

## FCC Test Report

**Report No.:** RFBCKT-WTW-P21031102

**FCC ID:** HFSQTAD53

**Test Model:** QTAD53

**Received Date:** Mar. 31, 2021

**Test Date:** Apr. 27 ~ May 04, 2021

**Issued Date:** May 27, 2021

**Applicant:** QUANTA COMPUTER INC

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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**FCC Registration /  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
RFBCKT-WTW-P21031102	Original Release	May 27, 2021

## 1 Certificate of Conformity

**Product:** 5G Hotspot

**Brand:** T-Mobile

**Test Model:** QTAD53

**Sample Status:** Engineering Sample

**Applicant:** QUANTA COMPUTER INC

**Test Date:** Apr. 27 ~ May 04, 2021

**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 :** Gina Liu, **Date:** May 27, 2021  
Gina Liu / Specialist

**Approved by :** Dylan Chiou, **Date:** May 27, 2021  
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 -31.21 dB at 0.53800 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.5 dB at 4824.00 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.
---	Occupied Bandwidth Measurement	Pass	Reference only
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	Antenna connector is MUR not a standard connector.

Note:

- 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.
- 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) ( $\pm$ )
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	3.86 dB
	200 MHz ~ 1000 MHz	3.87 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.29 dB
	18 GHz ~ 40 GHz	2.29 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	5G Hotspot
<b>Brand</b>	T-Mobile
<b>Test Model</b>	QTAD53
<b>Status of EUT</b>	Engineering Sample
<b>Power Supply Rating</b>	5Vdc / 9Vdc / 12Vdc (Adapter) 3.85Vdc (Battery)
<b>Modulation Type</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
<b>Modulation Technology</b>	DSSS, OFDM, OFDMA
<b>Transfer Rate</b>	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 300.0 Mbps 802.11ax: up to 573.5 Mbps
<b>Operating Frequency</b>	2412 ~ 2462 MHz
<b>Number of Channel</b>	11 for 802.11b, 802.11g, 802.11n (HT20/VHT20), 802.11ax (HE20) 7 for 802.11n (HT40/VHT40), 802.11ax (HE40)
<b>Output Power</b>	CDD Mode: 74.302 mW Beamforming Mode: 36.499 mW
<b>Antenna Type</b>	Refer to Note as below
<b>Antenna Connector</b>	Refer to Note as below
<b>Accessory Device</b>	Refer to Note as below
<b>Data Cable Supplied</b>	Refer to Note as below

Note:

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

Modulation Mode	Beamforming Mode	Tx Function
802.11b	Not Support	1TX
802.11g	Not Support	1TX
802.11n (HT20/VHT20)	Support	2TX
802.11n (HT40/VHT20)	Support	2TX
802.11ax (HE20)	Support	2TX
802.11ax (HE40)	Support	2TX

\* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 / VHT20 / VHT40 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)

2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	TEN PAO INTERNATIONAL LTD.	S018BYU1200150	I/P: 100-240Vac, 50/60Hz, 600mA O/P: 5Vdc/9Vdc/12Vdc=3A/2A/1.5A
Adapter 2	Aohai Technology Co., Ltd	A138A-120150U-US2	I/P: 100-240V~50/60Hz, 0.5A O/P: 5Vdc, 2.5A/9Vdc, 2A/12Vdc, 1.5A
USB Cable	Electronics Taiwai Ltd.	DDEMU110079	0.95m shielded USB cable without core
Battery	VEKEN	141033	3.85Vdc, 6240mAh, 24.02Wh

3. There are two sources for EUT's main board and memory. Only the supplier is different and the rest of the specifications are the same.

Sample	Item	Brand	Model
A	PCB - Main	Unimicron Technology Corporation.	12VPL4024C for MODEM board, 06VPL4028C for Main board
	Memory - Main	Nanya Technology Corporation	NM4888KSPAXAI-3E
B	PCB - Second	AKM Meadville	HI12C124A for MODEM board, HI06T221A for Main board
	Memory - Second	Jeju Semiconductor Corp.	JSFDDQ5QHAFGD-405

\* After pre-tested, sample A was the worse and chosen for final test.

4. The antenna information is listed as below.

Ant. Type	Brand	Connector	Band	Freq. Range	Ant 0 Gain (dBi)	Ant 1 Gain (dBi)
PIFA	T-mobile	MUR	2.4GHz/BT	2400-2500MHz	-0.949234	0.371887
			5.2&5.3GHz	5150-5350MHz	1.09367	1.72142
			5.6GHz	5470-5725MHz	3.4947	2.48417
			5.8GHz	5725-5850MHz	2.75287	1.02439

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

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20/VHT20) and 802.11ax (HE20):

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

7 channels are provided for 802.11n (HT40/VHT40) and 802.11ax (HE40):

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

### 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 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
-	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	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 11	1	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 11	1	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)
-	802.11ax (HE20)	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11ax (HE40)	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11ax (HE20)	1 to 11	1, 11	OFDMA	BPSK	MCS0
-	802.11ax (HE40)	3 to 9	3, 9	OFDMA	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 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0
-	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
-	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

### Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	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	Edison Lee
APCM	25 deg. C, 65 % RH	3.85 Vdc	Jisyone Wang

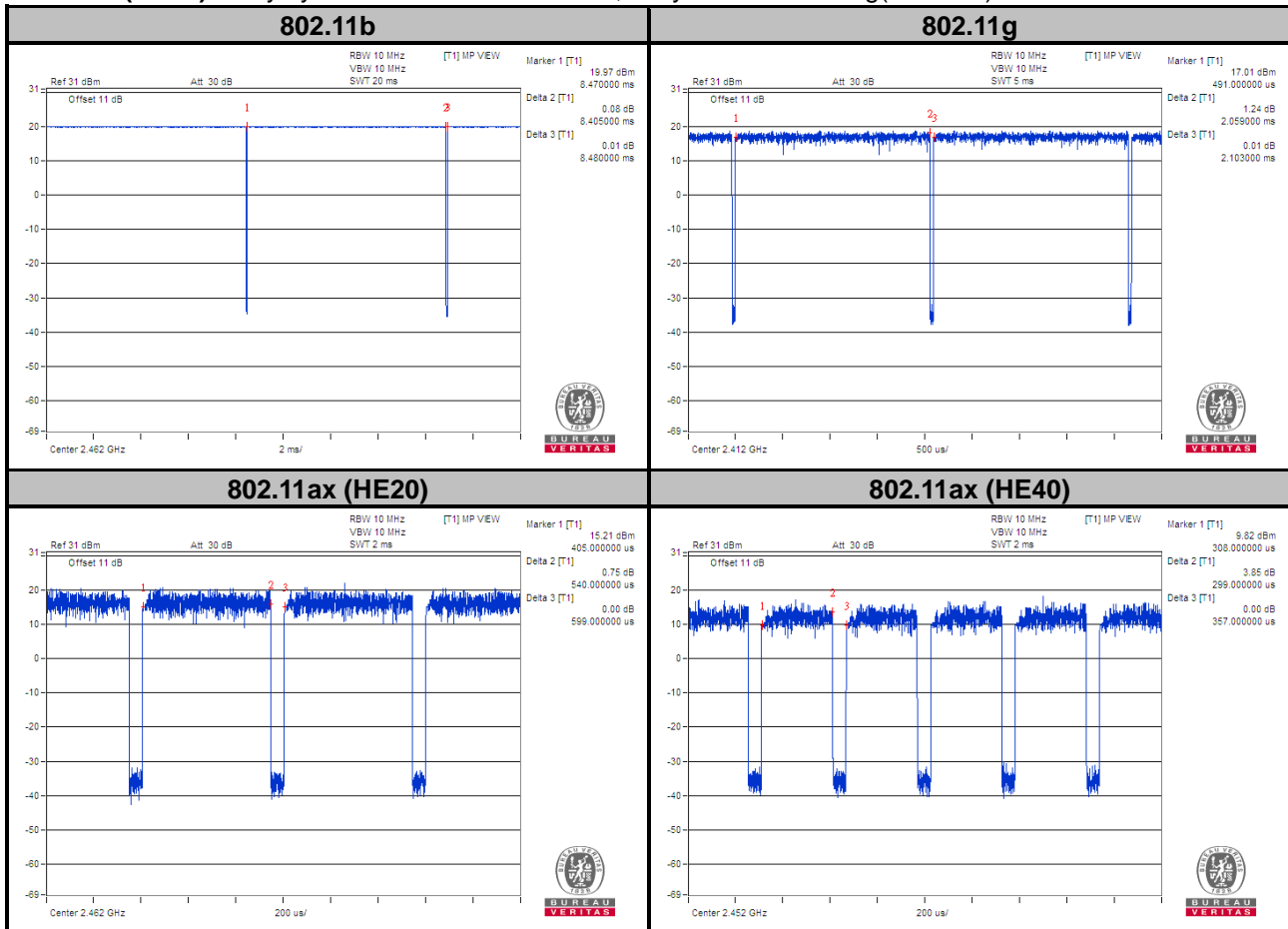
### 3.3 Duty Cycle of Test Signal

**802.11b:** Duty cycle =  $8.405/8.48 = 0.991$ , Duty cycle of test signal is  $\geq 98\%$ , duty factor is not required.  
 Duty cycle of test signal is  $< 98\%$ , duty factor shall be considered.

**802.11g:** Duty cycle =  $2.059/2.103 = 0.979$ , Duty factor =  $10 * \log(1/0.979) = 0.09$

**802.11ax (HE20):** Duty cycle =  $0.54/0.599 = 0.902$ , Duty factor =  $10 * \log(1/0.902) = 0.45$

**802.11ax (HE40):** Duty cycle =  $0.299/0.357 = 0.838$ , Duty factor =  $10 * \log(1/0.838) = 0.77$



### 3.4 Description of Support Units

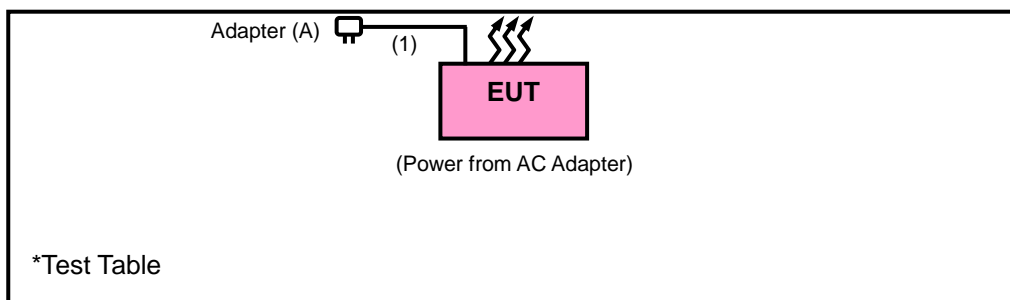
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Adapter	TEN PAO INTERNATIONAL LTD.	S018BYU120050	N/A	N/A	Accessory of the EUT

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Type-C USB Cable	1	0.95	Y	0	Accessory of the EUT

#### 3.4.1 Configuration of System under Test



### 3.5 General Description of Applied Standards and References

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. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna EMCI	EM-6879	269	Sep. 17, 2020	Sep. 16, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 22, 2021	Mar. 21, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM- SM-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
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
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 04, 2020	Sep. 03, 2021
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. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98 %) or 10 Hz (Duty cycle  $\geq$  98 %) for Average detection (AV) at frequency above 1 GHz.  
(11b: RBW = 1 MHz, VBW = 10 Hz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;  
11ax (HE20): RBW = 1 MHz, VBW = 3 kHz ; 11ax (HE40): RBW = 1 MHz, VBW = 10 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

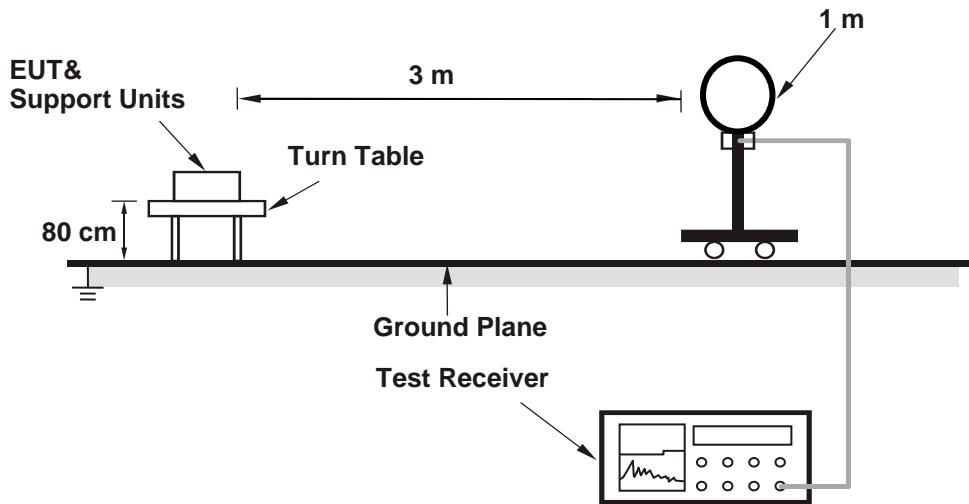


4.1.4 Deviation from Test Standard

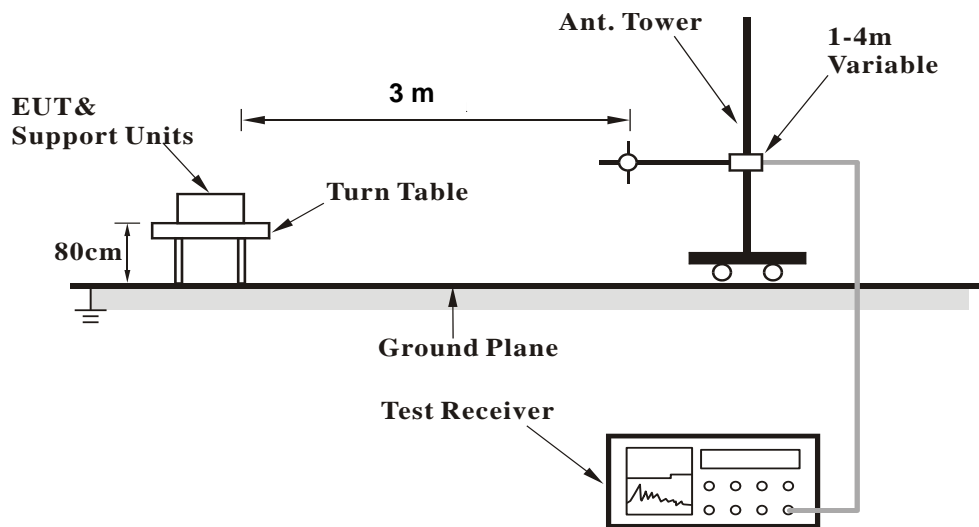
No deviation.

