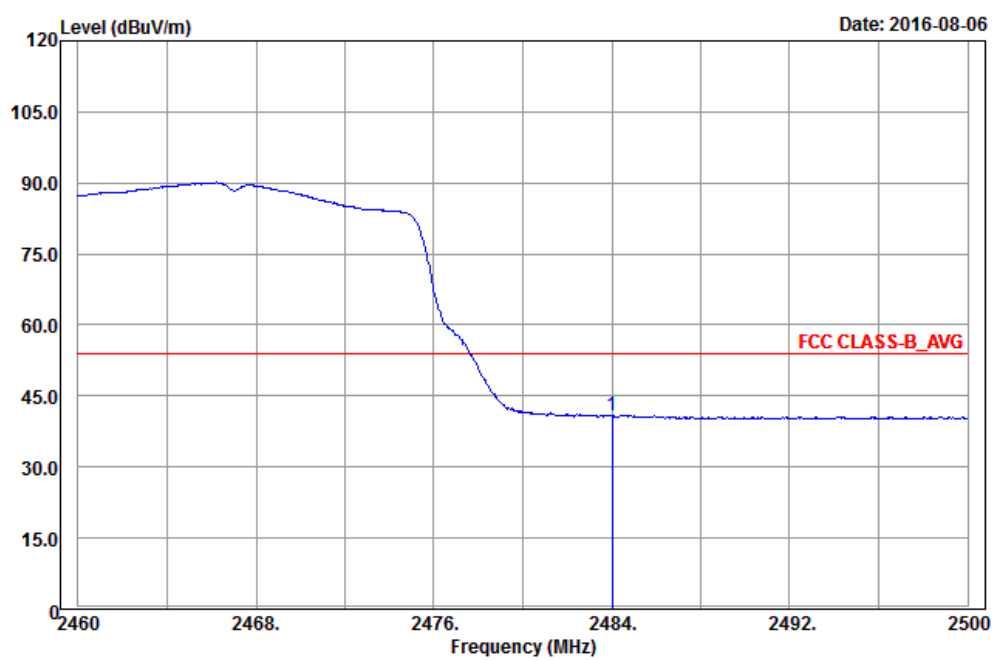
Vertical



Average Horizontal



Vertical



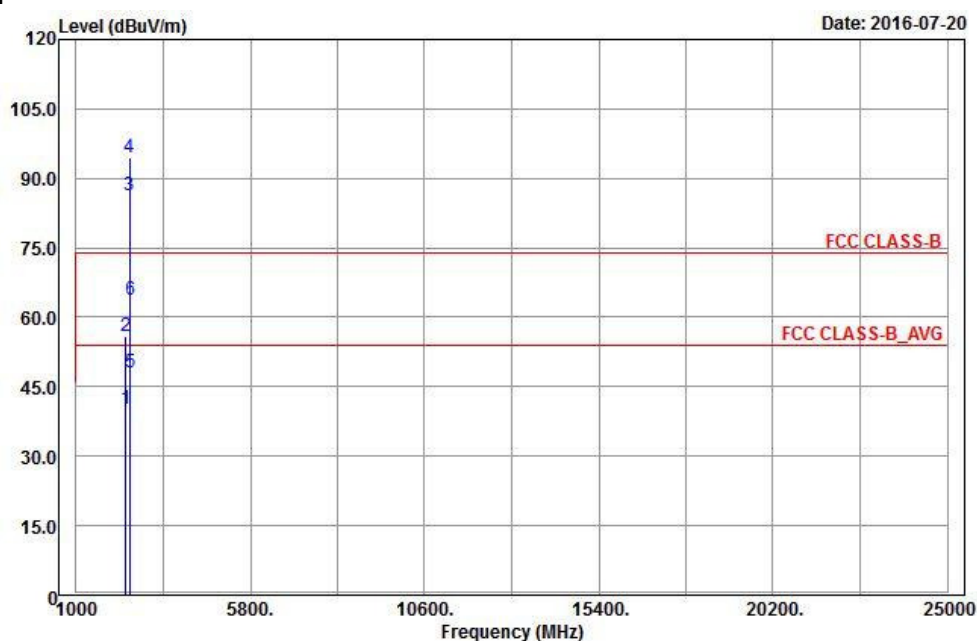
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2354	40.25	38.66	54	-13.75	31.76	5.33	35.5	137	6	Average
2354	55.74	54.15	74	-18.26	31.76	5.33	35.5	137	6	Peak
2467	95.58	93.63			31.87	5.5	35.42	137	6	Average
2467	102.28	100.33			31.87	5.5	35.42	137	6	Peak
2484	43.41	41.45	54	-10.59	31.88	5.5	35.42	137	6	Average
2484	58.32	56.36	74	-15.68	31.88	5.5	35.42	137	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2368	40.18	38.54	54	-13.82	31.76	5.37	35.49	117	100	Average
2368	55.84	54.2	74	-18.16	31.76	5.37	35.49	117	100	Peak
2467	90.61	88.66			31.87	5.5	35.42	117	100	Average
2467	97.31	95.36			31.87	5.5	35.42	117	100	Peak
2484	40.93	38.97	54	-13.07	31.88	5.5	35.42	117	100	Average
2484	55.7	53.74	74	-18.3	31.88	5.5	35.42	117	100	Peak

Remarks:

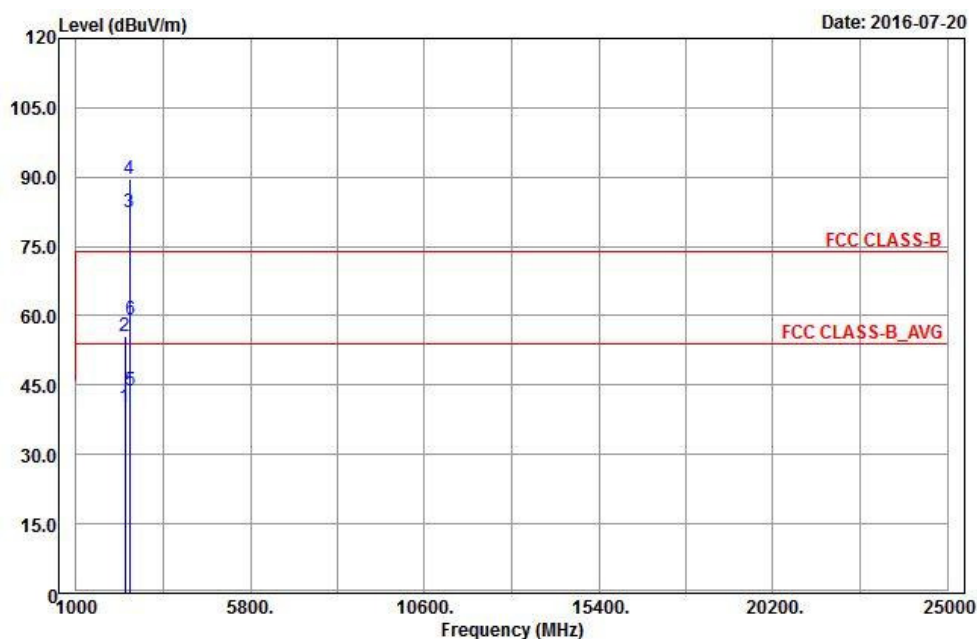
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



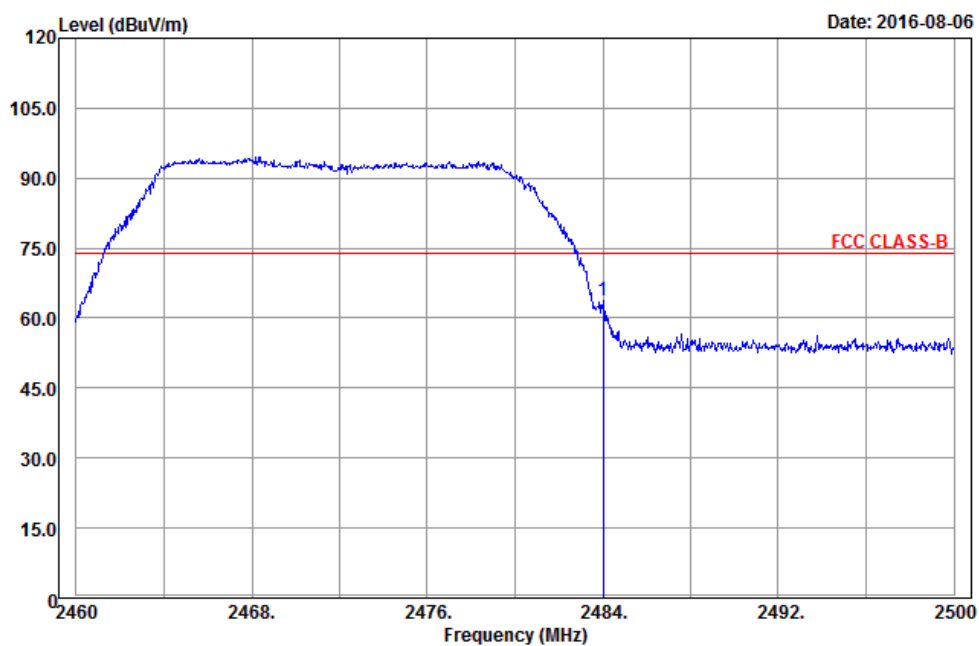
Vertical



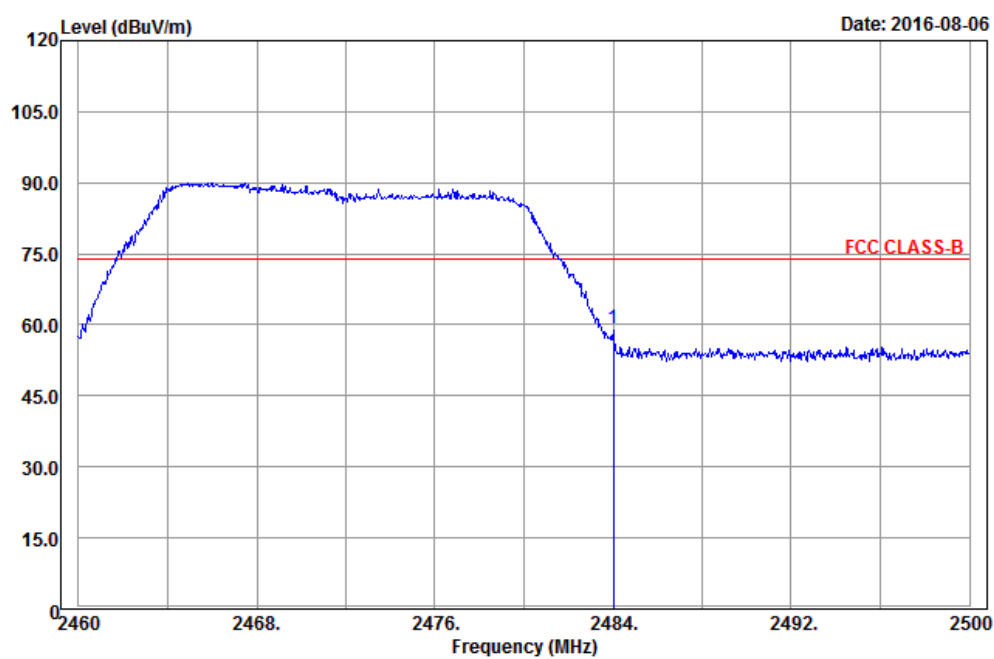
BandEdge

Peak

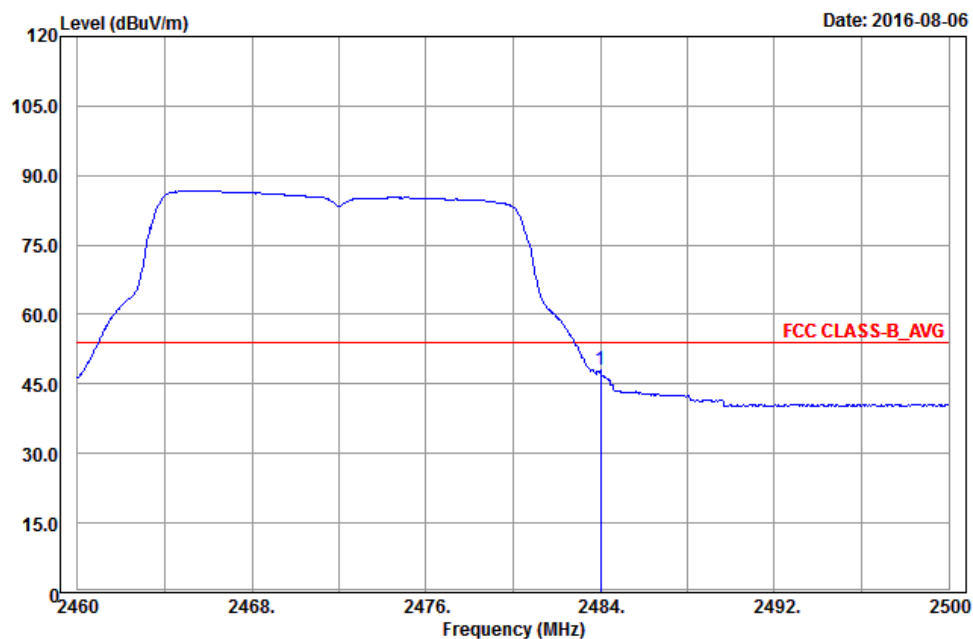
Horizontal



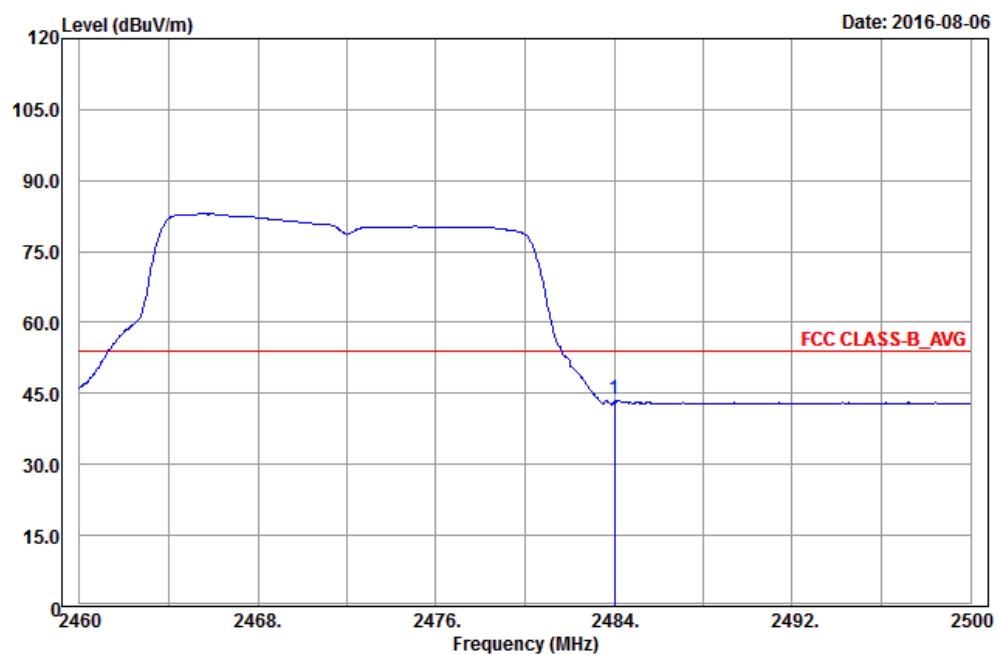
Vertical



Average Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2372	40.29	38.63	54	-13.71	31.78	5.37	35.49	136	6	Average
2372	55.9	54.24	74	-18.1	31.78	5.37	35.49	136	6	Peak
2472	86.38	84.42			31.88	5.5	35.42	136	6	Average
2472	94.6	92.64			31.88	5.5	35.42	136	6	Peak
2484	48.12	46.16	54	-5.88	31.88	5.5	35.42	136	6	Average
2484	63.61	61.65	74	-10.39	31.88	5.5	35.42	136	6	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2354	40.13	38.54	54	-13.87	31.76	5.33	35.5	115	100	Average
2354	55.61	54.02	74	-18.39	31.76	5.33	35.5	115	100	Peak
2472	82.53	80.57			31.88	5.5	35.42	115	100	Average
2472	89.59	87.63			31.88	5.5	35.42	115	100	Peak
2484	43.68	41.72	54	-10.32	31.88	5.5	35.42	115	100	Average
2484	59.26	57.3	74	-14.74	31.88	5.5	35.42	115	100	Peak

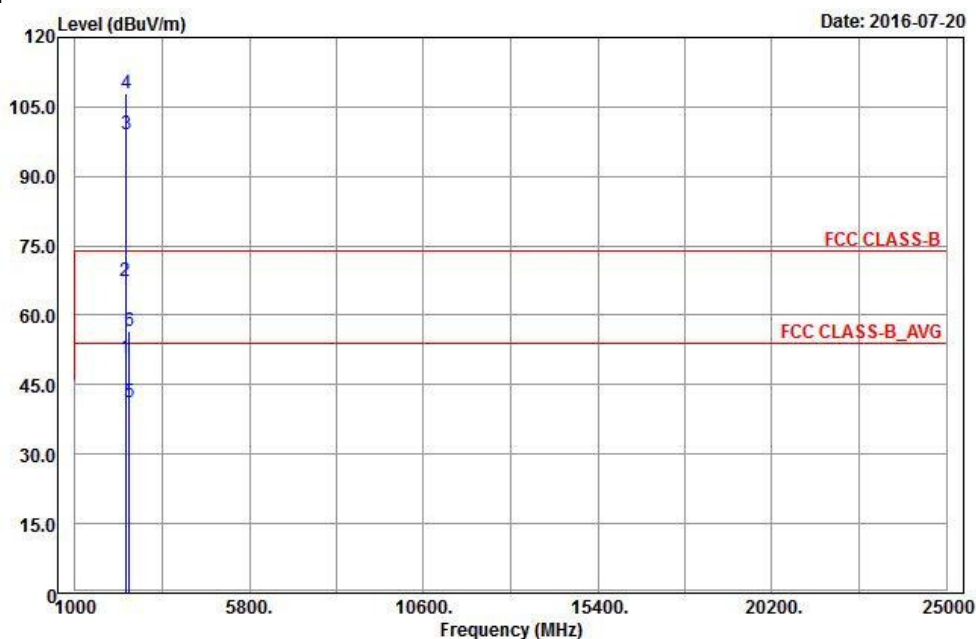
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 MHz: Fundamental frequency.

