

Partial FCC Test Report

Report No.: RF200605C05-2

FCC ID: O57AX200NGW

Test Model: AX200NGW

Received Date: Jun. 05, 2020

Test Date: Jul. 16, 2020 ~ Jul. 21, 2020

Issued Date: Aug. 07, 2020

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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RF200605C05-2	Original Release	Aug. 07, 2020

1 Certificate of Conformity

Product: WLAN and BT , 2x2 Pcle M.2 2230 adapter card

Brand: Intel® Wi-Fi 6 AX200

Test Model: AX200NGW

Sample Status: Engineering Sample

Applicant: Lenovo(Shanghai) Electronics Technology Co., Ltd.

Test Date: Jul. 16, 2020 ~ Jul. 21, 2020

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 RF characteristics under the conditions specified in this report.

Prepared by : Shelly Hsueh , **Date:** Aug. 07, 2020
Shelly Hsueh / Specialist

Approved by : Dylan Chiou , **Date:** Aug. 07, 2020
Dylan Chiou / Senior Project Engineer

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 -15.45 dB at 0.40160 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -2.9 dB at 2390 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
---	Occupied Bandwidth Measurement	N/A	Refer to Note
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	Pass	Antenna connector is I-PEX not a standard connector.

Note:

1. This report is a partial report, only test item of Conducted Emission, Radiated Emissions and Maximum Peak Output Power were performed for this report. Other testing data please refer to Intel report no.: 181210-03.TR04 for module (Brand: Intel® Wi-Fi 6 AX200 , Model: AX200NGW).
2. For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WLAN and BT , 2x2 Pcle M.2 2230 adapter card
Brand	Intel® Wi-Fi 6 AX200
Test Model	AX200NGW
Status of EUT	Engineering Sample
Nominal Voltage	15.44 Vdc (Battery) 20.0 Vdc (Adapter)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
Modulation Technology	DSSS, OFDM, OFDMA
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 HT8 802.11ax: up to HE0
Operating Frequency	2412 ~ 2472 MHz
Number of Channel	13 for 802.11b, 802.11g, 802.11n (HT20), 802.11ax (HE20) 9 for 802.11n (HT40), 802.11ax (HE40)
Output Power	253.83 mW
Antenna Type	Refer to Note as below
Antenna Connector	Refer to Note as below
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

- The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	Tx Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ax (HE20)	2TX
802.11ax (HE40)	2TX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ax mode for HE20 / HE40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

- The EUT is authorized for use in specific End-product. Please refer to below table for more details.

Product	Brand	Model
Notebook Computer	Lenovo	ThinkBook 14 G2 ARE*****

Note: *=0~9,A-Z,a-z,"-" or blank, for marketing use only, with no impact on RF compliance of the product.

3. The following accessories were for the End-product.

Product	Brand	Model	Description
Adapter	Lenovo	ADLX65YAC3D	I/P: 100-240 Vac, 50-60 Hz, 1.8 A O/P: 20 Vdc, 3.25 A 1.8m cable with 1 core
Battery	Lenovo	L19C4PDB	3912mAh, 60Wh, 15.44Vdc

4. The antenna information is listed as below.

WLAN Antenna							
Ant. Type	Manufacturer		Parts Number	Antenna Gain (dBi)			
				BT/WLAN 2.4 GHz	WLAN 5.15~5.35 GHz	WLAN 5.47~5.725 GHz	WLAN 5.725~5.85 GHz
PIFA	YAGEO Corporation	Main	DC33002G400 (ANTA0LC13952WLAN1)	0.51	1.09	2.36	1.31
		Aux.	DC33002G400 (ANTA0AC13952WLAN1)	0.91	-2.68	-1.39	-1.89
PIFA	MAG.LAYERS Scientific-technics co, LTD	Main	PCA-8020-25GC7-A1 (DC33002G500)	-0.86	0.89	-0.54	-0.62
		Aux.	PCA-8020-25GC7-A1 (DC33002G500)	0.89	0.05	-0.12	-0.53

5. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible

6. The above EUT information is declared by manufacturer and for more detailed features description, please refers 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), 802.11ax (HE20):

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		

9 channels are provided for 802.11n (HT40), 802.11ax (HE40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	8	2447
4	2427	9	2452
5	2432	10	2457
6	2437	11	2462
7	2442		

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE \geq 1G**: Radiated Emission above 1 GHz **RE<1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **Power**: Maximum Output Power Measurement

Note: “-” means no effect.

Note: For radiated emission (below 1GHz) and power line conducted emission test items chosen the worst maximum power

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, 7, 11, 12, 13	DSSS	DBPSK	1.0
	802.11g	1 to 13	1, 7, 11, 12, 13	OFDM	BPSK	6.0
	802.11ax (HE20)	1 to 13	1, 7, 11, 12, 13	OFDMA	BPSK	HE0
	802.11ax (HE40)	3 to 11	3, 7, 9, 10, 11	OFDMA	BPSK	HE0

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)
-	802.11ax (HE40)	3 to 11	7	OFDMA	BPSK	HE0

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)
-	802.11ax (HE40)	3 to 11	7	OFDMA	BPSK	HE0

Maximum Output Power 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, 7, 11, 12, 13	DSSS	DBPSK	1.0
	802.11g	1 to 13	1, 7, 11, 12, 13	OFDM	BPSK	6.0
	802.11n (HT20)	1 to 13	1, 7, 11, 12, 13	OFDM	BPSK	HT0/HT8
	802.11n (HT40)	3 to 11	3, 7, 9, 10, 11	OFDM	BPSK	HT0/HT8
	802.11ax (HE20)	1 to 13	1, 7, 11, 12, 13	OFDMA	BPSK	HE0
	802.11ax (HE40)	3 to 11	3, 7, 9, 10, 11	OFDMA	BPSK	HE0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Adair Peng, Titan Hsu
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Titan Hsu
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Titan Hsu
Power	25 deg. C, 65 % RH	120 Vac, 60 Hz	Titan Hsu

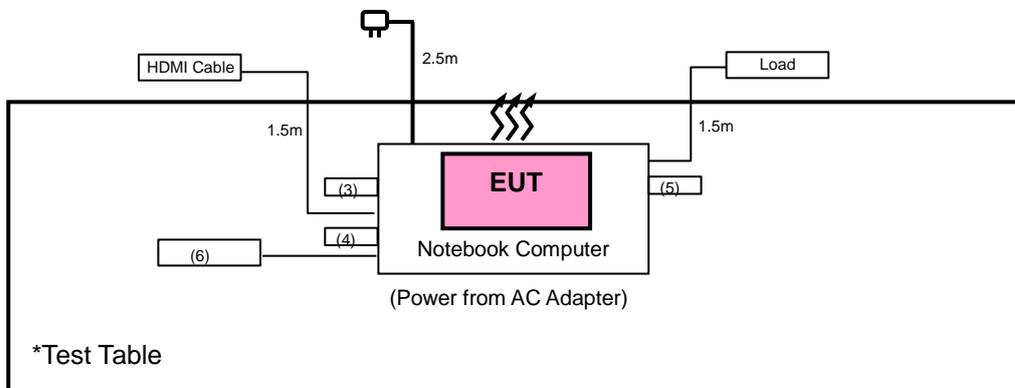
3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
1.	Notebook Computer	Lenovo	ThinkBook 14 G2 ARE*****	NA	NA	-
2.	Adapter	Lenovo	ADLX65YAC3D	NA	NA	-
3.	Type-C USB	SanDisk	SDDDC3-320G	NA	NA	-
4.	USB 2.0 FLASH	v250W	03	NA	NA	-
5.	USB 2.0 FLASH	v250W	05	NA	NA	-
6.	Earphone	Apple	NA	NA	NA	-

Note: All power cords of the above support units are non-shielded (1.8m).

3.3.1 Configuration of System under Test



3.4 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 and references:

Test Standard:

FCC Part 15, Subpart C (15.247)

ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

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)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
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 ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	9120D	209	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna EMCI	EM-6879	269	Sep. 16, 2019	Sep. 15, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 20, 2019	Aug. 19, 2020
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 20, 2019	Aug. 19, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 20, 2019	Aug. 19, 2020
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM- SM-8000	Cable-CH3-03 (309224+170907)	Aug. 20, 2019	Aug. 19, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55 190004/MY551900 07/MY55210005	Jul. 13, 2020	Jul. 12, 2021

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 Chamber 3.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 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:

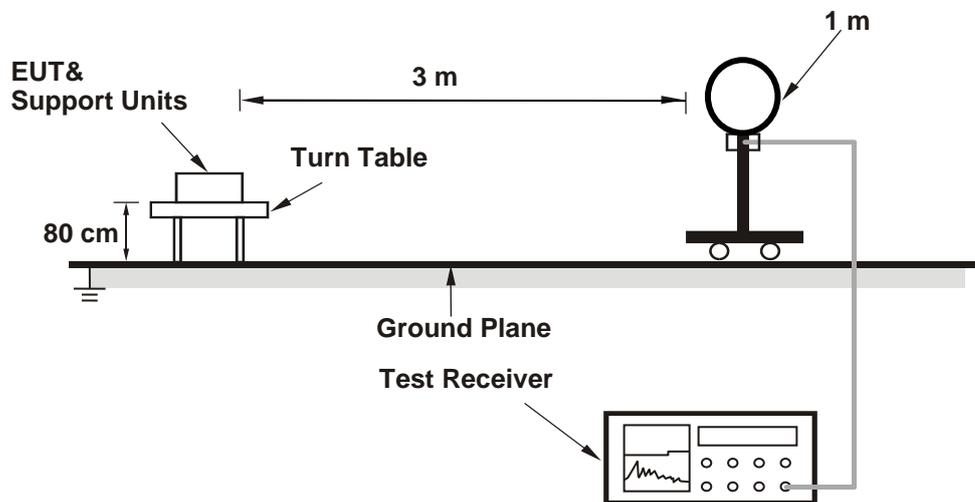
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

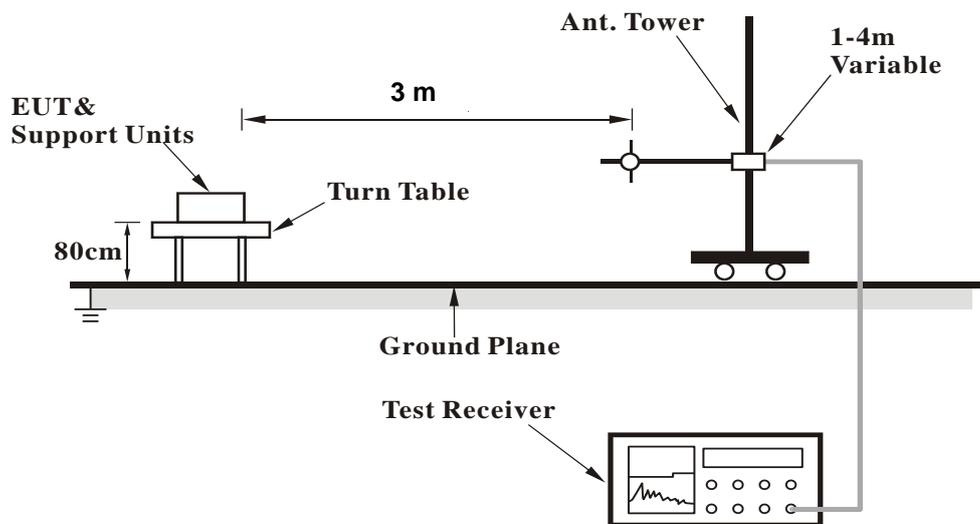
No deviation.