4.1.5 Test Set Up

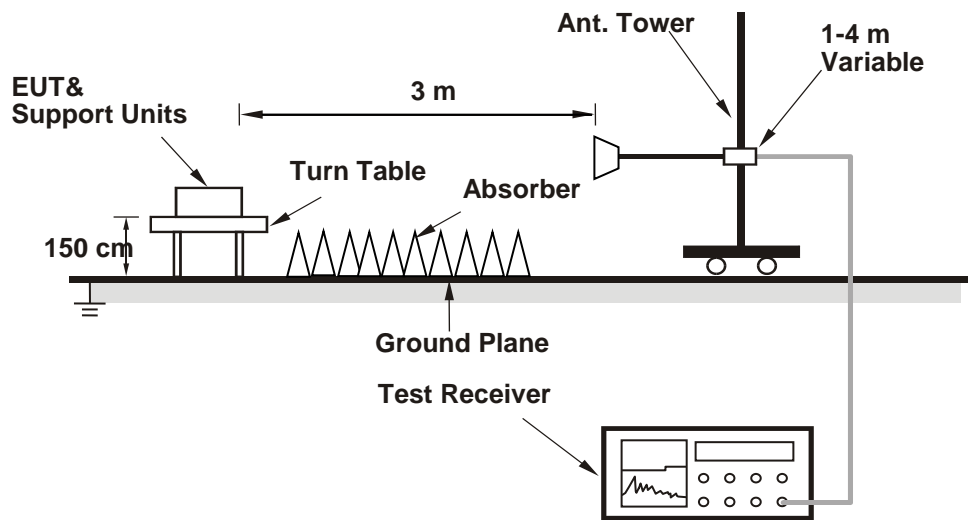
<Radiated Emission below 30 MHz>



<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

<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 1 : 2412 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	58.8 PK	74.0	-15.2	1.40 H	307	24.4	34.4
2	2390.00	46.7 AV	54.0	-7.3	1.40 H	307	12.3	34.4
3	*2412.00	108.0 PK			1.40 H	307	73.7	34.3
4	*2412.00	105.2 AV			1.40 H	307	70.9	34.3
5	4824.00	56.5 PK	74.0	-17.5	1.84 H	347	50.1	6.4
6	4824.00	53.5 AV	54.0	-0.5	1.84 H	347	47.1	6.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	59.1 PK	74.0	-14.9	1.42 V	267	24.7	34.4
2	2390.00	46.4 AV	54.0	-7.6	1.42 V	267	12.0	34.4
3	*2412.00	106.2 PK			1.42 V	267	71.9	34.3
4	*2412.00	102.1 AV			1.42 V	267	67.8	34.3
5	4824.00	52.5 PK	74.0	-21.5	1.16 V	232	46.1	6.4
6	4824.00	47.6 AV	54.0	-6.4	1.16 V	232	41.2	6.4

#### 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.

<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 6 : 2437 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	106.9 PK			1.58 H	312	72.6	34.3
2	*2437.00	104.3 AV			1.58 H	312	70.0	34.3
3	4874.00	55.7 PK	74.0	-18.3	1.79 H	342	49.9	5.8
4	4874.00	52.5 AV	54.0	-1.5	1.79 H	342	46.7	5.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	106.3 PK			1.30 V	263	72.0	34.3
2	*2437.00	103.7 AV			1.30 V	263	69.4	34.3
3	4874.00	51.6 PK	74.0	-22.4	1.21 V	237	45.8	5.8
4	4874.00	46.6 AV	54.0	-7.4	1.21 V	237	40.8	5.8

**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.

<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 11 : 2462 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (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	107.3 PK			1.49 H	313	72.9	34.4
2	*2462.00	104.5 AV			1.49 H	313	70.1	34.4
3	2483.50	59.5 PK	74.0	-14.5	1.49 H	313	25.1	34.4
4	2483.50	48.8 AV	54.0	-5.2	1.49 H	313	14.4	34.4
5	4924.00	56.1 PK	74.0	-17.9	1.63 H	343	50.4	5.7
6	4924.00	53.1 AV	54.0	-0.9	1.63 H	343	47.4	5.7

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (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			1.32 V	272	72.1	34.4
2	*2462.00	103.9 AV			1.32 V	272	69.5	34.4
3	2483.50	60.5 PK	74.0	-13.5	1.32 V	272	26.1	34.4
4	2483.50	48.7 AV	54.0	-5.3	1.32 V	272	14.3	34.4
5	4924.00	50.9 PK	74.0	-23.1	1.21 V	235	45.2	5.7
6	4924.00	46.3 AV	54.0	-7.7	1.21 V	235	40.6	5.7

**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.

<b>RF Mode</b>	TX 802.11g	<b>Channel</b>	CH 1 : 2412 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	59.2 PK	74.0	-14.8	1.41 H	304	24.8	34.4
2	2390.00	47.0 AV	54.0	-7.0	1.41 H	304	12.6	34.4
3	*2412.00	106.7 PK			1.41 H	304	72.4	34.3
4	*2412.00	96.9 AV			1.41 H	304	62.6	34.3
5	4824.00	50.8 PK	74.0	-23.2	1.46 H	345	44.4	6.4
6	4824.00	38.3 AV	54.0	-15.7	1.46 H	345	31.9	6.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	59.5 PK	74.0	-14.5	1.40 V	271	25.1	34.4
2	2390.00	46.8 AV	54.0	-7.2	1.40 V	271	12.4	34.4
3	*2412.00	105.8 PK			1.40 V	271	71.5	34.3
4	*2412.00	96.0 AV			1.40 V	271	61.7	34.3
5	4824.00	48.9 PK	74.0	-25.1	1.25 V	247	42.5	6.4
6	4824.00	35.9 AV	54.0	-18.1	1.25 V	247	29.5	6.4

**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.

<b>RF Mode</b>	TX 802.11g	<b>Channel</b>	CH 6 : 2437 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	107.2 PK			1.61 H	314	72.9	34.3
2	*2437.00	97.0 AV			1.61 H	314	62.7	34.3
3	4874.00	49.9 PK	74.0	-24.1	1.49 H	347	44.1	5.8
4	4874.00	37.3 AV	54.0	-16.7	1.49 H	347	31.5	5.8

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	106.6 PK			1.30 V	262	72.3	34.3
2	*2437.00	96.5 AV			1.30 V	262	62.2	34.3
3	4874.00	48.1 PK	74.0	-25.9	1.21 V	246	42.3	5.8
4	4874.00	35.0 AV	54.0	-19.0	1.21 V	246	29.2	5.8

**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.

<b>RF Mode</b>	TX 802.11g	<b>Channel</b>	CH 11 : 2462 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (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	108.5 PK			1.36 H	306	74.1	34.4
2	*2462.00	97.8 AV			1.36 H	306	63.4	34.4
3	2483.50	60.7 PK	74.0	-13.3	1.36 H	306	26.3	34.4
4	2483.50	49.5 AV	54.0	-4.5	1.36 H	306	15.1	34.4
5	4924.00	49.7 PK	74.0	-24.3	1.49 H	341	44.0	5.7
6	4924.00	37.0 AV	54.0	-17.0	1.49 H	341	31.3	5.7

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (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	106.0 PK			1.30 V	262	71.6	34.4
2	*2462.00	96.5 AV			1.30 V	262	62.1	34.4
3	2483.50	60.3 PK	74.0	-13.7	1.30 V	262	25.9	34.4
4	2483.50	48.9 AV	54.0	-5.1	1.30 V	262	14.5	34.4
5	4924.00	47.8 PK	74.0	-26.2	1.19 V	241	42.1	5.7
6	4924.00	35.0 AV	54.0	-19.0	1.19 V	241	29.3	5.7

**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.



<b>RF Mode</b>	TX 802.11ax (HE20)	<b>Channel</b>	CH 1 : 2412 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (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	68.4 PK	74.0	-5.6	1.82 H	325	34.0	34.4
2	2390.00	51.9 AV	54.0	-2.1	1.82 H	325	17.5	34.4
3	*2412.00	110.4 PK			1.82 H	325	76.1	34.3
4	*2412.00	98.7 AV			1.82 H	325	64.4	34.3
5	4824.00	56.0 PK	74.0	-18.0	1.79 H	347	49.6	6.4
6	4824.00	44.6 AV	54.0	-9.4	1.79 H	347	38.2	6.4

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (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	69.9 PK	74.0	-4.1	1.16 V	266	35.5	34.4
2	2390.00	52.6 AV	54.0	-1.4	1.16 V	266	18.2	34.4
3	*2412.00	112.4 PK			1.16 V	266	78.1	34.3
4	*2412.00	100.3 AV			1.16 V	266	66.0	34.3
5	4824.00	49.9 PK	74.0	-24.1	1.25 V	227	43.5	6.4
6	4824.00	38.6 AV	54.0	-15.4	1.25 V	227	32.2	6.4

**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.

<b>RF Mode</b>	TX 802.11ax (HE20)	<b>Channel</b>	CH 6 : 2437 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	112.9 PK	74.0		1.60 H	309	78.6	34.3
2	*2437.00	101.4AV	54.0		1.60 H	309	67.1	34.3
5	4874.00	56.8 PK	74.0	-17.2	1.62 H	342	51.0	5.8
6	4874.00	45.0 AV	54.0	-9.0	1.62 H	342	39.2	5.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	114.8 PK			1.36 V	262	80.5	34.3
2	*2437.00	102.4 AV			1.36 V	262	68.1	34.3
3	4874.00	49.4 PK	74.0	-24.6	1.25 V	225	43.6	5.8
4	4874.00	38.0 AV	54.0	-16.0	1.25 V	225	32.2	5.8

**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.
6. " # " : The radiated frequency is out of the restricted band.

<b>RF Mode</b>	TX 802.11ax (HE20)	<b>Channel</b>	CH 11 : 2462 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (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	111.7 PK			1.74 H	325	77.3	34.4
2	*2462.00	99.9 AV			1.74 H	325	65.5	34.4
3	2483.50	71.4 PK	74.0	-2.6	1.74 H	325	37.0	34.4
4	2483.50	52.9 AV	54.0	-1.1	1.74 H	325	18.5	34.4
5	4924.00	53.5 PK	74.0	-20.5	1.82 H	346	47.8	5.7
6	4924.00	41.7 AV	54.0	-12.3	1.82 H	346	36.0	5.7

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (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	114.4 PK			1.07 V	276	80.0	34.4
2	*2462.00	102.6 AV			1.07 V	276	68.2	34.4
3	2483.50	70.9 PK	74.0	-3.1	1.07 V	276	36.5	34.4
4	2483.50	53.2 AV	54.0	-0.8	1.07 V	276	18.8	34.4
5	4924.00	49.2 PK	74.0	-24.8	1.15 V	213	43.5	5.7
6	4924.00	37.9 AV	54.0	-16.1	1.15 V	213	32.2	5.7

**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.

<b>RF Mode</b>	TX 802.11ax (HE40)	<b>Channel</b>	CH 3 : 2422 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (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	67.6 PK	74.0	-6.4	1.68 H	307	33.2	34.4
2	2390.00	51.4 AV	54.0	-2.6	1.68 H	307	17.0	34.4
3	*2422.00	108.2 PK			1.68 H	307	73.9	34.3
4	*2422.00	96.4 AV			1.68 H	307	62.1	34.3
5	4844.00	55.0 PK	74.0	-19.0	1.47 H	349	48.9	6.1
6	4844.00	40.9 AV	54.0	-13.1	1.47 H	349	34.8	6.1

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (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	68.9 PK	74.0	-5.1	1.11 V	266	34.5	34.4
2	2390.00	52.8 AV	54.0	-1.2	1.11 V	266	18.4	34.4
3	*2422.00	110.1 PK			1.11 V	266	75.8	34.3
4	*2422.00	98.4 AV			1.11 V	266	64.1	34.3
5	4844.00	49.6 PK	74.0	-24.4	1.22 V	223	43.5	6.1
6	4844.00	37.4 AV	54.0	-16.6	1.22 V	223	31.3	6.1

**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.

<b>RF Mode</b>	TX 802.11ax (HE40)	<b>Channel</b>	CH 6 : 2437 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	109.1 PK			1.63 H	304	74.8	34.3
2	*2437.00	97.3 AV			1.63 H	304	63.0	34.3
3	2483.50	68.6 PK	74.0	-5.4	1.63 H	304	34.2	34.4
4	2483.50	51.9 AV	54.0	-2.1	1.63 H	304	17.5	34.4
5	4874.00	55.3 PK	74.0	-18.7	1.83 H	341	49.5	5.8
6	4874.00	42.0 AV	54.0	-12.0	1.83 H	341	36.2	5.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	111.5 PK			1.41 V	274	77.2	34.3
2	*2437.00	99.7 AV			1.41 V	274	65.4	34.3
3	2483.50	69.6 PK	74.0	-4.4	1.41 V	274	35.2	34.4
4	2483.50	52.9 AV	54.0	-1.1	1.41 V	274	18.5	34.4
5	4874.00	49.0 PK	74.0	-25.0	1.20 V	221	43.2	5.8
6	4874.00	37.0 AV	54.0	-17.0	1.20 V	221	31.2	5.8

**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.

<b>RF Mode</b>	TX 802.11ax (HE40)	<b>Channel</b>	CH 9 : 2452 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	107.5 PK			1.54 H	311	73.2	34.3
2	*2452.00	95.1 AV			1.54 H	311	60.8	34.3
3	2483.50	66.3 PK	74.0	-7.7	1.54 H	311	31.9	34.4
4	2483.50	51.9 AV	54.0	-2.1	1.54 H	311	17.5	34.4
5	4904.00	54.1 PK	74.0	-19.9	1.51 H	345	48.5	5.6
6	4904.00	40.6 AV	54.0	-13.4	1.51 H	345	35.0	5.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	108.0 PK			1.11 V	274	73.7	34.3
2	*2452.00	95.8 AV			1.11 V	274	61.5	34.3
3	2483.50	67.7 PK	74.0	-6.3	1.11 V	274	33.3	34.4
4	2483.50	52.8 AV	54.0	-1.2	1.11 V	274	18.4	34.4
5	4904.00	49.1 PK	74.0	-24.9	1.17 V	218	43.5	5.6
6	4904.00	36.6 AV	54.0	-17.4	1.17 V	218	31.0	5.6