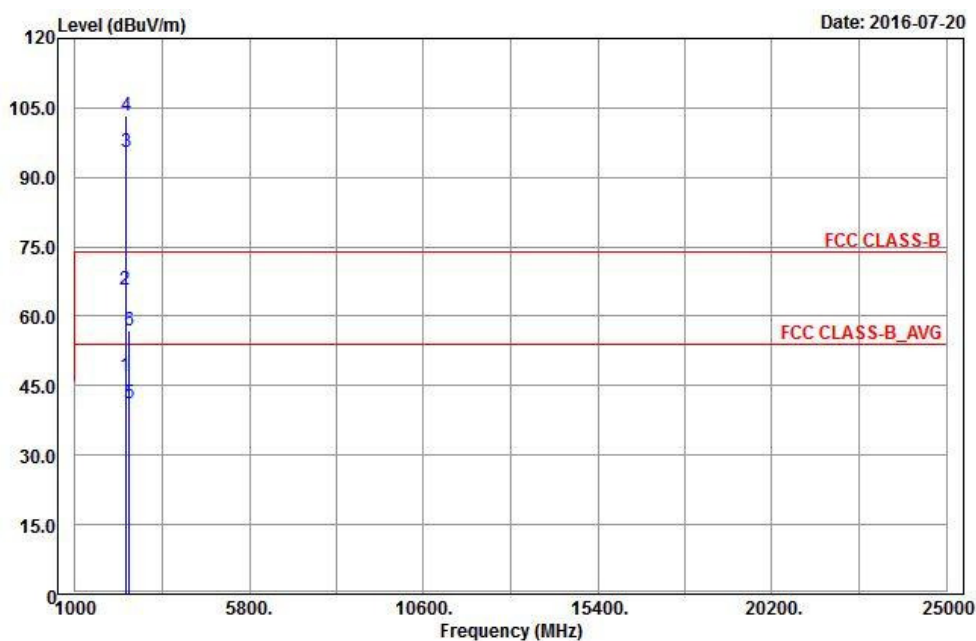
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



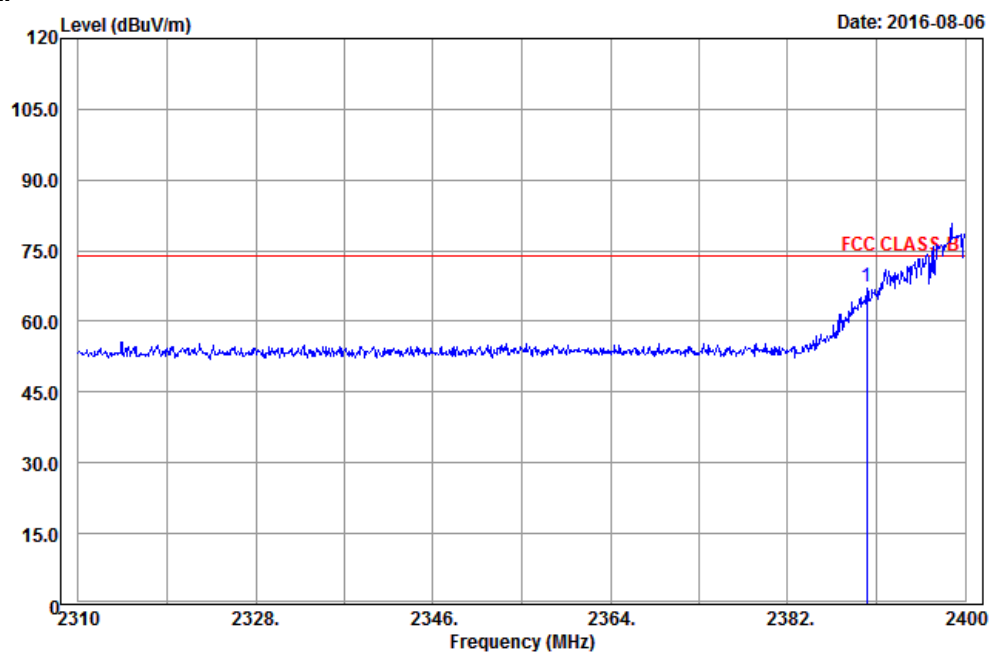
Vertical



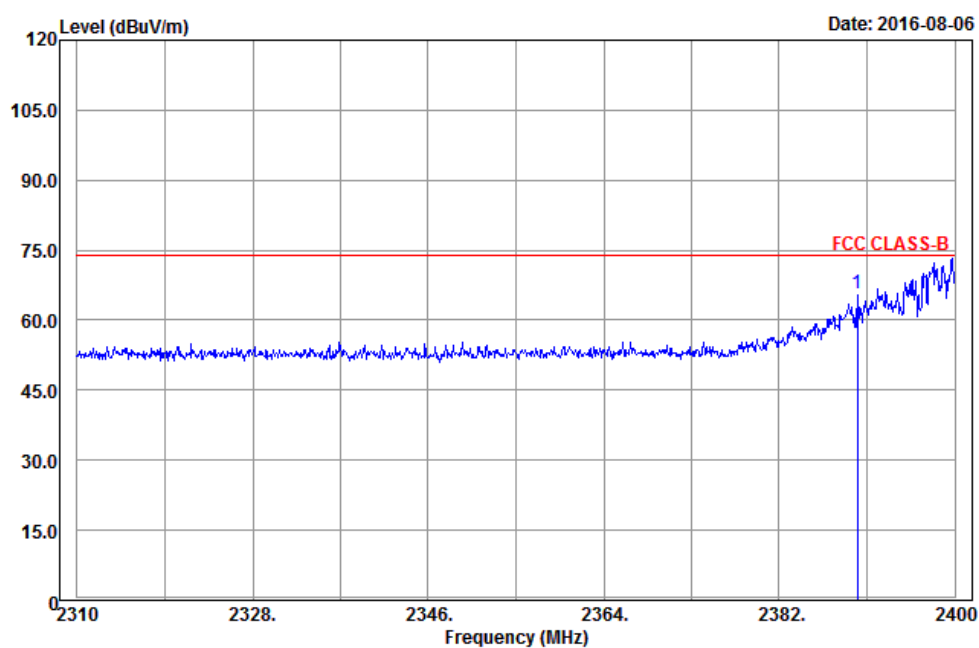
BandEdge

Peak

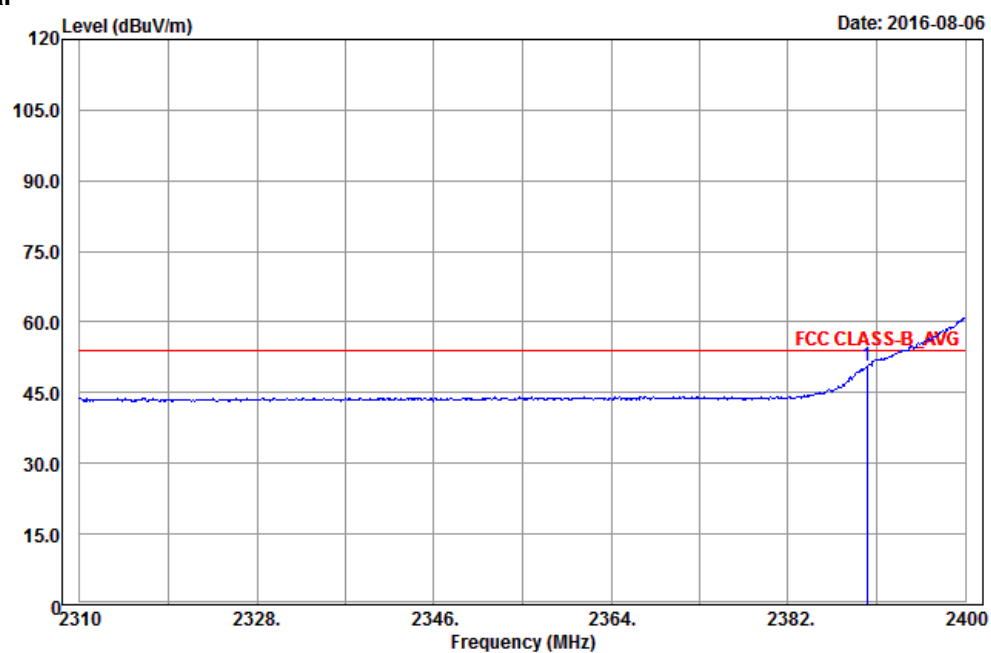
Horizontal



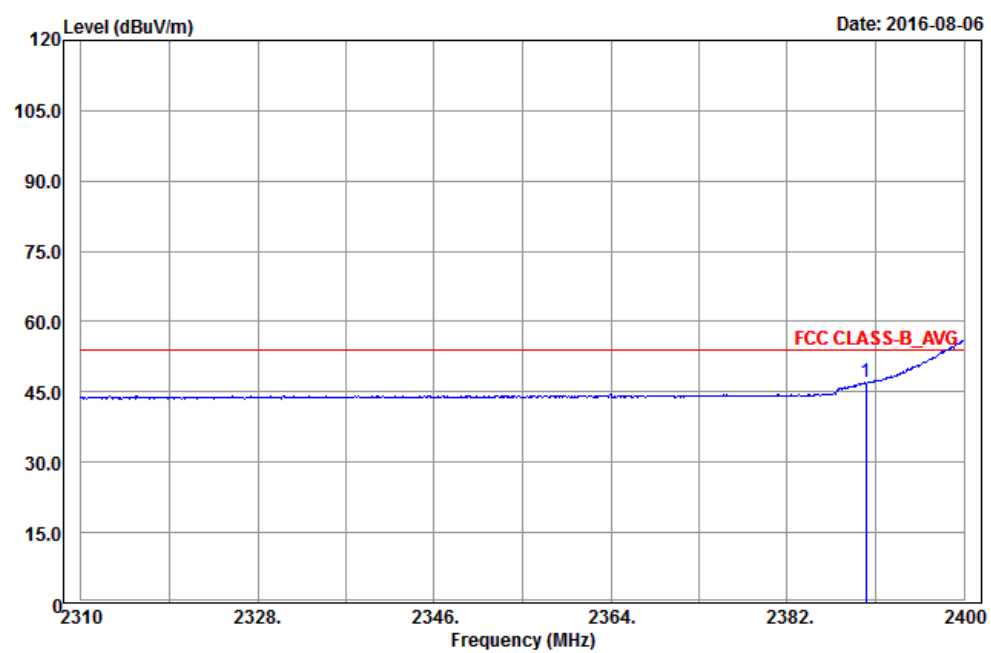
Vertical



Average Horizontal



Vertical



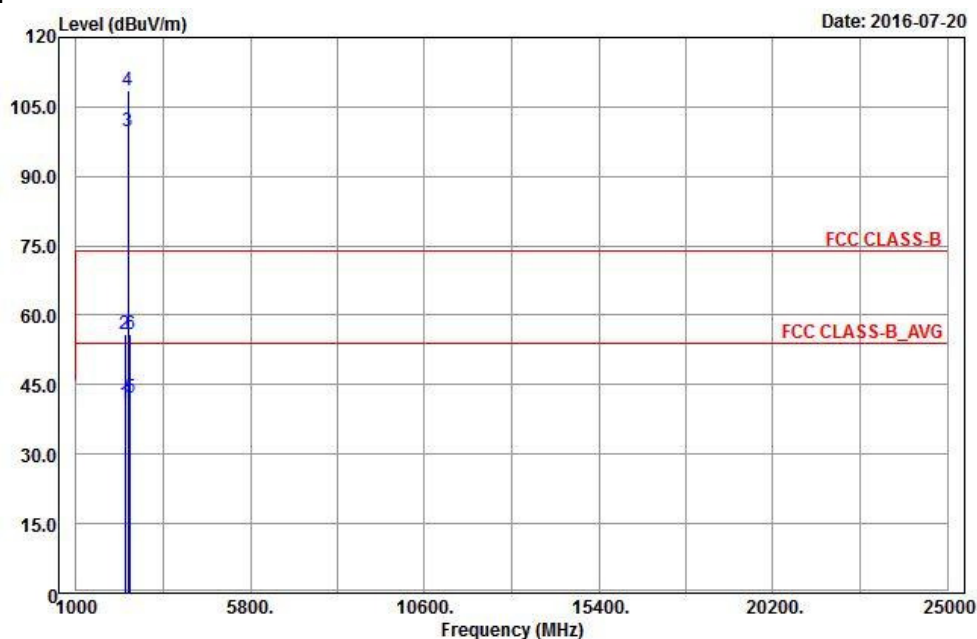
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	50.78	49.05	54	-3.22	31.8	5.4	35.47	126	168	Average
2390	67.5	65.77	74	-6.5	31.8	5.4	35.47	126	168	Peak
2412	99.13	97.36			31.81	5.43	35.47	126	168	Average
2412	107.8	106.03			31.81	5.43	35.47	126	168	Peak
2492	41.26	39.24	54	-12.74	31.9	5.53	35.41	126	168	Average
2492	56.7	54.68	74	-17.3	31.9	5.53	35.41	126	168	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.09	45.36	54	-6.91	31.8	5.4	35.47	209	37	Average
2390	65.74	64.01	74	-8.26	31.8	5.4	35.47	209	37	Peak
2412	95.64	93.87			31.81	5.43	35.47	209	37	Average
2412	103.31	101.54			31.81	5.43	35.47	209	37	Peak
2500	41.2	39.18	54	-12.8	31.9	5.53	35.41	209	37	Average
2500	56.85	54.83	74	-17.15	31.9	5.53	35.41	209	37	Peak

Remarks:

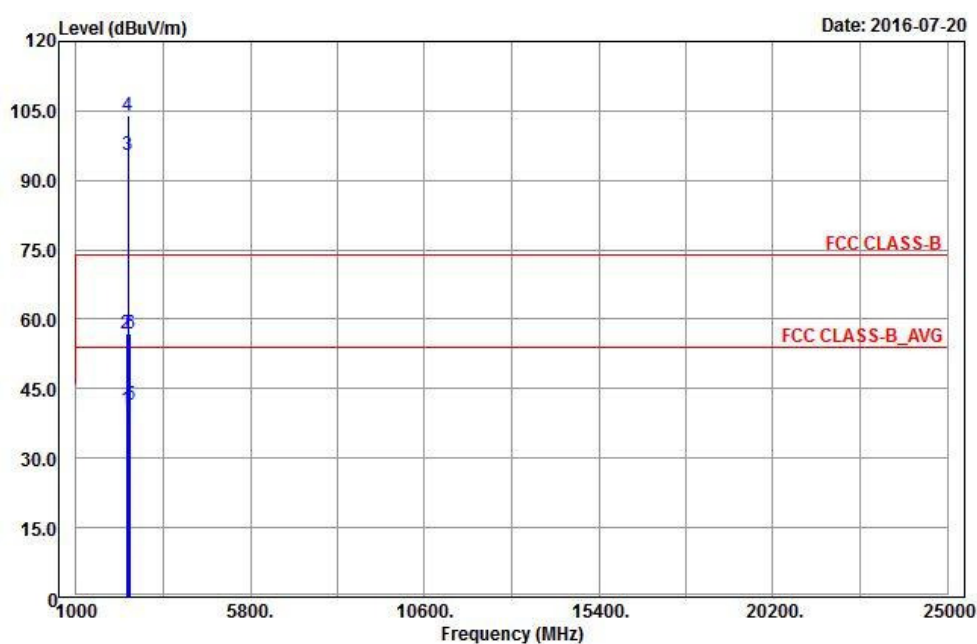
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



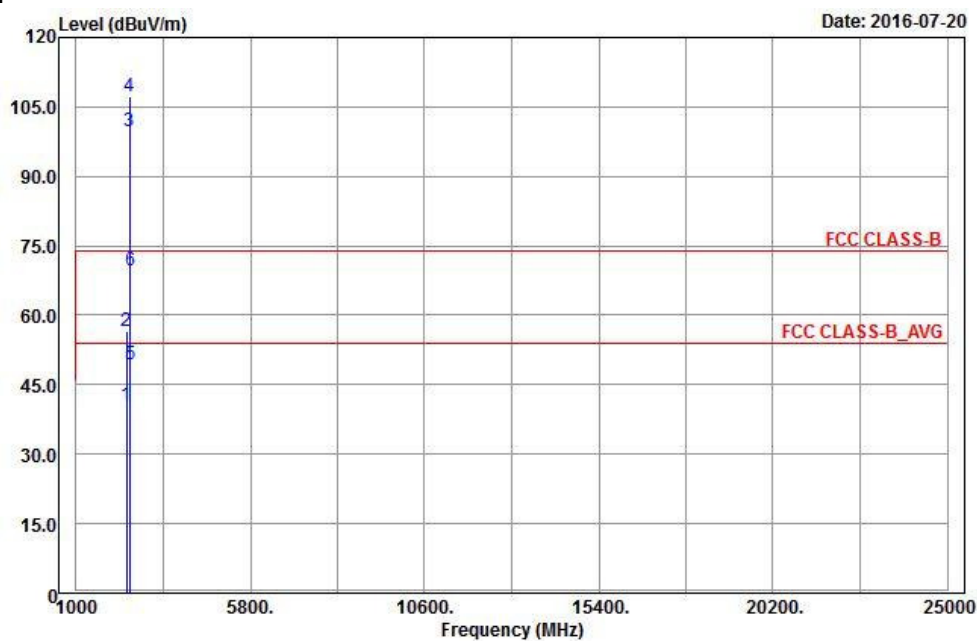
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2344	40.95	39.38	54	-13.05	31.74	5.33	35.5	110	191	Average
2344	55.75	54.18	74	-18.25	31.74	5.33	35.5	110	191	Peak
2437	99.73	97.88			31.85	5.46	35.46	110	191	Average
2437	108.4	106.55			31.85	5.46	35.46	110	191	Peak
2490	42.16	40.15	54	-11.84	31.9	5.53	35.42	110	191	Average
2490	55.77	53.76	74	-18.23	31.9	5.53	35.42	110	191	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382	40.59	38.9	54	-13.41	31.78	5.4	35.49	186	37	Average
2382	56.89	55.2	74	-17.11	31.78	5.4	35.49	186	37	Peak
2437	95.33	93.48			31.85	5.46	35.46	186	37	Average
2437	103.96	102.11			31.85	5.46	35.46	186	37	Peak
2490	41.57	39.56	54	-12.43	31.9	5.53	35.42	186	37	Average
2490	56.85	54.84	74	-17.15	31.9	5.53	35.42	186	37	Peak

Remarks:

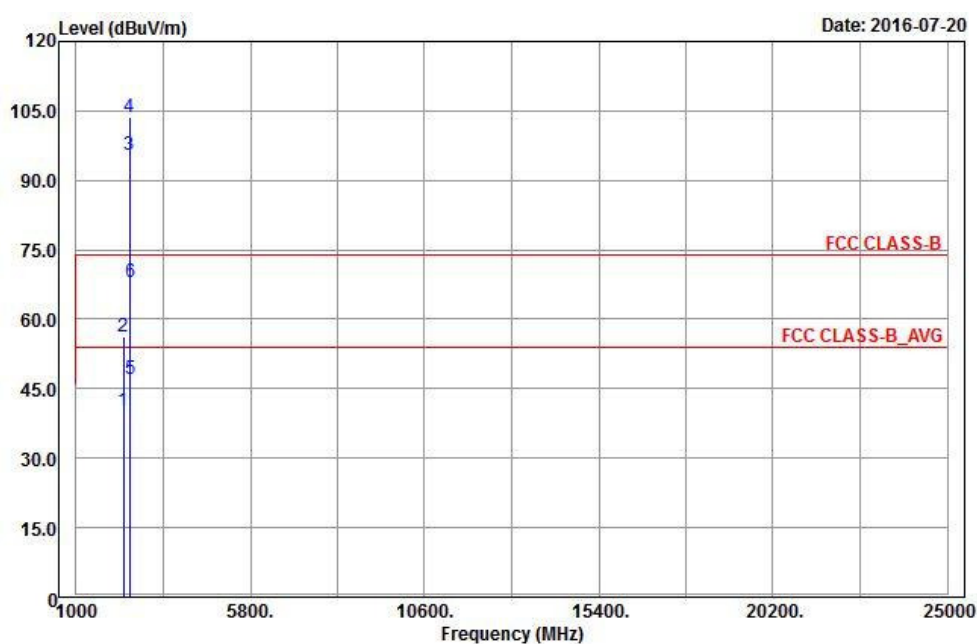
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



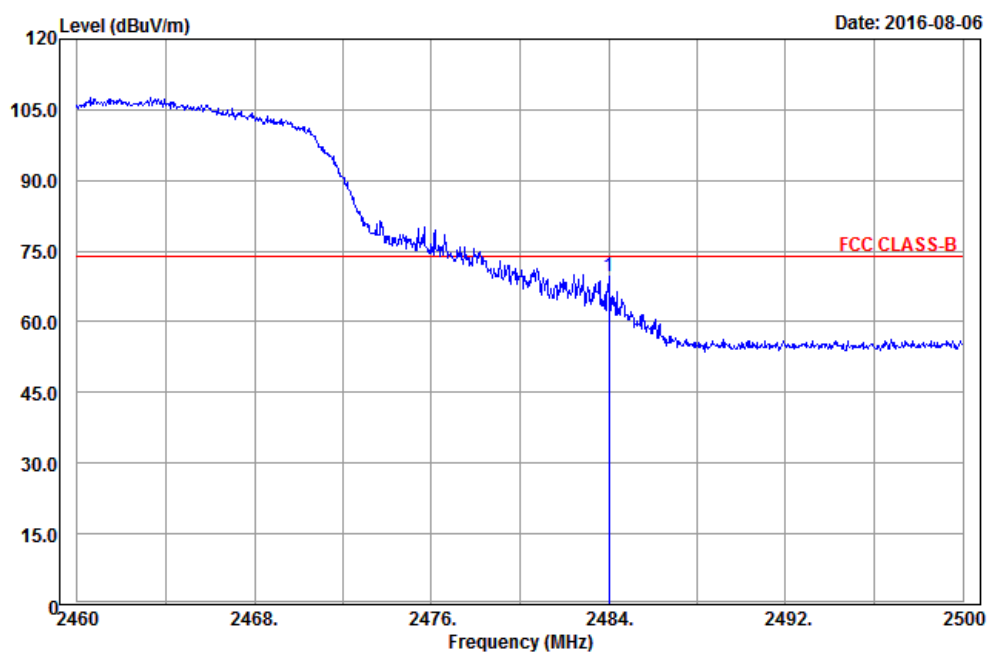
Vertical



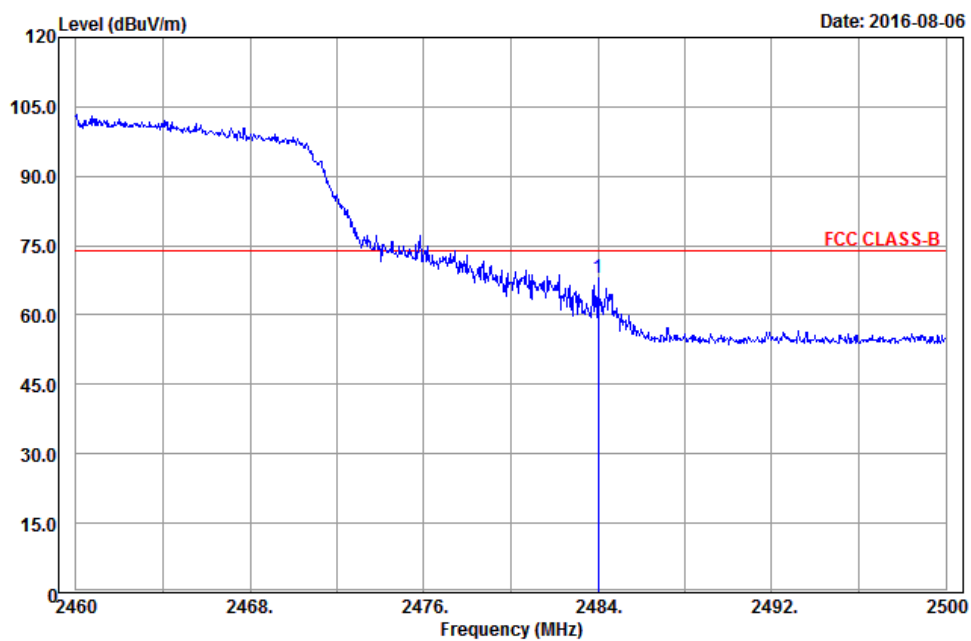
BandEdge

Peak

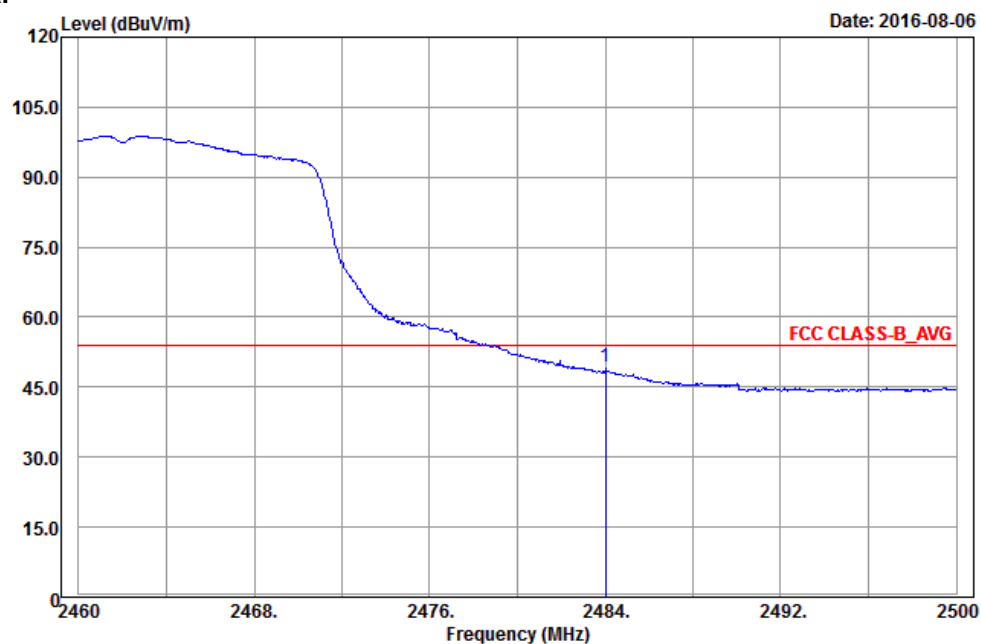
Horizontal



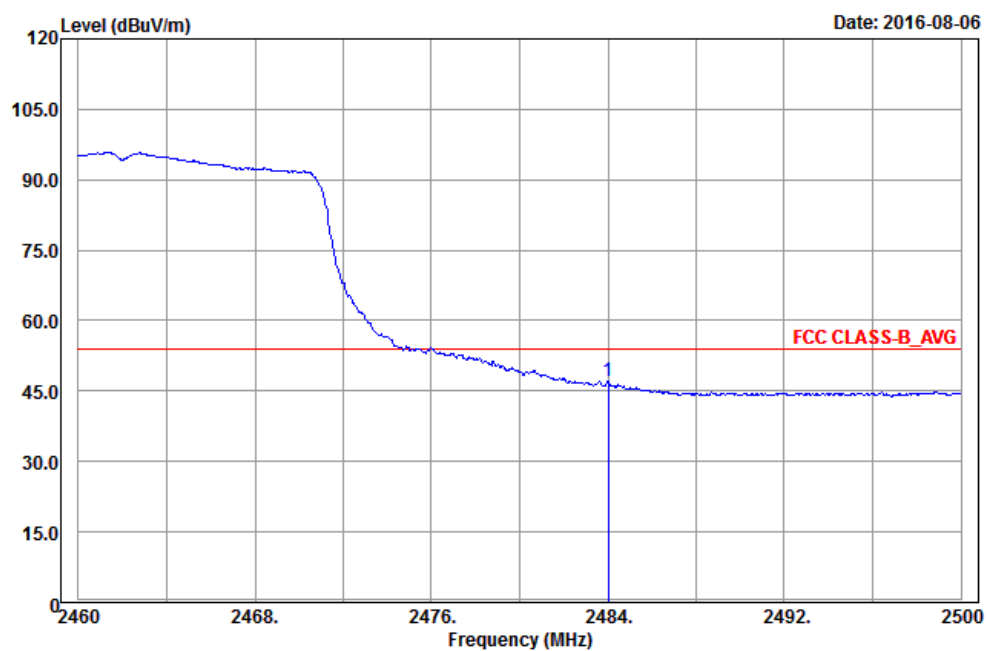
Vertical



Average Horizontal



Vertical



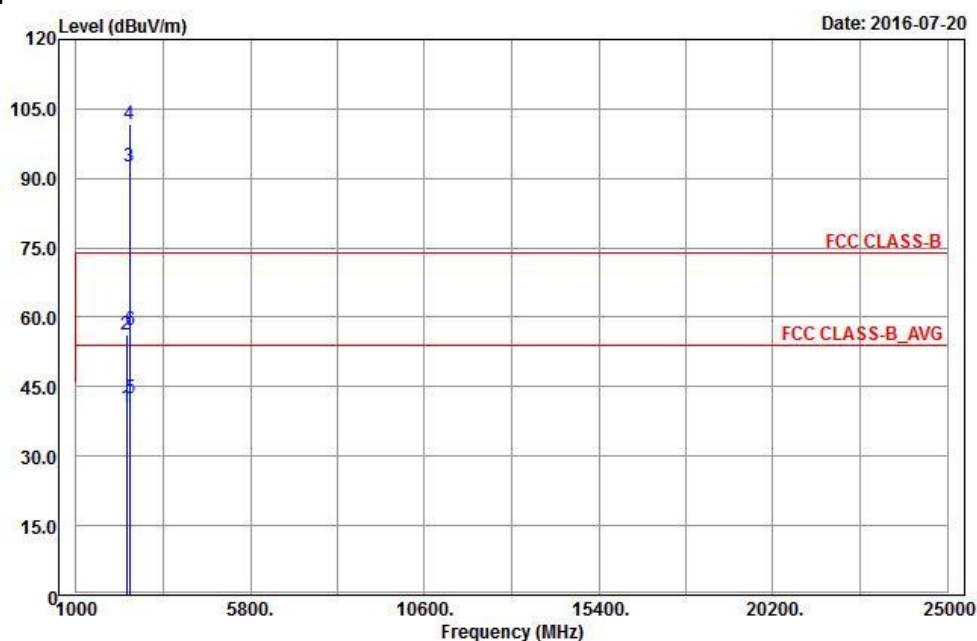
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382	40.53	38.84	54	-13.47	31.78	5.4	35.49	125	191	Average
2382	56.6	54.91	74	-17.4	31.78	5.4	35.49	125	191	Peak
2462	99.64	97.71			31.87	5.5	35.44	125	191	Average
2462	107.35	105.42			31.87	5.5	35.44	125	191	Peak
2484	49.31	47.35	54	-4.69	31.88	5.5	35.42	125	191	Average
2484	69.72	67.76	74	-4.28	31.88	5.5	35.42	125	191	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2310	40.37	38.89	54	-13.63	31.71	5.3	35.53	186	37	Average
2310	56.18	54.7	74	-17.82	31.71	5.3	35.53	186	37	Peak
2462	95.49	93.56			31.87	5.5	35.44	186	37	Average
2462	103.54	101.61			31.87	5.5	35.44	186	37	Peak
2484	47.03	45.07	54	-6.97	31.88	5.5	35.42	186	37	Average
2484	68.14	66.18	74	-5.86	31.88	5.5	35.42	186	37	Peak