4.1.5 Test Set Up

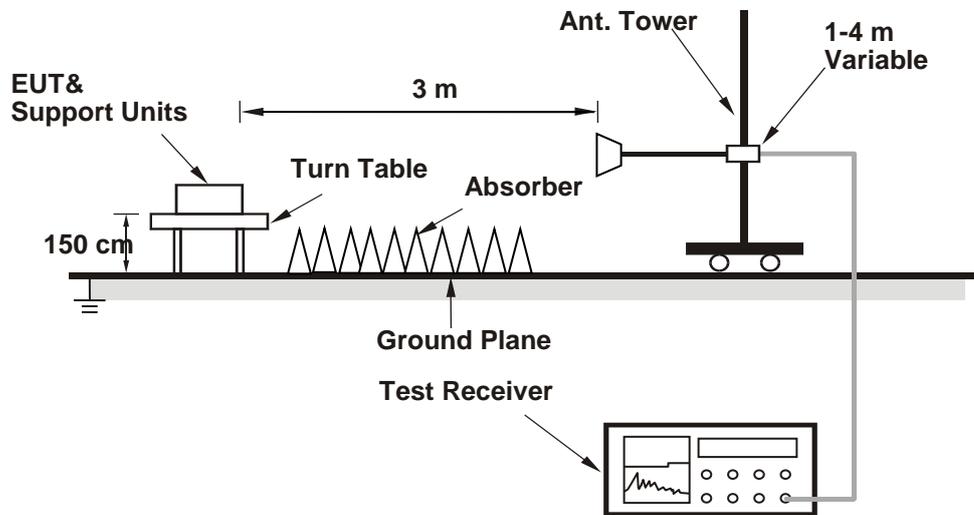
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

ABOVE 1GHz DATA

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.8 PK	74.0	-13.2	2.08 H	46	28.5	32.3
2	2390.00	48.4 AV	54.0	-5.6	2.08 H	46	16.1	32.3
3	*2412.00	106.6 PK			2.08 H	46	74.3	32.3
4	*2412.00	99.8 AV			2.08 H	46	67.5	32.3
5	4824.00	48.0 PK	74.0	-26.0	1.78 H	277	44.8	3.2
6	4824.00	36.2 AV	54.0	-17.8	1.78 H	277	33.0	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.3 PK	74.0	-12.7	1.72 V	183	29.0	32.3
2	2390.00	48.4 AV	54.0	-5.6	1.72 V	183	16.1	32.3
3	*2412.00	108.3 PK			1.72 V	183	76.0	32.3
4	*2412.00	101.9 AV			1.72 V	183	69.6	32.3
5	4824.00	48.5 PK	74.0	-25.5	2.03 V	153	45.3	3.2
6	4824.00	37.7 AV	54.0	-16.3	2.03 V	153	34.5	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 7	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	106.8 PK			2.11 H	50	74.5	32.3
2	*2442.00	99.8 AV			2.11 H	50	67.5	32.3
3	4884.00	48.0 PK	74.0	-26.0	1.81 H	281	45.1	2.9
4	4884.00	34.9 AV	54.0	-19.1	1.81 H	281	32.0	2.9

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	108.6 PK			1.66 V	181	76.3	32.3
2	*2442.00	101.8 AV			1.66 V	181	69.5	32.3
3	4884.00	48.6 PK	74.0	-25.4	1.94 V	142	45.7	2.9
4	4884.00	36.3 AV	54.0	-17.7	1.94 V	142	33.4	2.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.1 PK			2.03 H	49	73.7	32.4
2	*2462.00	99.1 AV			2.03 H	49	66.7	32.4
3	2483.50	61.7 PK	74.0	-12.3	2.03 H	49	29.3	32.4
4	2483.50	48.2 AV	54.0	-5.8	2.03 H	49	15.8	32.4
5	4924.00	48.2 PK	74.0	-25.8	1.72 H	271	45.1	3.1
6	4924.00	36.1 AV	54.0	-17.9	1.72 H	271	33.0	3.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.9 PK			1.70 V	185	75.5	32.4
2	*2462.00	101.2 AV			1.70 V	185	68.8	32.4
3	2483.50	62.1 PK	74.0	-11.9	1.70 V	185	29.7	32.4
4	2483.50	48.3 AV	54.0	-5.7	1.70 V	185	15.9	32.4
5	4924.00	48.7 PK	74.0	-25.3	2.07 V	142	45.6	3.1
6	4924.00	37.5 AV	54.0	-16.5	2.07 V	142	34.4	3.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 12	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2467.00	104.9 PK			2.15 H	47	72.5	32.4
2	*2467.00	97.4 AV			2.15 H	47	65.0	32.4
3	2483.50	61.5 PK	74.0	-12.5	2.15 H	47	29.1	32.4
4	2483.50	48.1 AV	54.0	-5.9	2.15 H	47	15.7	32.4
5	4934.00	48.1 PK	74.0	-25.9	1.85 H	290	44.9	3.2
6	4934.00	34.8 AV	54.0	-19.2	1.85 H	290	31.6	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2467.00	106.6 PK			1.81 V	179	74.2	32.4
2	*2467.00	99.6 AV			1.81 V	179	67.2	32.4
3	2483.50	61.9 PK	74.0	-12.1	1.81 V	179	29.5	32.4
4	2483.50	48.3 AV	54.0	-5.7	1.81 V	179	15.9	32.4
5	4934.00	48.7 PK	74.0	-25.3	1.92 V	132	45.5	3.2
6	4934.00	36.2 AV	54.0	-17.8	1.92 V	132	33.0	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 13	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	102.9 PK			2.15 H	50	70.5	32.4
2	*2472.00	95.4 AV			2.15 H	50	63.0	32.4
3	2483.50	62.5 PK	74.0	-11.5	2.15 H	50	30.1	32.4
4	2483.50	48.4 AV	54.0	-5.6	2.15 H	50	16.0	32.4
5	4944.00	47.3 PK	74.0	-26.7	1.82 H	283	44.1	3.2
6	4944.00	33.4 AV	54.0	-20.6	1.82 H	283	30.2	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	104.5 PK			1.84 V	178	72.1	32.4
2	*2472.00	97.4 AV			1.84 V	178	65.0	32.4
3	2483.50	64.4 PK	74.0	-9.6	1.84 V	178	32.0	32.4
4	2483.50	48.5 AV	54.0	-5.5	1.84 V	178	16.1	32.4
5	4944.00	47.9 PK	74.0	-26.1	2.08 V	141	44.7	3.2
6	4944.00	34.7 AV	54.0	-19.3	2.08 V	141	31.5	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.3 PK	74.0	-14.7	3.56 H	63	27.0	32.3
2	2390.00	47.2 AV	54.0	-6.8	3.56 H	63	14.9	32.3
3	*2412.00	103.3 PK			3.56 H	63	71.0	32.3
4	*2412.00	93.3 AV			3.56 H	63	61.0	32.3
5	4824.00	46.0 PK	74.0	-28.0	1.75 H	275	42.8	3.2
6	4824.00	32.3 AV	54.0	-21.7	1.75 H	275	29.1	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.1 PK	74.0	-13.9	1.96 V	180	27.8	32.3
2	2390.00	46.7 AV	54.0	-7.3	1.96 V	180	14.4	32.3
3	*2412.00	103.5 PK			1.96 V	180	71.2	32.3
4	*2412.00	93.4 AV			1.96 V	180	61.1	32.3
5	4824.00	45.2 PK	74.0	-28.8	2.15 V	150	42.0	3.2
6	4824.00	32.5 AV	54.0	-21.5	2.15 V	150	29.3	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 7	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	105.7 PK			3.22 H	282	73.4	32.3
2	*2442.00	95.5 AV			3.22 H	282	63.2	32.3
3	4884.00	45.6 PK	74.0	-28.4	1.83 H	285	42.7	2.9
4	4884.00	31.9 AV	54.0	-22.1	1.83 H	285	29.0	2.9

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	111.0 PK			2.95 V	332	78.7	32.3
2	*2442.00	100.4 AV			2.95 V	332	68.1	32.3
3	4884.00	46.5 PK	74.0	-27.5	1.85 V	285	43.6	2.9
4	4884.00	32.0 AV	54.0	-22.0	1.85 V	285	29.1	2.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.4 PK			3.59 H	293	73.0	32.4
2	*2462.00	94.7 AV			3.59 H	293	62.3	32.4
3	2483.50	58.6 PK	74.0	-15.4	3.59 H	293	26.2	32.4
4	2483.50	46.9 AV	54.0	-7.1	3.59 H	293	14.5	32.4
5	4924.00	46.1 PK	74.0	-27.9	1.76 H	280	43.0	3.1
6	4924.00	32.5 AV	54.0	-21.5	1.76 H	280	29.4	3.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.4 PK			2.88 V	330	76.0	32.4
2	*2462.00	98.4 AV			2.88 V	330	66.0	32.4
3	2483.50	59.0 PK	74.0	-15.0	2.88 V	330	26.6	32.4
4	2483.50	48.0 AV	54.0	-6.0	2.88 V	330	15.6	32.4
5	4924.00	46.4 PK	74.0	-27.6	1.75 V	275	43.3	3.1
6	4924.00	32.1 AV	54.0	-21.9	1.75 V	275	29.0	3.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.

CHANNEL	TX Channel 12	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2467.00	99.4 PK			3.82 H	44	67.0	32.4
2	*2467.00	89.5 AV			3.82 H	44	57.1	32.4
3	2483.50	58.7 PK	74.0	-15.3	3.82 H	44	26.3	32.4
4	2483.50	47.0 AV	54.0	-7.0	3.82 H	44	14.6	32.4
5	4934.00	45.8 PK	74.0	-28.2	1.80 H	285	42.6	3.2
6	4934.00	32.2 AV	54.0	-21.8	1.80 H	285	29.0	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2467.00	105.7 PK			2.91 V	332	73.3	32.4
2	*2467.00	95.7 AV			2.91 V	332	63.3	32.4
3	2483.50	59.0 PK	74.0	-15.0	2.91 V	332	26.6	32.4
4	2483.50	47.4 AV	54.0	-6.6	2.91 V	332	15.0	32.4
5	4934.00	46.0 PK	74.0	-28.0	1.90 V	284	42.8	3.2
6	4934.00	32.8 AV	54.0	-21.2	1.90 V	284	29.6	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.