**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.

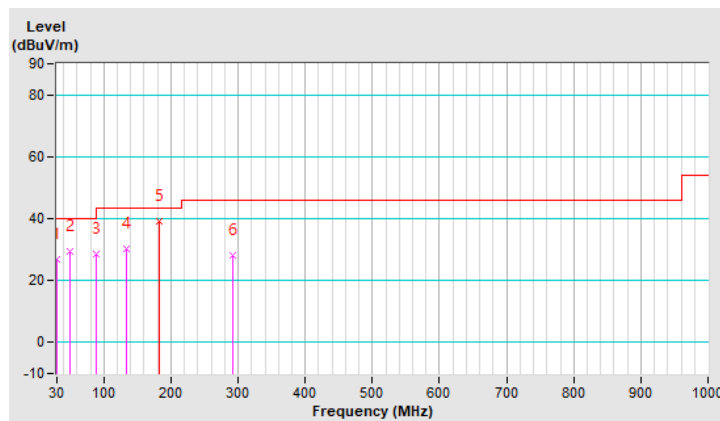
**9 kHz ~ 1 GHz Worst-Case Data:**

<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 1 : 2412 MHz
<b>Frequency Range</b>	30MHz ~ 1GHz	<b>Detector Function</b>	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBUV)	Correction Factor (dB/m)
1	30.00	26.9 QP	40.0	-13.1	1.99 H	5	37.8	-10.9
2	49.68	29.4 QP	40.0	-10.6	1.49 H	119	38.5	-9.1
3	89.04	28.6 QP	43.5	-14.9	1.99 H	132	42.9	-14.3
4	134.03	30.1 QP	43.5	-13.4	1.99 H	73	39.6	-9.5
5	181.84	39.1 QP	43.5	-4.4	1.49 H	265	49.2	-10.1
6	291.48	28.1 QP	46.0	-17.9	1.00 H	75	34.8	-6.7

**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.



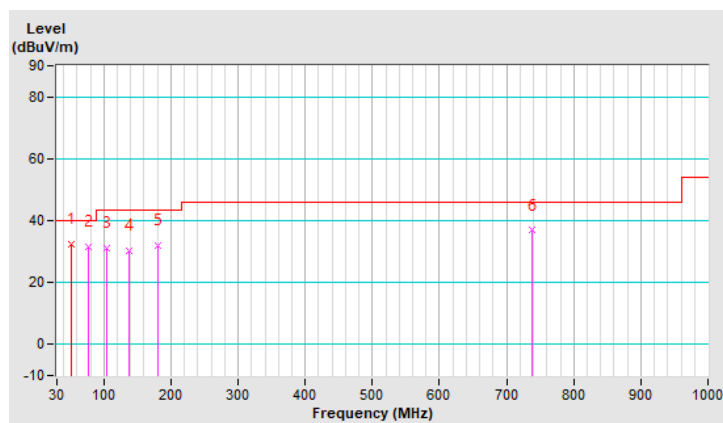
<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 1 : 2412 MHz
<b>Frequency Range</b>	30MHz ~ 1GHz	<b>Detector Function</b>	Quasi-Peak (QP)

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	52.18	32.3 QP	40.0	-7.7	1.00 V	325	41.3	-9.0
2	76.39	31.7 QP	40.0	-8.3	1.99 V	337	44.2	-12.5
3	104.51	31.2 QP	43.5	-12.3	1.00 V	152	43.7	-12.5
4	138.25	30.3 QP	43.5	-13.2	1.00 V	163	39.4	-9.1
5	180.42	32.0 QP	43.5	-11.5	1.00 V	201	42.0	-10.0
6	737.12	36.8 QP	46.0	-9.2	1.00 V	218	33.8	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 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	ESR3	102783	Dec. 21, 2020	Dec. 20, 2021
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2020	Sep. 03, 2021
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 28, 2021	Jan. 27, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 18, 2020	Aug. 17, 2021
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 2 (Conduction 2).  
 3. The VCCI Site Registration No. is C-12047.

#### 4.2.3 Test Procedures

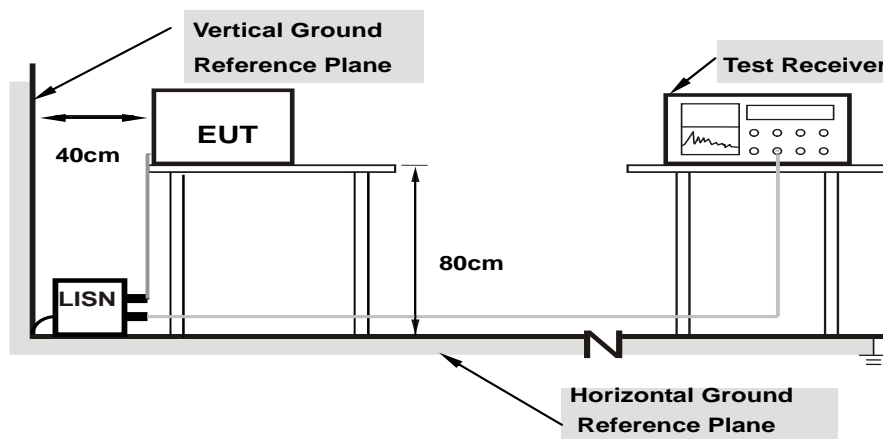
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling 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.

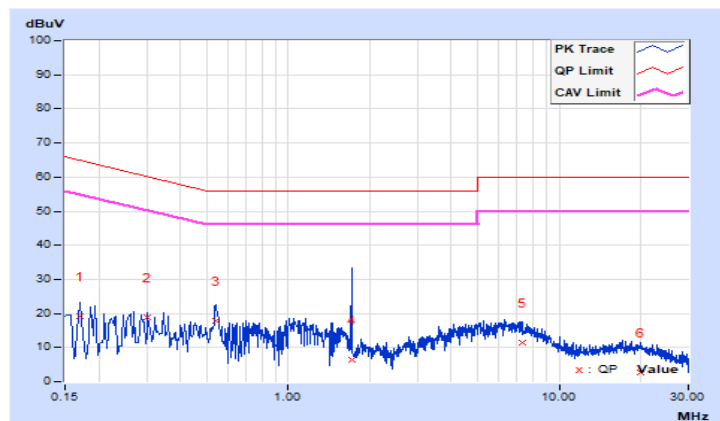
#### 4.2.7 Test Results

<b>Frequency Range</b>	150kHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	25°C, 75%RH
<b>Tested by</b>	Edison Lee	<b>Test Date</b>	2021/4/29

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	0.17000	0.15	19.21	8.78	19.36	8.93	64.96	54.96	-45.60	-46.03
2	0.30200	0.20	18.66	4.87	18.86	5.07	60.19	50.19	-41.33	-45.12
<b>3</b>	<b>0.53800</b>	<b>0.25</b>	<b>17.59</b>	<b>14.54</b>	<b>17.84</b>	<b>14.79</b>	<b>56.00</b>	<b>46.00</b>	<b>-38.16</b>	<b>-31.21</b>
4	1.71400	0.34	5.89	0.91	6.23	1.25	56.00	46.00	-49.77	-44.75
5	7.31400	0.48	11.01	1.58	11.49	2.06	60.00	50.00	-48.51	-47.94
6	20.07400	0.70	2.09	0.58	2.79	1.28	60.00	50.00	-57.21	-48.72

**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

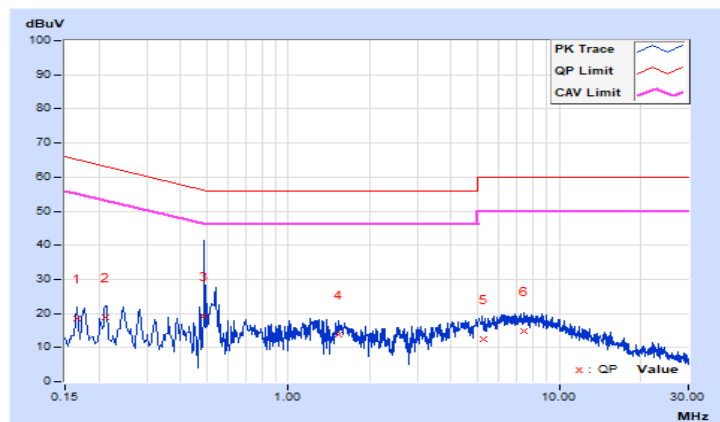


<b>Frequency Range</b>	150kHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	25°C, 75%RH
<b>Tested by</b>	Edison Lee	<b>Test Date</b>	2021/4/29

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	0.16600	0.15	18.52	9.52	18.67	9.67	65.16	55.16	-46.49	-45.49
2	0.21015	0.17	18.66	4.71	18.83	4.88	63.20	53.20	-44.37	-48.32
3	0.49000	0.26	18.96	7.74	19.22	8.00	56.17	46.17	-36.95	-38.17
4	1.53800	0.35	13.31	2.17	13.66	2.52	56.00	46.00	-42.34	-43.48
5	5.23800	0.51	11.99	1.82	12.50	2.33	60.00	50.00	-47.50	-47.67
6	7.45000	0.57	14.23	4.51	14.80	5.08	60.00	50.00	-45.20	-44.92

**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

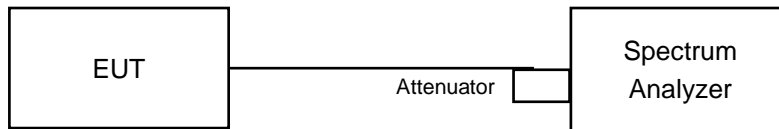


### 4.3 6 dB Bandwidth Measurement

#### 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

- a. Set resolution bandwidth (RBW) = 100 kHz
- b. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. 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 Results

##### 802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.10	0.5	Pass
6	2437	8.08	0.5	Pass
11	2462	8.09	0.5	Pass

##### 802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.21	0.5	Pass
6	2437	15.20	0.5	Pass
11	2462	15.72	0.5	Pass

##### 802.11ax (HE20)

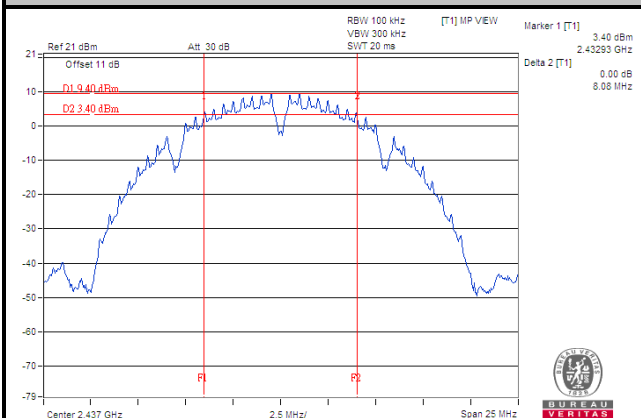
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	18.48	18.68	0.5	Pass
6	2437	17.35	17.60	0.5	Pass
11	2462	18.72	18.42	0.5	Pass

##### 802.11ax (HE40)

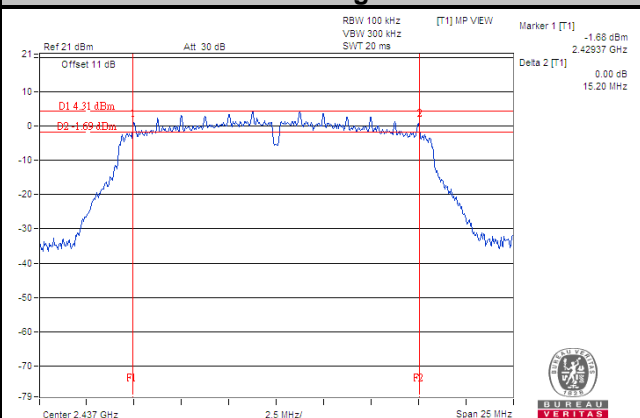
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	37.41	36.98	0.5	Pass
6	2437	35.48	36.18	0.5	Pass
9	2452	37.41	36.77	0.5	Pass

### Spectrum Plot of Worst Value

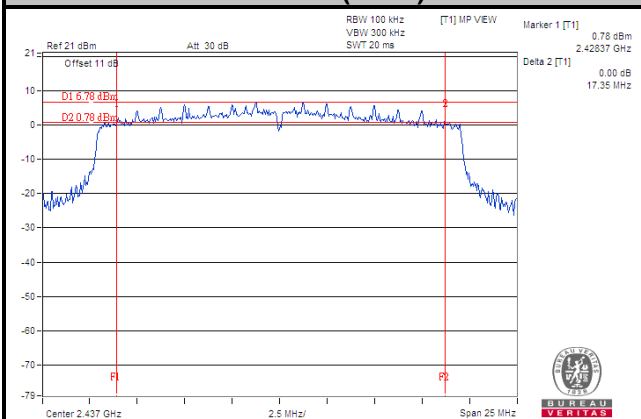
#### 802.11b



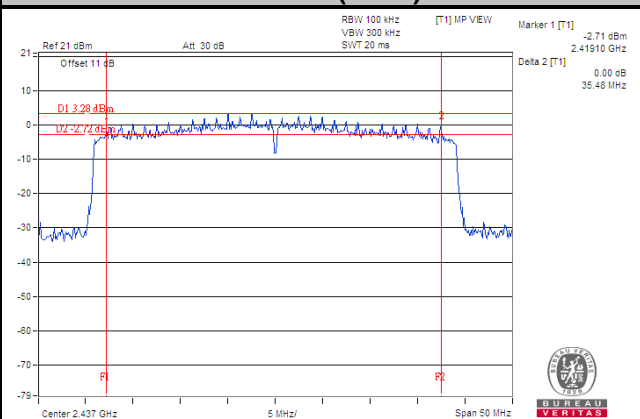
#### 802.11g



#### 802.11ax (HE20)

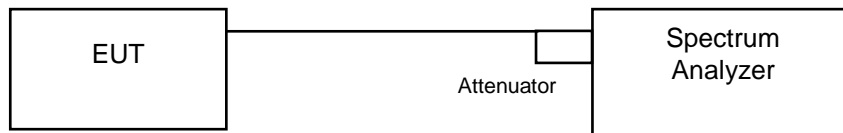


#### 802.11ax (HE40)



## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Test Setup



### 4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

### 4.4.4 Deviation from Test Standard

No deviation.