Remarks:

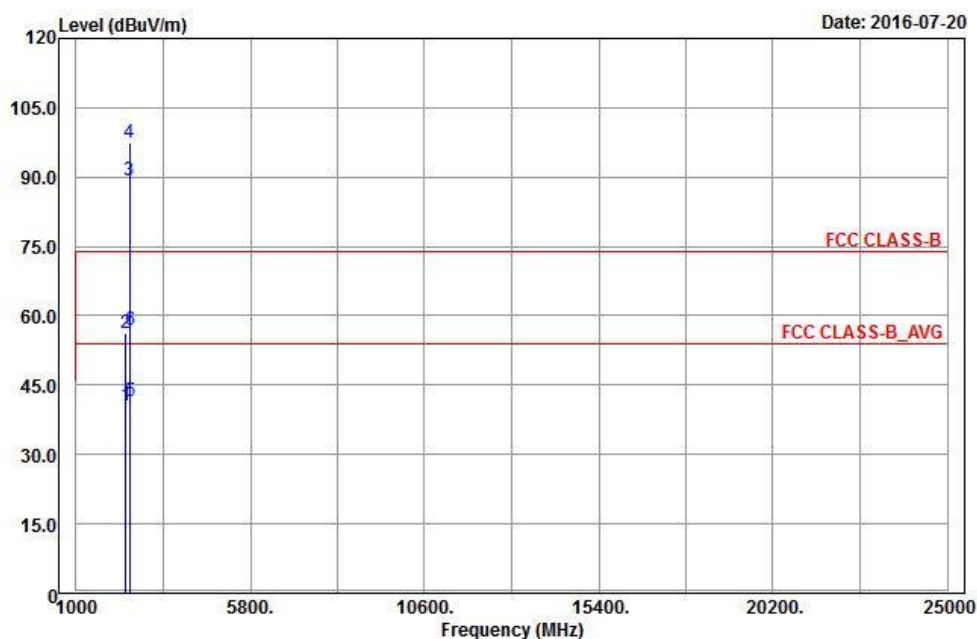
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



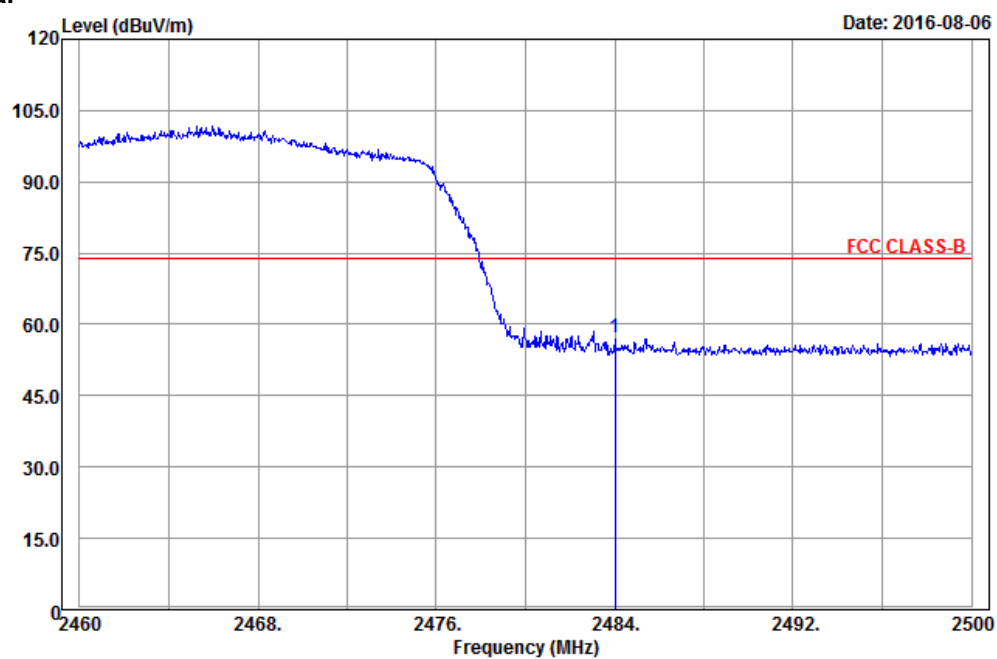
Vertical



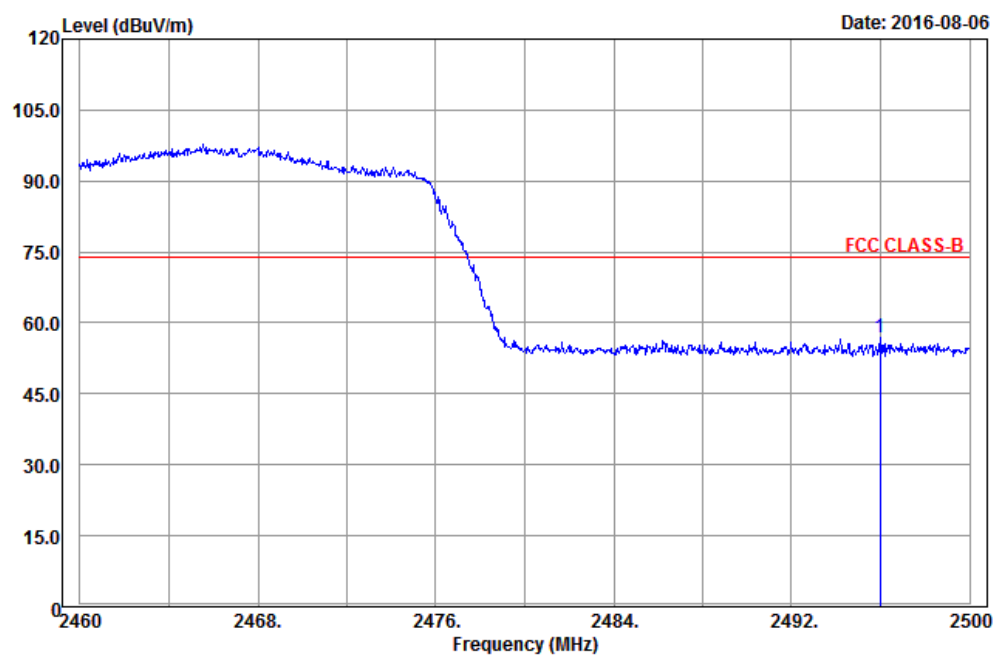
BandEdge

Peak

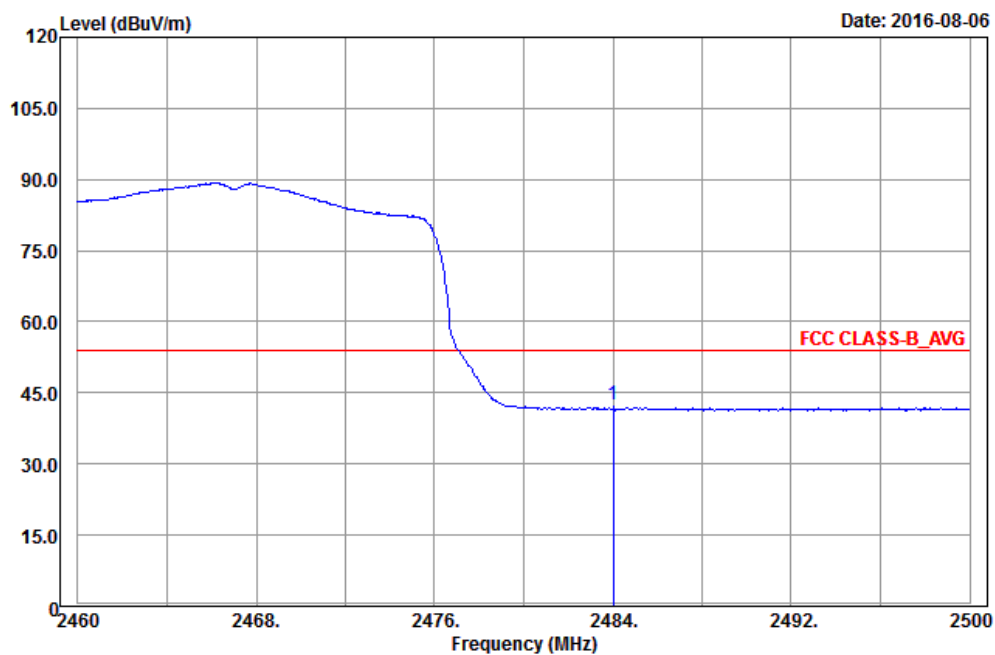
Horizontal



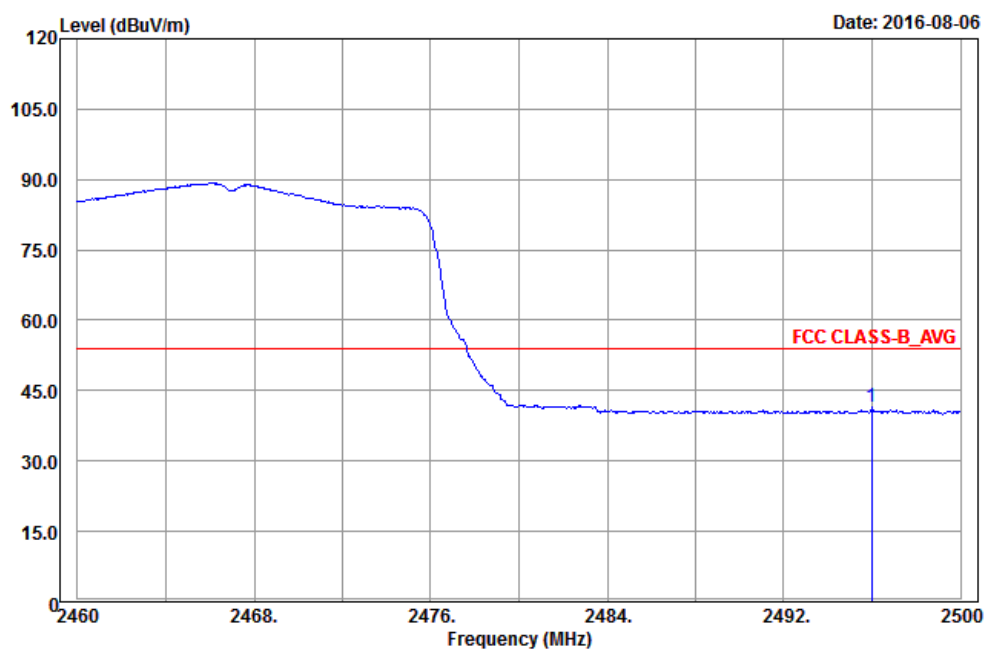
Vertical



Average Horizontal



Vertical



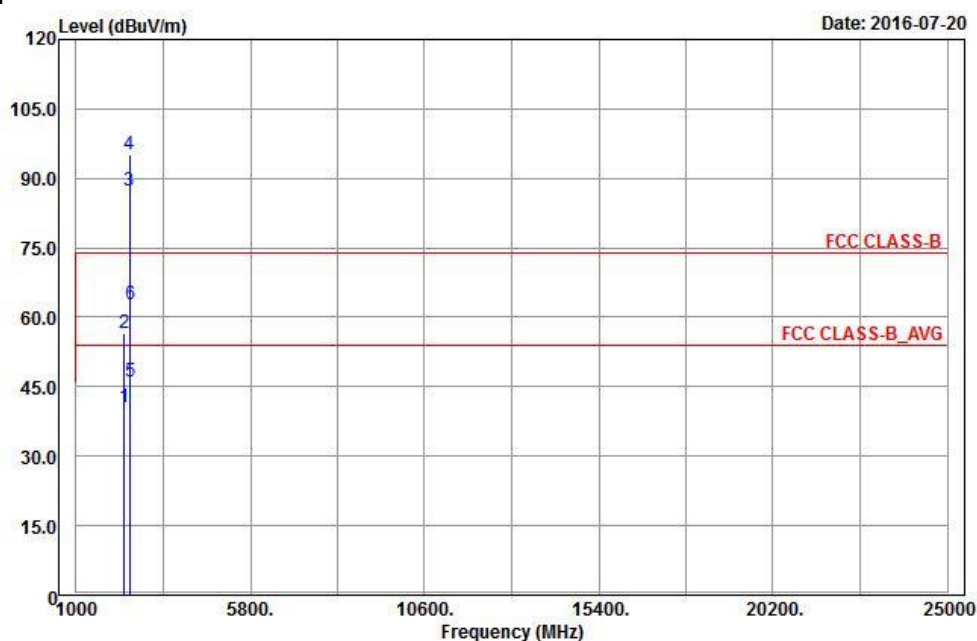
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382	40.61	38.92	54	-13.39	31.78	5.4	35.49	124	191	Average
2382	56.09	54.4	74	-17.91	31.78	5.4	35.49	124	191	Peak
2467	92.63	90.68			31.87	5.5	35.42	124	191	Average
2467	101.57	99.62			31.87	5.5	35.42	124	191	Peak
2484	42.4	40.44	54	-11.6	31.88	5.5	35.42	124	191	Average
2484	57.24	55.28	74	-16.76	31.88	5.5	35.42	124	191	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2358	40.4	38.77	54	-13.6	31.76	5.37	35.5	180	36	Average
2358	56.38	54.75	74	-17.62	31.76	5.37	35.5	180	36	Peak
2467	89.23	87.28			31.87	5.5	35.42	180	36	Average
2467	97.45	95.5			31.87	5.5	35.42	180	36	Peak
2496	41.66	39.64	54	-12.34	31.9	5.53	35.41	180	36	Average
2496	57	54.98	74	-17	31.9	5.53	35.41	180	36	Peak

Remarks:

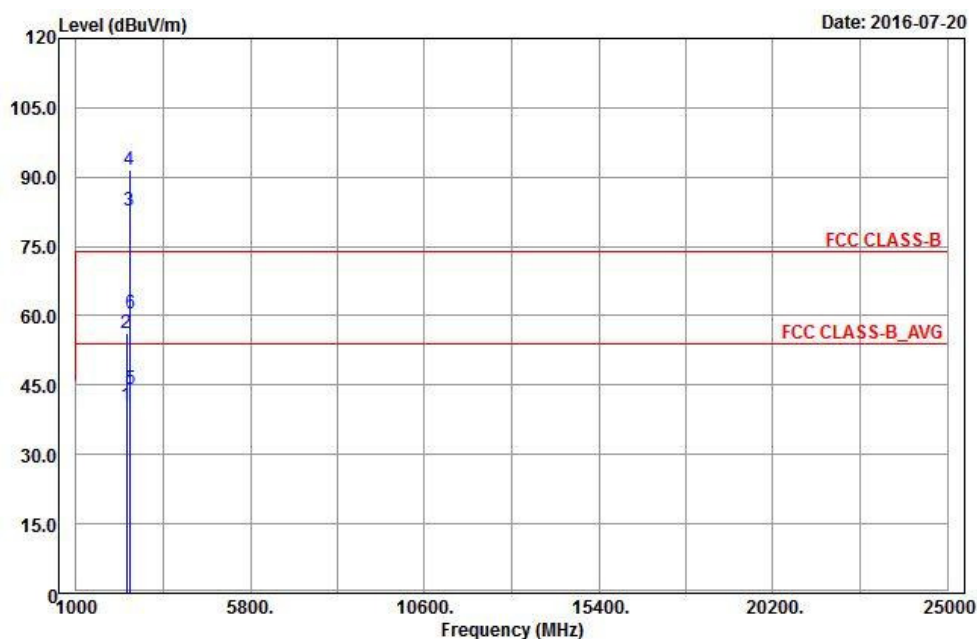
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 1MHz , VBW : 3MHz Average (AV) RBW : 1MHz , VBW : 10Hz
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