CHANNEL	TX Channel 13	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	95.4 PK			2.52 H	40	63.0	32.4
2	*2472.00	85.1 AV			2.52 H	40	52.7	32.4
3	2483.50	62.5 PK	74.0	-11.5	2.52 H	40	30.1	32.4
4	2483.50	47.2 AV	54.0	-6.8	2.52 H	40	14.8	32.4
5	4944.00	46.7 PK	74.0	-27.3	1.75 H	285	43.5	3.2
6	4944.00	32.3 AV	54.0	-21.7	1.75 H	285	29.1	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	97.4 PK			2.03 V	187	65.0	32.4
2	*2472.00	87.1 AV			2.03 V	187	54.7	32.4
3	2483.50	63.7 PK	74.0	-10.3	2.03 V	187	31.3	32.4
4	2483.50	47.5 AV	54.0	-6.5	2.03 V	187	15.1	32.4
5	4944.00	46.7 PK	74.0	-27.3	1.75 V	280	43.5	3.2
6	4944.00	32.6 AV	54.0	-21.4	1.75 V	280	29.4	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

802.11ax (HE20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.3 PK	74.0	-9.7	3.70 H	292	32.0	32.3
2	2390.00	51.1 AV	54.0	-2.9	3.70 H	292	18.8	32.3
3	*2412.00	109.3 PK			3.70 H	292	77.0	32.3
4	*2412.00	96.9 AV			3.70 H	292	64.6	32.3
5	4824.00	45.9 PK	74.0	-28.1	2.05 H	299	42.7	3.2
6	4824.00	32.5 AV	54.0	-21.5	2.05 H	299	29.3	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.9 PK	74.0	-15.1	1.94 V	182	26.6	32.3
2	2390.00	46.8 AV	54.0	-7.2	1.94 V	182	14.5	32.3
3	*2412.00	105.5 PK			1.94 V	182	73.2	32.3
4	*2412.00	92.5 AV			1.94 V	182	60.2	32.3
5	4824.00	45.7 PK	74.0	-28.3	2.06 V	168	42.5	3.2
6	4824.00	32.0 AV	54.0	-22.0	2.06 V	168	28.8	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 7	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	112.6 PK			3.77 H	299	80.3	32.3
2	*2442.00	100.1 AV			3.77 H	299	67.8	32.3
3	4884.00	46.0 PK	74.0	-28.0	2.13 H	303	43.1	2.9
4	4884.00	32.7 AV	54.0	-21.3	2.13 H	303	29.8	2.9

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	108.7 PK			2.14 V	184	76.4	32.3
2	*2442.00	95.6 AV			2.14 V	184	63.3	32.3
3	4884.00	45.7 PK	74.0	-28.3	2.15 V	170	42.8	2.9
4	4884.00	32.1 AV	54.0	-21.9	2.15 V	170	29.2	2.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.6 PK			3.68 H	295	74.2	32.4
2	*2462.00	94.0 AV			3.68 H	295	61.6	32.4
3	2483.50	59.4 PK	74.0	-14.6	3.68 H	295	27.0	32.4
4	2483.50	46.8 AV	54.0	-7.2	3.68 H	295	14.4	32.4
5	4924.00	46.0 PK	74.0	-28.0	2.00 H	293	42.9	3.1
6	4924.00	32.7 AV	54.0	-21.3	2.00 H	293	29.6	3.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.5 PK			1.94 V	158	74.1	32.4
2	*2462.00	93.3 AV			1.94 V	158	60.9	32.4
3	2483.50	59.4 PK	74.0	-14.6	1.94 V	158	27.0	32.4
4	2483.50	46.7 AV	54.0	-7.3	1.94 V	158	14.3	32.4
5	4924.00	45.7 PK	74.0	-28.3	2.05 V	163	42.6	3.1
6	4924.00	32.3 AV	54.0	-21.7	2.05 V	163	29.2	3.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 12	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2467.00	103.6 PK			3.55 H	297	71.2	32.4
2	*2467.00	91.4 AV			3.55 H	297	59.0	32.4
3	2483.50	59.4 PK	74.0	-14.6	3.55 H	297	27.0	32.4
4	2483.50	46.9 AV	54.0	-7.1	3.55 H	297	14.5	32.4
5	4934.00	46.5 PK	74.0	-27.5	2.11 H	293	43.3	3.2
6	4934.00	33.2 AV	54.0	-20.8	2.11 H	293	30.0	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2467.00	104.2 PK			2.05 V	157	71.8	32.4
2	*2467.00	91.4 AV			2.05 V	157	59.0	32.4
3	2483.50	59.7 PK	74.0	-14.3	2.05 V	157	27.3	32.4
4	2483.50	47.0 AV	54.0	-7.0	2.05 V	157	14.6	32.4
5	4934.00	46.2 PK	74.0	-27.8	2.15 V	170	43.0	3.2
6	4934.00	32.7 AV	54.0	-21.3	2.15 V	170	29.5	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 13	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	100.5 PK			3.56 H	295	68.1	32.4
2	*2472.00	87.3 AV			3.56 H	295	54.9	32.4
3	2483.50	60.0 PK	74.0	-14.0	3.56 H	295	27.6	32.4
4	2483.50	47.2 AV	54.0	-6.8	3.56 H	295	14.8	32.4
5	4944.00	46.5 PK	74.0	-27.5	2.18 H	294	43.3	3.2
6	4944.00	33.0 AV	54.0	-21.0	2.18 H	294	29.8	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	101.4 PK			2.06 V	154	69.0	32.4
2	*2472.00	87.6 AV			2.06 V	154	55.2	32.4
3	2483.50	59.6 PK	74.0	-14.4	2.06 V	154	27.2	32.4
4	2483.50	46.8 AV	54.0	-7.2	2.06 V	154	14.4	32.4
5	4944.00	46.1 PK	74.0	-27.9	2.03 V	169	42.9	3.2
6	4944.00	32.5 AV	54.0	-21.5	2.03 V	169	29.3	3.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

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CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.5 PK	74.0	-13.5	3.68 H	295	28.2	32.3
2	2390.00	48.5 AV	54.0	-5.5	3.68 H	295	16.2	32.3
3	*2422.00	105.0 PK			3.68 H	295	72.7	32.3
4	*2422.00	92.1 AV			3.68 H	295	59.8	32.3
5	4844.00	45.8 PK	74.0	-28.2	2.22 H	288	42.7	3.1
6	4844.00	32.4 AV	54.0	-21.6	2.22 H	288	29.3	3.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.7 PK	74.0	-13.3	1.31 V	198	28.4	32.3
2	2390.00	48.0 AV	54.0	-6.0	1.31 V	198	15.7	32.3
3	*2422.00	101.6 PK			1.31 V	198	69.3	32.3
4	*2422.00	89.2 AV			1.31 V	198	56.9	32.3
5	4844.00	45.6 PK	74.0	-28.4	1.96 V	173	42.5	3.1
6	4844.00	32.0 AV	54.0	-22.0	1.96 V	173	28.9	3.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 7	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	103.9 PK			3.70 H	294	71.6	32.3
2	*2442.00	90.5 AV			3.70 H	294	58.2	32.3
3	4884.00	45.8 PK	74.0	-28.2	2.23 H	309	42.9	2.9
4	4884.00	32.5 AV	54.0	-21.5	2.23 H	309	29.6	2.9

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	101.8 PK			1.29 V	198	69.5	32.3
2	*2442.00	89.3 AV			1.29 V	198	57.0	32.3
3	4884.00	45.4 PK	74.0	-28.6	1.95 V	163	42.5	2.9
4	4884.00	32.0 AV	54.0	-22.0	1.95 V	163	29.1	2.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	102.3 PK			3.99 H	294	69.9	32.4
2	*2452.00	89.7 AV			3.99 H	294	57.3	32.4
3	2483.50	59.9 PK	74.0	-14.1	3.99 H	294	27.5	32.4
4	2483.50	47.3 AV	54.0	-6.7	3.99 H	294	14.9	32.4
5	4904.00	45.8 PK	74.0	-28.2	1.99 H	296	42.8	3.0
6	4904.00	32.3 AV	54.0	-21.7	1.99 H	296	29.3	3.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	103.0 PK			2.07 V	186	70.6	32.4
2	*2452.00	90.2 AV			2.07 V	186	57.8	32.4
3	2483.50	60.0 PK	74.0	-14.0	2.07 V	186	27.6	32.4
4	2483.50	47.2 AV	54.0	-6.8	2.07 V	186	14.8	32.4
5	4904.00	45.4 PK	74.0	-28.6	2.03 V	165	42.4	3.0
6	4904.00	31.8 AV	54.0	-22.2	2.03 V	165	28.8	3.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.

CHANNEL	TX Channel 10	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2457.00	98.7 PK			3.61 H	292	66.3	32.4
2	*2457.00	86.9 AV			3.61 H	292	54.5	32.4
3	2483.50	59.6 PK	74.0	-14.4	3.61 H	292	27.2	32.4
4	2483.50	47.0 AV	54.0	-7.0	3.61 H	292	14.6	32.4
5	4914.00	45.7 PK	74.0	-28.3	2.11 H	306	42.6	3.1
6	4914.00	32.1 AV	54.0	-21.9	2.11 H	306	29.0	3.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2457.00	100.4 PK			1.90 V	182	68.0	32.4
2	*2457.00	87.2 AV			1.90 V	182	54.8	32.4
3	2483.50	60.2 PK	74.0	-13.8	1.90 V	182	27.8	32.4
4	2483.50	47.2 AV	54.0	-6.8	1.90 V	182	14.8	32.4
5	4914.00	45.8 PK	74.0	-28.2	2.06 V	166	42.7	3.1
6	4914.00	32.0 AV	54.0	-22.0	2.06 V	166	28.9	3.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	98.0 PK			3.56 H	293	65.6	32.4
2	*2462.00	85.3 AV			3.56 H	293	52.9	32.4
3	2483.50	60.1 PK	74.0	-13.9	3.56 H	293	27.7	32.4
4	2483.50	47.0 AV	54.0	-7.0	3.56 H	293	14.6	32.4
5	4924.00	45.4 PK	74.0	-28.6	2.15 H	305	42.3	3.1
6	4924.00	32.3 AV	54.0	-21.7	2.15 H	305	29.2	3.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	99.0 PK			1.89 V	181	66.6	32.4
2	*2462.00	85.7 AV			1.89 V	181	53.3	32.4
3	2483.50	62.3 PK	74.0	-11.7	1.89 V	181	29.9	32.4
4	2483.50	47.2 AV	54.0	-6.8	1.89 V	181	14.8	32.4
5	4924.00	45.4 PK	74.0	-28.6	1.99 V	158	42.3	3.1
6	4924.00	31.9 AV	54.0	-22.1	1.99 V	158	28.8	3.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.