### 4.4.5 EUT Operating Conditions

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



#### 4.4.6 Test Results

##### 802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	12.52	Pass
6	2437	12.60	Pass
11	2462	12.72	Pass

##### 802.11g

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	16.68	Pass
6	2437	16.68	Pass
11	2462	16.78	Pass

##### 802.11ax (HE20)

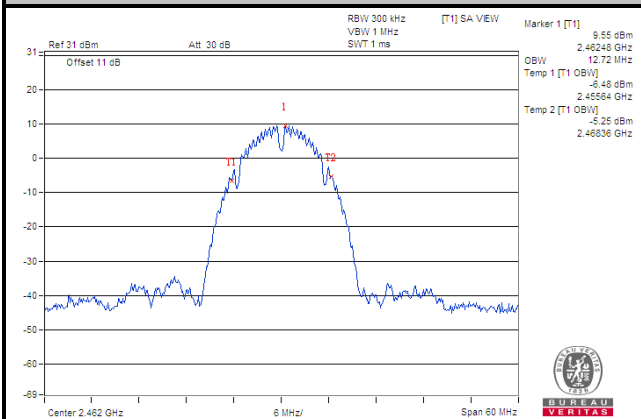
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
1	2412	18.87	18.84	Pass
6	2437	19.08	19.08	Pass
11	2462	19.08	19.08	Pass

##### 802.11ax (HE40)

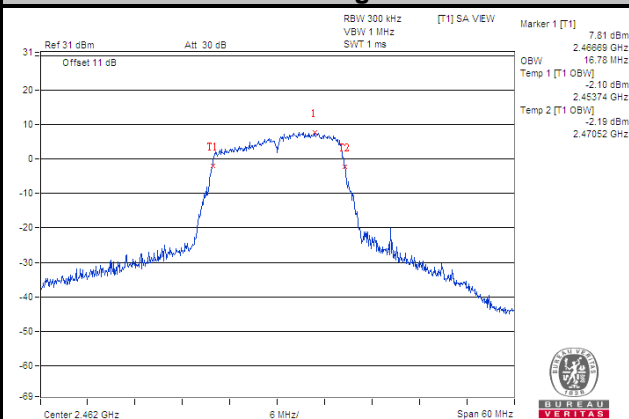
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
3	2422	37.80	37.68	Pass
6	2437	37.80	37.80	Pass
9	2452	37.80	37.92	Pass

### Spectrum Plot of Worst Value

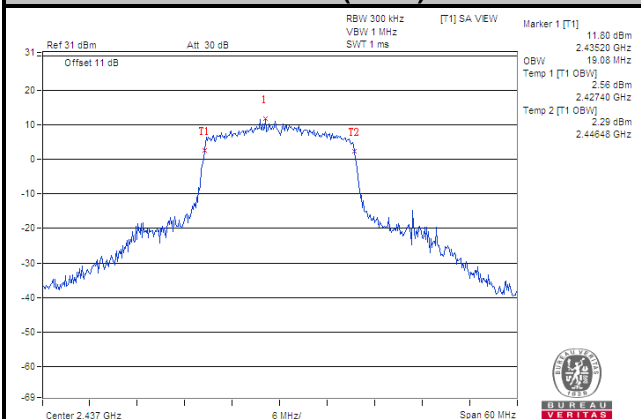
**802.11b**



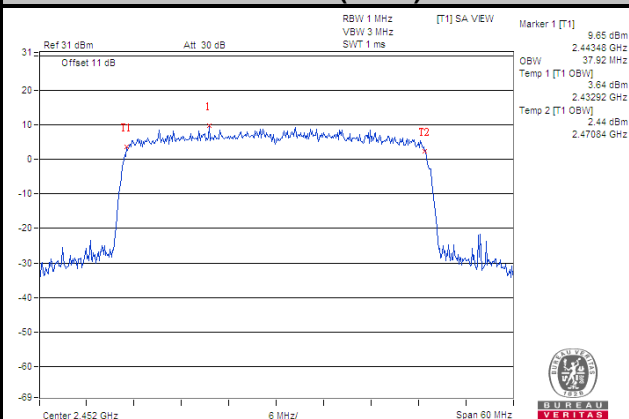
**802.11g**



**802.11ax (HE20)**



**802.11ax (HE40)**



## 4.5 Conducted Output Power Measurement

### 4.5.1 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,

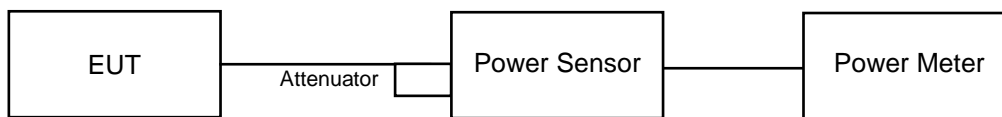
Array Gain = 0 dB (i.e., no array gain) for NANT  $\leq$  4;

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

Array Gain =  $5 \log(\text{NANT}/\text{NSS})$  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 =  $10 \log(\text{NANT}/\text{NSS})$  dB.

### 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 Procedures

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.

### 4.5.5 Deviation from Test Standard

No deviation.

### 4.5.6 EUT Operating Conditions

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

#### 4.5.7 Test Results

#### CDD Mode

#### 802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	73.621	18.67	30	Pass
6	2437	74.302	18.71	30	Pass
11	2462	73.961	18.69	30	Pass

#### 802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	36.813	15.66	30	Pass
6	2437	37.584	15.75	30	Pass
11	2462	37.068	15.69	30	Pass

#### 802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.45	14.44	55.658	17.46	30	Pass
6	2437	15.90	15.23	72.247	18.59	30	Pass
11	2462	14.60	14.54	57.285	17.58	30	Pass

#### 802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.85	14.71	60.129	17.79	30	Pass
6	2437	15.56	15.34	70.173	18.46	30	Pass
9	2452	13.68	13.44	45.415	16.57	30	Pass

### 802.11n (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.50	14.46	56.109	17.49	30	Pass
6	2437	15.92	15.26	72.658	18.61	30	Pass
11	2462	14.63	14.56	57.616	17.61	30	Pass

### 802.11n (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.87	14.73	60.407	17.81	30	Pass
6	2437	15.58	15.36	70.497	18.48	30	Pass
9	2452	13.70	13.46	45.624	16.59	30	Pass

### 802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.52	14.48	56.368	17.51	30	Pass
6	2437	15.94	15.28	72.993	18.63	30	Pass
11	2462	14.66	14.58	57.949	17.63	30	Pass

### 802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.89	14.75	60.686	17.83	30	Pass
6	2437	15.61	15.39	70.985	18.51	30	Pass
9	2452	13.72	13.48	45.835	16.61	30	Pass

### Beamforming Mode

#### 802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	11.44	11.43	27.831	14.45	30	Pass
6	2437	12.89	12.22	36.126	15.58	30	Pass
11	2462	11.59	11.53	28.644	14.57	30	Pass

#### 802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	11.84	11.70	30.067	14.78	30	Pass
6	2437	12.55	12.33	35.089	15.45	30	Pass
9	2452	10.67	10.43	22.709	13.56	30	Pass

#### 802.11n (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	11.49	11.45	28.057	14.48	30	Pass
6	2437	12.91	12.25	36.331	15.60	30	Pass
11	2462	11.62	11.55	28.81	14.60	30	Pass

#### 802.11n (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	11.86	11.72	30.206	14.80	30	Pass
6	2437	12.57	12.35	35.251	15.47	30	Pass
9	2452	10.69	10.45	22.814	13.58	30	Pass

**802.11ax (HE20)**

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	11.51	11.47	28.186	14.50	30	Pass
6	2437	12.93	12.27	36.499	15.62	30	Pass
11	2462	11.65	11.57	28.977	14.62	30	Pass

**802.11ax (HE40)**

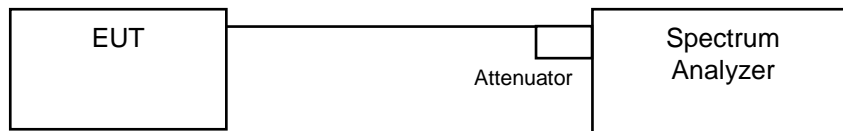
Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	11.88	11.74	30.345	14.82	30	Pass
6	2437	12.60	12.38	35.495	15.50	30	Pass
9	2452	10.71	10.47	22.919	13.60	30	Pass

## 4.6 Power Spectral Density Measurement

### 4.6.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 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

For Average Power (Duty cycle  $\geq 98\%$ )

- a. Set instrument center frequency to DTS channel center frequency.
- b. Set span to at least 1.5 times the OBW.
- c. Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d. Set VBW  $\geq 3 \times \text{RBW}$ .
- e. Detector = power averaging (RMS) or sample detector (when RMS not available).
- f. Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span}/\text{RBW}$ .
- g. Sweep time = auto couple.
- h. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- i. Use the peak marker function to determine the maximum amplitude level.

For Average Power (Duty cycle  $< 98\%$ )

- a. Measure the duty cycle (x).
- b. Set instrument center frequency to DTS channel center frequency.
- c. Set span to at least 1.5 times the OBW.
- d. Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- e. Set VBW  $\geq 3 \times \text{RBW}$ .
- f. Detector = power averaging (RMS) or sample detector (when RMS not available).
- g. Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span}/\text{RBW}$ .
- h. Sweep time = auto couple.
- i. Do not use sweep triggering. Allow sweep to "free run".
- j. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- k. Use the peak marker function to determine the maximum amplitude level.
- l. Add  $10 \log (1/x)$ , where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.



#### 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

##### 802.11b

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-16.19	8	Pass
6	2437	-15.51	8	Pass
11	2462	-16.1	8	Pass

##### 802.11g

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3 kHz)	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-21.65	0.09	-21.56	8	Pass
6	2437	-20.81	0.09	-20.72	8	Pass
11	2462	-20.05	0.09	-19.96	8	Pass

##### 802.11ax (HE20)

TX Chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	1	2412	-23.3	3.01	0.45	-19.84	8	Pass
	6	2437	-19.85	3.01	0.45	-16.39	8	Pass
	11	2462	-22.9	3.01	0.45	-19.44	8	Pass
1	1	2412	-23.51	3.01	0.45	-20.05	8	Pass
	6	2437	-19.69	3.01	0.45	-16.23	8	Pass
	11	2462	-23.62	3.01	0.45	-20.16	8	Pass

#### NOTE:

- Directional gain =  $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 2.75 \text{ dBi} < 6 \text{ dBi}$ , so the limit no need to be reduced.
- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.

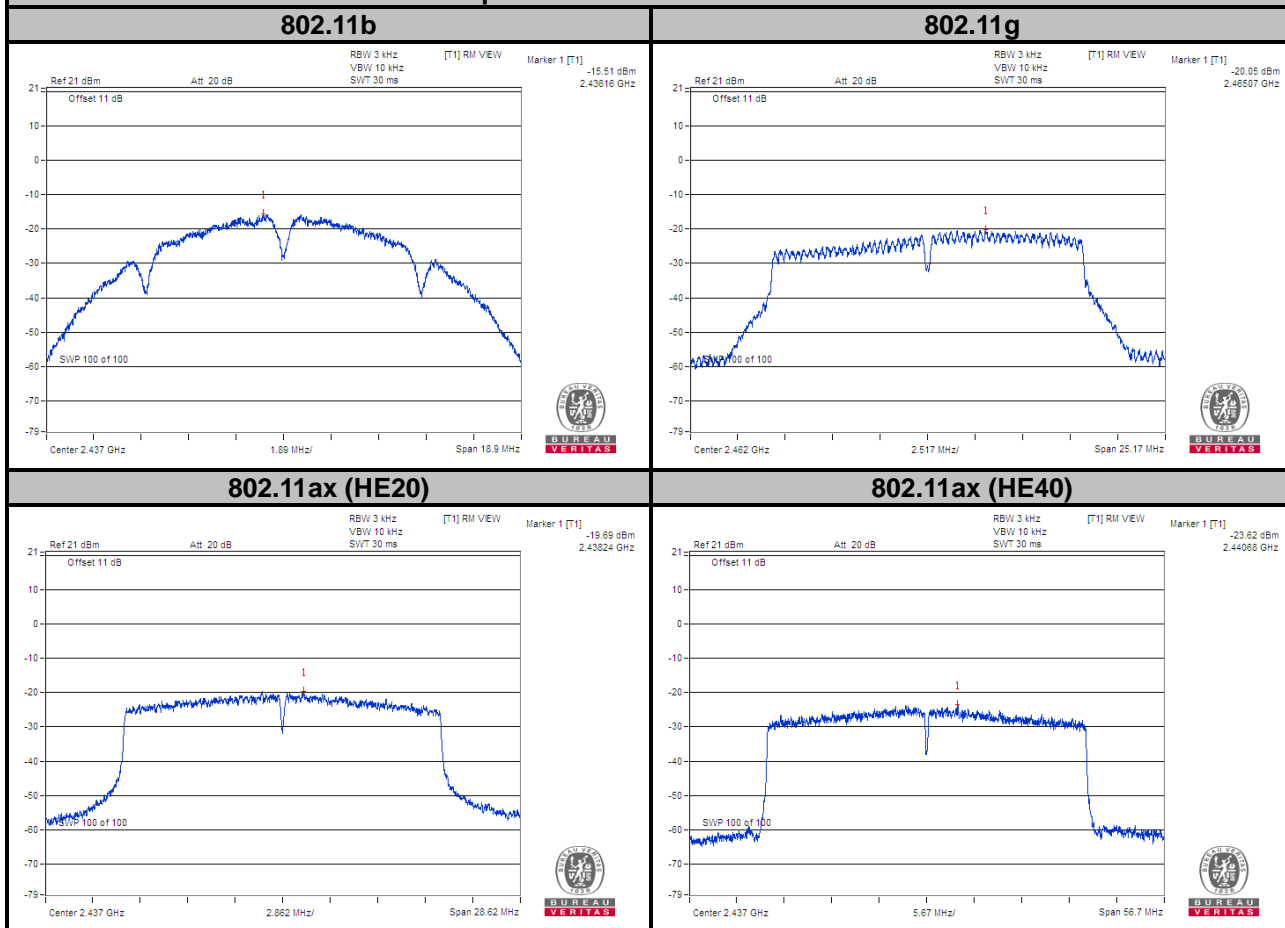
### 802.11ax (HE40)

TX Chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	3	2422	-25.4	3.01	0.77	-21.62	8	Pass
	6	2437	-23.93	3.01	0.77	-20.15	8	Pass
	9	2452	-27.42	3.01	0.77	-23.64	8	Pass
1	3	2422	-26	3.01	0.77	-22.22	8	Pass
	6	2437	-23.62	3.01	0.77	-19.84	8	Pass
	9	2452	-27.21	3.01	0.77	-23.43	8	Pass

**NOTE:**

- Directional gain =  $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 2.75 \text{ dBi} < 6 \text{ dBi}$ , so the limit no need to be reduced.
- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.

### Spectrum Plot of Worst Value

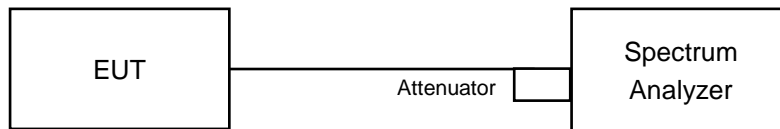


## 4.7 Conducted Out of Band Emission Measurement

### 4.7.1 Limits of Conducted Out of Band Emission Measurement

Below -30 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

### 4.7.2 Test Setup



### 4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.7.4 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.

### 4.7.5 Deviation from Test Standard

No deviation.