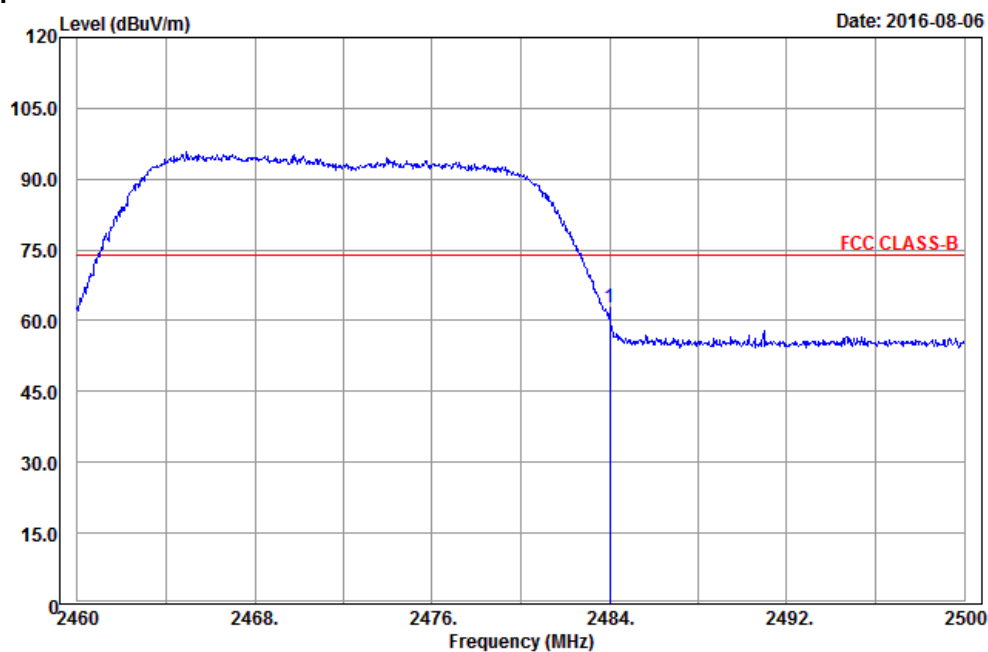
Vertical



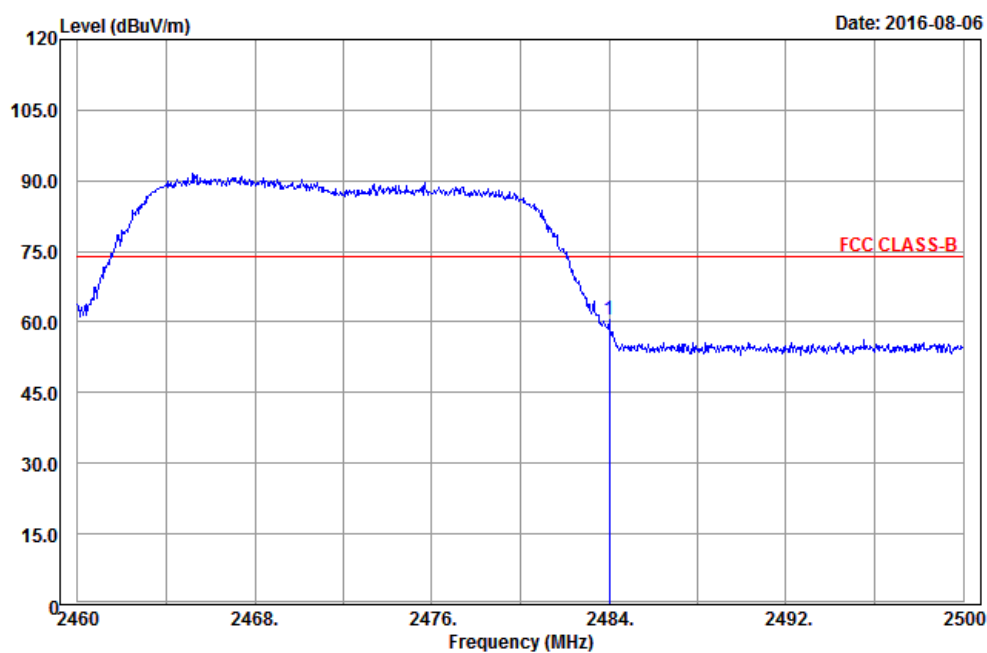
BandEdge

Peak

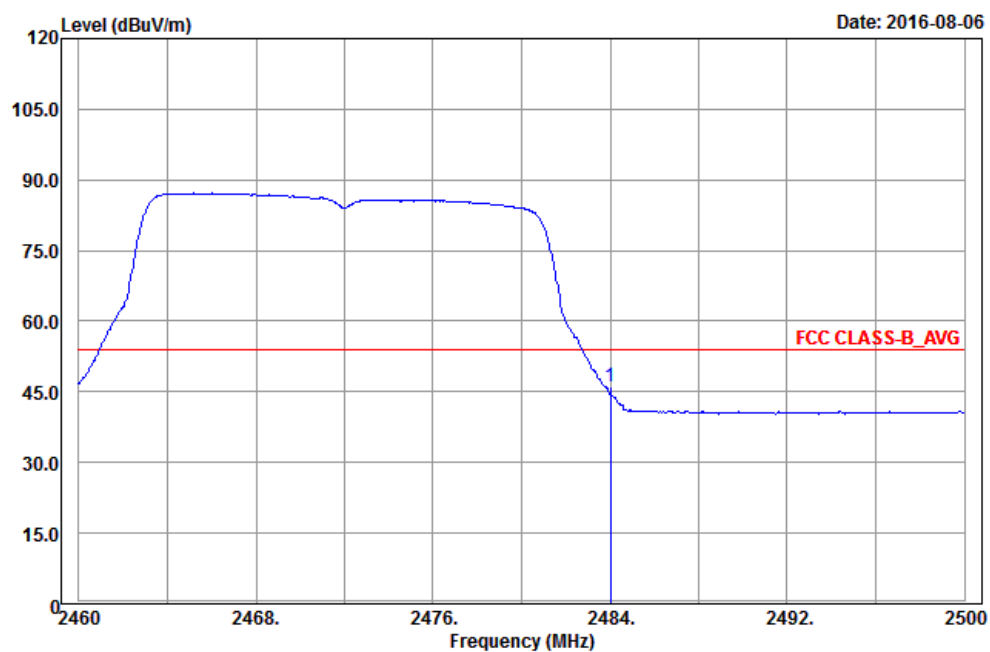
Horizontal



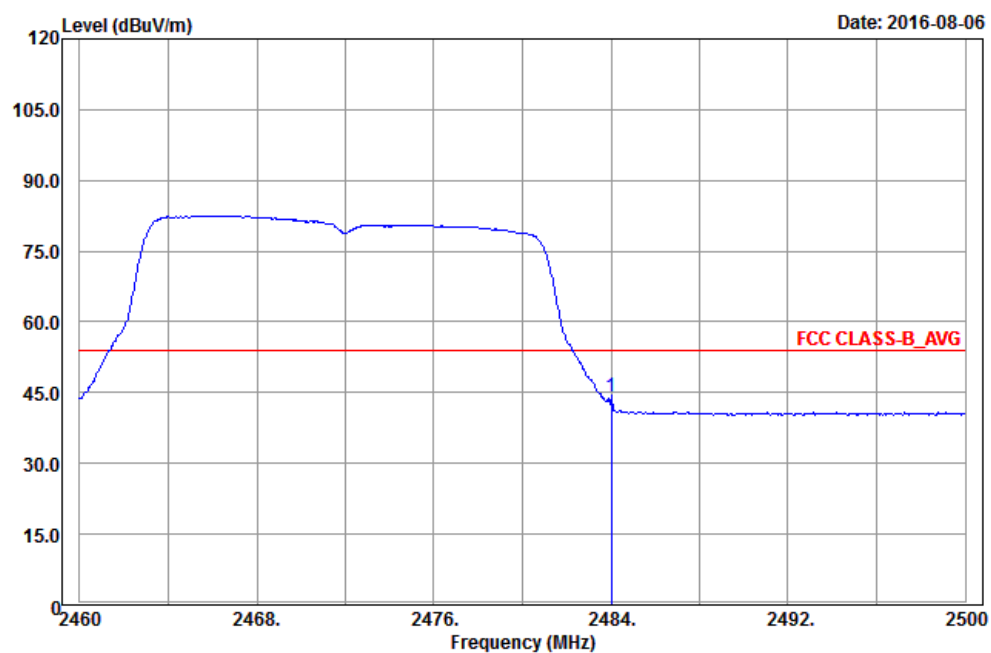
Vertical



Average Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2334	40.5	38.96	54	-13.5	31.73	5.33	35.52	124	191	Average
2334	56.55	55.01	74	-17.45	31.73	5.33	35.52	124	191	Peak
2472	87.3	85.34			31.88	5.5	35.42	124	191	Average
2472	95.15	93.19			31.88	5.5	35.42	124	191	Peak
2484	45.96	44	54	-8.04	31.88	5.5	35.42	124	191	Average
2484	62.76	60.8	74	-11.24	31.88	5.5	35.42	124	191	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382	40.63	38.94	54	-13.37	31.78	5.4	35.49	180	36	Average
2382	56.2	54.51	74	-17.8	31.78	5.4	35.49	180	36	Peak
2472	82.83	80.87			31.88	5.5	35.42	180	36	Average
2472	91.45	89.49			31.88	5.5	35.42	180	36	Peak
2484	44	42.04	54	-10	31.88	5.5	35.42	180	36	Average
2484	60.37	58.41	74	-13.63	31.88	5.5	35.42	180	36	Peak

Remarks:

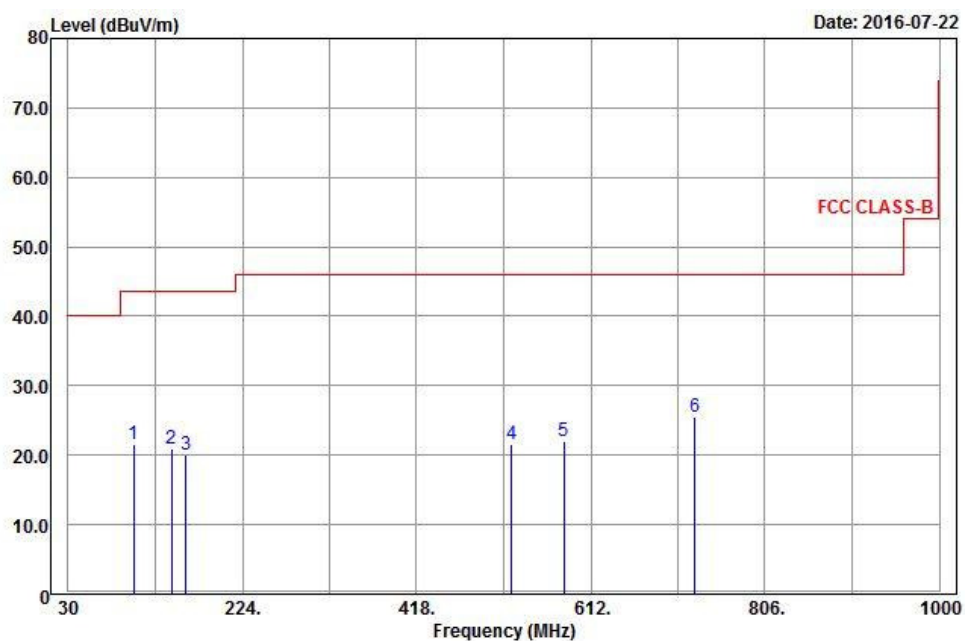
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 MHz: Fundamental frequency.

30 MHz ~ 1 GHz WORST-CASE DATA:

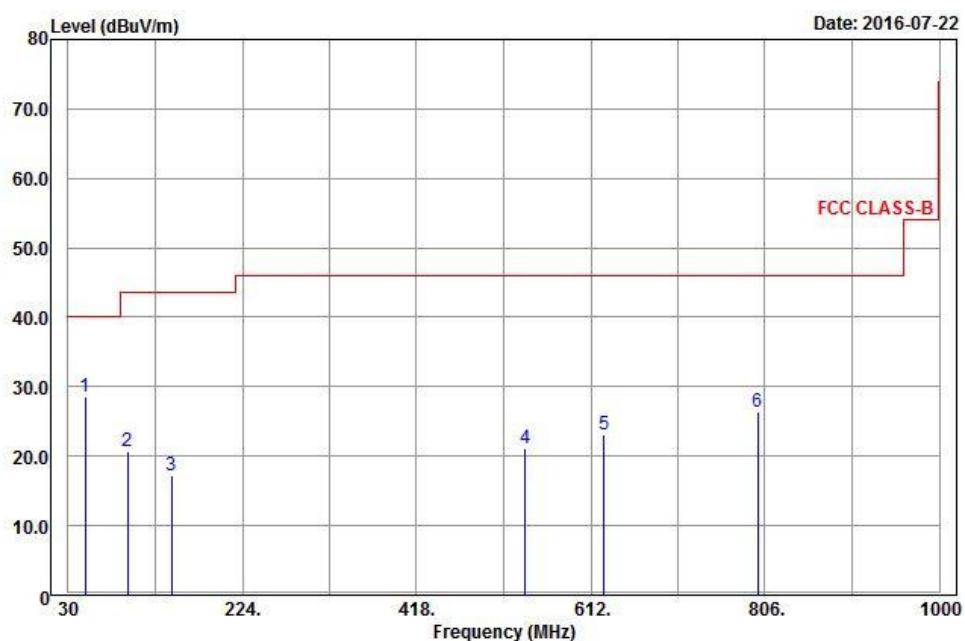
802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) RBW : 120KHz , VBW : 360KHz Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
102.63	21.61	42.96	43.5	-21.89	9.63	1.28	32.26	102	245	Peak
145.29	21	42.16	43.5	-22.5	9.73	1.38	32.27	180	360	Peak
160.95	19.99	40.01	43.5	-23.51	10.73	1.52	32.27	160	3	Peak
524	21.55	30.29	46	-24.45	20.7	2.7	32.14	200	215	Peak
582.1	21.98	31.01	46	-24.02	20.35	2.82	32.2	170	195	Peak
727.7	25.41	30.97	46	-20.59	23.4	3.16	32.12	115	254	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
48.9	28.53	51.71	40	-11.47	8.14	0.9	32.22	128	25	Peak
96.42	20.77	42.11	43.5	-22.73	9.42	1.28	32.04	114	104	Peak
144.75	17.28	38.44	43.5	-26.22	9.73	1.38	32.27	136	316	Peak
539.4	21.09	30.03	46	-24.91	20.48	2.76	32.18	153	294	Peak
626.9	23.02	30.16	46	-22.98	22.1	2.93	32.17	150	124	Peak
798.4	26.34	30.66	46	-19.66	24.42	3.32	32.06	130	155	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 16, 2015	Nov. 15, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 11, 2016	Jan. 10, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	835239/001	Feb. 26, 2016	Feb. 25, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

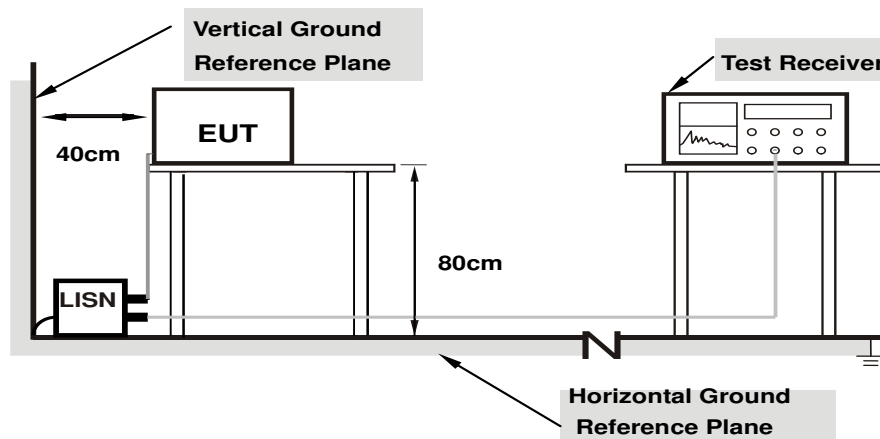
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