9 kHz ~ 30 MHz Data:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

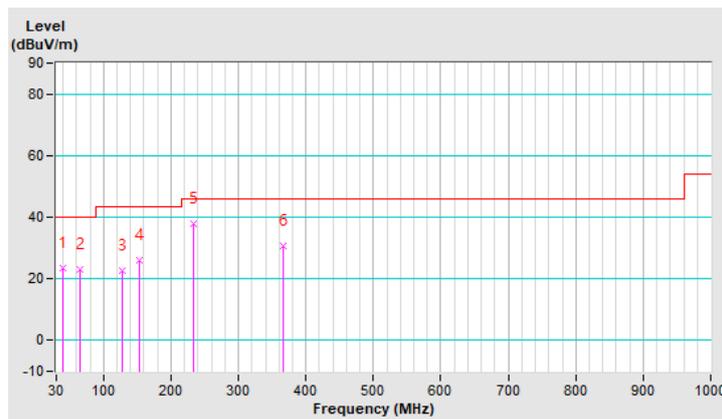
802.11ax (HE40)

CHANNEL	TX Channel 7	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.84	23.3 QP	40.0	-16.7	1.99 H	357	32.8	-9.5
2	65.14	22.9 QP	40.0	-17.1	1.99 H	138	32.9	-10.0
3	128.41	22.8 QP	43.5	-20.7	1.49 H	58	33.0	-10.2
4	153.71	26.0 QP	43.5	-17.5	1.49 H	171	34.6	-8.6
5	232.43	37.9 QP	46.0	-8.1	1.49 H	81	48.7	-10.8
6	365.99	30.8 QP	46.0	-15.2	1.00 H	176	36.3	-5.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

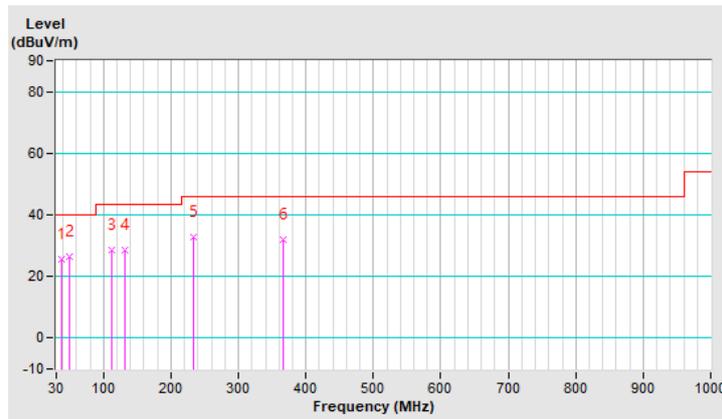


CHANNEL	TX Channel 7	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.03	25.7 QP	40.0	-14.3	2.00 V	324	35.6	-9.9
2	49.68	26.4 QP	40.0	-13.6	1.51 V	28	35.2	-8.8
3	111.54	28.7 QP	43.5	-14.8	1.51 V	88	40.5	-11.8
4	131.22	28.6 QP	43.5	-14.9	1.51 V	6	38.5	-9.9
5	232.43	32.8 QP	46.0	-13.2	2.00 V	339	43.6	-10.8
6	365.99	32.1 QP	46.0	-13.9	1.00 V	16	37.6	-5.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



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	Dec. 11, 2019	Dec. 10, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
Software ADT	BV ADT_Cond_ V7.3.7.4	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-12040.

4.2.3 Test Procedures

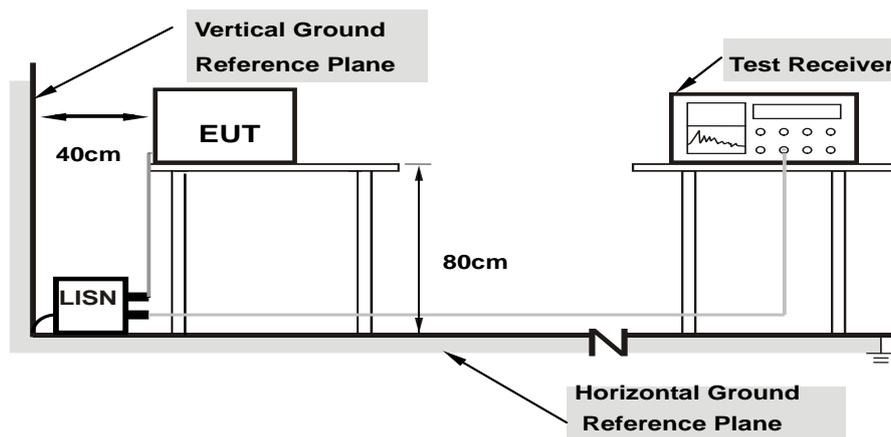
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling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

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

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

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

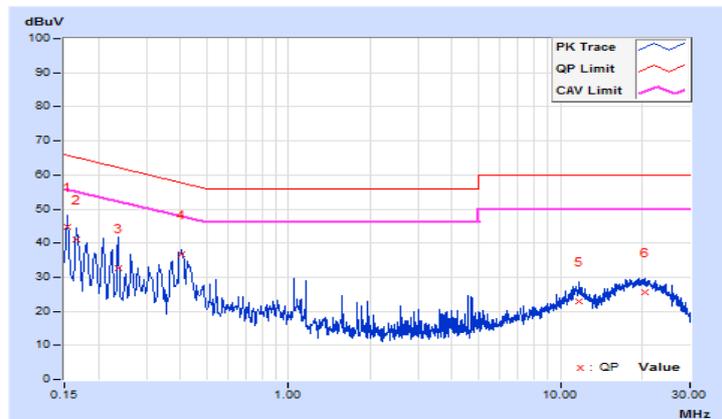
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	23°C, 67%RH
Tested by	Adair Peng	Test Date	2020/7/21

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	0.15391	9.63	35.25	19.80	44.88	29.43	65.79	55.79	-20.91	-26.36
2	0.16564	9.63	31.54	17.52	41.17	27.15	65.18	55.18	-24.01	-28.03
3	0.23602	9.63	22.98	10.12	32.61	19.75	62.24	52.24	-29.63	-32.49
4	0.40415	9.65	26.90	21.43	36.55	31.08	57.77	47.77	-21.22	-16.69
5	11.77834	9.88	13.01	8.36	22.89	18.24	60.00	50.00	-37.11	-31.76
6	20.53283	9.91	15.77	10.99	25.68	20.90	60.00	50.00	-34.32	-29.10

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

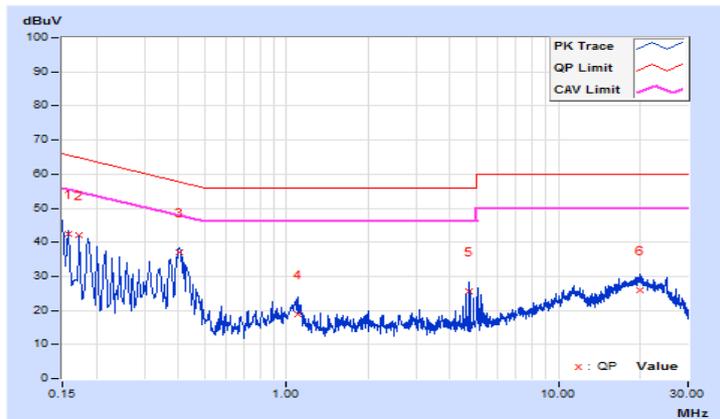


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	23°C, 67%RH
Tested by	Adair Peng	Test Date	2020/7/21

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	0.15782	9.66	32.83	17.75	42.49	27.41	65.58	55.58	-23.09	-28.17
2	0.17346	9.65	32.32	16.95	41.97	26.60	64.79	54.79	-22.82	-28.19
3	0.40160	9.67	27.53	22.70	37.20	32.37	57.82	47.82	-20.62	-15.45
4	1.09593	9.71	9.25	3.31	18.96	13.02	56.00	46.00	-37.04	-32.98
5	4.66996	9.83	15.73	1.99	25.56	11.82	56.00	46.00	-30.44	-34.18
6	19.96197	10.03	15.77	11.14	25.80	21.17	60.00	50.00	-34.20	-28.83

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 Conducted Output Power Measurement

4.3.1 Limits of Conducted Output Power Measurement

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

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

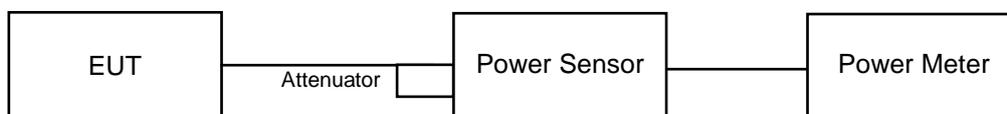
Array Gain = 0 dB (i.e., no array gain) for NANT \leq 4;

Array Gain = 0 dB (i.e., no array gain) for channel widths \geq 40 MHz for any NANT;

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20 MHz channel widths with NANT \geq 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

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 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.