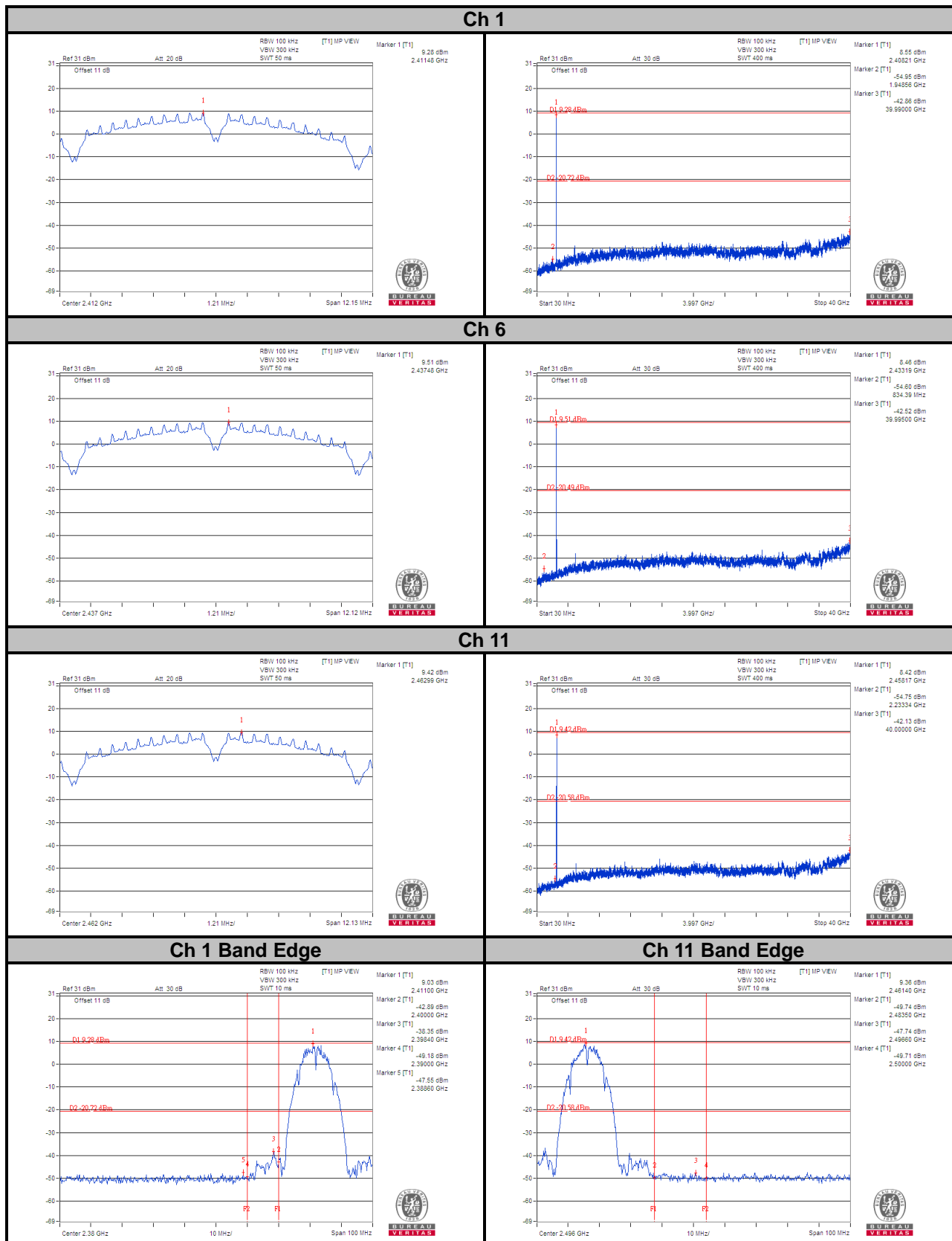
### 4.7.6 EUT Operating Condition

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

### 4.7.7 Test Results

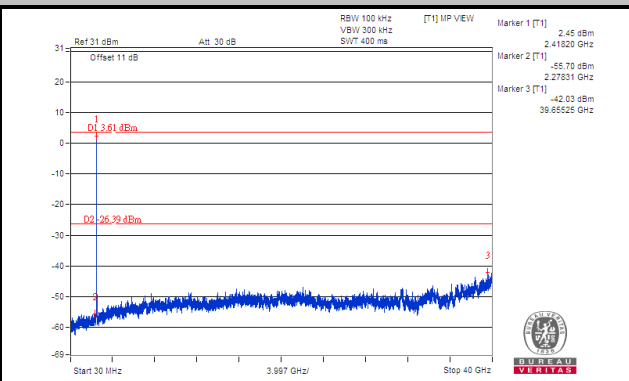
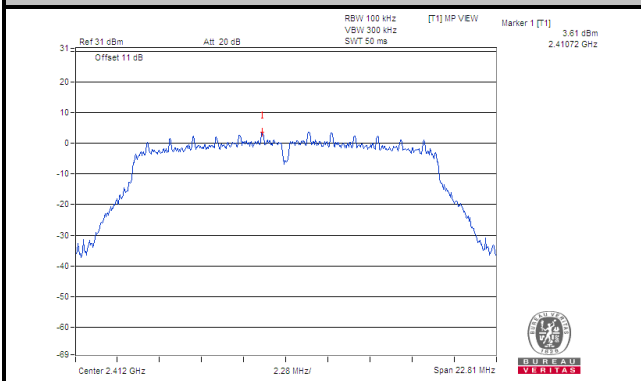
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 30 dB offset below D1. It shows compliance with the requirement.

#### 802.11b

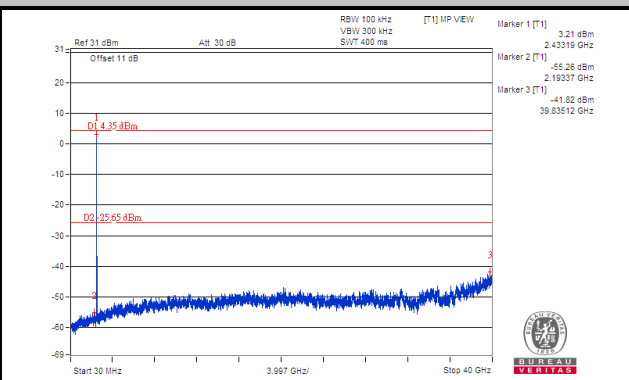
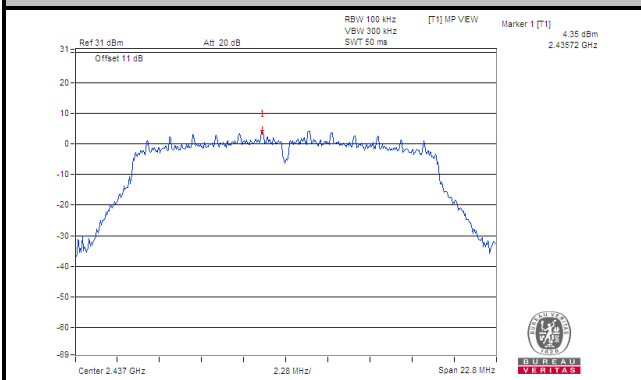


# 802.11g

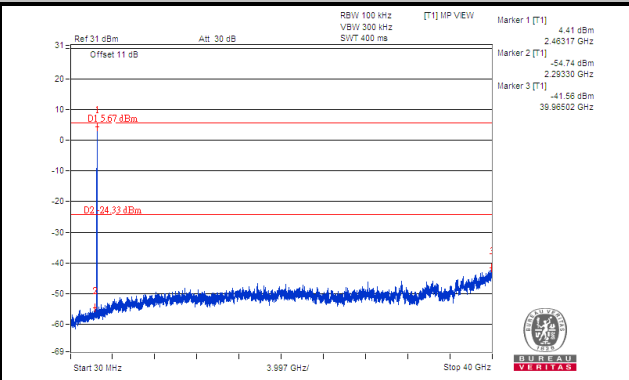
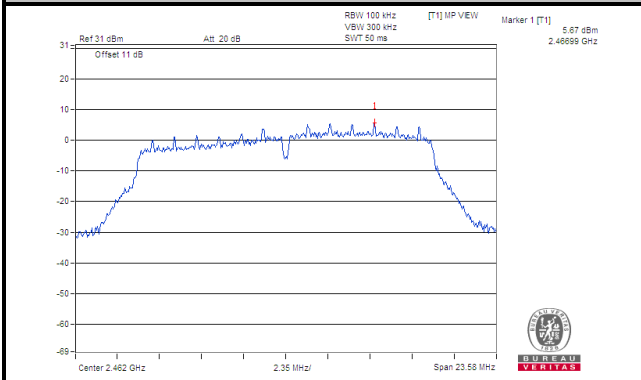
## Ch 1



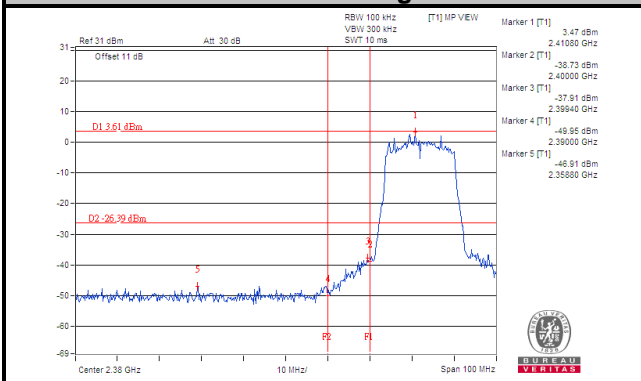
## Ch 6



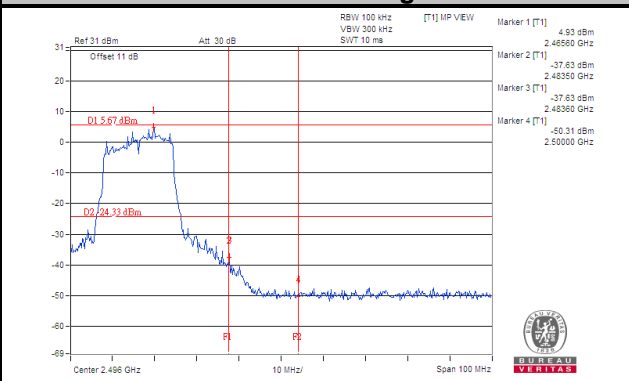
## Ch 11



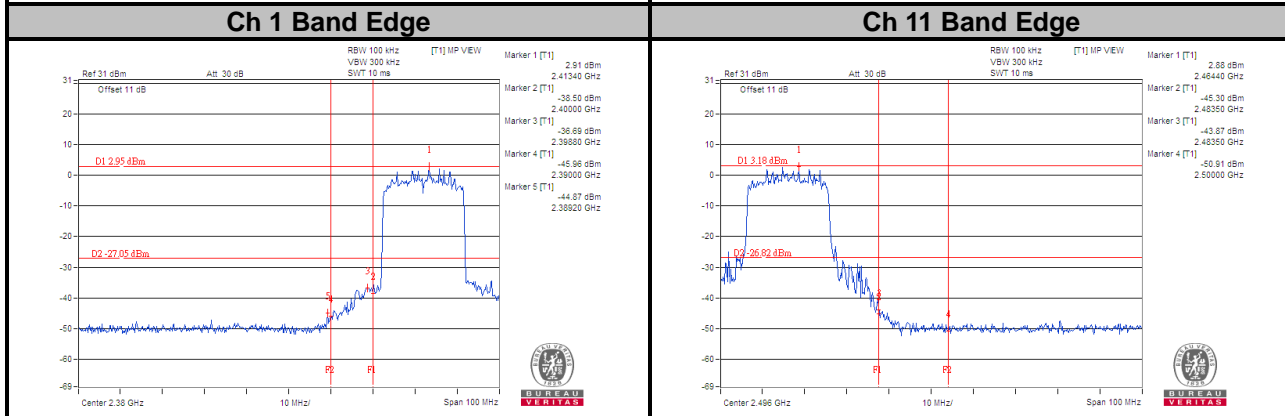
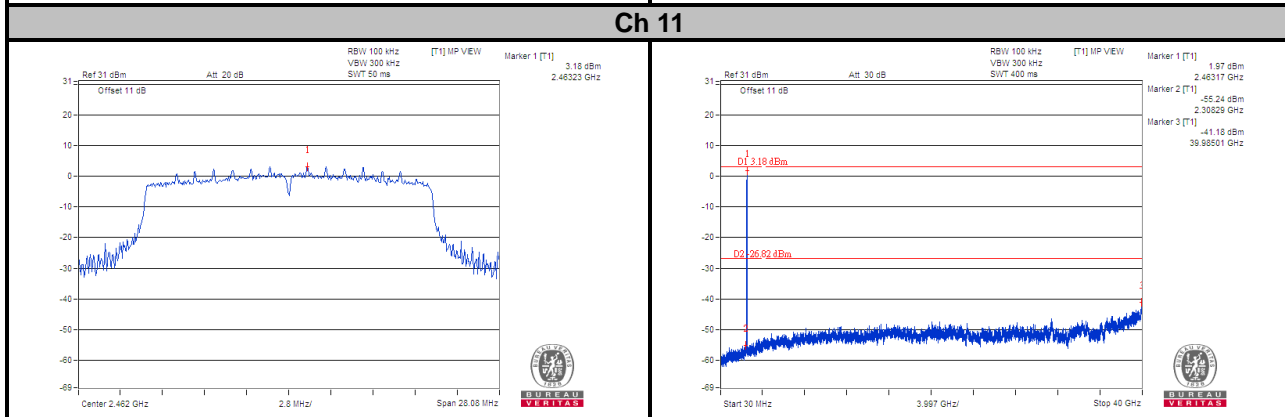
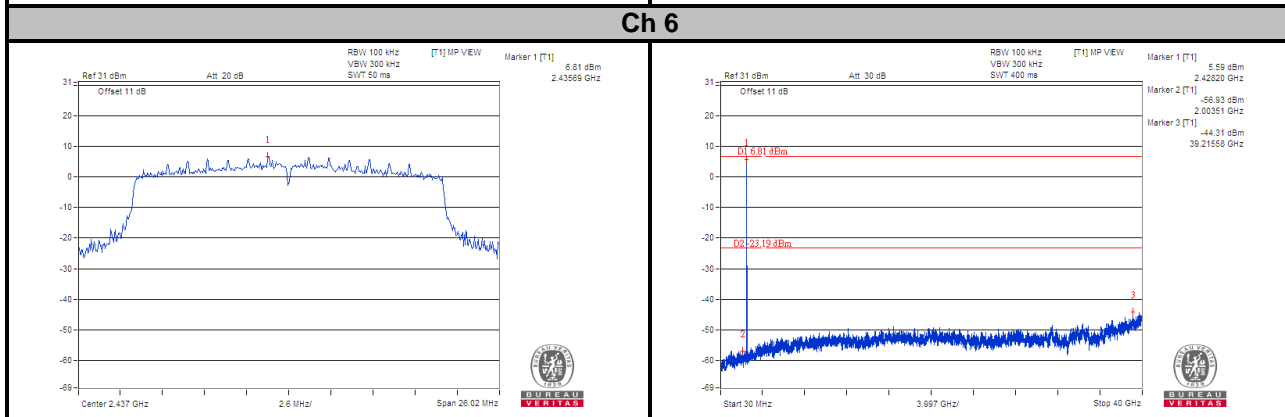
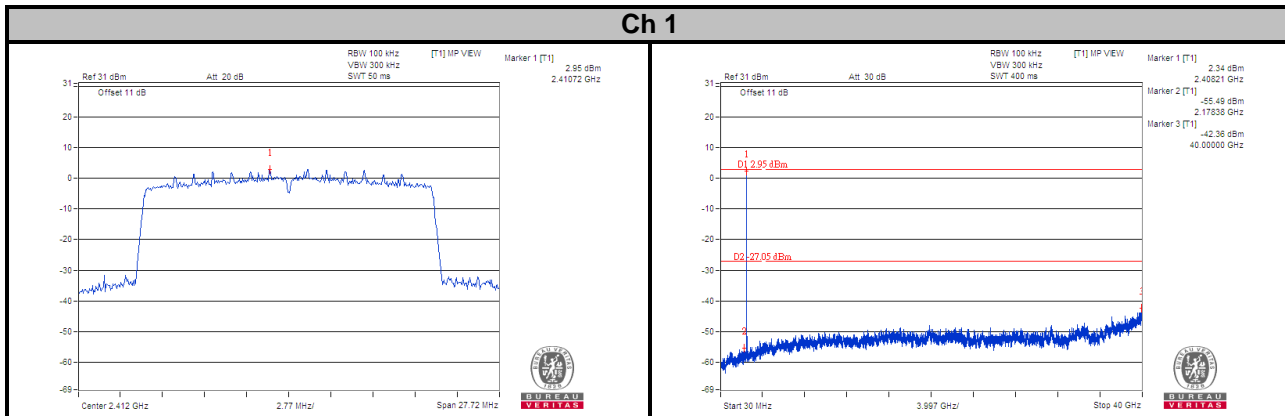
## Ch 1 Band Edge