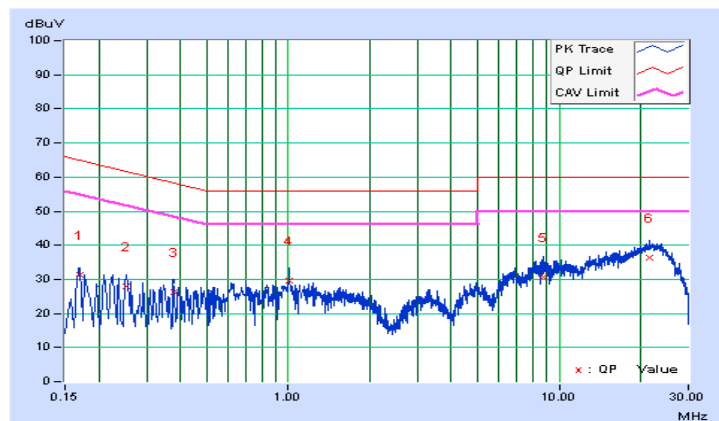
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/7/26

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	10.02	21.21	9.78	31.23	19.80	64.98	54.98	-33.75	-35.18
2	0.25166	10.05	17.74	4.39	27.79	14.44	61.70	51.70	-33.91	-37.26
3	0.37700	10.11	16.05	5.04	26.16	15.15	58.35	48.35	-32.19	-33.20
4	1.01020	10.20	19.37	12.84	29.57	23.04	56.00	46.00	-26.43	-22.96
5	8.70117	10.66	19.83	11.46	30.49	22.12	60.00	50.00	-29.51	-27.88
6	21.68237	11.46	25.01	15.04	36.47	26.50	60.00	50.00	-23.53	-23.50

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

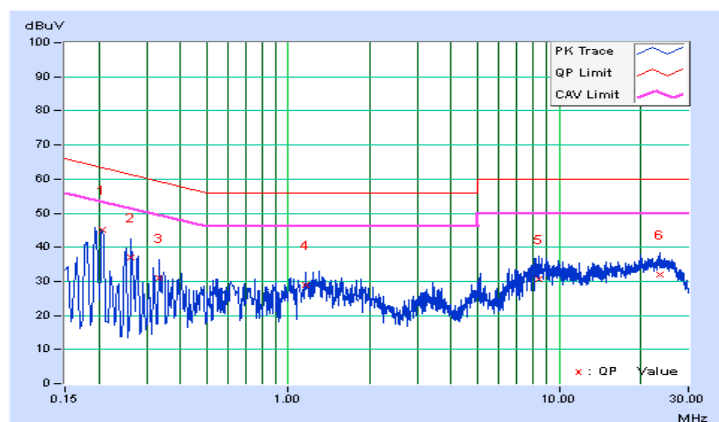


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/7/26

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20511	10.04	34.95	23.06	44.99	33.10	63.40	53.40	-18.41	-20.30
2	0.26339	10.07	27.07	13.11	37.14	23.18	61.32	51.32	-24.18	-28.14
3	0.33377	10.10	20.97	10.97	31.07	21.07	59.36	49.36	-28.29	-28.29
4	1.16269	10.22	18.88	12.35	29.10	22.57	56.00	46.00	-26.90	-23.43
5	8.41965	10.70	20.05	11.34	30.75	22.04	60.00	50.00	-29.25	-27.96
6	23.51616	11.72	20.17	12.80	31.89	24.52	60.00	50.00	-28.11	-25.48

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

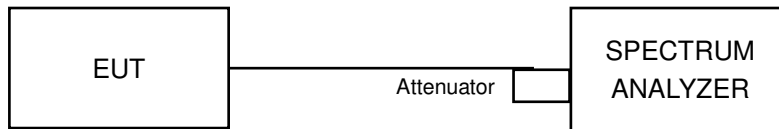


4.3 6 dB Bandwidth Measurement

4.3.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.59	0.5	Pass
6	2437	9.06	0.5	Pass
11	2462	9.07	0.5	Pass
12	2467	8.58	0.5	Pass
13	2472	8.10	0.5	Pass

802.11g

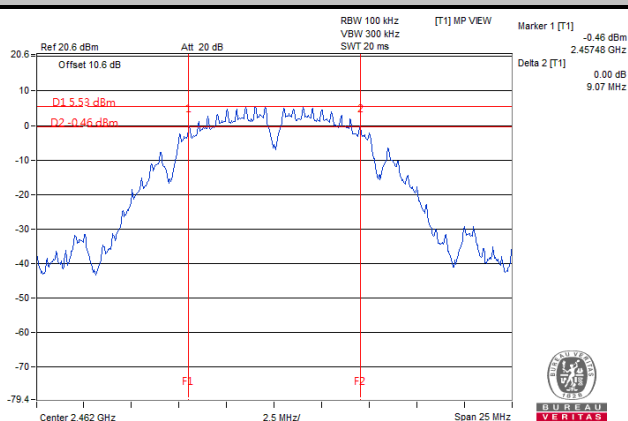
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.37	0.5	Pass
6	2437	16.35	0.5	Pass
11	2462	16.14	0.5	Pass
12	2467	16.13	0.5	Pass
13	2472	16.10	0.5	Pass

802.11n (HT20)

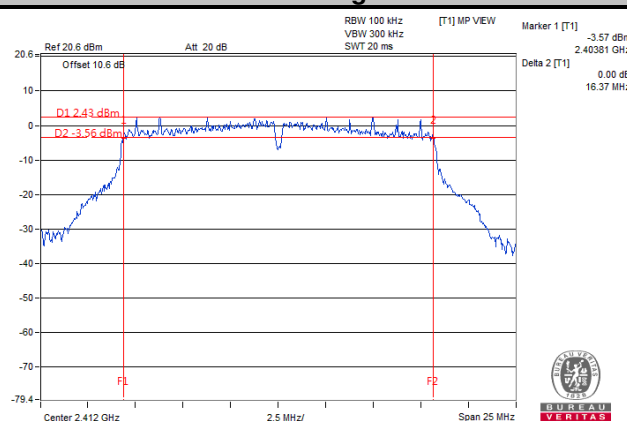
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.57	0.5	Pass
6	2437	17.21	0.5	Pass
11	2462	16.39	0.5	Pass
12	2467	16.12	0.5	Pass
13	2472	16.35	0.5	Pass

Spectrum Plot of Worst Value

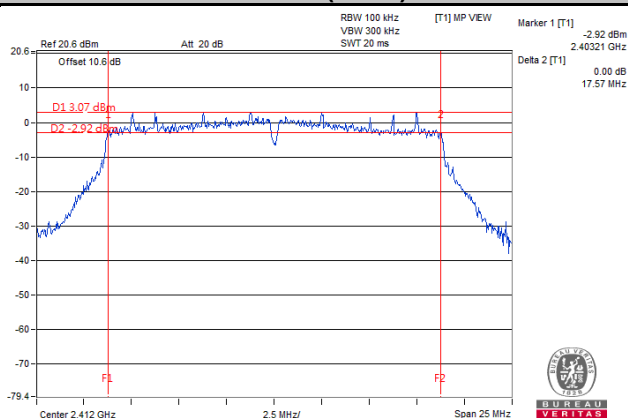
802.11b



802.11g



802.11n (HT20)

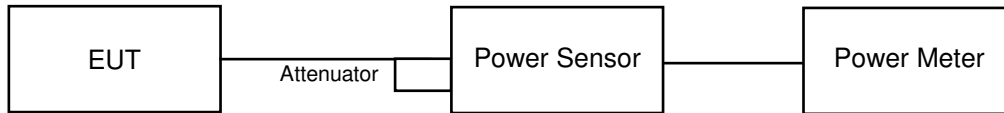


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.4.7 Test Results

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	53.95	17.32	30	Pass
6	2437	54.83	17.39	30	Pass
11	2462	52.00	17.16	30	Pass
12	2467	51.40	17.11	30	Pass
13	2472	27.04	14.32	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	252.93	24.03	30	Pass
6	2437	256.45	24.09	30	Pass
11	2462	261.22	24.17	30	Pass
12	2467	92.90	19.68	30	Pass
13	2472	18.41	12.65	30	Pass

802.11n (HT20)

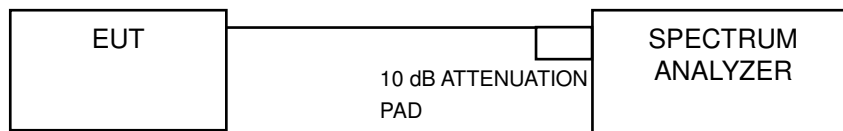
Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	252.35	24.02	30	Pass
6	2437	247.17	23.93	30	Pass
11	2462	244.91	23.89	30	Pass
12	2467	91.41	19.61	30	Pass
13	2472	22.18	13.46	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

802.11b

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-8.28	8	Pass
6	2437	-8.35	8	Pass
11	2462	-8.03	8	Pass
12	2467	-8.08	8	Pass
13	2472	-11.31	8	Pass

802.11g

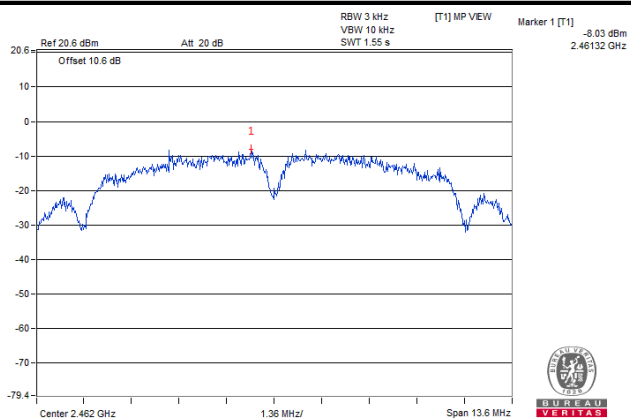
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-9.88	8	Pass
6	2437	-9.64	8	Pass
11	2462	-9.52	8	Pass
12	2467	-15.53	8	Pass
13	2472	-22.40	8	Pass

802.11n (HT20)

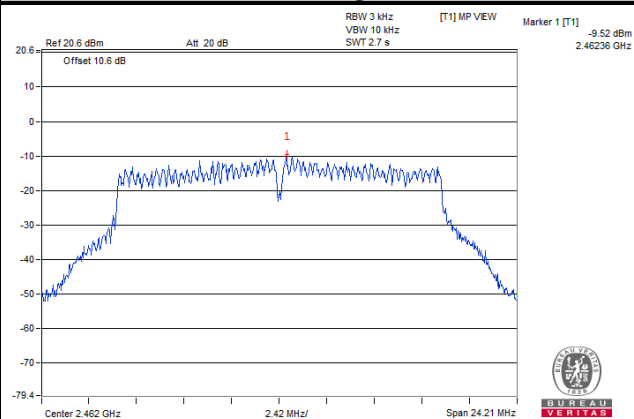
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-10.84	8	Pass
6	2437	-10.30	8	Pass
11	2462	-10.73	8	Pass
12	2467	-17.11	8	Pass
13	2472	-23.60	8	Pass

Spectrum Plot of Worst Value

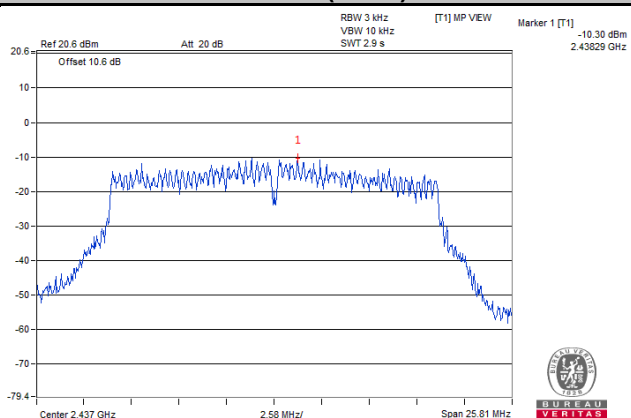
802.11b



802.11g



802.11n (HT20)

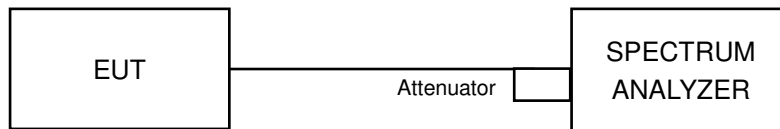


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

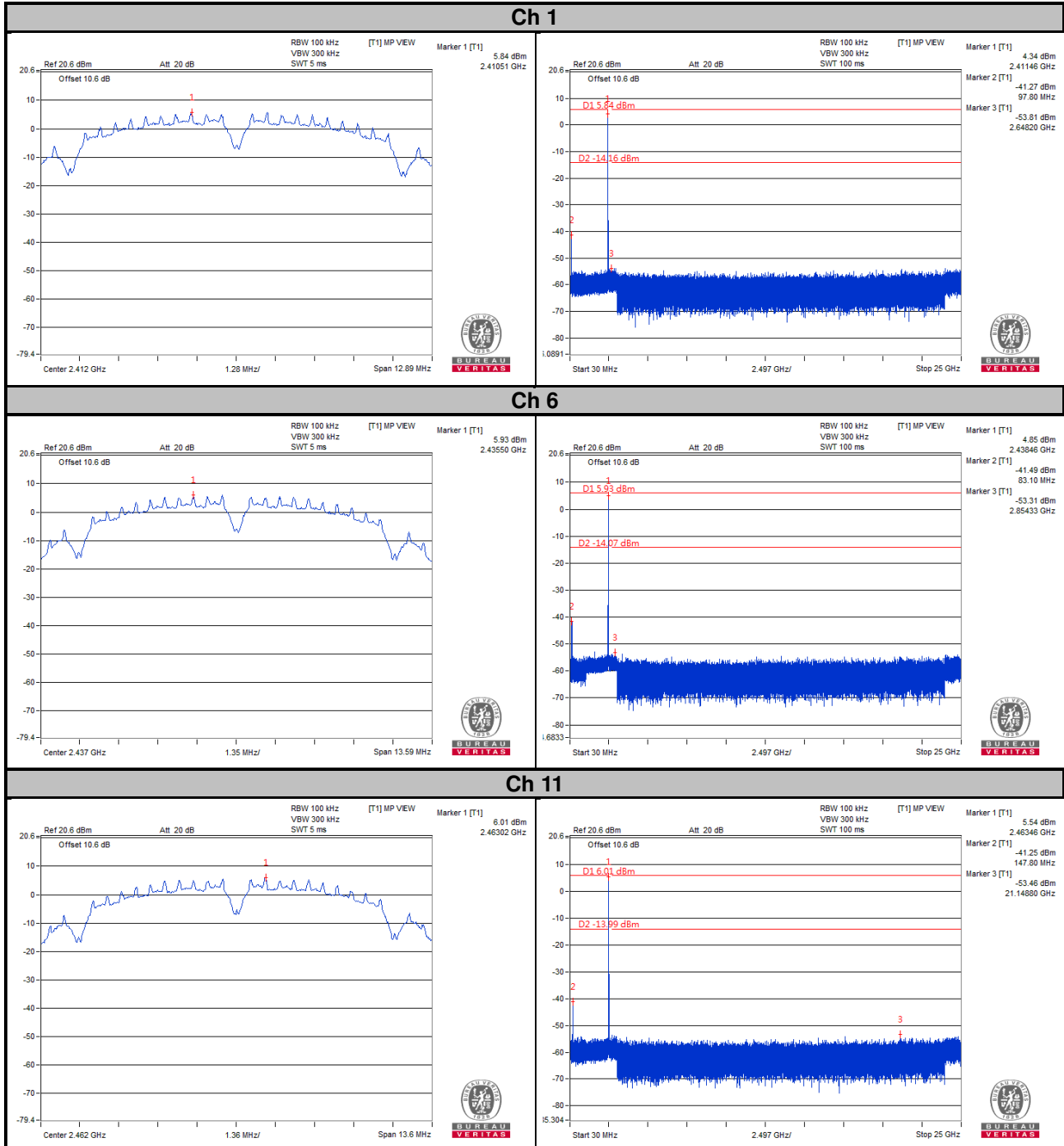
4.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

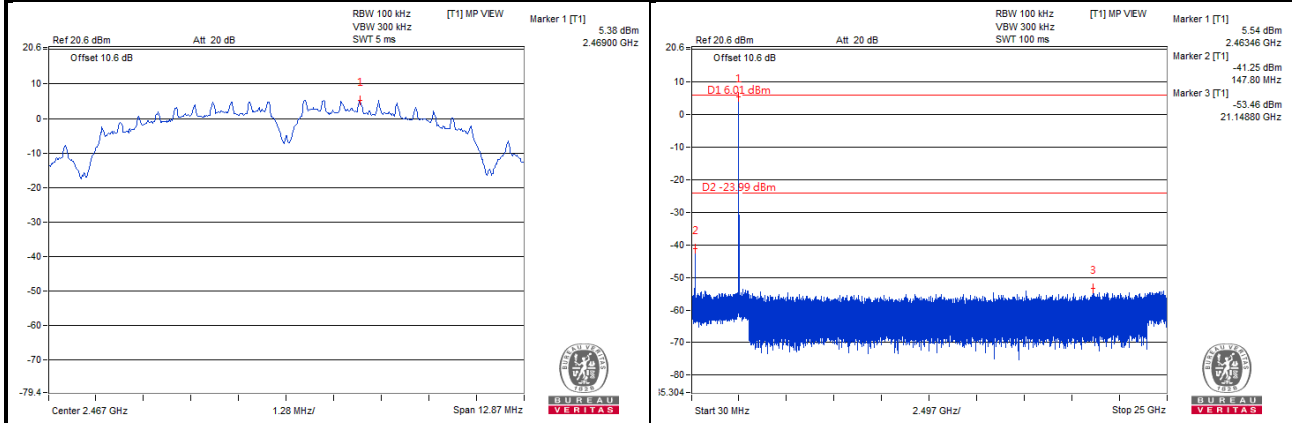
4.6.7 Test Results

The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20 dB offset below D1. It shows compliance with the requirement.