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

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 Results

802.11b (SISO)

Channel	Frequency (MHz)	Peak Power (mW)		Peak Power (dBm)		Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1		
1	2412	116.68	123.31	20.67	20.91	30	Pass
7	2442	156.31	157.40	21.94	21.97	30	Pass
11	2462	119.67	120.78	20.78	20.82	30	Pass
12	2467	69.18	78.16	18.40	18.93	30	Pass
13	2472	39.54	48.08	15.97	16.82	30	Pass

Channel	Frequency (MHz)	Average Power (mW)		Average Power (dBm)		Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1		
1	2412	71.78	76.38	18.56	18.83	30	Pass
7	2442	95.50	95.94	19.80	19.82	30	Pass
11	2462	72.28	73.45	18.59	18.66	30	Pass
12	2467	41.69	47.97	16.20	16.81	30	Pass
13	2472	23.99	29.24	13.80	14.66	30	Pass

802.11g (SISO)

Channel	Frequency (MHz)	Peak Power (mW)		Peak Power (dBm)		Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1		
1	2412	120.78	121.62	20.82	20.85	30	Pass
7	2442	215.77	210.38	23.34	23.23	30	Pass
11	2462	103.04	103.51	20.13	20.15	30	Pass
12	2467	54.08	54.83	17.33	17.39	30	Pass
13	2472	88.10	88.72	19.45	19.48	30	Pass

Channel	Frequency (MHz)	Average Power (mW)		Average Power (dBm)		Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1		
1	2412	42.56	43.05	16.29	16.34	30	Pass
7	2442	85.31	86.70	19.31	19.38	30	Pass
11	2462	33.42	33.65	15.24	15.27	30	Pass
12	2467	18.97	19.05	12.78	12.80	30	Pass
13	2472	12.11	12.22	10.83	10.87	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.67	15.03	90.32	19.56	30	Pass
7	2442	20.97	21.00	250.92	24.00	30	Pass
11	2462	17.11	17.47	107.25	20.30	30	Pass
12	2467	14.10	14.41	53.31	17.27	30	Pass
13	2472	16.39	16.72	90.54	19.57	30	Pass

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	12.24	13.36	38.43	15.85	30	Pass
7	2442	16.27	16.35	85.52	19.32	30	Pass
11	2462	12.25	12.47	34.45	15.37	30	Pass
12	2467	9.70	9.81	18.90	12.77	30	Pass
13	2472	7.68	7.80	11.89	10.75	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.80	18.01	123.50	20.92	30	Pass
7	2442	18.46	18.50	140.94	21.49	30	Pass
9	2452	17.00	17.20	102.60	20.11	30	Pass
10	2457	15.44	15.71	72.23	18.59	30	Pass
11	2462	15.75	15.90	76.49	18.84	30	Pass

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.83	12.91	38.73	15.88	30	Pass
7	2442	13.24	13.37	42.81	16.32	30	Pass
9	2452	11.51	11.61	28.65	14.57	30	Pass
10	2457	8.71	8.78	14.98	11.76	30	Pass
11	2462	7.67	7.83	11.92	10.76	30	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.70	18.14	124.05	20.94	30	Pass
7	2442	21.00	21.07	253.83	24.05	30	Pass
11	2462	17.13	17.49	107.75	20.32	30	Pass
12	2467	14.12	14.49	53.94	17.32	30	Pass
13	2472	16.47	16.77	91.89	19.63	30	Pass

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	13.24	13.39	42.91	16.33	30	Pass
7	2442	16.15	16.22	83.09	19.20	30	Pass
11	2462	12.19	12.22	33.23	15.22	30	Pass
12	2467	9.77	9.87	19.19	12.83	30	Pass
13	2472	7.79	7.87	12.14	10.84	30	Pass

802.11ax (HE20) (26/0)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.68	18.12	123.48	20.92	30	Pass
13	2472	16.43	16.71	90.84	19.58	30	Pass

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	13.21	13.35	42.57	16.29	30	Pass
13	2472	7.76	7.85	12.07	10.82	30	Pass

802.11ax (HE20) (52/37)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.65	18.11	122.92	20.90	30	Pass
13	2472	16.41	16.70	90.53	19.57	30	Pass

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	13.20	13.34	42.47	16.28	30	Pass
13	2472	7.74	7.82	12.00	10.79	30	Pass

802.11ax (HE20) (106/53)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.64	18.00	121.17	20.83	30	Pass
13	2472	16.39	16.68	90.11	19.55	30	Pass

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	13.17	13.29	42.08	16.24	30	Pass
13	2472	7.71	7.81	11.94	10.77	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	22.64	22.77	372.89	25.72	30	Pass
7	2442	22.79	22.84	382.42	25.83	30	Pass
9	2452	17.09	17.23	104.01	20.17	30	Pass
10	2457	15.50	15.80	73.50	18.66	30	Pass
11	2462	15.80	15.97	77.56	18.90	30	Pass

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.78	12.89	38.42	15.85	30	Pass
7	2442	13.14	13.19	41.45	16.18	30	Pass
9	2452	11.54	11.67	28.95	14.62	30	Pass
10	2457	8.79	8.88	15.30	11.85	30	Pass
11	2462	7.70	7.91	12.07	10.82	30	Pass

802.11ax (HE40) (242/61)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	22.60	22.71	368.61	25.67	30	Pass
11	2462	15.78	15.91	76.84	18.86	30	Pass

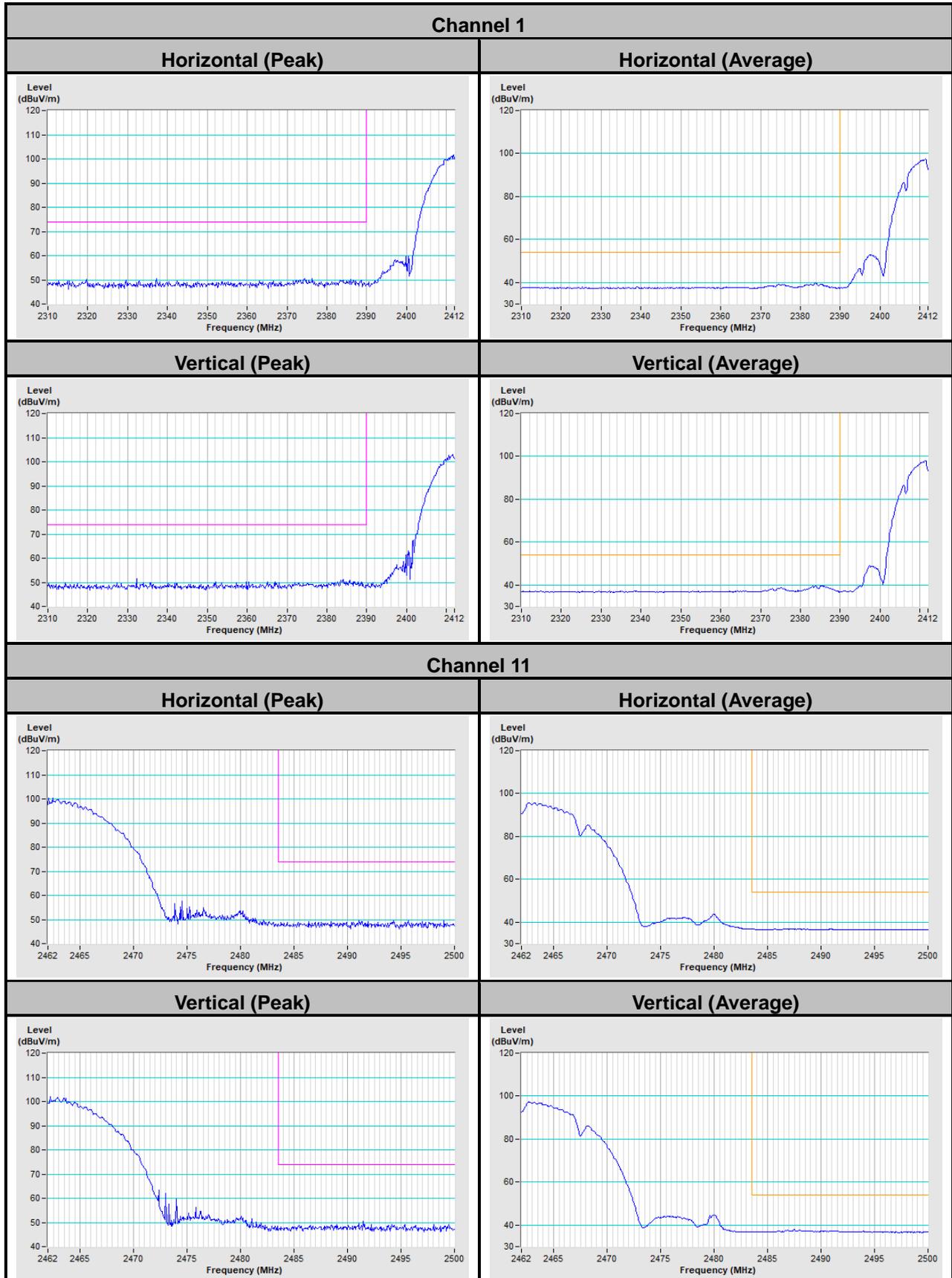
Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.77	12.88	38.33	15.84	30	Pass
11	2462	7.65	7.88	11.96	10.78	30	Pass

5 Pictures of Test Arrangements

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

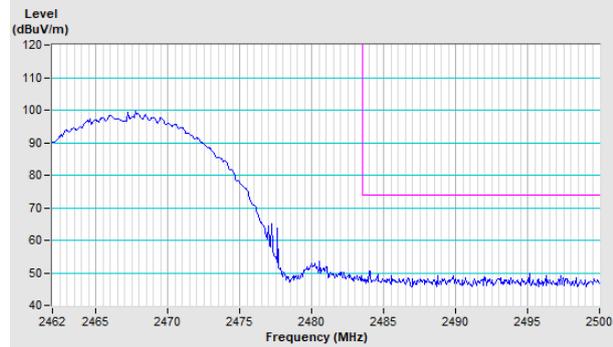
Annex A- Band Edge Measurement

802.11b

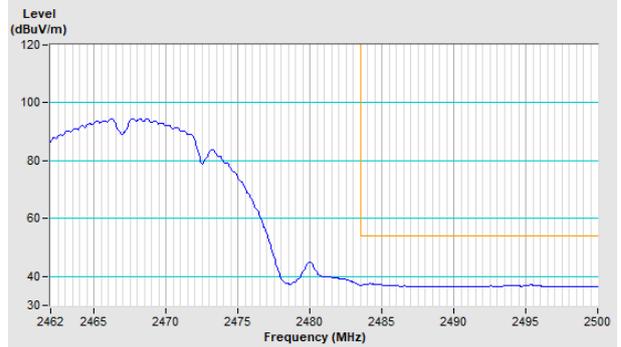


Channel 12

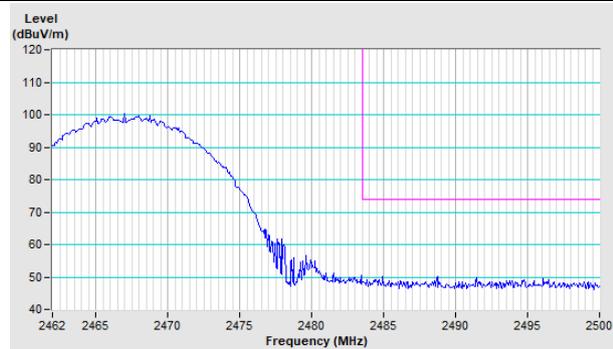
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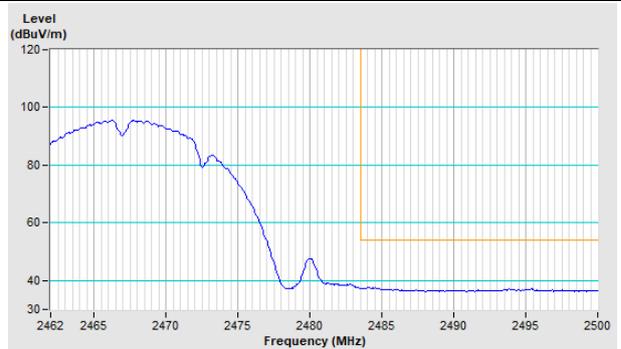
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Vertical (Peak)