## Ch 11 Band Edge

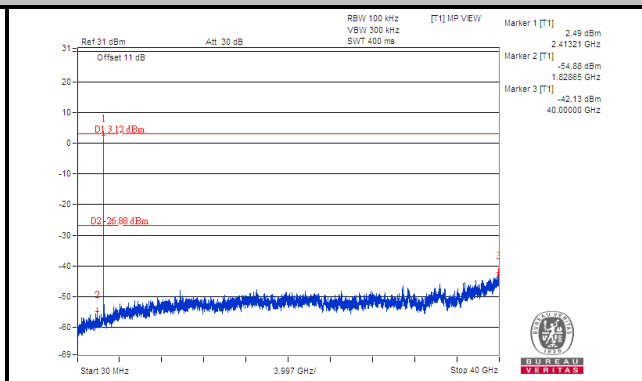
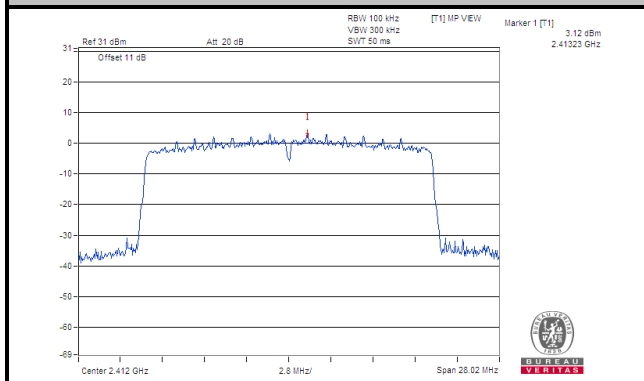


**802.11ax (HE20)**  
**CHAIN 0**

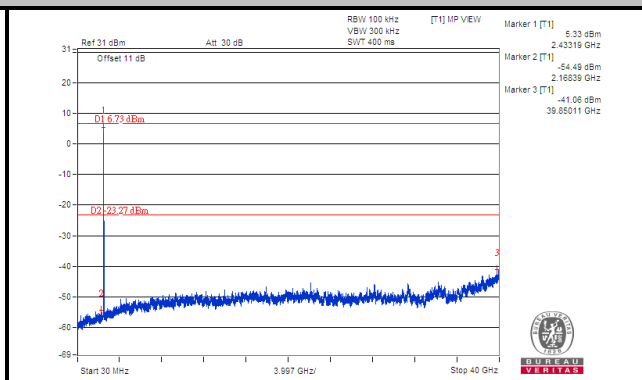
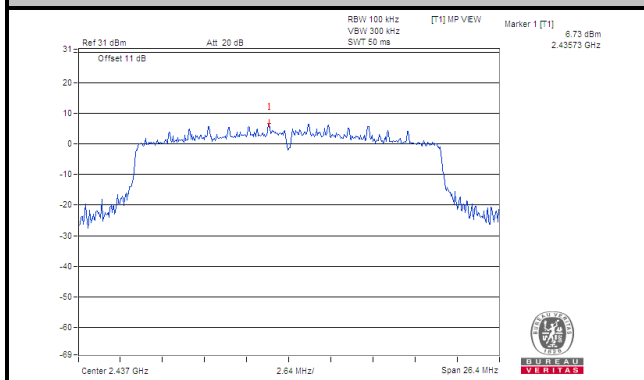


### CHAIN 1

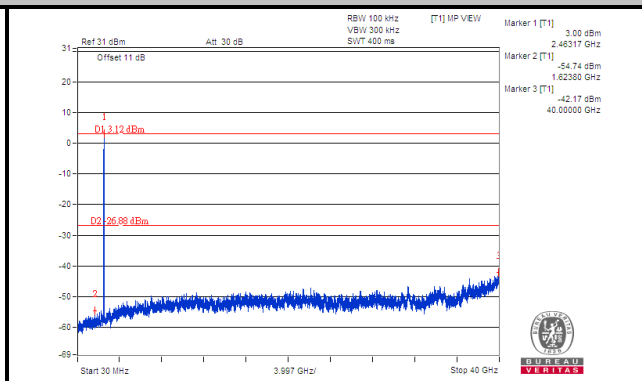
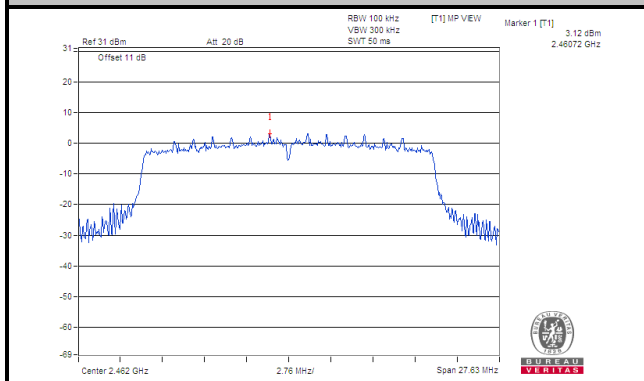
#### Ch 1



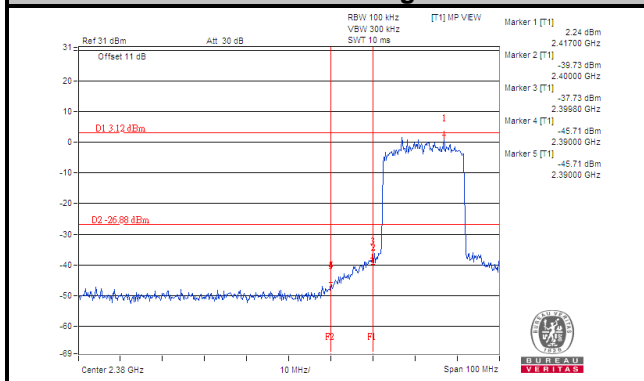
#### Ch 6



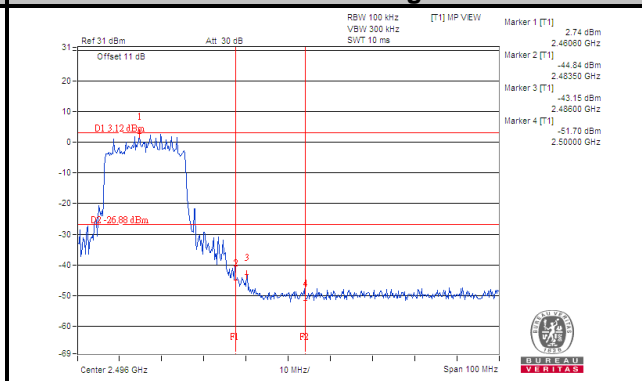
#### Ch 11



#### Ch 1 Band Edge



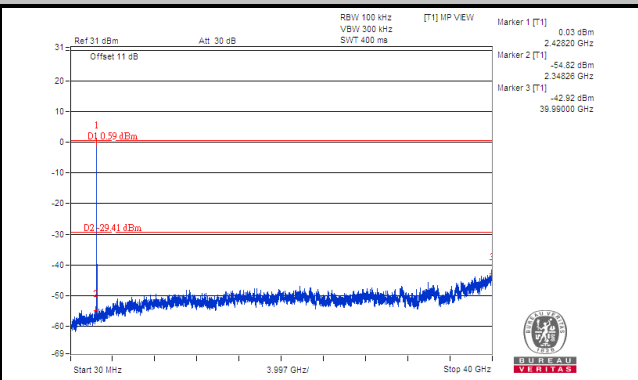
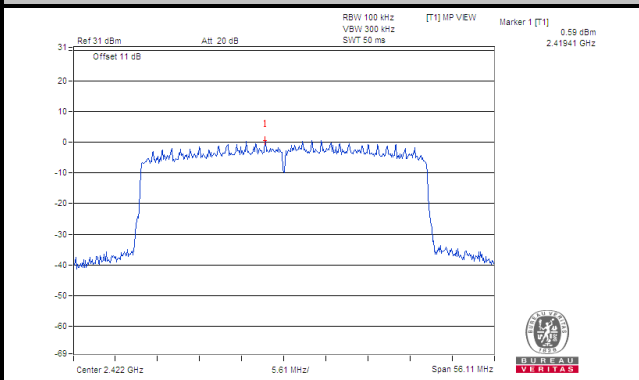
#### Ch 11 Band Edge



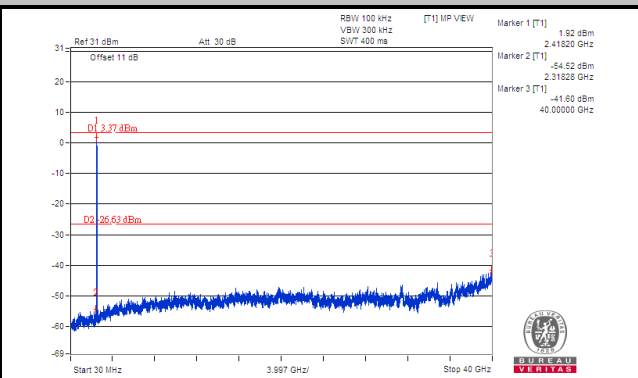
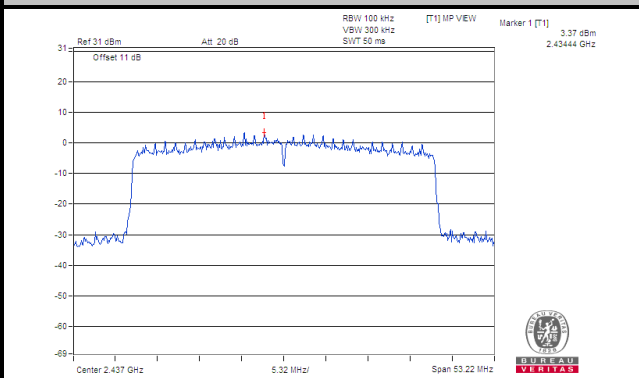


**802.11ax (HE40)**  
**CHAIN 0**

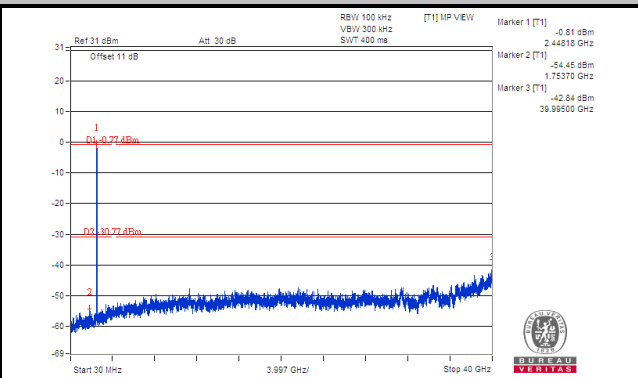
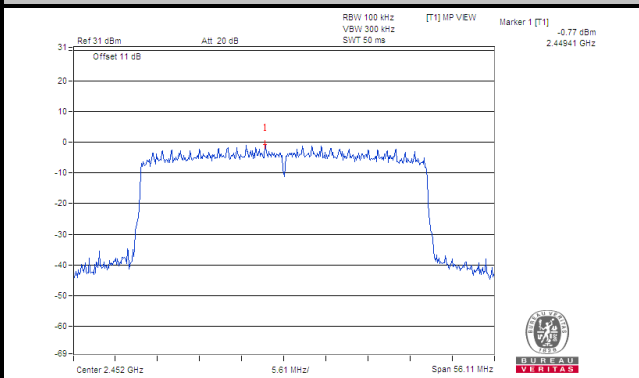
**Ch 3**



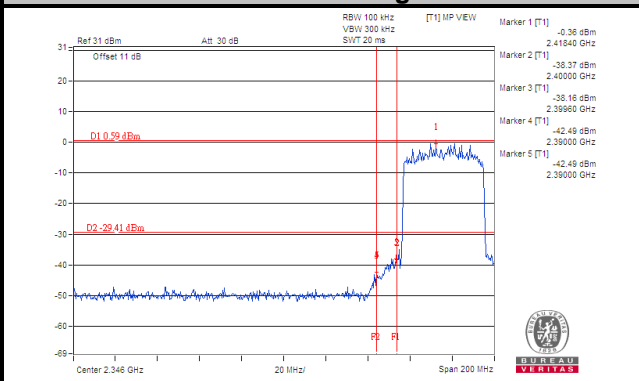
**Ch 6**



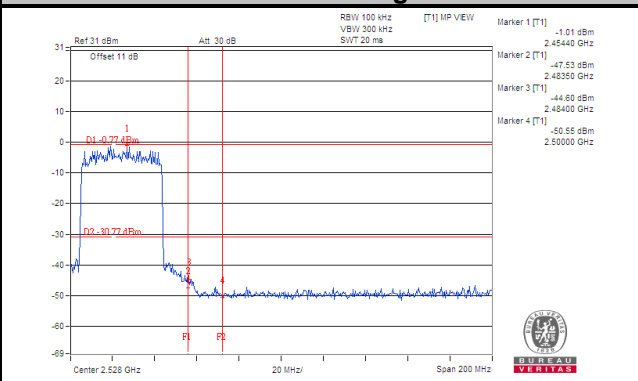
**Ch 9**



**Ch 3 Band Edge**

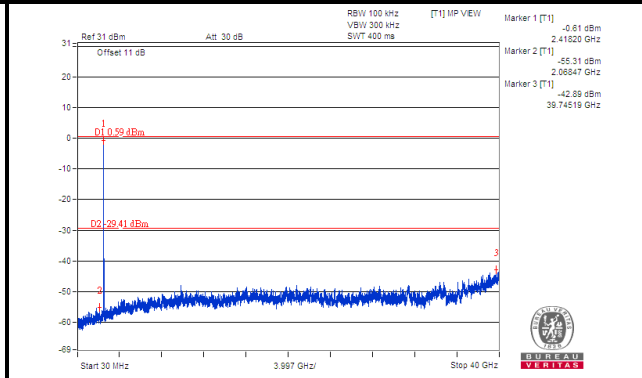
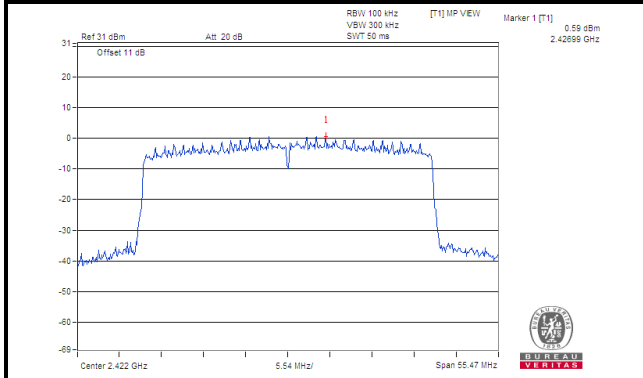