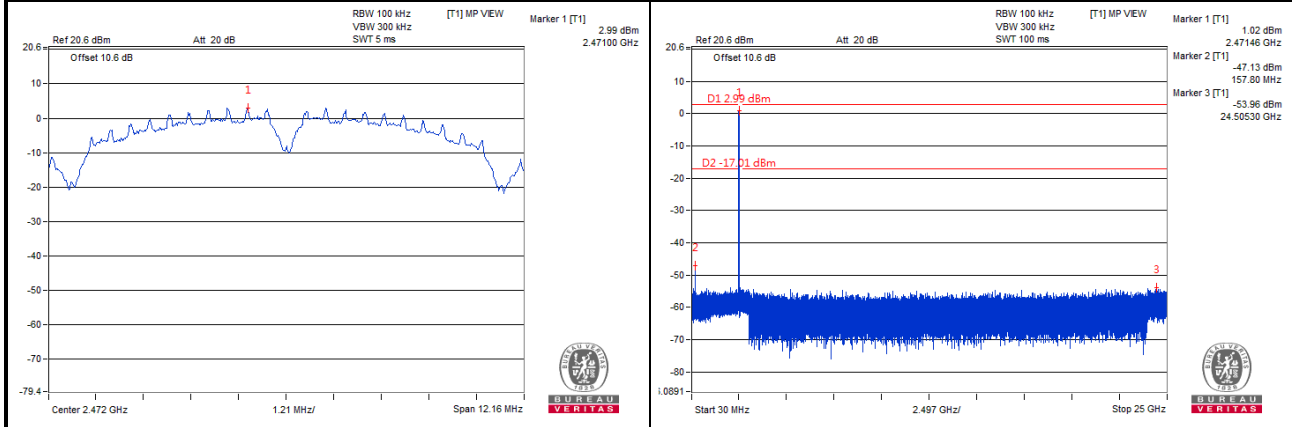
802.11b

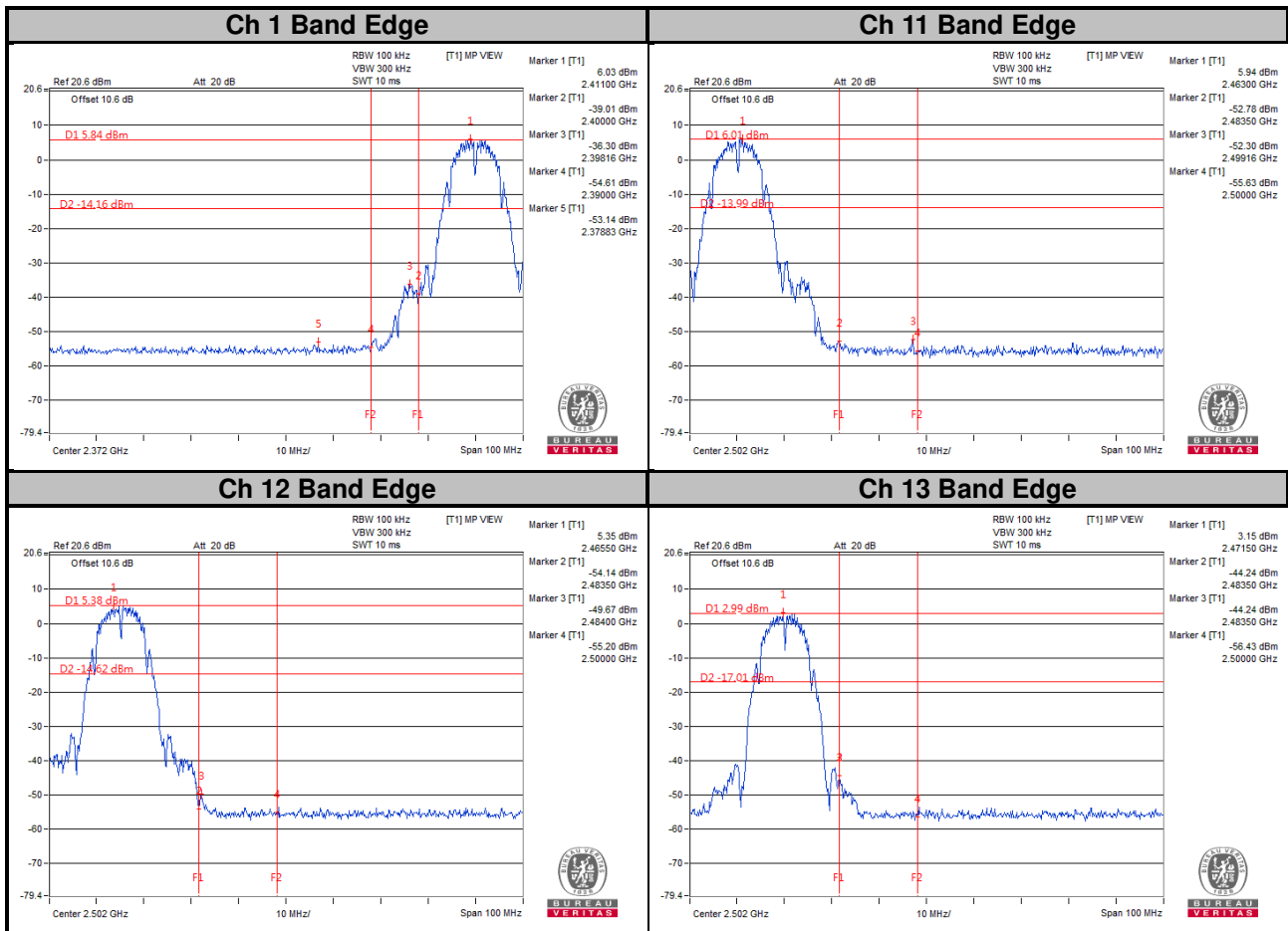


Ch 12



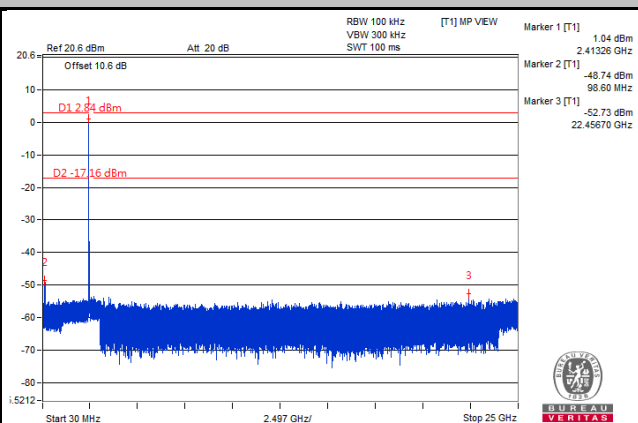
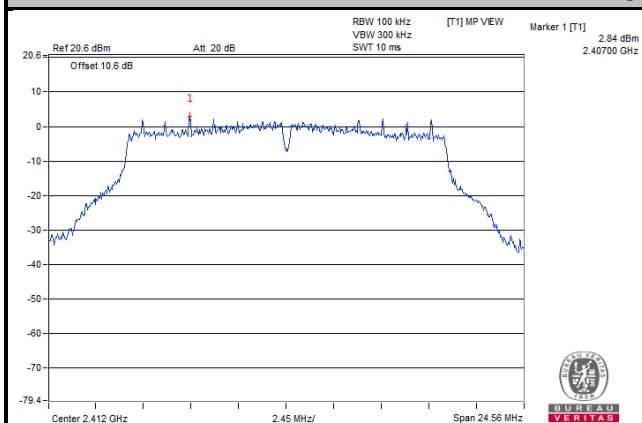
Ch 13



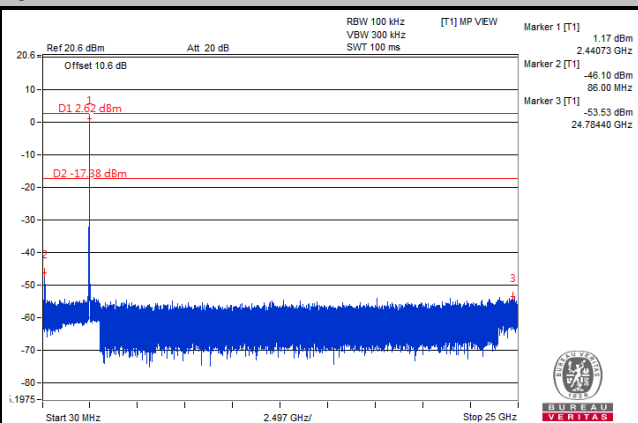
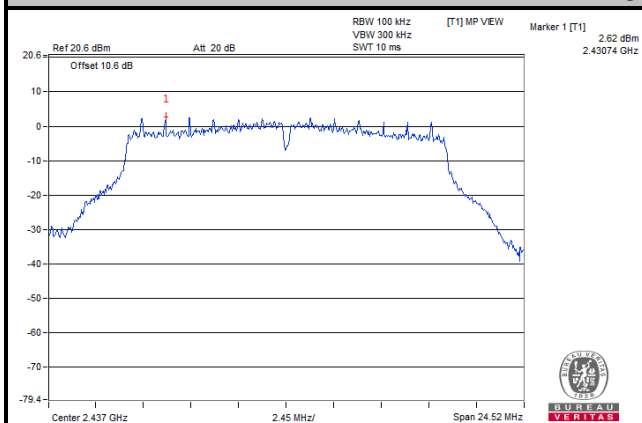


802.11g

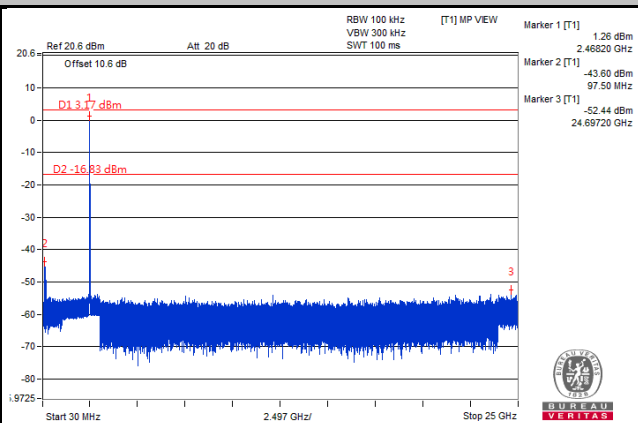
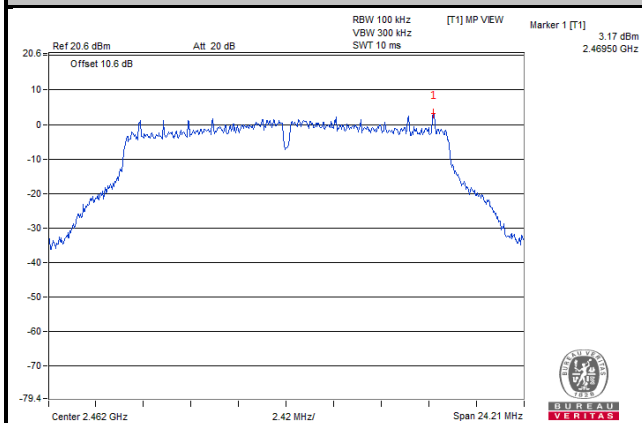
Ch 1



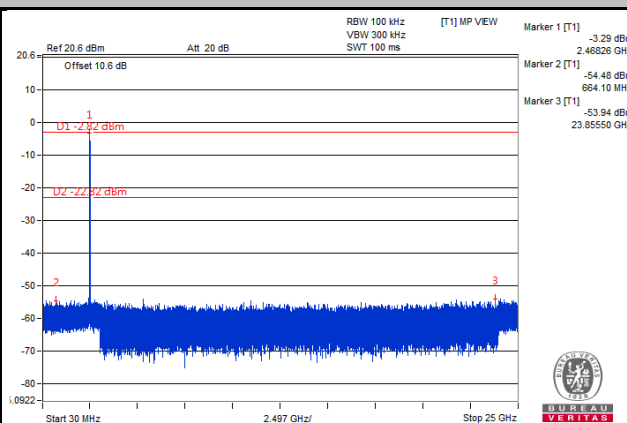
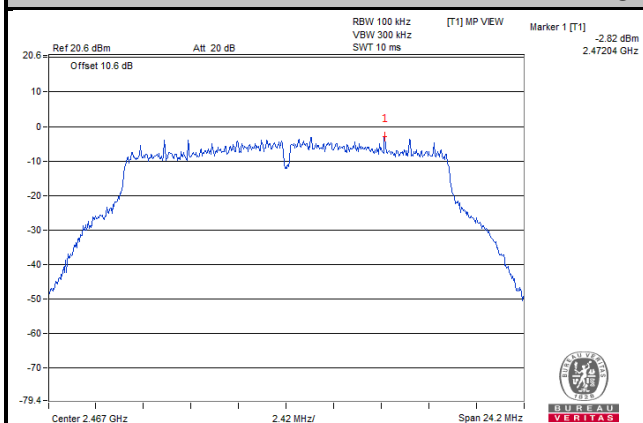
Ch 6



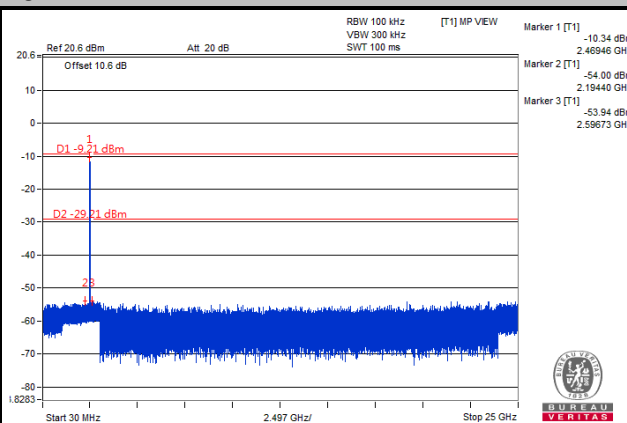
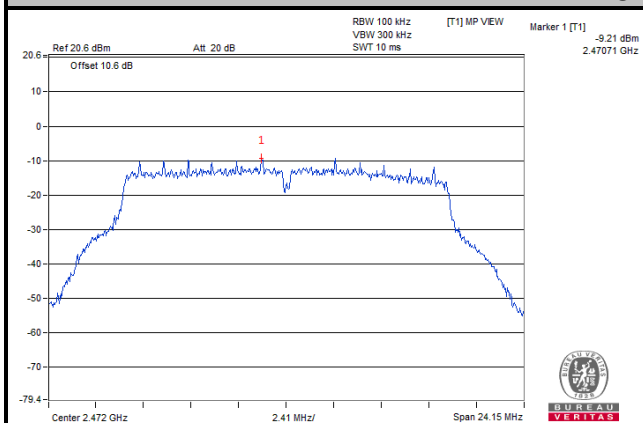
Ch 11