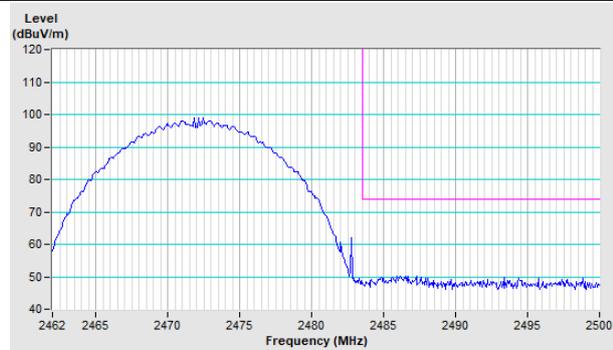


Vertical (Average)

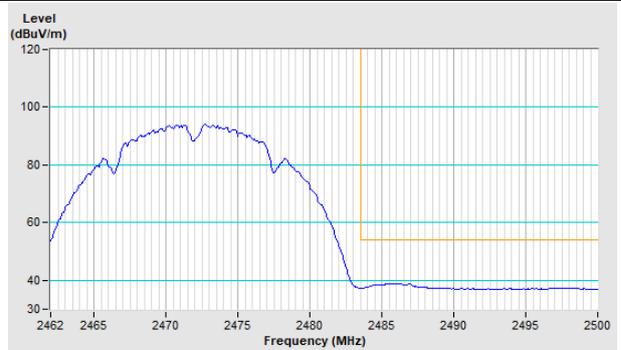


Channel 13

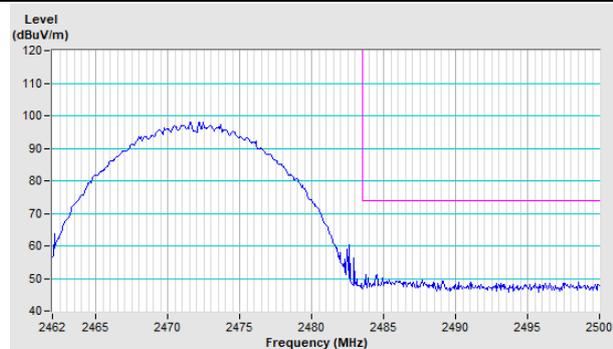
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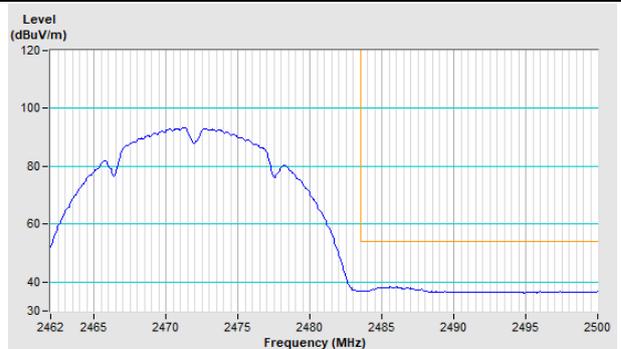
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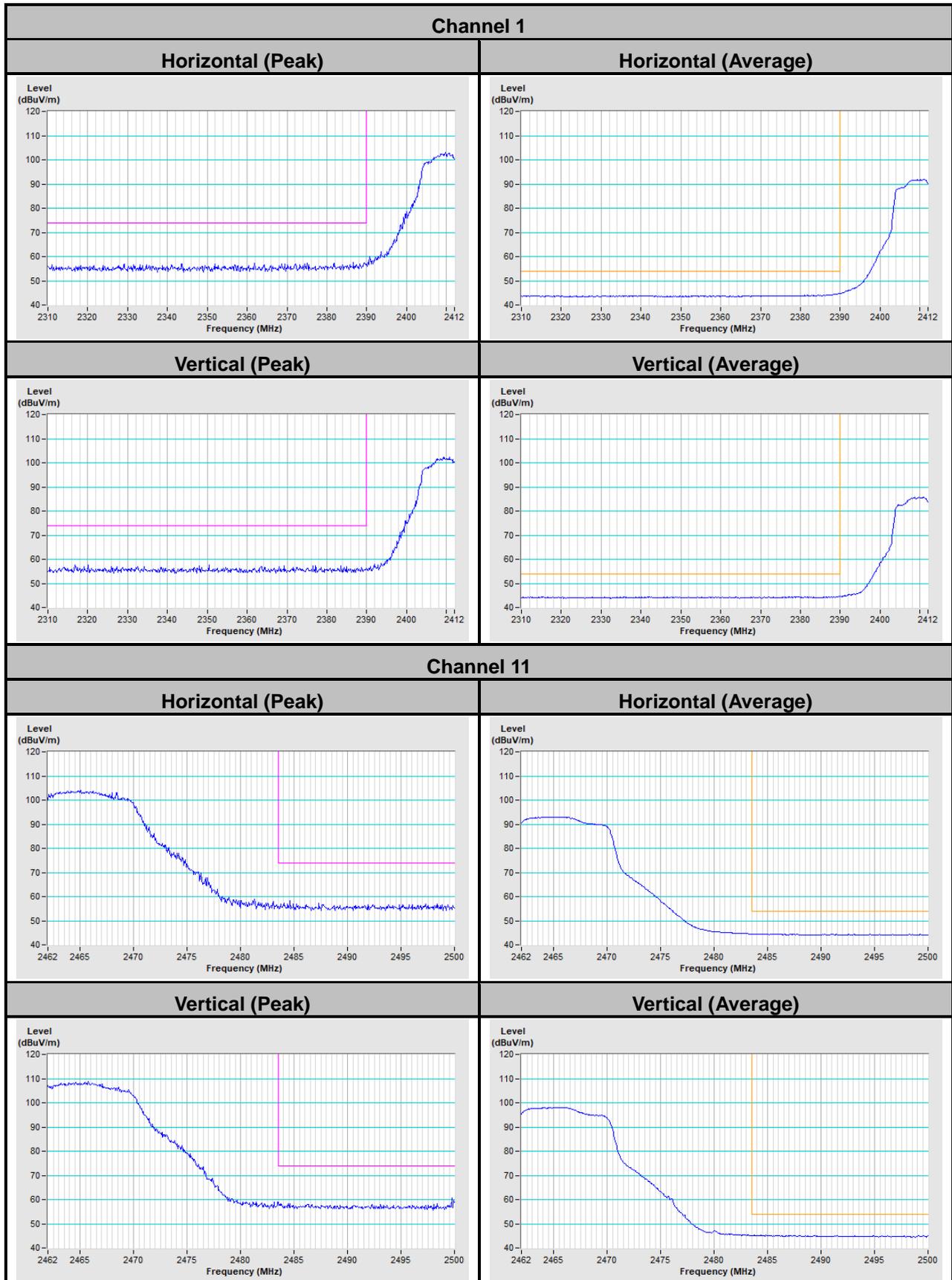
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Vertical (Average)

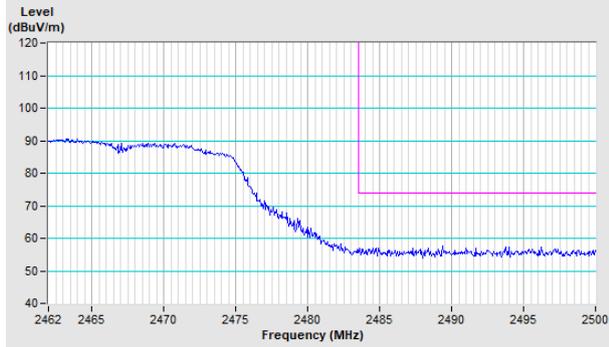


802.11g

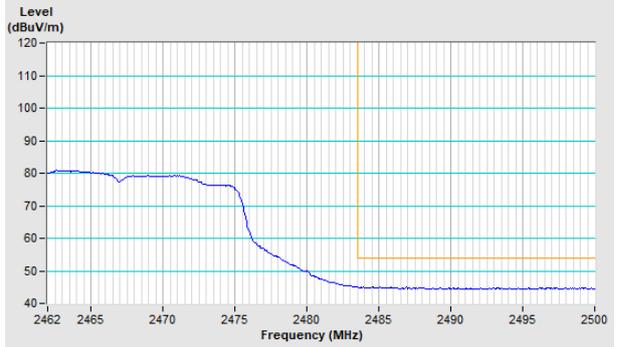


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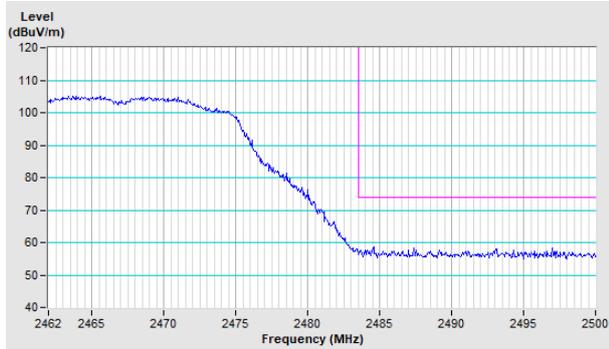
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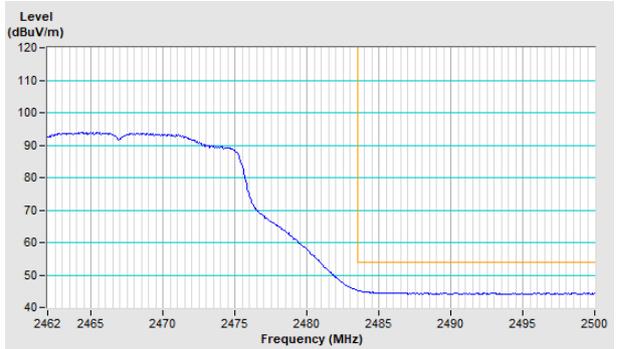
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Vertical (Peak)

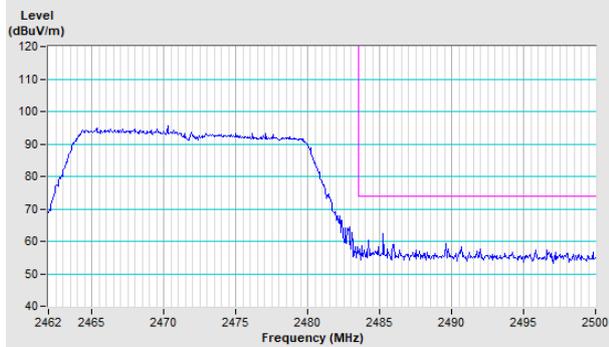


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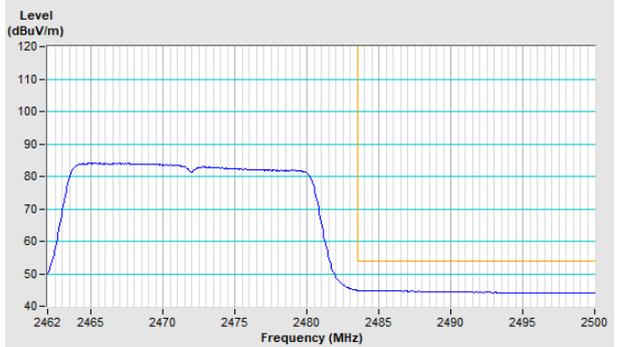