**Ch 9 Band Edge**

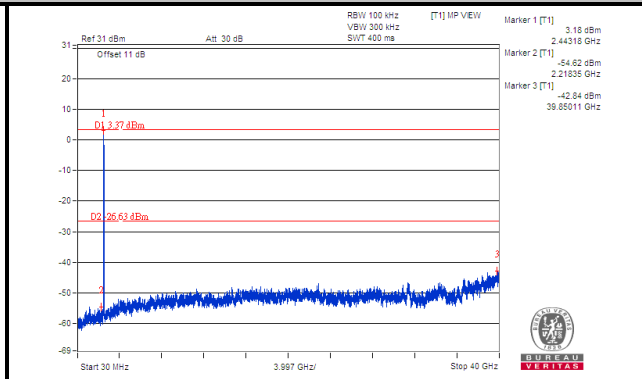
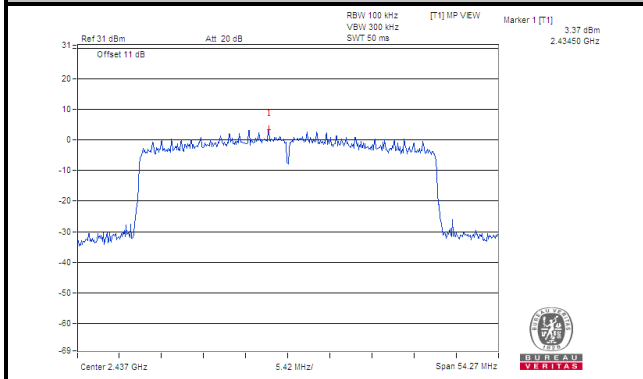


CHAIN 1

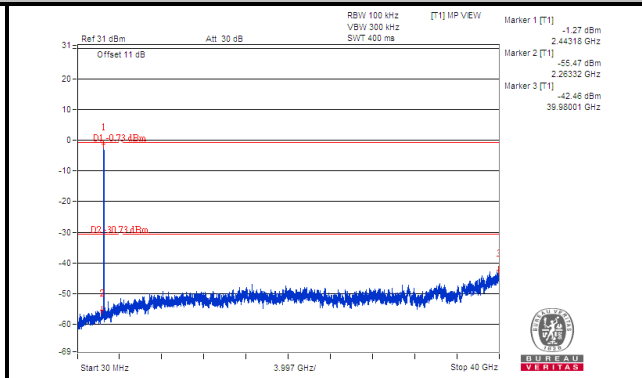
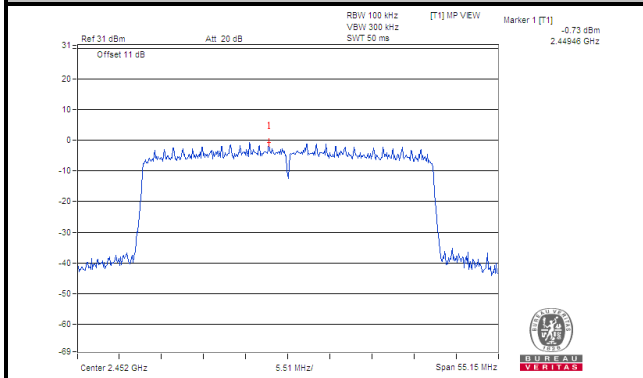
Ch 3



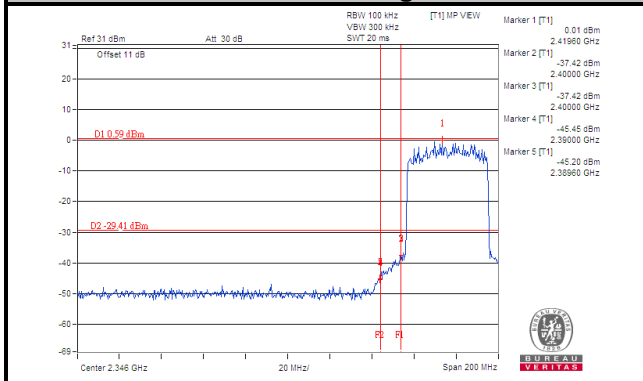
Ch 6



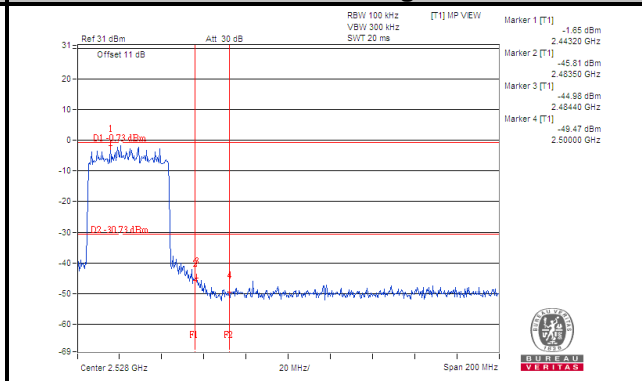
Ch 9



Ch 3 Band Edge



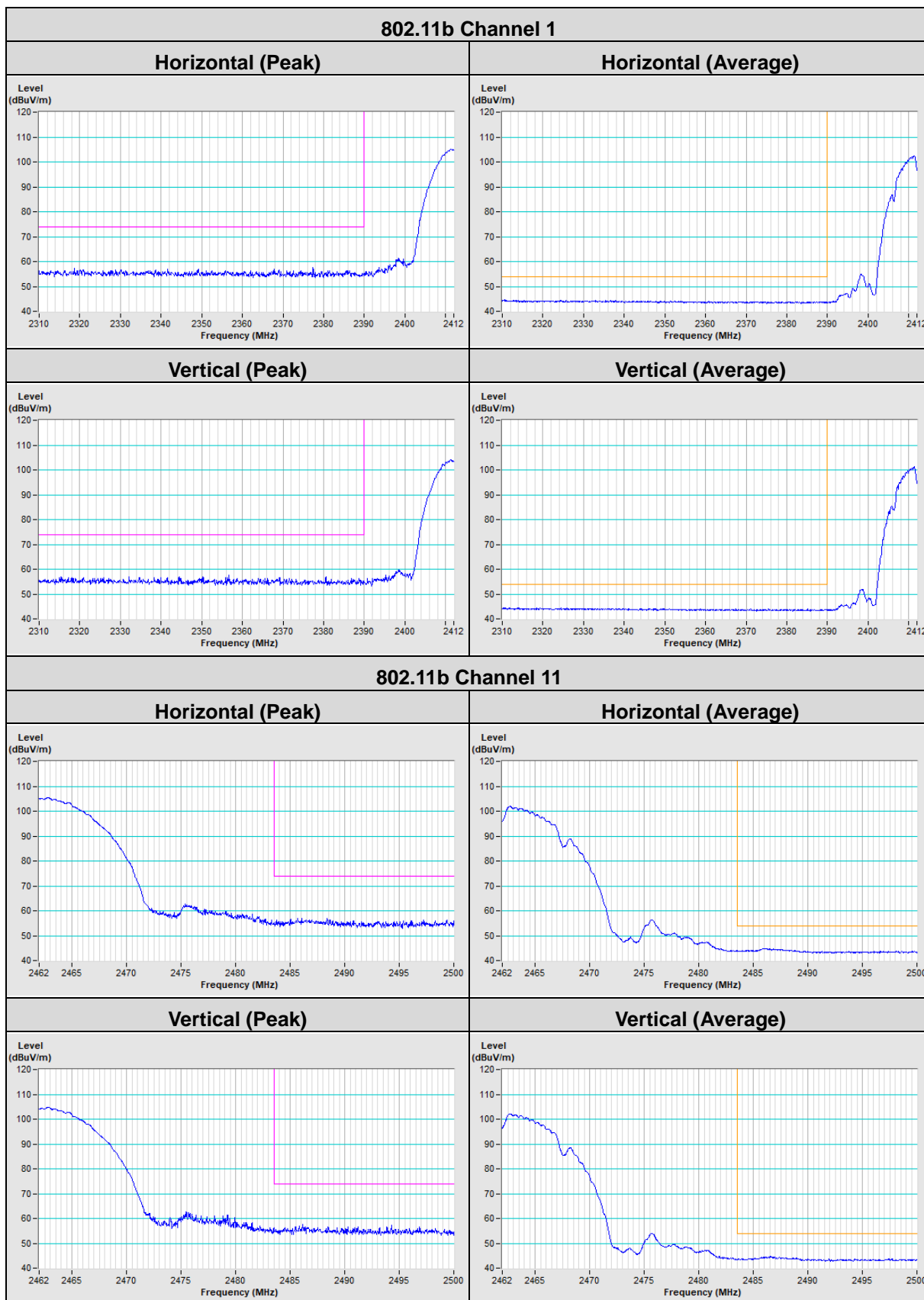
Ch 9 Band Edge



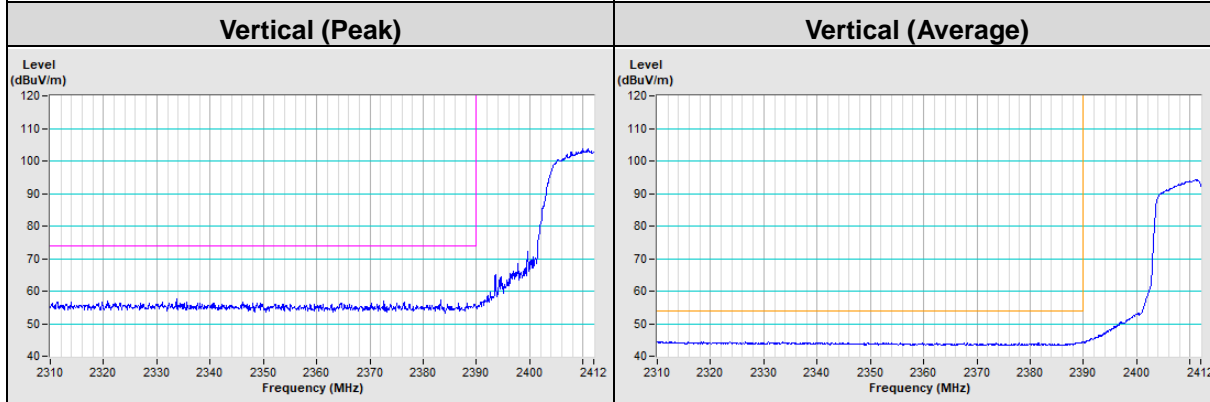
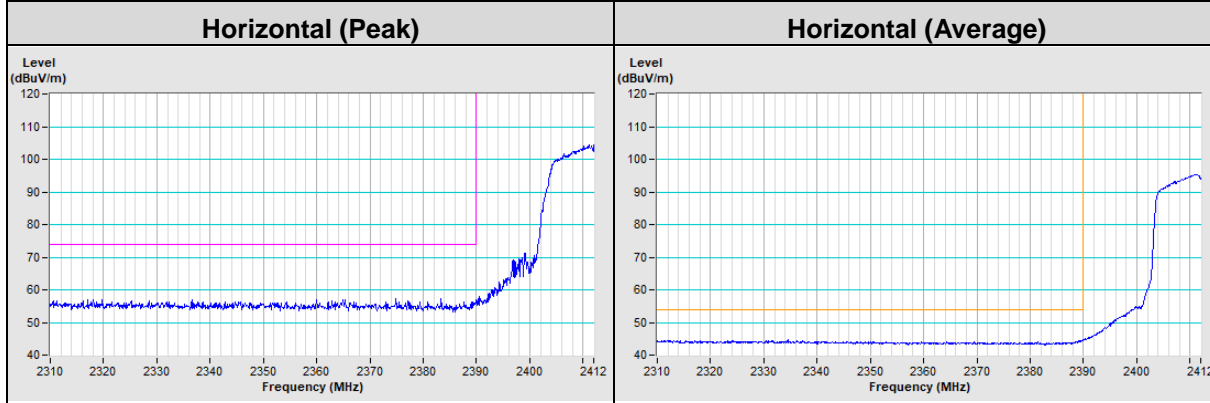
## 5 Pictures of Test Arrangements