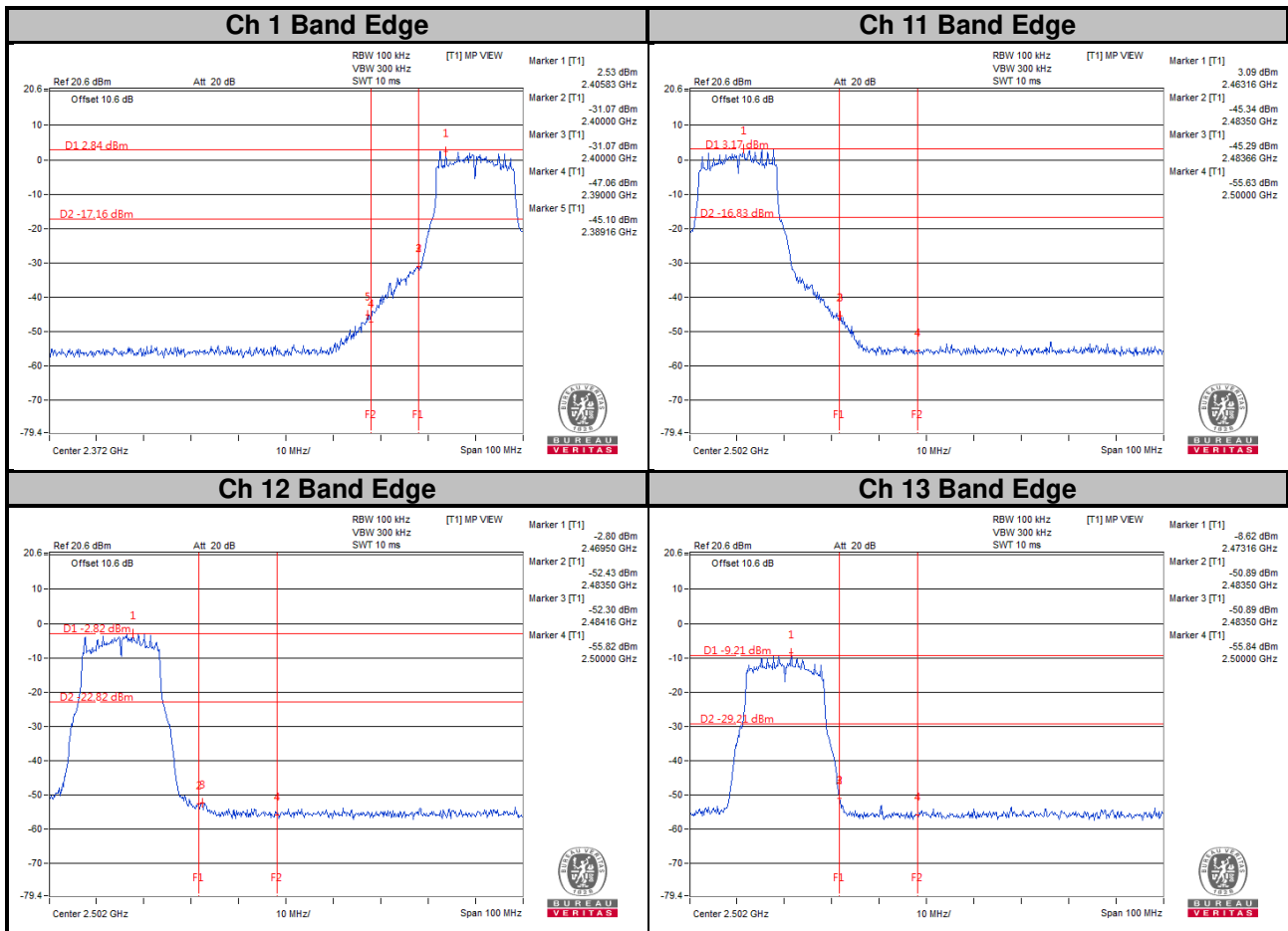


Ch 12



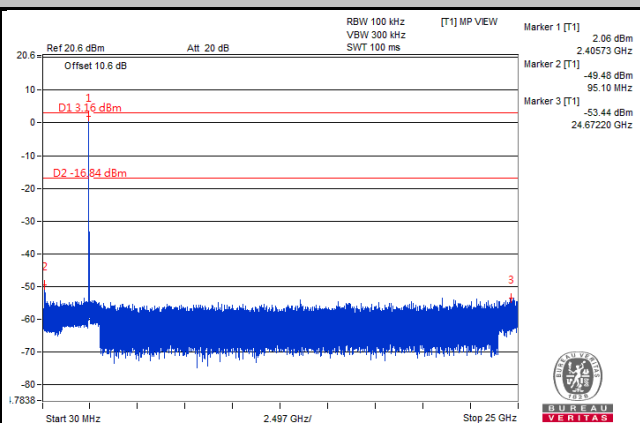
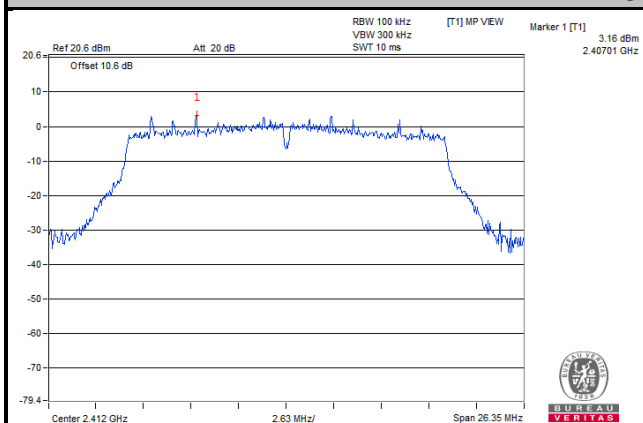
Ch 13



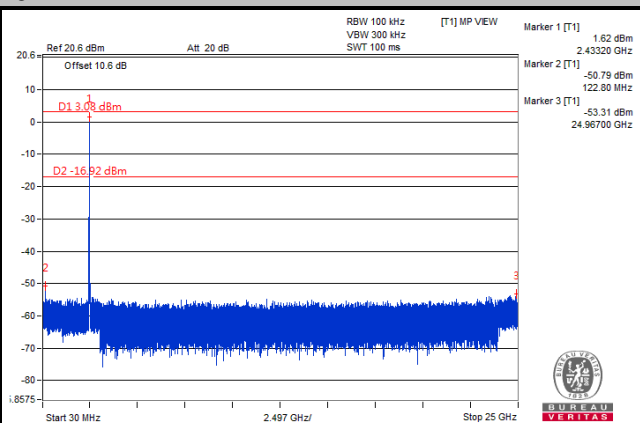
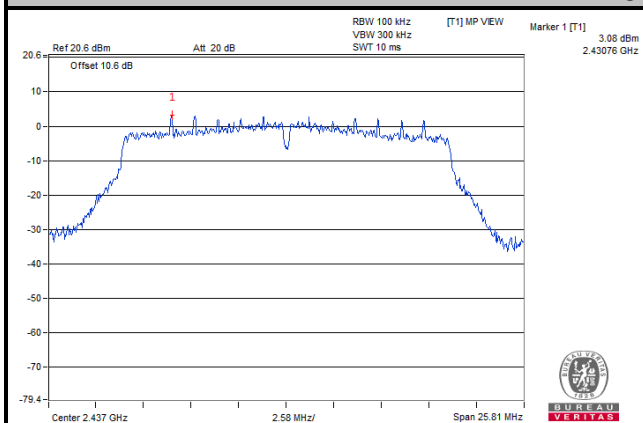


802.11n (HT20)

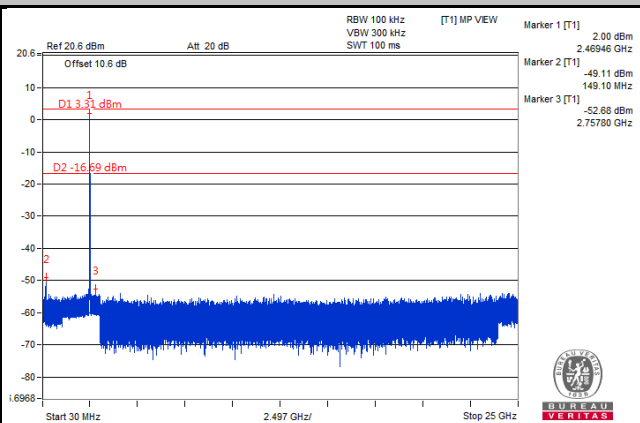
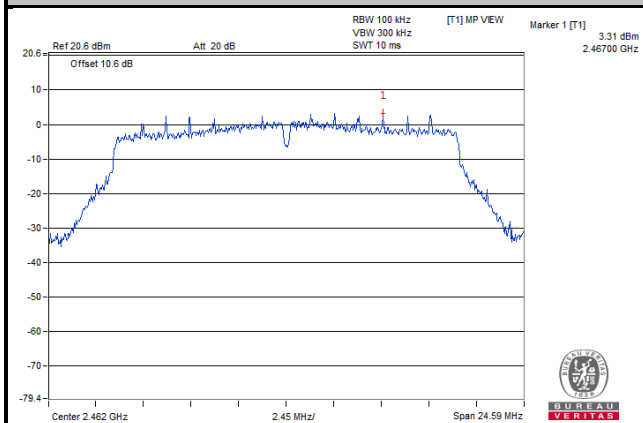
Ch 1



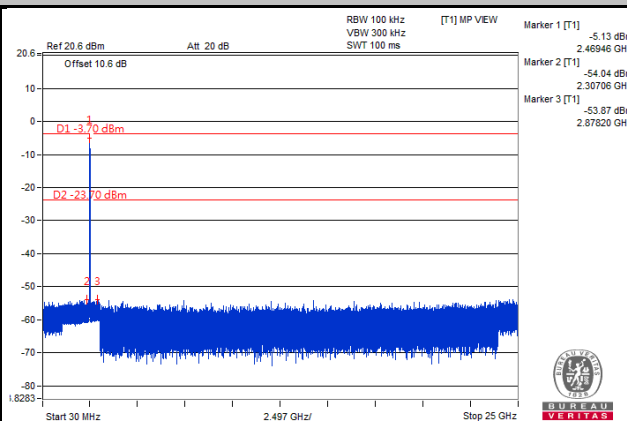
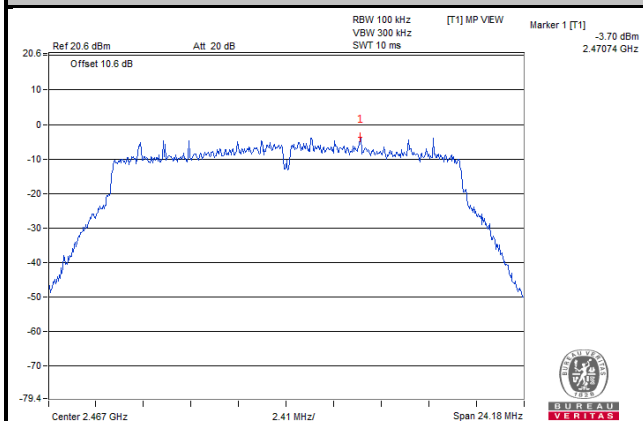
Ch 6



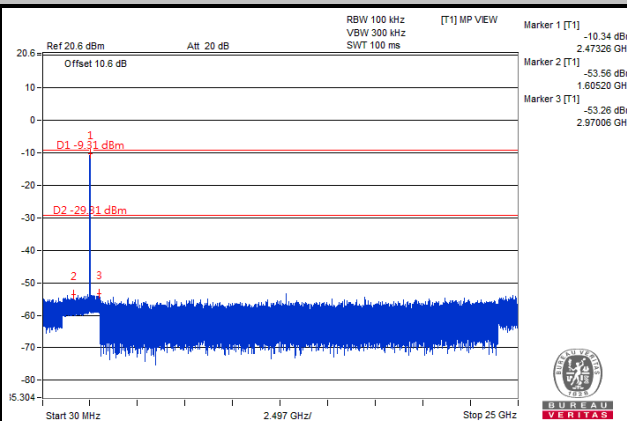
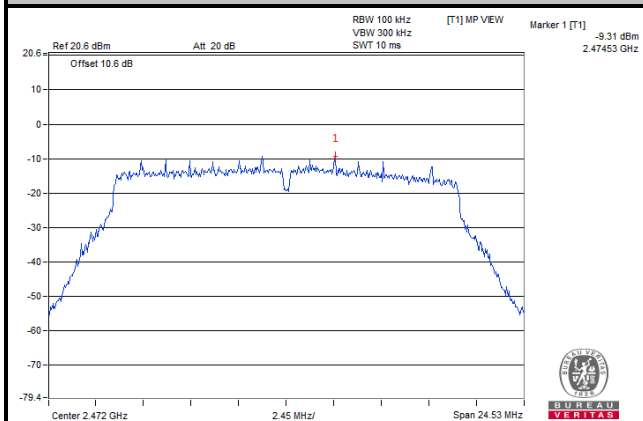
Ch 11

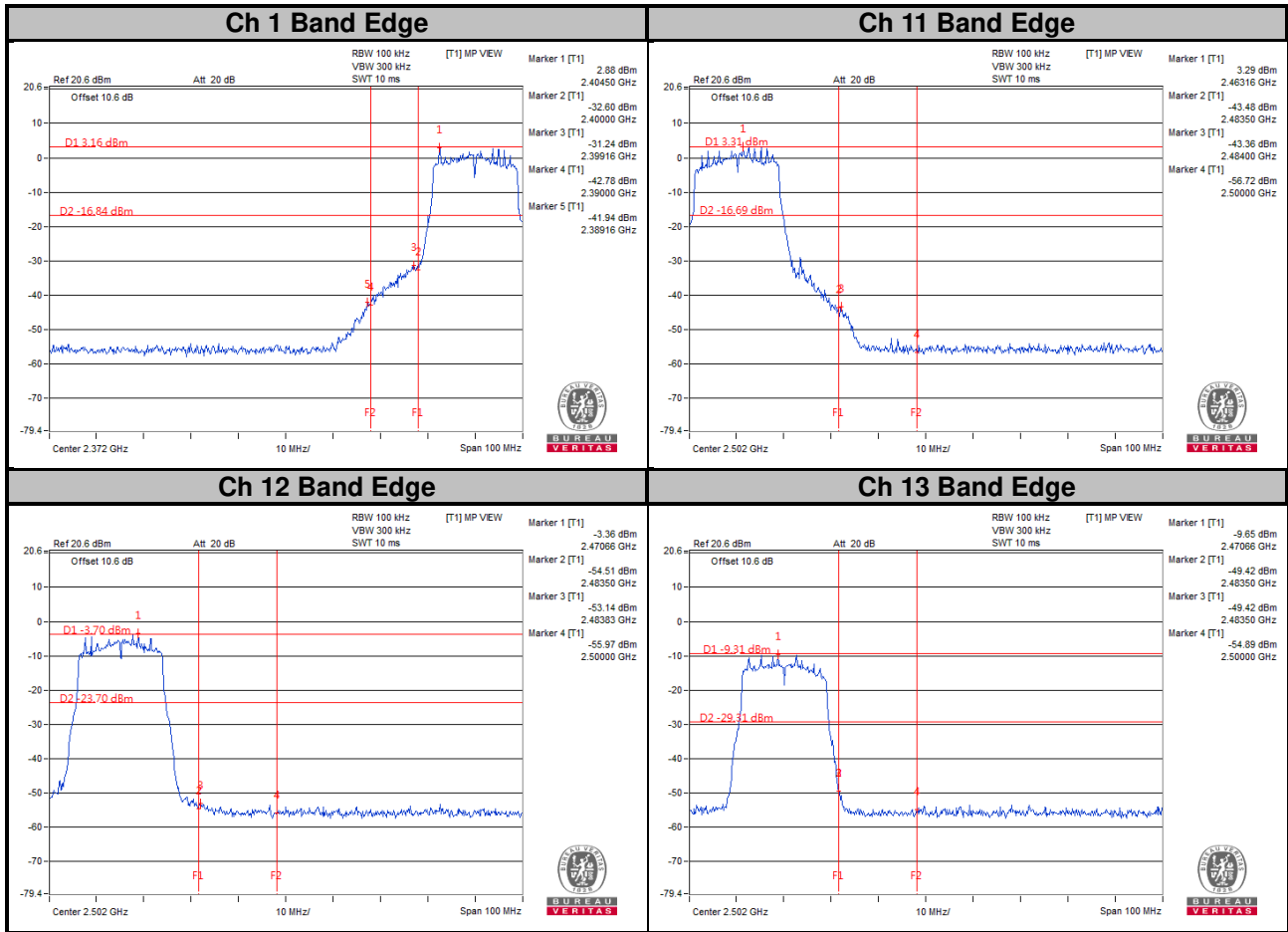


Ch 12



Ch 13





5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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