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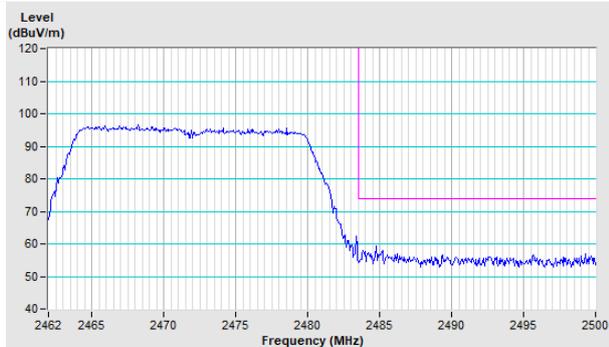
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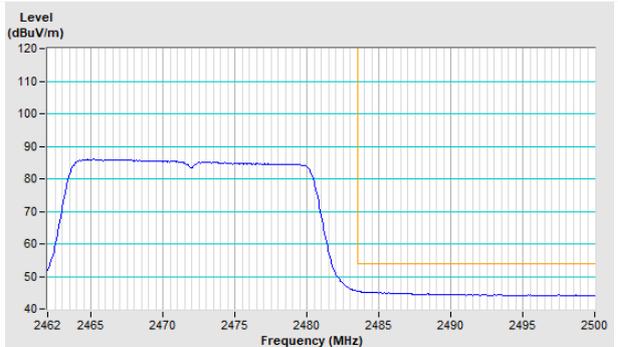
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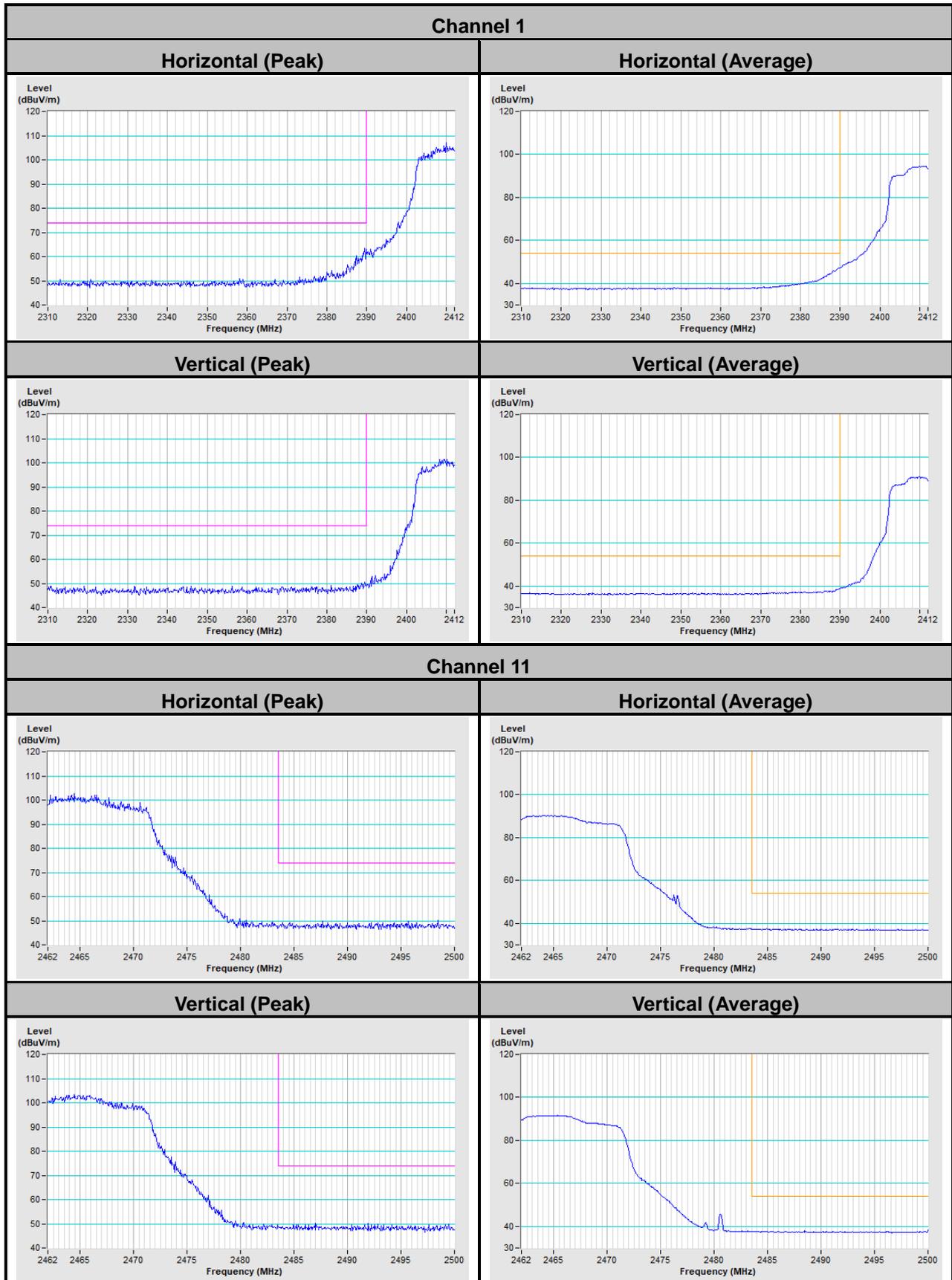
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Vertical (Average)

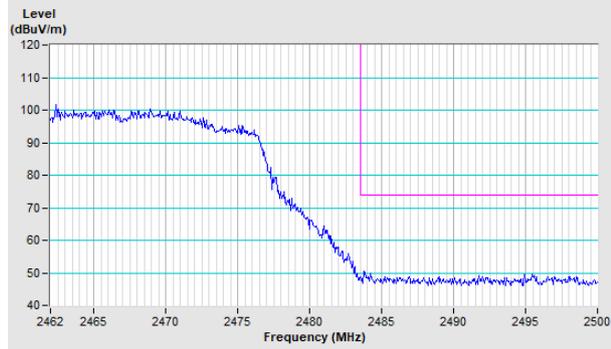


802.11ax (HE20)

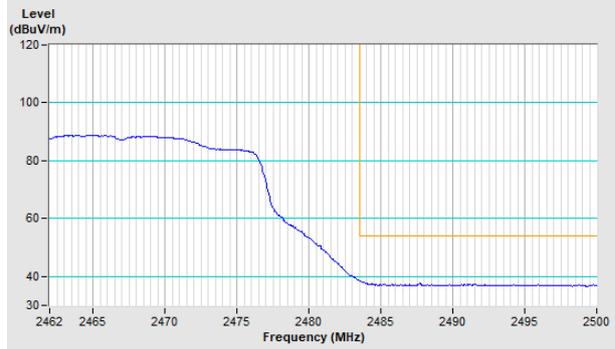


Channel 12

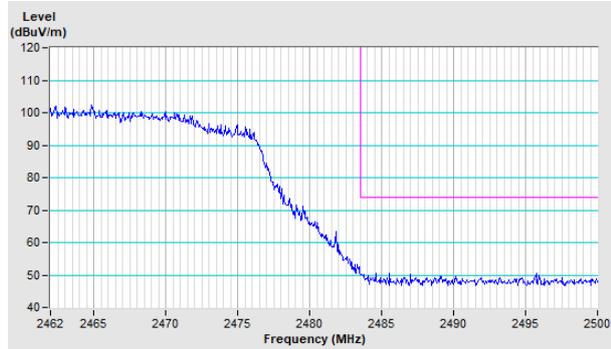
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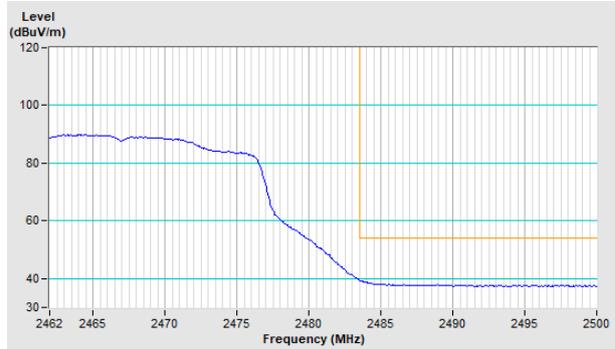
Horizontal (Average)



Vertical (Peak)

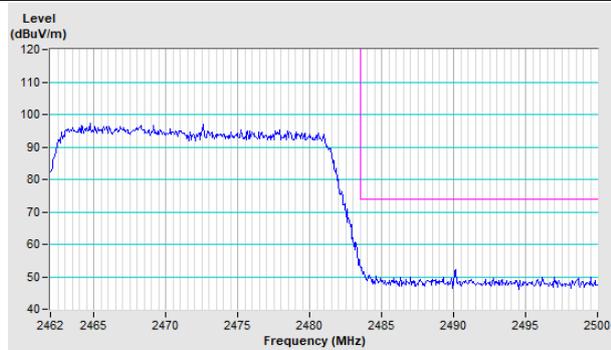


Vertical (Average)