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

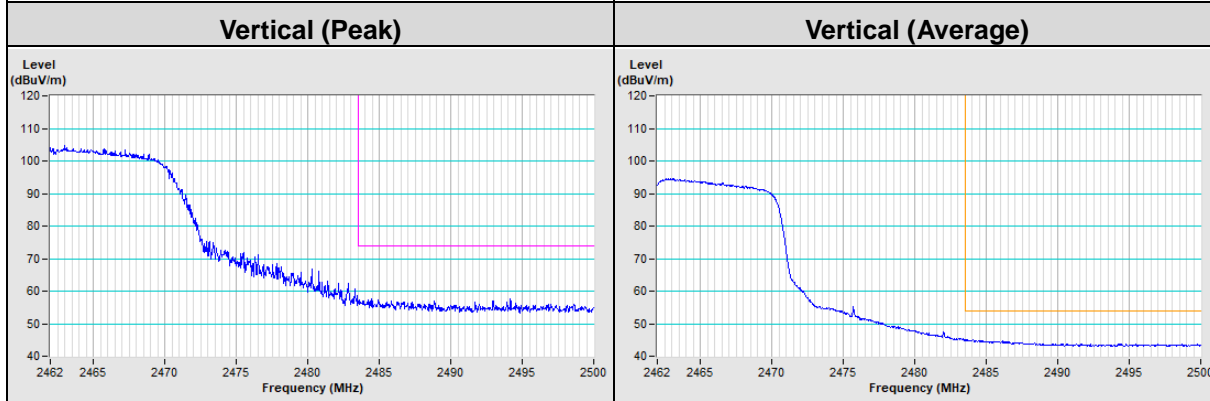
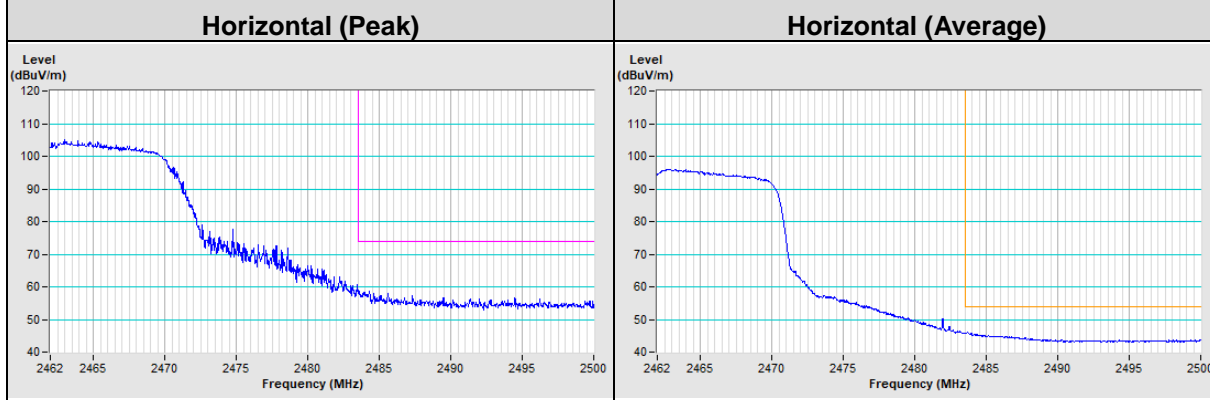
### Annex A- Band Edge Measurement



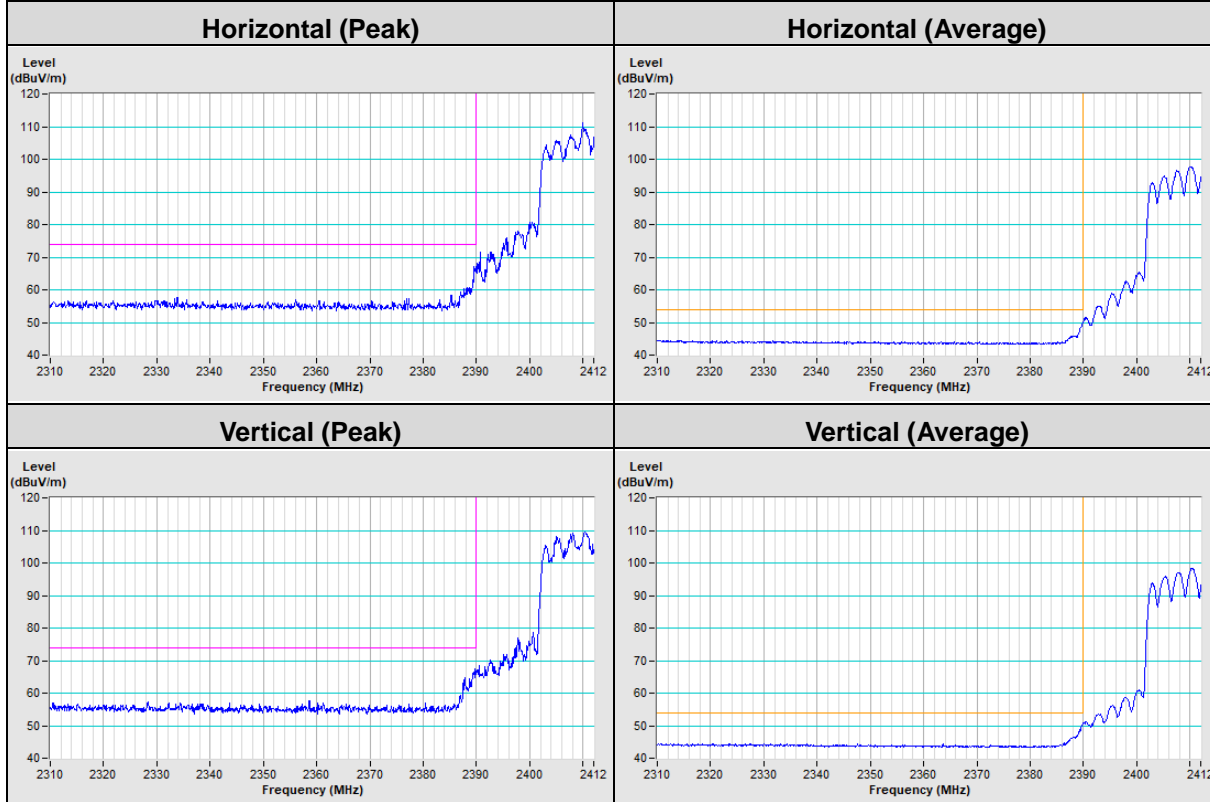
### 802.11g Channel 1



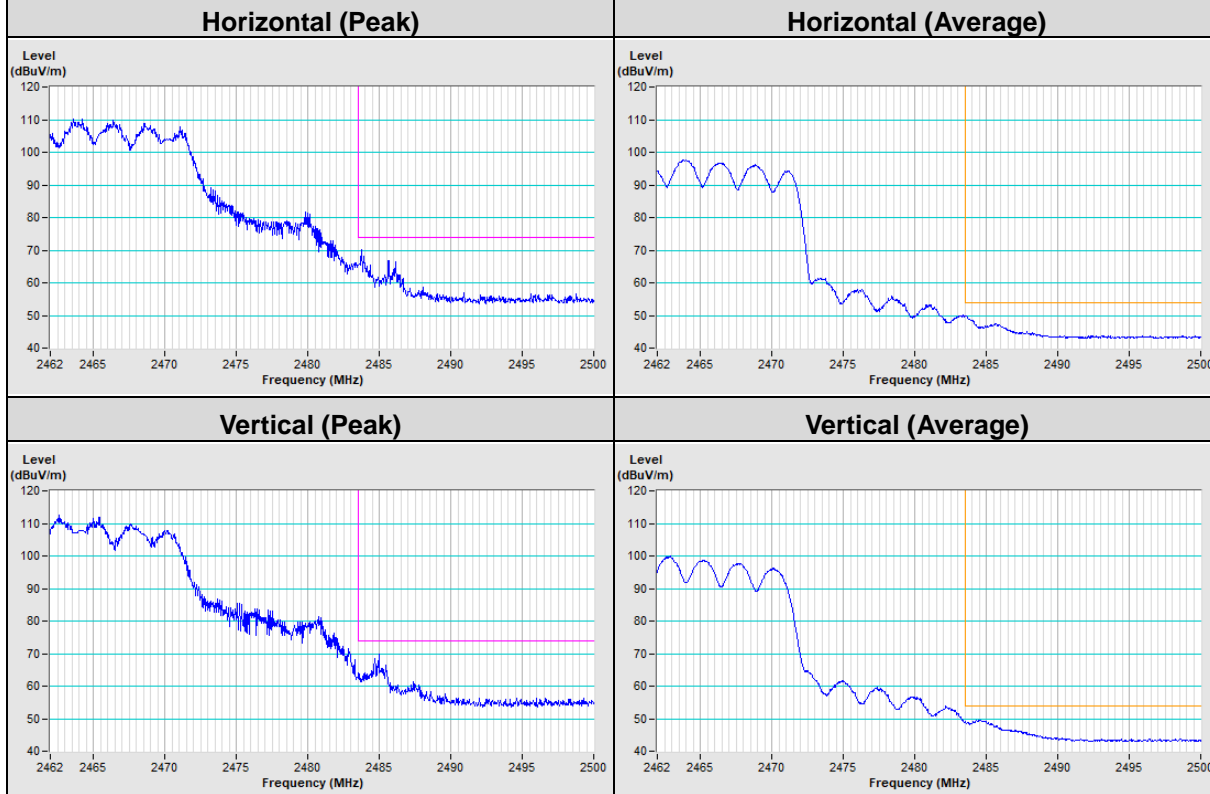
### 802.11g Channel 11



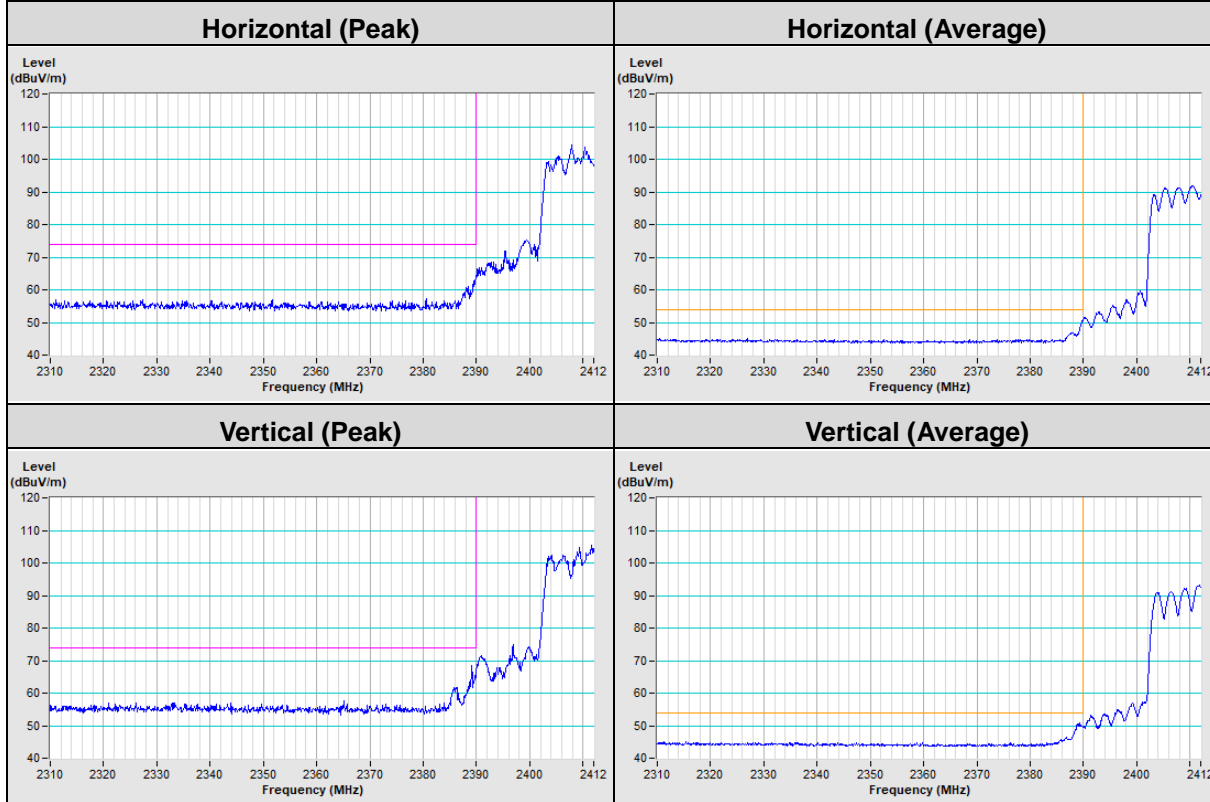
### 802.11ax (HE20) Channel 1



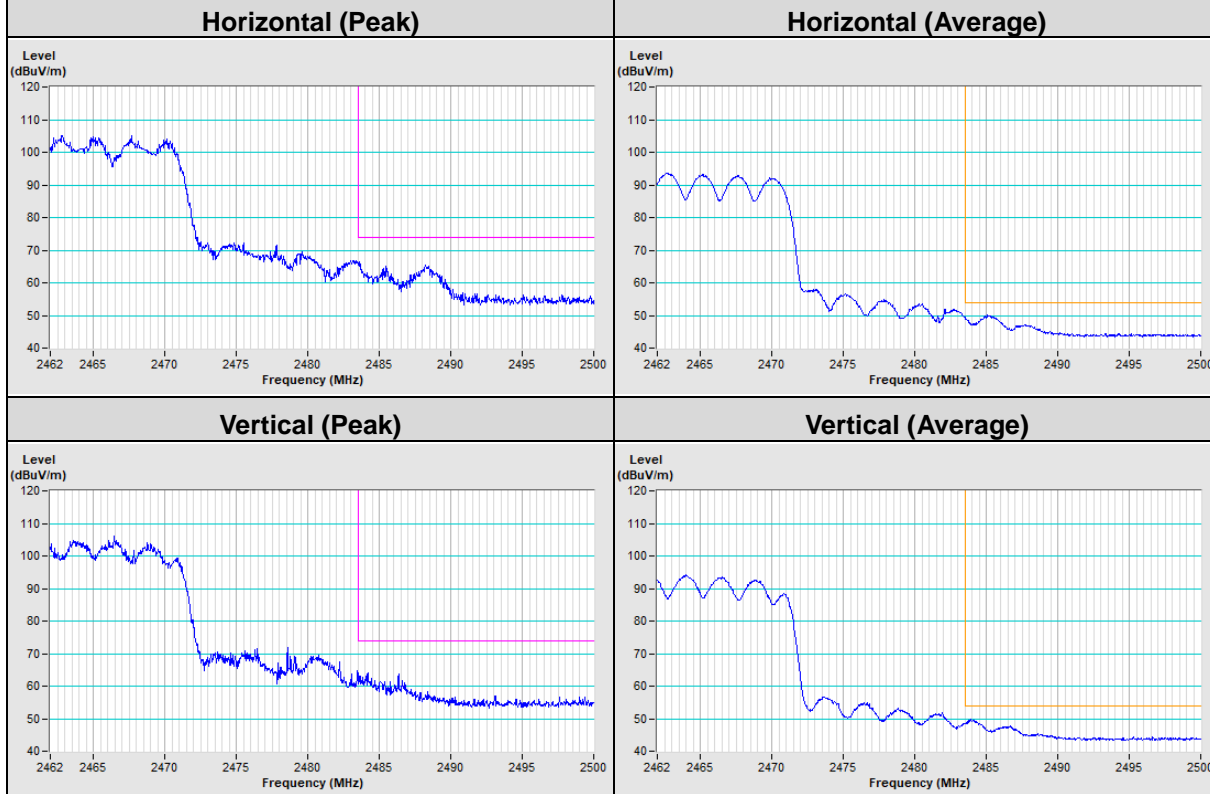
### 802.11ax (HE20) Channel 11



### 802.11ax (HE40) Channel 3



### 802.11ax (HE40) Channel 9



## 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.

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

--- END ---