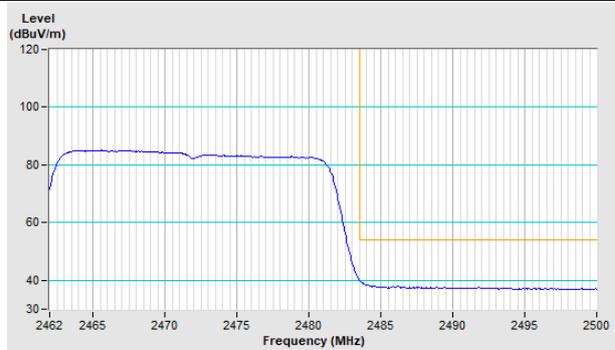


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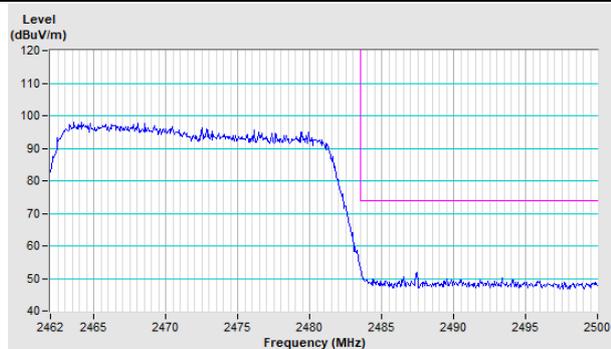
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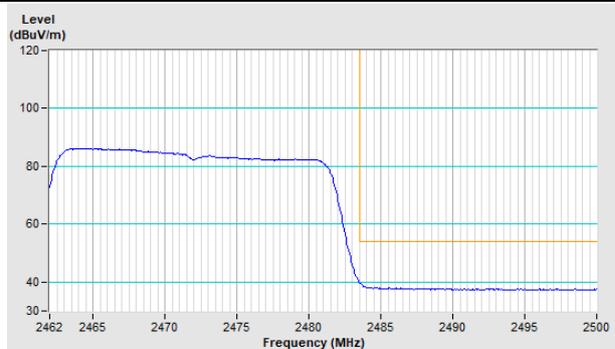
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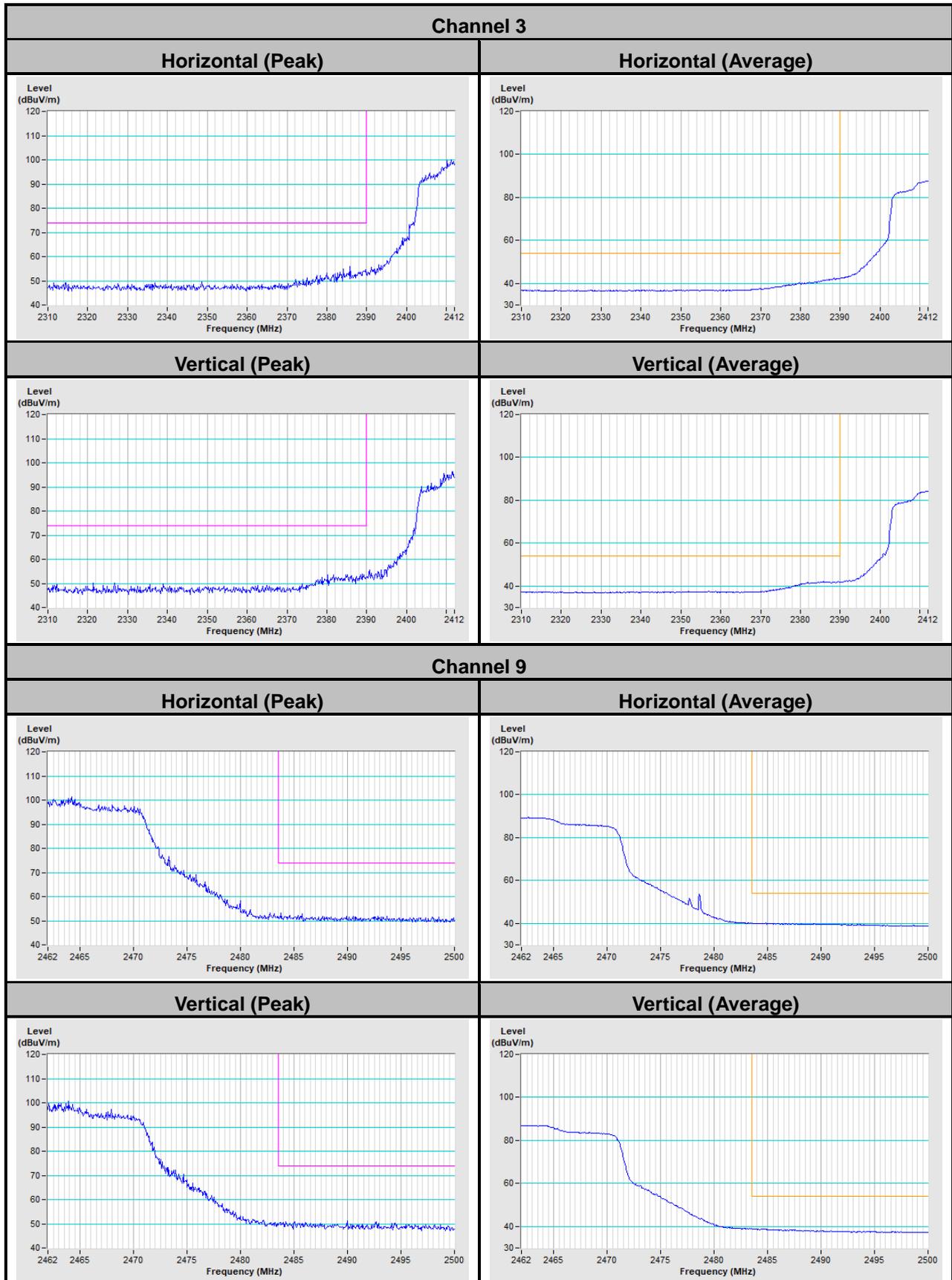
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Vertical (Average)

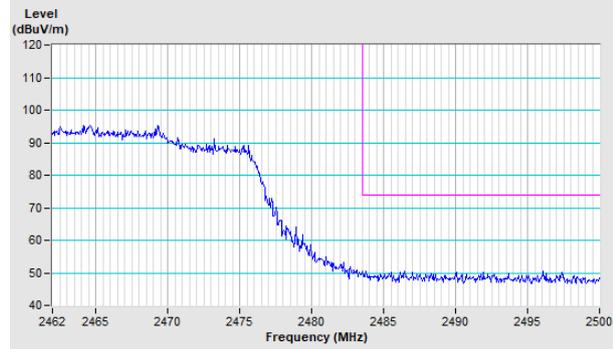


802.11ax (HE40)

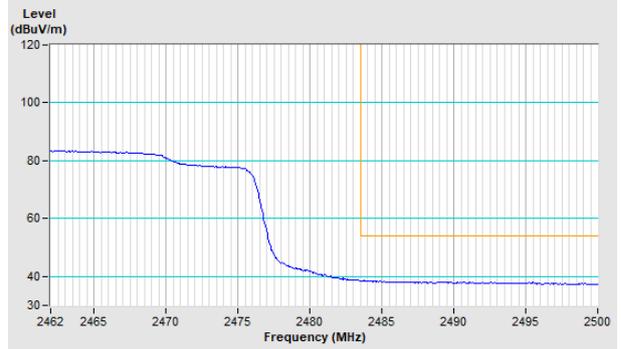


Channel 10

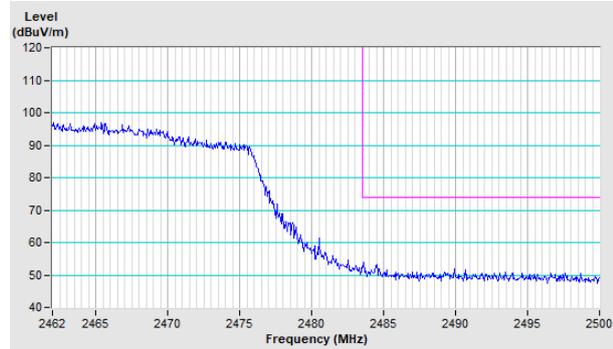
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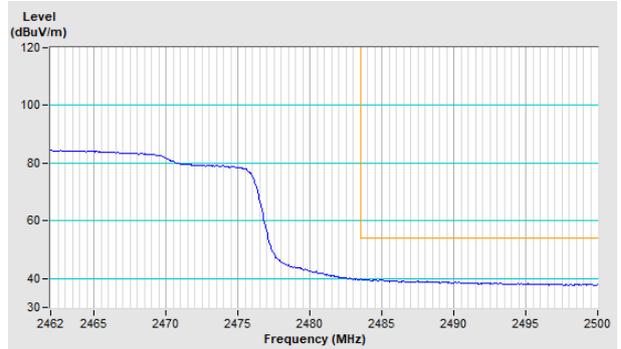
Horizontal (Average)



Vertical (Peak)

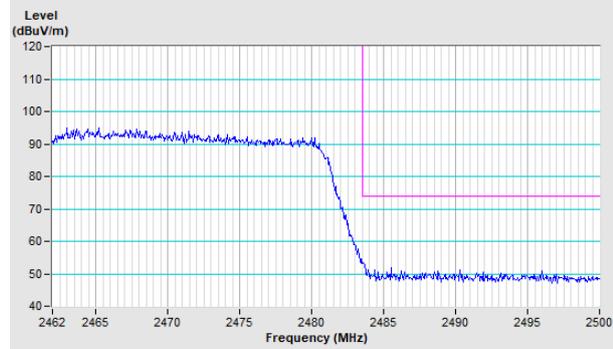


Vertical (Average)

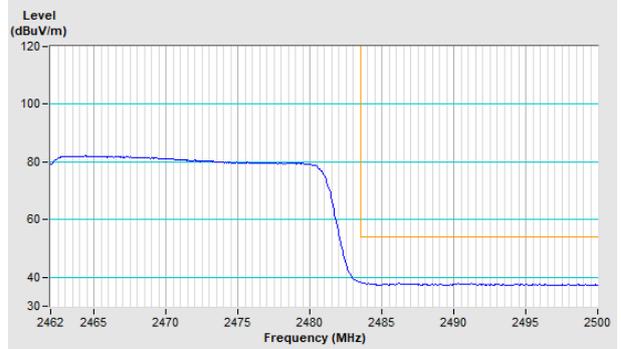


Channel 11

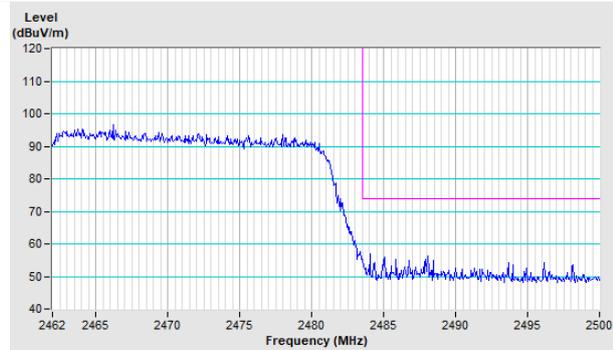
Horizontal (Peak)



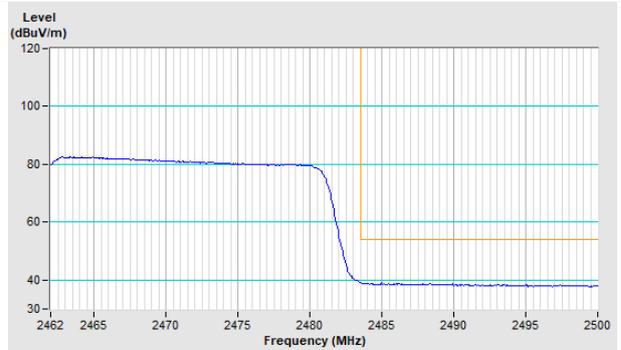
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of 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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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Hsin Chu EMC/RF/Telecom Lab

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Email: service.adt@tw.bureauveritas.com

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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